
JL
Lm56, m32
N50·2
98871

Legislative Bodies wherein the Hon. Speaker and the Legislature Secretariat staffi will be discussed and it is entirely left to you, Sir. . ."

MR. SPEAKER:—"Four hours for this Demand and so the whole day will be taken up."

*THE HON. SRI B. GOPALA REDDI:—"There is a little constitutional change that has come over under this Demand. Previously under the Government of India Act, the Speaker's salary and the Deputy Speaker's salary were voted and not charged and the Ministers' salaries were charged previously, but now under the present Constitution of India, Ministers' salaries have become voted and your salaries have become charged. So, that is the constitutional change. Perhaps, in consonance with the position of the Speaker, his salary should be a charge on the revenues of the State and not voted as the salaries of Ministers. Previously the position was otherwise. I think, it is a welcome change and, as I said, it is in consonance with your exalted position. So, Sir, I move the Demand."

MR. SPEAKER:—"Motion moved—

'That Government be granted a sum not exceeding Rs. 55,10,300 under Demand IX—Heads of States, Ministers and Headquarters Staff.'"

JANAB M. MUHAMMAD ISMAIL:—"Mr. Speaker, Sir, I move—

'That the allotment of Rs. 55,10,300 for Heads of States, Ministers and Headquarters staff be reduced by Rs. 100 to discuss the failure of the Government to place a definite

SECRETARIAT LIBRARY 22 OCT 1952 MADRAS GOVERNMENT

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY JULY 8 1950

SECRETARIAT LIBRARY 9 AUG 1950 MADRAS

TABLE OF CONTENTS

Tuberculosis Service in Scotland REPORT BY SCOTTISH COMMITTEE 61
Treatment of Painful Amputation Stumps W. RITCHIE RUSSELL, M.D., F.R.C.P., and J. M. K. SPALDING, B.M. 68
P.T.A.P.: Determination of Essential Lf Dosage GUY BOUSFIELD, M.D., and LEWIS B. HOLT, M.SC. 73
Ill Effects of Radium Menopause HUGH C. MCLAREN, M.D., F.R.C.S.Ed. 76
Observations on Treatment of Thyrotoxicosis IAN MURRAY, M.D., F.R.C.P.Ed. 80
Body Weight in Graves's Disease HUGH CONWAY, M.B., M.R.C.P. 84
Treatment of Simple Epithelial Cysts with Secondary Photo-Electron Radiation LIONEL COHEN, M.B., and SAMUEL A. KIMMEL, M.B. 87

MEDICAL MEMORANDA
Plasmodium vivax Infection. S. K. MUKHERJEE, M.B.Cal., M.R.C.P., D.T.M.&H., and A. K. MITRA, M.B.Cal. 88
Unusual Case of Subacute Intussusception with Spontaneous Elimination. M. E. FORRESTER, M.B., B.S., D.C.H., and J. M. BOYD, M.B., B.S. 89

REFRESHER COURSE
The Management of Pulmonary Tuberculosis. F. H. YOUNG, O.B.E., F.R.C.P. 97

GENERAL ARTICLES AND NEWS
THE ITALIAN HOSPITAL 99
Royal College of Surgeons 100
HARVEIAN SOCIETY DINNER 101
TUBERCULOSIS IN SOUTH KOREA 102
MEDICAL LIBRARIANSHIP IN GREAT BRITAIN 102
ORDER OF ST. JOHN OF JERUSALEM 103
Nova et Vetera 103
MEDICAL NOTES IN PARLIAMENT 112
UNIVERSITIES AND COLLEGES 117
MEDICAL NEWS 119
BIRTHS, MARRIAGES, AND DEATHS 120
QUESTIONS AND COMMENTS 121

MEDICO-LEGAL
Claim Against Doctors Fails 116

Epidemiology Section 118

LEADING ARTICLES
Crisis in Tuberculosis 92
Demand for Early Settlement 93
The Annual Meeting 94

ANNOTATIONS
The Physiology of Learning 94
Central Action of Tubocurarine 95
Stillbirths 95
Children and the Cinema 96

REVIEWS
The Sulphonamides 90
A Study of Antibiotics 90
The Hounaman Monkey 90
Handbook of Therapeutics 91
Books Received 91

OBITUARY
S. Ernest Dore, M.D., F.R.C.P. 110
J. F. Ward, M.D., F.R.C.P. 111
James Lyons, M.D., M.Ch., F.R.C.S.Ed. 111
Bethia M. Newlands, M.B., D.P.H. 112
Kenneth McAlpine, M.B. 112

SUPPLEMENT
118th Annual Meeting: Programme *13*
Remuneration of General Practitioners *18*
Prescribing in the Health Service *24*
CORRESPONDENCE *25*
ASSOCIATION NOTICES *26*

CORRESPONDENCE
Stress and the General Adaptation Syndrome. FF. ROBERTS, M.D.; G. S. W. EVANS, M.D.; J. H. D. MILLAR, M.D. 106
Delayed Feeding of Premature Infants. A. G. WATKINS, M.D., and J. JACOBS, M.D. 106
Vascular Changes in Diabetes. R. D. LAWRENCE, M.D. 107
Cancer of the Lung and Smoking. E. L. TIGHE, M.D. 107
Smallpox in the Unvaccinated. J. W. GEMMILL, M.B. 107
Multiple Primary Carcinoma. H. J. MCCURRICH, M.S. 107
Popular Health Journal. C. G. EASTWOOD, M.D. 108
Ogilvie's Syndrome of False Colonic Obstruction. A. J. HOBSON, F.R.C.S. 108
The Medical Bill. W. B. MANLEY 108
Scarlet Fever, Rheumatic Fever, and Acute Nephritis. C. G. BURGESS, M.B. 109
Acute Tubular Necrosis. JOHN SOPHIAN, F.R.C.S. 109
Intestinal Obstruction Due to Food. A. R. BANHAM, F.R.C.S.; GEORGE A. JACKSON, M.R.C.P. 109
Morphine in Status Asthmaticus C. WATNEY ROE, M.R.C.S. 110
Mission to Lepers. A. DONALD MILLER 110

REPORTS OF SOCIETIES
MANCHESTER MEDICAL SOCIETY: Some Unusual Cases 104

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON, W.C.1

No. 4670, WEEKLY, PRICE 2/-

Copyright

REGISTERED AS A NEWSPAPER

The awkward age

—so it used to be called. We now think the Teens have a grace of their own and we encourage their new interest in appearances. Footwear is still a problem because the Teens are still growing. Clarks, who take the Teens seriously, make good-to-look-at shoes with a little extra space at the toe for growth. These shoes are made in several widths to each size, the right width decided by means of Clarks special footgauge which measures for girth as well as for length and breadth. A well-fitted Clarks shoe keeps smart and, even more important, it keeps growing feet straight and strong.

Clarks
SHOES

Established 1825

Protein deficiency

Some new facts about amino acids

EVERY physician is familiar with the problem of delayed convalescence associated with loss of weight. Recent medical research into the metabolism of protein after illness, injury or shock, throws a new light on a vexed problem.

Some ten amino acids are known to be essential in the diet. They must be ingested, for they cannot be made in the body. In this they resemble most vitamins, but unlike vitamins, they cannot be stored. By building tracer elements into synthetic essential amino acids, it has been possible to show that these substances are immediately built into protein tissues. From this it follows that tissue protein is constantly being broken down and built up anew.

The acute stage of illness or injury is marked by a vastly increased urinary nitrogen excretion. This catabolic phase, as it is called, is believed to be due to protein-raiding on the part of the patient in order to provide an increase of the essential amino acids needed for repair. After a short initial period, it is known that a high intake of first-class protein in the diet is capable of reversing the negative nitrogen balance.

Where there is loss of weight, there is frequently loss of appetite also. The ideal protein diet, therefore, is one which will tempt the palate and which will throw no undue strain on the digestive processes.

The particular advantages of Brand's Essence in the above conditions are:—

1. **It is soluble animal protein of high biological value.**
2. **It promotes gastric secretion.**
3. **It is extremely palatable.**
4. **As it can be taken as a jelly or a liquid, it is easy to ingest, digest and absorb.**



Issued by the makers of BRAND'S ESSENCE

As an Antacid
or in febrile conditions
Invalid
Lembar
justifies the doctor's highest recommendation. Obtainable from registered Pharmacists

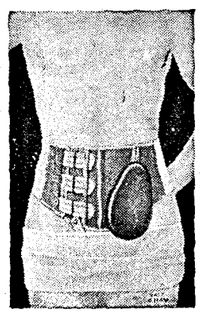
Lemon Juice	38.0% w/v
Sucrose	23.7% w/v
Liquid Glucose B.P.	28% w/v (equivalent to Dextrose (Monohydrate) 10.5% w/v)
Barley (*Sol. Extract*) from	7.4% w/v

Plus flavouring and permitted preservative.

MADE BY RAYNER AND COMPANY LIMITED, LONDON, N.18

HIGHLY SATISFACTORY RESULTS
follow the adoption of
SALTS PATENT COLOSTOMY BELT

Since we first introduced this Belt we have supplied many hundreds, and the results have been highly satisfactory. Outstanding advantages are: (1) Receiver is detachable and sterilizable by boiling; (2) Bag easily removed without removal of belt; (3) Bag easily emptied and washed; (4) No crevices or metal fittings to hold faeces; (5) Smell reduced to a minimum; (6) Less bulk than the old style. Bags are easily and economically replaced. Further details and Measure/Order forms available to professional people on request.



Appointments at London address: 1, STANLEY HOUSE, 103, Marylebone High Street, London, W.1 Tel.: Welbeck 3034

Guarantee
We guarantee Aseptic Belts to remain free from defects in workmanship or material for a period of three years from the date of supply. Should any defect develop during this period, we undertake to repair or replace the Belt free of charge.
Salt and Son Ltd.

SALT & SON LTD BIRMINGHAM 2

414

SECRETARIAT LIBRARY 1 1951 MADRAS GOVERNMENT

BRITISH MEDICAL JOURNAL

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

Edited by

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

VOLUME II, 1950

JULY TO DECEMBER

LONDON

BRITISH MEDICAL ASSOCIATION

TAVISTOCK SQUARE, W.C.1

JL
L m56, M32
N50-2



BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 8 1950

TUBERCULOSIS SERVICE IN SCOTLAND

REPORT OF A SUBCOMMITTEE* APPOINTED JOINTLY BY THE CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE OF SCOTLAND AND THE TUBERCULOSIS SOCIETY OF SCOTLAND

In June, 1949, the Central Consultants and Specialists Committee in Scotland and the Tuberculosis Society of Scotland set up a Joint Subcommittee to report on the effect of the National Health Service on the Tuberculosis Service, with special reference to specialists within that service. The Subcommittee has drawn up a report of the highest importance, not only to Scotland but to the rest of Great Britain. It is here reproduced in full.

Introduction

We have interpreted our remit as requiring us to consider the trend of development of the tuberculosis service, and, in association with this, the number of hospital beds which would be required for an optimum service, and the staff establishment which would be necessary to operate such an optimum service. We have given consideration to the training appropriate for specialists in this service and the relationship of these specialists to the medical officer of health. Our conclusions are contained in Part I of this report.

At an early stage in our deliberations we found our discussions constantly turning to the problems inherent in the present serious situation in the management and control of tuberculosis in Scotland. We accordingly prolonged our discussions in the hope of offering some suggestions on how this crisis might be overcome. These suggestions are contained in Part II of this report.

PART I

Historical

The clinico-pathological studies of the great hospital clinicians of the nineteenth century contributed very greatly to our knowledge and understanding of many diseases, among them the dreaded phthisis. These studies and Robert Koch's crucial discovery of the tubercle bacillus in 1882 established beyond all doubt the infectious character of the disease. Its importance as a problem in public health was thus starkly presented. This discovery, the prevalence of the disease, its deadliness, and its tragic social consequences all combined to throw out a challenge which was soon taken up by able and imaginative doctors. Methods of treatment were revolutionized and the value of the sanatorium regime of rest, fresh air, and good diet became quickly established. At first the influence of climate was misunderstood and exaggerated. It was Sir Robert Philip who placed the sanatorium in its proper perspective by associating it, as he did in Edinburgh between 1887 and the end of the century, with a properly devised dispensary and domiciliary service. Philip's concepts have guided the subsequent development of the organized tuberculosis services of this country, of which he is acknowledged to have been the founder.

It has been the customary pattern of the evolution of social services in our country that once an enterprise has been successfully set on foot by the voluntary efforts of its pioneers it is taken over for development by public authority. The tuberculosis service was no exception, and in 1912 it became the responsibility of the major local authorities. From then until 1948 the great bulk of sufferers from pulmonary tuberculosis were treated in institutions administered and staffed by these authorities. So far as the medical staff were concerned this had one unfortunate consequence, in that it tended to keep separate those who worked in dispensaries and those who worked in sanatoria or hospitals. In general, whilst the former aimed at becoming medical officers of health, the professional goal of the latter was a physician-superintendentship. This dichotomy was a defect, undesirable in the interests both of the individual patients and of the service. It arose chiefly in the service of the larger local authorities, who, however, by 1948 had gone far towards remedying it by staff integration.

There has been an important development within the tuberculosis field during the past two decades which has a significant bearing on any consideration of staffing problems within the service. During this period there has occurred a remarkable change in the therapeutic outlook, a steadily increasing use of active surgical procedures, and, more recently, the introduction of antibiotics and other forms of chemotherapy to supplement the old conservative

*The following were appointed by the Central Consultants and Specialists Committee of Scotland: Dr. J. G. M. Hamilton, Edinburgh (chairman); Dr. G. J. Cleland, Mauchline; Dr. I. Simson Hall, Edinburgh; Dr. A. Lyall, Aberdeen; Mr. T. Murray Newton, Glasgow; Dr. A. Smith, East Kilbride. The following were appointed by the Tuberculosis Society of Scotland: Professor Charles Cameron, Edinburgh (resigned); Dr. C. W. Clayson, Lochmaben; Dr. D. G. McIntosh, Dundee; Dr. A. Maclean, Glasgow; Dr. W. A. Murray, Drem. Dr. D. Bell, Aberdeen, and Dr. G. J. Summers, Edinburgh, were co-opted. Dr. E. R. C. Walker acted as the secretary of the subcommittee.

The subcommittee invited to assist them at particular meetings Dr. W. G. Clark, M.O.H. City of Edinburgh, and Miss M. O. Robinson, Chief Nursing Officer, Department of Health for Scotland, who are, of course, not responsible for the opinions expressed in the report.

sanatorium regime. A consequence of this change has been that the tuberculosis specialist is becoming more closely associated with the practices and methods of the general hospital. Indeed, it might almost be said that a cycle is being completed, and that tuberculosis, after a long period of relative segregation, is returning to the wide fold of general medicine.

Organization and Administration

The administration of the major part of the tuberculosis service has now become a function of the regional hospital boards. We agree that this change is desirable, for we feel that the initial diagnosis, in-patient or out-patient treatment, and aftercare of a person suffering from tuberculosis constitute a single clinical problem manifestly coming within the province of the hospital and specialist service under the regional hospital boards. We feel that division of function as between hospital and dispensary could not improve the working of the service, and indeed could only hamper its efficiency. We therefore return to the original conception of Philip of a combined hospital and dispensary unit served by a single medical staff. It seems most desirable that doctors working in this service should utilize and enhance their experience and skill by practice in out-patient diagnostic and therapeutic work, in the treatment of in-patients within the hospitals or sanatoria, and in diagnostic, therapeutic, follow-up, and preventive work in the homes of the people. On grounds of general principle we also feel that those who conduct the ancillary services of mass radiography and B.C.G. vaccination should have direct association with and interest in the other aspects of the service; they should not be condemned to long periods of repetitive routine without the stimulus of varied work. Such integration is no new concept. In Glasgow, for example, development had already proceeded far along these lines before the introduction of the National Health Service. It is our contention that the medical measures required for the control of tuberculous infection in the population at large are so intimately bound up with the care of persons suffering from the disease that they should be an integral part of the tuberculosis service administered by the regional hospital boards. We conceive that, apart from their statutory duties with reference to notifications and the Tuberculosis Register, the functions of the local health authorities through the medical officers of health should be concerned with provisions of a social and environmental character.

The following paragraphs summarize the general policy which we advocate concerning this aspect of the service:

(*a*) There should be close collaboration between the tuberculosis physician and the medical officer of health for the exchange of information and the integration of their separate functions.

(*b*) For the purposes of prevention of the spread of tuberculous infection and of the care and aftercare of the tuberculous patient the regional hospital board should provide the services of medical personnel and the local health authority should provide the services of health visitors, who, however, so far as their clinical work is concerned should be under the control of the senior tuberculosis physician.

(*c*) The work of diagnosis and treatment and of aftercare and prevention are in the modern view so closely related that no useful purpose would be served by requiring the tuberculosis physician and his staff to spend prescribed portions of their time in the service of the regional hospital board on the one hand and the local health authority on the other.

(*d*) The regional hospital board's staff should be responsible for domiciliary consultations at the request of general practitioners; for prescribing specialized domiciliary treatment, in the carrying out of which they should co-operate with general practitioners and health visitors; for the dispensary diagnostic service; for hospital treatment; for clinical aftercare; for the examination of contacts; and, so far as practicable, for the isolation of infection.

(*e*) The medical officer of health should be responsible, on behalf of the local health authority, for the provision of suitable accommodation (houses, shelters, etc.); beds, bedding, and nursing equipment; extra nourishment and clothing; domestic help; the boarding out of children from infected households; the establishment and management of preventoria. In all these matters he should have the advice of the tuberculosis physician.

(*f*) The part played by almoners and social welfare workers in rehabilitation and economic welfare is important. If these workers remain in the employment of the local health authority arrangements should be made whereby they work under the tuberculosis physician so that the latter may keep the medical officer of health informed of the medical aspects of the rehabilitation of individual patients.

(*g*) Mass radiography is a case-finding procedure. It should be regarded as a means leading to early treatment and thus to the prevention of the spread of tuberculous infection. The provision of a mass radiography service should therefore be the responsibility of the regional hospital board, whose officers should constitute the medical staff of the mass radiography units. At the same time much of the detailed administrative work required in the operation of a mass radiography service could be best carried out by the medical officer of health.

Development of the Tuberculosis Service into a Chest Service

There has been a noticeable but natural trend over the past two or three decades for the tuberculosis specialist to concern himself with pulmonary diseases other than tuberculosis. This appears to us to have come about through the introduction and development of such modern techniques as radiology, bronchoscopy, thoracic surgery, and chemotherapy. Furthermore, many tuberculosis specialists have deliberately changed the descriptive titles of their clinics and of themselves in an attempt to overcome the stigma associated with tuberculous disease so as to encourage patients to obtain specialist advice at an early stage. In this way there have arisen the "chest clinic" and the "chest physician." However, this development of the tuberculosis service into a specialist service for all respiratory diseases has been handicapped by the fact that many tuberculosis officers have in the past received a training which has been inadequate to qualify them for the specialist handling of non-tuberculous pulmonary diseases. In the past, tuberculosis officers entered the service of local authorities and, as we have pointed out, in many instances aimed at promotion, not to clinical posts as superintendents of sanatoria but to administrative posts as medical officers of health. It was therefore necessary for the young man in this field to take the Diploma in Public Health and, since his time was limited, to eschew the higher general medical qualifications, such as the M.R.C.P. Nevertheless, many energetic tuberculosis officers, with inclinations strongly developed towards clinical medicine rather than towards administrative work, have by experience and through their own initiative made themselves expert in respiratory diseases other than tuberculosis.

The tuberculosis service should be encouraged to develop into a full chest service working in close relationship with the general hospital and specialist service. At the same time those who are and will continue to be heavily involved in the diagnosis and care of patients suffering from tuberculous disease of the lung, which indeed must remain their predominant concern, will have special knowledge of the protean manifestations of tuberculous infection. Accordingly they should still be associated with the care of patients suffering from non-pulmonary tuberculous diseases, though there is obviously need for the services of appropriate "anatomical" specialists in the diagnosis and treatment of these diseases.

We therefore propose the following definition of the scope of the future chest service: (*a*) The diagnosis and treatment of tuberculous and other diseases of the chest.* (*b*) Co-operation with the appropriate specialists in the diagnosis and treatment of other forms of tuberculosis. (*c*) The aftercare of persons who have suffered from tuberculous disease. (*d*) The prevention of the spread of tuberculous infection. (*e*) Research and training.

Training

If the tuberculosis service is to develop into an adequate chest service the training of its officers must be altered and improved. The time has now come when the portal of entry into the specialty should be through general medicine and the M.R.C.P. rather than through the public health departments and the D.P.H. We feel that the tuberculosis or chest specialist ought to be thoroughly grounded in general medicine before taking up training in the specialty. With this idea in mind, and having made reference to the reports of the committees of the Royal College of Physicians of London on the training of various specialists, we offer the following recommendations regarding the period and nature of the training of chest physicians:

1st and 2nd years after graduation: Either (*a*) Two years in house-officer posts (of which one post must be in general medical wards); or (*b*) one year in house-officer posts (of which one post must be in general medical wards) and one year in general practice. The posts other than those in general medical wards might usefully be, *inter alia*, in infectious diseases hospitals or sanatoria.

3rd year—Junior registrar
4th year—Registrar
5th year—Registrar
} General Medicine. Obtains M.R.C.P.

6th year
7th year
8th year
} Senior registrar appointments within the chest service.

During the senior registrar period the aspirant should be encouraged to broaden his experience by travelling and by undertaking research work, or by working in non-clinical departments, such as those of anatomy or physiology. During this period he might with advantage acquire the Certificate in Public Health, but we see no particular advantage to be gained by his undertaking the longer and more elaborate course for the Diploma in Public Health.

It is very desirable in our view that the trainee specialist should not spend his early registrar years within the specialty. These years should be spent in the broader field of general medicine, and more closely specialized work should be taken up only after this period of general training has been completed—namely, at the senior registrar stage, or at least not earlier than the fifth year after graduation. It has been argued that this would leave the chest service deprived of junior men for doing routine hospital and dispensary work. However, the routine work referred to is in fact fundamentally important for the training of the chest specialist, and no senior registrar should feel demeaned by having to do such work after he has entered upon the training for his specialty.

*In accordance with the accepted view in this country the term "diseases of the chest" does not include conditions within the sphere of cardiology.

At the same time sanatoria and tuberculosis hospitals, like any others, require junior men of house-officer grade. While these have been difficult to recruit in the past and continue to be difficult to recruit, the requirement of a resident or intern post between graduation and registration proposed in the Medical Bill presently before Parliament should, when in force, provide a source of recruitment from which sanatoria and tuberculosis hospitals will benefit in the same way as general hospitals. It is contrary to his best interests for a young practitioner to declare his intention to enter this specialty by taking a house post in a tuberculosis hospital. A house post in such a hospital should be regarded as analogous to a house post in any other hospital and as providing the same type of experience.

Bed-requirements and Establishments

As noted above, it is our view that the tuberculosis service should be organized in units designed to include both the hospital and the dispensary aspects of the service, and served by a single integrated staff. Such a form of organization having been postulated, it was necessary to consider first the optimum size of population to be served by such a unit, and thereafter the composition of the proposed unit. After examining the position throughout Scotland, it seemed to us that the city of Dundee (population approximately 200,000) provided a suitably compact example which, in relation to both incidence of and deaths from tuberculosis, lay somewhere between the best and the worst. There was further justification for taking this as a model unit, for we were assured that for a concentrated population of this size a single tuberculosis dispensary (chest clinic) would be convenient for the needs of the community. In more sparsely populated districts it is evident that for a similar number of persons a greater number of dispensaries might well be needed to suit the convenience of both patients and staff. It seemed to us, in addition, that this unit of population could be reproduced singly or in multiples in the hospital regions of Scotland.

Estimates of the staff required for operating such a combined hospital-dispensary unit must naturally depend upon the amount of work to be carried out in the dispensary and the number of beds required for the treatment of patients suffering from tuberculosis amongst a population of this size. Various attempts have been made to estimate the optimum bed provision for tuberculosis. The Hospital Surveyors (1945), for example, used the formula of two-and-a-half times the number of deaths from pulmonary tuberculosis in 1938. The adoption of 1938 as the datum line was determined by the fact that this was the last year for which fully reliable figures were available to the surveyors. Since figures are now available for several post-war years, we tested the results of this method of estimation by applying various factors to the deaths in a variety of years both before and after the war. In addition, we obtained from physicians in the regions personal estimates of the regional bed-requirements. Some of the various figures so obtained are set out in the Appendix. It will be seen that no one of these formulae accurately matches all the estimates given by the physicians. The explanation of this divergence we consider to lie in the fact that these formulae could not wholly reflect such local differences as concentration or dispersion of population and the proportional incidence of pulmonary and non-pulmonary tuberculosis. Consequently, while we recognized that a general formula might have its value in deciding an overall policy, yet in respect of the problem under discussion the personal estimates of responsible physicians appeared more suitable.

On this basis we have estimated that for a population of 200,000 the appropriate bed-requirements would lie between 250 and 350.

Based on these figures, both of population and of bed-requirements, and after discussion of the working of such a combined hospital–dispensary unit at the present time, our recommendations are that the following would be an appropriate senior medical staff establishment (expressed in terms of whole-time officers) : three medical officers of trained rank, three senior registrars.

In our opinion the number of medical officers just suggested would be sufficient to undertake hospital, dispensary, and domiciliary attendances, mass radiography, and B.C.G. vaccination, and still leave a margin to permit of appropriate annual leave. It was never in our minds that the particular duties of each member of such a staff should be laid down in any hard-and-fast manner. The senior tuberculosis physician would naturally allocate the duties of the various members of his staff, but we should hope that he would usually find it possible to give the opportunity to all members of his staff to take part in the various activities of the unit. While we recognize that the training of many tuberculosis officers transferred from local authorities to regional hospital boards did not correspond with that which we recommend for the future, we urge the necessity for using the services of all such transferred officers within the integrated staffs we advocate.

We must emphasize at this point our recognition that regional differences in the incidence of tuberculosis, the density of population, and the concentration of hospital or other provisions might be sufficiently great as to render necessary considerable variations in the proposed establishment. It may be appropriate in some areas that one large hospital provides all or nearly all the required beds for a population served by several dispensaries. This might permit of some degree of concentration of staff. Conversely, in extensive and more sparsely populated areas a larger staff might be required to serve a larger number of dispensaries and smaller hospitals.

On the basis of the establishment discussed above, the staff requirements in the five Scottish regions would be as shown in the following Table, which also shows the staff requirements which were independently estimated by tuberculosis physicians in the regions :

Region	Physicians' Estimate	6 Staff per 200,000
Western	89	89
South-eastern	32	32
Eastern	14	12
North-eastern	11	14
Northern	7	6
Total for Scotland	153	153

House-officers

In addition to the staff proposed above it will be necessary for the tuberculosis hospitals and sanatoria to have an appropriate complement of house-officers whose duties should be confined to work in these hospitals. In the larger sanatoria an establishment of one house-officer to approximately 100 beds would be appropriate. It is evident, however, that many of the tuberculosis beds will be in hospitals of smaller size or in wards within general or fever hospitals. Wherever in such circumstances there is a concentration of 60 or more tuberculosis beds the establishment should provide for one house-officer. In the case of still smaller hospitals the services of one or more house-officers might be shared between several hospitals.

Clerical Staff

In the operation of any tuberculosis service there is bound to be a considerable volume of clerical work. We consider that the skill and time of the medical staff should not be dissipated in work which could be done satisfactorily by secretaries and clerks. Therefore, for each notional hospital–dispensary unit we recommend that there should be as a minimum : one secretary, two shorthand-typists, and one filing-clerk, exclusive of the staff required for the particular duties of the mass radiography unit.

Residential Accommodation

Since we envisage the employment of a not inconsiderable number of registrars of senior grade, many of whom may be married, we find it necessary to recommend that immediate steps be taken to increase the residential accommodation for men in this category employed at tuberculosis hospitals and sanatoria. We think that the recruitment of a sufficient number of senior registrars may be difficult under the conditions of accommodation obtaining just now at sanatoria, and because of the critical shortage of houses generally.

PART II

"Crisis Expansion"

During the months which have passed since we were appointed public attention has been increasingly drawn to the disturbing facts of the present tuberculosis situation in Scotland. As is now widely known, the salient point in this situation is that, whereas in England and Wales both the death rate and incidence rate, which rose during the second as during the first world war, have reverted almost to pre-war levels, in Scotland they have not done so. On the contrary, although there may be evidence of a commencing decline in the death rate, the notification figures continue to rise. It is of course recognized that these figures may not be a true index of incidence, since they may in part be explained by improved case finding through mass radiography, examination of contacts, and other means. Nevertheless, the stark fact remains that provision for known cases is tragically insufficient. It is now a common experience for doctors to be unable to arrange for patients suffering from tuberculosis the institutional care they know to be necessary. The important therapeutic advances of recent years make this situation the more distressing for all concerned.

We realize that the responsible authorities are fully aware of all this, have given much anxious thought to the problems which have arisen, and have instituted measures designed to solve them. Nevertheless, we feel bound to record the strong impression left after many hours spent in discussing and considering the present state of affairs, and the steps taken to meet it, that there is lacking any general appreciation of the urgency of the problem and of the need for a real emergency drive to deal with it. Not until it is tackled in a spirit of crusade will the fight be won. A slow building up of first-class sanatorium accommodation is not, in our view, what is called for. There are obvious and cogent reasons why any rapid development of this kind is out of the question. Even if it were not so, it is doubtful wisdom to make long-term and expensive

After this, return of function is encouraged by exercises, but it is not advisable to apply grease massage to the grafts until they are more consolidated—for example, three to four weeks after grafting.

Homogenous Skin-grafting

Contrary to reports, I do not believe that a successful take of skin from one person to another is possible. Medawar has shown in his experiments that such a take does not occur and that homogenous grafts are shed after three to six weeks. Homogenous skin is applied only in sheets, because in patches this skin promotes heavy formation of antibodies.

However, there are cases in which homogenous skin-grafting serves a purpose, albeit temporarily. Consider a child with widespread burns of 40% or more body surface. The trunk, thighs, and legs may be involved so that there is little or no unburned skin to provide grafts. Such a child will be gravely ill with toxaemia, anaemia, and fluid loss even when the sloughs have been removed or encouraged to separate. Provided the child survived, spontaneous healing would occur over many months, producing thin unstable epithelium over broad areas, with dense thick scarring in the flexures, which in turn would produce contractures, deformities, and loss of function. The early application of skin in sheets from another person would provide the "best dressing" for the burn areas, after separation of sloughs. It would reduce the toxaemia and tide the child over a critical period of three to six weeks. During this time some of the less badly burned areas would have time to heal and thus provide the patient with his own skin for grafting, if only a little at a time, until full skin cover was attained. Such temporary homogenous skin cover would qualify as a life-saving measure.

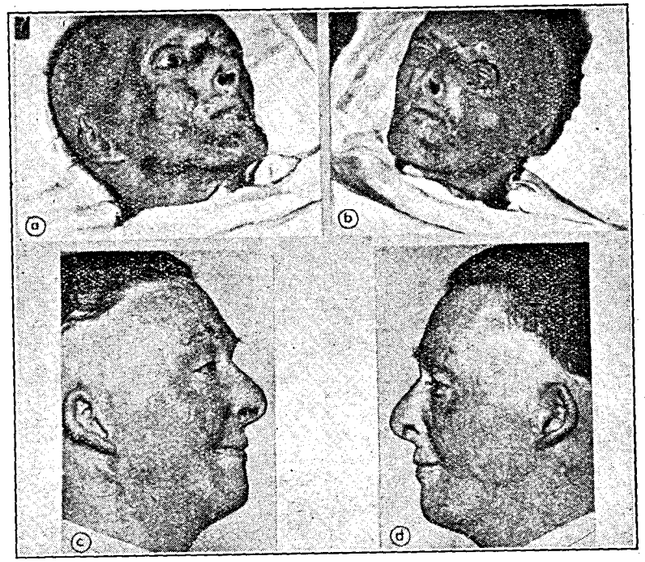


FIG. 2.—Recent burns; face. *(a, b)* Appearance in toxaemia. Ectropion of all eyelids; loss of nose-tip and parts of ears; loss of skin of forehead and cheek; *(c, d)* End result. Treatment prolonged, with intervals out of hospital. Postage-stamp grafts to forehead and cheeks still remain. Thiersch grafts to eyelids and lips. Hairy Wolfe grafts to eyebrows. Left upper arm flap to nose. Small tubed flaps from neck to margins of pinnae.

Splinting.—Areas that have been skin-grafted should be immobilized. Plaster-of-Paris gutters are most satisfactory to immobilize joints above and below the lesion.

Donor Sites.—Where possible, thighs and upper arms are chosen first. It must be stressed that as much skin as is necessary and possible should be taken from one limb before going on to another. For example, use one thigh to its utmost and keep the other thigh untouched in reserve to provide definitive skin cover. A donor site once used to provide Thiersch grafts can be used again four to six weeks later.

Application of Skin Grafts

Priority Areas.—Full-thickness skin loss of trunk and parts of limbs between joints is straightforward in that skin cover is the only issue. However, in those cases of widespread burns involving face and hands, in addition to other areas, there is a need to consider covering certain areas before others, particularly if there is likely to be shortage of available skin (Fig. 2). For example, ectropion of the eyelids should be dealt with first, in order to allow the lids normally to cover the cornea. Finger-joints and limb flexures come next in importance, and, finally, broad areas, such as trunk, thighs, forehead, cheeks, and lips. The burned hand at all times must be placed in the position of function (grasping a tennis-ball)—the best position for ankylosis, should ankylosis occur. This position is maintained by splinting while skin grafts are being applied and until they have taken.

Full-thickness Skin Grafts and Skin Flaps.—There is no indication, in my opinion, for the use of Wolfe grafts or skin flaps in the primary skin cover of burns. A Wolfe graft is a free graft of whole skin thickness. This leaves a defect which usually requires a Thiersch graft to cover it. Furthermore, a Wolfe graft is a more difficult graft to handle successfully than a Thiersch graft even under ideal conditions, and from a practical viewpoint it is not good surgery to put a Wolfe graft on to a granulating area in a burned patient and to hope for success. The use of skin flaps is best left to a later date, when healing and restoration of function have been obtained by using Thiersch grafts as described earlier.

Causes of Failure of Skin Cover in Burns.—(1) The application of a sheet of skin graft to a granulating area has less chance of success than covering with "postage stamps." (2) Placing grafts on unhealthy or too heavily infected granulations will lead to loss of some or all the grafts. The β-haemolytic streptococcus and *Pseudomonas pyocyanea* are potent sources of failure when present in heavy concentration. Adequate pre-operative pressure dressings on the granulations, with antiseptics or the appropriate chemotherapy, are necessary to obtain flat healthy granulations. (3) Imperfect pressure dressings to the grafts and incomplete fixation of the dressing will allow movement of the dressing on the graft and the collection of exudate under and around the grafts, with failure. Absent and poor splinting to the grafted limb may produce the same unsatisfactory results. (4) Rough removal of dressings on the fourth, sixth, and eighth days—that is, by tearing off grafts which had in fact taken. (5) Poor general condition of the burned patient will lead to partial or total failure of grafts. Mr. R. P. Osborne in his paper has indicated general and local preparation of the burned patient.

Methods of Cutting Skin Grafts.—There are various knives in use. To obtain small grafts the ordinary cut-throat razor may serve. On the other hand, those in frequent practice prefer the Blair knife, the Humby and Marks–Blair knives, which have an adjustable roller along the edge of the blade, or the dermatome. The various knives are most suitable on plane surfaces—for example, the sides of the thighs—but on the abdomen or back suction boxes are usually required, to produce a plane surface. The dermatome can be used on any surface, as the sticky drum picks up the skin and presents it to the knife edge. Knives and drums have their separate followers.

Refrigeration of Grafts.—Sheets of skin wrapped in tulle gras and placed in sealed sterile bottles in an ordinary refrigerator can be preserved for several weeks and then successfully used. This has been described by Jerome Webster (1944) and by D. N. Matthews (1945). The procedure is particularly effective in the treatment of moderately burned children, in that when the first cleansing of the burned area is undertaken under anaesthesia the grafts can be cut and refrigerated, to be used during the succeeding two to three weeks as the granulating areas permit, without the necessity of further anaesthetics. Combined with envelope therapy, the number of anaesthetics for a particular case can be reduced to two or even one.

A point is now reached in the treatment of the burned patient where, following the application of skin in squares, early healing is a fact. Consistent with the extent of the burn, the earlier the healing, the better the chance of return of function. The physiotherapist comes into the picture about three weeks from the date of grafting, with appropriate exercises to the limbs, gentle grease massage, and wax baths to the grafts.

Sequelae

Despite all this, certain sequelae may and do arise: (1) irritation in and around the grafts; (2) contractures; (3) keloid scarring.

Irritation in and Around the Grafts.—This is often relieved by antihistamine drugs internally and calamine lotion and antihistamine creams locally.

Contractures.—Particularly in the flexures, there may arise bands of scar tissue limiting joint movements. There may be some response to grease massage and to night-splinting, but marked degrees of contracture are on occasion inevitable. In these cases the only immediate consolation is that without skin-grafting it would have been much worse. Reference will be made to such cases later.

Keloid Scarring

Quite apart from burns, many people develop keloid scars where the skin has been traumatized. Frequently keloid will occur in the area between the mouth and lower neck, and also on the front of the chest, and yet not elsewhere (Fig. 3). On the other hand, some few patients show marked keloid everywhere on the body. In those cases in which keloid occurs it has followed suture of a skin wound under tension. It is a frequent complication in burned patients, and in my experience appears about one to two months after healing. The keloid scars may continue to increase for several months, and then show fading over a period of years.

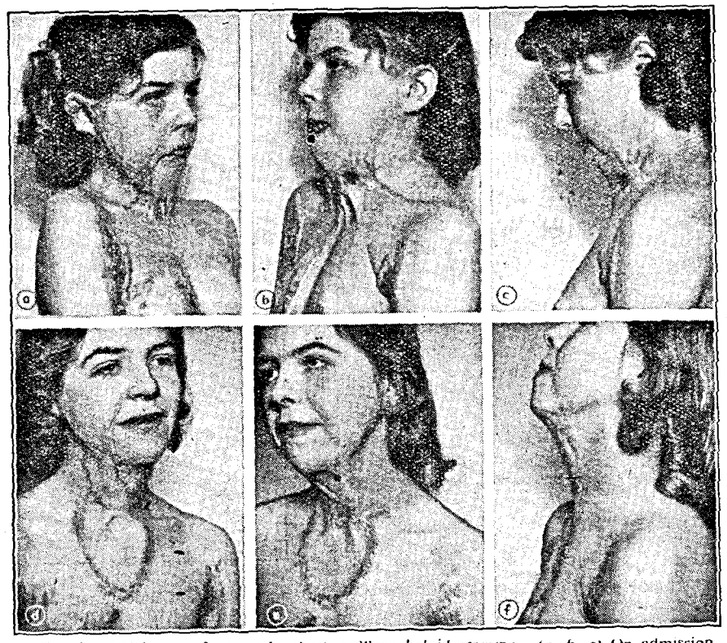


FIG. 3.—Old burns; face, neck, chest, axillae; keloid scarring. (*a, b, c*) On admission, scar contracture of neck and axillae; dense keloid. *X*-ray therapy. (*d, e, f*) After transfer of abdominal tubed flaps to neck in stages. Recurrence of keloid scarring.

Recent and rapid keloid formation is red, raised, hot and tender on pressure, and irritates to a marked degree. Old and slowly forming keloid scarring is hard and pale. Keloid scars and hypertrophic scars differ histologically only in the accumulation of scar tissue. Keloid scarring will recur after excision of a keloid scar and suture, at the margins of skin grafts and flaps, and in the donor site of a skin graft. There is no known cause for the occurrence and recurrence of keloid scars, and there is no consistent difference histologically between keloid scars, hypertrophic scars, and ordinary scar tissue. The tendency to keloid scar formation in a patient is said to diminish after the early twenties.

It is a practical point to review all cases of recently healed burns one to two months after healing, in order to check the occurrence of keloid.

Treatment of keloid scarring is sought, therefore, for pain, irritation, deformity, and disfigurement. Pain and irritation in the early keloid are treated by moderate doses of *x* rays or radium, and relief occurs over two to three months. The irradiation must be superficial and limited to the skin area involved. The dosage is that which produces a faint erythematous reaction in the skin, and this is a matter for the judgment of the skilled radiotherapist. *X* rays or surface radium may be used, and where low-voltage therapy apparatus is available the technical superiority of *x* rays over radium is unquestionable.

provision to meet what should and could be only a short-term need. The answer, we believe, does not lie in this direction but in what we have come to describe as a "crisis expansion" on the lines of the Emergency Medical Service so rapidly provided at the outbreak of the last war. The highest priority should be given to all measures which may be expected favourably to influence the situation. We regard it as essential that, while proper and due economy should be exercised in the carrying out of such measures, financial stringency should not be allowed either to weigh against their institution or to handicap their efficacy. For a nation which in the foreseeable future will require the greatest possible proportion of fit workers to allow this to happen would be to be penny wise and pound foolish.

The outstanding problem, though by no means the only important one, is the rapid provision of more functioning hospital beds for tuberculosis, and the greatest single obstacle to achieving this is recognized to be the shortage of nursing staff.

Bed Accommodation

According to such information as we were able to obtain in the autumn of 1949, the total number of hospital beds in Scotland then available for the accommodation of patients suffering from all forms of tuberculosis was approximately 6,000, but of these some 500 could not be used owing to lack of nurses. As shown in the Appendix, the total number of beds required according to the physicians' estimates for the hospital treatment of all types of tuberculosis is 7,605. It was further estimated by these physicians that of these beds approximately one-seventh would be required for the treatment of non-pulmonary tuberculosis. The estimated requirement for pulmonary tuberculosis is, therefore, approximately 6,500 beds. By the deduction of a similar proportion for non-pulmonary tuberculosis the number of beds available for pulmonary tuberculosis in the autumn of 1949 was 5,150. From these figures we concluded that some 1,350 additional beds would meet the present need.

We have endeavoured to obtain information about the number of beds at present available in infectious diseases hospitals. It has not proved possible to obtain completely reliable returns, but from such information as we did obtain we are satisfied that the total number is very considerable. On the average only about one-third of the beds in infectious diseases hospitals are occupied at any one time by patients suffering from infectious diseases other than tuberculosis. After setting aside a further one-third for emergency purposes it should, in our view, be possible to make available the remainder of the beds in these hospitals for the purpose of the crisis expansion we have in mind, provided the problems of improvisation, organization, and staffing can be solved. We fully appreciate that some technical difficulties would have to be overcome. For example, the present open-ward system obtaining in the great majority of these hospitals makes it necessary to assign whole wards to the treatment of different types of infectious disease. Under this system whole wards may stand empty or be occupied by only a few patients for quite long periods of time. The solution to this problem we believe to lie in the reconstruction, makeshift or permanent, of at least a proportion of these wards into cubicle wards. If this were done on the appropriate scale it should be possible to provide for the treatment of tuberculosis the necessary 1,350 beds over and above those already in use in infectious diseases hospitals for the care of tuberculous patients.

Whilst we believe that this would be the most satisfactory way of meeting the need, it might be found impracticable for one reason or another to provide in this way all the beds required. Should this prove to be the case the most careful consideration should be given to the possibility of using wards in general hospitals. The regional hospital boards and their medical education committees may feel that the larger teaching hospitals should be excluded from any scheme of this kind, but it should be possible to find a considerable amount of accommodation in other general hospitals.

To sum up, we are convinced that there are available in Scotland hospital beds to the number required for a crisis expansion.

Shortage of Nursing Staff

There are three categories of staff required—namely, trained nurses, student nurses, and part-trained personnel. In the first and third categories the nurses may be in part-time employment. Any rapid critical expansion must rely on the services of nurses from all three, and particularly on extensive use of part-time and part-trained nurses. Indeed, such expansion as has occurred during the past few years has been achieved largely by this system of "dilution" rather than by any substantial increase in the number of young women entering tuberculosis nursing as a career. In some hospitals part-time nurses and untrained personnel form 50% or more of the staff, but there is naturally a number of factors which limit the extent to which this system can be used, apart from the obvious one of the total number of such persons available. One limiting factor, for example, is the number of trained nurses with the necessary qualifications and experience to fill the senior charge posts.

The efforts which have been made to recruit nurses for sanatorium work seem to have been directed almost entirely towards the student nurse, the part-time nurse, and the part-trained auxiliary. It seems to have been assumed that the trained nucleus of the service was relatively static and only to be increased by increments from those completing their training in the ordinary way. Even given a highly satisfactory recruitment of student nurses this could only mean a relatively slow expansion once the initial dilution had been achieved. With a recruitment scarcely above replacement level it is evident that little increase is to be looked for except through a significant recruitment from outside to the senior ranks within the service.

It is to this means of expansion that attention should now be directed. We believe that a successful recruiting campaign might well prove to be the key to the solution of the expansion problem. Moreover, it offers in this field the advantages of a short-term scheme to deal with a short-term emergency, which we have already pointed out in connexion with the finding of beds. Utilizing the same degree of dilution by part-time nurses and part-trained personnel as has been referred to above, we estimate that the recruitment of approximately 150 trained nurses would permit of the opening of the 1,350 beds which we have reckoned to be necessary. We are aware that the possibilities of recruitment of part-time and part-trained nurses vary in different parts of the country, but we cannot imagine that the supply has been nationally exhausted. In our view the new beds which might be made available in this way need not be proportionately distributed all over the country; it would have a marked effect on the national problem even if they were wholly confined to one region.

Recruitment of Trained Nurses

We consider that an important, possibly the principal, source of recruitment of this trained senior staff will be found among the group of nurses who, having completed their training, are now in their parent hospitals as junior sisters or staff nurses, often more or less "marking time" while awaiting promotion to full charge posts. The opportunity of a responsible charge post in the tuberculosis service, supplemented by the stimulating prospect of playing a part in a task of urgent national importance, might well attract trained nurses already in such employment in general hospitals. We consider that the matrons of general hospitals should be invited to co-operate whole-heartedly in bringing the needs of the tuberculosis service to the attention of nurses in the categories we have described. It is only with the energetic and interested support of the senior administrators in the general nursing service that a recruiting campaign of this kind can be expected to succeed.

We have felt that many nurses are repelled from work in sanatoria in the mistaken belief that little clinical interest attaches to such work. Modern advances in the treatment of pulmonary tuberculosis have been such that the speed of turnover at sanatoria has increased and a much greater proportion of patients suffering from this disease are susceptible to active medical and surgical treatment, with real prospects of alleviation or cure. While it cannot be denied that the average stay in hospital of patients suffering from tuberculosis is much longer than that of patients in general hospital wards, nevertheless these modern therapeutic advances have changed the atmosphere in sanatoria so that it is now comparable to that obtaining in active general hospitals.

We are strongly of the opinion that an essential part of any recruiting campaign which aims to attract the trained nurse must include appropriate lectures, by tuberculosis physicians and senior tuberculosis nurses, designed to give a true picture of a nurse's life and work in a modern sanatorium. A campaign with this object must attempt to remove the doubts which still exist in the minds of women concerning the risks of contracting tuberculous disease while working in tuberculosis hospitals and sanatoria. The necessary assurance can confidently be given, for it is generally considered that these risks are in point of fact smaller in well-run sanatoria than they are in general hospitals, which, by virtue of the pressure of present circumstances, are often obliged to admit and care for cases of open tuberculosis under hygienic conditions far below those demanded by sanatoria.

We are aware that in the past the conditions in which nurses lived and worked in some tuberculosis institutions have been bad by any standard, as indeed they have been in many other hospitals. The existence of these "black spots" must have influenced the attitude of matrons and others responsible for the welfare of nurses and thus acted as a serious deterrent to the recruitment of nurses. While we cannot claim that the living and working conditions of nurses in every sanatorium have yet reached the optimum standard, nevertheless it is undoubtedly true that a good standard has been reached in the great majority. This fact should be brought energetically to the notice of nurses in general.

Recruitment of Student Nurses

We have been informed that there is a surplus of applicants for many training schools. We understand that in many instances such applicants as cannot be accepted are directed by matrons to the appointments offices of the Ministry of Labour and National Service. The co-operation of matrons should be sought in regard to this, in order that they may strongly urge upon girls whom they cannot take into their own schools that they should seriously consider taking up tuberculosis nursing. The responsible officers in the appointments offices should also be instructed to press the claims of tuberculosis nursing upon those who seek their advice. We have received evidence that this is not always being done at the present time.

One of the major deterrents to the entry of young women to nursing in the tuberculosis service has been the objection on the part of their parents, based upon the public's exaggerated fear of the risks of acquiring tuberculous disease. The crusade against tuberculosis ought to contain as an important and integral part a campaign designed to educate the public, first, regarding the size and national importance of the problem, and, secondly, regarding the correct assessment of the risks undertaken by those who take up tuberculosis nursing. Such a campaign should include the dissemination of factual information regarding the degree of protection which can be conferred on tuberculosis workers by B.C.G. vaccination. The public should be informed of the comparative freedom from risk associated with nursing in sanatoria. We suggest that in a thorough and intensive campaign of this sort the co-operation of the B.B.C. should be invoked. We have in mind such a feature as "Focus on Tuberculosis" in which, by using the services of physicians, surgeons, nurses, and patients, emphasis could be laid upon the new and optimistic therapeutic outlook in this disease. The object should be clearly defined as an attempt to raise the campaign against tuberculosis to the level of a nation-wide crusade. It may be that in doing so the services of publicity and advertising experts could also be invoked with advantage.

What has been said in the foregoing paragraphs about the recruitment of trained and student nurses applies equally to that of part-time and part-trained personnel.

Industrial Nurses

The total number of trained nurses at present employed in industry is comparatively small and we do not think that any recruiting campaign should be specifically directed towards nurses so employed. We feel most strongly, however, that the needs of the tuberculosis service are so crucial that in the meantime any further recruitment of trained nurses into the industrial field should be actively discouraged. There is a legitimate demand for the services of nurses in industry, but this can be met, at any rate temporarily, by the greater use of first-aid workers.

Extension of Facilities for Domiciliary Treatment

As an immediate step and pending the successful outcome of an energetic recruiting drive for nurses, a most useful contribution might be made by extending to patients in their homes some of the forms of active treatment normally used only in hospital. It has been within the experience of most practising doctors that patients notified as suffering from pulmonary tuberculosis may wait for months before obtaining hospital beds, and during this time the illness may advance to such an extent as to diminish their chances of recovery or at any rate to ensure that they will occupy the hospital beds which they eventually reach for a longer period of time than would have been the case had they been under active treatment from the start. A proportion of beds should be set aside in sanatoria for short-term cases who could be given, for example, appropriate collapse therapy and then returned to their homes where supervision could be continued. It is possible for such patients to be brought to the dispensary or hospital as often as is necessary for continuation of active treatment.

While the day-to-day supervision of patients undergoing domiciliary treatment should be largely in the hands of their own practitioners, it is desirable that full specialist co-operation should be available, and this may well involve an immediate increase in the specialist staff on present establishments. It is important in this regard that the regional hospital boards should institute some form of direct contact between the specialists in the tuberculosis service and general practitioners. We have in mind not only individual contact in connexion with individual cases but the institution of professional meetings at the hospitals or clinics, at which there could be expounded the modern views of treatment and control of tuberculous disease. We have received so much evidence of the interest which general practitioners are taking in the problem of tuberculosis in their practices that we feel sure that such a procedure would be received with general approval.

Hostels and Night Sanatoria

We have considered the suggestions which have frequently been made that night sanatoria or hostels for tuberculous workers should be provided. There has been little practical experience of these in this country, and it seems to us that grave difficulties would be encountered in obtaining any large measure of consent to their use, both from the sufferers themselves and from their relatives. There persists, unfortunately, a degree of social ostracism of the tuberculous, and this would militate against the wide use of hostels or living quarters for those whose ordinary work and recreation in any case would require to be sought in the general community.

The Ministry of Labour and National Service in their schemes for the tuberculous have up till now been unable to provide for persons with open tuberculosis, because their workshops are manned by persons disabled by various conditions. Difficulty has been experienced in making arrangements for the training even of patients with quiescent as opposed to healed tuberculosis. Consideration might be given to the development in the larger sanatoria of hostel accommodation for ex-patients, both sputum-positive and sputum-negative. The former might be encouraged to stay for relatively long periods if small factories within the sanatoria could offer remunerative work. Under present circumstances any larger attempt at colonization of the tuberculous is not possible, and we doubt whether at any time colonies such as those at Papworth would offer any substantial contribution to the solution of the problem in Scotland.

Preventoria

The institution of preventoria may be expected to play a valuable part in preventing the spread of tuberculous disease. While the policy of instituting preventoria appears to have been accepted by the central authorities, few active steps have yet been taken to implement it. Energetic measures should be taken by central and local authorities to make available suitable buildings for the reception and care of children from homes in which tuberculosis has appeared. In our view such preventoria should be similar in type and organization to the wartime residential nurseries. The recruitment of children's nurses and supervisors for such establishments might not be easy, but we recall that it was found possible to recruit sufficient staff for the wartime nurseries, both day-time and residential.

An appeal for persons to undertake work of this kind, backed as it would be by the general propaganda campaign, is not likely to fail. We would again emphasize that narrow monetary considerations should not be allowed to be a stumbling-block.

B.C.G. vaccination of children involves the segregation of those selected for vaccination for a period of weeks. The preventoria which we envisage would seem to be suitable establishments for this segregation, but we regard it as important that the establishment of preventoria should not await a widespread introduction of B.C.G. vaccination, nor should their use be limited to the segregation of children undergoing this form of immunization.

Housing

The importance of the part played by faulty housing in undermining attempts to eradicate tuberculosis from the community needs no emphasizing by us. Medical officers of health are fully aware of this, and local authorities are doing their best to meet the needs. Improved housing of families affected by tuberculosis attacks the problem in two ways. First, it lessens the danger of spread of the disease by making possible effective room segregation of patients. Secondly, and for the same reason, it makes possible the domiciliary treatment of chronic cases, thus freeing hospital beds for those who can most benefit from hospital treatment. Every encouragement should therefore be given to local authorities to adopt energetic and imaginative measures to provide for affected families. Here again we would stress that the accent should be on "crisis expansion."

Central Responsibility

Because of the national character of the problem the Department of Health for Scotland, as the central authority, would be closely involved in the various projects we have described for tackling the present situation. All these, as we have tried to indicate, are but parts of what is essentially a single operation. For this reason there will clearly be need for effective central co-ordination and direction. It may be that the Department will feel that this need can be met through their present establishment and arrangements, but we suggest that careful consideration should be given to the desirability of appointing an appropriately qualified person to undertake this task. Such an appointment, we suggest, should be of a temporary character, perhaps for a period of three to five years. In our view it should be held by a medical man of proved administrative ability and wide experience in the tuberculosis field. Whether this appointment be made or not, we consider it to be essential, if our proposals are to be successfully adopted, to have in being a consultative committee of experts available to advise on their implementation.

SUMMARY OF PART II

The present situation in the management and control of pulmonary tuberculosis in Scotland is so serious as to be critical, and can be met only by a "crisis expansion" of the tuberculosis service.

1,350 additional beds are urgently required for this expansion.

These can quickly be made available in infectious diseases hospitals by structural improvisation and modification.

The greatest single obstacle is the shortage of nursing staff.

We have made proposals for a recruiting campaign, the principle feature of which is the attraction of trained nurses to the tuberculosis service.

All steps should be taken to make active modern treatment available to the patient in his home.

Much more energetic steps should be taken to provide preventoria.

As part of a "crisis expansion" local authorities should adopt a bold and imaginative policy in the allocation of houses.

Money spent freely but wisely for these purposes will prove to be a sound national investment.

A vigorous, sustained, and well-planned campaign of public education regarding tuberculosis should be undertaken.

We have made recommendations for the central co-ordination and direction of these operations.

A much greater sense of the urgency of the situation is required on the part of all—the general public, the administrators, the nurses, and the doctors. What has hitherto been a desultory and intermittent campaign must be transformed into nothing less than a national crusade.

The subcommittee wish to record their keen appreciation of the tireless work and indispensable assistance given by their secretary, Dr. E. R. C. Walker, and the clerk to the subcommittee, Miss S. V. Williamson, and to express their indebtedness to the British Medical Association for the facilities afforded.

APPENDIX

Beds Required for Optimum Service

Region	Population	Present Beds (Autumn, 1949)		Requirements Based on Physicians' Estimates	2½ × 1938 Pulmonary Tuberculosis Deaths (Hosp. Surveyors, 1945)	2½ × 1946–8 Average Annual Pulmonary Tuberculosis Deaths	2¾ × 1946–8 Average Annual Pulmonary Tuberculosis Deaths
		Staffed	Unstaffed				
Northern ..	195,000	228	3	355	232	285	314
North-eastern ..	506,000	428	21	516	380	415	457
Eastern	419,000	401	53	600	472	540	594
South-eastern ..	1,135,000	948	126	1,580	1,140	1,365	1,487
Western	2,914,000	3,513	301	4,554	4,227	5,690	6,259
Total for Scotland	5,169,000	5,518	504	7,605	6,451	8,295	9,111

TREATMENT OF PAINFUL AMPUTATION STUMPS

BY

W. RITCHIE RUSSELL, M.D., F.R.C.P., F.R.C.P.Ed.

AND

J. M. K. SPALDING, B.M., B.Ch.

(From the Department of Neurology, Radcliffe Infirmary, Oxford)

Last year one of us (Russell, 1949) described a method of treating painful amputation stumps and phantom limbs by repeated percussion to the stump neuromata. This form of treatment was developed on the theory that conduction in a mixed nerve is easily interrupted by repeated pressure without causing pain, and that the regenerating nerve fibres which form neuromata in an amputation stump might well be even more vulnerable to minor trauma than are normal nerves and nerve endings. It was considered likely, therefore, that if painful neuromata are repeatedly hammered their nerve fibres will gradually degenerate and be replaced by fibrous tissue. It was hoped that this process would be followed by relief of spontaneous pain, and in the report mentioned above seven consecutive cases were described, all of which responded remarkably well to this form of treatment. These seven patients have recently been followed up, and the progress report of all of them has been very satisfactory. Most have been able to discontinue treatment to a large extent, but some still give the stump an occasional hammering if the pain shows a tendency to recur. These patients have therefore either lost all tendency for the pain to recur, or, if they have slight twinges, these can be removed by a short period of treatment. This is most encouraging, for the evidence available indicates that with the passage of time there is no tendency for the pains to become resistant to the treatment—rather the reverse.

Further Cases

The purpose of this paper is to give the results achieved in further cases, and to include more details of the methods used.

We have had under consideration 37 further cases, but a number of these had disabilities which rendered them unsuited to percussion treatment. For example, in three cases the amputation followed extensive nerve lesions of the limb concerned; one case had a cold, diffusely tender stump which was relieved by sympathetic nerve block as advised by Leriche (1939); one case had sciatica, one had osteoarthritis of the spine, two had faulty prostheses, one was a major hysteric, and one refused to co-operate.

There were, however, 33 cases, including the seven published in 1949, which seemed to suffer from pain in the stump or phantom limb of such a nature that treatment by percussion was at least worth a trial. The main features of these cases are given in Table I.

Percussion treatment has been adopted elsewhere, and a number of cases which have proved resistant to this and to other forms of treatment have been referred to us. These cases fall into the second half of Table I, and owing to this selection of cases the results shown in that half of the table are not so good as in the earlier cases.

From the table it will be seen that there were 26 cases of lower-limb amputations (22 above the knee) and eight

TABLE I.—*Chief Features of the Main Group of Cases*

Case No.	Age	Site of Present Amputation	Date of 1st Amputation	Chief Operations	Interval from 1st Amputation to Onset of Pain	Pain		"Jactitations" of Stump		Temperature of Stump to Touch	Palpable Neuromata	Pain on Pressure on Neuromata or Tender Areas in Stump. Referred to:		Results		
						Phantom	Stump	With Pain	Without Pain			Phantom	Stump	1 Week	1–3 Months	Over 3 Months
1	25	L. finger	1937	1944, symp.	6 years	Lanc.	Tend.		•		Yes	Yes	Yes	Exc.	Exc.	Exc. 5 years
2	25	R. thumb, 2 fingers	1947	1948–9, st. (4)	At once	Ach.	Tend.				,,	,,	,,	,,	,,	Exc., 12 m.
3	24	L. shoulder disart.	1944			,,	No				,,	Yes	,,	,,	,,	Exc., 12 m.
4	47	R. A/K	1917	1917, B/K amp.; 1920, A/K amp.; 1929–42, neur. (6); 1946, n.s. (sci.)	11 years	Lanc., rig.	,,	Yes		Normal	,,	,,	No	I.S.Q.	,,	Exc., 11 m.
5	54	R. A/K	1947		At once	Rig.	Ach.	,,	Yes	,,	No	,,	,,	Imp.	Good, 2 m.	Imp., 10 m.
6	59	R. A/K	1934		14 years	Lanc., rig.	No	,,		,,	,,	,,	,,	,,	Exc.	Exc., 4 m.
7	37	L. B/K	1943		2–3 weeks	Ach., rig., comp.	,,	,,		,,	Yes	,,	,,	Exc.	,,	Exc., 9 m.
8	38	R. A/E (L. A/K)*	1944	1944, A/E (and A/K) amp.; 1947 neur.; 1948, symp.	4–5 days	Ting., rig.	,,	No	No	Warmer than normal	,,	,,	,,	I.S.Q.	Imp.	Imp., 7 m.
9	50	L. A/K	1926	1926, disart. at knee; A/K amp.	4 years	Lanc.	,,	Yes	,,	Normal	No	,,	,,	,,	,,	Good, 7 m.
10	53	L. A/K	1915	1915, A/K amp.; 1937–49, neur. (several)	22 ,,	Ach.	Lanc.	,,		,,	Yes	,,	,,	Good	Exc.	Exc., 8 m.
11	52	R. A/K	1917	1917, A/K amp.; 1918, st.; 1946, st.; 1947, n.s. (sci.)	27 ,,	No ph.	,,	,,	No	Cold	No	No	Yes	I.S.Q.	Good	Imp., 7 m.
12	53	L. A/K	1929	1929, A/K amp.; 1931, st.	1½ ,,	Tick.	,,	No	,,	Normal	,,	,,	,,	,,	Exc.	Exc., 6 m.
13	55	R. A/K	1917	1917, Syme's amp., st.; 1918, A/K amp.	At once	Comp., lanc.	No	Yes		,,	Yes	Yes	No	,,	Imp.	I.S.Q.
14	42	L. B/K	1948		7 months	Burn.	,,	,,	Yes	Cold	No	,,	,,	Imp.	,,	Good, 6 m.
15	60	R. hip disart.	1921		27 years	Burn., lanc. comp.	,,			Normal	Yes	,,	,,	Exc.	Exc.	Exc., 8 m.
16	49	L. A/E	1941	1941, B/E amp.; 1942, A/E amp.; 1943, n.s. (br. pl.), neur.; 1944, mes. tract.	At once	Ting., rig.	Tend.	Yes		,,	,,	,,	Yes	I.S.Q.	I.S.Q.	
17	65	L. A/K	1916	1916, A/K amp.; 1945, st. (2)	25 years	Ach.	No			,,	No	No	,,	,,	,,	
18	50	R. A/K	1918	1918, A/K amp.; 1919, st.; 1948, sp. an.	2 weeks	,,	,,	Yes		Cold at tip	Yes	Yes	No	Exc.	Exc.	
19	58	R. B/K	1948		3 ,,	Rig., lanc.	Tend.	,,		Normal	No	,,	Yes	I.S.Q.	Imp.	Good, 4 m.
20	60	L. A/K	1915	1915, A/K amp.; 1916, st.; 1922, neur.; 1933, neur.; 1937, st.	1½ years	No	Lanc.	,,	Yes	Cold before pain	,,	No	,,		I.S.Q., 1 m.	Imp., 4 m.
21	70	R. A/K	1918	1918, B/K amp.; 1919, st. (2); 1920, A/K amp.	31 ,,	Ach.	No	No	No	Cold at tip	,,	Yes	No	Imp.	I.S.Q., 3 m.	
22	58	L. A/K	1916	1916, A/K amp.; st.	3 ,,	No ph.	Ach.	Yes	Yes†	Normal	,,		Yes	,,	Good, 3 m.	
23	36	L. A/K	1942	1942, A/K amp.; 1944, st.	3 ,,	Burn.	No	,,	,,†	,,	,,	Yes	No	I.S.Q.	I.S.Q.	
24	58	L. A/K	1919	1919, B/K amp.; 1923, st.; 1924, A/K amp.; 1926, n.s. (sci.); 1931, neur.; 1934, neur.; 1943, n.s. (sci.)	2 ,,	,,	Ach.	No	No	,,	Yes	,,	Yes	Imp.	Good, 2 m.	
25	64	L. A/K	1918		At once	Lanc.	No	Yes	Yes	,,	No	,,	No		I.S.Q.	
26	65	L. A/E	1916	1916, 3rd fing. amp.; 1925, 4th and 5th fing. amp.; 1926, symp.; 1930, A/E amp.; 1942, neur.; 1950, see text	26 years	No	Burn.	,,	No	Cold	Yes	,,	Yes	I.S.Q.	I.S.Q., 2 m. (see text)	
27	63	R. A/K	1917	1917, A/K amp.; 1922, st.; 1931, n.s. (sci.)	At once	Burn., lanc.	No	,,	,,	Normal	No	No	No	,,	Good, 2 m.	
28	53	L. A/K	1917	1917, A/K amp.; 1929, st.	,,	No	Lanc.	,,	,,	,,	,,	,,	Yes		I.S.Q., 7 w.	
29	26	L. B/K	1944	1944, Syme's amp., B/K amp.	2 months	Ach.	Tend.	,,		,,	,,	Yes	,,	Imp.	Good	
30	51	L. A/K	1918	1918, A/K amp., st.; 1921, neur.	At once	Ach., lanc.	No	,,	Yes	,,	Yes	,,	No	Exc.	Exc.	
31	70	R. A/E	1918		3 years	No	Lanc.	,,		,,	,,	,,	,,	I.S.Q.	I.S.Q.	I.S.Q., 8 m.
32	45	R. A/E	1948	1948 (before amp.) symp.; A/E amp.; 1949, st. (3)		No ph.	Burn., ting.	,,	Yes	Warmer than normal	,,	,,	Yes	,,	Imp.	Imp., 6 m.
33	48	R. A/K	1944		At once	Lanc.	No	,,	No	Normal	No	Yes	No		Imp., 2 m.	Good, 3½ m.

Cases 1–7 are those described in a preliminary report (Russell, 1949).
* This man had a double amputation. He complained of pain only in the upper-limb phantom.
† Jactitations occurred at times when these patients were asleep.

Abbreviations:
Amputations: A/K, above knee; B/K, below knee; A/E, above elbow; B/E, below elbow; Disart., disarticulation.
Operations: Amp., amputation; neur., neuromectomy; mes. tract., mesencephalic tractotomy; n.s. (br. pl.), nerve section (brachial plexus); n.s. (sci.), *nerve section (sciatic nerve); sp. an., spinal anaesthetic*; st., other stump operations.
Pain: Ach., aching; burn., burning; comp., complex; lanc., lancinating; rig., rigidity; tend., tender; tick., tickling; ting., tingling; no ph., no phantom limb on first attendance.

Definitions:
Excellent (exc.): Having no pain or able to dispel occasional attacks of pain for certain by percussion.
Good: Much less pain but not completely amenable to percussion.
Improved (imp.): Having less pain.
Unchanged (I.S.Q.): No apparent benefit from percussion treatment.

upper-limb amputations (six above the elbow). One man (Case 8) had had both an arm and a leg amputated, but complained of pain in the phantom arm only. A surprising finding in many cases was the long interval between the original amputation and the onset of pain. This interval was over one year in 16 cases and over five years in nine. Nineteen of the patients were wounded in the first world war, and eight in the second world war. In all cases amputation had been undertaken because of the direct or indirect results of trauma.

The Stump and Phantom Pains

The sensation of a phantom limb appears after nearly all amputations, as has been maintained by Weir Mitchell (1872), Leriche (1939), and Henderson and Smyth (1948). Not only had all our cases experienced phantom-limb sensations, but in all except three (Cases 11, 22, 32) these sensations were still present, generally in association with phantom-limb pains. The persistence of phantom sensations was therefore a marked feature in this group of cases. This contrasts with the experience of Henderson and Smyth (1948), who studied the "normal" phantom sensations in some 300 men with amputations in a prisoner-of-war camp. About 98% of their cases experienced the sensation of a phantom limb after amputation, but after six to twelve months the phantom sensations were only rarely felt, while they had for the most part disappeared after two to three years. Only about 6% of these 300 complained of pain during the period of observation.

The pains of which the patients complained were clearly often of very great severity. They were referred to the phantom limb in 17 cases, to the stump in seven, and to both phantom and stump in nine cases (Table I).

The patients' descriptions of the pain are very varied, but a distinction should be made between the pains which are almost always present in some degree and the pain which occurs in bouts. The latter consists of severe lancinating or stabbing pain recurring several times a minute and lasting for several hours or even days. In severe cases the patient is very miserable during a bout, and the pain is reminiscent of severe trigeminal neuralgia. During an attack the patient is reluctant to allow the stump to be touched, and is careful to prevent even a draught from playing on it, while the stump jumps or jactitates with each jab of pain.

Case 25.—A man aged 64 was wounded in the left leg and thigh in September, 1918, and two days later the limb was amputated just above the upper wound at the level of the mid-thigh. Before amputation he had severe pain in the left hip, upper thigh, and in the foot, but the areas in which he had been wounded felt numb. Since amputation he has been liable to attacks of stabbing pain. It is felt in the phantom limb, mainly in the ankle, especially the lateral side, and each stab is accompanied by a jactitation of the stump. Attacks at first lasted only two hours and recurred every two to three weeks, but in the past two years the pain has grown steadily worse, and attacks last 12 to 24 hours and recur every two to seven days. During an attack he is quite incapacitated. The first follow-up report on this case was not satisfactory, and further observation will be required.

In addition, however, to these "nerve" pains, many patients describe a painful set rigidity of the toes or fingers which can be particularly unpleasant. Other types of pain often accompany this rigidity, as in the following case.

Case 19.—A man aged 58 had a railway goods truck pass over his right leg in July, 1948, and a few hours afterwards the leg was amputated below the knee. Three weeks later he began to feel pain in the phantom limb. It was of four types. The fourth and fifth toes were constantly hyperflexed and painfully rigid; the big toe felt rigid and constricted "as though it were protruding through a hole in his sock but more uncomfortable"; tight cramp-like sensations were felt in the phantom calf muscles; and lastly there were occasional pains shooting into the lateral side and ball of foot, the big toe, and the fourth and fifth toes. This man had an extremely tender stump and gradually improved with percussion treatment.

One may wonder why this feeling of rigidity is so painful. Livingston (1943) describes how he asked a patient "why the sense of tenseness in the [phantom] hand was so frequently emphasized among his complaints. He asked me to clench my fingers over my thumb, flex my wrist, and raise the arm into a hammerlock position and hold it there. At the end of five minutes I was perspiring freely, my hand and arm felt unbearably cramped, and I quit. 'But you can take your hand down,' he said."

Complex sensations may also be described, as in the following case:

Case 7.—A man aged 37 was wounded in the sole of the left foot in October, 1942, and in January, 1943, the leg was amputated below the left knee. Two or three weeks after amputation he began to feel an aching pain in the lateral side of the ankle and to have the sensation both of the presence of the wound in the sole of his foot and of the nail of his big toe being twisted off. When he percussed neuromata in the stump he felt at first a temporary aggravation of the phantom sensations. These included the opening of the wound in the foot and a sensation of blood running between the fourth and fifth toes. He says that he does not remember experiencing this sensation before amputation. Percussion on one spot at first intensified the feeling that the nail of his big toe was being torn off, and then caused the toenail sensation to disappear. The patient responded very quickly to percussion, and nine months later wrote that he was able to play strenuous table tennis. Occasionally when he was taking less exercise he began to get a slight recurrence of pain, but he could at once drive it away with percussion.

Examination of the Stump

The amputation stumps varied greatly, but on the whole the spontaneous pains seemed to depend on factors showing no connexion with the general state of the stump tissues other than nerves.

Most of the cases with frequent or continual pain had tender neuromata or hyperaesthetic scars which on pressure caused pain that was often referred to the phantom and caused jactitation. This tenderness on pressure with pain radiating to the phantom appeared to be due to neuromata of large or small size which were the "touch" spots for the pain. We have come to regard this type of reaction as an indication that treatment by percussion is likely to be successful.

Details of Treatment by Repeated Percussion

Treatment by percussion depends on the view that if the thousands of nerve fibres in a neuroma are repeatedly subjected to trauma they degenerate, cease to be tender, and lose their capacity for causing spontaneous pain.

Every effort is therefore made to find and locate as accurately as possible all tender neuromata. They can generally be felt as nodules a few millimetres to a few centimetres in diameter which on pressure give paraesthesiae referred to the phantom or, less commonly, cause local pain. In some cases the neuromata are so covered by muscle that their presence can be presumed only if a well-localized area can be found where pressure or hammering elicits paraesthesiae in the phantom or marked local pain.

If the neuromata are very tender a sphygmomanometer cuff is applied to the proximal part of the stump and inflated sufficiently to occlude the arterial blood supply



FIG. 1.—Mallet and applicator in use.

After some minutes the anoxaemia makes the neuromata less sensitive* and they can be percussed. This is usually done with a mallet and an applicator consisting of a wooden shaft about 15 cm. long with a metal "dome of silence" on one end to provide a smooth contact that will not damage the skin and a crutch rubber on the other to deaden the sound of tapping (Fig. 1). The applicator is held firmly on the neuroma and hammered with the mallet as hard and as rapidly as is possible without causing the patient undue discomfort. If the patient has sensations referred to the phantom or stump these confirm that the applicator is well placed on the neuroma.

After percussion has been performed for several minutes the cuff is removed and percussion is continued for 20 minutes. After the first treatment the cuff is generally not necessary, and the percussion is repeated three or four times daily.

An electrical vibrator is sometimes preferred to the mallet. It gives percussion over a wider area, but is less powerful and is sometimes more apt to bruise the skin than is the mallet and applicator. Whichever form of treatment is used the patient is taught to apply it himself. Electrical vibrators† are especially useful in upper-limb amputations which the patient cannot himself treat with a mallet and for dealing with lower-limb neuromata which the patient cannot reach. A stand to hold the vibrator firmly in any desired position is an advantage for treatment in hospital (Fig. 2), as prolonged handling of a vibrator causes numbness of the physiotherapist's hands.

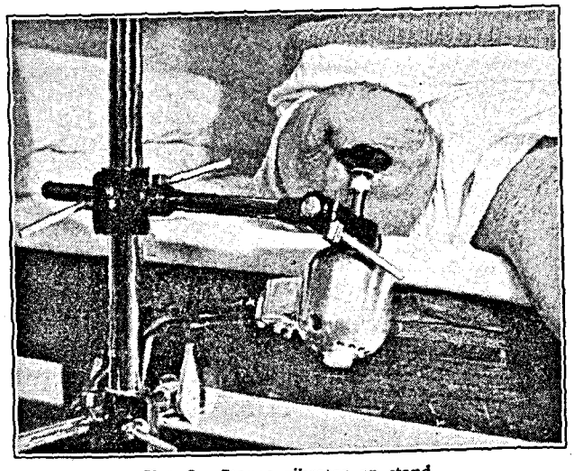


FIG. 2.—Stanco vibrator on stand.

A more powerful percussor‡ (Fig. 3) with a remote drive has been found useful for treating deeply placed neuromata. Only smooth metal or vulcanite applicators should be used with mechanical vibrators: other materials, such as rubber, are apt to damage the skin by friction.

The response of a favourable case is illustrated by the following report:

Case 15.—A man aged 60 was wounded in the thigh in June, 1918. The wound healed quickly, and for six months he walked well, but was then found to have a tuberculous infection of the upper part of the femur. The head and neck were excised, and shortly afterwards, in 1921, the right lower limb was disarticulated at the hip. He had no pain until November, 1948, when he began to feel an intermittent burning sensation in the toes and lateral side of the phantom foot, accompanied by the sensation of jerky and powerful plantar flexion at the ankle.

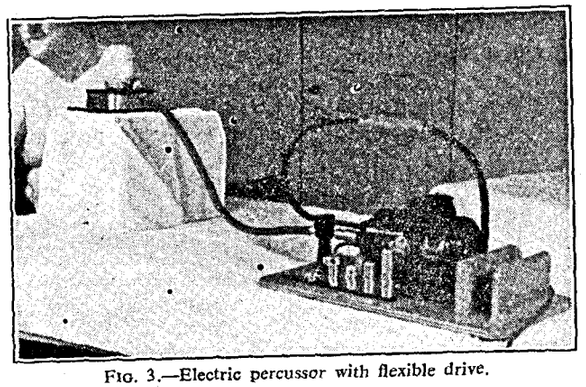


FIG. 3.—Electric percussor with flexible drive.

At other times, especially at night, the phantom limb felt fixed in flexion and he could not get to sleep until he had straightened it.

He had a well-marked sciatic neuroma. When this was percussed he felt a variety of sensations in the phantom leg, mainly a feeling of fixity or tension, but even after a single treatment of 15 minutes he volunteered that his leg was now at rest and within four days he had a longer night's sleep than for four months. Nine months later he was never bothered with pain and he only rarely needed to use the mallet. He was able to withstand the jolts of his local bus and the changes of weather, either of which had formerly brought on pain.

In other instances, however, the benefit of treatment becomes apparent more slowly.

Case 12.—A man aged 53. At the age of 3 years he had an illness which left him with a weak left leg, and in adult life the leg was 2 in. (5 cm.) shorter than the right. In October, 1929, he was involved in a road accident and suffered injuries to his head and left leg. He was unconscious for 13 days, but has had no permanent disability from the head injury. The left leg was amputated at the level of the mid-thigh 14 days after the accident. Eighteen months later he developed a sinus and a sequestrum was removed. After this operation he began for the first time to feel spontaneous pain, which was intermittent with periods of complete freedom. At first he had attacks of pain lasting 18 hours and recurring every month, but in the last six years the attacks had been occurring every 10 days. During an attack he felt in the stump a "drawing" or lancinating pain lasting two to three seconds and recurring three times a minute; and in the phantom a very disagreeable sensation in the toes and sole as though they were being strongly tickled. There was no neuroma palpable in the stump, but he was taught to percuss some tender areas. He obtained no relief for a month, but continued the percussion three times a day, and thereafter the pain became less frequent and could be dispelled by percussion. After six months he was applying percussion for 10 minutes once a day, and wrote: "The

*This method of local anaesthesia was in use in the fourteenth century (de Mondeville, 1320).

†The "Stanco" vibrator is manufactured by Stanley Cox, Ltd., 11, Gerrard Street, London, W.1.

‡The vibrator stand and the percussor were designed by Dr. E. J. Schuster, and manufactured by Mr. H. G. East, instrument maker, Oxford.

phantom makes an attempt to come about once every three weeks now, but it is too feeble to trouble me in any way, and I can usually knock it away in 10 minutes of hammering."

Results of Treatment

The results of treatment carried out as described above are usually highly gratifying. In many cases the first treatment gives relief which is so obvious that the patient quickly becomes an enthusiastic exponent of the method. In others the results are at first less apparent, and, as the patient often at first looks askance at the treatment, considerable time and effort have to be expended in persuading him to continue. Here the advantages of treating the patients in a centre where there is a tradition of cures are obvious.

Though few cases have been under treatment for more than a year the effect of it seems to be better as time passes; in most cases the patient can gradually reduce the number of treatments after some weeks, and in some instances even stop treatment.

For instance, Case 7, nine months after his first attendance, writes: "I do very little hammering these days. Only when it is raining hard or I am very tired or shaky do I need to 'tap,' and then it is to a phantom that seems 'half-hearted' and nothing compared with the feelings of discomfort I had before having treatment."

Case 1 was treated over five years ago in Cairo, and this patient writes from South Africa to say that he has had no further pain in his finger stumps except when on holiday and not using his hands much, when the pain sometimes returns. There is thus no evidence that these pains become resistant to treatment by percussion; indeed, the reverse seems more probable.

In Table II an attempt is made to classify the results of treatment in the 33 cases comprising the main group. Nine of these cases have been entered as deriving no benefit from

TABLE II.—*Results of Treatment in 33 Cases (Definitions as in Table I)*

	Total	Excellent	Good	Improved	Unchanged
No. of cases	33	11	8	5	9
Mean duration of follow-up (months)* ..		6	4	7	—
Range (months) ..		1–11	2–8	4–10	—

* Case 1 (follow-up over 5 years) is excluded.

treatment by percussion. It should, however, be added that there was only one failure among the first 15 cases treated, while in the last 18 there were eight failures. This worsening of recent results is due partly to cases of especial difficulty being referred, and partly to the treatment of some of the later cases being inadequately supervised. One "failure" (Case 26) subsequently obtained complete relief after an operation; this case is described later. It therefore seems that the proportion of failures in this series is higher than it would be in a less selected group. One occasional difficulty in dealing with pensioners depends on their having a vested interest in maintaining a high percentage of disability. There were, however, very few cases in which we felt that this factor seriously interfered with treatment.

Discussion

Although the theoretical prospect of converting a tender neuroma into a painless knot of fibrous tissue by repeated trauma seemed likely enough, the success of our attempts to do this in practice exceeded expectations. It was hard to believe that the well-known effects of pressure or trauma on nerve endings had not previously been fully exploited.

Gordon and Carleton (1923) described a somewhat similar method in a paper entitled "Hysterical Pain," and considered, on the basis of a theory of thalamic function, that the patients must experience pain to improve. Our experience suggests, however, that good results may be obtained whether the treatment is painless or painful, and that the changes observed indicate that the important part of the treatment depends on the physical changes caused at the periphery, in the neuromata and tender scars. Further, it seems clear that, whatever psychological factors there may be, the severe pain usually depends on afferent impulses which originate in the neuromata.

One highly gratifying feature of the treatment is that the patients are often enabled to discontinue drugs they have taken for years, and are again able to sleep without being repeatedly wakened by pain.

The chief complaint of Case 15 was that the pain used to keep him awake at night. There was improvement in this respect within a few days of beginning percussion, and eight months later he wrote: "I have rarely had to use the tapping, and when I have it has only been of very short duration, between three and five minutes. I feel really well and full of energy, and I can safely say when I go to bed that I am going to sleep, and I do sleep well. I really think that nerve is afraid of the mallet."

Dr. John Scarff, of the Neurological Institute, New York, has kindly sent particulars of a patient, a professional man, who after a mid-thigh amputation for embolism 10 years ago had suffered continuous pain. He became dependent on codeine in increasing amounts to enable him to work, until he was taking 20 gr. (1.3 g.) hypodermically each 24 hours. Finally he became exhausted and was obliged to enter hospital. After being treated with prolonged thiopentone he began to hammer the stump neuromata. This brought relief, and two months later he was not only free of pain but had taken no narcotic of any kind since starting the treatment.

The possibility of treating other painful conditions by similar methods has been little explored, except in the case of tender scars, in which excellent results may be expected. Fibrositic nodules are also sometimes quickly rendered painless by a mechanical vibrator.

One point with regard to amputation operations should be mentioned—namely, that our experience suggests that at operation the nerves should not be cut short but left long in an exposed situation. It is often the well-hidden and protected nerves which cause most pain.

In Case 26 we felt obliged to advise disarticulation of a short stump at the shoulder to make it possible to crush the neuromata, which were very high in the axilla, and to leave the nerves as long as possible so they could be easily percussed. He was a man of 65 when he first attended. He had had a minor injury to the middle finger of his left hand in 1915, but the wound did not heal, and a year later the finger was amputated. The hand and forearm were swollen and remained so, and the other fingers became flexed into the palm. The fourth and fifth fingers were amputated in 1925, he had a cervical sympathectomy in 1926, and in 1930 the arm was amputated above the elbow. He had the sensation of a phantom limb after amputation, but it was not painful, and in the last two years he has rarely felt it at all. In 1936 he began to feel a constant burning pain in the whole stump and an aching pain in the left shoulder radiating down the left side of the chest into the left flank. The pain had been relieved for six months in 1942 by excision of neuromata, but the pain had recurred. It was unfortunately impossible adequately to percuss the neuromata, many of which were at or above the apex of the axilla.

At operation the neuromata were not excised but crushed with clamps and left in an easily accessible position over the chest wall. His pain was relieved immediately by this operation, and, should it recur, treatment by percussion is now much more likely to be successful, as the neuromata are easily reached.

In conclusion it should be emphasized that treatment by percussion has not on any occasion in our experience done harm. In some cases benefit has been apparent almost from the first treatment, but in others considerable perseverance has been required to get the desired relief.

Summary

The treatment of painful amputation stumps by repeated percussion to the neuromata has proved successful in most cases.

Of 33 cases considered suitable for percussion treatment, 19 reported good or excellent results and 5 were improved. There was only one failure in the first 15 cases treated, but in the last 18 cases, some of which were especially difficult, there have been eight apparent failures.

Methods of applying the treatment are described. The neuromata are located as accurately as possible. If they are very tender the arterial supply to the stump is occluded by a sphygmomanometer cuff, as anoxaemia renders them less sensitive. Percussion is done with a mallet and an applicator about 15 cm. long. After several minutes the cuff is removed and percussion continued for 20 minutes. An electrical vibrator may be used in place of the mallet, and is of particular value in treating areas beyond the patient's reach. Cases with cold and diffusely tender stumps should be treated by sympathetic block or section rather than percussion.

Illustrative case histories are given.

We are specially indebted to Dr. E. J. H. Schuster for designing and constructing apparatus, also to several members of the Ministry of Pensions staff for their encouragement with this study, and to *Miss Ruth Hurst for her assistance with the treatment of many of* these cases at Headington Hill Hall Rehabilitation Centre, Oxford.

REFERENCES

Gordon, R. G., and Carleton, H. H. (1923). *Brain*, **46**, 221.
Henderson, W. R., and Smyth, G. E. (1948). *J. Neurol. Neurosurg. Psychiat.*, **11**, 88.
Leriche, R. (1939). *Surgery of Pain*, Chap. VIII. London.
Livingston, W. K. (1943). *Pain Mechanisms* (Introduction). Macmillan, New York.
Mitchell, S. Weir (1872). *Injuries of Nerves and their Consequences*, Chap. XIV. Philadelphia.
de Mondeville, H. (1306–20). *Chirurgie*. Troisième Traité, Doct. I, Chap. VI, Sect. IV.
Russell, W. Ritchie (1949). *British Medical Journal*, **1**, 1024.

Another highly successful year's working was announced at the annual general meeting on June 6 of the Medical Sickness, Annuity, and Life Assurance Society, Ltd. The chairman, Mr. R. J. McNeill Love, said that when he last addressed the members he had reported on improvements in the policies and policy conditions, and he was now pleased to say that these had produced most satisfactory results. It had been hoped that the new life assurance business might pass the £1,000,000 mark for the first time, and it was gratifying to find that the amount actually achieved was £1,420,734. The figures for the current year indicated that this progress had been fully maintained. A subsidiary company, Medical Sickness Finance Corporation, Ltd., appeared for the first time in the accounts. By the end of last year it had assisted members of the medical and dental professions in the purchase of cars and equipment to the extent of about £100,000. The directors were convinced that this would be a satisfactory investment, especially when there was an increase in the number of cars for the home market. The increase in life assurances effected during the year amounted to £649,614. Claims had increased by £14,646, but were well within the amount expected. The amount paid in sickness benefit was £77,448. The funds of the Society stood at £4,371,026, an increase of practically £330,000.

P.T.A.P.

DETERMINATION OF THE ESSENTIAL Lf DOSAGE

BY

GUY BOUSFIELD, M.D.

Camberwell Laboratory, Public Health Laboratory Service

AND

LEWIS B. HOLT, M.Sc.

Wright–Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, W.2

P.T.A.P. is an integrated diphtheria prophylactic prepared by the adsorption of highly purified toxoid on to pure aluminium phosphate—each prepared separately. Because of this it is possible not only to duplicate accurately any given composition but also to alter, at will, the amounts of both, as well as their ratios. In this we have a means of answering a number of important questions in diphtheria prophylaxis which previously could not be reliably investigated at all.

Of the several questions that required an accurate answer three have now received attention: (*a*) How much mineral carrier is required to produce the maximal antitoxin response? (*b*) What is the route of choice for inoculation? (*c*) What is the essential or optimum quantity of toxoid necessary?

An account of work done to determine the correct dosage of aluminium phosphate carrier for young children has already been described (Bousfield, 1947a, 1947b; Holt and Bousfield, 1949). This amount was found to be not less than 5 mg. of $AlPO_4$, determined by observing the Schick conversion rate following a single injection. The conversion rate obtained, using 5 or 7.5 mg. of $AlPO_4$, was of the order of 97%; and this was found to persist for at least 15 months in 95% of the children examined. These figures bear interesting comparison with those of Faragó (1935), who, by using a 1-ml. dose of large-precipitate A.P.T., obtained an overall S.C.R. of 93.5% (4,297 cases) following one inoculation, and furthermore reported no significant decline in the S.C.R. after one year.

We have found the route of choice to be intramuscular, in that the relative effectiveness of the intramuscular route to the subcutaneous is 2.6—that is, in order to obtain the same results, 2.6 times as much $AlPO_4$ carrier must be used by the subcutaneous route as by the intramuscular.

Included in these same reports were the results of preliminary attempts to determine the essential toxoid dosage. No statistically significant differences were obtained when the $AlPO_4$ carrier was maintained constant at 7.5 mg. injected, and the amount of toxoid varied from 30 to 5 Lf per dose; the S.C.R.s were determined three months after a single intramuscular inoculation (Holt and Bousfield, 1949, Tables III and IV).

As the solution of this question is one of no small importance or interest the experiment has now been extended. For purposes of accurate comparison it is not a reliable procedure to compare uncritically one set of clinical results with another made at a different time or place. Because of this it is a minimum precaution always to arrange that new materials should overlap, in terms of the variable under investigation, with former preparations used in previous experiments.

It is of some importance also to describe the exact procedure used in making the Schick tests. Schick control was invariably used in all work carried out since

midsummer, 1948 (Bousfield, 1948). Burroughs Wellcome Schick toxin and control were used, 0.2 ml. being inoculated intradermally on the flexor surface of either forearm. The tests were read seven days later without any knowledge of the treatment the child had received. The readings are recorded in such a way that negative results are entered only when the reaction, if any, does not exceed approximately 5 mm. in diameter. For the purpose of this work any reaction greater than this is recorded as positive. This routine is exacting, but is fully justified by the quantitative work of Vahlqvist and Högstedt (1949) on the relationship between circulating antitoxin and the Schick-test result.

Investigation of Minimum Amount of Toxoid which will Produce a Reasonable S.C.R.

A series of preparations was made in which the aluminium phosphate content was maintained constant at 10 mg./ml., and the contents of purified toxoid (1,900 Lf/mg. of protein nitrogen) varied from 10 to 1 Lf per ml. These preparations were made from a sample of P.T.A.P. of exactly known titre and one which had matured at room temperature for nine months; this was appropriately diluted with a 10-mg./ml. suspension of $AlPO_4$, to give the desired concentrations of toxoid.

As in previous work, Schick-positive children between their first and second birthdays were employed. A uniform dose of 0.5 ml. was used, the inoculations were made into the deltoid muscle, and two time intervals of observation were adopted. Four weeks after their single inoculation 494 cases were post-Schick tested, and a further 192 two months after injection. The details of the results are shown in Table I.

TABLE I.—*Schick Conversion Rate in Children (aged 1 Year) Using Samples of P.T.A.P. Containing a Constant Amount of $AlPO_4$ Carrier (10 mg./ml.), but Decreasing Amounts of Purified Toxoid (Intramuscular Inoculation, dose 0.5 ml.)*

Time	Dose of Toxoid (Lf) Injected	Post-Schick Test Result +	−	Total	S.C.R. (%)
1 month after injection	5	11	105	116	90·5
	2·5	11	116	127	91·4
	1	37	98	135	72·6
	0·5	45	71	116	61·2
2 months after injection	5	1	50	51	98·0
	2·5	2	49	51	96·1
	1	6	38	44	86·4
	0·5	19	27	46	58·7

The results of work of this kind may be examined in two ways.

First Examination of Results

The easiest and perhaps slightly naïve way is to present them in graphic form, using percentage S.C.R. on one ordinate and dosage of toxoid on the other. This method of presentation is shown in Fig. 1, supplemented by all previous results obtained, working on the same lines. These latter results are given in Table II.

TABLE II

Dose of Toxoid (Lf)	Post-Schick Results +	−	Total	S.C.R. %
5	20	452	472	95·76
10	6	244	250	97·60
15	51	1,677	1,728	97·05
20	5	251	256	98·05
30	9	244	253	96·44
Total ..	91	2,868	2,959	96·92

χ^2, 5 Lf/the rest = 3·33. P = <0·1

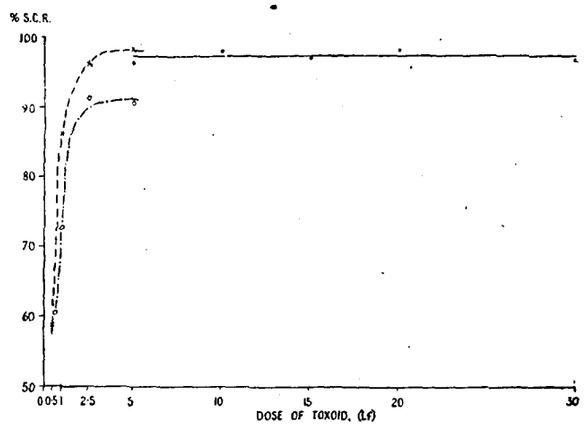


FIG. 1.—Schick-conversion rate in Schick-positive children, aged 1 year, to single inocula of P.T.A.P. containing a constant amount of $AlPO_4$ (5 mg.) and varying amounts of purified toxoid. ——. = previous results Table II. x——x = current results after two months. o——o = current results after one month.

From the graph (Fig. 1) it would appear that the S.C.R. is substantially constant between dosages of about 3 Lf and 30 Lf. If it be conceded that the S.C.R. definitely declines when less than 2.5 Lf of toxoid is used, an approximate evaluation may be made of the critical ratio of toxoid to $AlPO_4$ carrier, which, with those figures, becomes 2.5 Lf/5 mg. of $AlPO_4$, or 0.5 Lf/mg.

These findings—the result of a clinical experiment in immuno-physiology—show an excellent agreement in character with a similar experiment performed in guinea-pigs, in which the critical ratio of toxoid to mineral carrier was found to be approximately 0.2 Lf/mg. of $AlPO_4$ (Holt, 1949). But there seems to be a difference in the amounts of toxoid in the two instances—0.5 Lf/mg. of $AlPO_4$ for children and 0.2 Lf/mg. for guinea-pigs. Although it is difficult to be certain that the difference in these critical ratios is a real one, it would seem that the amount of specific antigen required to convert a normal globulin-producing cell to an antitoxin-producing cell may vary from one animal species to another. Even so, these findings do reveal how very great is the physiological activity of the antigen proper (toxoid protein) when it is administered in this form.

It may be of some interest, at this point, to mention the results obtained in immunizing an exceedingly sensitive adult (combined Schick result) with preparation C (P.T.A.P. Lf 2 and 10 mg. of $AlPO_4$/ml.). This subject tolerated 0.2 ml. of the prophylactic (0.4 Lf). Her antitoxin titre before treatment was <0.005 u./ml. of serum and four weeks after the one inoculation <0.01 u./ml., but four months after a second 0.2 ml. it rose to 0.2 u./ml. This subject, a difficult one, was therefore adequately immunized with a total of 0.8 Lf of purified toxoid, with no more than a transient (48 hours) feeling of slight local discomfort and malaise. The possibility must be admitted, however, that in view of the combined reaction shown there existed the possibility of contact with *Corynebacterium diphtheriae*, although probably not a virulent strain.

These observations do emphasize how appallingly inefficient and inexpertly prepared some samples of A.P.T. obtained from unusual sources must have been in the early days of the war. Even two doses of such material sometimes failed to give a 50% S.C.R. On the other hand, the law governing the amount of toxoid in present-day prophylactics (A.P.T. or P.T.A.P.) demands a minimum

of 50 Lf/ml. From this we see that there is approximately a tenfold margin of safety (against deterioration) in respect of P.T.A.P. as issued for general use.

Second Examination of Results

A more refined analysis is possible by applying statistical methods which permit an examination of the data in several ways and by using devices for checking the accuracy of hypotheses.

For the purpose of a complete-as-possible analysis of the results described above, it was found best to use all the relevant available data; this was done, and the results are given in Table III.

TABLE III.—*Showing all Available S.C.R. Data Following a Single 0.5-ml. Intramuscular Inoculation of Different Samples of P.T.A.P. (All Cases are Children Between Their First and Second Birthdays)*

Dose Toxoid (Lf)	Dose $AlPO_4$ Carrier (mg.)	pH	Time Interval (Months)	Post-Schick Result +	−	S.C.R. (%)	Total Cases	Probit % S.C.R.	χ^2*	d.f.	P
0·5	5	5·2	1	45	71	60·49	162	5·266	0·0143	1	0·9–0·95
			2	19	27						
1·0	5	5·2	1	37	98	75·98	179	5·776	2·735	1	0·05–0·2
			2	6	38						
2·5	5	5·2	1	11	116	92·70	178	6·454	0·609	1	0·3–0·5
			2	2	49						
5·0	5	5·2	1	11	106						
	5	5·2	2	1	50						
	5·5	5·2	1	4	51						
	6·5	5·2	1	3	81	94·84	639	6·629	7·963	6	0·2–0·3
	7·5	5·2	1	2	86						
	7·5	5·2	3	6	114						
	7·5	5·2	6	6	119						
10	7·5	5·2	3	2	123	97·60	250	6·977	0·171		0·5–0·7
	7·5	5·2	6	4	121						
15	5·0	5·2	1	28	883						
	5·0	6·5	1	2	206						
	5·0	5·2	1	4	167	97·05	1,728	6·888	7·934	5	0·2–0·3
	7·5	5·2	3	5	118						
	7·5	5·2	6	2	122						
	7·5	6·5	1	10	181						
20	7·5	5·2	3	1	124	98·05	256	7·064	0·724	1	0·3–0·5
30	7·5	5·2	6	4	127						
	7·5	5·2	3	4	120	96·44	253	6·804	0·001	1	0·95–0·98
	7·5	5·2	6	5	124						
									20·151	17	0·2–0·3

* χ^2 indicates homogeneity within toxoid doses. All χ^2s with one degree of freedom have been corrected for continuity (Yates's correction).

Although these data are of heterogeneous origin, the materials having been used at different times of the year, and were different, apart from the variable under investigation—namely, a slight variation in the amount of $AlPO_4$ injected, some prepared at *p*H 5, others at *p*H 6.5, and the observations made one, two, three, and six months after inoculation—the results are fairly homogeneous. In fact, all internal analyses show no appreciable differences between these variations. If, therefore, there are differences due to the above-mentioned variations, they must be very small, as the total χ^2 between experiments (within toxoid doses) is 20.151 with 17 degrees of freedom; this indicates a satisfactory homogeneity.

In view of its homogeneity this material seemed to provide a particularly reliable body of data for use (at least in a first-stage analysis) of the Lf-dose-response curve. This curve is plotted as probits of the percentage S.C.R. against log. dose of toxoid (see Carlinfanti, 1948), and is shown in Fig. 2. It will be seen from this curve that there is a tendency towards a maximum response and one that is less than 100%.

An assumption, and one not unreasonable from a biological point of view, is that a small proportion of the child population just does not react demonstrably—

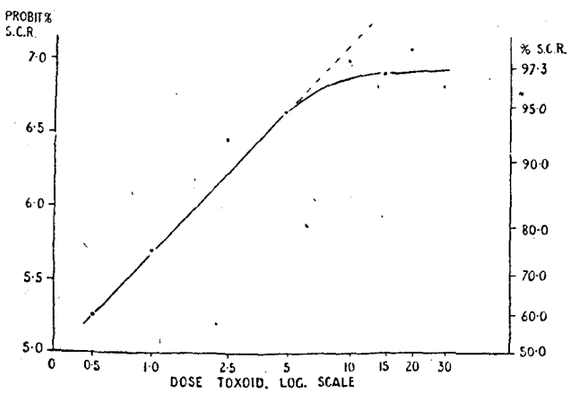


FIG. 2.—Probit % S.C.R./log dose toxoid. C = 0.027. 97.3% convertible, 2.7% non-convertible.

namely, show circulating antitoxin—to any single inoculum, whatever the dose. A similar observation was made by Scheibel (1943) in guinea-pigs, also using diphtheria toxoid. This worker observed that the "non-immunizability" was inherited and in a nearly typical Mendelian manner. It seems, therefore, not unlikely that a similar situation might exist in man, although for the purpose of mass-immunization it does not matter whether the lack of responsiveness in a proportion of the total population is determined genetically or not. It does not follow that the same proportion of refractory subjects will be found following a two-dose system of immunization.

Two well-spaced injections of P.T.A.P. containing 15 or 25 Lf of toxoid with 5 mg. of $AlPO_4$ are now being found to yield virtually 100% S.C.R. two or three months after the *second injection*.

A study of the responses in individual guinea-pigs to one injection and to two spaced injections of toxoid has revealed that most of the poor antitoxin producers—as judged by their responsiveness to a single inoculation—do respond satisfactorily to a second injection (unpublished work). The adult clinical example referred to above may be quoted as a case in point for man.

If we accept the assumption that a proportion of the child population does not respond to a single inoculum, we may try to estimate this proportion, and test whether this hypothesis fits the whole body of data.

From the point of view of statistical analysis this is a problem closely related to one solved by Finney and by

Fisher for the treatment of dose-response curves in the presence of natural mortality. In our present case the situation is reversed in that instead of a lower asymptote we have an upper one. The method of dealing with this problem statistically is by substituting the residual percentage of Schick positives for the natural "mortality," and then working on the decrease of positives with increasing dosage of toxoid—that is, with a negative regression coefficient. The "maximum likelihood" estimate obtained with Finney's (1949) improved method is 2.7 ± 0.5% of "non-convertible" children, and the fit of hypothesis obtained by accepting this figure is very good: χ^2 with five degrees of freedom gives a probability of >50%. The curve corresponding to this hypothesis is shown in Fig. 2. Briefly, this analysis suggests, and supports the suggestion, that when an infinite quantity of toxoid is used with 5 or 7.5 mg. of $AlPO_4$ carrier the maximum S.C.R. obtainable (single dose) is 97.3% (±0.5% standard error), and when 10 Lf are used the expected S.C.R. will be 96.8% and with 5 Lf 95.25%.

This statistical analysis confirms the conclusions drawn from the simple % S.C.R./dose toxoid curve in that there is a maximum (<100%) S.C.R. for P.T.A.P. The maximum is reached asymptotically, and in such a way that the advantage of using more than 10 Lf per dose is negligible.

Summary

Schick-positive children in the London area aged 1 year were given one intramuscular inoculation (0.5 ml.) of samples of P.T.A.P. containing 10 mg. of $AlPO_4$ per ml. and decreasing amounts of purified toxoid.

With an inoculation of only 0.5 Lf a S.C.R. of 60% was obtained, and with 5 Lf one of 93.8%.

By employing all relevant data previously obtained, it appeared that a maximum S.C.R. of about 97% was obtainable using a single 5–10 Lf dose, and that this S.C.R. was not exceeded (on the average) if more toxoid were used.

A special statistical examination of all the results also showed that a maximum S.C.R. of <100% is obtainable with a single inoculation of P.T.A.P. (10 or 15 mg. of $AlPO_4$ per ml.). Using an infinite quantity of toxoid this maximum S.C.R. was calculated to be 97.3% ± 0.5%; using 10 Lf per dose, the expected S.C.R. is 96.8%, and with 5 Lf 95.25%.

These maximum conversion rates for a single inoculation are most probably significantly below those following a two-dose method of immunization.

Our thanks are due to Dr. A. Anderson, M.O. of No. 9, Middlesex area, and to Dr. H. D. Chalke, M.O. of No. 7 Division, L.C.C., for facilities in connexion with the above work. The same thanks would have been expressed in the case of the late Dr. Harry Smith, formerly M.O. of No. 1 Division, L.C.C. Grateful thanks are also due to Dr. L. Cavalli, of the Department of Genetics, Cambridge, for his most valuable assistance in the special statistical analyses demanded by the findings of this investigation.

REFERENCES

Bousfield, G. (1947a). *Lancet*, **1**, 286.
—— (1947b). Ibid., **2**, 867.
—— (1948). *Med. Offr*, **80**, 8.
Carlinfanti, E. (1948). *Lancet*, **2**, 629.
Faragó, F. (1935). *Amer. J. Hyg.*, **22**, 495.
Finney, D. J. (1949). *Ann. appl. Biol.*, **36**, 187.
Holt, L. B. (1949). *Brit. J. exp. Path.*, **30**, 289.
—— and Bousfield, G. (1949). *British Medical Journal*, **1**, 695.
Scheibel, I. F. (1943). *Acta path. microbiol. scand.*, **20**, 464.
Vahlqvist, B., and Högstedt, C. (1949). *J. Immunol.*, **62**, 277.

Dr. Angeliki Tsacona, gynaecologist and obstetrician, and president of the League of Women Scientists of Salonika, is visiting the United Kingdom under the auspices of the British Council. She is studying gynaecological and obstetrical methods in British hospitals, and is particularly interested in the use of anaesthetics in childbirth.

ILL EFFECTS OF THE RADIUM MENOPAUSE*

BY

HUGH C. McLAREN, M.D., F.R.F.P.S., F.R.C.S.Ed. M.R.C.O.G.

Reader in Obstetrics and Gynaecology, University of Birmingham

Induction of the menopause for non-malignant uterine bleeding is a safe and effective method of treatment, and is much used in the Birmingham School, but the resultant improvement in the patient's health may obscure certain immediate and remote sequelae. In this review attention has been paid to flushing and sweating, loss of libido, and premature senile changes in the genital tract.

In all, 118 cases were examined at an average interval of two years after receiving intrauterine radium (2,400 mg.-hours). The ages of the patients varied from 33 to 58 (average 45). The outstanding symptom after irradiation was flushing, and the cases were grouped according to the following definitions:

(*a*) *Mild Flushing* (commonest).—An occasional sensation of heat and sometimes sweating with an obvious flush of the face and neck. Normal duties are not disturbed and the patient is seldom inconvenienced.

(*b*) *Moderately Severe Flushing.*—From 12 to 20 or more flushes by day severe enough to cause temporarily listlessness and a sense of fatigue. Generalized sweating usually accompanies flushing, and this often causes the patient to waken from sleep with her night attire uncomfortably wet.

(*c*) *Severe Flushing* (rare).—A severe disability causing insomnia, listlessness, and fatigue (20 cases from *b* and *c* were already under stilboestrol therapy in this series).

The results after radium were: severe flushings, 5 (4%); moderately severe flushings, 53 (45%); mild flushings, 51 (44%); and flushings absent, 9 (7%).

The incidence of serious and persistent attacks of flushing after irradiation is three times the normal, or approximately the same as that following surgical castration (Table I).

TABLE I.—*Comparison of Menopausal Flushing**

	Pre-menopausal	Post-menopausal	Radium	*X* rays	Castration	Hyst. Only
No. of cases	74	78	118	17	43	67
Incidence of severe or moderately severe flushing	7 (9%)	13 (17%)	58 (49%)	10 (59%)	20 (46%)	1 (1·5%)

* Comparative figures from previous report (McLaren, 1941).

On the other hand, simple hysterectomy with conservation of ovarian tissue is not followed by the immediate onset of these symptoms. Moreover, the reservation of radium for patients nearer to 50 than 40 years of age does little to alter the incidence of severe flushing (McLaren, 1941).

Spontaneous Cure of Flushing.—It is commonly held that the passing of a few months will cure flushing, and that a little encouragement is all that is required from the doctor. With this in mind we carefully investigated 71 patients who had completed the radium menopause for periods up to four years (average two years), to find that a spontaneous cure had resulted in only 13 cases, while four appeared to be more seriously affected with the passage of time. The remaining 54 cases (76%), however, continued to have flushing of unabated severity, so that "radium" flushes are by no means transient.

*A postgraduate lecture delivered at the Royal College of Obstetricians and Gynaecologists on November 18, 1949.

Sex Function After Radium.—Before any pelvic operation or treatment by radium or *x* rays there arises in the patient's mind the question, "Shall I be able to continue my normal married life?" At the time of writing no adequate controls are available—that is, it is not known how many women become sexually anaesthetic after the normal menopause. It is considered, nevertheless, that the sudden loss of libido and the onset of sexual dysfunction after radium should be recorded.

Method of Study

The difficulties in obtaining accurate information and the degree of selection of cases were as follows: (1) Before radium treatment uterine bleeding had often caused both physical and mental disturbances, so that sometimes sexual activity had been minimal for months. (2) When patients could not be questioned about sex function—for example, embarrassed patients, unmarried women, widows, or women with unfit husbands. (3) When the patient was obviously telling us what she thought might be expected of her—for example, when a woman, alleging normal sex life, was found to have a painful lesion of the vulva or vagina. (4) Lastly, in all cases the sexual performance of the male partner could only be guessed at from questioning the patient.

I interviewed all the patients in privacy, and after a general talk about weight, flushings, amenorrhoea, etc., the subject of sexual function was tactfully opened. After ascertaining that the husband was healthy, I explained that we were anxious to know if their married life had been improved or in any way altered since the cure of menorrhagia. In various forms the following questions were put:

1. "Before treatment, how frequently did intercourse take place—twice weekly or oftener?" Very often the question "after radium" was answered by a shrug, "Oh, I quite lost interest," or, "It became quite hopeless."

2. The orgasm was also discussed in the simplest terms. "Do you get complete satisfaction, just like your husband?" "Do you get satisfaction always, or once every two or three attempts?"

Very occasionally the male partner was accused of being precipitate or ineffective, but more often the patient herself admitted the sudden onset of sexual anaesthesia, sometimes aggravated by loss of secretion at the vulva.

Material

Half the patients were from Aberdeen and district and half from Birmingham and the Midlands. Information was available from a total of 236 cases. The variable ages of the patients were:

Group A: Aberdeen (116 Cases)

Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
27	1	40	3	45	8	50	4	55	3
34	1	41	4	46	10	51	12	56	1
36	1	42	9	47	12	52	3	57	1
37	2	43	7	48	4	53	6	58	2
38	4	44	6	49	9	54	2	61	1

Group B: Birmingham (120 Cases)

Age	No.	Age	No.	Age	No.	Age	No.	Age	No.
33	1	38	1	43	9	48	12	53	9
34	1	39	4	44	5	49	6	54	5
35	1	40	3	45	5	50	4	55	2
36	2	41	9	46	9	51	5	56	2
37	2	42	7	47	10	52	5	58	1

The following is an outline of the degree of selection. *Sex Urge:*—Computed from desire for intercourse or libido plus frequency of intercourse; 76 patients could provide no information (unmarried, widows, those with unfit husbands). The evidence was discarded as unreliable in 17 and accepted in 143. *Orgasm:*—No information, 79; evidence discarded, 31; reliable information available, 126.

Effect of Radium on Sex Urge

Before Radium.—Good, 11 (7%); moderate, 66 (46%); slight, 43 (30%); absent, 23 (16%)—a total of 143 cases. In other words, 66 (46%) of our cases either lacked or had only slight libido before treatment with radium. The remaining 77 cases (54%), however, had normal sexual desire and would therefore have reason to complain if they found themselves anaesthetic or completely disinterested as a result of radium treatment.

After Radium.—(1) *11 patients with "good" sex urge:*—Unchanged, 7 (64%); depressed to "slight," 1 (9%); complete loss of libido, 3 (27%). (2) *66 patients with moderate sex urge:*—Maintained, 15 (23%); depressed to "slight," 9 (13.5%); complete loss of sex urge, 42 (63.5%). (3) *43 patients with "slight" sex urge:*—Improved to "moderate," 2 (4.5%); unchanged, 14 (32.5%); complete loss of sex urge, 27 (63%). (4) *23 patients without sex urge:*—Unchanged, 23.

To summarize: sex urge already depressed or lost in about 50% of cases suffered further as a result of radium castration; for of 77 patients estimated to have normal sex urge 55 (71%) suffered a marked diminution or found themselves entirely without libido.

Effect of Radium on the Orgasm

Before Radium.—Orgasm usually or almost always, 65 (51.6%); orgasm occasionally, 30 (23.8%); orgasm never achieved, 31 (24.6%)—a total of 126 cases. In other words, 61 (48.4%) were unable to achieve the orgasm or did so only occasionally, while 65 (51.6%) normally achieved the orgasm, and would therefore have reason to complain if this faculty were lost as a result of radium castration.

After Radium.—(1) *65 patients who normally achieved the orgasm:*—No effect (orgasm maintained), 28 (43%); depressed (occasional orgasm), 14 (21.5%); absent, 20 (30.7%); doubtful, 3 (4.6%). (2) *30 patients who occasionally achieved the orgasm:*—No effect, 11 (36.7%); complete loss of orgasm, 19 (63.3%). (3) No orgasm before or after radium, 31 (24.6%).

As will be seen, the orgasm, already infrequent or absent in 61 cases (48.4%), was further affected by radium, so that 34 patients (52%) who normally achieved the orgasm found this no longer possible.

Dyspareunia after Radium.—Although the commonest symptoms after the use of radium were sudden loss of libido and a loss of normal genital sensation, dyspareunia was also present in at least 10% of cases. Occasionally patients noticed that lack of normal vulvar secretion at coitus aggravated the condition.

Premature Ageing of the Genital Tract after Radium

The Vulva and Introitus.—Vulvitis secondary to vaginitis was observed in 2 out of 82 cases, but the introitus appeared abnormal in 7 out of 72 cases—in fact, in 5 patients pain prevented the passage of a small speculum.

Atrophic Vaginal Changes.—Total number of Cusco examinations, 68; bleeding mucosal spots, 11 (16%). Clinically, we labelled these spots "senile vaginitis,"

TABLE II.—*Abnormal Introitus*

Case No.	Age	Condition of the Introitus
53	48	Red and inflamed but not painful
184	36	Painless telangiectasis
185	48	Involved in senile vaginitis
188	52	Perineo-vaginal junction split and bled easily
187	39	Tender inflamed introitus
263	58	Tender; periurethral oedema present
103	53	Tender inflamed introitus

although "pre-vaginitis" would perhaps be a more accurate term; for in our experience it requires the irritation of, say, a pessary before purulent vaginitis develops. In Table III

TABLE III.—*Vaginal Spotting*

	Normal Menopause		Post Radium		Castrate		Simple Hysterectomy	
	Average age, 63		Average age, 46		Average age, 45		Average age, 40	
	Red Spotting		Red Spotting					
	Macro.	Biopsy	Macro.	Biopsy	Macro.	Biopsy	Macro.	Biopsy
No. of cases	57	23	68	88	36	27	75	34
Atrophic or senile ..	15 (26%)	8 (35%)	11 (16%)	13 (14%)	4 (11%)	7 (26%)	0 (0%)	1 (3%)

comparative figures from a previous report (McLaren, 1941) show clearly that surgical castration, like radium, may produce senile mucosal spotting, whereas functional ovarian tissue prevents it.

The Cervix.—The following is a summary of the effect of radium on the cervix: (*a*) atrophy down to the merest rudiment, 27 of 100 cases (27%); (*b*) red spotting on the portio, 9 of 75 cases (12%); (*c*) flat erosions without mucopus, 10 of 131 cases (13%); (*d*) cervical mucus, 56 cases: absent or traces of mucus, 33 (59%); small amount of mucus, 23 (41%). A great variety of bizarre-shaped cells appear in the endocervical canal after irradiation, while radium-vacuolation was occasionally observed in the cytoplasm even six months after treatment. The commonest cells were the polymorph and the endocervical cell, 7 to 10 μ in diameter and possessing a relatively large nucleus. Large "fibre" cells 120 to 180 μ in length with rod-shaped nuclei and small squamae were also seen. Mucus in crenated or web-like form replaced the clear mucus of the sex-mature cervix. On one occasion, however, a small clear piece of mucus was found to contain abundant spermatozoa.

The Urethra.—In a previous report on patients over 60 we noted that in the normal menopausal urethra the external urethral orifice might occasionally show a tongue-like projection of mucosa. These protuberant areas were painless and did not bleed; they were considered to be physiological and not true caruncles. No such appearances were seen in this series. The recent work of H. G. Hanley (1944-5) on menopausal trigonitis and urethritis led us to search for this condition, but only two cases with frequency, sterile urine, and typical trigonal lesions have so far been discovered. (Mr. Guy Baines undertook the cystoscopic examinations.) Urethral smears were taken from 47 smears and compared with the normal. Only three smears could be labelled senile or immature with deep or undifferentiated small cells. The remainder were within normal limits—namely, clumps of intermediate cells (40 μ in diameter), small squamae, globular cells with long nuclei, leucocytes, free nuclei, and so on. Evidence of urethral irradiation was occasionally seen in cytoplasmic and nuclear vacuolation up to six months after treatment.

Vaginal Smears Reflecting Ovarian Activity

Vaginal smears can forecast the actual mucosal histology (1) with adult or mature cells (= adult differentiated epithelium), and (2) with very small or immature cells (= senile undifferentiated epithelium). Most menopausal smears were neither adult nor completely senile. Many smears had a large number of intermediate cells, and though they cannot always be correlated with the histology of the mucosa they do portray a degree of senility or lack of maturity. With these limitations of the vaginal smear in mind, 67 were classified as follows: grossly senile (grade I), 2; moderately senile (mixed or grade II), 44; menopausal clumping (grade III M), 19; and adult, as in sex-mature women (grade III), 2.

Seventy per cent. of the smears therefore had varying numbers of intermediate or senile cells. The 19 smears showing menopausal clumping resembled mid-pregnancy smears, and, indeed, in one case (after 17.5 g. of vitamin E, however) the pregnancy-like or "luteal" smear was found at laparotomy to correspond to the presence of a post-menopausal luteal cyst of the ovary (McLaren, 1949). These menopausal "pregnancy-like" smears appeared to have smaller flat cells lying superficial to deeper and larger cells. It is not suggested, however, that the hormone levels of pregnancy and the menopause are similar, although the resulting vaginal smears may be alike.

The presence of deeper mucosal cells in 70% of the smears probably results from a deficiency of ovarian hormones, and this is supported by the fact that flat squamae replace less mature cells after small doses of stilboestrol. The other possibility is that senile (menopausal) cells result from an excessive level of androgens or a new and increased response to a hormone of this type which is capable of depressing the maturation of the vaginal mucosa. Whatever the exact hormone pattern which produces senility or maturity in cell smears, there is no relation between the cytology and the severity of symptoms; so that patients with no flushings, for instance, produce senile smears and, vice versa, patients suffering intensely from flushing may have a relatively adult cell smear.

Miscellaneous Findings

Ignorance of the diagnosis and the aim of treatment was striking both in this series and in the Aberdeen group—for example, eight patients still practised contraception, while several admitted that they thought they had had cancer. One patient had amenorrhoea and a large abdomen, and was lactating freely. She was busily occupied in knitting baby-clothes for her pseudopregnancy.

Discussion

From the foregoing, the radium menopause is apparently free from any severe delayed effects, but flushings, sexual anaesthesia, and mild involutional changes in the genital tract may be important if not severe disabilities. Most of these ill effects can be improved by the use of stilboestrol. Indeed, 19 of our patients were already under stilboestrol treatment for flushings by their own doctors. However, 40 patients were suffering the discomfort of flushings with loss of sleep, etc., apparently content with the assurance that the effects of the "change" are inevitable and would soon cease.

Flushing and Sweating

Fifty per cent. of normal women approaching the menopause experience occasional flushes or sensations of heat, but in only one case in ten are they of serious type. The figure rises to 17% after the menopause and to 50% after radium or castration (McLaren, 1941). This figure is in agreement with that of Schmitz and Towne (1947), who recorded 48% with "serious menopausal manifestations" in 412 cases treated by *x* rays or radium.

To the severity of "induced" flushes must be added their suddenness of onset. In contrast to this, the normal woman is usually given time to become used to flushes, which may or may not slowly increase in frequency and intensity.

The similarity of the incidence of flushing after radium and castration raises the question—so far unanswered—

of the aetiology of flushing. Does radium destroy the ovary, or is its chief effect on the endometrium, finally preventing it from reacting to hormone stimulation? There seems as yet no clear answer, though probably both endometrial and ovarian irradiation are important in producing amenorrhoea. Ovarian damage and reduced secretion of follicular and luteal hormones (as reflected, for example, in the vaginal smears) may permit overaction of the anterior pituitary, but why this leads to uncontrolled flushing and sweating is not clear.

Loss of Libido

Do women normally become disinterested in sex matters at the menopause? I was somewhat discouraged in several attempts to find a suitable group of (gynaecologically) normal patients—for example, in the surgical wards. So far no controls are available to compare with patients who have been irradiated. Nevertheless, it seems an important finding that libido practically disappeared in well over half the patients under review. The cause of sexual anaesthesia would appear to be more than a temporary effect of irradiation on the sensory-nerve endings in the genital tract, for that might be expected to resolve in time. Ovarian sclerosis with loss of ovarian hormone is another possibility, but it is well known that some castrated women may continue to have a normal and satisfactory married life. The mere fact that the patient has amenorrhoea and knows that she can no longer bear children may, however, be the main factor in disturbing normal sex function.

There seems little doubt, therefore, that radium treatment quickly leads to sexual anaesthesia in 50% of women with normal sexual feelings. It may be that a similar group of patients passing through the normal menopause would likewise find themselves without interest in sex matters, but that does not detract from the fact that radium has caused this *prematurely*.

If, when adequate controls are available, it is found that the normal menopause also leads to sexual anaesthesia in a high proportion of cases, that will provide no support for the induction of the menopause except when it is obvious that no other method of therapy is effective. The development of sexual anaesthesia is a serious matter whether inevitable in the normal menopause or not, and to avoid it our future efforts must obviously aim at a method of controlling haemorrhage short of induction of the menopause.

Premature Involution of the Genital Tract

The occurrence of two cases of vulvitis, five with painful lesions of the introitus, and 11 with red "blood spots" on the vagina perhaps does not portray a picture of serious clinical lesions. But add the fact that dyspareunia was present in at least 10%, and that many of the patients suffering from newly developed sexual dysfunction no longer had Bartholin's secretion at coitus, and it will be obvious that radium does more than simply produce therapeutic amenorrhoea.

Mucosal Spotting.—The passing of a Cusco speculum with distension of the vagina seldom causes punctate areas of bleeding in the vaginal mucosa before the menopause, although in a previous study in normal post-menopausal women in the sixth and seventh decades the condition was found to be quite common—namely, 15 out of 58 (26%) (average age 63). Moreover, in younger women, after surgical castration, similar vaginal spots were found in 11% of cases (McLaren, 1941). It is not possible to say how many years must elapse before these atrophic changes become common in the normal woman, but the appearance of "senile spots" in 16% of cases after radium treatment (aged about 45) is unusual and almost certainly it is a consequence of irradiation. Since small doses of stilboestrol cure the condition it seems likely that lack of ovarian hormones is in fact the cause, and this is borne out in Table III, which clearly shows that conservation of ovarian tissue at hysterectomy prevents, or at least postpones, involutional changes in the vagina. The histological appearance of these "blood spots" is typical, whether on the portio or in the vagina—namely, the superficial epithelium is missing, so that only a few layers of small epithelial cells separate the lumen of the vagina from the submucosa. At the site of the epithelial defect there is a clustering of round cells, but no marked dilatation of blood vessels such as one sees in true senile vaginitis.

The red spotting of the vagina therefore seems to represent a deficiency of ovarian hormones and constitutes a potential rather than an actual disability—that is, it may be only after insertion of a pessary, or after coitus, that a true senile (purulent) vaginitis develops.

The Cervix.—In cases of persistent uterine bleeding in which either radium or surgery would suffice, after curettage has excluded cancer of the uterus, the scales are often tipped in favour of surgery by the presence of a hypertrophic eroded cervix from which excessive amounts of mucopus exude. The choice of surgery implies that the cervical condition will not be cured by radium, but, in fact, in our observations we have never seen a cervix after the radium menopause which produced excessive quantities of mucopurulent discharge. On the contrary, after radium treatment the cervix secretes little or no mucus and becomes less bulky, even atrophic. It is important, therefore, in assessing a clinical case to recognize that the radium menopause will cure what seems to be an unhealthy cervix and relieve symptoms arising from mucopurulent cervical discharge.

Comment

Apart from emphasizing the effects of castration by radium or any other method, our investigations do not answer the difficult clinical problem of selecting the safest and best method of treating a specific case of simple menorrhagia at or near the climacteric. After diagnostic curettage it is often good practice to delay a decision on final treatment, sending the patient to a convalescent home, where rest, fresh air, iron therapy, and so on may continue to improve her general condition.

Especially in metropathia, it is not uncommon for temporary, or even permanent, recovery to follow these simple measures. Very often, however, even after attempts at control with hormone therapy, a decision has to be given on treatment aimed at producing amenorrhoea. The definite morbidity and mortality of hysterectomy *versus* the safety and simplicity of *x* rays or radium is a lengthy subject which will not be discussed here. If, however, irradiation is chosen (and it rightly finds favour in the Birmingham school for certain cases), it is clear that several years of follow-up should be planned. The need for this is exemplified by the fact that, although 19 patients had reported menopausal flushings and were under hormone treatment by their own practitioners, 40 were not being treated, to say nothing of those who obviously required help in restoring their normal married life.

It seems logical and practical that follow-up examinations should fall to the gynaecologist who induced the menopause rather than to the patient's private doctor, who may or may not have retained the report on the pelvic pathology. If patients are seen at three-monthly or four-monthly

intervals for three years, or at least given the opportunity of visiting the clinic if they have any symptoms, severe flushing and minor genital lesions would be diagnosed and a correct dosage of stilboestrol established. By these simple measures most of the criticism levelled at radium could be met and further support given to it as a safe and effective agent in dealing with intractable bleeding at the menopause.

Summary

Severe or moderately severe flushing may persist for months or years in 50% of cases after the radium menopause (three times the normal incidence).

Only 50% of patients had interest in sex matters before treatment. Of the remainder every other case quickly became sexually anaesthetic after radium treatment. (No "controls" are available.)

Premature senility of the lower genital tract may follow soon after radium—for example, 5 out of 72 had a tender inflamed introitus, and 11 out of 68 had "pre-vaginitis" (red spots).

Responsibility for detection and treatment of the effects of radium rests with the gynaecologist rather than with the practitioner.

This report has been read and criticized by Professor H. N. Lloyd, Mrs. B. M. Willmott-Dobbie, Professor Dugald Baird, Dr. John Hewitt, and Dr. A. C. Crooke. Although unable to answer all the points they raised, it is a pleasure to acknowledge their help and useful suggestions. My thanks are also due to Sister M. Scotwell and to our technician, Miss M. E. Attwood, for their assistance in preparing this report.

REFERENCES

Hanley, H. G. (1944–5). *Proc. R. Soc. Med.*, **38**, (Sect. Urol.) 660.
McLaren, H. C. (1941). *J. Obstet. Gynaec. Brit. Emp.*, **48**, 1.
—— (1949). *British Medical Journal*, **2**, 1378.
Schmitz, H. E., and Towne, Janet E. (1947). *Amer. J. Obstet. Gynec.*, **53**, 199.

OBSERVATIONS ON THE TREATMENT OF THYROTOXICOSIS

BY

IAN MURRAY, M.D., F.R.C.P.Ed., F.R.F.P.S.

Physician in Charge, Department of Metabolic Diseases, Victoria Infirmary, Glasgow

There is much diversity of opinion regarding the treatment of thyrotoxicosis. Discussion still centres mainly on the relative merits of thyroidectomy and thiouracil treatment. Neither of these methods can, however, be regarded as wholly satisfactory, and no one would claim invariable success with either. An appreciable proportion of patients are found to relapse after either form of treatment; neither is completely devoid of risk, and there is the possibility, particularly after surgical treatment, of such sequelae as malignant exophthalmos or myxoedema. It is of course recognized that complete remission of thyrotoxic symptoms is obtained in a large number of cases treated either surgically or medically.

Astwood (1948), reviewing 400 cases treated with thiouracil, found that 85% of cases obtained satisfactory remission. Carrick Robertson (1948) noted improvement with the use of this drug in 62% of patients under the age of 21, but only in 43% of a series of 116 cases of all ages, while he claimed almost universally successful results with thyroidectomy. On the other hand, Goldman, cited by Astwood, obtained lasting relief in only 41.8% of cases treated surgically, and Vander-Laan and Swenson (1947) considered the results of thyroidectomy wholly satisfactory in only two-thirds of their cases.

Despite the satisfactory results not infrequently obtained in the treatment of thyrotoxicosis, it is apparent that the current methods are not always successful and that relapses are not uncommon. The purpose of this paper is to inquire into the circumstances which might determine this variability in response to therapy. The investigation is based on the examination of 265 patients referred to me on account of suspected thyrotoxicosis.

Diagnosis of Thyrotoxicosis

While the frank thyrotoxicosis of typical Graves's disease is easy to detect, many cases present difficulty in diagnosis. The recent method of studying excretion of radioactive iodine in the urine has emphasized rather than eliminated this difficulty, as it has shown that there are many "borderline" or doubtful cases. In any case of suspected thyrotoxicosis, nervousness is a feature. The combination of nervousness and thyroid enlargement may be wrongly taken to indicate thyrotoxicosis, as the thyroid may not be overactive although large, while, particularly in men, marked hyperthyroidism or thyrotoxicosis may exist with but slight increase in the size of the gland. Exophthalmos may occur without thyrotoxicosis and may be aggravated by thyroidectomy. Tachycardia is commonly found in nervous patients, whether thyrotoxic or not. Auricular fibrillation in a heart otherwise apparently normal is probably most commonly the result of thyrotoxicosis, but the latter condition may be quiescent although the cardiac irregularity persists. The B.M.R. is certainly raised in thyrotoxicosis, but it may be extremely difficult to obtain a truly basal estimation in a tense, nervous patient, and, in such, high figures may be recorded even in the absence of hyperthyroidism. While the blood cholesterol is commonly below normal its value is too variable to be of much diagnostic help.

Recognizing these difficulties, it is not surprising that in by no means all the cases in the present series could the diagnosis of thyrotoxicosis be accepted. Of the 265 cases as shown in Table I, only 144 were considered toxic, and 93, although having some degree of thyroid enlargement, non-toxic. The remaining 28 cases had no goitre and no symptom other than nervousness; these have been classified as "neurosis." The number of patients in the "non-toxic" group is so high relative to those in the toxic group that it might be considered that too rigid criteria were demanded for a diagnosis of toxicity. Circumstantial evidence in favour of the correctness of the classification is found in the incidence of cardiac arrhythmia among the toxic cases. As shown below, the incidence of this complication in the present series was found to be somewhat lower than that noted by other observers, which is contrary to what might be expected had the grouping been too highly selective. It may, however, be significant, as is considered later, that the average age of patients in the non-toxic group was less than in the toxic patients (Fig. 1).

TABLE I.—*Analysis of 265 Cases Referred to Clinic Suspected to be Suffering from Thyrotoxicosis*

Group	Female	Male	Total
A. Thyrotoxic	116	28	144
B. Goitrous but not thyrotoxic	91	2	93
C. Neurosis—no goitre or evidence of thyrotoxicosis	22	6	28
	229	36	265

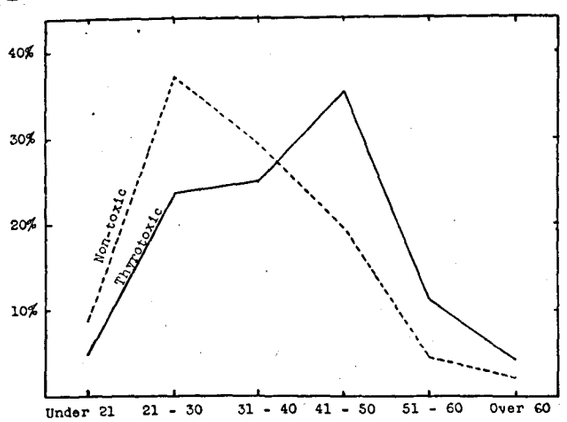


FIG. 1.—Percentage of patients in each age group.

Results of Treatment

Of the 144 thyrotoxic patients 116 were women. The age of the patients is shown in Fig. 2. It is seen that among women the largest age group (comprising 33.5%) was at the time of the menopause, while in men the peak (42%) is reached a decade later.

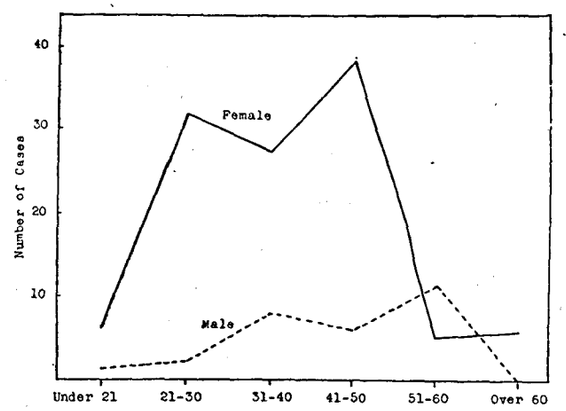


FIG. 2.—Sex distribution of thyrotoxic patients in each age group.

All these patients were treated with methyl-thiouracil, with two exceptions—one who was found to have a persistently low white cell count and for whom it was considered thiouracil might therefore be contraindicated, and another who for social reasons could not attend for the supervision necessary with medicinal treatment. The patients treated with thiouracil have all been observed for at least 18 months. The results of treatment are summarized in Table II. A satisfactory remission of symptoms has been obtained in 85 cases, of which 76 have ceased treatment for more than 12 months. There are 50 patients still receiving the drug, but it is anticipated that a considerable number of them will be able eventually to discontinue it. Thyroidectomy was performed on seven cases following a period of thiouracil treatment. In five of these complete remission of symptoms had been obtained and operation was carried out, for cosmetic reasons, at the patient's request. One patient elected thyroidectomy before satisfactory control had been obtained; while another, who had already undergone thyroidectomy on two occasions, so readily developed marked leucopenia each time thiouracil therapy was attempted that she had to be referred once more for surgical treatment.

TABLE II.—*Analysis of Cases Treated with Thiouracil*

Age Group	Total Treated	Off Treatment		Still on Treatment		Subsequent Thyroidectomy
		More than 12 Months	Less than 12 Months	More than 12 Months	Less than 12 Months	
Under 21	7	4 (1)	—	1 (1)	1 (1)	1
21–30 ..	34	19 (2)	4	9	1 (1)	1
31–40 ..	36	20	2 (1)	14 (3)	—	—
41–50 ..	43	23 (5)	2 (1)	14 (2)	—	4
51–60 ..	16	8	—	8 (2)	—	—
Over 60	6	2	1 (1)	2	—	1
	142	76 (8)	9 (3)	48 (8)	2 (2)	7

The figures in parentheses indicate the number of patients who had relapsed after a previous course of thiouracil.

Relapses

It will be seen from Table II that 21 cases relapsed after treatment with thiouracil. These had received a course of treatment averaging 13 months, and this had been followed by a period of remission, the average duration of which was eight months; thereafter thiouracil was resumed. Eleven patients have again had satisfactory remission of symptoms and have been able to abandon the drug, eight for more than 12 months; the remainder are still receiving thiouracil.

Experience showed that patients who had previously undergone thyroidectomy were more difficult to control and that they tended more readily to relapse if thiouracil therapy was stopped after control had been effected. This is in accord with the findings of Cookson and Staines (1947), who, after treating seven similar cases for 18 months, obtained remission in only two. In the present series there were 14 such cases, the effect of treatment on which with thiouracil is summarized in Table III. It is seen that 10 of these are still receiving the drug (in four cases it has been administered continuously for four years). The case submitted to repeat thyroidectomy is that referred to above in which there was marked sensitivity to thiouracil as indicated by severe leucopenia.

TABLE III.—*Thiouracil Treatment of Thyrotoxic Patients Who Had Previously Undergone Thyroidectomy*

Age Group	No. Treated	Off Treatment	Still on Treatment	Thyroidectomy Repeated
21–30 ..	2	—	2 (1)	—
31–40 ..	2	—	2	—
41–50 ..	9	2 (1)	6 (3)	1
51–60 ..	1	1	—	—
	14	3 (1)	10 (4)	1

The figures in parentheses indicate the number of patients who had relapsed after a previous course of thiouracil.

Comparison is made in Table IV between the results on patients treated initially with thiouracil and on those to whom the drug was administered after previous thyroidectomy. In the former group the relapse rate was 12.5%, while in the latter it was 36%. Of those treated only with thiouracil 64% are in a state of remission after abandonment of the drug. A considerable number of those still under treatment will, it is anticipated, come into this category later, and, even allowing for the possibility of some relapses, it would seem a fair estimate that at least 75% of the cases treated will have satisfactory remission of symptoms after stopping thiouracil. On the other hand,

TABLE IV.—*Effect of Methyl-thiouracil Treatment on Patients (A) Without, and (B) After Previous Thyroidectomy*

	No. Treated	Off Treatment	Still on Treatment	No. of Relapses	Subsequent Thyroidectomy
A	128	82 (64%)	40 (31%)	16 (12·5%)	6 (5%)
B	14	3 (21%)	10 (71%)	5 (36%)	1 (7%)

certain cases seem to require treatment for an indefinite period. This applies particularly to the post-thyroidectomy patient; of such cases in the present series 71% appear to be of this type.

Cardiac Arrhythmia

Brief reference may be made to this complication of thyrotoxicosis. As shown in Table V, auricular fibrillation was noted in 16 cases (11.1%). One patient was treated

TABLE V.—*Incidence of Auricular Fibrillation and its Control with Medical Treatment*

	No. of Cases	Cardiac Arrhythmia	Rhythm Restored
Various authors, 1944–6* ..	268	40 (15%)	27 (67·5%)
Cookson and Staines (1947) ..	95	16 (17%)	8 (50%)
Clarke (1948)	6	3 (50%)	
Goodwin (1949)	144	28 (19%)	13 (46·4%)†
Vérel (1949)	62	10 (16%)	9 (90%)
Present series	144	16 (11·1%)	11 (73%)

* Nussey (1944), Grainger *et al.* (1945), McGavack *et al.* (1945), Cookson (1945), Wilson (1946). † During this investigation into the effects of thiouracil, quinidine was not used.

surgically; of the remainder treated with thiouracil 11 (73%) regained normal rhythm, three requiring quinidine in addition. These results are comparable with those of other observers, which are summarized in the table. As might be expected, the higher the age group the greater was the proportion of patients found to suffer from auricular fibrillation (Table VI).

TABLE VI.—*Age Incidence of Auricular Fibrillation in Thyrotoxic Patients*

Age Group	No. Showing Arrhythmia	Percentage in Each Age Group	Sinus Rhythm Regained	Arrhythmia Persists
Under 21	0	0	—	—
21–30	0	0	—	—
31–40	1	3	1	—
41–50	6	14	4	2
51–60	5	31	4	1
Over 60	3	50	2	1

Complications of Treatment

Some degree of leucopenia was commonly encountered, but was rarely sufficient to call for discontinuance of thiouracil. There were, however, two fatalities—one patient, a young girl who had been treated with thiouracil and had remained well thereafter for several months, relapsed. It was suggested to her doctor that she should again be given methyl-thiouracil as an out-patient. She did not return to the clinic, and it was later discovered that she had developed severe sore throat, and, suspected to be suffering from diphtheria, had been removed to an isolation hospital, where she died soon after admission, throat swabs proving negative for that infection. It seems certain that her death was attributable to acute agranulocytosis.

The other patient, a middle-aged woman, developed marked leucopenia, and thiouracil treatment was stopped. She was kept under observation; folic acid and other therapeutic agents were tried, but the white cell count remained persistently low. More than a year later, although no further thiouracil had been administered, she suddenly developed severe epistaxis and died; necropsy revealed very marked hyperplasia of the bone marrow and splenomegaly, compatible with hypersplenism. Other toxic manifestations of this form of therapy were encountered in mild degrees, but did not interfere with treatment. One strange sequel, which does not seem to have been reported previously, was noted in two male patients who, after thyrotoxicosis was controlled, grew hair on areas of scalp which had been bald for years.

Psychiatric Aspects of Thyrotoxicosis

While it is true that a large proportion of thyrotoxic patients obtain satisfactory remission of symptoms, whether treated surgically or with thiouracil, it is apparent that they vary greatly in the manner in which they respond to treatment and in their liability to relapse. Some factor must exist to explain these differences.

A hereditary tendency is found in many patients. In the present series of 144 thyrotoxic patients a familial history was obtained in 22 (15.3%). In the non-toxic group of 93 patients a familial history was given by 11 (11.8%), while no patient in the third "neurosis" group gave such history. It has been suggested by Bartels (1941) that a defect, probably of the thyroid, is inherited. While this possibility cannot be denied, it is conceivable that a thyrotoxic mother may so affect the environment of the child that the latter may develop emotional disorder which may prove to be the background for the development of thyrotoxicosis.

Although for many years considered as a possible precipitating factor of thyrotoxicosis, emotional disturbance as the essential cause of the disorder has not gained universal acceptance. Langdon Brown (1932) wrote: "I am more and more impressed with the influence of emotion in the causation of Graves's disease." On the other hand, it has been postulated by Linnell and Greene (1947) that the essential lesion is in the hypothalamus, which, it is suggested, becomes hypersensitive and reacts to even a normal blood thyroxine. Dealing with the latter hypothesis, Means (1949) asks why this change in sensitivity should occur. It seems possible that if altered function of the hypothalamus is established the cause may be attributable to emotional influences on it.

Less attention appears to have been given to psychological disturbances in the treatment of thyrotoxicosis. Kiene and Dixon (1931) examined 15 patients who had previously undergone thyroidectomy and, concluding that recurrence of symptoms would not occur if nervous tension could be relieved, recommended complete psychiatric study of all cases of hyperthyroidism. Such a study was made on 200 thyrotoxic patients by Conrad (1934), from which she formed the opinion that therapy should include both means, such as partial thyroidectomy and also psychiatric guidance. The value of the latter form of treatment in restoring these patients to useful satisfactory life has recently been advocated by Lidz and Whitehorn (1949).

In the treatment of the patients in the series under review it soon became apparent that continuing emotional disturbance was always to be found in those who proved difficult to control. At this time the services of a psychiatrist, Dr. Adam Milne, became available, and he co-operated in the work of the thyroid clinic. His assistance in elucidating the emotional difficulties and in advising about their solution was invaluable.

While the association of physician and psychiatrist in the treatment of thyrotoxicosis may be regarded as ideal, one must agree with Lidz and Whitehorn that the brunt of helping the patient to regain emotional equilibrium must in general fall on the internist. Apart from the fact that the services of an expert psychiatrist are not always available, there is usually little difficulty in obtaining information from the patient about the disturbing factors in the life situation, for, as these writers point out, the thyrotoxic subject is generally an "outgoing" person who relates to others easily. Moreover, they consider there may be danger in energetic psychiatric approach, and recommend

an active "superficial" psychotherapy, amounting essentially to prompt decision and advice on practical details.

It is not possible here to give details of all cases in this series, but below are a few typical histories.

Illustrative Cases

Case 1: Rapid Response to Treatment.—A man aged 27, when first seen, was a classical example of thyrotoxicosis, with a large vascular goitre, exophthalmos, and all the typical symptoms. A remarkable psychiatric history was obtained from him. He had been an unstable child, timid and afraid of the dark, because of association with an apprehensive nervous mother and quarrels and drunkenness in his home. At 16 he had a "nervous breakdown" associated with worry and feelings of guilt over masturbation. He was an unsteady worker because, as he thought, conditions always affected his health. Just before joining the Army he had a "nervous breakdown," on account of which he left work. During this time he was "accidentally" called up for the Army. He was sent overseas and seems to have been intensely phobic about his health from the beginning. In India he developed nervous diarrhoea. He became panic-stricken when he got malaria, believing that because of his masturbation he would not be able to withstand it, and from then onwards his diarrhoea continued. He was invalided home with a diagnosis of sprue, although it seems probable that the disorder was of nervous origin. On returning to the United Kingdom he had an acute psychotic breakdown and was admitted to a military mental hospital, being eventually discharged from the Service. Owing to gross instability he lost one job after another. Then he developed syphilis—quite credibly, as he claimed, at the first possible exposure to infection. Although he sought immediate treatment this infection appears to have caused intense nervous upset and phobias of ill-health. Soon afterwards he developed the thyrotoxic symptoms. Although it was thought at the onset that the emotional disturbance was the essential disorder, his thyrotoxic state was so pronounced that it was considered necessary to bring this under control with thiouracil before any psychiatric approach was made. He responded remarkably rapidly to this treatment and soon began to receive simple psychiatric guidance. In a short time he declared he felt better than he ever had, and ascribed this to the reassurance he had got regarding masturbation. Thiouracil was stopped after 10 weeks and he has been under observation now for 16 months. During this time there has been no evidence of recurrence of thyrotoxicosis.

Case 2: Rapid Response to Treatment.—A fireman in the River Fire Service, aged 36, had been at work on a fire aboard ship and was trapped in the burning hold. He thought at the time that there was no way of escape, but eventually got out safely. When first seen nine months later he had lost 22 lb. (10 kg.) in weight and showed all the signs of thyrotoxicosis. He made a dramatically rapid recovery after only eight weeks' treatment with thiouracil. He has been kept under observation for three years and has remained perfectly well. This man, who made an unusually rapid response, seemed, unlike the usual thyrotoxic patient, not to have been nervous previously. Moreover, this form of psychological trauma as a precipitating factor is unusual.

Case 3: Requiring Maintenance Dose.—A woman aged 30, when first seen, showed all the classical features of thyrotoxicosis with considerable goitre which had developed within the previous 18 months. Nervousness had been her complaint for 2½ years, but she denied knowledge of any precipitating cause. She was the daughter of a West Highland crofter and admitted to excessive shyness in childhood. She has always been a nail-biter. At 19 she became a mental nurse and subsequently married an attendant in a mental hospital. She came to Glasgow, where she encountered serious housing difficulties. Shortly before the onset of symptoms her father, to whom she appears to have been over-attached, died. She had one child, and was always apprehensive about her health. Soon after her father's death she gave birth to her second child. At the time of onset of thyrotoxic symptoms, therefore, she had anxiety regarding housing and additional family responsibility, and great emotional disturbance from bereavement. This case illustrates the rather frequent association of bereavement with the onset of symptoms. Moreover, while the history of emotional upset before the onset of symptoms is highly suggestive, it is to be noted that the patient herself was unaware of a precipitating cause of nervousness.

Case 4: Requiring Maintenance Dose.—A man aged 58 presented marked symptoms of thyrotoxicosis with considerable exophthalmos. He appeared to have had a lifelong mild chronic anxiety state, dating from childhood, with fear in the dark, and a psychiatric illness of some severity during the first world war. Ever since that time his consumption of alcohol can only be described as profound, the anxiety state possibly being to some extent causative. In recent years he has worked during the night as a baker, and by day occupied himself as a police-watcher for a street bookmaker. This caused such nervous tension that he found himself incapable of carrying on if he was not "properly drunk." Latterly he became obsessed by the thought of police, seeing them in his sleep and panicking at the least sound. Mere mention of the word "police" caused noticeable increase of upper-lid retraction. He responded satisfactorily to thiouracil, and fibrillation settled eventually after quinidine. He has been under observation now for four years, during which time it has been found impossible to discontinue the thiouracil.

Case 5: Requiring Maintenance Dose, then suddenly able to abandon it.—A woman aged 25 gave a history that she had always been nervous. About two years before the date on which she was first seen she was working as a typist with an employer who was very exacting and sarcastic, and she attributed her greatly increased nervousness to this. At about the same time she got engaged to be married to a man who lived in London. She was markedly thyrotoxic, but made a very satisfactory response to thiouracil treatment. However, she remained nervous. She was obviously of a type that was easily upset, and described how she got very readily "into a flat spin" at her work. It transpired that she could not get a house in London, and under no circumstances would she go and live with her prospective mother-in-law. It was impossible for her to see her fiancé, because of distance and their different times of holiday. She continued in this state, although reasonably controlled with thiouracil, but there seemed no prospect of being able to abandon the drug until some eight months later when she broke the "engagement." Her condition improved immediately, and she was able to give up thiouracil. She has remained well without it for the past twelve months.

Case 6: Relapse.—A woman aged 25 with pronounced thyrotoxicosis gave a history of having been nervous all her life. She lived under poor social conditions in her parents' home, together with her husband and her five children. She was obviously terrified of another pregnancy. Later it transpired that at the age of 18 she had been raped one day returning from work. When she eventually told of this she said that she had forgotten about it, though she was then able to give the most detailed description of the incident. It is possible that she did in fact have amnesia of the event until it was brought to light in the course of psychiatric interview. She made a satisfactory response to thiouracil treatment and appeared to be very well until about six months later, when she again became pregnant. Although she was still on a maintenance dose of 50 mg. of methyl-thiouracil daily, her condition relapsed seriously. The pregnancy was terminated and sterilization performed. From that time onwards she has been well without thiouracil, maintaining her weight and a normal pulse rate. The goitre, however, was still considerable, and as she was worried about the appearance of this she eventually underwent thyroidectomy.

Case 7: Post-thyroidectomy Relapse.—A woman aged 53 underwent thyroidectomy first in 1941 and again 18 months later. Evidence of thyrotoxicosis soon became manifest again. Thiouracil was started in December, 1944. She has never been able to do without it since. On two occasions it was abandoned for periods of two months but had to be started again.

She has always been an emotional, insecure woman. For years she had anxiety about the health of her husband, who suffered from chronic heart disease and mental disorder until his death in August, 1947. She continues to be over-anxious and is easily upset emotionally. She suffers from paroxysmal auricular fibrillation and often complains of varying symptoms of a functional character.

Discussion

The above case histories are typical of the whole series and illustrate the important psychological features present in every patient. It would appear that emotional difficulties not only play an all-important part in precipitating a thyrotoxic state but also account for the differences in response to treatment and the tendency to relapse in certain cases. Accordingly it seems essential that in the treatment of thyrotoxicosis attention must be focused on the psychiatric aspects. In most cases the acute symptoms have to be controlled with thiouracil before the patient becomes responsive to simple psychotherapy, but the latter may, as in Case 1, prove the most important part of treatment. Admittedly the emotional problem may be difficult to solve and the thyrotoxic symptoms be kept in control only by continued therapy. Nevertheless, the discovery of the psychological disturbance may explain why a patient is unable to abandon thiouracil without relapsing and make it possible to give at least some advice and guidance, which often proves beneficial. It seems particularly desirable that examination of the psychological aspects should be attempted before any decision is made on thyroidectomy, as it might be possible in some cases to improve the patient without operation, while it might cause rejection as unsuitable of those cases which subsequently relapse and which then prove so difficult to control with thiouracil.

In conclusion, reference must be made to the second group in this series. These patients were nervous and had thyroid enlargement, but they were not thyrotoxic, at any rate at the time when examined. Yet four of the 93 patients had had thyroidectomy and a considerable number had in the past been treated with thiouracil without benefit. It is to be noted that, as shown in Fig. 1, these patients belonged to the younger age groups and that they gave a family history of thyrotoxicosis almost as high as that of the thyrotoxic group—11.8% compared with 15.3%. It seems an irresistible conclusion that these nervous goitrous patients are potential sufferers from thyrotoxicosis within the next 10 to 20 years. In view of what has been said above, it would appear desirable that such patients should have early psychiatric treatment in the hope that thereby this serious complication may be averted.

Summary

Examination was made of 265 patients suspected to be suffering from thyrotoxicosis. In only 144 cases was this diagnosis accepted.

Over 60% of thyrotoxic patients gained, and possibly at least 75% will ultimately gain, remission of symptoms after treatment with methyl-thiouracil. Patients who had previously undergone thyroidectomy often required a maintenance dose for an indefinite period and proved particularly liable to relapse if the drug was discontinued.

Inquiry into the psychiatric history revealed in every case disturbances which seemed of great importance in precipitating thyrotoxicosis, in accounting for relapse after either thiouracil therapy or thyroidectomy, and in explaining the necessity for continuing a maintenance dose. An attempt to deal with the emotional factor is regarded as an essential part of the treatment of thyrotoxicosis.

Attention is drawn to a group of patients complaining of nervousness and showing some thyroid enlargement but who were not regarded as thyrotoxic. It is suggested that such patients may be prone to develop toxic goitre in the future and that psychiatric treatment might be of prophylactic value.

Grateful acknowledgment is made to Dr. Adam Milne, now physician-superintendent, King's Seat Mental Hospital, Aberdeen, for his assistance in this investigation.

References

Astwood, E. B. (1948). *Lancet*, **2**, 151.
Bartels, T. D. (1941). *Heredity in Graves's Disease*. Copenhagen.
Brown, W. L. (1932). *British Medical Journal*, **1**, 223.
Cookson, H. (1945). *Lancet*, **2**, 485.
—— and Staines, F. H. (1947). *British Medical Journal*, **2**, 759.
Clarke, W. E. (1948). Ibid., **1**, 597.
Conrad, A. (1934). *J. nerv. ment. Dis.*, **79**, 505, 656.
Goodwin, J. F. (1949). *British Medical Journal*, **1**, 895.
Grainger, A., Gregson, D. A., and Pemberton, H. S. (1945). Ibid., **2**, 343.
Kiene, H. E., and Dixon, H. H. (1931). *J. nerv. ment. Dis.*, **74**, 483.
Lidz, T., and Whitehorn, J. C. (1949). *J. Amer. med. Ass.*, **139**, 698.
Linnell, J. W., and Greene, R. (1947). *Post-Grad. med. J.*, **23**, 377.
McGavack, T. H., *et al.* (1945). *J. clin. Endocrinol.*, **5**, 259.
Means, J. H. (1949). *Lancet*, **2**, 543.
Nussey, A. M. (1944). *British Medical Journal*, **2**, 745.
Robertson, C. (1948). *Lancet*, **2**, 675.
Vander-Laan, W. P., and Swenson, O. (1947). *New Engl. J. Med.*, **236**, 236.
Vérel, D. (1949). *British Medical Journal*, **1**, 892.
Wilson, A. (1946). *Lancet*, **1**, 640.

BODY WEIGHT IN GRAVES'S DISEASE

BY

HUGH CONWAY, M.B., B.Sc., M.R.C.P.

(From the Gardiner Institute of Medicine, University of Glasgow, and the Western Infirmary, Glasgow)

Loss of weight is one of the classical features of Graves's disease. It is recognized, however, that sometimes the loss may be insignificant, and occasionally weight may even rise while the disease is still active. Thus Joll (1939) said that "rarely the patient for a time actually gains weight, even very considerably." Linnell, Keynes, and Piercy (1946) pointed out the error of regarding loss of weight as a constant feature of thyrotoxicosis and observed that "maintenance, or even an increase, of weight is not very uncommon even in patients with primary toxic goitre."

Means (1948) noted that the nutritional state in Graves's disease varies greatly but in the average case weight loss is not evident. He added that occasionally a patient actually gains weight while thyrotoxic. A "plump" type of the disease was described by Trotter and Eden (1941). They studied eight patients who were plump in appearance and had gained weight before or after admission to hospital. Apart from the increase in weight these cases had several other features in common, and it was considered that they constituted a special type of Graves's disease. Moreover, differentiation of this type was found to be of practical importance because operative treatment gave unsatisfactory results.

The object of the present investigation was to study the nutritional state in Graves's disease, and the findings are based on 50 cases observed and treated during the past three years. Patients with hyperfunctioning adenoma of the thyroid (Plummer's disease) are not included.

Material and Methods

The series consisted of 47 women and 3 men; their ages varied from 22 to 54 years. Patients were accepted for the investigation only if the diagnosis was undoubted and complications, such as diabetes, were absent; otherwise they were unselected. The following information was obtained about each case.

Basal Metabolic Rate (*B.M.R.*).—A considerable number of estimations were made at short intervals until a constant result was obtained. This "level" was usually reached in 10–14 days.

Initial Weight.—This was expressed as a percentage of the expected weight, obtained from age, height, and sex tables, and compared with the patient's own estimate of weight alteration since the onset of symptoms.

Calorie Value of the Diet.—A full dietary history was taken and the daily calorie intake calculated for the period immediately before admission to hospital.

Energy Requirement.—The method described by Wright (1945) was used, allowance being made for the increased B.M.R. A typical day's activity was analysed, with emphasis on the nature of the occupation, the amount of exercise, and the use of leisure. The daily calorie requirement was assessed on the basis of three eight-hour periods of sleep, work, and leisure.

The difference between the theoretical energy requirement and the calculated calorie intake was noted.

Results

The incidence and range of the initial weights is shown in Fig. 1. Seven patients were definitely heavier and 33 lighter than their expected weight; 10 approximated very closely to it. There was a fairly close correspondence in individual cases between the subjective estimate of weight alteration and the measured variation from the expected weight. Thus two patients who could be described as "plump" complained of getting too fat, 12 noticed no change, and 30 had experienced loss of weight of varying degree. Despite a few marked discrepancies—for example, one patient who said that her weight had been steady was only 80% of her expected weight—it was considered that, overall, the calculated percentage of expected weight was a good guide to the actual weight changes (Table I).

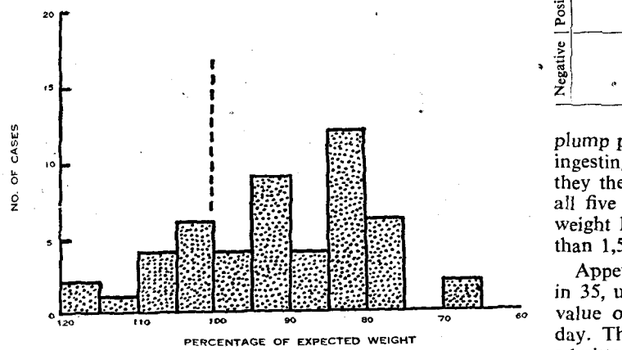


FIG. 1.—Distribution of the initial weights (expressed as a percentage of expected weight) of 50 cases of active Graves's disease.

The level of the B.M.R. bore no relation to the degree of alteration in weight. The B.M.R. was between +25% and +30% in nine patients whose weights varied from 109% to 67% of their expected weight. One patient who was acutely ill with all the classical clinical signs of Graves's disease, including marked loss of weight, had a B.M.R. of only +9%.

TABLE I.—*Comparison of Subjective Weight Change and Percentage of Expected Weight*

Subjective Weight Change	No. of Cases	Average Percentage of Expected Weight
Loss greater than 1 st. (6·3 kg.)	12	83
Loss up to 1 st.	18	88
Nil	12	95
Increase up to 1 st.	6	108
Increase greater than 1 st.	2	118

Age may be of some significance in determining the body's reaction to thyrotoxicosis. With one exception all patients who were heavier than expected were under the age of 30; on the other hand, all over 45 were considerably underweight.

In most cases the balance of daily calorie requirement over intake fell within the range +1,000 to −500 calories. No significance was attached to this degree of difference because of the obvious sources of error in assessing the two figures; when the same methods of calculation were applied to 10 normal adult subjects the range was +700 to −600 calories. The results were striking, however, in the cases at the extremes of the weight range (Table II). The two plump patients (120% and 117% of expected weight) were ingesting 1,850 and 1,600 calories respectively more than they theoretically required. At the other end of the scale all five patients who were 76% or less of their expected weight had a balance of requirement over intake of more than 1,500 calories.

TABLE II.—*The Difference Between the Daily Calorie Requirements and Intakes Compared with the Initial Weights (Expressed as a Percentage of Expected Weight)*

	Balance of Daily Energy Requirements over Dietary Intake (Calories)	No. of Cases	Percentage of Expected Weight	
			Range	Average
Positive	2,500–2,000	2	69–67	68
	2,000–1,500	3	76–75	76
	1,500–1,000	2	102–96	99
	1,000–500	13	107–79	90
	500–0	12	113–81	93
Negative	0–500	14	108–78	92
	500–1,000	1	—	90
	1,000–1,500	1	—	99
	1,500–2,000	2	120–117	118

Appetite was stated to be ravenous in 3 cases, increased in 35, unchanged in 11, and poor in one. The estimated value of the diets varied from 4,250 to 1,600 calories a day. The patient who was only 67% of her expected weight admitted having lost about 3 stone (19 kg.) and was taking the lowest diet of all. The figures for the two plump patients were the highest obtained—4,250 and 4,010 calories.

The Plump Cases

Some clinical details are shown in Table III. In Case 15 the adiposity was most marked on the upper back, anterior abdominal wall, and thighs—there were fresh striae in the latter site. This selective distribution was not obvious in the other patient, who just appeared to be moderately overweight. Biopsy of the abdominal wall showed in both instances normal adipose tissue and there was no clinical evidence of excessive fluid retention. The patients were

TABLE III.—*Clinical Features of the "Plump" Cases*

	Case 15	Case 23
Sex	Female	Female
Age	23	25
Duration of symptoms	4 months	6 months
B.M.R.	+25%	+30%
Percentage of expected weight	120	117
Complaint	Nervousness; goitre; "getting too fat"	Dyspnoea; prominent eyes; goitre; "getting too fat"
Menstrual periods	Regular	Regular
Enlarged tonsils	Absent	Absent
Appetite	Ravenous	Ravenous

considerably incapacitated by symptoms of severe thyrotoxicosis, and emotional instability was very pronounced. There was no menstrual upset.

The family history of Case 15 was of considerable interest. Her elder sister, now aged 36, was treated for Graves's disease by *x* rays in the Western Infirmary, Glasgow, in 1933. When interviewed, the sister said that during her illness she had a voracious appetite and became "puffy all over." The hospital record states that she was slightly obese and her weight was 139 lb. (63 kg.). At present she is very well and weighs 113 lb. (51.3 kg.). Compared with her younger sister she thought that her own obesity developed more slowly and was more generalized. There was nothing of significance in the family history of Case 23.

Methyl thiouracil alone was used in treatment, and satisfactory remissions were obtained. The drug was administered, in gradually decreasing dosage, for 18 months in Case 15 and for 15 months in Case 23; during the period of therapy they lost 16 lb. (7.3 kg.) and 12 lb. (5.4 kg.) respectively. The slow reduction in weight was a very striking feature and compares closely with the post-operative finding of Trotter and Eden (1941). The fall in weight was accompanied by a gradual diminution of appetite, and the calorie values of the diets, originally 4,250 and 4,010 calories a day, were 2,350 and 2,200 calories respectively one year after the beginning of treatment. The classical thyrotoxic symptoms such as nervousness, dyspnoea, and tachycardia subsided within a few months. The follow-up has as yet been short; but neither patient has relapsed, and their weights have remained steady.

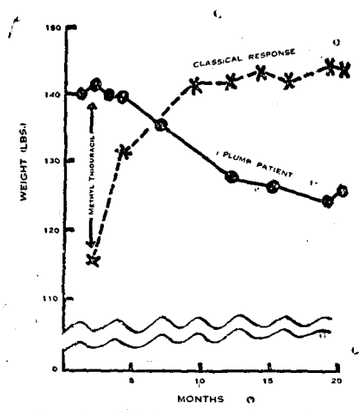


FIG. 2.—Weight curve of a plump patient compared with the classical response to thiouracil therapy.

Fig. 2 shows the striking difference between the weight curves of Case 15 and a patient who was considerably underweight before the start of treatment.

Discussion

Those who are most familiar with toxic goitre in all its manifestations agree that there is no sign of classical Graves's disease which may not be absent. There are many atypical categories, and diagnosis depends on a careful appraisement of the presenting clinical complex. A B.M.R. within the normal range or absence of eye signs does not necessarily exclude active thyrotoxicosis. The same holds for maintenance or even increase of body weight. Provided that natural remission is not taking place, gain of weight reflects an increase in the consumption of food sufficient to counterbalance the raised metabolism.

The plump patients differed from the classical ones in their excessively large appetite. No explanation can be offered for the cause of this bulimia, but its disappearance after treatment probably means that it was specifically due to the hyperthyroidism and not to any chance circumstance. Its occurrence in two sisters suggests the possibility of a familial influence. Whatever its pathogenesis, the large food intake acts in a protective manner and prevents the wasting which may be such a menacing feature of the disease. In the average case more food is eaten, probably in a vain attempt to counteract the nutritional effects of increased metabolism; occasionally the stimulation of appetite is so great that the attempt succeeds. As regards clinical severity, however, the well-nourished state of the plump patients was deceptive and their symptoms belied their appearance. They were no less seriously ill than more typical cases with an equivalent degree of thyrotoxicosis.

Trotter and Eden (1941) postulated that the plump type of Graves's disease was a specific entity; their patients were all young females who had pronounced signs but few symptoms; the incidence of lymphoid tissue overgrowth and amenorrhoea was higher than in ordinary cases and the results of operative treatment were unsatisfactory. The present investigation does not lend support to this theory. Apart from the gain in weight there were no gross differences between the plump patients and the classical ones. At one end of the scale were the fat patients, at the other the thin ones; between there was every nutritional grade. All were suffering from the same disease process—one which affects the balance of calorie intake and output; the latter usually exceeds the former, but the reverse may hold. The conception that weight is gained only in young women with a particular combination of physical signs seems hypothetical. The present study does support the contention that the set of circumstances causing increase in weight occurs exclusively in the young, but the series is small and only 11 patients were over the age of 40. It may be that the older patients have not the necessary resilience to protect themselves from the increased metabolism by excessive stimulation of appetite.

Thyroidectomy was performed on seven of the cases reported by Trotter and Eden (1941). Two died within a few hours and three had a recurrence. The authors considered that the operation was not only unsatisfactory but also dangerous, and suggested that medical treatment be preferred to surgical. This view was challenged by Linnell, Keynes, and Piercy (1946), whose experience of surgery in plump cases was no less satisfactory than in ordinary patients. If there remains any doubt about the wisdom of undertaking thyroidectomy, thiouracil treatment can be recommended.

Summary

The nutritional state has been studied in 50 cases of active Graves's disease. Their initial weights varied from well above to well below the expected weights. Two patients were plump in appearance.

The body weight depends on the balance between calorie intake and requirement. Appetite is specifically influenced by thyrotoxicosis and may overcompensate for the increased metabolic rate.

The fundamental disease process is the same in all patients whether they have lost or gained weight, and varies only in its relative effects on appetite and B.M.R.

The plump patients responded well to thiouracil therapy.

I wish to thank Professor J. W. McNee for criticism and advice in the preparation of this paper and Dr. A. A. Charteris for access to the records of his department.

REFERENCES

Joll, C. A. (1939). *British Medical Journal*, **2**, 433.
Linnell, J. W., Keynes, G., and Piercy, J. E. (1946). Ibid., **2**, 449.
Means, J. H. (1948). *The Thyroid and its Disease*, 2nd ed., p. 319. Lippincott, Philadelphia.
Trotter, W. R., and Eden, K. C. (1941). *Lancet*, **2**, 335.
Wright, S. (1945). *Applied Physiology*, 8th ed., p. 833. Oxford Univ. Press, London.

TREATMENT OF SIMPLE EPITHELIAL CYSTS WITH SECONDARY PHOTO-ELECTRON RADIATION

PRELIMINARY REPORT

BY

LIONEL COHEN, M.B., B.Ch., D.M.R.T.
(From the Radiation Therapy Department, Johannesburg General Hospital)

AND

SAMUEL A. KIMMEL, M.B., B.Ch.
(From the Non-European Hospital, Johannesburg)

This investigation was prompted by the relatively large number of children presenting at the Non-European Hospital, Johannesburg, for treatment of cystic swellings of the neck, generally of the "plunging ranula" type. For the purpose of this report a plunging ranula has been defined as any cystic swelling originating in the floor of the mouth and extending beyond the confines of the mouth.

Surgical removal has in our experience been unsatisfactory on account of technical difficulties encountered in the extensive dissection required and the frequent recurrence of the condition after removal. The injection of sclerosing agents has given uncertain results and produced occasional alarming reactions. Conventional roentgenotherapy with moderate dosage was found to be completely ineffective. For these reasons it was thought that an alternative form of therapy might be worth trying, and the gratifying results obtained with the safe and simple procedure adopted seem to justify publication at this stage.

Although the epithelial lining of these cysts is known to be resistant to ordinary doses of radiation, it was realized that it was possible to produce an intense local ionization in the cavity of the cyst with relatively small doses by exploiting the photo-electric activity of heavy metals exposed to Roentgen rays. It is a common experience in radiological practice that the presence in irradiated skin of heavy elements (ointments or lotions containing zinc, mercury, or iodine) causes a very great increase in the intensity of the skin reaction. It was therefore thought possible to destroy the secreting lining of a ranula by bringing into contact with it an aqueous suspension of a heavy element and exposing it to small doses of Roentgen rays.

The procedure provisionally adopted is to aspirate the contents of the ranula through a wide-bore needle under local analgesia and to introduce into the cavity 2 ml. of a 10% aqueous suspension of bismuth oxychloride ("bisoxyl"). This is followed by exposure to intermediate voltage Roentgen rays (140 to 180 kV) delivering about 300 r to the tissue at a single sitting. This quantity is entirely empirical; responses have been noted with smaller doses.

The photo-electric emission from irradiated matter varies in a complex manner with the atomic number of the elements concerned. It is estimated that, with use of the technique described, the composite value for the photo-electric absorption coefficient of the cyst fluid containing the suspended bismuth (Z = 83) would be not less than 40 times that of soft tissue (equivalent Z = 7); and the ionization in the immediate proximity of a bismuth particle might be many hundred times greater. The range of this secondary radiation, which consists entirely of relatively low-energy electrons, is only a few microns in tissue, so that no more than a single layer of cells could be affected, and no damage could be produced in the tissues underlying this single layer of epithelium.

Reactions to the procedure have been fairly uniform. Initially there is a brisk effusion which persists for the first week after the operation, so that, despite the previous aspiration, the cyst becomes somewhat larger and more tense than it was originally. Thereafter the mass shrinks steadily and within three weeks has become a small fibrous nodule. These reactions produce no discomfort, and treatment in hospital is unnecessary after the first week.

The four cases reported below have been selected from our earliest trials in order to illustrate the effect of the bismuth injection alone and the superiority of the combined injection–irradiation procedure.

Case 1

A coloured girl aged 10 was admitted on January 26, 1949, complaining of a gradually enlarging swelling in the right side of the neck of several years' duration. On examination a soft fluctuant mass was found extending from the floor of the mouth to the clavicle, and from the midline into the right posterior triangle of the neck in front of the sterno-mastoid muscle. It did not move on swallowing and was not attached to the skin.

On February 1, 60 ml. of a watery straw-coloured liquid was aspirated and 2 ml. of bisoxyl introduced. Next day the cyst had become larger and was much tenser; 300 r was administered to the mass laterally, and a further 300 r through the anterior aspect. On February 15 (13 days after irradiation) the lower half of the cyst had become obliterated while the upper half had not changed. A further 2 ml. of bisoxyl was injected into the remaining portion of the cyst, and 300 r delivered through anterior and lateral fields. On March 1 (27 days after the first treatment) a small firmly indurated lump was present in the right submental region.

Case 2

A Bantu boy about 13 years old was admitted on February 16 complaining of a slowly enlarging swelling under the chin of three months' duration. On examination a round fluctuant mass about 8 cm. in diameter was found occupying both digastric triangles of the neck. It was continuous with a small swelling in the floor of the mouth to the left of the fraenulum.

On February 24 the swelling was aspirated and 30 ml. of a yellowish gelatinous fluid was withdrawn. A further 10 ml. was aspirated on March 21 and 2 ml. of bisoxyl was introduced into the cyst. On March 24 the swelling had increased in size and was much tenser. The swelling in the floor of the mouth had also become larger. On April 23 (five weeks after aspiration) the characteristics had remained unchanged except that the cyst was a little firmer in consistency. *X*-ray therapy was administered, 300 r to the left and 300 r to the right side of the swelling. On May 5 (13 days after irradiation) the swelling in the floor of the mouth had disappeared, and that in the neck was hard and measured 3 by 2 cm. On May 17 (25 days after irradiation) the submental swelling was only 1 cm. in diameter, very firm, and loosely attached to the skin.

Case 3

A Bantu girl aged 15 was first seen in 1948, when she had a swelling in the right anterior triangle of the neck and another in the floor of the mouth to the right of the fraenulum continuous with it. She was admitted in March, 1949, complaining of steady enlargement of the lump. On examination there was a soft fluctuant swelling, occupying most of the right anterior triangle, measuring 10 by 7 cm. and extending from the midline to disappear postero-laterally behind the sternomastoid muscle. At this stage there was no swelling in the floor of the mouth.

On March 16, 50 ml. of a thick yellow mucoid fluid was aspirated, and 2 ml. of bisoxyl introduced. Two days later the mass had increased in size and had become firmer. On

April 5 (20 days after aspiration) the characteristics had remained unchanged, and 104 ml. of a pale yellow slightly mucoid fluid was aspirated and another 2 ml. of bisoxyl introduced. Next day a tense swelling larger than the original was again present. On April 27 the characteristics were unchanged, and 300 r was directed to the lesion. On May 10 (13 days after irradiation) a small, firm, indurated right submental nodule was palpable but not visible.

Case 4

A Zulu boy aged 15 first presented in March, 1948, with a swelling of the right side of the neck. Examination revealed two unrelated disorders—an extensive unilateral tuberculous adenitis with suppuration, and a distinct fluctuant swelling in the right submaxillary region communicating with a similar swelling in the floor of the mouth. Deep *x*-ray therapy, generated at 180 kV (cp) with 0.5 mm. Cu and 1 mm. Al



FIG. 1A.—Case 4 before treatment.

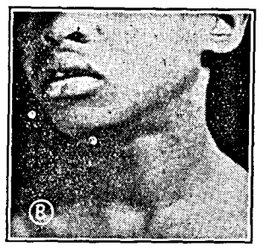


FIG. 1B.—Case 4 six weeks after the injection-irradiation procedure.

filtration, was directed to the cervical lymph nodes, which received 600 r in two weeks. It is estimated that the ranula received a similar dose. The glands responded partially to this treatment; the ranula remained unchanged.

On May 31, 1948, a block dissection of the cervical lymph nodes was performed, and histological examination of the specimen confirmed its tuberculous origin. Post-operative recovery was uncomplicated. On June 19 the adenitis was apparently cured; the ranula, however, persisted, and 10 ml. of glairy fluid was aspirated and 2 ml. of a sclerosing agent ("ethamolin") injected, with little effect.

The patient was readmitted on February 22, 1949, complaining that the swelling had persisted and was again enlarging. From February 23 to March 25 five injections, each consisting of 2 ml. of ethamolin, and three aspirations were done. There followed a pyogenic infection in the cyst, which was then incised and drained.

He was readmitted on October 7 with a complete recurrence (Fig. 1A). Fluid was aspirated on October 20 and 2 ml. of bisoxyl injected and 300 r given. On December 6 (six weeks after irradiation), apart from a hard nodule less than 1 cm. in diameter, there was no perceptible abnormality (Fig. 1B). He was well when seen on January 4, 1950.

Conclusions

It is obvious from a study of these four cases that the bismuth suspension alone did not obliterate the cysts; further, it is our experience that irradiation alone has no perceptible effect; yet the combined action of the two agents is completely curative. It is proposed to excise some of the residual nodules for histological study, though this is cosmetically unnecessary. At the time of writing, one year after starting the procedure, there have been no failures and no recurrences.

We wish to acknowledge the stimulating advice freely offered by Dr. P. Keen, of the Non-European Hospital, Johannesburg, under whose supervision this work was carried out.

Medical Memoranda

Plasmodium Vivax Infection

The following case report is of interest because it draws attention to an unusual symptom-complex of *Plasmodium vivax* infection—namely, severe urticaria, abdominal colic, and fever.

CASE REPORT

A Punjabi Hindu medical student aged 33 was admitted to hospital at 9 a.m. on August 2, 1949, with severe abdominal colicky pain which had started at 7.30 a.m. He developed an itchy rash all over his body within a quarter of an hour of admission, while the distressing colicky pain was continuing.

On examination his temperature was 102° F. (38.9° C.), pulse 100, and respirations 22. His blood pressure was 95/55. His abdomen was uniformly soft and localized tenderness could not be detected. The spleen and liver were not palpable. The rash consisted of weals irregular in shape and size, varying from small papules to moderately large plaques, with a pale centre and slightly reddish margins, and itching intensely.

On further inquiry the following facts came to light. At 9 a.m. on July 27 he first experienced an acute abdominal colic, situated around the umbilicus; the pain persisted for about two hours, with intermittent exacerbations, and then gradually subsided without any treatment. His bowels had been opened by a dose of liver salts. He remained well until July 31, when at about 8.30 a.m. he suddenly developed an itchy urticarial rash all over his body followed immediately by abdominal colic of similar nature. His temperature was 102° F., pulse 104, and respirations 22. Calcium gluconate, adrenaline hydrochloride, and "antistin" were given and the rash and colic disappeared in one hour, while his temperature had gradually subsided by 8 p.m. The defervescence was not associated with sweating. At 9.30 a.m. on August 1 severe and widespread urticaria developed, but there was no colic. He did not feel feverish and the temperature was not recorded. Next morning he was admitted to hospital.

The following therapeutic measures were adopted immediately after admission: absolute rest in bed; 25% glucose, 25 ml., and 10% calcium gluconate, 10 ml., intravenously; adrenaline hydrochloride (1 in 1,000), 0.5 ml. subcutaneously; normal saline enema, 1 pint (570 ml.); and an ice-bag over the abdomen. Colic was not relieved, but further spread of the urticaria was checked. Half an hour later 2 ml. of antistin was given intramuscularly and then continued twice a day. The rash faded completely within the next 20–30 minutes, and the abdominal colic subsided gradually. Antistin, 0.1 g., pulv. calc. lact., 10 gr. (0.65 g.), and mist. alkalin. diaphoret., 1 oz. (28 ml.), were given three times a day, and a sedative mixture with bromides and chloral was taken at bed-time. His diet consisted mainly of fluids—glucose water, barley water, green coconut water, milk, and tea. His temperature fell to normal by 7 p.m.

A blood count showed: Hb, 84% (Hellige); white cells, 7,000 (polymorphs 60%, lymphocytes 36%, monocytes 2%, eosinophils 2%). No malaria parasites were present in thick and thin smears. Examination of the stools (repeated three times) and urine revealed nothing abnormal.

Nothing untoward happened on August 3, but at 8 a.m. on the 4th the patient suddenly felt an attack of abdominal colic, which gradually grew worse and made him restless. His temperature was 103.4° F. (39.7° C.), pulse 102, and respirations 24. No urticarial rash could be detected anywhere on his body. He felt warm, but there was no chill or rigor. An ice-bag was placed over the abdomen and mist. carmin. bellad., 1 oz. (28 ml.), and antistin, 2 ml. intramuscularly, were given. The pain subsided gradually within half an hour. Thick and thin blood smears showed a fair number of B.T. malaria parasites, both ring and amoeboid forms (trophozoites). Proguanil was given immediately, two tablets three times on the first day, followed by one tablet thrice daily for seven days. Urticaria, colic, and fever did not develop during his next three days in hospital or during the subsequent follow-up.

COMMENT

The symptom-complex characterized by fever, abdominal colic, and urticarial rash appeared about the same time of the day.

The absence of chill and rigor, nausea and vomiting, and profuse sweating during defervescence preclude a clinical diagnosis of malaria; but demonstration of malaria parasites in the peripheral blood film during the last attack and the complete disappearance of symptoms after proguanil therapy suggest the unitary nature of the symptom-complex. Further, it was noted that antistin did not prevent the return of abdominal colic and fever.

In the dietetic history nothing was suspected which could be incriminated for urticarial attacks; and examination of the stool revealed no pathological condition which could explain the abdominal colic.

Lastly, the association of malarial attacks with abdominal pain is a common manifestation of malignant tertian infection.

Our thanks are due to the superintendent, Dr. K. L. Sen, for permission to publish this report.

S. K. MUKHERJEE, M.B.Cal., M.R.C.P., D.T.M.&H.,
Honorary Visiting Physician,
A. K. MITRA, M.B.Cal.,
Senior House-physician,
Lake Medical College Hospitals, Calcutta.

Unusual Case of Subacute Intussusception with Spontaneous Elimination

Cases in which an intussusception has sloughed off and been passed per rectum are rare enough to be placed on record.

CASE REPORT

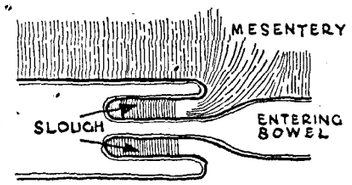
A child aged 2½ attended the casualty department on July 10, 1949, with vomiting and intermittent abdominal pain. She showed signs of a follicular tonsillitis and a urinary infection, but of no other abnormality. A course of sulphatriad (total 12 g.) cleared these with a temporary decrease of symptoms. However, the vomiting recurred and there was abdominal distension with some apparent constipation; she was therefore admitted for investigation.

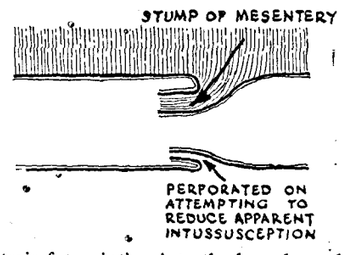
On admission on July 20 she seemed to be in good general condition, with no wasting, but was extremely fretful. Her abdomen was grossly distended, tense, and tympanitic; no guarding was elicited and no masses were felt; a few borborygmi were heard. On rectal examination the anus appeared normal, the rectum felt empty, but some soft yellow faeces were seen on the examining finger. Other systems were normal. Her blood count was within normal limits, except for a leucocytosis of 15,000 per c.mm. with 80% polymorphs.

The child ate well and did not vomit. She had from one to four motions a day, which were normal or relaxed, contained no blood, and grew no pathogens. Her temperature was 100° F. (37.8° C.) on admission, and it never really settled till after operation. On the fourth day she passed what appeared to be a necrotic piece of tissue 15 in. (38 cm.) long, followed by a small pale stool. The child appeared relieved and was less miserable; the rectum felt empty and there was no blood on the examining finger. The following day the abdominal distension increased, and there was visible peristalsis, with a step-ladder pattern, an apparent increase in abdominal pain, but no guarding or rigidity and no palpable mass. A radiograph of the abdomen showed several fluid levels in the small intestine. A laparotomy was decided upon, and an intravenous plasma drip was started pre-operatively, as the child had started to vomit.

Operation.—The lower end of the ileum was found to be congested and adherent to other parts of the small intestine; the caecum and appendix were normal, but about 2 ft. (61 cm.) proximal to the ileo-caecal junction a mass resembling an intussusceptum was felt in the lumen of the intestine. On a very gentle attempt to reduce this, the wall of the gut opened and a little faecal matter leaked out; a finger-like projection was then visible inside the intestine. Adhesions were divided and a resection and end-to-end anastomosis were carried out. The wound was closed without drainage, and sulphonamide, penicillin, and streptomycin therapy was instituted; the plasma infusion was continued for 24 hours after operation. Faeces and flatus were passed within 24 hours of operation. Post-operative recovery was uneventful, except for a rectal prolapse on the third day, which was easily replaced.

Specimens.—(1) The slough was found to consist of necrotic tissue containing some moderately large arteries and a band of collagen fibres running longitudinally, suggesting that necrotic whole gut was present, rather than mucosa only. (2) The mass within the resected intestine consisted of fatty tissue containing some rather large blood vessels, and with a covering of mucous membrane.





COMMENT

It seems probable that there was a subacute intussusception in which a portion of the mesentery was drawn into the lumen of the intussuscipiens; that the intussusceptum sloughed off, leaving a projection of mesenteric fat pointing into the bowel; and that the neck of the intussusceptum and the base of the intussuscipiens were joined by adhesions to form a spontaneous anastomosis, which broke down at the lightest touch (see illustration).

Leichtenstern (1877) reported spontaneous elimination in 42% of 593 cases; but since then few cases have been reported. Three cases of gangrenous intussusception have been reported recently (Kerr, 1949; Conway and Dawson, 1949), in one of which end-to-end anastomosis was possible; in none of them did spontaneous elimination occur. The present case resembles these in that diagnosis was made difficult by an unusual clinical picture. Although there was a story of early vomiting, there was no wasting, such as is usually found in subacute intussusception, and no blood was at any time passed per rectum.

We thank Dr. Ursula Shelley and Mr. Harold Dodd for permission to publish this case and for helpful criticism; and Dr. J. G. Bate for the pathological reports and for help and advice in preparing this account.

M. E. FORRESTER, M.B., B.S., D.C.H.,
J. M. BOYD, M.B., B.S.,
Late Resident Medical Officers,
Princess Louise Hospital for Children.

REFERENCES

Conway, D. J., and Dawson, R. L. G. (1949). *British Medical Journal*, 2, 1153.
Kerr, J. A. (1949). Ibid., 2, 580.
Leichtenstern, O. (1877). In Ziemssen's *Cyclopaedia of Practice of Medicine*, 7, 477. London.

Reviews

THE SULPHONAMIDES

The Sulphonamides. By F. Hawking, M.D., and J. Stewart Lawrence, M.D., M.R.C.P. (Pp. 390; 46 illustrations, including 12 plates (7 coloured) and 17 tables. £2 2s.) London: H. K. Lewis and Co. 1950.

The authors point out in their preface that it is now 14 years since sulphonamides were introduced into medical practice. During the first 10 our knowledge of their application continually expanded; but this has now had a chance to become crystallized and consolidated, as latterly no outstanding new development of practical importance has occurred. In the last few years only, therefore, has a stage been reached when the subject can be reviewed with that degree of detachment which is essential if the views expressed are to have some permanency. The same is often said about biographies of great men who have played a determining part in world affairs—it is difficult to write with balance and judgment about them till they are very old or dead. The sulphonamides are of course not yet dead, and will still have an important role to play for years to come, but their glory is on the wane as their prerogatives are more and more encroached upon by the new antibiotics.

This book suffers only from the drawback inseparable from all therapeutic works nowadays, in that it has become slightly out of date as it has gone through the press—not in respect of the sulphonamides themselves but in connexion with the long-acting preparations of penicillin, of streptomycin, aureomycin, and chloramphenicol, whose introduction has still further modified the authors' recommendations as regards sulphonamide treatment. The review comprises an interesting, authoritative, and well-expressed account of the chemical nature, pharmacological action, preparations, clinical application, and toxic effects of the sulphonamides. It is written with critical wisdom and is profusely documented (there is a bibliography of 25 pages at the end of the book). The sulphonamides in their splendid old age could hardly have desired a more fitting memorial than this fine book.

D. M. DUNLOP.

A STUDY OF ANTIBIOTICS

Antibiotics. By Robertson Pratt, Ph.D., and Jean Dufrenoy, D.Sci.(Paris). (Pp. 255; 66 illustrations. £2.) Philadelphia and London: J. B. Lippincott Company.

The authors of this book, who are on the staff of the University of California College of Pharmacy, San Francisco, are best known for their studies of the mode of action of penicillin on bacteria. These were largely pursued by an ingenious technique consisting in the treatment of assay plates, after only a few hours' incubation, with solutions of various reagents, which revealed in colour the chemical changes occurring in the zone of inhibition, in that of normal growth, and in the interesting boundary zone between them.

The authors' interest in antibiotics is theoretical rather than clinical, and they bring to it a profound knowledge of chemistry and of plant physiology. They have thus been led to write a book different from any other on its subject, philosophical in outlook, and dealing rather with principles and mechanisms than with the practice of chemotherapy, although much of the information given is of great value in considering treatment. For example, the pharmacological and antibacterial behaviour of penicillin is well described in the usual way, but accounts are also given of the properties of different penicillins, of the influence of unknown enhancement factors and of borrelidin on therapeutic effect, and of the theory of optimum concentration. There is a chapter on industrial production, of which one of the authors has had practical experience, and all the newer clinically valuable antibiotics are well described. One would have liked to see all those derived from bacilli treated together: there is scarcely enough difference between bacitracin and the polymyxins to justify segregating them in separate chapters.

The book is profusely illustrated with charts, graphs, and other figures, many being original. Perhaps the most remarkable is that in which the growth curve of a green alga and the number of synthetic dyes patented yearly between 1850 and 1925 are plotted together to illustrate the argument in a section entitled "Significance of Fields of Diffusion." Altogether it is a most original and refreshing book.

L. P. GARROD.

THE HOUNAMAN MONKEY

The Anatomy of Semnopithecus Entellus. By A. Ananthanarayana Ayer, B.A., M.B., B.S., M.Sc. (Pp. 182; illustrated. 20 rupees.) Madras: The Indian Publishing House. 1949.

Monkeys were known in the days of prehistory and were depicted in early Egyptian times. Hanno, the Phoenician, on his famous journey from Morocco to Upper Guinea in 470 B.C. brought back an account, with three skins, of the greatest of great apes, the gorilla. It is possible that his gorillas were chimpanzees. Pliny records that these three skins still existed in the Temple of Astarte in Rome in the second century A.D. Linnaeus, in his *Systema Naturae* (1735), did not hesitate to place man along with the apes, lemurs, and bats in the order Primates. It is strange that our knowledge of the anatomy, physiology, development, and behaviour of man's immediate congeners has grown so slowly. Knowledge of great value to medicine and surgery might have been gained if more doctors in India and Australasia had devoted themselves to the study of their own local fauna, with the hordes of primates in the one continent and the mysterious medley of marsupials in the other. During the twentieth century there has been a costly and productive study of the anatomy, development, and behaviour of *Macacus rhesus* by Streeter, Hartman, Strauss, and Schultz in Baltimore and of the chimpanzee by Yerkes in Florida. There has been but little study of monkeys and apes in this country of recent years. This is strange, for with the exception of Brazil, the Dutch East Indies, French Equatorial Africa, and the Belgian Congo, most primates occupy the areas on the map of the world which are still coloured red, or a faint pink. F. Wood Jones stated that the dead hand of Charles Darwin and of Henry Huxley inhibited the study of primate anatomy which was so well started by Robert Owen and St. George Mivart.

This monograph on *Semnopithecus entellus*, the Indian langur or hounaman monkey so venerated by the Hindus, is a valuable contribution to primate anatomy. It was completed in 1942, but publication was delayed for six years. The anatomy of this Indian langur is described in detail, system by system, with careful dissections, accurate diagrams, and a wealth of astute observation. The anatomy of the visceral systems—respiratory, alimentary, and urogenital—is very well done. The circulatory system, both arterial and venous, calls for still greater detail, as the pattern differs notably from that seen in man. The vessels of the thorax and abdomen are well worth further study at a time when thoracic and abdominal surgery are becoming more venturesome. In particular, the veins call for close examination, for they are of more significance clinically and a source of greater trouble surgically than the arteries. That despised minusculum, the pisiform bone, is described in detail, and the radiograph shows an epiphysis comparable to the epiphysis on the human os calcis. This proves that the pisiform is not a sesamoid bone. The peripheral nervous system is described in detail, with particular reference to the limb plexuses. The brain is shown to be the most advanced among the Cercopithecidae and has certain features which place it between the brains of *Macacus rhesus* and the gibbon. The fissures of the parietal lobe are certainly an advance on any other monkeys and confirm the early views of Elliot Smith.

It is a credit to the present Professor of Anatomy in Madras that he is following so well the path laid down by his predecessor, Professor U. V. Nayak, who died so young and yet contributed so much to our knowledge of the primates.

H. A. HARRIS.

HANDBOOK OF THERAPEUTICS

The Essentials of Materia Medica, Pharmacology and Therapeutics. By R. H. Micks, M.D., F.R.C.P.I. Fifth edition. (Pp. 438. £1 1s.) London: J. and A. Churchill. 1950.

This handy volume increases in usefulness with each successive edition and achieves this without any noticeable increase in size. It is written from the point of view of a practising physician rather than from that of the laboratory worker, but it is fair to say that the gap between these two has narrowed during the 15 years of the book's existence. The advances in specific, as opposed to symptomatic, treatment are responsible for this very desirable approximation.

The new edition contains an account of all the recently introduced substances, including the antibiotics, and it can claim to be free of any noteworthy omissions in a period when additions to the therapeutic armoury occur almost monthly. Tetraethylthiuramdisulphide is mentioned in the preface, but not in the index.

J. H. BURN.

The pioneers of medical ophthalmology in this country were physicians like Sir Clifford Allbutt and Sir William Gowers. Subsequently, it has been left to ophthalmologists to expound a subject which had become too big for either a physician or an oculist. Mr. Foster Moore's *Medical Ophthalmology* maintained the high tradition of Gowers's work, but like Gowers's book did not attempt to cover the whole field. This ambitious task has been undertaken in recent years by Dr. Tassman, of Philadelphia, and now by Mr. J. H. Doggart. Four introductory chapters in his *Ophthalmic Medicine* (London: J. and A. Churchill; 32s.) describe methods of examination, while the nine succeeding ones are on general concepts like allergy, the different infections, and inflammatory affections. The ocular aspect of the different systemic disorders such as skin diseases, endocrine affections, cardiovascular diseases, head injury, and bone diseases are discussed in other chapters, and there are sections about hereditary diseases, congenital abnormalities, the significance of refractive errors, and other disturbances with widespread manifestations. Though the scope of the book limits discussion in some cases to bare outlines, the text can be recommended as an introduction to a vast subject with a scattered and badly systematized literature. To the physician it should be useful as a guide to the ocular aspects of systemic diseases. The student of ophthalmology will find it a necessary reminder of the fact that the ophthalmologist is a physician as well as a surgeon.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Social Case-work in Great Britain. Edited by Cherry Morris. (Pp. 223. 12s. 6d.) London: Faber. 1950.

The Need for Emotional Adjustments in the Elderly. By L. Cosin, F.R.C.S. (Pp. 16. 1s.) London: The National Council of Social Service. 1950.

Teach Yourself Home Nursing. By M. Hutton, S.R.N., S.C.M., and S. K. Hutton, M.D. (Pp. 180. 4s. 6d.) London: The English Universities Press. 1950.

A Naturalist in the Gran Chaco. By Sir J. Graham Kerr, F.R.S. (Pp. 235. 21s.) Cambridge: University Press. 1950.

The XIVth International Veterinary Congress and the LXVIIth Annual Congress of the National Veterinary Medical Association of Great Britain and Ireland. Commemorative Pictorial Souvenir. (Pp. 24. 5s.) London: National Veterinary Medical Association of Great Britain and Ireland. 1949.

Science News, 16. Edited by J. L. Crammer. (Pp. 176. 1s. 6d.) Harmondsworth, Middlesex: Penguin Books. 1950.

Meaning and Purpose. By K. Walker. (Pp. 203. 1s. 6d.) Harmondsworth, Middlesex: Penguin Books. 1950.

A Doctor Digresses. By K. Walker. (Pp. 207. 10s. 6d.) London: Jonathan Cape. 1950.

Medical Jurisprudence and Toxicology. By J. Glaister, J.P., D.Sc., M.D., F.R.S.Ed. 9th ed. (Pp. 755. 35s.) Edinburgh: Livingstone. 1950.

A Handbook for the Diagnosis of Cancer of the Uterus by the Use of Vaginal Smears. By O. Gates, M.D., and S. Warren, M.D., D.Sc. 3rd ed. (Pp. 214. 32s. 6d.) Cambridge, Mass.: Harvard University Press. London: Geoffrey Cumberlege. 1950.

Transactions of the Association of Life Insurance Medical Directors of America. Fifty-eighth Annual Meeting. Edited by J. R. Gudger, M.D. Vol. 33. (Pp. 170. No price.) Newark, N.J.: Association of Life Insurance Medical Directors of America. 1950.

Le Problème du Cancer. By F. Daels. (Pp. 189. 7 Swiss francs.) Geneva: L'Effort Humain. 1950.

Les Maladies des Coronaires. By C. Laubry and P. Soulié. 2nd ed. (Pp. 618. 2,400 francs.) Paris: Masson. 1950.

L'Amibiase. By F. Blanc and F. Siguier. (Pp. 617. No price.) Paris: L'Expansion. 1950.

Spleniti e Spleno-epatiti. By G. Greco. (Pp. 118. No price.) Florence: Salpietra. 1949.

Chemotherapie der Tuberkulose mit den Thiosemikarbazonen. By G. Domagk. (Pp. 405. M. 60.) Stuttgart: Georg Thieme. 1950.

Praktische Elektrokardiographie. By F. Kienle. 3rd ed. (Pp 448. M. 38.) Stuttgart: Georg Thieme. 1950.

La Tríada Otoneurológica. By A. Ley. (Pp. 133. No price.) Barcelona: Ediciones Byp. 1950.

Kompendium der homöopathischen Therapie. By J. Mezger. (Pp. 151. M. 8.75.) Stuttgart: Hippokrates. 1950.

Homöotherapie. By the late K. Stauffer. 4th ed. Revised by F. Miller. (Pp. 679. M. 35.) Stuttgart: Hippokrates. 1950.

Collectanea Pharmaceutica Suecica. Vol. 4. (No price.) Stockholm: Ivar Haeggstroms Boktryckeri. 1950.

On the Classification of the Shigella Types. By S. Madsen. (Pp. 122. No price.) Copenhagen: Einar Munksgaard. 1949.

Physikalische Chemie in Medizin und Biologie. By W. Bladergroen, D.Phil. 2nd ed. (Pp. 675. 45 Swiss francs.) Basle: Wepf. 1949.

Coxitis tuberkulosa. By H. Gardemin. (Pp. 166. M. 18.) Berlin: Urban and Schwarzenberg. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY JULY 8 1950

CRISIS IN TUBERCULOSIS

With other infectious diseases coming under control, there is no doubt whatever that tuberculosis is now our major public health problem. Yet we all seem supinely to accept a situation in which some 10,000 patients are kept waiting for nine months or longer for hospital or sanatorium beds while some 5,000 beds assigned to tuberculosis are empty for lack of staff. There seems to have been lacking any sense of urgency, and little of the vigour of action that has brought under control the infinitely less tragic infection, diphtheria. Yet in 1948 more than 19,000 patients died of pulmonary tuberculosis in England and Wales and more than 3,400 in Scotland; in the same year close on 44,000 cases of pulmonary tuberculosis were notified in England and Wales, and more than 8,000 in Scotland.

The fact that tuberculosis is a more serious problem in Scotland than elsewhere in Britain lends special weight to the excellent report from Scotland published in the opening pages of the *Journal* this week. Drawn up by a joint subcommittee of specialists and of experts in tuberculosis, it was intended originally to make recommendations for the development of an "optimum service." The recommendations made in the first part of the report provide a basis for discussion of ways and means for attaining this ideal. Much of this part of the report is wise and to the point; its proposals show the way for determining a long-term policy.

But the meat of the report is in the second part, fittingly entitled "Crisis Expansion." It is this which marks it out for distinction and should wake up all those who are responsible for the care of the tuberculous. The committee outlines the present picture boldly, and what it says of Scotland applies with equal force to England and Wales. It records its strong impression "that there is lacking any general appreciation of the urgency of the problem and of the need for a real emergency drive to deal with it. . . . A slow building-up of first-class sanatorium accommodation is not what is called for." The committee urges a crisis expansion on the lines of the Emergency Medical Service. It recognizes that the outstanding problem in the present circumstances is how to provide rapidly more functioning beds for tuberculosis and how to staff them. Two major factors have been responsible for the hold-up of the tuberculous: the first is that more cases are being diagnosed, and the second that advances in medicine have brought an increasing number of cases within the range of effective treatment. In a few areas, it is true, treatment at home is being carried out with relative success, and tribute is due to those who have undertaken the task. But most clinics are not adequately staffed or equipped to conduct domiciliary treatment, and, too, not many homes are suitable for the prolonged treatment of infectious persons. Domiciliary treatment is at best an expedient.

How to provide the beds and how to staff them is the fundamental question in this crisis. Discussion about division of responsibilities under the National Health Service, of divorce of treatment from preventive services, is interesting but irrelevant to the main issue. The shortage of beds has been neither caused nor aggravated by the National Health Service; its origins go much further back. In fact there should be within the framework of the N.H.S. far greater possibility of solving the problem than there was before, because the hospital management committees, and through them the regional hospital boards, have the responsibility for bed allocations throughout large areas. The authors of the Scottish report propose that the beds needed shall be acquired by taking over wards in hospitals for infectious diseases: only about a third of their accommodation is now occupied at any one time. They suggest tentatively that if it were found impracticable to provide in this way all the beds needed wards in general hospitals might be used, though the larger teaching hospitals should be excluded. There is much to be said for their first proposal, but only as a partial solution. The opening of units at present closed down in hospitals for infectious diseases will require much additional staff. Some of these hospitals would be ill equipped for any purpose other than the housing of untreatable tuberculous patients. The main problem is to find beds for patients urgently requiring special observation and subsequent treatment. If the view of the committee is accepted that "not until it [tuberculosis] is tackled in a spirit of crusade will the fight be won," then all the large general hospitals, without exception, should share the task of providing treatment for the tuberculous. It has been demonstrated, for instance, at the Central Middlesex Hospital that tuberculosis can be safely treated in special wards of a general hospital, and Dr. Joules has suggested[1] that general hospitals should help to meet the crisis by allocating to tuberculosis at least 10% of their beds. This would bring many advantages. The staff would be available; and nurses, doctors, and medical students would become acquainted with a disease which, though rife in the community, they have had little opportunity of studying in general hospitals.

[1] *N.A.P.T. Bulletin*, June, 1950.

The report makes many sound proposals for the recruitment of nurses, which is the crux of the matter of caring for the tuberculous. The committee stresses the need for the recruitment of trained nurses. Nursing the tuberculous can, if proper precautions are taken, be as safe as any other nursing. The shortage of tuberculosis nurses is a part of the shortage in all services outside the main teaching hospitals. It is only when nursing conditions are improved, both materially and socially, that recruitment campaigns will have any effect. The tradition of good nursing in this country could be maintained without the outmoded discipline of some of the training schools, and the fully trained nurse must be adequately paid. While there is a shortage nurses should be employed on nursing work and not on tasks well within the competence of untrained domestic staff.

The Tuberculosis Group Committee of the B.M.A. is investigating the tuberculosis services, and a standing advisory committee has reported to the Central Health Services Council. It is hoped that this report will soon be published. But what is needed now—desperately needed—is not reports but action. The well-written, cogent, constructive account of the Scottish Committee's findings and conclusions must be read and digested by those in authority. And if authority does nothing, then those with the welfare of the tuberculous at heart must harry authority ceaselessly until something is done. Here is a chance to test the much-vaunted adequacy of the National Health Service. The coherent Scottish mind has not hesitated to use the word "crisis." Let us as a profession hammer this word home, and insist that something is done as an emergency operation to relieve the burden of sickness which now afflicts the tens of thousands of tuberculous sufferers in Britain.

DEMAND FOR EARLY SETTLEMENT

The Health Service has now been working for two years. That it continues to run fairly smoothly is a tribute to all those who take part in it, and indeed to the general public. But there can now be no doubt that general practitioners are discontented and are labouring under a sense of injustice. And there is good reason for this. Recently the General Medical Services Committee sent to every general practitioner a document[1] setting out the history of its negotiations and discussions with the Ministry of Health. When the general practitioners entered the Service they did so on the understanding that their remuneration, the terms of which were provisional and never agreed, should be reviewed. Their remuneration remains to-day about what it was two years ago, a small exception being the increase in the mileage fund. During this time the Ministry has on one pretext or another postponed making any detailed factual reply to the doctors' claims. Last summer it carried out an inquiry, which took longer than was expected, into the actual earnings of general practitioners. So ineffectual was the method of inquiry that its results were worthless. This summer further inquiries are promised. If general practitioners are becoming impatient the Government has only itself to blame.

When the representatives of local medical committees met on June 29 at B.M.A. House the conference expressed itself as "seriously disturbed at the repeated hold-ups and prolonged delays in the negotiations," but agreed to co-operate in carrying out the new inquiries, emphasizing that these must be made soon and be accurate. Further, the G.M.S. Committee was instructed to make preparations forthwith for the ending of contracts by general practitioners in the Service. Advice will be given to end the contracts if there is no prospect of a satisfactory settlement. Another special conference will be called if that decision has to be made, and in any case one will be held in December if agreement has not been reached. Feeling was evidently running high at the conference and reflected the opinion, ascertained by local inquiries, of many general practitioners not present there.

While the negotiations on pay have been dragging on, the Minister and his officers have taken the opportunity to arouse anxiety on other but related issues. Doubt has been cast on whether the Government intends to implement the Spens recommendations, for the Minister will not state that the present central pool is in accord with them or that it is not. But since the Spens Report was agreed between the Government and the profession doctors have a right to know this, and they would resent any attempt, of which there have been hints, to repudiate the report without their consent and before any other basis for remuneration has been worked out. The conference therefore called on the Minister to state immediately what size the central pool should be to accord with the charter laid down by the Spens Committee.

In emphasizing that changes in remuneration should be made only after proper negotiation and not by the Minister's arbitrary action, the conference expressed the alarm that any doctor, or indeed any employee, must feel when he sees the precipitate speed with which the Minister, without waiting for a full inquiry, has at various times cut the remuneration of other workers in the Health Service, such as the dentists and ophthalmic medical practitioners. To be ever at the mercy of possibly despotic decisions arrived at without taking all the facts into account would cause anxiety intolerable to men who have no alternative way of earning a living but in their profession, and, for most of them, no other

[1] *British Medical Journal Supplement*, 1950, 1, 179.

way of practising their profession but in the Health Service. The great safeguard is the Spens Report. Without this, general practitioners might well fear arbitrary decision. It is now, after two years' working, essential to discover whether the Government considers practitioners are being paid according to the Spens recommendations. It is surely but common sense and common justice that all ambiguity should be removed. Thucydides remarked 2,000 years ago that men resent violence less than injustice, and if the Minister of Health does not deal fairly and squarely with general practitioners, and remove their feelings of injustice, then they may feel compelled to take the very grave step of ending their contracts.

THE ANNUAL MEETING

The 118th Annual Meeting of the B.M.A. begins next week on July 13 and comes to an end on July 21. Liverpool acted as host at the Annual Meeting in 1912 and this is the first time that two neighbouring towns have joined together to offer accommodation and hospitality for such an occasion: the Southport Division is acting as host to the Representative Body and providing facilities for the Annual Representative Meeting; when the debates on medical politics, organization, and administration have come to an end at Southport, Liverpool will take over for the remainder of the Meeting, which will be devoted to the scientific sections. As the published programmes in this *Journal* have shown, those responsible for planning the scientific programme have provided rich and varied fare, and it is good to see in the list of speakers a number of distinguished visitors from overseas. The motions and amendments from Divisions and Branches which will come before the A.R.M., the majority of which have been published in the *Supplement*, well reflect the nature of the problems now worrying the medical profession, especially those engaged in general practice. Hot upon the resolutions recently passed by the conference of Local Medical Committees come another batch couched in similar terms and to be debated by the A.R.M. These motions show that general practitioners are, to say the least of it, dissatisfied with their present terms of service. Their dissatisfaction resides in the fact that they cannot get a plain answer to a plain question, and the elusiveness of the Minister, for example, on the Spens recommendations is something that they find baffling and frustrating. Another matter on which there are many motions is the representation of general practitioners on regional hospital boards and on the medical advisory committees of hospital management committees. This again reflects the uneasiness felt at the tendency to exclude general practitioners from hospital life and experience. Under the heading of consultants and specialists come a number of motions expressing dissatisfaction with the work of grading committees and with the position of senior hospital medical officers. Other motions draw attention to the few specialist appointments awaiting a very large number of trainee specialists and to the fact that so many senior registrars are now unable to find work as consultants. Among many other motions we may note one which asks the Council to investigate the case for and against a whole-time salaried medical service, so that, if in the future such a service be proposed, the medical profession will be in full possession of the arguments for and against.

Those who are aware of the hard work put in during the past year by those responsible for organizing the Annual Meeting at Liverpool and Southport know that the Meeting will be a worthy successor to the other two that have been held since the war. These Annual Meetings do much to encourage and sustain the sense of corporate membership of the B.M.A., and afford a yearly opportunity for those who attend the Meetings to renew old friendships and make new ones and to exchange views on all those things that matter in our professional life, from the effect of the increased cost of petrol on practice expenses to the effect of cortisone on the human constitution.

THE PHYSIOLOGY OF LEARNING

The physiology of learning and retention was discussed by Professor J. Z. Young, of University College, London, in the Ferrier Lecture of the Royal Society, given last week. The problem which he posed was the identification of "the change that happens in the nervous system during learning": for evidently an animal which has learnt something has been changed, and "may remain so for the rest of its life." Professor Young followed a broad review, starting with the admitted inadequacy of Sherrington's classical reflex scheme in relation to higher activities, giving an account of some recent work by his own department on the learning process and associated neurology of the octopus. The learning experiments were carried out by B. B. Boycott and Professor Young at the Zoological Station, Naples. They were illustrated by a film and used the well-known technique of combining a simple food stimulus—in this case the sight of a moving crab—with a further stimulus—in this case the sight of a small white square from which an electric shock could be administered. In the intact octopus it was found that the response to "crab plus square" could be readily reversed as a result of three exposures per day repeated over three days. On the other hand, with either of two higher centres removed, but not with half removed as a control, normal "long-term" learning was prevented, so that interaction between these two centres appeared necessary for the learning process. However, if the interval between exposures was sufficiently reduced, then an octopus which had thus been operated upon could still remember. To be precise, it could remember for five minutes but not for ten; which supported the view that "some stages of learning depend on the maintenance of an activity," and that when this activity has died down the results of "short-term" learning die with it. It would be difficult to imagine that the same process could account for the example of long-term and not consciously refreshed memory which human subjects can provide, or even for the permanent or near-permanent alterations in animal behaviour which can be experimentally effected; and Professor Young's main argument was that "more stable learning depends on the formation of specific pathways by some form of growth process." As a plan of organization common to both cephalopods and mammals he suggested a process of interaction between different higher centres, with the mutual relationships of fibres within their closely woven networks continually influenced by activity, "producing slight changes in form that alter the probable direction of the sequence of excitations." In other words, he considers that learning of the long-term kind is accompanied by morphological changes by which repetition of particular patterns of responses is facilitated so long as the associated changes themselves persist. He showed slides of histological preparations by Armstrong and Tittock, of his department, in support of the neurological plausibility of the suggested mechanism in the case of the octopus, and acknowledged also the assistance of D. Sholl and Dr. J. T. Aitken in regard to other material used in his lecture.

CENTRAL ACTION OF TUBOCURARINE

The property of paralysing the endings of motor nerves in skeletal muscle for which D-tubocurarine is so widely used to-day was demonstrated by Claude Bernard[1] in 1857, and earlier observations that it had a central action as well received less attention. Many workers since Claude Bernard, however, have obtained evidence of this central action, which is excitatory and not paralysing. Recently Euler and Wahlund[2] showed that the intrathecal injection of D-tubocurarine caused generalized convulsions in cats, and Eccles[3] found that it stimulated the frog's spinal cord. He investigated the action on the cord because extracts of curare cause paralysis not only at the neuromuscular junction but in sympathetic ganglia as well. He was therefore surprised to find the reverse effect on the cord. Soaking the cord in a curare solution increased the duration of the discharge of impulses set up by a single dorsal root volley. When the cord was soaked in strong solutions sustained activity was set up without stimulation. Salama and Wright[4] have injected tubocurarine into the ventricles of the cat's brain and have found that both by this route and also by the cisterna the injection causes an increase in the knee jerk and in the flexor reflex, an increase in the rate and depth of respiration, and a rise in blood pressure. General convulsions result. Intrathecal injections differ, however, because the effects are slow to appear, and if the subarachnoid space is blocked above the injection they are very small or absent. Thus in the cat the supraspinal centres are much more sensitive to the stimulant action of tubocurarine than is the spinal cord.

This new information about the central stimulant action of tubocurarine modifies the theory of its peripheral action. It is known that neostigmine augments the muscle strength of patients with myasthenia but weakens that of normal persons when given intra-arterially; thus neostigmine can have both a stimulant action and a paralysing action at the motor end-plate. Tubocurarine causes paralysis only at the motor end-plate but has a stimulant action on the centres of the medulla and above. Some will consider that these two actions of tubocurarine are unrelated. Others will see in them evidence that the process of transmission by acetylcholine at the motor end-plate is closely related to transmission from one neurone to another in the brain. Fortunately the central stimulant action is of no importance in the practical application of tubocurarine.

[1] *Leçons sur les effets des substances toxiques et médicamenteuses*, 1857, Paris.
[2] *Acta physiol. scand.*, 1941, **2**, 327.
[3] *J. Neurophysiol.*, 1946, **9**, 87.
[4] *Brit. J. Pharmacol.*, 1950, **5**, 49

STILLBIRTHS

The medico-social problem of stillbirths has often been discussed since the publication of the stillbirth rate in 1929 by the Registrar-General. The rate varies consistently in different areas of the country, and the association with economic-environmental indices has led to stress being placed on the importance of social conditions. The results obtained in several investigations suggest that there has been some confusion between correlation and causation, and on the evidence now available the social factor appears to be an inadequate explanation for variations in the rate. In a recent review of this complex subject Sutherland[1] has carefully considered the epidemiology and social significance of stillbirths. There are about 21,000 of these each year in England and Wales, and if the stillbirth rate throughout the country could be reduced to the level of the rate in London there would be nearly 3,000 fewer stillbirths a year.

Medical, social, environmental, and biological factors affect the chance of surviving the process of birth, and it is often impossible to determine the exact cause of a stillbirth. Their classification under various causes has differed greatly in different investigations: the proportion of stillbirths for which no definite cause could be assigned has ranged from 1/5 to 1/3, while complications of labour have been held responsible for between 1/4 to 1/3, and toxaemia for about 1/10, of all stillbirths. A common finding has been that in a large proportion of stillbirths some foetal defect was present or the birth was premature. Much has been written about the effect on the baby of haemolytic disease and of the results of an attack of German measles early in the mother's pregnancy, but these disorders are not necessarily associated with stillbirths and collectively they can have very little influence upon the stillbirth rate. The relation

[1] *Stillbirths*, 1949, London.
[2] *Hlth Bull.* (Dept. of Health for Scotland), **6**, 17.
[3] *Physiol. Rev.*, 1921, **21**, 438.

between social and economic conditions and the chance of a stillbirth has been demonstrated by many workers: for the country as a whole the rate increases from social class I to social class V. In America the rate has been shown to decrease as the father's income rises. Overcrowding increases the risk of infection; this is serious for live infants, but is not likely to affect the stillbirth rate. While the nutrition of the mother is obviously important, malnutrition probably does not have such a great influence on the stillbirth rate as was once believed. The system of rationing and the priorities given to expectant mothers during the war reduced or cancelled altogether the differences between the diets of the various social classes. Despite this levelling of nutrition the stillbirth rate of the higher social classes fell much more than that of the lower social classes. McKinlay[2] found for Scotland that the fall in the stillbirth rate per 1,000 births between 1939 and 1945 was from 33.9 to 20.9 for class I, from 37.8 to 26.0 for class II, from 38.0 to 37.1 for class IV, and from 42.4 to 39.1 for class V. The experience in the occupied countries during the war supported Huggett's contention that the foetus grows at the expense of the mother.[3]

The proportion of first-born among the births affects the stillbirth rate, since these infants are more likely to be born dead than the second or third child, but for fourth and later children the stillbirth rate rises again. It also rises as the intervals between pregnancies shorten and as the mother's age increases. Whether the age of the father has any influence is debatable, but from the results obtained in animal experiments it is unlikely that the age of the father is of any importance. Two causes of stillbirth are often ignored because their influence on the rate is difficult to assess. Attempts by expectant mothers to produce abortion probably have some effect, but more important is the genetic factor. The origin of some congenital malformations, which are a common cause of stillbirths, is undoubtedly genetic, though in many cases both hereditary constitution and maternal environment and other non-genetic factors probably act together. The relationship is, however, a complex one, and its unravelling presents one of the most difficult problems in human genetics. The end-point of many conditions fatal to the foetus is not reached at the same time, and the result may be either abortion, stillbirth, or early neonatal death. The problem of stillbirths is part of a larger one which includes prenatal and early post-natal deaths, and any scheme which aims at lowering the stillbirth rate must, to be successful, be of a comprehensive character.

CHILDREN AND THE CINEMA

One-half of all the children of school age in Great Britain go to the cinema once a week, and nearly a quarter of them go twice a week or more often. Many more children go to the cinema than go to church and Sunday school. It may be said, therefore, that, after home and school, the cinema is the most important influence in the life of the modern child. The report of the Departmental Committee on Children and the Cinema, of which Professor K. C. Wheare was chairman, has recently been published.[1] The committee inquired into the effects of cinema attendance upon children and was asked to make recommendations about the classification of films, the conduct of cinema clubs for children, and other related questions.

Films are classified at present into three categories: "U" for universal exhibition; "A" films, which children may see only if accompanied by an adult; and "H" for horrific films, which children are not permitted to see. The committee presents good reasons for regarding this classification as unsatisfactory. The "A" classification places upon parents or guardians the responsibility for deciding, usually without first-hand knowledge, whether a film is fit for their children to see. It has also had the unforeseen and unfortunate result that children now stand outside cinemas asking adults to take them inside to see "A" films. The following classification is suggested by the committee: "C" films, which are made solely for exhibition to children, and "X" films, which are entirely unsuitable for exhibition to children. It recommends the formation of a Central Committee on Children and the Cinema, and one of its main duties would be the selection and classifying of films for children.

There has been considerable argument about the effect of the cinema on the mind, the behaviour, and the morals of children. There is good evidence that many children are frightened, and that some are terrified, in the cinema, but the Committee does not find any proof that there is a direct relationship between the films and juvenile delinquency. The cinema may sometimes determine the path of the delinquent, but films seldom provide the initial impulses towards delinquency. The threat of the film to the young mind is more subtle. Too many films are stupid, sentimental, crude, or materialistic, and so unlikely to stimulate the quick intelligence, the lively humour, and the idealism of youth.

Children's cinema clubs have been a remarkable development of recent years, and the report gives to them a limited approval. To the disinterested observer they would seem to be an artificial by-product of the industry. The social and recreational activities of children should not have their normal centre in the field of commercial entertainment, and the average manager of a cinema is seldom likely to possess the qualities of an experienced youth leader. The most important problem is the inadequate number of films which are specially produced for exhibition to children. Most of these have been made by the J. Arthur Rank Organization, and it appears probable that financial difficulties may hinder this public-spirited activity in the future. The proposed Central Committee may require therefore the control of some public money, and it must also generate in the film industry something of the enlightened social conscience which animates the B.B.C. The function of the film is admittedly not education but entertainment. Yet a deliberate attempt by the cinema to increase the range of enjoyment and the artistic sensibility of the public at large, and particularly of children, would be a valuable social experiment.

The Gold Medal of the Royal Society of Medicine was awarded on July 4 to Professor E. D. Adrian, O.M., M.D., F.R.S.

[1] *Report of the Departmental Committee on Children and the Cinema.* London: H.M.S.O. Price 3s.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE MANAGEMENT OF PULMONARY TUBERCULOSIS

BY

F. H. YOUNG, O.B.E., F.R.C.P.

Consulting Physician, Charing Cross Hospital; Physician, Brompton Hospital
Tuberculosis Officer, St. Bartholomew's Hospital

Until recently the part played by the general practitioner in the management of a patient suffering from pulmonary tuberculosis was confined largely to diagnosis at the earliest possible moment, the care of the patient when quiescence had been achieved, and the palliative and symptomatic treatment of patients with advanced disease who were beyond the scope of radical treatment. The radical treatment was carried out institutionally.

The present position, in which patients have to wait for six months and upwards before admission to sanatorium can be obtained, has altered his role completely. He must now be prepared to undertake treatment in the home.

Among the very few facts that have been established beyond question is that, all things being equal, the fate of the patient depends on the stage at which the diagnosis is made. Early diagnosis is arrived at as the result of (1) mass and routine radiographs of symptomless patients, and (2) alertness of the general practitioner to recognize the possibility that certain very mild toxic and lesional symptoms may indicate the presence of pulmonary tuberculosis. Only the second concerns us here. If the practitioner has already in his mind that pulmonary tuberculosis is a likely diagnosis in any patient who complains that he is slightly below par, or has a cough for a month without an obvious cause, the disease will be diagnosed much earlier.

A few fundamental points must be emphasized:

(*a*) That blood in the phlegm comes from the throat so rarely, except in the presence of a definite epistaxis, that this source should never be diagnosed.

(*b*) That it takes a large number of cigarettes smoked over a long period to produce a smoker's cough.

(*c*) Young adults do not get persistently tired without reason; a method of life which has not previously produced tiredness is not likely to be the cause.

(*d*) The patient's explanation of a symptom should not be accepted without investigation if the symptom is sufficient to bring him to the doctor.

(*e*) "Catarrh" is often caused by intrathoracic conditions.

(*f*) Pleurodynia is not a diagnosis. If it is called a pain in the chest no one will be misled.

(*g*) However expert the doctor is in the use of the stethoscope he can never exclude tuberculosis with it.

When tuberculosis is suspected it should not take more than ten minutes to scribble a card to a clinic or a hospital asking for a radiograph, to give the patient a special carton for collection of sputum and instruction what to do with it, and to estimate the erythrocyte sedimentation rate. If these are all normal few cases of pulmonary tuberculosis will be missed. From the point of view of pure economics it is cheaper to take 2,000 negative radiographs than to delay diagnosis of one case of pulmonary tuberculosis for three months. In young adults, by the law of average, five cases with *x*-ray shadows indicating a tuberculous lesion which requires full investigation will be found in every 2,000 cases *x*-rayed at random.

Telling the Patient

The method by which the diagnosis is conveyed to the patient is most important. He must always be told what is the matter as soon as the diagnosis is certain. To many patients the diagnosis will come as a crushing blow; to some it will seem almost a sentence of death; so it is advisable to point out that with adequate treatment and co-operation with the doctor the prognosis is good, but no commitment should be made on time. The patient should be informed that to get well is a full-time job: the important thing is to get him well once and for all and to make a good job of the treatment at whatever expense in time. He should be encouraged to ask questions even if the answers to them cannot be given: it will help the doctor to see his reaction to diagnosis and to understand how to handle him. Fears brought out into the open are less frightening than those which are brooded over.

When pulmonary tuberculosis is diagnosed the patient should be put to bed immediately. Frequently, owing to his commitments, this may be impossible; so if the symptoms of toxaemia are minimal he may be allowed a few days during which he can make some provisional arrangements, provided he rests as much as possible when doing so. The object of insisting on bed rest without delay is to prevent the disease from getting worse while a plan of campaign is being arranged. Few patients who have any real chance of getting well will deteriorate during a month's rest in bed. Even if you could get the patient into a hospital or sanatorium it is unlikely that any specific method of treatment would be embarked upon profitably before he had had a few weeks' rest in bed.

First Measures

Having got the patient in bed the following should be done:

1. The clinical state must be assessed.

2. His temperature should be taken for at least five minutes in the mouth, on waking and at 2 p.m., 6 p.m., and 10 p.m. for a week: after this it need be taken only first thing in the morning and at the other time at which it has been found to be highest.

3. The sedimentation rate should be estimated.

4. If the temperature is 100° F. (37.8° C.) or more the patient should be confined strictly to bed, use a commode, and be blanket-bathed. If it be less, or after it has remained at normal for a week, he may be allowed up once a day for toilet purposes and twice a week for a bath.

The doctor must then go into details about

1. The food—its quality and service.

2. Ventilation and heating of the room.—There is no need to freeze the patient, but the room must be well ventilated and the lighting of his room must be adequate.

3. Visitors.—The daily number and length of stay must be laid down. No more than one, and for half an hour at a time, is the golden rule, unless the patient is atoxic.

4. Rest hours.—The patient should lie flat in solitude without doing anything except listen to the wireless for an hour before and after lunch and before supper.

5. Occupation.—Until the temperature has settled completely for at least 14 days his occupation should be confined to reading, listening to the wireless, and writing occasional letters.

6. Sleep.—A mild hypnotic should be given without hesitation to produce sleep if there is insomnia.

7. Prevention of infection to others.—All handkerchiefs must be put into a bag and soaked in 1/20 lysol before being sent to the laundry; if there is sputum, a proper container must be used with 1/20 lysol at the bottom. When bed-making, the attendants should wear a mask. No children should be allowed in the room, and adolescents should sit near an open window.

8. Small amounts of alcohol may be allowed. Smoking should be cut down without undue delay to about five cigarettes a day.

9. All the instructions must be discussed with the patient and family, and put down in writing. If the doctor does this the patient will realize that they are important.

Main Plan of Treatment

The plan of treatment must then be worked out with the help of an expert—either the tuberculosis physician or a private consultant. Unless the patient is really ill, it will do him little harm to be taken in a car to the consultation, but his doctor should be present to discuss the plan. A place in an appropriate institution must be booked. It can easily be cancelled if not needed. Generally speaking, three months' bed rest will be the start. If cavities are present this will usually be followed by collapse therapy, for which institutional treatment is necessary. Provided that steady improvement in the reduction of toxaemia is taking place as shown by symptoms, fall in temperature, sedimentation rate, and reduction of sputum, rest may be carried on for three months.

At the end of that time the case should be reviewed, with fresh radiographs, sputum tests, etc., in consultation with the expert. There is no need to get the patient up before going to the consultation. There are three possibilities. First, all evidence of toxaemia, occult and manifest, may have disappeared and the radiograph may show much improvement; cavities if present may have closed and the sputum become negative. This indicates a short further period of bed rest to consolidate the improvement and a gradual increase in activity, preferably in an institution or sometimes, if the patient's temperament and home circumstances are satisfactory, at home. The older the patient the less well will he usually settle down in a sanatorium. Secondly, improvement in toxaemia has taken place but improvement radiographically is slow and/or cavities are present. Bed rest must not be relaxed and institutional treatment insisted on, though the latter is not urgent, as further improvement may be looked for. Thirdly, little improvement has taken place. In this event institutional treatment is urgent; for the patient will probably not improve without collapse therapy with or without streptomycin, etc.

Collapse Therapy

The only form of collapse therapy that is normally applicable at home is a pneumoperitoneum with a phrenic nerve interruption. If this is thought to be indicated the patient can be got into a hospital for a week to have the phrenic nerve crushed and the pneumoperitoneum started. A pneumoperitoneum can be kept up by a careful general practitioner who will take the trouble to learn the technique. The complications are very rare, and failure to sustain the optimum rise of the diaphragm is not very serious. Except in early and fortunate cases, this procedure will usually only prepare the patient for more drastic collapse therapy, but often a very marked improvement can be obtained. Artificial pneumothorax should never be handled except by an expert with an *x*-ray plant at his disposal: irreparable harm can be done by an incorrect choice of cases and errors in its conduct. Frequently the actual technique of refills is easy, but it requires long experience to be able to handle cases to the best advantage and to avert and deal with complications.

In recent years apical thoracoplasty has been used more often in cases with small cavitated lesions at the apex, and in skilled hands has a low mortality rate. It is no longer reserved for patients with extensive disease. Resection of part or the whole of a lung is being used on quite a large scale now that the theoretical objections have been found to be unfounded. It is attended, however, by much greater risks than thoracoplasty and should be attempted only by those with very wide experience.

Chemotherapy

Streptomycin is now settling down to its proper place in the treatment of pulmonary tuberculosis. Broadly speaking, its use lies in the treatment of recent infiltrative or pneumonic disease, tuberculous laryngitis, or tuberculous tracheobronchitis, which is a much commoner condition than was previously assumed. In cavitated disease its value lies in getting a patient fit for collapse therapy. A useful simile is that of a boxing match in which you are getting the worst of the contest. If a friend can hold one of your opponent's hands you will be given the opportunity to knock him out. If you fail to do so during the time that the hand is held you will be beaten when your opponent gets the use of his hand again if he is still on his feet. Streptomycin plays the part of the friend, and its favourable action is limited in time. After a varying period the tubercle bacillus becomes resistant to it and your chance has been lost. Accordingly its use should always be part of a well-considered plan of campaign. Complications are by no means negligible, especially in old patients.

P.A.S. (para-aminosalicylic acid) is given in doses of 10–20 g. daily for a month and is used for similar types of case. The effects are less dramatic and certain than with streptomycin, but the development of resistance against it is rare under ordinary circumstances. Unfortunately its use has to be discontinued in a large number of cases because of vomiting and diarrhoea. There are hopes that the use of both of these drugs together may get over many of their disadvantages.

In most cases institutional treatment is necessary sooner or later, but the patient will have to be reassured that in a well-run place superinfection is not a practical risk.

The Convalescent Patient

When the patient becomes convalescent the role of the general practitioner is very important. Even to the specialist it is often difficult to decide when the patient should be allowed to get up; the general practitioner should therefore keep on the safe side: it is much better for the patient to remain at rest for a month too long than to get him up too soon. As a rule at least a normal temperature, a normal sedimentation rate, three negative sputa, and a radiograph showing no cavitation and only retrogressing shadows should be obtained before the patient is allowed up. When the patient is judged fit to get up the time out of bed and the amount of exercise are gradually increased, so that he is up for eight hours and walking a mile at the end of a month, and up all day except for two hours' rest and walking four to six miles a day at the end of three months.

When the patient returns from institutional treatment a full report from the hospital or sanatorium should be obtained and a full assessment of the case made, with the help of a new radiograph. Both for patients who have returned from sanatorium and those who have recovered at home a detailed programme should be drawn up with the assistance of the specialist who is going to help to look after the patient; gradual increase of activities should be permitted if the check-ups show healing of the disease. The temperature chart should be continued and monthly radiographs and sedimentation rate obtained until the patient is judged fit to return to work. Any deterioration of these should lead to careful review of the case and, if necessary, more drastic treatment. Return to work should, if possible, be gradual. Usually the patient should go back to his old job unless the hours are excessive, the work very strenuous, or the conditions unhealthy.

For the first six months a monthly check-up is essential and a comparative radiograph called for at least every two months. Relapse should be spotted as early as possible, but too much attention must not be paid to equivocal radiological changes; small differences in shadows are often due to differences of technique, but the appearance of a new shadow in a reasonably comparable film should be regarded as evidence of relapse. This often appears without any clinical change. Sputum, if present, should be examined regularly.

Any febrile catarrhal attack indicates the necessity for a new radiograph before return to work is allowed. When relapse has been diagnosed prompt treatment is indicated. A second period of bed rest seldom produces as good a result as the first, and collapse therapy is usually indicated. The intervals between the check-ups which have taken place every month for the first six months can be extended to two months, but this should be maintained for two years. After this, every three months will be sufficient for the next two years, but a radiograph should be taken every six months for an indefinite period if the disease has been extensive or slow to respond to treatment. If the patient remains well for two years the chances of healing improve steadily. It must be remembered that worry and strain and excessive activity at home are just as harmful as long hours at work, and are usually much easier to avoid.

Home Contacts

Examination of the home contacts following the diagnosis of pulmonary tuberculosis in a member of the household must not be neglected. All children under 10 should be tested for infection by a jelly test, or by the Mantoux test (up to 1/1,000 dilution) if over 10 years of age. A negative result, provided that six to eight weeks have elapsed since the last contact, indicates freedom from infection, and calls for no further action while contact is not taking place. All positive reactors and older contacts must be *x*-rayed. In contacts over 30 a single negative radiograph is sufficient unless contact is continued with an infectious case. Children who are positive reactors and adolescents should be *x*-rayed again after a further six months and annually for five years.

The use of B.C.G. on negative reactors must be considered if contact with infection is likely to be maintained. B.C.G. is a culture of living avirulent tubercle bacilli. It is used to give an individual who has never been infected with tuberculosis the acquired immunity which he would receive if he had been infected, without the risk of developing the disease. It is obviously not applicable if the Mantoux test is positive. The chances of serious complication are negligible. At present its use should be confined to infants, children, and adolescents who are living in tuberculous households, and medical students, nurses, and the like who are specially exposed to infection.

Arrangements are being made for it to be available at tuberculosis clinics.

Conclusion

The successful treatment of pulmonary tuberculosis depends largely on attention to detail and willingness to assess deviation from normal. Often a doubt will arise: the clue to correct action is the decision whether serious harm will ensue if the solution of the problem is left until the next visit. If the answer is in the negative the patient should not be informed of the doubt, but action should be taken immediately a decision is made. The average tuberculous patient knows a great deal about himself, so the assumption by the doctor of knowledge which he does not possess is fatal, but it is equally bad to give the impression that the lack of knowledge leads to a lack of interest.

THE ITALIAN HOSPITAL

The Italian Hospital in Queen Square, London, which has been closed since 1941 except for some out-patient activity during the last two years, was reopened on June 19. The Earl of Perth, vice-president of the hospital, received the guests, including many representatives of the Italian colony in London. Cardinal Griffin, Archbishop of Westminster, attended to give his blessing, and inaugural speeches were made by the Italian Ambassador, Duke Gallarati-Scotti, and the Consul-General for Italy, Dr. Vita-Finzi, chairman of the committee of management. It was stated that this hospital, the only one of its kind in the United Kingdom, was founded 66 years ago by the generosity of an Italian, Commendatore Giovanni Battista Ortelli.

In accordance with its constitution, the hospital gives preference in its wards (58 beds) and out-patient department to Italians and Italian-speaking people, but actually it has always been open to the sick and injured of all nationalities, and its British patients have almost equalled its Italian patients in number. The hospital was damaged in the war and also suffered much from dilapidation, so that it became a mere shell, but extensive renovations and improvements have been completed throughout the building, which is now furnished and equipped as a modern hospital, although the structure is Victorian.

Cardinal Griffin spoke of the difficulties which had to be overcome in finding money to put the building in order and in enlisting both medical and nursing staff. The nursing is in charge of the Sisters of Verona, assisted by lay nurses.

A vote of thanks to the governors of King Edward's Hospital Fund for London was moved by Mr. H. P. Winsbury-White, chairman of the medical committee, who explained that the hospital had not been taken over by the Ministry of Health under the National Health Service Act and was still dependent on voluntary contributions. The generous help of the King's Fund was gratefully acknowledged.

Commendatore John Sperni moved a further vote of thanks to the Ministry of Health, the London County Council, and the Corporation of Holborn, in which borough the hospital is situated. The Mayor of Holborn spoke of the appropriateness of having such a hospital again functioning in a part of London which has many Italian associations. The proceedings concluded with the singing of the hymn of the Italian Republic, and the company made an inspection of the wards and departments.



The Earl of Bessborough presenting a congratulatory address on behalf of the Royal College of Physicians and Surgeons of Canada to the President, Sir Cecil Wakeley, on the occasion of the 150th anniversary of the foundation of the College.

ROYAL COLLEGE OF SURGEONS

150th ANNIVERSARY DINNER

In the year 1800, by Royal Charter, the Corporation of Surgeons was constituted the Royal College of Surgeons of England. The 150th anniversary of that event was celebrated with fitting state on June 27, when a dinner at the College was attended by H.R.H. the Duke of Gloucester. Before the dinner the President (Sir Cecil Wakeley), assisted by the Vice-presidents (Sir Harry Platt and Professor Ernest Finch), received addresses from each of the other Royal Colleges and Corporations in Great Britain and Ireland, the Royal Society, the Royal Society of Medicine, the Royal College of Physicians and Surgeons of Canada (presented by Lord Bessborough, an Honorary Fellow of the College), the Royal Australasian College of Surgeons, the College of Surgeons of Paris, the Society of Apothecaries of London, the General Medical Council, the American College of Surgeons, the British Postgraduate Federation, the Worshipful Company of Barbers (which is No. 17 in the order of precedence of the City Guilds), and from 13 universities and four London medical schools.

The DUKE OF GLOUCESTER, in responding to the toast of "The Queen, the Princess Elizabeth, the Duke of Edinburgh, and other members of the Royal Family," recalled the associations of the College with the Royal House. The College was incorporated by charter of George III. To mark its centenary in 1900 the institution of the Honorary Fellowship was approved by Queen Victoria, and the first Honorary Fellow elected was the then Prince of Wales, afterwards Edward VII. In its 150th year, as the first event in the celebrations which culminated that evening, the College had elected the Queen to its Honorary Fellowship. His sister, the Princess Royal, and his uncle, the Earl of Athlone, had similar connexions with the College and greatly regretted their inability to attend the dinner.

Mr. S. C. ROBERTS, Vice-Chancellor of the University of Cambridge, in proposing the toast of the College, spoke of the early history of the Guilds of Barbers and of Surgeons and of their combination in the reign of Henry VIII. It was evident, he said, that the present high level of surgical efficiency was not immediately attained, and he gave some quaint accounts of complaints against surgeons in the sixteenth century. The Royal College since its constitution in 1800 had flourished exceedingly, and all the guests would desire to offer their congratulations on this occasion. They honoured surgery, an art rather than a science, demanding the most exquisite skill and the keenest judgment.

At this point the Duke of Gloucester received on behalf of the College a silver tankard presented by the Royal Australasian College of Surgeons and a medal presented by the College of Surgeons of Paris.

Sir CECIL WAKELEY, in responding, said that during its first hundred years of incorporated existence the College progressed steadily as a licensing body. The Fellowship was instituted in 1843 and the licence in dental surgery in 1859, and the Conjoint Board was set up in 1884. The College was twice enlarged, and the museum and library grew apace. During the last fifty years the progress had been remarkable. He referred to the appointment in 1908 of Sir Arthur Keith (an honoured guest that evening) as conservator of the museum; to the institution of primary Fellowship examinations overseas, the first in Canada in 1929 and in Australia in 1931; to the receipt of some great benefactions and the creation of trusts and scholarships. In 1941 came disaster, when three-fifths of the College and museum were destroyed by enemy action. Within two months of that catastrophe Lord Webb-Johnson (as he now was) was elected President, and during his eight years of office the College, maimed and mutilated as it was, developed a vigour greater than at any time in its previous existence. With the help of generous gifts special departments were formed with professors at their head, and the scientific work of the College was systematically organized. The College had played a leading part in organizing postgraduate study and had strengthened imperial ties by the institution of Commonwealth travelling scholarships.

Thanks to the foresight of Lord Webb-Johnson the College had become possessed of nearly the whole of the south side of Lincoln's Inn Fields, which would enable it to benefit from the well-timed generosity of Lord Nuffield, who was giving £250,000 for the erection of the Nuffield College of Surgical Science, where about 100 postgraduate students would be provided with the facilities of collegiate life. With the assistance of the Wellcome trustees, of many kindred institutions, and, above all, of the Fellows of the College who had contributed so loyally to the restoration and development fund, it was planned to build a great hall and enlarge the museum. It was the determination of the College to fulfil with all the energy it could command the duty laid upon it under the charter of George III—the promotion and encouragement of the study and practice of the art and science of surgery.

Lord WEBB-JOHNSON proposed the health of the guests. After a reference to the earlier history of the College he said that the greatest happiness on an occasion like this was to be surrounded by friends, and the College was fortunate in that the friends who surrounded it were so representative and distinguished. The College had passed through a crisis, and in that crisis had sought and found friends in all parts of the world.

Sir JOHN ANDERSON, who responded, referred to the progress of surgery and the new hope it gave to sufferers from abnormalities and diseases formerly regarded as mortal. Thanks to surgery the King had been restored to an active normal life. The achievements of plastic surgery were frequently evident, and by various new procedures lives were saved and suffering diminished. He referred with appreciation to the fact that recently a surgeon had left "his plumber's tools" behind him and stretched with his fingers a valvular orifice of the heart. In congratulating the Royal College on its notable anniversary its guests would desire to acclaim the profession, at the head of which the Royal College with its sister institutions stood.

After the dinner the guests visited the museum and the council room, in which were displayed John Hunter's anatomical specimens illustrating some of his best-known work and specimens which showed the progress towards the rebuilding of the museum series destroyed by enemy action in 1941. It was stated that 158 new specimens had been prepared so far to replace the losses in the anatomical museum, and 215 to replace the losses in the comparative osteology collection. Exhibits were also on view from the odontological series, the unit illustrating ophthalmological research, and a series of colour photographs illustrating the diseases and injuries of modern warfare and their treatment by surgery and antibiotics. The College plate was on view, including the latest acquisition, presented by the Worshipful Company of Barbers, a replica of the cup given to the Barber-surgeons Company by Henry VIII. The records of the College were also shown, including the roll of Honorary Fellows, containing the signatures of all who had received this distinction from Edward VII on July 24, 1900, to the present Queen on March 20, 1950.

HARVEIAN SOCIETY DINNER

LORD LINLITHGOW'S TRIBUTE TO THE G.P.

A large gathering assembled in the Grocers' Hall on June 29 for the Buckston-Browne-Gray-Hill Dinner held by the Harveian Society of London, the president, Dr. R. R. Trail, being in the chair. After the company had toasted in silence the memory of William Harvey and of Sir George Buckston-Browne, the Marquess of Linlithgow proposed the health of the Harveian Society in a thoughtful speech which, despite the heat of the evening, was listened to with deep appreciation.

Lord Linlithgow said that as a layman he had had a long and varied contact with and interest in scientific research. He had seen much money spent on lavishly equipped premises and had been saddened to note that "in some despite the marble and the gilding the sacred fires are untended and the altars cold." The limiting factor was the quality of the research worker. "It is the man that matters." Harvey could have had no research team in the modern sense any more than Pasteur had two hundred years later. "Yet Harvey was very far from being alone. For by great and patient labour he had acquired all the knowledge available in the schools, all such past experience as could be gathered from the written word and amongst contemporaries an unequalled mastery of anatomy founded in the untiring exercise of dissection." There was, Lord Linlithgow believed, nothing to equal Harvey's principal achievement in its significance, its dramatic quality, and its completeness. Though Sir Francis Bacon had employed Harvey he remained without knowledge of his physician's great discovery. It would be of the greatest interest to know whether the Lord Chancellor had called in Harvey as a general practitioner or as a specialist. In his essay "Of Regimen of Health" Bacon wrote this on choosing a doctor: "Forget not to call as well the best acquainted with your Body as the best reputed of for his faculty." Lord Linlithgow hoped that this, which had been so clearly understood 350 years ago, was not now to be forgotten. He went on to say:

The Family Doctor

"For my part, I have a great fear that the position of the family doctor is in serious jeopardy. I doubt very much if the public at large has yet understood how much is at stake in this issue. I would like to say that where medicine in any of its branches is concerned I am without political bias. What concerns me, and most other men of good will, is the health, efficiency, and happiness of the common run of men and women. Nor am I directing my argument this evening to the economic aspect of the National Health Act, though it is true that in my judgment its impact upon our overstrained economy may well—and before many months pass—provide one of the sharpest political issues ever presented to this country. Nor, again, would it be reasonable to expect perfection at the start of so extensive a scheme. Indeed, it must take much experience and some years before the machine can be fully run in.

"What troubles me is that, unless I am mistaken, signs are multiplying to show that the status and usefulness of the general practitioner have already suffered damage, and that unless something is done in good time the public interest is going to be gravely hurt. I admit that my fitness to judge is not strongly founded; for I am no more than a private citizen who reads the newspapers and such literature on these topics as he can make time for. But to-night I am content to present myself to you as a patient, and one insured under the scheme. Not so long ago we patients were encouraged to hope that prevention of disease rather than its cure was to be the target, and I can conceive of none more worthy. But does not prevention depend upon the early recognition of aberrations from the normal? And who in the world is going to do me this service of very early diagnosis if it is not the G.P., who is, or ought to be, my family doctor, the person who as early as 1620 was valued 'as the man best acquainted with my body'? Please, for my sake, cherish him. Please do not leave him and his kind in deepening isolation, cut off from the springs of progressive medicine, deprived of effective contact with the hospital services! Help him to keep abreast of progress and to use effectively the tremendous armoury of therapeutic substances which, almost from day to day, research is providing. Give him a little time in which to think as well as time to work. Make the general branch a worth-while career such as may attract at least its share of the best students.

"I value specialization as much as any man; and if the nature of my case warrants it, I wish my G.P. to send me to a specialist without delay. I must hope that the road to him may not be clogged by large numbers of patients whose state does not, in fact, need his ministration or give warranty to those who have directed them to him. Am I not right in holding that the only way to set right this last matter is to raise the status, capacity, and performance of the G.P.? As a patient, I desire, in fairness both to the medical profession and to myself, that doctors should be adequately remunerated. I am properly anxious that no practitioner should be driven, on grounds of bread and butter, to extend his practice beyond the utmost number of patients to which he can give proper care. I am aware that many issues arise of great moment to the medical profession. Then again, I am left in no doubt about the political significance of the National Health scheme or the cleavage of opinion upon certain of its aspects, although all parties are pledged to support it. For myself and my fellow patients, I will crave but one boon. It is that all concerned should bear constantly in mind that we patients are the most important party in this whole matter, and that it is our welfare that is at stake."

Lord Linlithgow ended by making some remarks about his interest in tuberculosis. With the president of the Society he had taken part in the work done at Papworth and at Enham-Alamein. His father-in-law, the late Sir Frederick Milner, had been one of the earliest and most devoted supporters of Papworth. Lady Linlithgow shared her father's enthusiasm, and when he (Lord Linlithgow) went to India she dedicated herself to the task of founding there an organization for coping with the fearful problem of tuberculosis. In British India and in the Indian States Lady Linlithgow succeeded in raising a fund of about £800,000, which was disbursed upon the establishment of clinics and general anti-tuberculosis measures. When they left India in the autumn of 1943, Lady Linlithgow had succeeded in establishing a tuberculosis association in every Province and in almost every State. These were almost without exception conducted by Indians.

In response to the toast, the president, Dr. R. R. Trail, in a speech of much learning compared the England of Harvey's day with England now. He gave a fascinating account of the manners and customs of those who lived in that turbulent period of British history. Harvey had lived at the time of the Armada and of the Civil War, had been physician to James I and Charles I, had been alive when Shakespeare and Milton were alive, and, when he died at the age of 80, had witnessed revolution and regicide. The toast of the guests was proposed with eloquence and wit by Dr. M. C. W. Long. He reminded those present that the dinner they were enjoying had been endowed by Sir George Buckston-Browne who gave the Harveian lecture in 1901 on urinary [illegible]ay Hill, with whose name the dinner was also associated, in good fellowship and in the ordinary fashion. Among the guests present he welcomed in particular Dr. Arthur Allen, of the U.S.A.

The evening being late, response to the toast of the guests was made with admirable point and brevity by Lieut.-General Sir Frederick Browning and Dr. W. Russell Brain, President

Lm56, M32 N5c2 9887

of the Royal College of Physicians. Dr. Brain, asking what was the state of the circulation of medicine to-day, observed that in consulting medicine they had some large vessels, and in the peripheral circulation, where the most important things took place, there were the general practitioners. Nothing could happen in one part of the circulation without effect on the rest. He, too, stressed the importance of the future of general practice and of general practitioners.

TUBERCULOSIS IN SOUTH KOREA

According to a report issued by the World Health Organization, tuberculosis is the most widespread of all diseases in Korea and the most serious public health problem. The statistics available in the country are unreliable, but in 1947 the death rate was 52 reported deaths per 100,000 population. However, according to local estimates the actual annual death rate is probably more than 300 per 100,000. The disease is present in all forms, but the bovine type is rare, since cow's milk is not commonly drunk in Korea.

Of children entering primary school at the age of 7, about 30% are tuberculin-positive; when they leave at the age of 14 to 16 about 50% to 60% are tuberculin-positive. The percentage seems to be higher in Seoul than in rural areas. Among college students 84% of the males are said to be tuberculin-positive, and 73% of the females.

Some information on the prevalence of pulmonary tuberculosis was obtained by mass-radiography surveys during 1944–9 by Dr. C. S. Cho, formerly professor of radiology at the National Seoul University Medical School. "Active tuberculosis" is defined as "progressive changes in the *x*-ray picture of the lungs, including changes in the apex and elsewhere, pulmonary gland infiltration, and pleurisy signs." In accordance with this definition the incidence of active tuberculosis was found in the surveys to be 3.2% in orphanage children, 1.7% in urban, and 0.9% in rural primary-school children. It was 1.2% in boys at middle schools, and 2.4% in girls. Among college students it was 3.2% in males and 2.7% in females. Among textile workers the incidence was 2.8%, metal industry workers 1.5%, rubber industry workers 2.7%, and clerical workers 3%. Out of 426 children admitted to the paediatric ward of the Seoul Red Cross Hospital in 1949, 134 (31.4%) had tuberculosis; and out of 8,647 children examined at the paediatric out-patient clinic of the Taegu Presbyterian Hospital in 1949, 1,266 (14.7%) had tuberculosis. Mass-radiography surveys showed that about 2% of the total population of twenty million in South Korea had active tuberculosis. The total number of tuberculosis beds was 530, but there were no beds for tuberculous children. The report states that there are about 3,800 doctors, 1,500 nurses, and 1,500 midwives in South Korea, though only half of the nurses and midwives are in practice.

Among measures suggested for controlling tuberculosis are: sending a W.H.O. consultant to advise on training in medical schools and on the development of public health measures; additional laboratory equipment; and—urgently needed—more beds for tuberculous cases.

An account of the Nutrition Research Laboratories at Coonoor, India, is given in a pamphlet written by the director, Dr. V. N. Patwardhan. He outlines the history and development of the laboratories, and the great work done by Sir Robert McCarrison, the founder-director, on research into nutrition in India. Inquiries into the nutritive value of foodstuffs have been carried out at the laboratories, as well as diet surveys and research into the nutritional status of the people and into nutritional deficiencies. Many medical and other workers have been trained there, including social welfare workers, health visitors, and teachers. In an introduction Rajkumari Amrit Kaur, Minister of Health for India and President of the World Health Organization, emphasizes the need for nutritional research in India and of raising the standard of nutrition there.

MEDICAL LIBRARIANSHIP IN GREAT BRITAIN

MEDICAL LIBRARY ASSOCIATION CONVENTION

As principal guest speaker at the annual convention of the Medical Library Association held at Boston, Massachusetts, Mr. W. J. Bishop, librarian of the Wellcome Historical Medical Library and honorary secretary of the Medical Section of the Library Association of Great Britain, opened the proceedings on June 21 with an address on medical libraries and librarianship in Great Britain.

Taking as his theme the part played by medical libraries in the advance of medicine, Mr. Bishop examined the means by which their usefulness has been, and could be yet further, improved. Most important were inter-library and international co-operation; the organization of librarians into professional groups for the mutual exchange of information and ideas; and the recruitment, training, and examination of juniors in order to build up a well-educated and highly trained body of registered medical librarians. The first attempt in Britain along these lines had been the Medical Library Association of Great Britain, which was founded in 1908 and came to an untimely end in 1910. It owed its origin to the fact that Professor Walker Hall in 1906 moved from Manchester, where there was an excellent medical library, to Bristol, where there was a poor one. Mr. C. Clayton, then librarian of the Manchester Medical Society, served him so well with inter-library loans that he suggested that this practice should be extended and organized by an association of medical libraries. Other provincial libraries, in the same stage of development as Bristol, saw great possibilities in the scheme. The big London libraries were not so anxious to see their stock dispersed far and wide.

The outcome was that 32 library representatives attended a preliminary conference held during the annual meeting of the British Medical Association at Sheffield in 1908. In January of the following year, at a meeting in the Leeds School of Medicine, a committee was formed with Osler as its president. The inaugural meeting of the new Medical Library Association was duly held at Queen's University, Belfast, on July 28, 1909, again on the occasion of a B.M.A. annual meeting. Osler gave an address on "The Medical Library and Postgraduate Work," and an exhibition of manuscripts and rare books was arranged in the university.

In July, 1910, once more "by kind permission of the British Medical Association," the second annual meeting was arranged in London at the same time as the B.M.A. meeting, and several papers were read. Thereafter little more was heard of the M.L.A., probably because its energetic secretary, Mr. Clayton, left the Manchester Medical Library and nobody was found to take his place. Within a short time the B.M.A. Library began to fulfil one of the M.L.A.'s objects by improving its facilities and introducing postal loans. Then after the 1914–18 war Professor Leiper and his assistants compiled the "Union Catalogue of Periodicals" (published by the B.M.A. in 1923), which had been another of the chief aims. Short as was the existence of the Medical Library Association, it had achieved something in stimulating these advances. The reasons for its failure, in Mr. Bishop's opinion, were the faulty conception of an association of libraries instead of librarians; the small number of well-trained medical librarians at that time; and the prominence given to the study of medical history, a good aim in itself but not one of the chief functions of such an association.

Medical Section of the Library Association

Sir John MacAlister, secretary and librarian of the Royal Society of Medicine and a former secretary and president of the Library Association, writing in 1910 gave it as his considered opinion that the scheme would have stood a better chance of success if it had been constituted as a branch of the Library Association. Later events showed the wisdom of this opinion. When a group of London medical librarians suggested in 1947 that the time had come to establish a professional body, preliminary discussions resulted in its formation as a subsection of the Library Association. It is significant that on that occasion the initiative was taken by librarians themselves, that the stimulus came from London, which had proved the stumbling-block in the old association, and that it quickly received the warmest support from medical librarians throughout the country, as well as encouragement from the parent association. Prominent among its aims were the establishment of an exchange system, the compilation of union lists and similar co-operative projects, and the encouragement of inter-library loans. At the preliminary meeting held at Chaucer House, the headquarters of the Library Association, on October 4, 1947, there were 33 librarians present; by October 29 the new body already had 60 members. By the end of 1948 membership reached 100, and the group was accorded the status of a full section of the Library Association. Present membership is 180 and is rising steadily.

An exchange scheme was established within the first three months of the existence of the new section, and by now many thousands of periodicals and books have been collected and distributed to libraries at home and abroad. Valuable work has been done by a special committee studying the selection of subject-headings for medical libraries, and another committee has published a select book-list and hints on the organization of medical libraries in hospitals, which last has been asked for by more than 300 hospitals in all parts of the world.

Turning to the future, Mr. Bishop spoke of the "crisis" in medical bibliography: the cessation of the index-catalogue, the myth of "complete coverage of the literature," when the year's output in one specialty might take ten years to read; and the problems of selecting from and organizing the literature, problems which could not be solved by any of the mechanical methods now becoming fashionable. The best solution, said Mr. Bishop, lay in the improved training of the medical librarian so that he could act as an expert guide through the complexities of the overwhelming mass of periodical literature. In this matter the infant Medical Section of the Library Association had gone ahead of the veteran Medical Library Association of America and had already succeeded in introducing into the final examinations for the Fellowship of the Library Association special papers in medical literature and medical librarianship. The syllabus, which is of university standard, is exacting and comprehensive and could be mastered only by assistants who had spent some years of hard work and study in a medical library.

In concluding his address Mr. Bishop made a plea for a movement in medical librarianship back to the study of the reader and the book, urging his audience to remember that the library was one of the greatest factors in medical progress.

At the end of the Boston Convention on June 25 Mr. Bishop began a tour of medical libraries in the eastern States of the U.S.A. and in Canada.

A two-day conference is being arranged jointly between the Institute of Biology and the Atomic Scientists' Association, with the support of the British Association, on the subject of atomic energy and its biological hazards. It will be held at the Royal Institution, Albemarle Street, London, W.1, on October 20 and 21. Other societies interested in the meeting include the British Institute of Radiology. The object of the conference is to consider, on the basis of the available facts from both the biological and physical aspects, the possible biological hazards arising from the development and application of atomic science now and in the future. The meeting will comprise four sessions as follows: (1) Biological and medical effects of nuclear radiations. (2) Tolerance levels and measures of protection. (3) Biological implications. (4) Atomic energy and the future. In each session opening addresses will be given by invited speakers, and they will be followed by discussion. Preliminary arrangements are being made by a joint committee, of which the chairman is Professor Alexander Haddow, of the Chester Beatty Research Institute, Royal Cancer Hospital, London.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knight: Dr. J. H. G. Robertson, C.B.E. *As Commanders (Brothers):* Surgeon Captain T. Madill, O.B.E., M.B., R.N., and Dr. J. C. Ashton. *As Officers (Brothers):* Surgeon Captain A. W. McRorie, M.D., D.P.H., K.H.P., R.N., Colonel F. A. Bearn, C.B.E., D.S.O., *M.C.*, M.D., Brigadier T. W. Davidson, M.B., Lieutenant-Colonels E. H. R. Altounyan, O.B.E., *M.C.*, M.D., F.R.C.S., and E. G. Montgomery, M.B., Messrs. H. S. Taylor-Young, F.R.C.S., and I. Newton, F.R.C.S., Drs. H. Middleton, *M.C.*, D. A. B. Hopkin, D. L. Johnson, N. M. Maclennan, B. O. Bradshaw, P. Pringle, C. W. Isaac, S. H. Ward, R. A. H. Fulton, E. E. Butler, and W. S. Wallis. *As Associate Officers (Brothers):* Squadron Leader F. S. Krusin, M.R.C.S., L.R.C.P., and Dr. T. Seshachalam. *As Serving Brothers:* Surgeon Commander D. F. Walsh, M.B., F.R.C.S., R.N., Squadron Leader L. E. Claremont, M.R.C.S., L.R.C.P., Mr. J. S. Grant, M.D., F.R.C.S., Drs. G. M. Kay, T. W. H. Porter, A. G. N. Weatherhead, L. E. Jones, R. V. C. Richards, J. A. Thompson, W. W. Wilson, R. C. J. Meyer, D. K. Fisher, R. W. S. Ashby, A. Strang, D. R. Edwards, and S. L. Mainland. *As Associate Serving Brothers:* Drs. A. A. Masser and F. Rassim. *As Serving Sister:* Dr. Margaret Melvin.

Nova et Vetera

JOHANN MIKULICZ-RADECKI

Last month Sir Gordon Gordon-Taylor led a delegation from the Royal Society of Medicine to attend the 67th Congress of the Deutsche Gesellschaft für Chirurgie, which was held on May 31 at Frankfurt-am-Main. The occasion coincided almost exactly with the centenary of the birth of the German surgeon Johann Mikulicz-Radecki. In paying tribute to his memory, Sir Gordon Gordon-Taylor said:

"It is a proud privilege that is granted me to pay a tribute to the memory of a great German surgeon, for the centenary of the birth of Johann Mikulicz-Radecki coincides almost exactly with the date of this congress of German surgeons, of which he was so strong and stalwart a pillar during the latter half of the nineteenth century and in the first few years of the present one. I am further honoured in following this morning so famous a surgical figure as Ferdinand Sauerbruch.

"Not only am I here in Frankfurt to pay this tribute to Mikulicz on behalf of the Royal Society of Medicine, of which I am acting president at this juncture, but I am also commissioned by the President of the Royal College of Surgeons of England, the headquarters of British surgery, to associate the name of our surgical college with this eulogy directed to the memory of a master surgeon. Nay, if I might venture for one minute to assume a wider responsibility, I feel sure that to-day I am speaking for all the surgeons of all nations in the world in rendering homage to that great shade, who did so much and achieved so much to promote the science and art of surgery.

"I am by no means assured that the subject on which I myself propose to speak later on—interinnomino-abdominal amputation—is one that would have particularly commended itself to the famous surgeon, for in the well-known textbook of surgery which was my surgical bible in more youthful years and of which he was joint author with Ernst von Bergman and Bruns one senses a tendency to relative conservatism in respect of the treatment of neoplasms in the vicinity of the hip.

"The exteriorization method of ablating cancer of the large intestine, for ever associated with the name of Mikulicz, must always rank as the most monumental milestone in the onward progress of colonic surgery, and the so-called Mikulicz–Paul technique did far more to promote the safety of colonic resection than any single factor, save perhaps the sulphonamide or streptomycin therapy of very recent years. Not only were the lives of countless cancer sufferers all over the world saved by the Mikulicz technique, but during the last world war the application of the principle of exteriorization of the colon was

almost universally applied by British surgeons to the treatment of war injuries of the large bowel and did much to diminish the mortality of this serious lesion.

"As one of the surgical acolytes of the famour Theodor Billroth, of Vienna, he assisted at the actual birth of gastric surgery, and in 1881 at this congress he reported three cases from the Vienna clinic in which Billroth had performed gastrectomy, one of them being the first successful case ever performed. By a curious trick of fate Mikulicz was destined to die at a premature age from malignant disease of an organ the surgery of which he had done so much to promote.

"This is no place nor is there the time to catalogue all his achievements, but in 1885 he was the first to operate for gastric haemorrhage. The pioneer is rarely the one who exploits, and Mikulicz was not spared to see the operative treatment of haematemesis established as the appropriate method of treatment in certain cases; a sweet reasonableness on the part of the internist towards the problem has only been secured after fierce discussion and by hard endeavour, and in this German-speaking surgeons have played no unimportant a part. Nor in Britain has the subject passed unnoticed, and my friend Norman Tanner and even I myself have taken a very active interest in the pioneer work of Mikulicz, Finsterer, and others.

"In every generation there are a chosen few who shed a special lustre on it by reason of their character, their attainments, and their record of service, God's greatest gift to man; and when the riband of surgical history is finally unrolled, in glittering and golden letters will be found inscribed thereon the name of Johann Mikulicz-Radecki. I offer to him, on behalf of surgeons everywhere, my tribute of laurel for honour and of rosemary for remembrance."

Reports of Societies

SOME UNUSUAL CASES

Dr. A. HILLYARD HOLMES delivered his presidential address, on April 5, to the Manchester Medical Society. He referred to the amalgamation of five societies to form the newly constituted Manchester Medical Society, with sections of medicine, pathology, surgery, anaesthetics, and odontology. The oldest of these societies, the Manchester Medical Society, was formed in 1834; the present Pathological Society was formed in 1885 to replace the microscopical section of the Medical Society, which had been in existence since 1875. The other three societies were of much more recent origin.

After references to the early meetings of the Medical Society and to some notable presidential addresses, the speaker detailed a number of interesting clinical cases, illustrating them by lantern slides. Three cases of haemoptysis proved to be due to hydatid cysts, malignant haemangioma of the right auricle, and a congenital pulmonary cyst, respectively. In the last-named condition haemoptysis had recurred for nearly twenty-five years, and *x*-ray films taken in 1928 supported the diagnosis.

There followed descriptions of a case of dissecting aneurysm of the aorta, observed for three and a half years, and of a congenital cerebral aneurysm causing an isolated third nerve palsy, observed over fourteen years and finally treated by ligation of the artery. Brief allusion was made to four diseases which were incurable when the speaker was a student—namely, Addison's disease, pernicious anaemia, tuberculous meningitis, and diabetes mellitus with coma.

Sir HARRY PLATT proposed a vote of thanks to the president.

The paraplegic branch of the British Legion performs a useful service for its members in producing a quarterly magazine called the *Cord*. It gives disabled readers up-to-date information about the various appliances designed to help them, and mingles light comment on the difficulties of the disabled with instruction on how to overcome them. Information may be obtained from the editor at 114, Arran Road, Catford, London, S.E.6.

Correspondence

Stress and the General Adaptation Syndrome

SIR,—In view of the fate which has overtaken all previous attempts to construct a monistic pathology and its corollary, monistic therapeutics, it required no little courage on the part of Professor Selye to make the attempt, especially at a time when the knowledge of disease is a thousandfold greater than it was at the time of the systematists who have preceded him. Moreover, the despair into which we are plunged by the centrifugal force of scientific medicine makes any attempt at integration welcome and compels us to give it our earnest consideration and at the same time to subject it to critical analysis.

Any such system must satisfy two criteria: first, it must be sufficiently catholic to embrace all pathological and clinical evidence whether this is obtained collaterally or directly; secondly, the theory on which it is based must be logically unassailable.

As to the first, Professor Selye (*Journal*, June 17, p. 1383) lists a large number of heterogeneous diseases which are responsive to cortisone. I do not for a moment doubt the validity of his claims. It is, however, worth pointing out that a list equally long and equally heterogeneous can be and has been made of diseases responsive to *x* rays, though some of the claims have not stood the test of time. The remarkable thing is that though the two lists are not identical they have a large number of diseases in common: eczema, dermatitis, rheumatoid arthritis, spondylitis, Hodgkin's disease, the leukaemias, lymphosarcoma, Boeck's sarcoid, hyperthyroidism, psoriasis, keloid, etc. If *x* rays have not the dramatic action of cortisone on rheumatoid arthritis, what could be more dramatic than their action on many forms of cancer, a field in which cortisone is useless? We thus have two large groups of diseases of widely differing pathology whose members are partly identical and partly different, responding to two agencies as far apart in origin and character as they could possibly be. Are we to conclude that *x* rays act not directly but through the intermediation of the hypothalamus–hypophysis system? I find this hard to believe. Moreover there are many diseases which respond up to a point, and usually almost the same point, when treated by the most diverse agencies. Hodgkin's disease, for example, responds to *x* rays, to urethane, to derivatives of mustard gas, and now to cortisone and A.C.T.H. All kinds of things retard malignant growth to some extent. How do these facts square with Professor Selye's theory?

Turning now to the theory itself, I quote extracts verbatim from the opening paragraphs of his address. Each is followed by the deductions which, according to my reasoning, should be drawn from it: the italics are mine.

1. *Living organisms can respond to stress as such. . . .*"
   Stress is something to which organisms can respond.
2. "*We called this response the general adaptation syndrome.*"
   The general adaptation syndrome is the means by which the organism responds to stress.

3*a*. "*Anything that causes stress endangers life, unless it is met by adequate adaptive responses.*"
   Stress is a condition caused by anything which endangers life in the absence of adaptive responses.

3*b*. "*Conversely, anything that endangers life causes stress and adaptive responses.*"
   Stress is a condition caused by anything which endangers life; it is accompanied by adaptive responses. 3*a* and 3*b* are therefore not the converse the one of the other; they are partly identical and partly inconsistent.

4*a*. "*In the general adaptation syndrome the manifestations of passive non-specific damage are intricately intermixed with those of active defence.*"
   The general adaptation syndrome has two components, damage and defence. It is not clear to me how damage can be part of an adaptive process. Note that damage is passive.

4*b*. "*This* [i.e., 4*a*] *is an inherent characteristic of the stress which elicits the general adaptation syndrome.*"
   The dual nature of the general adaptation syndrome (4*a*) is a characteristic of the stress which causes the general adaptation syndrome.

5. "*In addition to damage and defence, every stressor also produces certain specific actions. . . .*"
   In the diagram which accompanies this paragraph stressor is represented as the cause of the whole train of reactions, but stress which forms part of the title of the article and the pivot of the argument is omitted. The word "stressor" is introduced incidentally and without being defined. In common parlance it should of course mean something which causes stress, and this would seem to be its meaning here if we assume with 4*b* that the two things which it produces—namely, damage and defence—are the components of stress. Since, however, damage and stress are also described as the components of the general adaptation syndrome (4*a*) which is caused by stress, stressor seems to be the same as stress.

6. "*In the biological sense stress is the interaction between damage and defence, just as in physics tension or pressure represents the interplay between a force and the resistance offered to it.*"

Damage has been represented as passive (4*a*). But a thing that is passive cannot take part in an interaction. Similarly, in a physical system a resistance which is passive cannot play. Stress must therefore be the unilateral action of defence upon damage, that is, of one of its own components upon the other. To return to the physical analogy, the truth is that tension is not the interplay of force and resistance (when resistance is active) nor the play of force upon resistance (when resistance is passive). It is the *result* of interplay or play as the case may be. Stress therefore becomes the result of the action of one of its components (defence) upon the other (damage). But stress has been described as the action itself. Therefore stress is not only itself but the result of itself. According, however, to 1 and 2 (above) all living organisms can respond to stress by the general adaptation syndrome, which, according to 4*a*, consists of damage and defence. Therefore stress, in addition to being itself and the result of itself, is also the cause of itself.

The above remarks, I assure Professor Selye, are not dialectic fireworks but a sincere expression of my intellectual difficulties and of my desire to comprehend his meaning. As an earnest of my good will may I express my admiration of his humility, especially welcome in these days of scientific arrogance? "The complete comprehension of life," he says, "is beyond the limits of the human mind." He thus echoes Herbert Spencer's belief: "Both science and religion must recognize that the Power which the Universe manifests to us is utterly inscrutable."—I am, etc.,

Cambridge. FF. ROBERTS.

SIR,—The Heberden Oration and your leading article of June 17 provide much material for thought and reflection: thought, to grasp the meaning and implications of the present outlook; reflection, to discern what progress the passage of years has brought, to distinguish revolutionary theories and new ground from ideas which are merely modifications of earlier thought.

Often in the natural course of evolution conceptions can be so developed, expanded, modified, elucidated, or integrated that they finally present as an entirely new creation something whose advent might possibly be expected to herald the opening of a new era in medical progress.

Your leading article implied that the theory of stress diseases and adaptation evoked little enthusiasm until the effect of hormones in the treatment of rheumatoid arthritis was so dramatically demonstrated. This may be so; but it is difficult to believe that practitioners in the past were wholly oblivious to the reactions of the individual or his adjustments to hostile assault, stress, and environment.

A conception so all-embracing as the general adaptation syndrome must inevitably initiate a volume of research work covering a wide field, and it might not be unhelpful to future investigations if a review of earlier ideas were made at this stage.

In September, 1931, I moved to unearth the opinions of the giants of the day about rheumatic disease in general. This is what I read:

Poynton and Schlesinger[1]: "New methods of approach are badly needed, and, above all, fresh conceptions of disease. . . . Real advance will only be made by breaking away from traditional experiments with cultures *in vitro*, and by paying more attention to the reactions of the patient."

Macinder Wetherby[2]: "Clinically I am unable to place a sharp dividing line between cases termed rheumatic fever, and those with an apparently similar onset that progress to chronic articular involvement."

Rolleston[3] noted how the manifestations of rheumatic disease changed with the passage of time.

Swift, Derrick, and Hitchcock[4]: "The state of the tissues of the patient is the most important characteristic factor of the disease, and the specificity of the streptococci recovered may play a relatively unimportant role."

Gross[5] showed that the nature of a reaction was often influenced by the age of the patient, citing cardiac disease in rheumatism, and nephritis.

Pemberton,[6] after the 1914–18 war, was able merely by prescribing rest and a reduced carbohydrate diet to cure many cases of atrophic arthritis, even when focal sepsis was present. He gave a notable contribution to the work when he demonstrated that in arthritis not only was there lowered blood sugar tolerance, which recovered as the patient improved, but that even after this the impaired tolerance could be reproduced in 40% of patients by interference with the peripheral circulation. He also wrote: "Extreme nervousness, apprehension, and irritability are conspicuous features, also depression and melancholia, while many examples of functional insanity originate from the common background productive of arthritis and should be regarded as branches of the same pathological state."

The day of the haemolytic streptococcus and focal sepsis was waning. More and more did workers tend to concentrate upon the reactions of the individual. As Pemberton said: "It is necessary to admit a disturbance of underlying function expressing itself widely throughout the economy and subject to many influences."

In 1932 and 1933 cases of rheumatic disease which occurred in my own limited sphere of general practice were investigated in a somewhat elementary fashion; the findings were submitted in 1934 as a thesis entitled "The Autonomic Nervous System and the Rheumatic Diathesis." The following extracts are taken from it:

(1) "In acute rheumatic fever of children, subacute rheumatism of the adult, and many if not all forms of chronic rheumatism one complete disease, and one only, is confronted."

(2) "Rheumatic disease, with diabetes, exophthalmic goitre, and asthma, should be defined as offshoots of the same pathological root, and that the victims, through weakness in their reaction to physical and mental bombardment, render themselves prone to attack."

(3) "Physiology furnishes proof daily of the influence of psychological stimuli on this mechanism. One sees the palpitation or cold sweat of fear, the blush of embarrassment and anger, or the dilated pupils of the startled, but it may not be so apparent that in the susceptible not only these acute exacerbations, but also prolonged fatigue, worry, overwork, apprehension or gross mental strain, may either immediately, or over the course of time, give rise to definite pathological conditions which involve some portion of the autonomic endocrine scheme."

(4) "Other hostile factors exist, in the form of psychical unrest, emotion, mental conflict, nervous shock, anaemia, chill, barometric variations, susceptibility to which has been found to be a characteristic weakness of the rheumatic subject."

(5) "An unstable autonomic system is a prominent feature of the rheumatic state. It is usually an inherited and familial weakness, which prevents the subject from responding adequately and efficiently to external influences, whether physical or mental."

(6) "It is not possible entirely to resist the suggestion that conditions, whether physiological or pathological, which are associated with high blood sugar are also those which are favourable to the onset of rheumatism, and the autonomic system is the only connecting link whereby these conditions can be co-ordinated in the mind's eye."

(7) "Each ailment invested its victim with a power of antagonism to any other one of the diseases of the group. It was as if the severance of the weakest link had relieved the tension throughout the whole structure of the system."

(8) "The controlling mechanism of the autonomic endocrine apparatus is in the hypothalamus, which is connected with the posterior lobe of the pituitary gland; furthermore, this part of the pituitary may even influence the controlling nuclei of the autonomic system in the hypothalamus through a recently described vascular portal circulation (Cushing and Fulton)."

(9) "Focal sepsis itself, or at any rate its activity, may be a phenomenon induced by the rheumatic state."

(10) "Treatment must be adequate to deal with the effects of emotion, exhaustion, and shock."

Sufficient has been written to show that eighteen years ago we had begun to direct our gaze towards a picture not very dissimilar from that which the brilliant work of Professor Selye has now unveiled before us.

His words describe the background[9]:

"Adaptation to our surroundings is one of the most important physiological reactions in life; one might perhaps even go so far as to say that the capacity of adjustment to external stimuli is the most characteristic feature of living matter. It is not unexpected therefore that some of the most common diseases of man appear to be diseases of the adaptive mechanism."

Previously one could only say:

"Examples show the association between dysfunction of the endocrine organs and rheumatic disease. Naturally the story is incomplete, for insufficient knowledge of body chemistry and endocrine action leads into a veritable maze of complexity. But this halt in progress has its function, for it deflects the mind from the test tube to the simpler conception of man as a part of the universe, endowed with a pedigree, subject to assault, and girt with environment."[9]

When, in 1932–3, focus began to be concentrated on the defensive reaction rather than on the invader, it at once became obvious that a much closer affinity existed between all forms of rheumatic disease than had previously been thought possible; further, that other pathological entities should be added to this group, for the common factor was stress. But one never imagined that the list of diseases could reach its present dimension, for then there was no knowledge of Professor Selye's valuable pathological and experimental work; this reason also accounts for the fact that more emphasis was placed on the autonomic and vascular aspect of the defence than on the endocrine. There were other divergences. Small importance was assigned at that time to the role of the anterior pituitary gland and suprarenal gland. They were merely considered as part of the general endocrine scheme; nor would a postulate which held that attack by one disease of the group rendered the individual relatively immune to assault by another agree with the outlook of to-day. Hypertension may still create difficulties, for a characteristic feature of the rheumatic state is low blood pressure. These, however, are but fragments. The main picture remains. Its title has not changed. "The gods approve the depth but not the tumult of the soul."

Professor Selye's publications form a milestone in medical progress. Not only this, they are of absorbing interest to anyone who, in the past, may have striven, however crudely and however inadequately, to comprehend the nature of the reaction of the host to the assaults of his environment.—I am, etc.,

High Wycombe, Bucks. G. S. W. EVANS.

REFERENCES

1 Poynton, F. J., and Schlesinger, B., *Recent Advances in Study of Rheumatism*, 1931, p. 55. London.
2 Wetherby, M., *Arch. Intern. Med.*, 1932, **50**, 932.
3 Rolleston, H., *British Medical Journal*, 1933, **1**, 499.
4 Swift, H. F., Derrick, C. L., and Hitchcock, C. H., *J. Amer. med. Ass.*, 1928, **90**, 906.
5 Gross, L., *The Blood Supply to the Heart in its Anatomical and Clinical Aspects*. New York, 1921.
6 Pemberton, R., *Arthritis and Rheumatoid Conditions*, 1929, pp. 48, 159. Philadelphia.
7 Cushing, Harvey, *Pituitary Body, Hypothalamus, and Parasympathetic Nervous System*. London. 1932.
8 Fulton, J. F., *New Eng. J. Med.*, 1932, **207**, 60.
9 Selye, Hans, *Practitioner*, 1949, **163**, 398
10 Evans, G. S. W., Thesis, February, 1934, Cambridge.

SIR,—Professor Hans Selye's article on his concept of the adaptation syndrome in the *Journal* of June 17 (p. 1383) was of great interest to me. I noticed that he did not include sprue and allied conditions in the list of diseases which have responded to A.C.T.H. and cortisone.

I have thought for some years that sprue might result from adrenal strain or "stage of exhaustion." Sprue occurred in "epidemic" proportions in the Burma campaign, where stress existed, and the added upset of salt and water metabolism could well have had a "specific action" on the adrenals; also the diarrhoeal diseases which abounded provided the "extraneous conditioning of the target organ." There is much suggestive evidence that the adrenal may play some part in fat absorption and in the aetiology of sprue. Perhaps A.C.T.H. and cortisone have been tried and found wanting? I know that some adrenal cortical hormones have been tried in sprue without success.—I am, etc.,

Belfast. J. H. D. MILLAR.

Delayed Feeding of Premature Infants

SIR,—Employing similar methods to those of Professor W. Gaisford and Dr. S. Schofield (*Journal*, June 17, p. 1404), we have been using delayed initial feeding of premature newborn infants in Cardiff for the last eighteen to twenty-four months. In our experience we confirm most of the points illustrated in their article—namely:

1. Though infants lose more initial weight—and, relatively, the smaller they are the greater the percentage loss of weight—the result seems to be a more virile infant.
2. Oedema (occurring in 12% of our series) disappears much more quickly.
3. Once feeding is commenced, difficulties (e.g., regurgitation or vomiting, cyanotic attacks, etc.) are more rarely encountered.
4. The nursing staff all favour a demand-initial-feed technique and soon become expert in detecting the true "hunger cry" of the newborn infant.

Very rarely have we found a rise of temperature during the initial starvation period. Nothing approximating to the text-book "inanition fever of the newborn" has been seen—not even in the series of mature infants treated by this delayed feeding technique. No infants in our series required parenteral fluid, and we are persuaded that when a raised temperature is present the aetiological factor is probably infection.

Table A is presented for comparison with Tables I and II of Gaisford and Schofield.

Table A

Weight	No.	Hour of First Feeding		Weight Loss		Percentage Weight Loss (of birth weight)
		Range	Average	Range	Average	
lb. (kg.)				oz. (g.)	oz. (g.)	
5 -5½ (2·27–2·5)	102	16 - 80	38	½-14 (14·0–397)	5½ (156)	6%
4½- 5 (2·04–2·27)	78	19 -119	45	1 -12 (28·3–340)	5½ (156)	7%
4 -4½ (1·81–2·04)	55	19 - 123	55	½-12 (7·0–340)	5 (142)	7%
3½-4 (1·59–1·81)	34	17½–104	60	2 - 13 (56·7–368)	6½ (184)	10%
3 -3½ (1·36–1·59)	17	17½–104	64	1 -10½ (28·3–297)	6½ (184)	12%
2½-3 (1·13–1·36)	12	27 124	58	1 -11 (28·3–312)	6 (170)	14%
2 -2½ (0·91–1·13)	8	24 -104	56	2 - 7 (56·7–198)	5½ (156)	14%

The delayed or demand-initial-feeding technique has been similarly adopted for mature as well as for premature infants. It has been found to be especially advantageous in the carrying out of the "non-touch" technique treatment of those mature infants who have undergone a difficult delivery—i.e., breech delivery, difficult forceps, etc. Even the so-called normal baby has less feeding upsets on this technique. Table B shows the findings in 1,218 mature infants.

Table B

Weight	No.	Hour of First Feeding		Weight Loss		Percentage Weight Loss (of birth weight)
		Range	Average	Range	Average	
lb. (kg.)				oz. (g.)	oz. (g.)	
10+ (4·54+)	11	12 - 58	40	5–18 (142–510)	12 (340)	7%
9 -10 (4·08–4·54)	61	3½–66	33	1–16½ (28·3–482)	8 (227)	5½%
8 - 9 (3·63–4·08)	281	7 -88	29	1–17½ (28·3–496)	8 (227)	6%
7 - 8 (3·17–3·63)	467	6 -58	30	0–16 (·0–454)	7 (198)	5½%
6 - 7 (2·72–3·17)	322	5 -92	35	1 13 (28·3–369)	6 (170)	5½%
5½- 6 (2·49–2·72)	76	12 -75	37	2–15½ (56·7–439)	6½ (184)	7%

In using a demand-initial-feeding technique in premature and especially in mature infants great care must be taken of the maternal breasts. Some form of expression of the breast at regular intervals must be employed (we favour three-hourly hand expression) in preparation for later feeding at the breast.

Finally, we would like to support the suggestion of Professor Gaisford and Dr. Schofield that practitioners and midwives should practise this non-feeding technique in the care of premature babies pending their transfer to hospital, so helping to lessen early inhalation asphyxia.—We are, etc.,

A. G. WATKINS.
Welsh National School of Medicine. J. JACOBS.

Vascular Changes in Diabetes

SIR,—I should like to answer a few questions and probably raise some others in connexion with Dr. C. Shiskin's letter (June 24, p. 1490) on vascular changes in diabetes. In this I do little more than repeat the opinions expressed in the Banting Lecture (*Lancet*, September 3, 1949, p. 401), in which I mentioned the same case as Dr. Shiskin does, in which after thirty-nine years (now forty-one) of diabetes there are no vascular stigmata. His diabetes has been unusually well "controlled." Dolger may find in New York that 100% of diabetics of twenty-five years' duration have retinal haemorrhages, but I have several patients, myself included, who have escaped such initial signs of vascular involvement—and many more who have not.

The most interesting and important suggestion of Dr. Shiskin's last paragraph is that vascular degeneration is independent of diabetic control and depends on a common unknown factor which causes both "diabetes" and vascular degeneration. It is easy in this respect to postulate, as I did some years ago, some pituitary Cushing-like (A.C.T.H.) factor, but against this simple and vague explanation are two facts: (1) Retinal complications have occurred in haemochromatosis and relapsing pancreatitis, in which the disease is a straight attack on the islet of Langerhans without other endocrine involvement. (2) No diabetic, except in the mildest disturbance of carbohydrate metabolism found by some routine chemical test, has ever a normal sugar metabolism. All insulin cases show inevitably phases of hyperglycaemia, and to talk of physiological normality of blood-sugar control only displays ignorance of the real metabolic condition. Different degrees of uncontrol would be a truer description. In view of (1) and (2) we cannot rule out and must still consider years of continued and varying hyperglycaemia as a possible prime factor in these dreadful complications of retinopathy, hypertension, and renal glomerulosclerosis.—I am, etc.,

London, W.1. R. D. LAWRENCE.

Cancer of the Lung and Smoking

SIR,—With reference to your annotation on smoking and cancer of the lung (June 24, p. 1477), may I be permitted, as a non-smoker and therefore presumably uninterested in the defence of tobacco, to indicate other possibly relevant environmental changes between the years 1920 and 1947?

The first of these is, in Great Britain, the systematic surfacing of roads with tarmac and associated tar spraying. When motor-cycling many years ago and when tarred roads were not so universal I was compelled to wear goggles on account of the intense conjunctival irritation caused by tar dust. Prior to the use of goggles, upon squeezing my eyes with my handkerchief I have observed my lacrimal secretion to be deeply stained by tar. If such an amount of tar dust could fall on the surface of the eye a much larger amount must have been respired. Motorists requiring demonstration of the amount of tar dust floating above a road on a dry day are asked to observe the condition of their hands after handling a steering wheel for a short time with even a portion of a window open.

Another environmental change is the increased amount of exhaust fumes, which render walking on our main roads a doubtful pleasure. In this connexion I would mention particularly the fumes of Diesel-engined heavy vehicles, and express surprise that no woman member of the public appears to have commented on these filthy exhausts.

It must be noted that I confine myself to mentioning some possibly relevant environmental changes, and that I leave any question of causal relationship to malignant disease as a matter for investigation.—I am, etc.,

Swansea. H. R. TIGHE.

Smallpox in the Unvaccinated

SIR,—In your issue of June 24 ("Points from Letters," p. 1492), Dr. H. Tudor Edmunds, after referring to the Asian seaman who initiated the recent outbreak of smallpox in Glasgow, makes the assertion, "Had this seaman not been vaccinated previously his attack of smallpox would have been recognized as soon as he was examined. . . ." He therefore opposes vaccination and the ensuing state of possibly incomplete immunity because, should an attack of smallpox supervene, the clinical picture may be so modified and atypical that the disease is not recognized and its spread thereby facilitated. He thus reiterates an argument against vaccination previously expounded many times and notably by Dr. C. Killick Millard. According to this argument it is always the atypical case modified by previous vaccination that is emphasized as a menace.

It is unfortunate for these views that Dr. Edmunds should also mention the doctor who was infected and died. This case was atypical and very difficult to diagnose. It was well that information regarding contact with the primary case soon became available, because the haematemesis at the outset of her illness did not justify a diagnosis of smallpox even to be entertained in the first instance. The exanthem did not at any time show a papular element. She had never been vaccinated.

A better example of the same type is the first case in the Glasgow outbreak of 1942. He was a seaman of pure white stock who sickened on board an inward-bound ship. On May 24 a rash appeared and the illness was diagnosed as measles by the ship surgeon. This diagnosis was confirmed by two more medical officers on board, and again confirmed by another medical officer when the ship reached the Clyde on May 29. Finally, on the patient's arrival at the hospital for admission to a measles ward the correct diagnosis was made by the physician superintendent, a man of great experience. This patient, who later died, initiated the subsequent outbreak of smallpox in Glasgow. He had never been vaccinated.

It would appear that, while smallpox may be unrecognized because it is atypical due to previous vaccination, it may also be unrecognized because it is atypical for precisely the opposite reason—viz., the patient has never been vaccinated at all.

This argument against vaccination is manifestly absurd when related, for example, to the resulting situation among the above ship's complement if all of them had been previously unprotected by vaccination. Those who died of confluent or malignant smallpox would have had the final satisfaction of knowing, although beyond mortal aid, that they had at least done everything to ensure, if one can believe it, their own early and accurate diagnosis.—I am, etc.,

Glasgow. J. S. GEMMILL.

Multiple Primary Carcinoma

SIR,—As there seems to be an interest in multiple primary carcinomata I thought that it might be interesting to report two cases, one a case with simultaneously two primary carcinomata each in an entirely different system of the body to the other, and a case of three primary carcinomata occurring consecutively and in different places.

CASE 1

The first case was a fisherman, aged 76, from Littlehampton, who in January, 1943, came to my out-patient clinic for carcinoma of the left upper eyelid. It was arranged that this growth should be treated by *x* rays. It is an old maxim that a rectal examination should be performed on every surgical patient, but in this case it seemed unnecessary. However, while awaiting *x*-ray treatment the patient was admitted as an emergency for intestinal obstruction, and it was found that he had a carcinoma of the rectum. I carried out an abdomino-perineal resection of the rectum in two stages, and his eyelid was treated by *x* rays.

The pathologist reported on a biopsy of the eyelid that the condition was a squamous epithelioma. The rectal growth was an adenocarcinoma with moderate penetration of muscle coat and a tendency to colloid production. He did very well, and in spite of wartime conditions returned to work as a fisherman and somewhat embarrassed my domestic staff by leaving at the door as a token of his gratitude a live lobster.

CASE 2

The second case is that of a woman, who is now alive and well, aged 75, and who was shown at a B.M.A. meeting recently.

In 1941 she had a panhysterectomy and salpingo-oophorectomy for adenocarcinoma of the uterus. The operation was carried out by Mr. Alan W. Douglas, who was then R.S.O. at the Royal Sussex County Hospital. In 1946 Mr. Leslie Lauste, who was acting for me, saw this patient, who was admitted as an emergency for intestinal obstruction. He found a carcinoma of the ascending colon and carried out a two-stage removal.

In 1948 I carried out a local mastectomy of the right breast for carcinoma and removal of axillary glands by means of diathermy, and she was afterwards treated by Dr. Millington with deep x rays. The glands were invaded by growth histologically.

All three growths were confirmed histologically, and were in entirely different systems of the body—uterus, bowel, and breast. I am indebted to Dr. L. R. Janes in each case for the histological reports.

I have not met with another case of triple primaries.—I am, etc.,

Hove, Sussex. H. J. MCCURRICH.

Popular Health Journal

SIR,—When Sir Robert Hutchison suggests the title "The Hypochondriac" for the B.M.A.'s new popular health journal he exhibits an attitude of mind which is the despair of all public health officers engaged in health education. It would not be so bad if the general public were merely ignorant of health matters, but, unfortunately, they are actively ill-informed by popular journalistic efforts and by advertisements relating to patent medicines, and our task in public health is made unnecessarily difficult because of this. We at least welcome a popular journal which will convey accurate information because it is edited under medical auspices, and, whether it is read by hypochondriacs or not, it can do nothing but good in giving real instruction to the public.

One group of readers of whom Sir Robert Hutchison seems quite unaware is formed by school-teachers and others having to do with education of children; they are avidly searching for accurate information on which to base their lessons in hygiene and applied biology.—I am, etc.,

Cambridge. CYRIL G. EASTWOOD, Medical Officer of Health.

Ogilvie's Syndrome of False Colonic Obstruction

SIR,—In the *Journal* of October 9, 1948 (p. 671), Sir Heneage Ogilvie reported cases in which intestinal upset suggesting obstruction of the bowel followed interference with the splanchnic plexus by new growth. MacFarlane and Kay (*March 12, 1949, p. 1267*) reported three further cases of such pseudo-obstruction but with no pathological findings at operation. I felt that the following case, in which symptoms of interference with the physiological functioning of the alimentary tract followed destruction, partial or completed, of the splanchnic ganglia, would be of interest.

The patient, a man in his sixties, had had Von Recklinghausen's disease since his early twenties. He had multiple subcutaneous nodules and much pigmentation. For three months two nodules on his chest had begun to grow fast. For a month he had been vomiting, and for a few days before admission to hospital this vomiting had been incessant. While being examined in out-patients prior to admission he had a marked Stokes-Adams attack in which his heart block was so complete that death almost supervened. A few weeks' treatment in hospital failed to relieve his almost incessant vomiting but gave time for a biopsy of one of the enlarging lumps on the chest wall. This proved to be a secondary neoplasm of doubtful pathological origin. In view of continued vomiting a laparotomy was performed, but the stomach and colon and upper small intestines were found to be quite normal. At the back of the upper abdomen round the crura of the diaphragm and extending upwards and into the diaphragm on both sides was a large irregular mass, obviously of new growth.

The growths on the chest were of course secondaries from the growth in the abdomen, and in view of the Stokes-Adams attack, suggesting cardiac involvement, Dr. Harold Avery (who had seen the patient) and myself both felt that they may have been due to direct extension of the growth, involving to some degree the heart itself.

The interesting fact is that this patient had such persistent and uncontrollable vomiting without any demonstrable lesion or obstruction either to the oesophagus, stomach, or bowel generally. This was demonstrated not only radiographically but operatively. The vomiting seemed to be due to involvement of the nerve supply of the stomach from the splanchnic plexuses. It is interesting to note that since operation, and without any different treatment, the vomiting has since been much less marked and the patient's life more comfortable and endurable.—I am, etc.,

London, W.1. A. J. HOBSON.

The Medical Bill

SIR,—Mr. P. C. L. Diggory's letter (*Journal*, June 24, p. 1492) is welcome evidence that the British Medical Students Association, over which he presides, is alive to certain defects in the Bill as it stands, among them the one to which my own letter drew your attention—i.e., the injustice of enforcing an onerous new condition, to wit twelve months' compulsory resident medical service *after qualification but before registration*, against medical students who signed on, and have since done years of their training, on the old basis. This injustice, which was not mentioned in the House of Lords debates, Mr. Diggory's association would remedy by deferring the appointed day "until after the expected date of qualification of those who have already commenced their studies." A simpler and at the same time more effective remedy would, I suggest, be by way of a proviso exempting from the new condition those who were bona fide medical students when the Bill was presented to Parliament or passed into law. I don't like the word "expected."

It seems to me important also to stress the fact (mentioned by Lord Llewellin in the debate) that until 1939, 50% of qualified students went into general practice immediately upon registration, including (as the Goodenough report says) "some well-qualified students who on account of their own or their families' financial circumstances felt unable to take advantage of the benefits offered by postgraduate experience in hospitals." This fact is a useful measure of the hardship which the new restriction may inflict upon many students. Unless something is done now the large class of students who hitherto for one reason or another have not been able to manage as free agents and as doctors even six months in a hospital job will in future be forced to do an extra twelve months' (or more) resident service as students or "interns" (another ominous word!). This criterion is in no way weakened by the further fact that during the war 94% of newly qualified doctors took hospital jobs immediately after registration; because, of course, this increase was obviously due to purely wartime measures such as (*a*) compulsory national service, and (*b*) compulsory direction of doctors of military age into civil hospital appointments.

Two other points made in the Lords also need comment. Lord Llewellin, by way of support for the new restriction, "recalled that both in the case of barristers and solicitors part of the preliminary training was spent in practical work under an experienced lawyer." This statement conveys a very wrong impression. A Bar student is entitled (*a*) immediately upon qualification to be called to the Bar, and (*b*) immediately upon call to practise anywhere; and no barrister is required as a condition precedent to qualification or call or practice to undergo any sort of practical training. Many of them do in fact learn some of the ropes, either before or after call, in the chambers of a busy practitioner—I did so myself, after call and concurrently with practice on my own account; but none is obliged to. It is hard indeed to imagine the Inns of Court—those ancient champions of law and justice—trying, as this Bill apparently seeks to do in the case of medicine, to enforce an onerous unilateral change in the conditions upon which they accepted their students. As to the would-be solicitor, he spends the whole period of his training (five years or less, according to circumstances) as an articled clerk in the office of a private practitioner.

Secondly, Lord Horder limited his commendation of the proposed new condition to the ground that a doctor newly registered under the present conditions goes out into practice "ill fitted in respect of responsibility and judgment"—i.e., lacking a sense of responsibility. This may possibly be true of some of the youngest of them, though I should have thought that daily experience, during their long years of clinical training, of disease and death must surely by the end of their course have sobered the least responsible among even them. But how can it be true of the fine ex-Service types, with their war experience and their training in responsibility, of the many men with wives and families, and of the 30+, 40+, 50+, and occasionally even 60 + ancients who together form a considerable proportion of the total number of medical students? Are all these irresponsible too? If not, why should they all be treated as if they were?—I am, etc.,

Guildford. W. B. MANLEY.

Scarlet Fever, Rheumatic Fever, and Acute Nephritis

SIR,—Dr. T. W. Buchan (May 27, p. 1268) asks for information on the average duration of fatal cases of scarlet fever, rheumatic fever, and acute nephritis. From study of a short series of thirty fatal cases of acute nephritis occurring between the years 1939 and 1946 in the R.A.F. and W.A.A.F. it appears that the mean duration was 47 days, the median figure being 36 days. The cases were distributed as follows:

Duration of case in days	1–9	10–19	20–29	30–39	40–49	50–59	60–69	70–79	80–89	90–99	More than 100
Number of cases	2	6	5	5	0	1	3	3	0	3	2

Six deaths occurred in October, five in March, four in January, three in May and August, two in June and July, and one in February, April, September, November, and December. I can give no information about the duration of fatal cases of scarlet fever or acute rheumatism as the numbers of deaths from these causes in the R.A.F. and W.A.A.F. were even fewer than those from acute nephritis.

I am indebted to the Director-General, Medical Services, Royal Air Force, for permission to publish these figures.

—I am, etc.,

Stanmore, Middlesex. C. G. BURGESS, Wing Commander.

Acute Tubular Necrosis

SIR,—In the discussion at a meeting of the Section of Experimental Medicine of the Royal Society of Medicine on acute tubular necrosis Professor J. H. Dible, according to your report (May 27, p. 1262), stated that the lesion affected the whole nephron; that there was cellular necrosis of the tubules; that the cast material in the early stages in the secondary convoluted tubule was hyaline and not pigmented; and that the ascending limb and secondary convoluted tubule were especially affected, although the whole of Henle's loop showed the lesion. Granular material was present in the glomerular space. It is clear from Professor Dible's statements that the mechanical blockage by blood products is not the aetiological factor, as it was absent at the early stages in all cases, and at all stages in a proportion of cases.

Dr. E. M. Darmady went further in stating that, in view of Professor Jean Oliver's experiments, tubular blockage by pigment casts could no longer be regarded as responsible for this type of renal lesion. In certain cases, he said, nervously intermediated renal vasoconstriction remained a possible explanation, but in others it appeared to be excluded, and one had to consider other mechanisms—e.g., Professor Selye's alarm syndrome might be concerned. But he gave no details about the Johns Hopkins experiment on which he based his opposition to a common neurogenic aetiology: for example, he did not state at what level the cord was transected, nor what functional tests were applied to ascertain that all the renal nerves had in fact been divided. So I personally cannot regard this evidence as excluding the possibility suggested by the experiments of Trueta *et al.* in 1947.

With regard to Dr. G. M. Bull's dismissal of the "Oxford shunt" as a possible factor, I should in the first place like to know what he implies by the term in question, for it was invented abroad and is as yet very variously interpreted. Secondly, though acute nervous diversion of the renal cortical blood flow may be associated with low degrees of desaturation of the reduced total renal blood flow, I am unaware of any experimental evidence of the degree of desaturation associated with a diversion lasting long enough to produce inactivity of the tubular cells such as was found by Dr. Bull in his patients.

Dr. Hingson, by his method of continuous caudal analgesia, which appears to abolish afferent glomerular arteriolar spasm, has dealt successfully with the clinical state of anuria in various fields, and his results are dramatic. Professor Oliver, from the evidence provided by his dissection of nephrons, has attempted to show a distinction between damage caused by primary ischaemia and by toxin producing a renal shut-down. Dr. Hingson's therapeusis logically covers the former group in its entirety. It should encroach on the latter at the stage when the ischaemic protective mechanism is no longer serving a purpose and is in fact inimical to recovery.—I am, etc.,

London, W.1. JOHN SOPHIAN.

Intestinal Obstruction Due to Food

SIR,—The article by Mr. Neil Ward-McQuaid (May 13, p. 1106) and the letters which have followed show that many cases of this condition have been recorded and that future interest may well settle upon the foods which form rare causes. I therefore think that one of my two cases at least is worth mentioning. So far it seems to be the only case resulting from the "pickled onion."

Case 1.—A lady aged 52 was admitted to hospital on November 16, 1949. She had had abdominal colic for several days which had been severe for twenty-four hours. She had been vomiting since November 11. On November 15 she had passed a watery stool but there had been no flatus since then. On examination she was dehydrated and distended. She was tender to the left of a subumbilical scar of an incision for a hysterectomy in 1946. There was vigorous audible peristalsis. Laparotomy through a right paramedian incision showed a firm lump in the lumen of the ileum about 6 in. (15.24 cm.) above the ileocæcal valve. There was gross distension of the gut above the obstructing mass, which on removal was found to be a large pickled onion. Her convalescence was uneventful. Inquiry showed that she had eaten this onion about ten days previously at a party.

Case 2.—A lady aged 59 was admitted to hospital on January 8, 1946, with pain which had commenced on January 6. She had been vomiting since her last bowel action on January 6. She had a distended resistant abdomen and acute bronchitis. Exploration showed that her acute intestinal obstruction was due to orange pith. The only special interest in this case lies in the fact that she had hurriedly eaten an orange which was part of her grandchild's ration.

I am forced to wonder to what extent these cases are caused by hurried eating and failure to masticate food adequately.—I am, etc.,

Northampton. A. R. BANHAM.

SIR,—The article on "Intestinal Obstruction due to Food" by Mr. Neil Ward-McQuaid (May 13, p. 1106) recalled my meeting with a case in 1947. The obstructing material, grapefruit, was finally vomited.

The patient was a woman of about 50 and of moderate physique who had been seized with spasms of violent, diffuse abdominal pain of colicky type some three-quarters of an hour before, followed by vomiting. When I saw her she was pale and shaken; a spasm of abdominal pain came on within a few minutes. She went pale, sweated, and her pulse slowed. She drew her knees up and was tense, and any physical movements made were an attempt to curl herself up in a ball. About five minutes later the pains eased and she vomited some bile-stained fluid. In the interval before the next bout of pain the temperature and pulse were normal; there was no abdominal rigidity; something appeared to be palpable in the anatomical location of the pylorus, and it seemed to harden and soften; tenderness was present to the left of the mid-line slightly below this level.

She was advised that she should be removed to hospital or a surgeon should see her. She refused these suggestions but agreed to going into hospital next morning if no better. Obstruction due to some food eaten and lodged at the duodeno-jejunal flexure was considered at this stage.

Since the lady remained obdurate about seeing a surgeon, it was decided to see if the effect of posture and gravity would achieve anything; two to three bouts of pain had occurred in the meantime. Accordingly her head was lowered and pelvis elevated by manipulating pillows, and she was turned on her right side inclined towards the bed. The next access of pain, her last, was followed by the vomiting up of nearly a half of a grapefruit "eaten" the same day. It had been incompletely divided with a knife into four or five pieces, as is usual before serving it at a meal.

It was as surprising that she had managed to bolt such a large piece of food as it was gratifying that the simple manœuvre had been successful. She was up and about as usual next day.

—I am, etc.,

Reading, Berks. GEORGE A. JACKSON.

Morphine in Status Asthmaticus

SIR,—I was particularly glad to read Dr. Clement Francis's letter of June 17 (p. 1429) because I deplore the attempt to completely ban the use of morphine or its derivatives in this condition. This is a time-honoured remedy, and it would appear to me that deaths from asthma and bronchial asthma have become more frequent since the introduction of modern adrenaline therapy with the exclusion of morphine and atropine.

I entirely agree with Dr. Francis that other therapy should be given at first, and whenever possible I give an expectorant mixture, with ephedrine or "neo-epinine," get the patient well propped up in bed, warm, and with plenty of fresh air, and obtain oxygen if possible.

If I am called at night to a patient in a bad attack, I endeavour to assess the condition of the heart and lungs and inquire what drugs have already been taken, and I usually start by giving an injection of one of the pituitary-and-adrenaline preparations or adrenaline alone, and nikethamide sometimes seems helpful. After watching the patient I then decide the dose of morphine or "omnopon" that is safe to inject, and this varies from ⅛ gr. to ¼ gr. (8 to 16 mg.), always with atropine 1/100 gr. (0.65 mg.).

I am convinced that I have saved lives by this method, and shall be sorry if young doctors become afraid of its judicious use, and doubt if there is any new treatment at present that will adequately replace it.—I am, etc.,

London, W.14. C. WATNEY ROE.

Mission to Lepers

SIR,—The Mission to Lepers was founded in 1874 as an international and interdenominational society in order to enable Protestant missions to undertake work for those suffering from leprosy—and from its social consequences—by giving financial support and general guidance. Since then it has grown into a great society with extensive work in many lands. In the past it has not been the policy of the Mission to send out its own doctors and nurses. This was not necessary so long as the co-operating societies were able to provide the personnel. But to-day they are unable to do so in sufficient numbers. And this is just at a time when the prospects of curing leprosy have been brought nearer by the introduction of sulphone treatment. This has led the council of the Mission to decide that the time has come to send out itself a certain number of doctors, nurses, and other medical workers.

There are vacancies at present in India and China for a few men doctors and women nurses. Those who may consider offering themselves should be young, and wholly sympathetic to Christian missions. They should be prepared themselves to serve as medical missionaries and to co-operate wholeheartedly with missions and churches in the countries to which they go. The field of work offers no financial prizes; ordinary medical missionary allowances will be given; but the work does afford a fine field for Christian doctors eager to give themselves to a difficult task at a time of great opportunity. Those who wish to apply should be under 30 years of age and should send, along with details of qualifications and experience, references from those who know their character and capabilities.—I am, etc.,

7, Bloomsbury Square, London, W.C.1. A. DONALD MILLER, General Secretary.

Obituary

S. ERNEST DORE, M.D., F.R.C.P.

Dr. S. E. Dore, who died on June 27 at the age of 77, was until his retirement a few years ago one of the most prominent dermatologists in London.

Samuel Ernest Dore was educated at Mill Hill School and St. John's College, Cambridge. He studied medicine at St. Mary's Hospital, and there he came under the influence of Sir Malcolm Morris, whom he assisted in the skin department until Morris's retirement, afterwards continuing to help him in private practice. After leaving St. Mary's Dore became assistant to Dr. Pringle at the Middlesex Hospital, and on the retirement of Dr. Colcott Fox he was appointed physician to the skin department at the Westminster Hospital. Later he was also physician to the skin department at St. Thomas's Hospital, holding the two posts together until he reached the age for retirement. He also held similar appointments at the Hampstead General and the Evelina Hospitals, and in 1924 accepted an invitation to join the reconstituted staff of St. John's Hospital for Skin Diseases.

Dore proceeded M.D. in 1906 and took the M.R.C.P. a year later, being elected F.R.C.P. in 1920. He was a corresponding member of the French Dermatological Society, and assistant editor of the *British Journal of Dermatology and Syphilis* from 1916 to 1918. During the greater part of that period he was in charge of the journal because of the editor's absence on war service. He was a very active member of the dermatological section of the Royal Society of Medicine, exhibiting many cases and taking a very active part in the discussions. He was honorary secretary of the section in 1914–15 and president in 1930–1. He also attended regularly meetings of the British Association of Dermatology and Syphilology, and was honorary secretary from 1930 to 1932 and president in 1933. He was president of the St. John's Hospital Dermatological Society from 1928 to 1930. Apart from all these activities Dr. Dore was a vice-president of the Section of Dermatology at the Annual Meetings of the B.M.A. in 1921 and 1932, and president of the section at the 1936 Meeting.

While working with Morris, Dore's interests were particularly directed to the uses of radiotherapy in the treatment of skin diseases. With Morris he wrote a book entitled *Light and X-ray Treatment of Skin Diseases,* and he also translated Wickham and Degrais's work on radium therapy. He was undoubtedly one of the pioneers of the use of radium in the treatment of rodent ulcer in this country. He contributed many papers on dermatological subjects to different journals, the most notable being one on the contractibility and nervous supply of the capillaries and one on a chronic mild localized type of acrodermatitis perstans, which is by some associated with his name. In 1941 he delivered the Malcolm Morris Memorial Lecture on advances in dermatology during the past forty years.

Dore was a man of retiring disposition, with an immense knowledge of his subject. He was always accessible to his colleagues, who made full use of his wisdom and mature judgment. His extremely equable temperament made him beloved by his colleagues and pupils. He married late in life, and leaves a widow to whom the sympathy of everyone who knew him will be extended.—A. G.

R. M. B. MacK. writes: While others who have more knowledge of the details of his life must write their appreciation of his career, it is perhaps fitting that one of his pupils should attempt to pay tribute to the memory of Dr. S. E. Dore. If one was asked to name the characteristics for which he was most beloved one would say for his equanimity and kindliness; if asked to answer a question concerning his ability one would say that it was in diagnosis and in knowledge of the writings of the French school that he excelled. Many in our profession seem always to be pursued by time, but Dore, although he accomplished as much work as most of his contemporaries, seemed always to be unhurried. His work was characterized by accuracy, urbanity, and friendliness; often the monotony of routine was relieved by a flicker of humour. His ability was often underestimated because he made no effort to impress his students; it followed that his work was appreciated more by postgraduate students than by undergraduates. It was characteristic that during the nineteen-twenties one of his colleagues should have remarked, "I have often been surprised to find that if there is anything new that is remotely connected with dermatology it is usually being tried out in Dore's department quite a while before the rest of us have even heard of it." In recent years it has been pleasant occasionally to see one's old master, apparently but little aged by the passing of the years; but as in his active days time had never succeeded in fretting him, it was natural that as he grew older he should have been but little changed. One had hoped, until recently, that he would continue to enjoy the tranquillity of his later years. That hope has been broken, but those of his pupils who continue in the practice of his specialty can but be grateful for the benisons of friendship, tutelage, and encouragement which for many years they received from him.

"R. O." writes: Dr. Dore's out-patient department at St. Thomas's had an atmosphere of its own, stamped with the characteristics of the man himself. It was kindly, genial, and unhurried. There was a guarded optimism and friendliness affecting patients, nurses, students, and staff—and without this one gets nowhere in medicine. The dermatological mysteries were expounded with skill, but with a diffident charm; and such searching questions as the one about the difference between eczema and dermatitis were dealt with to enduring satisfaction. The lurking acarus curled infallibly round the point of the pin, and the microscope—rather an ancient one—showed up the secrets of the fungus scraping. No session went by without some humorous touch, for this was in Dore's make-up, and he drew on a long experience.

Dr. Thompson Barron writes: After an association with Dr. Dore extending over 25 years it is difficult to do justice to his memory. We became close and intimate friends, having much in common apart from professional affairs. His was a charming personality, but he was of such a retiring nature that comparatively few got to know him intimately. He was always ready to do a good turn and to assist others in any way in his power. I mourn him with feelings of great personal loss. He was one of my dearest friends.

J. F. WARD, M.D., F.R.C.P.

Dr. John Forbes Ward, who died on June 29 after a short illness, was educated at the Stockport Grammar School and Manchester University, graduating M.B., Ch.B. in 1909. He then held a number of house appointments, including that of resident medical officer at the Manchester Royal Infirmary. At this time, too, he travelled in the United States and Europe. During the 1914–18 war he served with the R.A.M.C. in Gallipoli, Egypt, Sinai, France, and Belgium. Returning to this country he took the M.R.C.P. in 1919; and in 1920, when he proceeded M.D., he became visiting physician to the Royal Manchester Children's Hospital at Pendlebury and to St. Mary's Hospital for Women and Children. From then on Ward devoted all his time and energy to the care of children, becoming well known as a paediatrician in Manchester and in Lancashire generally. He had a wide medical knowledge, and a degree of understanding and kindness which impressed not only his young patients but also their parents. He was appointed University lecturer in the diseases of children at St. Mary's Hospital, and both here, at Pendlebury, and on the many committees on which he served his opinions, always honest, were often sought by his colleagues. He was elected F.R.C.P. in 1938.

An original member of the British Paediatric Association, Dr. Ward always looked forward to the annual meetings, especially those held at Windermere, as he knew and loved the Lake District and especially its bird-life and flora. Modest and retiring by nature, his friendship, once won, was enduring and firm, and he was a splendid companion at meetings such as these. Among other appointments Ward held was that of visiting physician to the Ethel Hedley Hospital for Crippled Children at Windermere, and in spite of the distance from his home he was a regular visitor there. At the outbreak of the 1939–45 war he rejoined the Forces. He served as lieutenant-colonel both at home and abroad, and he was not demobilized until 1945.

Ward was an expert numismatist and had a valuable and interesting collection of coins, but his chief delight was his beautiful garden, where he and his wife worked in their spare time. Never a "clubman," Ward spent a lot of his time during off-duty hours browsing in old bookshops in search of volumes to add to his large library. He was much loved and will be much missed, but he will always be remembered for his great qualities of high principle and integrity. He is survived by his widow and two daughters, to whom the deepest sympathy of his friends and colleagues will be extended.—H. T. A.

Dr. JAMES LYONS died suddenly on June 1 at his home in Lincoln at the age of 61. Born in Omagh, County Tyrone, he received his medical training at Queen's University, Belfast, and graduated M.B., B.Ch., B.A.O. in 1912. After holding resident appointments in Belfast, he was later house-surgeon at the Rotherham Hospital and senior house-surgeon at the Lincoln County Hospital. During the 1914–18 war he served in France as a captain in the R.A.M.C. and was medical officer to a cavalry regiment. Soon after demobilization James Lyons proceeded M.D. He went on to take the Dublin D.P.H. and the F.R.C.S.Ed. in 1920 and the M.Ch. of Belfast a year later. After a time spent as medical superintendent of the Bucknall Hospital, Stoke-on-Trent, he settled in Lincoln in 1923. Combining surgery with general practice, he was appointed surgeon to the Burton Road Hospital and subsequently consultant to Lincoln Corporation, Lincoln City Maternity Home, and Bracebridge Heath Hospital. In 1934 Dr. Lyons became police surgeon for Lincoln, and in 1947 he retired from general practice and thereafter specialized in obstetrics and gynaecology. A keen member of the B.M.A., he rarely missed attending a meeting, and he was chairman of the Lincoln Division in 1934–5 and president of the Lincolnshire Branch in 1938–9. During the 1939–45 war he undertook the onerous duties of honorary secretary to the local medical war committee and earned the gratitude of all his colleagues. James Lyons was one of the kindest of men and never spared himself in his patients' interests. In addition he had a most generous nature, and this, combined with marked professional ability, made him popular alike with patients and with his colleagues.

He leaves a widow and two daughters, to whom the sympathy of many friends will be extended in their sudden bereavement. —G. A. B. W.

Dr. BETHIA MUIR NEWLANDS, a senior assistant medical officer in Middlesbrough, died in Aberdeen on June 2. She received her medical education at the University of Aberdeen, where she graduated M.B., Ch.B. in 1919, going on to take the D.P.H. in 1925. Dr. Newlands held resident appointments at the Royal Victoria Infirmary, Newcastle-upon-Tyne, and in the children's hospitals of Nottingham and Bradford. After working in the Aberdeen public health department, she was appointed a school medical inspector, in 1928, by the West Riding County Council, where she remained for 14 years. In the last two years of her service there she was senior administrative medical officer. During the 1939–45 war she held the post of acting medical officer of health for Brighouse, and in 1946 she became senior assistant medical officer for Middlesbrough County Borough.

J. C. writes: Although Dr. Newlands was of a retiring disposition, her breadth of vision and eye for detail made her an excellent organizer. Right to the end of her working life, despite the handicap of mortal illness, she showed untiring zeal and was endlessly painstaking in the performance of her duties —to an extent that compelled the admiration even of those who are tempted, in moments of weakness, to act on Talleyrand's cynical admonition in the matter. Her monument is the vastly expanded maternity and child-welfare section of the health service in Middlesbrough.

Dr. KENNETH MCALPINE died on June 11 after a brief illness. A student of Glasgow University, he graduated M.B., Ch.B. in 1917. He had a brief period of service in the R.A.M.C. before starting on his career in the school medical service at Birmingham and at Stoke-on-Trent. He went to Leicester in 1924 as assistant school medical officer, and since then as an officer of the education authority he had given loyal and devoted service until his final illness just over a month ago. He became senior school medical officer in 1946, when he had to handle the many difficult problems of the immediate post-war years.

A. J. S. writes: Dr. McAlpine was an able and efficient administrator in a highly important public capacity, dealing with the health and well-being of the child population of Leicester. To many thousands of people in the city as well as to his intimate friends he was much more than that. His nice sense of punctilio in administrative affairs could never mask the kindly, generous nature of the man himself. His professional experience among children must have been unique; his personal dealings with each one of them, young and old, was of a texture not found in books, but stemmed from his deep love of children and his own innate charm. To those of us who worked with him and under his supervision, clerical staffs, nurses, professional colleagues, Dr. McAlpine will be remembered with sincere and lasting affection. To all who sought his advice at any time, he was an immediate guide, counsellor, and friend. But beyond those there must be thousands in Leicester who, meeting him as children and now grown up, would wish to pay generous tribute to a fine doctor and a most lovable personality.

The Hungarian Government has recently decreed the terms of service of Civil Servants and doctors and others working in the health services. According to the Hungarian News and Information Service the decree lays down a working week of 48 hours—8¼ hours a day for five days, and at least four hours on Saturday. Except on Saturdays employees are entitled to a 30-minute break a day for meals, which is counted and paid for as part of the working hours. After six months' service employees are allowed six working days' holiday with pay a year. This is increased by one day's holiday for each month's work up to one year. For each succeeding year of employment the annual holiday is increased by one day to 25 working days.

Medical Notes in Parliament

MEDICAL BILL

Second Reading

The Minister of Health, Mr. ANEURIN BEVAN, moved the second reading of the Medical Bill in the House of Commons on June 27. In the House of Lords the Bill was given a second reading on April 18 (*Journal*, April 29, p. 1011), and had been subsequently amended in committee (May 13, p. 1146) and on the report stage (May 27, p. 1275).

Mr. Bevan said the Bill did not undertake a complete revision of the medical Acts—which would be a major task, involving prolonged study and possibly evoking a great deal of controversy—but only set out to provide for a number of matters of urgent public importance, and for a few less important matters in which some early change in existing arrangements was obviously desirable. From discussion with representatives of the medical profession, and from the welcome given to the Bill in the House of Lords, the Government believed it would command general support.

Of the four main purposes of the Bill, the first was to improve the standard of medical education. In this the Bill gave effect to the main recommendations requiring legislation contained in the report of the Goodenough Committee issued in 1944. It provided in Clauses 1 to 6 that from a day to be appointed every medical student after passing his final examination, but before admission to the *Medical Register*, was to be required to serve satisfactorily for a prescribed period in one or more approved hospitals and institutions. An amendment in the House of Lords made it clear that the institutions should include, subject to certain safeguards, approved health centres. The intention was that this period of "intern" service should normally be one year, but by an amendment made in the House of Lords the period was left to be fixed by the General Medical Council, subject to the approval of the Privy Council, without any specified minimum. This would facilitate any modifications which might be necessary in the event of an emergency, and there was also just the possibility that at the outset there might be difficulty in enforcing a full year's service.

It would obviously be some time before a day could be appointed for giving effect to the requirement of intern service. It was necessary, for example, to ensure that there were sufficient house appointments or other suitable posts before the requirement could be imposed, and there were also accommodation problems. Further, some period of notice would have to be given to existing students. It was possible that some parts of the British Isles might be ready for the introduction of the compulsory intern service before others, and the Bill made it possible for it to be introduced piecemeal in different parts of the country if that should ultimately be considered desirable. He mentioned that the G.M.C. still exercised some jurisdiction in relation to the Republic of Ireland, and said that complete agreement had been reached between the two countries on the arrangements outlined in the Bill.

The G.M.C. had reciprocal arrangements with other countries, and provision was made that newly qualified doctors from these countries who applied here for registration should show that they had served an intern period or otherwise acquired equally extensive experience. This provision, too, it might be necessary to apply at different times to different countries; New South Wales and the Union of South Africa were already prepared for its introduction, but other countries were not, and time for consultation and adjustment would have to be given.

There was a further provision for the visitation of medical schools. The Bill empowered the G.M.C. to appoint visitors to places where medical students were taught. This again was in accordance with the views of the Goodenough Committee. Hitherto the Council had only been able to appoint visitors and inspectors of examinations, to report on the sufficiency or otherwise of examinations, but the standard of professional practice obviously depended more on the teaching given in the medical schools than on any control that could be exercised by visiting and inspecting the examinations. The general standard in the schools would have a profound effect or whether or not the intern period would be advantageous. Accordingly, the powers of the G.M.C. were being widened to enable them to visit the actual places where the medical students were taught, and to report on the training actually given.

There was power to give directions to the G.M.C. in connexion with the arrangements for visitation, and this was to be exercised by the Privy Council. He emphasized that the Government had been careful at all times to ensure that any influence over the academic side of medicine should be exercised by authorities like the Privy Council and the General Medical Council, and not directly by the Government. Here, as in the National Health Service Act, he had been particularly scrupulous to see that there was no governmental interference with academic medicine. The G.M.C. and the university authorities should have no difficulty in making arrangements so that there should be some agreement about these inspections. This particular provision required no long advance administrative arrangements, and should come into operation almost immediately.

The second purpose of the Bill was to alter the constitution of the General Medical Council. Its numbers were to be increased from 39 to 47; the number of Crown members was to be increased from five to eight, the number elected by the medical profession from seven to eleven, and the number appointed by the universities, medical corporations, and royal colleges (27) would be increased by the addition of a representative of the Royal College of Gynaecologists and Obstetricians.

The third part of the Bill was the improvement in the disciplinary machinery and procedure of the G.M.C. It was proposed by Clause 14 to entrust decisions on professional discipline to a new medical disciplinary committee of the Council which would have 19 members, including the President of the Council, at least six elected members, and at least two laymen. It was now provided, as a result of an amendment in the House of Lords, that cases should normally be dealt with not by the full committee of 19, which was rather large, but by between five and nine of the members, including at least one layman. The President would, however, be entitled to arrange for the full committee to deal with a particular case if he thought the circumstances warranted it.

Provision was made for evidence to be taken on oath and for witnesses to be subpoenaed. There was no similar power at present, and as a result it had often been impossible to secure the attendance of necessary witnesses. This change in law was exceedingly important from the point of view of the doctors. A doctor whose name was erased from the *Register* was given a right of appeal to the Judicial Committee of the Privy Council either on law or on fact, or against sentence. These were exceedingly important improvements on the existing situation. There was also provision for rules to be made both for the procedure of the disciplinary committee—rules made by the committee and subject to the Privy Council's approval—and about the functions which the legal assessors to the Council would exercise. All these changes would come into operation on a day to be appointed; this was necessary because the rules to be made would require careful consideration and discussion with the interests involved.

The fourth provision of the Bill was to increase the fees payable for registration. The present maximum which the G.M.C. could charge was £5, originally fixed in 1858. The functions of the G.M.C., carried on without imposing any charge on public funds, had obviously much increased, and the income from registration—the main source—and other sources had become quite insufficient to enable the Council to pay its way. The Bill provided for a maximum fee of 11 guineas for full registration, including five guineas for provisional registration when that was operative. There was power from the Privy Council to vary the maxima by order. The provision for increased fees would take effect on the passing of the Act.

G.M.C. and B.M.A.

Mr. WALTER ELLIOT said the proposed alterations in medical education were more important than all the other purposes of the Bill, because they would affect every graduate. The second, third, and fourth purposes—the machinery purposes—were unexceptionable. He hoped that consideration of the Bill would help to dispel the popular superstition that the General Medical Council was in some way or other the same thing as the British Medical Association, and that tremendous disciplinary powers were given to what was after all a trade union. The G.M.C. was in no way a trade union, as could be seen from the large number of persons appointed to it from outside.

They would all welcome the increase in the disciplinary powers of the G.M.C., because miscarriages of justice had taken place in the past owing to the lack of those powers. They were all glad, too, that a right of appeal had been given, although he thought the question would have to be examined further in committee whether the appeal direct to the Judicial Committee of the Privy Council in preference to the High Court was the right solution. He did not think that the danger which the Minister had mentioned, of different standards arising if appeals were made to the separate High Courts in the United Kingdom, was very great.

In the improvement of medical education the important step had been taken of recommending that an additional year should take its place in the medical curriculum. The danger was that the curriculum might be unduly prolonged, that the final period might be projected further and further away until it came to a time in a man's life when he could no longer take full advantage of it. The curriculum was already overloaded. The masses of information which the medical student had to acquire, and which were appropriate in other days, were not appropriate to-day. Medical education should constantly be remodelled to suit the necessities of the time, to avoid subjects piling up on each other instead of substitutions taking place.

He yielded to no one in his admiration of the training which the great hospitals gave to the young graduates, but responsibility was never felt when all the resources of a great hospital were around one as it was when starting to grapple with the multifarious emergencies of private practice with one's own hands and knowledge. It was said that a new set of posts would have to be created to give greater responsibility to the housemen. These posts would be difficult to get, and appropriate responsibility would be difficult to devolve upon them. This extra year would need to be looked at with very great care, to make sure that a sense of responsibility was really developed and that it was not merely used as a further occasion for learning. The Opposition welcomed the Bill and would do their best to give it an easy passage.

L.S.A. and T.U.C.

Dr. H. B. MORGAN strongly opposed the Bill. The first of the three chief functions of the G.M.C., he said, was the supervision of the *British Pharmacopoeia*. That was the one function which had been done very well. The second function was medical education—and that was very bad. There should be a one-portal system of entering the profession, on one fixed standard, so that everybody who came into the profession should pass a qualifying examination and be recognized throughout the world as being of a certain standard. Instead of that there were different standards. Too high a tribute could not be paid to the great university schools, but there were also undemocratic bodies of no great concern to the public but only to themselves. He mentioned the London Society of Apothecaries, and in reply to a question by Surgeon Lieutenant Commander R. F. B. BENNETT said that the standard of medical education and of the knowledge asked for was too low for qualification. There should be one governing professional qualifying examination, with an examiner—not examiners from the schools—to see that every man had a fair deal. Many organizations like the Colleges took no responsibility for training but were purely examining bodies, sometimes claiming revenue from those they deliberately flouted.

The Trades Union Congress wanted the subject of industrial diseases taught in the medical schools. It had asked the G.M.C. to include this subject of the relationship between occupation and health in the ordinary curriculum. The medical schools had done nothing. Only in Glasgow, Manchester, Durham, and Newcastle-upon-Tyne was there an organized course of lectures. One specialist in London, Dr. Donald Hunter, was doing

excellent work in the London Hospital, but the other schools did not bother about it at all.

Working-class parents had to make a great sacrifice for six years to get their son through the medical school. Now it was proposed to add another year. There were not sufficient institutions to keep all the doctors that would come out. Suppose a man did not want to go into general or even consulting practice but wanted to be a specialist or to go in for medical literature, to become, perhaps, Editor of the *British Medical Journal*. Suppose he wanted to go into medical research, or tropical medicine. Must he waste another year on a subject in which he was not interested?

This Bill was a rotten Bill. It was a Conservative Bill. Extended registration would hurt the working-boy. The composition of the G.M.C. should be such that it should include no nominee, or very few in comparison with the elected members. It should be a purely professional body. He was ashamed to say that the Government had not yet approached the T.U.C. for its views on a matter of such importance to industrial workers—medical education and conditions. The Bill should be taken back and reconsidered.

A Minimum Standard

Dr. CHARLES HILL said that in his argument for the common portal of entry Dr. Morgan had ignored the fact that the role of the G.M.C. was to secure a minimum standard and leave the licensing bodies to apply a standard in excess of that if they chose. On the question of industrial medicine in the curriculum, Dr. Morgan should apply himself to that part of the Bill which strengthened the power of the General Medical Council in visiting medical schools, and so enabling the G.M.C. to exercise a stronger influence over those schools. On the third point, he hoped it was not right to assume that, as a result of this new and important arrangement under which there was first qualification and then registration, this was merely a year added to the curriculum. If that assumption was right the full purpose of this Bill in relation to medical education would not be served. He welcomed as a most important change this arrangement under which, towards the end of a student's career, when examinations were out of the way, a man or woman was enabled to assume a post of some responsibility under supervision.

He hoped the Bill would lead to a re-examination of medical education, and to the elimination of some unnecessary parts. He hoped too that the new posts to be created for internship would be designed for the purpose, and in relation to the function they had to fulfil in medical education, and not be house appointments as they now knew them multiplied for the purposes of the additional year. They would get the full fruits of this important new development only if that year was related to a revised medical curriculum, and if special posts with the right kind of responsibility were created for the purpose.

In regard to the disciplinary provisions of the Bill, he was glad that discipline was going to be a matter not for the Council as a whole but for a committee specially established for the purpose; that would lead the Council to think more and more about medical education, and save them having so much of their time taken up with disciplinary work. He did not like the arrangement whereby any person involved in the original sorting out and assessment of cases might also be a member of the disciplinary committee.

The answer to Dr. Morgan's point about the use of the extra year to a man who was going to be a medical journalist, or an expert on tropical diseases, was that the man might subsequently decide to enter practice, and if he had not done this extra year, which was a part of the curriculum, not something grafted on to it, there would be two standards in operation. He welcomed the Bill as making a substantial qualitative contribution to medical education.

Mrs. JEAN MANN suggested that the Bill should be amended to let the year of provisional registration be served not only in hospital but under an experienced general practitioner. Otherwise the extra period as a houseman in her view would be just a waste of time and of no help to the general practitioners who were now overworked.

Mr. RICHARD FORT asked what were the chances of there being room in the hospitals for all the house appointments envisaged first by the Goodenough Report and now by the Bill. Would it be possible to administer the extra year's planning so that the interns would be able to have the 20 or 30 beds in conformity with the Goodenough recommendations? There was also the question of free board and lodging for the interns. Would provision be made for that, and if so what sums of money were likely to be involved? Could anything be said now about the rates of remuneration? They should know whether they were talking about an improvement in medical education which would take place within the next two years or so, or whether they were looking forward to something which would only take place within the next decade.

Revision of the Curriculum

Dr. A. D. D. BROUGHTON welcomed the Bill as seeking to raise the standards of medical efficiency and conduct. That part of it which related to the G.M.C. and its disciplinary committee he saw as designed to maintain a high standard of ethics. On that part which affected medical education, he pointed out that now that all intern postgraduate appointments carried remuneration the financial obstacle had been removed from the path leading to greater proficiency, and a period of service for every doctor would raise the standard of subsequent professional work. The argument that it was sought to add another year to the course of medical training was only correct in so far as it affected a minority of students. The majority of newly qualified men and women, in their desire to gain useful experience, already undertook postgraduate duties in hospitals.

Supporting the contention that there was a need for close examination of the medical curriculum, he said he wished that the Government had gone further in the Bill, because the system of medical education required review, revision, and reform. In this connexion he hoped that it could be revised soon in such a manner as to allow the schoolboy to learn more about the arts, and possibly the classics, before going to a university to embark on years of intensive scientific study. That would provide the doctor with wider knowledge, and make him still more capable of carrying the heavy burden of responsibility when he entered practice.

Surgeon Lieutenant-Commander R. F. B. BENNETT agreed that a good deal of lopping in the curriculum was possible, and mentioned in particular the extremely minute knowledge of anatomy and his studies of botany and zoology. He asked if the inspection of medical schools by the G.M.C. would mean that those schools within a university which could already be inspected by their own university and the University Grants Committee were to be liable to three forms of inspection.

He referred, on the proposed disciplinary provisions, to the selection of the crime of adultery as the one type of civil case in which the G.M.C. disciplinary committee should not have the power to call further evidence before pronouncing judgment on an erring doctor. He understood that criminal charges could be regarded as proved on conviction, and action taken accordingly by the disciplinary committee. But adultery was a civil offence. Why, when that was found proved, should that alone be selected as the one civil offence on which no further evidence could be offered to the G.M.C. before a decision was reached? Finally he referred to the increased registration fee, remarking that it was a little hard on the student of all people to have to pay more, and asking if the fee could not be eased.

Practical Training

Mr. SOMERVILLE HASTINGS said that although the Bill did not go as far as he would have liked, he welcomed it because it made the education of British doctors, already the most practical in the world, even more practical. The trouble to-day was that there was too sharp a division between the time when as a medical student the young doctor had few responsibilities and never had to make decisions, and the time when he suddenly became qualified and found that the life or death of his patients depended on his diagnosis and treatment. The Bill was good in that its proposals would make this transition more gradual, but careful thought would be needed on how the principles of the Bill were to be carried out. He could not see that there were enough suitable appointments for interns to go round. There would be difficulties in deciding whether a young doctor's work was "satisfactory," and there was also the case of the physically handicapped person. A man who had lost all or part of his hand could not be an efficient house-surgeon, or take an appointment as an obstetrician, yet the Bill said that he had to serve part of his time in one of these capacities.

They were told that service in a health centre would do as well as service in a hospital, and he was glad of it, but at present the health centres did not exist. Moreover, while he agreed that to help an efficient doctor in a health centre would be most valuable training for a general practitioner, he thought that service in a special department in a health centre should only count as training for a specialist.

He was disappointed about the constitution of the G.M.C., in that only 11 of its 47 members were to be elected by the profession. The General Nursing Council had 34 members, of whom 17 were elected by the profession. On disciplinary procedure, he would like to see some less penalty than that of being struck off the *Register*. According to the Bill a doctor struck off could not apply for replacement for eleven months, and in that time any doctor's practice would have gone to pieces.

Dr. BARNET STROSS, questioning the denigration of the Bill by Dr. Morgan because it did not contain power to compel every medical school to set up a chair in industrial medicine, said every school would readily and gladly do so—and set up a chair in social medicine too—if they had the money available.

There were some questions to be answered when the Bill was in committee. For example, what was meant by the word "satisfactory" as used in connexion with the year's extra work? Further, if a person was crippled during training, or fell ill—possibly with infantile paralysis—was he to be denied the opportunity of further work or of service with approved institutions? How long would they have to wait, and if there were no immediate opportunities for entry, how long would it be before they could register?

On the penal side there were also certain changes which it was hoped to bring about in committee. They must separate the judicial from the executive functions of the Council, and be certain that no one who had been concerned with a preliminary investigation should sit later on the disciplinary committee itself. He hoped to see also that no action in future was taken against a medical man unless a formal and written complaint was sent in and could be supported by whoever had made it.

Undue Specialization

Mr. H. H. LINSTEAD said he thought someone might have seized the opportunity to pay a tribute to the G.M.C. for the work they had done in the educational and disciplinary fields over a long period of years, and in conditions of some difficulty. He had attended sessions of the G.M.C., sitting in its disciplinary capacity, and he had been amazed at the way in which an extremely clumsy machine managed to function with what certainly appeared to an onlooker to be efficiency and justice. It was not the quality of the Council which was at fault, but the difficulty of appeal which tended perhaps to give it a bad name.

Overloading and undue specialization was something from which every profession suffered. There was no simple answer. They could not cut out of the curriculum of a scientific profession any substantial amount of its basic science. As science advanced the medical practitioner must keep pace with it. If there was to be found any answer it must be partly, he thought, in the direction of the qualified practitioner relying upon specialists in other branches in professions allied to medicine for a great deal of the technical work which at present he did himself. The radiographer and the physiotherapist, for example, must have responsibility on their shoulders. Moreover, in the teaching of sciences more attention must be paid to making them part of a liberal education.

Some consideration would have to be given to the conditions in which health centres were to be approved for the year's training. Only one of the dozen centres in existence was fit for the training of general practitioners. The disciplinary machine must be examined more closely. No member of the G.M.C. should at the same time be a member of the penal cases and disciplinary committees. The penal cases committee must not assume to itself part of the function of the disciplinary committee. If the finding of the High Court in the one case involving adultery in a matrimonial cause was to be accepted as binding on the Council, they must examine carefully why a similar state of affairs was not to apply to other cases.

He welcomed the introduction for the first time in this type of legislation of the Judicial Committee of the Privy Council. Most professions valued their association with the Privy Council, and if they could gradually substitute the Judicial Committee for the High Court as the court of appeal for professional tribunals they might find that they had introduced a useful innovation in the legal system. Finally he pointed out supervision of the *British Pharmacopoeia* was one of its functions which the G.M.C. did not carry out. With the passage of years they had ceased to be the appropriate body for this work, and had handed the duty over to the Pharmacopoeia Commission, composed of one or two doctors but mainly of chemists and pharmacists.

Government Reply

Miss MARGARET HERBISON, Joint Under-Secretary of State for Scotland, replying to the debate, said there had been much criticism of the overloading of the curriculum in the medical schools and she felt that the debate, in which so many had spoken from full knowledge of the subject, might bear some fruit. She hoped there would be an examination of the curriculum.

She agreed that the teaching of industrial medicine was of the greatest importance. The Trades Union Congress considered that insufficient time was given to it, but Dr. Morgan was less than fair when he suggested that in our medical schools and universities almost nothing was being done in that field of medicine. In the Glasgow, Manchester, and Newcastle universities the courses in industrial medicine had been financed by the Nuffield Foundation. There were one or more lecturers in the subject in Birmingham, Bristol, Edinburgh, London, and Sheffield. The Government was satisfied that the correct way of getting this or any other subject into the curriculum was not by vesting power of direction in the General Medical Council. That would be found objectionable not only by the medical profession but also by the public.

To deal with the duplication of examinations the Government hoped to arrange that there would, in effect, be only one set of examiners. One great improvement in the Bill lay in providing that visitors not merely examined an examination but really examined what was being taught in the medical schools. In that way they hoped that the General Medical Council would be able by persuasion, not by force, to make those changes in the curriculum which public opinion seemed to think necessary.

When a doctor was provisionally on the *Register* he would be able to sign a death certificate. It had been asked why there had been selected in the Bill one case where the disciplinary committee could not re-examine evidence. It would create great difficulties if this were not so. On the other hand, it might be that after examination the Government might decide that other cases ought to be put in the same category. This one was chosen because it was the one that in the past had often come before the General Medical Council.

The suggestion that this intern period might be spent in general practice as a trainee assistant was completely contrary to the findings of the Goodenough Report. It would be contrary also to the views expressed by the General Medical Council. The Government felt that the best experience could be got in hospitals and similar institutions, and if they were to yield to this new suggestion there would be great difficulty in supervising the course properly. It would be better to wait, and find out how the provisions of the Bill worked before making any extension for experience in general practice.

Some fear had been expressed that those who served on the penal services committee would be serving also on the disciplinary committee. What had been found out in other fields did not bear out the contention that this would be wrong. There was nothing in other fields to justify the contention that a man's judgment would be prejudiced if he tried in the first instance

to find whether there was a prima facie case for inquiry. This was the procedure in the case of solicitors, and there was another instance among the justices of the peace in England, who, after they had committed a man for trial at quarter sessions, could, and often did, sit at the quarter sessions. It could not be contended that they had been prejudiced, but it was a point worth discussion in committee.

Although there had been questions about the supply of posts for intern training, the Government intended to leave the period of twelve months in the Bill, but they could not say at this stage how soon they could make it work. In Scotland there might be more difficulty than in England and Wales, for one-third of the doctors produced in the whole of Britain were trained there. They had come to the conclusion that it would not be possible to provide a great number of places in Scotland, and that perhaps England would provide the beds for these other doctors who were trained in Scotland. A doctor qualifying in Ireland who wanted to get on to the *Register* must from the appointed day do intern service there in the same way as doctors qualifying here.

The motion for the second reading was agreed to.

Cost of Drugs in N.H.S.

Colonel ROPNER asked the Minister of Health on June 29 why, without effective consultation with their Central Committee or awaiting the findings of the Whitley Committee which was inquiring into the matter, he had imposed on chemist contractors under the National Health Scheme a cut from 33% to 16% in the on-cost allowance on drugs supplied by them on prescription.

Mr. BEVAN in reply said that he was determined that all unnecessary expenditure on the National Health Service should be eliminated, and after consultation with the chemists' representatives in accordance with the regulations he was satisfied that there were grounds for an immediate provisional reduction in this allowance. Negotiations were proceeding, however, and he had undertaken to accept whatever final percentage might be agreed by the Whitley Council or awarded by an arbitrator.

Mr. E. L. MALLALIEU asked the Minister of Health whether, having regard to the fact that many doctors prescribed expensive proprietary preparations for which cheaper non-proprietary preparations of equal therapeutic value might be substituted, he would consult the British Medical Association as to the best way of bringing the matter to the notice of both doctors and chemists, with a view to saving expenditure without in any way impairing the service to the patient.

Mr. BEVAN said he had been in consultation with the British Medical Association about the action to be taken on the Report of the Joint Committee of the Central and Scottish Health Services Councils, which had been considering prescribing under the National Health Service. The report was to be published, and would be available on July 1. Copies were being sent to all doctors, both general practitioners and hospital medical staffs, taking part in the National Health Service, with a covering letter asking for their help in avoiding unnecessarily expensive prescribing. The question of other action on the report was under consideration.

The report to which Mr. Bevan referred is summarized at page 24 of this week's *Supplement*.

Midwives' Uniform

The terms of the Midwives (Amendment) Bill in relation to the wearing of the proposed national uniform for midwives were finally determined when the Bill was considered on Report in the House of Commons on June 28.

Clause 6, which authorizes the rules to be made on this matter, was amended in the following terms:

"(3) Any agreement made (whether before or after the passing of this Act) between a local health authority or other body or association and a midwife employed by them for the purpose of attending on women in their homes as a midwife or maternity nurse shall be void in so far as it precludes the midwife from wearing a uniform prescribed by virtue of subsection (1) of this section."

Mr. A. BLENKINSOP, Parliamentary Secretary to the Ministry of Health, moving this amendment, recalled that in the earlier debates, although the Government felt that the balance of advantage might be in allowing the local authority to decide the matter for themselves, in view of the strong feelings fairly generally expressed that there should clearly be full opportunity for the midwives to wear the new national uniform that was being approved, he promised to put down an amendment to clarify the intention of that made in the House of Lords. The amendment he now moved made it clear that the midwife would have the full right to wear the new national uniform if she so desired, even though there might be an agreement with the local authority about some locally designed uniform. This arrangement was limited to domiciliary midwives. There had been some criticism of this amendment from the local authorities. If in some localities there was in use a local distinctive uniform, he was sure that the midwives in the area would be content and happy to continue to wear it, but should a midwife desire to wear the new nationally designed uniform she would now have full power to do so.

Dr. A. D. D. BROUGHTON supported the amendment on the ground that there should be a national uniform for midwives, and that they should have the right to wear it if they so desired. Dr. BARNET STROSS put some questions at the request of his local authority. Would the amendment confer on midwives the right to wear the prescribed uniform irrespective of the wishes of the local authority; would it mean that this was a departure from the principle that all matters concerning conditions of service should pass through the appropriate Whitley Council, as in the past; and would not a new anomaly be created with respect to other members of local authority staffs, such as the domiciliary nursing service, which would be wearing a uniform prescribed by the local health authority whereas there would be a uniform for midwives prescribed by the national authority?

Miss HORSBRUGH said the choice was now left to the midwife as to the uniform she would wear, and she welcomed the amendment. Mr. W. Ross suggested that they were falling into error through this modern curse of uniformity in pressing for a national uniform instead of taking into account regional considerations.

Mr. BLENKINSOP said they were allowing a wide freedom, and in a case like that of Glasgow, where a uniform was universally respected and was specifically worn, midwives would naturally desire to continue to wear it. He was sure that local authorities on consideration would be able to secure a satisfactory working of this arrangement, and that where there was a satisfactory local uniform in use already the midwife would desire to continue to wear it.

The amendment was agreed to, and the Bill was afterwards read a third time.

Medico-Legal

CLAIM AGAINST DOCTORS FAILS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

A man of 59 with a long history of mental ill-health sustained a fracture of the neck of the left femur while undergoing electric convulsion therapy at Barnsley Hall Mental Hospital, Gloucester, on May 20, 1947. He made no complaint at the time. Next day his wife telephoned to the hospital, and the resident surgeon advised her to call in the family doctor. She accordingly sent for Dr. George F. Henderson, of Headless Cross, near Redditch, who did not find the fracture. On June 10 the patient, William Dawe, returned to the hospital, and Dr. Andrew Shepherd, the medical superintendent, and Dr. John P. McGuinness, the resident surgeon, pressed him to become an in-patient and have a full examination, but he refused. He was then limping and using a stick, but was not assisted. On June 19 he became an in-patient, and on examination the fracture was discovered. He subsequently sued the three doctors, and Dr. Elizabeth Eleanor Henderson, the wife of Dr. George Henderson, for damages for alleged negligence, stating that as a result of the failure of the mental hospital doctors to diagnose the fracture until June 19, and

of the two Drs. Henderson to diagnose it at all, his left leg had been shortened by 1½ inches (3.75 cm.) and had suffered limitation of movement.

At the trial before Mr. Justice Hallett at Worcestershire Assizes at the end of January,[1] the patient's wife gave evidence that she was now living apart from him and that for many years before 1947 he had been full of complaints and had made many absolutely unfounded accusations against her. When Dr. George Henderson had seen him on May 21 the doctor had said that the matter would be better in the hands of the people at Barnsley Hall, but the patient had flatly refused to go there. Dr. George Henderson said in evidence that when he saw the patient on May 21 he was walking in a downstairs room but complained of pain in his left leg. The doctor had regarded his complaints as unreliable: he had been complaining for seven years and in addition was in a confused and hysterical condition. He had examined him honestly and carefully and had noticed that there was a limitation of movement of the leg, but no obvious shortening or abnormal position. Dr. Shepherd testified that an impacted fracture might be missed by a general practitioner after such a treatment. Dr. McGuinness did not agree that he could have discovered the fracture on June 10. An examination had not been possible then because Dawe had refused to become an in-patient.

Judgment

The learned judge stressed that the evidence of the patient was quite unreliable. Electric convulsion therapy was beneficial in certain mental disorders, but involved a degree of risk. The patient had been free to refuse to re-enter hospital, and after this advice of the doctors had been refused it seemed a very strong proposition to suggest that they were guilty of negligence because they did not then suggest a second, third, and fourth best course in the hope that the patient would accept one of them. He gave judgment for the doctors with costs.

[1] *Birmingham Post*. January 27 and 28, 1950.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology)*: T. D. Anderson, W. D. Anderson, V. Armett, A. M. Baker, J. A. C. Bamford, A. P. Barclay, J. H. F. Batstone, J. F. Bennett, J. W. Bradbeer, E. J. F. Brewer, G. S. Brindley, J. M. Brown, P. B. Brown, M. J. Clarke-Williams, R. A. Cooper, J. C. M. Currie, N. L. Dallas, J. M. H. Dickson, J. W. Draper, H. B. Eckstein, M. L. E. Espir, R. M. F. Fox, M. Gibbs, J. N. Gibson, P. H. Gorodi, I. M. Guiver, A. T. G. Gunn, U. M. P. Hill, R. P. Holmes, M. L. House, P. E. Huddy, H. F. Juckes, Mrs. M. E. Kendrew, C. D. Lacey, K. Last, Mrs. J. Lodwick, J. S. McCormick, J. J. McMullan, J. W. E. Mark, R. D. Montgomery, J. K. Perkins, F. S. Perry, H. F. W. Pribram, M. G. Rinsler, I. H. Robinson, H. M. Roseveare, K. E. K. Rowson, T. B. Scott, S. E. Sebag-Montefiore, J. A. J. Smith, P. G. I. Stovin, P. R. V. Tomson, P. H. Wheeler, K. G. Williams, V. G. Wills. *Part II (Principles and Practice of Physic, Pathology, and Pharmacology)*: C. A. M. Aitken, J. B. Berry, M. D. Billington, M. Binnie, M. H. S. Bound, D. R. Bowsher, H. H. Broadhead, J. M. Brown, P. B. Brown, A. A. F. Bryson, D. Butcher, J. S. W. Chambers, A. C. Chovil, E. M. D. Craig, J. E. Dalby, J. W. B. Dalgleish, T. D. W. Davies, H. de Glanville, H. B. Eckstein, I. D. Edeleanu, M. L. E. Espir, A. D. Fuller, P. R. Gittins, J. R. Gough, K. W. Gray, K. E. Halnan, G. Harvey Evers, G. E. Heald, J. M. Heaton, J. M. Hodson, G. Holden, R. P. Holmes, J. F. Hort, T. M. Howell, P. G. A. Irvine, J. D. Jackson, E. W. Jones, H. F. Juckes, Mrs. M. E. Kendrew, F. E. Kirk, K. Last, J. F. Lees, C. R. Leeson, T. S. Leeson, D. W. Lemmon, Mrs. J. Lodwick, J. S. McCormick, E. Marley, H. M. Michaelson, J. L. Milligan, R. D. Montgomery, B. J. Muir, A. D. Muirhead, M. J. D. Newman, D. S. H. W. Nicol, A. O'Brien, R. H. Oram, A. B. L. Peake, R. F. Pearson, M. J. Peel, G. N. St. J. Penney, J. K. Perkins, S. T. Pickles, R. B. Prowse, D. R. Pugh, J. N. Redfern, F. Reiseger, A. M. Richardson, M. G. Rinsler, J. M. G. Ritchie, D. W. T. Roberts, C. R. Robinson, J. H. Ross, H. B. Russell, S. E. Sebag-Montefiore, J. B. Spargo, P. C. Steel, P. G. I. Stovin, J. D. E. Strong, D. R. Sweetnam, Mrs. E. R. Taylor, R. Thomas, P. R. V. Tomson, A. C. Townsend, S. E. Trickey, A. G. Wallace, W. J. Wigfield, J. P. Williams, P. L. Williams, P. O. Williams, V. G. Wills.

UNIVERSITY OF ST. ANDREWS

The following degrees have been conferred:

M.D.—C. R. Baxter, J. M. Gilmpre, K. G. Lowe (with honours and a Rutherford gold medal), E. J. Michie, Marjorie S. Milln, D. S. Macphail, J. H. Prain (with commendation and a Rutherford silver medal), *D. H. Smith.

CH.M.—A. A. Douglas (with honours).

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—Mary R. Kerr (with distinction), *J. N. Gale, *Ruth Y. Golder, *Marjorie M. Kinnear, *Marion C. Miller, D. Allan, G. C. Azie, J. Bartholomew, F. Bell, Veronica M. Bowman, Edith M. B. Bryant, Marjorie F. Carnan, J. D. Carr, Helen M. Crockatt, A. A. Duncan, E. E. Ecoma, Antonia Firnberg, H. Fyfe, Jean O. Gerrard, D. B. Gibb, Anne L. M. Graham, A. B. Grant, P. H. Harley, R. G. Hendry, B. O. Igwebe, Elinor K. Johnston, M. Kirstein, Elizabeth F. Laird, A. J. Lawson, Irene Leeser, R. L. MacDonald, J. D. Macgregor, A. R. Mackenzie, J. M. McKenzie, Muriel J. Martin, I. M. Mennie, Margaret G. Millar, H. R. Milne, I. G. Murray, P. W. O'Brien, W. L. Ogilvy, D. B. L. Rankine, H. C. Renney, Marie Renwick, Madeline M. Russell, J. H. F. Silver, T. Sonnenschein, D. C. C. Stark, J. K. Steel, S. A. Stephen, B. R. D. Suttie, Pauline F. Taylor, M. G. Wagg, Jane M. Wallace.

*With commendation.

UNIVERSITY OF EDINBURGH

The following Macarthur Postgraduate Lectures will be given at the Anatomy Lecture Theatre, University New Buildings, Edinburgh: Thursday, July 13, 5 p.m., "Experimental Studies on the Eye Based upon the Regeneration of the Neural Retina and the Lens" (to be illustrated by coloured films), by Professor L. S. Stone, M.D., Bronson Professor of Comparative Anatomy, Yale University School of Medicine; Tuesday, July 18, 5 p.m., "Benjamin Rush, M.D.: His Edinburgh Student Days and What Came of Them," by Dr. George W. Corner, Director of the Department of Embryology, Carnegie Institution of Washington, Baltimore, U.S.A. Senior students and graduates in medicine are invited to attend the lectures.

UNIVERSITY OF WALES

The Council of the Welsh National School of Medicine has appointed Harold Scarborough, Ph.D., M.B., Ch.B., F.R.C.P.Ed., Professor of Medicine and Director of the Medical Unit at the School. Dr. Scarborough is at present Reader in Medicine in the University of Birmingham.

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

PATHOLOGY AND BACTERIOLOGY.—A. S. Baier, Joyce M. Bennett, Vyvien J. Bennett, J. W. Bough, D. R. Boyns, P. Callaghan, J. S. Campbell, G. W. Clark, R. L. Corpock, Bronwen N. Davies, D. B. S. Davies, Barbara C. Edwards, J. C. Evans, Marjorie J. S. Evans, J. N. Glanville, A. M. S. Hansrod, P. I. Harry, W. E. J. Horton, A. P. Jones, D. J. Jones, Nesta Lewis, Rachel B. J. Lewis, Mary I. Lloyd, J. E. Merrell, Janet M. Moffat, I. B. Morgan, J. H. Naysmith, E. J. Phillips (with distinction), R. P. Phillips, D. H. Richards, Joyce M. Smith, Glenna Thomas, G. Williams, W. Williams.

OBSTETRICS AND GYNAECOLOGY.—Ilid M. L. Davies, Dilwyn T. Jones, T. M. Morgan, S. J. S. Polwin, J. W. Rees, Esther H. Thomas.

UNIVERSITY OF BIRMINGHAM

On July 1 the honorary degree of D.Sc. was conferred on Dr. Herbert M. Evans, director of the Institute of Experimental Biology, University of California, and on Dr. Leonard Colebrook, F.R.S., director of the Burns Unit at the Birmingham Accident Hospital from 1944 to 1948. The honorary degree of D.Litt. was conferred on Mr. Stanley Morison, typographical adviser to the Cambridge University Press.

UNIVERSITY OF LEEDS

W. J. O'Connor, M.D., has been appointed Senior Lecturer in Physiology, and T. K. Marshall, M.B., Ch.B., Lecturer in Forensic Medicine.

No. 24

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 17.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	39	4	19	—	—	28	4	14	3	1
Deaths		—	—				—	—		
Diphtheria	51	2	14	1	1	81	4	26	3	3
Deaths	—	—	—	—	1	1	—	—	—	—
Dysentery	351	17	143	1	—	53	2	51	1	1
Deaths					—				—	—
Encephalitis, acute	8	3	—		—	3	1	2	—	—
Deaths		—		—			—			
Erysipelas			19	8	1			30	3	6
Deaths							—			
Infective enteritis or diarrhoea under 2 years				19					21	
Deaths	10		3	1	1	26	4	—	2	1
Measles*	8,857	529	835	266	119	9,249	801	576	217	159
Deaths†		—	1	—	—			1	—	—
Ophthalmia neonatorum	40	5	10		—	45	4	5	2	—
Deaths					—					—
Paratyphoid fever	9	—	—	1 (B)	—	24	1	3 (B)	—	—
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	431	25	7	—	10	416	30	10	6	9
Deaths (from influenza)‡	6	1	—	1	—	8	1	—	—	—
Pneumonia, primary			138	¶				159	16	
Deaths	130	21		5	7	147	26		6	5
Poliomyelitis, acute	93	9	17	4	15	19	2	—	—	—
Deaths§	2	—		—		4	1			
Puerperal fever	6	—	2				—	13		
Deaths										
Puerperal pyrexia‖	85	9	2	—	1	96	11	14	1	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	850	72	120	59	54	1,090	82	180	63	44
Deaths†			—	—	—				1	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	—	1	4	5	9	2	—	1	—
Deaths	1	1	—		1	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,649	199	380	73	43	1,806	102	128	76	63
Deaths	4	1	—	—	—	8	—	1	2	—
Deaths (0–1 year)	221	30	29	14	5	246	32	26	16	6
Deaths (excluding stillbirths)	4,138	653	491	143	106	4,276	653	573	164	100
Annual death rate (per 1,000 persons living)			9·9					11·5	10·2	
Live births	7,761	1225	979	431	270	7,326	1218	982	420	269
Annual rate per 1,000 persons living			19·7					19·7	26·0	
Stillbirths	187	22	28			192	36	26		
Rate per 1,000 total births (including stillborn)			28					26		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Smallpox on s.s. Strathnaver

A Goanese seaman was landed from s.s. *Strathnaver* at Aden on June 19 believed to be suffering from chicken-pox. The diagnosis was later confirmed as modified smallpox. Passengers and crew were vaccinated during the voyage. The vessel arrived in the port of London on the morning of July 2. There was no case of sickness on board on arrival. Some 1,200 passengers and crew disembarked and were placed under surveillance until July 5 in the areas to which they travelled.

Practitioners are advised by the Ministry of Health to consider a diagnosis of smallpox if a person who travelled on this vessel falls sick. Revaccination may cause extreme modification of the clinical illness and of the exanthem.

Poliomyelitis

Notifications during the week ended June 24 were: paralytic cases 104 (77), non-paralytic cases 38 (16). Figures for the previous week are shown in parentheses. Although this is a substantial increase, the high prevalence still seems to be chiefly confined to a relatively limited area of the Midlands. There were 45 notifications in Warwickshire (41 in Birmingham C.B.), 9 in Staffordshire, and 14 in Worcestershire. Thus the epidemiological picture differs from that in the corresponding weeks of 1947 and 1949.

Discussion of Table

In *England and Wales* there were decreases in the notifications of measles 1,855, acute pneumonia 49, and diphtheria 22. There were rises in the incidence of whooping-cough 212 and poliomyelitis 14.

The largest falls in the incidence of measles were Warwickshire 214, Durham 147, Middlesex 147, Kent 145, Cheshire 138, Lincolnshire 113, Northumberland 104, and Shropshire 95. The largest exceptions to the general decline were rises in Gloucestershire 69 and Hertfordshire 62.

The local trends of scarlet fever remained almost unaltered. The largest rises in the notifications of whooping-cough were Gloucestershire 57, Lancashire 41, and Essex 39; the largest falls were Yorkshire West Riding 44 and Durham 30. The fall in the incidence of diphtheria was mainly due to two counties, Durham and Kent, with 10 and 8 fewer cases, respectively, than in the preceding week.

The incidence of dysentery was maintained at a high level. The chief centres of infection were: Lancashire 119 (Oldham C.B. 33, Chadderton U.D. 17, Preston C.B. 16, Crompton U.D. 14, Manchester C.B. 8, Burnley C.B. 8, Liverpool C.B. 7, Lees U.D. 7); Yorkshire West Riding 81 (Sheffield C.B. 24, Spenborough U.D. 21, Leeds C.B. 8, Bradford C.B. 8); Durham 43 (Stanley U.D. 19, South Shields C.B. 8, Gateshead C.B. 6); London 17 (Southwark 6); Staffordshire 15 (Walsall C.B. 12); Northumberland 15 (Newcastle-upon-Tyne C.B. 14); and Yorkshire East Riding 14 (Kingston-upon-Hull C.B. 14).

Notifications of acute poliomyelitis in Birmingham C.B. rose from 20 to 28; the other large centres of infection were Lancashire, Liverpool C.B. 4; Staffordshire, Rugely U.D. 4; and London, Stepney 3, Woolwich 3.

In *Scotland* there were decreases in the notifications of measles 125, acute primary pneumonia 32, and scarlet fever 20. There were rises in the incidence of whooping-cough 22, acute poliomyelitis 9, and dysentery 9. The largest returns for dysentery were Glasgow 78, Midlothian county 23, and Edinburgh 13. Areas with more than one notification of acute poliomyelitis were Glasgow 8, Renfrew county 3, and Fife county 2. All the cases of diphtheria were notified in the western area.

In *Eire* decreases were recorded in the notifications of whooping-cough 62 and measles 25. The decline in the incidence of whooping-cough was general throughout the country. In Dublin C.B. notifications of measles increased by 22 in contrast to the general fall.

In *Northern Ireland* the trends of infectious diseases showed only slight variations from those of the preceding week.

Week Ending June 24

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 973, whooping-cough 3,746, diphtheria 39, acute pneumonia 344, measles 9,086, acute poliomyelitis 142, dysentery 213, paratyphoid fever 9, typhoid fever 13.

Quarterly Returns for Northern Ireland

The quarterly report for the third quarter of 1949 shows that the birth rate was 21.2 per 1,000. The infant mortality was 43 per 1,000 registered births, and was 2 more than in the preceding third quarter. The general death rate was 9.5 per 1,000 and was 0.5 below the average of the five preceding third quarters. Of the 84 deaths from the principal epidemic diseases, 58 were attributed to diarrhoea and enteritis and 14 to whooping-cough.

Medical News

Honorary Physicians to the King

The following have been appointed Honorary Physicians to the King for a period of three years as from July 1: Dr. Samuel Barron, M.R.C.P.I., Medical Officer of Health, City of Belfast; Dr. Walter Eric Chiesman, F.R.C.P., Medical Adviser to H.M. Treasury; Dr. Sydney Walter Fisher, Principal Medical Inspector, Mines Department, Ministry of Fuel and Power; Dr. Arthur Massey, C.B.E., Chief Medical Officer, Ministry of National Insurance; Dr. Robert Hughes Parry, F.R.C.P., Medical Officer of Health, City of Bristol, and Professor of Preventive Medicine, University of Bristol; and Dr. Harry James Rae, *M.C.*, Medical Officer of Health, City of Aberdeen and Counties of Aberdeen and Kincardine. The following have now completed their term of office as Honorary Physicians to the King: Dr. James Boyd, F.R.C.P.I., Sir William Allen Daley, M.D., F.R.C.P., Dr. A. M. Fraser, Sir Walter Haward, O.B.E., M.B., B.S., Sir William Wilson Jameson, G.B.E., K.C.B., M.D., F.R.C.P., F.R.C.O.G., and Dr. Norman Tattersall.

Relief of Widows and Orphans

The annual general meeting of the Society for Relief of Widows and Orphans of Medical Men was held on June 7, with Mr. Hope-Gunning, vice-president, in the chair. Seven members were elected to the court of directors, and Mr. G. T. Mullally was elected a vice-president. The report and financial statement for 1949 were adopted. At the end of the year the membership of the society was 244. During the year 43 widows were in receipt of grants, and the total sum distributed was £4,311 10s. The by-law relating to the income limit of widows enabling them to receive grants has been raised from £125 to £150 per annum. The meeting concluded with votes of thanks to the chairman and to the president of the society, Sir Robert Young, for his services during the past year. Further details about membership of the society may be obtained on application to the Secretary, 11, Chandos Street, London, W.1.

Immunization Stopped in Birmingham

Owing to the rising incidence of poliomyelitis in Birmingham, schemes for immunization against diphtheria have been temporarily stopped there on the advice of the Ministry of Health. The relation between recent inoculation and paralytic poliomyelitis was discussed in a leading article in this *Journal* on July 1 (p. 28).

The Royal Society of Medicine

At the annual meeting of Fellows of the Royal Society of Medicine on Tuesday, the gold medal of the society was presented to Professor E. D. Adrian, O.M., M.D., F.R.S. Sir Henry Dale, in making the presentation, said the medal was awarded triennially, and this was the eleventh occasion on which it had been presented. He spoke of the outstanding contribution which Professor Adrian's researches had made to medicine. The diploma of Honorary Fellowship was presented to Professor Alfred Gigon, M.D. (Basle). There were four other recipients of the diploma who were prevented for various reasons from attending. These were Professor Gosta Forssell, M.D. (Stockholm), Professor Alberto Houssay, M.D. (Buenos Aires), Professor Abdul Mooro Pasha (Cairo), and Professor Wilder Penfield, C.M.G., M.D., F.R.S. (McGill University, Montreal). The scrolls, said Sir Henry Dale, would be transmitted to them, except in the case of Professor Mooro, who was expected to be in England shortly, when an occasion would be taken to present it to him in person. The report of the council of the society, which was presented at the meeting, stated that there were now on the roll of membership 9,714 names (9,203 of them being Fellows), an increase of 325 on the year. Lord Webb-Johnson was unanimously elected to the presidency of the society.

Medical Insurance Agency

The annual meeting of the Medical Insurance Agency was held on June 23 at B.M.A. House. The report of the committee of management for 1949 disclosed a record amount of service to the profession, a record total of rebates of premium granted to clients, and a record profit available for medical charities. New covenants were entered upon with the Royal Medical Benevolent Fund, the Royal Medical Foundation of Epsom College, and the Benevolent Fund of the British Dental Association. Re-elected to the committee were Dr. Charles Hill, Dame Barrie Lambert, Professor J. W. McNee, Dr. Henry Robinson, Sir Arnold Stott, and Dr. E. R. C. Walker; Mr. R. L. Newell was also elected. Dr. James Fenton was re-elected chairman and Dr. Henry Robinson honorary secretary. The total of life insurance negotiated by the agency and completed with various companies was about £2,976,000; it was reported that in 1950 this figure might be exceeded. The chairman paid tribute to the work of the general manager, Mr. A. N. Dixon, and his staff, and to the honorary secretary. The establishment of branches at Cardiff and Birmingham is being considered, in addition to those already existing at Edinburgh, Leeds, Manchester, and Dublin.

Wills

Professor Thomas Porter McMurray, C.B.E., Emeritus Professor of Orthopaedic Surgery, Liverpool University, President-elect of the B.M.A. for 1950–1, left £92,215. Dr. Henry Walker, of Louth, Lincs, left £11,047; Dr. Thomas Mulvany, of Muswell Hill, £7,801; Dr. William Edmond, formerly of Shrewsbury, £17,275; Dr. Walter Lazarus-Barlow, formerly of Smithy Hall, West Mersea, late Professor of Experimental Pathology at London University and Director of the Cancer Research Laboratories, Middlesex Hospital, £5,782; Major-General Andrew Gibbs, formerly honorary physician to King George V, £12,668; Dr. John Gordon-Munn, formerly of Heigham Hall, Norwich, who had been Lord Mayor of Norwich, £64,970; Dr. Gordon Lane, O.B.E., of Eastbourne, £15,447; Dr. Lilias Emily Frazer-Nash, of Kingston Hill, Surrey, one of the first women doctors to qualify in medicine in this country, £15,254; Mr. Norman Patterson, of Ashridge Park, Berkhamsted, late surgeon, Throat Hospital, Golden Square, W., £17,856; Lieutenant-Colonel Charles Deyns, J.P., of Bletchley, £50,176; Dr. Thomas McKiernan, of Falmouth, £22,792; and Dr. William Branson, C.B.E., of Bury St. Edmunds, for some years on the consulting staff of the Royal Free Hospital, £38,419. Dr. Thomas Glynn-Morris, of Liverpool, left £22,703; Dr. Charles Evans Jenkins, of Sale, Cheshire, £10,218; Dr. William Caldwell Steele, late of Walthamstow, £17,494; and Dr. James Arthur Unitt, of Quorn, £50,020.

COMING EVENTS

The Osler Club

The annual dinner of the Osler Club will be held at the South Kensington Hotel, Queen's Gate Terrace, London, S.W.7, on July 12, at 7.45 p.m. The guest of honour will be Sir Henry Souttar, who will deliver the Oslerian Oration. The charge is 15s., and members are invited to bring other members of the medical profession interested in the club and its work. Dress: lounge suits. Those wishing to attend should write to the secretary, Dr. M. J. Linnett, 70, Shooters Hill Road, Blackheath, London, S.E.3.

Industrial Radiology

The summer meeting of the Industrial Radiology Group of the Institute of Physics will be held at the New Horticultural Hall, Victoria, London, S.W.1, from Tuesday, July 25, to Friday, July 28. Admission to the lectures and Group summer exhibition (and to the technical exhibition of the International Congress of Radiology) will be by ticket only, obtainable free from the Institute of Physics, 47, Belgrave Square, London, S.W.1, from which details of the lectures are also obtainable. Early application is advised.

Salford Mental Health Services

An informal conference to discuss better co-ordination locally of home and hospital services for mental health will be held at the Town Hall, Salford, on July 14 at 2.30 p.m. Dr. Joshua Bierer, of the Institute of Social Psychiatry, London, will speak on individual and social psychiatry, and Dr. J. W. Affleck, of the Leeds Mental Healtn Services, will also speak.

Speech Therapy

The Eighth International Conference on Speech Therapy will be held in Amsterdam on August 21–26. Particulars may be obtained from the secretary, Dr. Hanny Veldkamp, 27, P.C. Hooftstraat, Amsterdam-Z.

Health Education

The Central Council for Health Education will hold a Summer School at St. Hugh's College, Oxford, on August 14–27. The fee will be 17 guineas. Under the direction of Dr. Robert Sutherland there will be tutorial discussions on health-education principles and methods and the theory of group discussion. Experts will give five lectures, and students will form small groups to exchange experiences from their jobs in youth clubs, schools, clinics, and the home. The school is intended to appeal to educational and medical administrators, doctors, teachers, youth leaders, public health nurses, industrial nurses, welfare workers, training organizers, and students. Further information may be obtained from the medical adviser and secretary, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

Entomology

The Ninth International Congress of Entomology will be held on August 17–24 at Amsterdam. Entomologists wishing to receive in due course the programme and application forms are asked to communicate with the Secretariate, Physiologisch Laboratorium, 136, Rapenburgerstraat, Amsterdam.

SOCIETIES AND LECTURES

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

Tuesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, July 11, 4.30 p.m., "*Some Principles of Antenatal Pathology*," by Professor R. A. Willis.

Wednesday

CAMBRIDGE UNIVERSITY.—At Addenbrooke's Hospital, Cambridge, July 12, 2.30 p.m., "*The Social Background of Tuberculosis*," by Dr. W. Paton Philip.

LONDON COUNTY MEDICAL SOCIETY.—At Queen Mary's Hospital, Carshalton, Surrey, July 12, 2.30 p.m., clinical meeting.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace Road, London, S.W.—July 12, 2.30 p.m., paper: "*The Prevention and Control of the Rheumatic Diseases*," by Dr. Oswald Savage.

Thursday

EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, July 13, 5 p.m., "*Experimental Studies on the Eye Based upon the Regeneration of the Neural Retina and the Lens*," Macarthur Postgraduate Lecture by Professor L. S. Stone (Yale University). To be illustrated by coloured films.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, London, S.W.—July 13, 5 p.m., "*The Bearing of Protein Structure on Clinical Problems*," Bertram Louis Abrahams Lecture by Professor E. C. Dodds, F.R.S.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—July 13, 5 p.m., "*The Diagnosis and Treatment of Acute Deep Venous Thrombosis*," Surgery Lecture by Dr. Gunnar Bauer (Mariestad Hospital, Sweden).

Friday

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—July 14, 3.45 p.m., "*The Jaws in Generalized Skeletal Disease*," Charles Tomes Lecture by Professor Lester Cahn (Columbia University); 5 p.m., "*Epulides*," Charles Tomes Lecture by Professor A. B. P. Amies (University of Melbourne).

ROYAL SANITARY INSTITUTE.—At Great Yarmouth, Norfolk, July 14, 10 a.m., papers: "*The Work of the Public Analyst*," by Dr. Eric C. Wood, A.R.C.S., F.R.I.C.; "*The Fishing Industry of Great Yarmouth*," by Mr. G. H. Spinks. Afternoon: visits will be made.

Saturday

●RENAL ASSOCIATION.—At Ciba Foundation, 41, Portland Place, London, W., July 15, 11.30 a.m., "*Development of Modern Renal Physiology*," by Dr. Homer Smith.

APPOINTMENTS

BAIN, J. W. L., T.D., M.B., Ch.B., D.A., Anaesthetist, Aberdeen General Hospitals and Special Hospitals Groups (Consultant Status).

CRUICKSHANK, ERIC KENNEDY, M.D., M.R.C.P., Professor of Medicine, University College of the West Indies.

DAWSON, MARJORY A., M.B., Ch.B., D.P.H., Assistant County Medical Officer, Assistant School Medical Officer, Medical Officer of Health for Samford and Gipping Rural District Councils and Stowmarket Urban District Council.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Consultant Psychiatrist at St. Audry's Mental Hospital, I. K. Marshall, M.R.C.S., L.R.C.P., D.P.M. Consultant Anaesthetist (part-time) at County Hospital, Huntingdon, G. H. W. Keates, M.B., B.S., D.A. Senior Registrar in Anaesthetics at Norfolk and Norwich Hospital, A. L. Reynard, M.R.C.S., L.R.C.P., D.A.*

SHELLEY, WILLIAM HADFIELD, M.D., D.P.M., Consultant Psychiatrist, Warlingham Park Hospital, Warlingham, Surrey.

SLEIGH, JOHN, M.B., Ch.B., D.P.H., Medical Officer of Health, Andover Municipal Borough and Andover and Kingsclere and Whitchurch Rural Districts, Hampshire.

WIGLEY, GUY SIMPSON, M.R.C.S., L.R.C.P., D.P.H., Deputy County Medical Officer of Health, Middlesex County Council.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Cleobury.—On June 23, 1950, at Bromley, Kent, to Brenda Julie, wife of John Cleobury, M.B., B.S., a son—Nicholas Randall.

Jefferiss.—On June 30, 1950, at Poltimore House Nursing Home, Exeter, to Vivien, wife of Derek Jefferiss, B.M., M.R.C.O.G., a daughter.

DEATHS

Dore.—On June 27, 1950, Samuel Ernest Dore, M.D., F.R.C.P., of London, W.1, and N.W.11.

Gleed.—On June 28, 1950, at 38, Ballard's Lane, Finchley, London, N., Seymour Richard Gleed, M.R.C.S., L.R.C.P., aged 68.

Johnstone.—On June 24, 1950, at Torbeckhill, Lockerbie, Dumfriesshire, George Johnstone, M.B., C.M., late of Middleton, Lancs.

Knapton.—On June 28, 1950, at Oaklands, Lynton, N. Devon, Henry Alfred Forbes Knapton, M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired, aged 80.

Lang.—On June 25, 1950, at Drumassie, Crossford, Lanarks, *John McCallum* Lang, M.D., D.P.H., aged 60.

Lewers.—On June 26, 1950, at his home, Corinella, Ilfracombe, Hugh Bunnett Lewers, D.S.O., O.B.E., M.B., B.S.

Mann.—On June 29, 1950, at 4, Wellington Circus, Nottingham, Dorothea Jane Mann, M.D.

Mell.—On June 9, 1950, at Broad Green Hospital, Liverpool, Felix Oswald Newton Mell, C.I.E., M.B., C.M., Lieutenant-Colonel, I.M.S., retired, of Mona House, Castletown, Isle of Man, aged 80.

Milne.—On June 24, 1950, at St. Ives, Dorridge, Warwicks, Colin Milne, M.B., Ch.B., D.P.H., aged 57.

Poison.—On June 27, 1950, at Miramar, Milford-on-Sea, Hants, James Ronald Poison, M.D., late of Worcester, aged 91.

Shortall.—On June 15, 1950, at Newry, Co. Down, N. Ireland, Christopher Joseph Shortall, M.D., M.Ch., F.R.C.S.I., aged 45.

Thomson.—On June 27, 1950, at 10, Ripon Road, Harrogate, Yorks, Joseph Alexander Thomson, M.B., Ch.B., D.M.R.E.

Ward.—On June 29, 1950, John Forbes Ward, M.D., F.R.C.P., of Deepdene, Manor Road, Cheadle Hulme, Cheshire.

Young.—On June 28, 1950, at Chichester, John Charles Young, M.R.C.S., L.R.C.P., of 43, West Drive, Aldwick, Sussex, aged 78.

Any Questions?

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

Adenoidectomy

Q.—*What are the indications for, and the advantages of, adenoidectomy without tonsillectomy? In a child of 6, with apparently healthy tonsils, would adenoidectomy alone be of any value in preventing recurrent attacks of otitis media, or should it be combined with tonsillectomy? To what other conditions should attention be directed in cases of recurrent otitis media in young children?*

A.—The indications are all troubles caused by enlarged adenoids, such as post-nasal obstruction, with consequent nasal catarrh and often sinusitis; mouth breathing with maldevelopment of the hard palate; and obstruction of the Eustachian tube openings leading to intermittent or chronic infection or catarrh of the middle ear. Sometimes enlarged adenoids interfere with sleep, causing nightmares possibly, and perhaps being related in some cases to nocturnal enuresis. The advantages are that it is such a minor procedure compared with tonsillectomy, and it can, if indicated, be performed on young infants. Tonsils should never be removed unless they are causing trouble, certainly not in the case cited. Other conditions which should be considered in any child with recurrent otitis media are infections of the nasal sinuses, which are shown on *x*-ray examination, and the general lack of resistance caused by bad food and bad housing. Occasionally after adenoidectomy small collections may persist behind the tubal openings, and these may have to be destroyed by radium or *x* rays.

Parkinsonian Rigidity

Q.—*Can you tell me if "myanesin" has been extensively used in the treatment of Parkinson's disease of the predominantly rigid type? What is the usual dosage? Are there any harmful effects resulting from daily administration? What are the advantages, if any, over radiant heat or other palliatives in a fairly advanced case?*

A.—"Myanesin" is an α-substituted glycerol ether and its action is different from that of curare. Curare exerts its effect at the neuromuscular junction, while there is evidence that myanesin acts centrally on the synapses of the spinal cord. Myanesin has been used in an attempt to reduce the rigidity of Parkinson's disease, but no account of a carefully studied series of cases appears to have been published. In the writer's experience with a few cases myanesin by mouth may reduce rigidity, but there tends to be increased muscle weakness and the tremor may become more marked. No harmful effects were caused unless a large dose was given, when the patients complained of double vision and dizziness. The dose of the elixir advised by the makers (B.D.H.) is ½ to 1 drachm (1.8 to 3.5 ml.) from one to six times a day. There is more likely to be a reduction of the Parkinsonian rigidity with a full dosage of one of the solanaceous alkaloids, such as hyoscine or stramonium, or with one of the recently introduced antispasmodics, of which "artane" is often the most efficacious.

Kraurosis Vulvae

Q.—*Have there been any recent advances in the treatment of kraurosis vulvae?*

A.—It depends upon what is meant by kraurosis vulvae. The term should be restricted to a condition of extreme atrophy, with secondary infection, fibrosis, and contracture, occurring after the menopause and related to the cessation of ovarian function. There are no new forms of treatment, but there is an increasing awareness that it is important to be cautious about the diagnosis. In this respect it should be noted that kraurosis is a comparatively rare disease causing pain and dyspareunia. If the symptom is pruritus another cause should be looked for. The disease as it occurs in post-menopausal women responds well to oestrogen therapy, at least temporarily. The difficulty is to discontinue treatment without the condition relapsing. When the skin has become healthy the dose should be gradually reduced, but in some cases intermittent treatment over a prolonged period seems necessary. Local applications of emollient preparations are also helpful.

Anti-gas-gangrene Serum

Q.—*What is the value of anti-gas-gangrene serum?*

A.—Anti-gas-gangrene serum has been employed in both prophylaxis and treatment of this grave infection. The general practice is to use a polyvalent antitoxin against the toxins of *Clostridium welchii, septicum*, and *oedematiens*, the anaerobes most commonly associated with gas gangrene. Opportunities to assess the value of these antitoxins are limited to times of war, since gas gangrene is a rare infection in civilian practice. Towards the end of the 1914–18 war a controlled trial in the prophylaxis of gas gangrene with *Cl. welchii* antitoxin was carried out and gave results which showed that the serum reduced both the incidence and case mortality of the infection. In the 1939–45 war, assessment of the value of gas-gangrene antitoxin, either in the prophylaxis or in the treatment of war wounds, was made difficult by the simultaneous use of chemotherapeutic substances, such as the sulphonamides and, later, penicillin. The available evidence, however, indicated that the case mortality in established gas gangrene was lowered by large doses (50,000 units or more) of polyvalent antitoxin, although the antitoxin was effective only in patients receiving adequate surgical treatment. *Cl. welchii* antitoxin has also been used in the treatment of gangrenous appendicitis, peritonitis, and puerperal infections. It seems likely that penicillin or some other antibiotic will largely replace gas-gangrene antitoxin in the prophylaxis and treatment of infections associated with this group of anaerobes.

Dangerous Drugs Issued to Nurses

Q.—*An instance has occurred where a district nurse has been given a supply of a scheduled drug for administration to a number of patients in accordance with the doctor's instructions, and, owing to the cessation of the treatment for one cause or another, the nurse has been left with a residual supply. By holding a supply the nurse is technically infringing the regulations. Is there any provision in the regulations for the disposal of such excess supplies of dangerous drugs?*

A.—A registered medical practitioner can provide a patient with a supply of a scheduled drug for administration in accordance with his directions either by issuing a prescription to that effect or by handing to the patient, or a competent relative, or a nurse in charge of the patient the scheduled drug he considers appropriate for the treatment of that patient. It is not necessary to enter in the register of supplies particulars of drugs administered to a patient by the doctor personally or by someone acting under the direct personal supervision of the doctor and in his presence. On the other hand, drugs handed to the patient or to the nurse in attendance on the patient for subsequent administration must be recorded in the doctor's register of supplies. An entry must be made on the day on which the drug is supplied or on the following day. Each patient must be considered and recorded separately.

There is no provision in the Dangerous Drugs Regulations for dealing with excess supplies of scheduled drugs that are left over unused after the recovery, removal, or death of the patient. These excess supplies are the property of the patient when they have been provided through the medium of the issue of a prescription; they may be the property of the practitioner when they have been handed over by him out of his personal store of scheduled drugs. In any event, if the practitioner is of opinion, or has reason to believe, that there will be a surplus unused after certain events have occurred, it is only common sense to take suitable steps to recover that surplus from the patient's relatives or the nurse concerned. The regulations are

silent on this point, but clearly the practitioner should take some steps to ensure that the surplus is destroyed or, where desirable, recovered by him and placed in his locked cupboard.

Treatment of Naevus

Q.—*A baby girl, aged about 4 weeks, has a naevus which covers the nose, with small flecks on both upper and lower eyelids on each side. What is the best time to start treatment, and what type of treatment is recommended?*

A.—It is presumed that this is a naevus of the port-wine stain type. Painting with an alcoholic solution of thorium X, 1,500 e.s.u. per ml., once every month or six weeks for, in the first instance, twelve paintings may effect considerable paling of the lesions. The part should be cleaned gently with spirit before painting, and treatment may be started immediately.

Inheritance of Spina Bifida

Q.—*A patient aged 45 has a spina bifida occulta which has never given any trouble, and which was only discovered accidentally in the course of an x-ray examination. The brother of the patient has an only child, aged 7, who has recently undergone an operation for a cerebellar tumour. A first cousin (daughter of the patient's father's sister) has had two children, of whom the first died at the age of 3 months from spina bifida; the second child has survived to the age of 6 with a spina bifida, but cannot walk. The cousin's siblings have produced nine normal children, but the patient's siblings (apart from the brother) have produced none. The patient contemplates matrimony, and wants to know what are the chances of his producing healthy children. Nothing is known of the heredity of the proposed spouse.*

A.—This is rather a difficult question, because the chances for relatives other than brothers and sisters of affected persons are hardly known. Nor is the genetic relation of spina bifida occulta to the manifest condition understood as yet. Nevertheless, on the facts given, the increased risk for any children of this patient is probably very small. It is probably not larger than the *one-in-forty chance that any random pregnancy will* end in a serious malformation of one kind or another. Hence it seems safe to advise that the patient should ignore the slight added risk implied by a family history of this type.

Prognosis of Primary Syphilis

Q.—*What is the prognosis of primary syphilis with modern treatment? What are the chances (a) of a complete cure, and (b) of being able to produce non-syphilitic children?*

A.—The prognosis of primary syphilis treated by modern methods is extremely favourable, particularly if treatment is started in the sero-negative stage. (*a*) No method of proving biological cure has yet been devised, but presumptive cure, as evaluated by absence of clinical signs and persistently negative serum reactions (including tests of the cerebrospinal fluid) over a period of at least two years after treatment, may be expected in nearly 100% of adequately treated sero-negative primary cases and in 90% or more of sero-positive primary cases. (*b*) Adequate treatment of both males and females should ensure their children being non-syphilitic. Penicillin, which is the treatment of choice for syphilis, has been employed only since 1943, so that some years must elapse before we can be sure that late manifestations such as cardiovascular syphilis and neurosyphilis will not appear; however, provided it is used in optimum dosage, preferably combined with bismuth and perhaps an arsenical, there is every reason to suppose that cure will be obtained in the vast majority of cases.

Treatrent of Iritis

Q.—*What mydriatic should be used in the treatment of iritis in a patient of 65 to 70? The tension of the eye is normal.*

A.—In most cases it would be safe to start treatment with ½% atropine twice daily, increasing the strength up to 1% three times a day. If, however, there is some question whether the tension of the eye is raised—and this rise may be due to the iritis—it is better to start with ½% homatropine twice daily. If after twelve hours there is some relief of symptoms, go on to 1% homatropine three times a day. With continued improvement proceed to 1% atropine twice daily, and later three times a day if necessary. The point about using homatropine is that its effect can be overcome fairly quickly by eserine.

Thymus and Growth

Q.—*Can you please tell me of any substances—for example, thymus gland—which may be used to increase growth? I want to try out their effects with exotic fish, which I breed as a hobby.*

A.—Some years ago Rowntree in America reported experiments with extracts of thymus gland which appeared to indicate that growth and development were accelerated through several generations. The effect reported was really an increase in the rate of development, rather than any absolute increase in growth. These experiments have never been repeated with similar results, and it is generally held that they can no longer be sustained as indicating such an action of the thymus gland. The growth hormone of the pituitary gland was originally used with salamanders, a point which might be of interest in connexion with experiments on tropical fish.

NOTES AND COMMENTS

What is a Chill?—Dr. A. V. ADAMS (Heathfield, Sussex) writes: May I request enlightenment about the disturbance of normal physiology underlying the clinical condition—so conspicuously unmentioned in medical literature—known as "a chill"? At sea I have found that a sudden fall in relative atmospheric humidity is followed almost invariably by a high incidence of chills. There may well have been no corresponding fall in atmospheric temperature, and the victim may well have not been exposed to draughts. An especially bad zone for chills is the Gulf of Suez when travelling north from the Red Sea, and I have become a victim myself on all too many occasions, despite the most careful precautions in the direction of avoiding draughts and putting on extra clothing. These chills may take many forms. . . . The diagnostic importance of this syndrome is clearly considerable. If the chill is sudden and severe in onset, as is frequently the case, and if the ship has come from India, both smallpox and the typhoid group immediately call for exclusion. But the problem of differential diagnosis is of obvious enough importance. The problem on which I seek enlightenment is what disturbance of physiology is going on, and what organ or organs are the seat of the disturbance. Can one incriminate a sudden alteration in ionic balance and water metabolism due to environmental changes of similar suddenness and violence, which renal function cannot deal with fast enough? . . . My own view, and I have no evidence to prove it, is that a violent change in *milieu extérieur* produces a concomitant change in *milieu intérieur*, and that it takes a while for the *status quo ante* of the *milieu intérieur* to be restored.

Management of Diverticulosis.—Dr. C. EDWARDS (Bournemouth) writes: I would suggest that one answer to this question is this. Since the removal of roughage from the food affects the quantity to be evacuated, the addition of one of the gel-forming preparations would increase the bulk in the rectum. Instead of the dried scybala (in spite of liquid paraffin) a bulky soft stool is formed, and the paraffin may be reduced and perhaps abandoned.

The "Medical Directory."—The Editor of the *Medical Directory* (104, Gloucester Place, London, W.1) writes: To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid, we will gladly forward a duplicate upon request. The full name of the doctor should be sent for identification.

Correction.—In the later issues of the *Journal* of June 10 (p. 1351) it was incorrectly stated that Barrowmore Hospital was previously known as "Borrowdale Sanatorium." This should have been "Barrowmore Sanatorium."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 *a.m. to 5 p.m.*). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 15 1950

2,665 CASES OF ABORTION

A CLINICAL SURVEY

BY

ALBERT DAVIS, M.D., Ch.M., F.R.C.S., M.R.C.O.G.

Gynaecological Surgeon, Prince of Wales's, St. Giles', and Dulwich Hospitals

This review is based on a series of consecutive cases of abortion under my care at St. Giles' and Dulwich Hospitals, London. The two hospitals are relatively closely situated in a working-class suburb, with approximately the same number of gynaecological beds, under the same consultative direction. They therefore offer excellent opportunity for comparison of different methods of treatment, for these can be carried out under fairly comparable conditions. During the past 15 years (with the exception of a wartime interval) advantage has been taken of this opportunity to assess the value of varying treatments, and it was the primary object of the present investigation to determine the relative merits of active and passive treatment in cases of incomplete abortion, and to settle, if possible, some of the issues of this perennial source of argument. A second object was to compare the potency (if any) of different chemotherapeutic agents in infected cases. For these purposes a detailed analysis was made of enough cases to reduce percentage error to a reasonable minimum—the actual number recommended by our statistical adviser was 2,500, and this has been only slightly exceeded, the cases being almost evenly divided between the two hospitals concerned. The results of this analysis are given below, and it is suggested that they are definite enough to be of therapeutic significance.

During the course of this investigation various secondary factors—age, parity, morbidity, etc.—had necessarily to be considered. These proved of sufficient interest to merit analysis, and they are classified below under the appropriate headings.

Age

The average age of the patients was 29 years, the youngest being 17 and the oldest 49. This corresponds with the figures given by Gellert (1926), who found the average age between 20 and 30 years; only 3% of his cases were younger than 20 years. Similarly, the report of the Children's Bureau of New York (1934) gives an average of 25 to 29 years.

The age incidence seems at first sight surprisingly high, but this is explained by the fact that abortion is much commoner among married women, and that the average age of marriage is fairly high—the Registrar-General's report for 1945 gives it as 24 years. Again, however, the type of patient is important. At St. Mary Abbots Hospital, which admits a large number of "luxury trade" women—manicurists, hairdressers, West End shop assistants, dancers, etc.—the average age of 100 consecutive abortion patients was 23 years, 14 being below 19 years. This type of girl, attractive, away from home, and fascinated by "glamour," is much more liable to abortion than the more respectable working-class girl. She is also, *pari passu*, much more subject to dangerous complications (see below).

Civil State

Of the 2,665 woman 2,350 were married, 303 were single, and 12 widows. This is in accord with McIlroy's (1929) report, that abortion is most frequent amongst the married, and with the statistics of Roesle (1929), who states that one-sixth of all his cases were unmarried. Richelt, on the other hand, found that 65% of his large series were unmarried.

These figures seem to vary considerably, not only in different countries but in different parts of the same country or even town. In rural communities, and in the purlieus of wealthy districts, the proportion of single girls is higher. At Paddington Hospital nearly 50% of all full-term deliveries in the large maternity unit are in single women, and a similar proportion exists amongst the abortion cases. In the two hospitals under consideration, however, convention again shows its influence, the great majority of the patients being "respectable" married women.

Analysis of the cases on this basis shows that the question of wedlock is an important one from the clinical aspect, for the complication rate is much higher in illegitimate abortions. In the present series of 315 unmarried women severe complications—gross haemorrhage, virulent infection, pelvic abscess, etc.—were present in 43 (14%) of the cases, while the corresponding figure for the 2,350 married patients was only 6%. This difference is *not* due, as is generally supposed, to later abortion, with its increased risk, in the single women, for the average duration of the pregnancy in these patients was 12.4 weeks, as against 12 weeks for all the cases. The most likely explanation lies in a combination of several factors—the inexperience of these girls, their isolation, and the desperate nature of their predicament.

Period of Gestation

The average period of gestation was 12 weeks. This corresponds roughly with the figures given by Roesle (1929) and Kopp (1936). The former found 60% of abortions occurring at the third and fourth months, the latter 58% between the second and third months. The main reason is that the average woman waits for two missed periods before being quite certain of her pregnancy. It then takes

another two or three weeks for her to make the necessary "contacts" to terminate the pregnancy.

The great majority (87%) were between ten and fourteen weeks pregnant, and there was wide variation in the remainder, from the earliest at five to the latest at 26 weeks. In two cases the patient was not pregnant at all, but had attempted criminal abortion in the belief that she was.

Period in Hospital

The average stay in hospital was thirteen days, the longest being fourteen weeks, and the shortest one day. These figures are somewhat deceptive, for 86% of the women went home eight or nine days after admission. The high average is provided by the very long periods of hospital treatment in infected and other complicated cases.

Previous Abortions

In 253 (9.5%) of the cases there was a history of one or more abortions, details of which are given in Table I.

TABLE I.—*Previous Abortions (253 Cases)*

No. of Abortions	No. of Cases	No. of Abortions	No. of Cases
1	189 (74%)	5	3 (1·2%)
2	38 (15%)	6	1 (0·5%)
3	15 (6%)	7	1 (0·5%)
4	5 (2%)	8	1 (0·5%)

These figures do not correspond with those given by Kopp (1936), who found that 25% of cases had had one previous abortion, 30% two, and 34% three; but her patients belonged mainly to the more prolific section of the population of New York, and are hardly comparable with our own.

Previous Full-term Pregnancies

Of the patients 669 (39%) had one or more children; this series is further analysed in Table II.

TABLE II.—*Previous Full-term Pregnancies (669 Cases)*

No. of Children	No. of Cases	No. of Children	No. of Cases
1	209 (31%)	7	3 (0·5%)
2	202 (30%)	8	7 (1%)
3	90 (14%)	9	3 (0·5%)
4	86 (13%)	10	6 (1%)
5	49 (7%)	11	3 (0·5%)
6	13 (2%)	12	2 (0·3%)

Roesle (1929) found that 10% of all his cases had one child, 7% two, 7% three, and 10% four or more. Kopp's analysis similarly gives a less steeply descending scale than my own, the ratio being 9:1, 8:2, 6:3, 4:4, 3:5, 2:6, the first figures applying to cases and the second to children.

It will be observed that roughly one-third of all the women had one or more children, and that two-thirds of these had either one or two, with a rapidly descending scale for the rest. The explanation of this is somewhat obscure. It might lie in the fact that sterility is a common post-abortal complication, or in the similar decrease in fertility following the second or third child. Another explanation may be that the somewhat crude circumstances attendant on criminal abortion might make many women prefer to go through with the subsequent pregnancy.

Spontaneous or Induced Abortion

The figures given by different authorities on this subject are variable. In their large individual series the indicated percentages of spontaneous abortion are given by du Puy (1932) as 58, Plass (1936) as 34, Kopp (1936) as 28, Sangmeister (1943) as 25, and Berle (1942) as 18. Parish (1939) found that 25% of 1,000 cases were spontaneous, 48% admitted illegal interference, the causation in the remaining 27% being unknown. The Derby City Hospital (1939) statistics give about 40% as due to criminal interference, while the corresponding figure given by the Society for the Provision of Birth Control Clinics (1939) is 27%. Of 3,000 cases investigated by the Joint Council of Midwifery (1939) 23% admitted to induced abortions, and the Interdepartmental Committee on Abortion (1939) came to the conclusion that 40% of the abortions in this country may be due to illegal interference.

My own view is that all these figures are vitiated by the fact that they depend on two fallacies: one, the very doubtful veracity of such patients, and, two, the individual opinion of medical officers. Most of the latter are psychologically inexperienced, and do not realize that a direct inquiry is practically useless. It is remarkable how often a patient who has denied interference will react affirmatively to a sudden accusation, and my own impression is that the great majority—perhaps 90%—of all abortions are induced in one way or another. The testimony of ward sisters, who are in the closest personal contact with the patients, bears this out; for most of them, when asked for their opinion, will corroborate this impression.

Methods of Procuring Abortion

The methods employed to procure abortion vary widely. The great majority were self-induced, either medicinally or by douching. Purgatives, "female pills," quinine, and herbal preparations comprised most of the former, but a curious specialty of the district was a tablespoonful of powdered ergot taken in a wineglassful of hot port.

The douche apparatus was usually a simple enema syringe, but, as it was found too difficult to insert the nozzle into the cervix, most patients preferred to use a "whirling spray" the top of which had been unscrewed. In both cases the injected solution was usually hot soapy water, with varying added quantities of lysol or other antiseptic. Sticks of slippery-elm bark were not very popular, being regarded as ineffective—due, probably, to the difficulty of inserting them into the cervix. They were indeed usually recovered from the vagina, and occasionally from the urethra or bladder. Knitting-needles, crochet hooks, and similar instruments were used only by a very few desperate patients.

Midwives and others acting as professional abortionists usually preferred a vaginal or uterine douche to more active measures, but some "stirred up" the uterine contents with a long sound. Curettage—usually without anaesthesia—was occasionally resorted to by some medical practitioners, but these generally preferred intrauterine paste injection.

Paradoxically, all but one of the deaths and the most severe complications in this series followed douching and not the theoretically more dangerous intrauterine manipulations. This corresponds with the figures cited in the Memorandum presented by the London County Council to the Interdepartmental Committee on Abortion (1939), which show that in nearly half of the 55 fatal cases in which there was known interference some kind of douching or uterine injection had been employed, while instruments were responsible for only 12. The explanation no doubt lies in the comparative infrequency of instrumental abortion, the dangers of which must be disproportionately high compared with those of douching. In the latter the degree of pressure employed is probably the important factor.

Injection introduced gently can be rapidly isolated by local uterine reaction, but fluid injected under the considerable tension of a vigorously squeezed enema syringe easily strips up the decidua and penetrates the sinuses, or passes directly through the tubes to the peritoneal cavity.

Types of Abortion

These are classified in Table III. Of the 95 cases of threatened abortion 61 continued with the pregnancy, 9 aborted completely, and 25 incompletely, the last all necessitating curettage. Of the 62 cases of inevitable abortion

TABLE III.—*Types of Abortion*

Type	No. of Cases
Threatened	95 (3·6%)
Inevitable	62 (2·3%)
Complete	192 (7·2%)
Incomplete	2,250 (84·4%)
Therapeutic	28 (1·0%)
Ectopic	32 (1·2%)
Molar	6 (0·2%)

44 aborted completely and 18 were surgically evacuated. The incomplete abortions were completed spontaneously in 771 cases (34.3%) and by operation in the remaining 1,479 cases.

Morbidity

The great majority of the cases showed some rise of temperature (Table IV). This was practically always initial, and usually subsided after evacuation—spontaneous or operative—of the retained products.

TABLE IV.—*Highest Recorded Temperature*

Temperature	No. of Cases
Normal	431
99° F. (37·2° C.)	913
100° F. (37·8° C.)	794
101° F. (38·3° C.)	341
102° F. (38·9° C.)	87
103° F. (39·4° C.)	77
104° F. (40° C.)	16
105° F. (40·6° C.)	6

In 431 of the patients the temperature was normal throughout. Included in this number were all the spontaneous, most of the therapeutic, and many of the threatened abortions. This high figure does not contradict the suggestion of the high incidence of criminal interference, for, though Taussig's dictum that practically every case of induced abortion shows some rise of temperature is undoubtedly true, there remain many afebrile cases in which such interference is undoubted and even admitted. A temperature of 101° F. or over is, however, diagnostic of an attempt to procure abortion, and it is noteworthy that such a rise can occur from abortion following the simple self-administration of abortifacient drugs or from local manipulations which leave the pregnancy undisturbed.

The cause of the fever in the great majority of cases is local in the uterus, as shown by the immediate fall after spontaneous or operative completion of the abortion. The pathology is an acute endometritis, secondary either to the introduction of an external infecting agent or to the presence of necrotic retained products. In the more heavily infected cases the pyrexia varies with the degree and rapidity of septic extension, from the prolonged remittence of pelvic abscess to the fulminating rigors of septicaemia; all types were present in this series. The temperature chart is, in fact, one of the most valuable adjuncts in the diagnosis of the infective complications of abortion, for most varieties give a characteristic record, from the low remittence of uterine sepsis and the higher remittence of pelvic abscess to the "Matterhorn" record of general infection.

Bacteriology

Swabs were taken from the vagina, cervix, and uterus in 50 consecutive cases. (It was impossible at first to avoid contamination of the uterine swab, but later this difficulty was mainly overcome by protecting it with a surrounding glass cannula. The results, however, were so similar in both series of cases that it was found unnecessary to separate them.)

In only two cases were the swabs sterile on culture. In all the rest a copious growth was obtained, the predominant organisms being *Staphylococcus albus* and *Bact. coli*, with smaller numbers of several of the commoner bacteria in many cases (Tables V and VI).

TABLE V.—*Cultures from the Genital Tract (50 Cases)*

	No. of Cases
Staph. albus alone	11
Staph. albus + *Bact. coli*	10
Staph. albus + diphtheroids	4
Bact. coli alone	4
Diphtheroids alone	2
Diphtheroids + *B. proteus*	2
Staph. albus + *Cl. welchii*	2
Str. (N.H.) + *Bact. coli* + Doederlein's bacillus	2
Staph. albus + *Corynebacterium xerosis*	2
Str. (N.H.) + diphtheroids	1
Staph. aureus (N.H.) alone	1
Staph. aureus (N.H.) + diphtheroids	1
Str. viridans + *Str. faecalis*	1
Str. viridans + *Staph. aureus* (N.H.)	1
Str. (N.H.) + *Cl. welchii*	1
Bact. coli + diphtheroids + Doederlein's bacillus	1
B. proteus alone	1
Str. haem. (C.), *Staph. albus*, + *Bact. coli*	1
Staph. albus, *Bact. coli*, + *C. xerosis*	1
No growth	2

TABLE VI.—*Cultures from the Genital Tract (50 Cases)*

		No. of Cases
Staph. albus	present in	35
Bact. coli	,, ,,	23
Diphtheroids	,, ,,	18
Str. (non-haemolytic)	,, ,,	6
Cl. welchii	,, ,,	3
Doederlein's bacillus	,, ,,	3
B. proteus	,, ,,	3
Corynebacterium xerosis	,, ,,	3
Staph. aureus	,, ,,	3
Str. viridans	,, ,,	2
Str. faecalis	,, ,,	1
Str. haemolyticus G	,, ,,	1
No growth	,, ,,	2

This high incidence is significant of active infection, for, though the vagina is more heavily contaminated in the later weeks of pregnancy, it is relatively "clean" during the first three months, when the bacteriology corresponds roughly with that of the non-pregnant organ (Miller, 1933). In the latter Eeles (1925) found non-haemolytic streptococci in only 20% of nulliparae and 25% of multiparae, with a correspondingly low percentage of staphylococci, *Bact. coli*, *B. proteus*, diphtheroids, and Gram-positive bacilli. No *Cl. welchii* or haemolytic streptococci were present in any of his 50 cases. The figures given by Duncan (1947) in 133 consecutive patients admitted for hysterectomy are as follows: 90 smears were negative and 44 positive, the latter showing Gram-negative cocci and bacilli and Gram-positive cocci; only 46 of the group had positive cultures, the majority of which were *Bact. coli*. Even immediately before delivery the vaginal contamination is considerably less than during abortion, as shown conclusively by Taylor and Wright (1930), who in 1,123 cases found *Staph. albus* in 58%, *Staph. aureus* in 1%, Doederlein's bacillus in 35%, diphtheroids in 25%, coliforms in 31%, and various types of streptococci in 5%. The difference in the bacteriology of the uterus is greater, for, though all uterine swabs in the abortion series gave a heavy mixed growth on culture, it has been shown by several workers that the puerperal cavity investigated at caesarean section is sterile in 50% of cases (Harris and Brown, 1928; Armstrong and Burt-White, 1929; Gundel and von Oettingen, 1930).

The cervix showed the greatest difference. In almost all the abortion cases it was heavily infected, while in the course of another investigation I found the cervix sterile in 50% of third-day puerperas, with relatively poor growth in the remainder; in only 25% were rich cultures obtained. (There was no difference in the incidence of virus infection, for inclusion bodies were universally absent.)

Complications

The complications and related conditions encountered in this series are shown in Tables VII, VIII, IX, and X.

TABLE VII.—*Gross Infection*

	No. of Cases
General:	
Septicaemia	5
Pyaemia	1
Local:	
Local severe uterine infection	41
Parametritis	25
Salpingitis	19
Pelvic peritonitis	16
General peritonitis	4
Pelvic abscess	13

TABLE VIII.—*Other Complications and Multiple Abortion*

	No. of Cases
Other complications:	
Gross haemorrhage (Hb below 60%) necessitating blood transfusion	68
Pyelitis	9
Femoral thrombosis	3
Pulmonary embolism	1
Cerebral embolism	1
Hysteria	1
Insanity	1
Drug gastritis	3
Vaginal burns	2
Vaginal necrosis	2
Vaginal laceration	2
Multiple abortion:	
Twins	3
Triplets	2
Rupture of uterus	4
Acute appendicitis	1

TABLE IX.—*Associated Conditions*

	No. of Cases
General:	
Influenza	8
Mitral stenosis	6
Coryza	5
Pneumonia	3
Syphilis	3
Scarlet fever	1
Coincident ectopic pregnancy	1
Local:	
Retroversion	13
Fibroids	13
Prolapse	5
Acute gonorrhoea	4
Primary chancre	1
Ovarian cyst	1

TABLE X.—*Molar Pregnancy*

	No. of Cases
Carneous mole	3
Hydatidiform mole	2
Chorion epithelioma	1

Retroversion

There were 13 cases (0.5%) in which the abortion was associated with retroversion. The period of gestation varied from eight to twelve weeks, with an average of ten weeks. Three of the patients gave a history of one previous abortion and one of two, while nine had at least one living child. In nine cases the patient had aborted incompletely before admission. The uterus was replaced in the remainder, but in only one case was this successful in producing continuation of the pregnancy. Acute retention of urine occurred in two patients, both of whom subsequently miscarried. It is difficult to be certain, particularly when abortion is already in progress, how far it has been caused by incarceration, and in only four of these cases was actual impaction definitely present. But even if all the abortions were due to this factor, the frequency of retroversion as a general cause remains almost negligible. The difficulty of conserving such pregnancies once bleeding has begun is also well demonstrated in these figures.

Injuries

Rupture of the uterus occurred in four cases. In one, an inexperienced surgeon extracted a piece of what he thought was omentum during the course of a therapeutic abortion. This proved to be a very fatty appendix epiploica, and at laparotomy (A. D.) the corresponding hiatus was found at the border of the pelvic colon. The intestinal mucosa itself was intact, but there was a perforation at the lowest part of the body of the uterus on the right side of the cul-de-sac. The tear had incidentally produced a complete rupture of the uterine artery (a rare accident), with profuse parametric haemorrhage. This was fairly easily controlled by suture, and the patient made a rapid and uninterrupted recovery. In two other cases the perforation had been followed by traction on the small intestine, a loop of which presented at the vulva. In the first the bowel was almost undamaged, and was returned through the uterine tear into the abdomen. In the second there was extensive damage with strangulation, necessitating resection and anastomosis. This was carried out *in situ*, and the repaired gut replaced in the same way. Both patients were too shocked to withstand laparotomy, but both made a complete recovery. In a further case the rupture was self-produced.

Mrs. A, aged 38, a 4-para, was admitted as an emergency case with the history that during an attempt to induce abortion by means of a syringe she had felt a pain of extreme intensity in the abdomen at the moment she was injecting the contents of the syringe. She was nearly three months pregnant, and had had some haemorrhage that morning. Seen four hours after the injection, she was collapsed and in great pain. Temperature was 97° F. (36.1° C.), the pulse 110 and thready, and the colour good. There was some loss per vaginam, the abdomen was tense, very tender all over, but not rigid. The signs of initial shock soon disappeared, but were rapidly replaced by those of internal haemorrhage, and operation six hours later revealed an abdomen full of blood. This was scooped out and was found to contain the foetus in its sac with the placenta, both lying quite free. The uterus was raised, to expose a perforation on the anterior wall high up, 2 cm. long, and bleeding freely. A rapid supravaginal hysterectomy was carried out with continuous blood transfusion, and the abdomen closed with interrupted silkworm-gut sutures taking in all layers. (This rapid method of abdominal closure is ideal in these cases; the scar seems to hold at least as well as the more orthodox layered one, and acute herniation is not more common.) The patient made a good recovery, except for an intra-abdominal abscess which had subsequently to be drained.

Careful subsequent questioning of this very frank patient led to the conviction that this was not a case of perforation by direct trauma, but of explosive rupture due to a forcible injection. There was a long clean hole too extensive and clear-cut for a perforation, and absence of the mucosal protrusion which seems characteristic of the former. The foetus and placenta seem rather to have been literally blown out of the uterus than squeezed through the narrow rent by muscular contraction.

Ectopic Abortion

There were 32 cases of extrauterine gestation in the series—an incidence of 1.2%. Of these, 28 were married and 4 single. The average age was 33 years, the youngest being 18 and the oldest 44.

Two patients had one child, three had 2 children, three had 3, two 4, one 6, and one 12. Only two of the patients had previously aborted, each of them twice. The period of gestation varied from 5 to 18 weeks, with an average of 7 weeks for all cases. The gestation was in the right Fallopian tube 15 times and in the left 17, and there was a coincident intrauterine pregnancy in two cases. The mortality rate was 0.3%, only one patient dying at operation.

Mortality

There were six deaths in the series—a mortality rate of 0.26%. This figure is considerably less than that given in most foreign statistics. Freudenberg (1932), for example, gives a figure of 1.2% for Germany, and Taussig (1936), collecting statistics from a variety of countries, obtained an average of 2.1%, and assumes a mortality of somewhat less than 2% for the United States.

The discrepancy is a considerable one, but is probably explained by the exclusion from our own figures of patients dying at home under local medical care, and of the not inconsiderable number of cases of sudden death. Two of the latter were seen at necropsy, but as they were not admitted they are not included in this hospital series.

The cause of death was *Cl. welchii* septicaemia (2 cases), traumatic vaginal and uterine necrosis with pelvic abscess (2 cases), traumatic perforation of the uterus with secondary peritonitis (1 case), and staphylococcal septicaemia (1 case).

The physical signs and post-mortem changes found in these cases are characteristic, and are almost exactly paralleled in the large series described by Hill (1936) and by Dawbarn and Williams (1938). A point of interest is the high average length of gestation, which was 15 weeks, compared with the average of 12 weeks for the whole series. This corroborates the well-known fact that the dangers of abortion rise proportionately with the period of gestation, with considerably added risk after the third month.

Of great interest is the actual cause of death in those patients dying suddenly during an attempt to procure abortion. One such patient, found dead in a bathroom with an enema syringe by her side, showed no fatal post-mortem pathology, the only positive finding being some soap solution in the uterus, which also contained an undisturbed foetus of about 14 weeks.

The actual injection of fluid is apparently unnecessary for a fatal issue, for cervical stimulation alone can cause sudden death. Michel and Morin (1922) have reported the case of a woman who, under the mistaken impression that she was pregnant, attempted abortion with an enema syringe, but died before any fluid had been injected; and cases have been recorded of women dying during the course of an ordinary vaginal examination (Mondor, 1936).

It is possible that reflex sympathetic shock may be the fatal factor in some of these cases, and the recent discovery of a rich submucous nerve plexus surrounding the external cervical os (Davis, 1938) provides considerable support for this theory. It is probable, however, that death in the majority of cases is due to cerebral embolism of injected fluid, for there are several reports of such patients dying in convulsions. These are usually epileptiform (Möller, 1922), but they are commonly followed, if death is not immediate, by signs of gross cerebral damage. Thus one of Neidhardt's (1915) cases showed hemiplegia, facial palsy, and unequal pupils; and similar signs were present in cases reported by Walcher (1926) and others. Cerebral symptoms are also seen in some of the cases which recover (Burgerhout, 1926), and I recently saw a woman in whom epileptiform convulsions were followed by transitory hemiplegia shortly after a paste injection.

The pathology in these cases is that of air embolism, and confirms the clinical view that the symptoms are due to multiple capillary gas embolism in the lungs or brain. It is true that the normal post-mortem intravenous formation of gas may sometimes be extremely rapid, but in two cases seen by me there had certainly been no time for this process, and it may be accepted that the air found in these and other cases was introduced, and not the natural gas of putrefaction. Confirmatory evidence is provided by the histological appearance of the affected organs, which show small multiple perivascular necroses.

In spite of these findings, however, it appears that air alone is not responsible for the changes described, but that it must be injected in soap-bubble form to cause embolism. Parade (1929) has shown experimentally that intravenous injection of a moderate amount of air is relatively safe, but that in combination with soap it is fatal; and a patient in the present series injected enough air (under considerable pressure) into her uterus to produce abortion, but without any apparent metastatic effect. It is true that soap and extraneous fat have rarely been chemically identified in the affected organs, but the amount necessary to provide bubble covering is so minute that it might easily escape ordinary analysis. On the other hand, Müller-Hess and Hallermann (1932) believe that the solid constituent of the injected material is the sole embolic factor, and Brack (1932) found paste emboli in the lungs in two cases.

Lipiodol, which is not easily miscible with air, may similarly be embolic to the lungs (where it can occasionally be demonstrated radiologically), but never, apparently, with fatal result. The accidental intravasation of this material is a fairly common phenomenon, and as its employment is frequent and universal the absence of distant complications indicates that it is relatively safe in intravenous injection. Other theories have been advanced to explain the peculiar changes of injected soap solutions. Balthazard (1920) suggests that strong emulsions change the haemoglobin into alkaline haematin, causing death by asphyxia, but I was unable to effect this change *in vitro*. Környey (1934) states that the soap may cause haemolysis and also destroy the capillary walls, allowing of extravascular permeation and direct damage to the surrounding tissues, which are also rendered ischaemic by the same process. There is, however, no histological proof of this theory, and the same applies to the suggestion made by Haselhorst and Schaltenbrand (1933) that the basic process is a rapid and universal clot formation.

On the whole, therefore, the most reasonable theory of the cause of death in these cases is that of a multiple minute air-bubble embolism. This explains the infrequency of pure air or pure fat embolism, and the danger of their combination. That this danger is a considerable one has repeatedly been stressed by a variety of authors, and the reported deaths from embolism following abortion are almost universally due to the intrauterine injection of some sort of soap solution. (The uterine paste employed by many abortionists is composed of olive oil, cocoa butter, caustic soda, and potassium iodide, and so is essentially a soap. Otherwise a simple household soap emulsion is used, some tincture of iodine being added as an antiseptic.) Englemann (1932) reports 17 deaths from this cause, and the literature abounds with records of similar fatalities, the result of either therapeutic or illegal abortion.

It may be assumed, therefore, that, though a few of these patients die suddenly from reflex sympathetic inhibition of the cardiac or respiratory centres, the result of cervical plexus stimulation, the cause of death in the majority is some form of soap-bubble embolism—cerebral, pulmonary, or coronary.

The presence of a direct venous pathway to the brain has been demonstrated by Batson (1940), who found a free anastomosis between the pelvic and perivertebral veins, material injected into the former being easily conveyed via the latter to the dural sinuses. This by-pass from the caval

pathway is facilitated by a rise in intravenous tension, and it is easy to understand how it may equally be opened under the pressure—often 100 mm. Hg—exerted by the Higginson syringe. It is unnecessary, therefore, to postulate patency of the foramen ovale to explain the mechanism of pelvic-cerebral embolism.

Treatment

The uterus was evacuated immediately in all cases of gross haemorrhage, except for the necessary interval for resuscitation and blood transfusion where required. Other incomplete abortions were treated with hot enemata and oxytocics, with operative evacuation within a few hours if these failed or were incompletely successful. An exception was made in those cases with high temperature, general peritonitis, or other signs of gross sepsis, when operation was delayed until improvement in the patient's general condition allowed of safe intervention.

The argument of active versus passive treatment of infected incomplete abortion has provided endless but inconclusive controversy. The statistics collected by Taussig from several clinics in many countries endorse the view of most teachers that expectant treatment is the safer, but the more recent figures given by Corston and Stallworthy (1947) and by Purdie (1947) indicate that immediate evacuation is apparently as safe. Our own experience confirms the latter finding. The duration in hospital of 251 consecutive cases treated by immediate operation was 9.5 days, while that of a control series of 338 cases treated expectantly was 13 days. This discrepancy may be explained partly by the varying degrees of experience of the operators concerned. Operative evacuation of an infected uterus is a delicate, highly dangerous procedure, and when performed by junior house-officers, who are so often delegated to this inconvenient task, the results are inevitably bad. In the hands of the skilled obstetrician, however, accidents are rare and the advantages considerable. The infecting agent is removed, the abortion is properly completed, and the period of convalescence is materially shortened.

The employment of an injection of oxytocin direct into the uterus is another factor which has materially modified the older view of the greater safety of conservative treatment. The contraction so produced materially reduces the risks of infective embolism, of perforation, and of gross haemorrhage, and makes evacuation so much the safer. The disadvantages of the method are the possibility of shock and the reactionary atony which occasionally follows the contractions. The former is rare and usually slight, and the latter is easily controlled by bimanual compression and the intravenous injection of ergometrine. Packing the uterus is unnecessary.

Chemotherapy

Various types of sulphonamide were given to 373 patients. The average stay in hospital of these cases was 13 days, while that of a control group of 200 untreated cases was 12 days—a difference of no statistical significance. These figures correspond with those of Studdiford (1939) and confirm the impression that chemotherapy here is largely useless, except in a few cases of specific susceptible infection. This is hardly surprising, in view of the mixed and very varied bacteriology generally present (Studdiford, 1939), and it is probable that the indiscriminate routine administration of sulphonamides to all cases of abortion is at least misdirected.

Peritonitis

There were four cases of true general peritonitis, as distinct from the common local pelvic peritonitis with associated "peritonism." Two were treated conservatively and both recovered, while a third died following laparotomy and drainage. This confirms the general experience that opening the abdomen in these cases serves mainly to introduce fresh organisms into an already virulently infected cavity, and that drainage of the meagre quantity of semi-purulent exudate usually present is both harmful and unnecessary. On the other hand, Falk and Blinick (1947) found that medical treatment, including sulphonamides and penicillin in varying dosages and routes of administration, fluid balance, and the use of small and large repeated blood transfusions, serums, vaccines, various non-specific therapies, oxytocics, Wangensteen drainage, etc., were equally of no avail in their relatively large series of cases.

There would thus appear to be little choice between simple drainage and conservative treatment, so that the bias must necessarily be in favour of the latter. There remains, however, the more radical treatment of hysterectomy. This once popular method has recently been revived, with good results, by Falk and Blinick, but it is at best a desperate measure, and the radical removal of uterus, tubes, and ovaries which it involves would make most surgeons hesitate before embarking on so formidable a procedure in a desperately ill and generally young patient. However, in one of our cases, that of a 4-gravida in fair condition, in whom perforation was certain, the operation was completely successful, and one must conclude that there is a definite though necessarily limited indication for its use in post-abortal peritonitis.

Pelvic Abscess

There were 13 cases of pelvic abscess. Three resolved under medical treatment, two ruptured spontaneously (one per rectum, the other per vaginam), and eight were drained by operation. This was invariably colpotomy, even when the abdomen had been opened for other complications, as occurred in two of the cases, and it is undoubtedly the ideal method of drainage. It is easy, moderately safe, and provides excellent gravity drainage, and it should more often replace the relatively inefficient abdominal methods commonly adopted, all of which necessarily involve intraperitoneal spread of the pus, apart from the added risk and discomfort of a major operation.

Therapeutic Abortion

There were 28 cases in the series, an incidence of 1% (Table XI). The indications were cardiac disease (6), chronic nephritis (5), molar pregnancy (5), pulmonary tuberculosis (3), epilepsy (2), disseminated sclerosis (2), pernicious vomiting (2), hydronephrosis (1), malignant hypertension (1), and carcinoma of cervix (1).

The indications were those usually accepted as necessary for therapeutic induction, with the possible exception of pulmonary tuberculosis, but the difficulty of obtaining suitable sanatorium accommodation for these patients is usually an overriding factor. Two further conditions—rubella in early pregnancy and high multiparity—have recently been added to our list of indications, but there are none in the present series. Several patients with temporary mental instability were referred by psychiatrists, but this was invariably transient, the result of unwanted pregnancy, and interruption was refused.

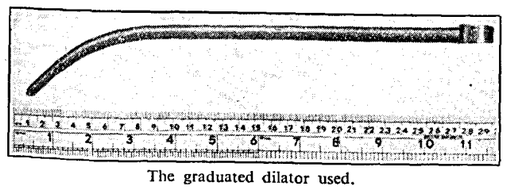
Methods of Therapeutic Abortion

The uterus was evacuated vaginally in 18 cases and abdominally in ten. Intrauterine paste injection was used in two cases, both patients being too ill for more direct

TABLE XI

No.	Civil State	Age	Weeks of Amenorrhoea	Previous Abortions	Previous Full-term Pregnancies	Indication	Method
3841	M	32	12	1	4	Mitral stenosis	D. and c. and vaginal sterilization
4017	M	25	20	0	1	,,	Abdominal hysterotomy
4149	M	30	8	1	2	,,	Paste injection
4182	M	25	14	0	1	,,	D. and c.
2741	M	26	8	1	0	,,	,,
4806	M	40	6	1	1	Paroxysmal tachycardia	,,
8380	M	27	12	0	1	Chronic nephritis	,,
2043	M	30	24	0	1	,,	Abdominal hyst. and sterilization
2906	M	34	24	0	1	,,	Abdominal hyst.
2496	M	33	26	0	0	,,	,,
3777	M	21	10	1	0	,,	D. and c. and vaginal sterilization
5898	M	40	20	1	10	Missed aborts.	Vaginal sterilization
3860	M	29	20	0	0	,,	Paste injection
4786	M	39	7	1	3	,,	D. and c.
4198	M	35	16	0	0	Hydatidiform mole	Vaginal evacuation
4306	S	31	24	0	0	Chorion epithelioma	Panhysterectomy
3287	M	28	10	0	1	Pulmonary tuberculosis	Abdominal hysterectomy
3234	M	36	18	0	1	,,	,,
2338	S	22	8	0	0	,,	D. and c.
4179	M	31	12	0	0	Epilepsy	Abdominal hyst. and sterilization
4401	M	38	10	0	4	,,	D. and c.
4345	M	25	20	0	0	Disseminated sclerosis	Abdominal hyst. and sterilization
1978	M	39	10	1	4	,,	D. and c.
2615	M	26	8	0	1	Pernicious vomiting	,,
7225	M	22	8	0	2	,,	,,
3995	M	33	10	0	3	Hydronephrosis	,,
3213	S	24	24	0	0	Malignant hypertension	Abdominal hyst.
13	M	42	12	1	4	Carcinoma cervix	D. and c.

procedures. General anaesthesia with thiopentone–cyclopropane was usually employed, except in patients with cardiac failure or extensive pulmonary tuberculosis, when heavy premedication and local procaine injection was the method of choice. In vaginal evacuation oxytocin is withheld until adequate dilatation of the cervix, which it renders spastic. The special dilator used (see Fig.) is



The graduated dilator used.

tapered to the end, and has the advantage over the non-graduated Hegar type in minimizing cervical laceration. With the largest necessary dilator remaining in place, 10 units of oxytocin are injected direct into the uterine body, and firm retraction awaited. This usually takes place within three minutes, the amniotic sac being extruded intact and with very little haemorrhage. The sequence is by no means invariable, but it approximates most nearly to the mechanism of spontaneous abortion, and even when broken allows of considerable reduction of the profuse haemorrhage which is the invariable accompaniment of non-medical evacuation.

Oxytocin contraction also reduces the risk of instrumental perforation, and allows of curettage when the uterine contents have been fragmented. Extrusion may be similarly aided during abdominal hysterotomy: the contraction produced minimizes the blood loss of the incision and expresses the gestation sac intact after some minutes.

Sterilization was carried out in five cases at the time of the abortion, in two by the vaginal route. This method is comparatively easy, and is eminently suitable for cardiac cases, but haemorrhage from "catspaw" laceration in the soft uterus may be troublesome, and the operation is best performed after an interval of some weeks.

Summary

The average age of 2,665 abortion patients was 29 years, the youngest being 17 and the oldest 49; 2,350 of the women were married, 303 were single, and 12 were widows.

The average period of gestation was 12 weeks, 87% of the cases being between 10 and 14 weeks pregnant.

The average stay in hospital was 13 days, but 86% of the patients went home eight or nine days after admission, the high average being due to the relatively few complicated cases.

A history of previous abortion was obtained from 9.5% of the patients: 74% of these had had one, 15% two, 6% three, 2% four, 1.2% five, and 0.5% six, seven, and eight respectively.

Of the patients 29% had one or more children: 31% of these had one, 30% two, 14% three, 13% four, 7% five, 2% six, 0.5% seven, 1% eight, 0.5% nine, 1% ten, 0.5% eleven, and 0.3% twelve.

The incidence of spontaneous abortion is low. Probably 90% of the cases were induced, in the majority by the patient herself.

The method of choice for procuring abortion was vaginal douching under pressure. Professional abortionists employed intrauterine douching or catheterization. A small minority used slippery elm and similar foreign bodies.

Of the clinical types of abortion 3.6% were threatened, 2.3% inevitable, 7.2% complete, 84.4% incomplete, 1% therapeutic, 1.2% ectopic, and 0.2% molar.

There was a rise of temperature in 84% of all cases. This was usually moderate and initial, subsiding rapidly after completion of the abortion.

Genital infection was present in all but two of 50 consecutive cases examined bacteriologically. Cultures yielded a copious growth, the predominant organisms being *Staph. albus* and *Bact. coli*. Inclusion bodies were not identified in any case.

Gross infection was the commonest complication. There were five cases of septicaemia, one of pyaemia, and 118 with severe local septic involvement. Of these 41 had severe metritis, 25 parametritis, 19 salpingitis, 16 pelvic abscess. Gross haemorrhage, necessitating blood transfusion, occurred in 68 cases. Retroversion was present in 13 cases, showing the comparative rarity of the association. There were four cases of traumatic rupture of the uterus.

Of the abortions 32 were ectopic, an incidence of 1.2%. In two a coincident intrauterine gestation was present.

There were six deaths, a mortality of 0.26%. Three patients died from *Cl. welchii* septicaemia, two from burns (the result of local corrosive injection), and one from *Staph. aureus* septicaemia. A further patient (not included in the series) died from soap-bubble cerebral embolism. It is suggested that this last is the mechanism in most sudden fatalities.

Treatment was mainly directed, when the abortion was irritable or incomplete, to evacuation of the uterus, either medically or surgically. Active treatment was apparently superior to conservative, as shown by the lessened period in hospital and incidence of complications. Chemotherapy was largely useless in the presence of infected retained products, except in a few cases of specific susceptible infection. (Penicillin was not available for this series, but survey of a more recent group in which it was administered as routine shows it to be similarly ineffective.) Peritonitis remains the most fatal complication, and it is probable that radical operation is the treatment of choice. For pelvic abscess colpotomy provides the most direct route for drainage and the shortest convalescence.

Therapeutic abortion was performed 28 times, combined with sterilization in five cases. The indications were invariably gross

physical disease: in no case referred for psychological reasons was the mental factor regarded as strong enough for interruption of the pregnancy.

REFERENCES

Armstrong, R. R., and Burt-White, H. (1929). *British Medical Journal*, **1**, 592.
Balthazard, B. (1920). *Bull. Méd. leg. France*, **6**, 120.
Batson, O. V. (1940). *Ann. Surg.*, **112**, 138.
Berle, B. B. (1942). *Amer. J. Obstet. Gynec.*, **43**, 820.
Brack, E. (1932). *Zbl. Gynäk.*, **56**, 122.
Burgerhout, H. (1926). *Ned. Tijdschr. Geneesk.*, **70**, 925.
Children's Bureau Publications, New York (1934). No. 223, p. 106.
Corston, J. M., and Stallworthy, J. (1947). *British Medical Journal*, **2**, 89.
Davis, A. A. (1938). *Dysmenorrhoea*, p. 86. Oxford University Press, London.
Dawbarn, R. Y., and Williams, B. (1938). *British Medical Journal*, **2**, 279.
Derby City Hospital Report (1939). Quoted in Report of Interdepartmental Committee on Abortion, 1939, p. 10. H.M.S.O.
Duncan, C. J. (1947). *Amer. J. Obstet. Gynec.*, **53**, 324.
du Puy, G. A. (1932). *Calif. West med. J.*, **37**, 368.
Eeles, J. (1925). *Edinb. med. J.*, **32**, Obst. 155.
Englemann, F. (1932). *Zbl. Gynäk.*, **56**, 119.
Falk, H. C., and Blinick, G. (1947). *Amer. J. Obstet. Gynec.*, **54**, 314.
Freudenberg, K. (1932). *Münch. med. Wschr.*, **79**, 758.
Gellert, P. (1926). *Zbl. Gynäk.*, **50**, 1127.
Gundel, M., and von Oettingen, K. (1930). Ibid., **54**, 327.
Harris, J. W., and Brown, J. H. (1928). *Amer. J. Obstet. Gynec.*, **16**, 332.
Haselhorst, G., and Schaltenbrand, G. (1933). *Zbl. Gynäk.*, **57**, 2759.
Hill, A. M. (1936). *J. Obstet. Gynaec. Brit. Emp.*, **43**, 201.
Interdepartmental Committee on Abortion (1939). Report, H.M.S.O.
Joint Council of Midwifery (1939). Quoted in Report of Interdepartmental Committee on Abortion, 1939, p. 11. H.M.S.O.
Kopp, M. E. (1936). Quoted in Taussig's *Abortion, Spontaneous and Induced*, p. 375. Kimpton.
Környey, St. (1934). *Klin. Wschr.*, **13**, 1502.
McIlroy, L. (1929). Report to Conference on Maternal and Child Welfare, London, July, 1929.
Michel, R., and Morin, R. (1922). *Bull. Soc. Obstét. Gynéc. Paris*, **17**, 702.
Miller, J. (1933). In Curtis's *Obstetrics and Gynaecology*, **2**, 717. Saunders, Philadelphia.
Möller (1922). *Z. MedBeamte*, **35**, 502.
Mondor, H. (1936). *Les Avortements Mortels*, p. 43. Hachette, Paris.
Müller-Hess, J., and Hallermann, W. (1932). *Med. Welt.*, **6**, 373.
Neidhardt (1915). *Z. MedBeamte*, **28**, 110.
Parade, H. (1929). *Zbl. Gynäk.*, **53**, 949.
Parish, T. N. (1939). In Report of the Interdepartmental Committee on Abortion, 1939, p. 10. H.M.S.O.
Plass, E. D. (1936). In Taussig's *Abortion, Spontaneous and Induced*, p. 25.
Purdie, A. W. (1947). *British Medical Journal*, **2**, 272.
Roesle, E. (1929). *Dtsch. med. Wschr.*, **55**, 1051.
Sangmeister, H. J. (1943). *Amer. J. Obstet. Gynec.*, **46**, 755.
Society for Provision of Birth Control Clinics (1939). Quoted in Report of Interdepartmental Committee on Abortion, 1939, p. 10. H.M.S.O.
Studdiford, W. E. (1939). *N.Y. St. med. J.*, **39**, 1274.
Taussig, F. J. (1936). *Abortion, Spontaneous and Induced*, p. 26. Kimpton, London.
Taylor, J., and Wright, H. D. (1930). *J. Obstet. Gynaec. Brit. Emp.*, **37**, 213.
Walcher, K. (1926). *Mitt. Grenzgeb. Med. Chir.*, **39**, 314.

Before the war the Department of Scientific and Industrial Research produced a series of twelve leaflets, "Methods for the Detection of Toxic Gases in Industry." Leaflet No. 7, "Carbon Monoxide," has just been completely revised and now describes a new, simpler, and more accurate method of detection developed during the war at the Royal Aircraft Establishment. Dangerous concentration of carbon monoxide may occur in many industries, particularly steelworks, foundries, gas works, coke oven plants, and wherever gas producers and water gas plant are used. It is most dangerous when formed unknowingly, as by the improper use of geysers, boilers, braziers; in mine explosions ("after-damp"), in the smoke from fires; and in the exhaust gases from internal combustion engines. In the new test a sample of air is drawn through an indicator tube which is stained by the carbon monoxide. The length of the stain gives the concentration present in the air. Complete instructions for carrying out the test are given in the leaflet (H.M.S.O. Price 6d., 15 cents U.S.A., by post 7d.)

HABITUAL ABORTION

PROPHYLACTIC VALUE OF PROGESTERONE PELLET IMPLANTATION

BY

P. M. F. BISHOP, D.M.

Endocrinologist to Guy's Hospital and Chelsea Hospital for Women, and to the Department of Obstetrics and Gynaecology, Postgraduate Medical School of London

AND

N. A. RICHARDS, M.B., M.R.C.O.G.

Chief Assistant, Chelsea Hospital for Women

With Statistical Assistance from

RICHARD DOLL, M.D., M.R.C.P.

Statistical Research Unit, Medical Research Council

For the purpose of this study "habitual abortion" is defined as "idiopathic" abortion before the end of the fifth month of pregnancy, occurring on two or more consecutive occasions immediately preceding the pregnancy, in which pellet implantation has been used. Abortion is regarded as "idiopathic" if no recognized organic cause has been found. "Primary" habitual abortion refers to the condition in which all previous pregnancies have resulted in abortion. "Secondary" habitual abortion indicates that one or more previous pregnancies have proceeded beyond the 28th week.

Material

The present series consists of 45 patients who have received an implant of six 25-mg. pellets of progesterone during the pregnancy under consideration. The implantation was carried out according to the technique described elsewhere (Bishop, 1949).* No other treatment or precautionary regime was prescribed. These 45 cases represent all the patients with a history of habitual abortion treated by this method at the Chelsea Hospital for Women since 1947. It has been possible to obtain direct information concerning the outcome of the treated pregnancy in each of these cases.

Of these patients, 33 fall into the group of "primary" habitual abortion and 12 into the group of "secondary" habitual abortion.

Implantation was performed as early as possible—that is, as soon as the patient was referred to us for treatment. In most cases this was before the tenth week of pregnancy.

Results

TABLE I.—*Results*

No. of Successive Abortions Immediately Preceding the Treated Pregnancy	No. of Patients	Outcome of Treated Pregnancy		Percentage Successful Results
		Success	Failure	
A. Primary Habitual Abortion				
2	20	18	2	90
3	8	7	1	88
4 or more	5	3	2	60
B. Secondary Habitual Abortion				
2	8	6	2	75
3	1	1	0	100
4 or more	3	3	0	
C. Primary and Secondary Habitual Abortion Combined				
2	28	24	4	86
3	9	8	1	89
4 or more	8	6	2	75

*It should be emphasized that progesterone pellets, unlike other compounds suitable for implantation, tend to extrude unless implanted deeply: in this series the pellets were implanted beneath the deep fascia of the thigh.

The case recorded as a failure in the primary habitual abortion group, in which there had been three previous abortions, was that of a patient who started to bleed on her way home from hospital after the implantation, and the abortion was completed the following day (Table I). There would therefore have been no time for the progesterone to have any effect in this case. Of the two failures in the group having had four or more abortions one had had five previous abortions and the other seven.

A successful result was defined as one in which the pregnancy proceeded to 28 weeks. In fact, 26 of the 28 patients who were "successfully" treated for primary habitual abortion had live babies. In one of the two cases in which the baby died caesarean section was performed for fulminating toxaemia at the 28th week of pregnancy and the baby lived only 30 minutes: in the other case there was a stillborn breech delivery at the 36th week.

One case recorded as a success in the secondary habitual abortion group (Table I, B) in which there had been more than four abortions had miscarried nine times before the implantation.

All 10 successfully treated patients in this group had live babies. One of these was born with osteogenesis imperfecta, but the mother had previously had one child suffering from the same condition. This was the only case in the whole series in which there was any foetal abnormality.

Four other cases of repeated abortion treated by pellet implantation were not included in this series of 45 cases, because they did not conform strictly to our definitions of primary and secondary habitual abortion. A summary of these four cases is given.

Cases Not Included in the Series

Case 1.—Primary habitual abortion: three abortions at six weeks, then one abortion at 22 weeks. The next pregnancy carried to 33 weeks with an implant, and the baby lived. This case (a success) was excluded from the series because one pregnancy before the treated pregnancy had carried to more than five months.

Case 2.—Primary habitual abortion: two abortions at four and a half months and one abortion at three months, followed by another abortion at five and a half months. The next pregnancy carried to 30 weeks with an implant, but the baby lived only a few hours. This case (strictly a success according to our definition) was discarded for the same reason as Case 1.

Case 3.—Primary habitual abortion: one abortion at two months followed by two abortions at five months. Another abortion at five and a half months preceded the treated pregnancy, which carried only to 22 weeks after an implant. This case (a failure) was discarded for the same reason as Cases 1 and 2.

Case 4.—Primary habitual abortion: two abortions at five months followed by an abortion with twins at 28 weeks after an implant. One twin was born macerated and the other lived 32 hours. This case (strictly a success) was not included in the series, because it so barely conformed with our requirements.

Had these cases been included in the series there would have been no alteration in the success rate of 90% in the primary habitual abortion cases (group A) with two successive abortions, nor in the success rate of 86% in the same group under C. The success rate in A with four or more successive abortions would have risen to 62% and fallen in the same group in C to 72%.

Incidence of Habitual Abortion

In studying reports of many thousands of pregnancies in women attending antenatal clinics and birth-control centres it was concluded by the Biological and Medical Committee of the Royal Commission on Population (1949) that "the proportion of all pregnancies ending in spontaneous abortion may be placed between the relatively narrow limits of 7 and 11%."

Complete information regarding the incidence of habitual abortion is not yet available. In order to obtain a true random sample it would be necessary to have details of all the pregnancies of the total population of a certain area, such as a borough or an urban or rural district.

Most of the figures at present available are derived from studies of patients attending antenatal clinics or obstetric departments. For instance, Javert (1948) analysed 56,803 pregnancies cared for at the Woman's Clinic of the New York Hospital during the 15-year period 1933–47, and classified 189 as cases of "primary habitual abortion (i.e., having had three or more consecutive spontaneous abortions beginning with the first pregnancy) and 115 as cases of secondary habitual abortion." He concluded that this corresponded to an incidence of 1 in 300 (0.3%) for primary and 1 in 493 (0.2%) for secondary habitual abortion.

Malpas (1938), studying about 6,000 pregnancies, found that 84 women had three or more consecutive abortions or stillbirths, an incidence of 1.4%.

These incidences have been calculated by relating the number of cases of habitual abortion to the number of pregnancies seen, whereas they might more usefully be related to the number of women.

Bishop (1937) analysed 2,687 case histories from Guy's Hospital Maternity Service and found that 0.4% of women had more than one initial idiopathic abortion at less than five months, and 0.1% (i.e., three cases) had three initial idiopathic abortions.

The "Spontaneous Cure Rate"

Various attempts have been made to calculate the likelihood of a pregnancy proceeding spontaneously beyond the 28th week, or to term, when preceding pregnancies have terminated in abortion. Though some believe that any series of consecutive abortions may be due to coincidence, it is generally thought that there is a recurrent factor in abortion sequences. The figures most commonly quoted are those of Malpas (1938) and Eastman (1947). The "spontaneous cure rate," according to the calculations of Malpas, is as shown in Table II.

TABLE II.—*Malpas's Figures*

No. of Previous Abortions	Spontaneous Cure Rate of a Subsequent Pregnancy
1	50 to 78%
2	9 „ 62%
3	7 „ 27%
4	0·3 „ 6%

Eastman's calculations are based on the assumption that 10% of pregnancies terminate in spontaneous abortion and that a recurrent factor causes 0.4% to abort repeatedly. (This is the 0.4% in Bishop's series of 2,687 cases, mentioned above.) With these figures in mind he follows 100,000 hypothetical women through successive pregnancies (Table III).

Assuming the validity of these two sets of calculations, it is clear that the chances of a fourth pregnancy going to term are considerably less than those of a third pregnancy. This assumption is the basis of the definition of "habitual abortion" as representing three, rather than two, preceding abortions. It will, however, be obvious that a

TABLE III.—*Eastman's Figures*

Previous Abortion	Will Abort from Accidental Causes	Will Abort from Recurrent Causes	Total Abortions	Per cent. will Abort	Spontaneous Cure Rate
0	9,600	400	10,000	10·0	—
1	922 (9·6% of above figure)	400 (Same 400)	1,322	13·2	86·8
2	88 (9·6% of above figure)	400 (Same 400)	488	36·9	63·1
3	8 (9·6% of above figure)	400 (Same 400)	408	83·6	16·4

ence of three or more consecutive abortions represents e occurrence, and it is therefore unlikely that any idual set of observers will be able to present an essive series of three or more consecutive abortions. e present series there were only 17 such cases. We therefore included details of 28 cases with two ous abortions.

gnificance of Results Obtained in the Present Series

cepting Eastman's figures and projecting them further clude the spontaneous cure rate of four (or more) ious abortions as 2%, the probabilities of obtaining by ce the results obtained in the present series of primary tual abortions (see Table I) are:

With 2 previous initial abortions	0.007594
„ 3 „ „ „	0.000018
„ 4 „ „ „	0.000078

ombining the probabilities together, the overall probity is much less than 0.001 ($P = 0.001$ for $\chi^2 = 22.5$ $n = 6$; in this instance $\chi^2 = 50.5$).

, however, recurrent factors operate less often, say 0.1% of women, the expected success rates increase to , 44%, and 8%, and the probabilities of obtaining the ent figures are:

With 2 previous initial abortions	0.2758
„ 3 „ „ „	0.0157
„ 4 „ „ „	0.0045

the combined probability lies between 0.01 and 0.001. the true incidence of abortion due to recurrent factors till less, say 0.01%, the expected success rates increase 89%, 82%, and 45% (i.e., reasonably close to the erved figures) and the probabilities of obtaining the sent results are:

With 2 previous initial abortions	0.62
„ 3 „ „ „	0.56
„ 4 „ „ „	0.41

l the combined probability lies between 0.50 and 0.70. Thus, provided the "normal" incidence of spontaneous rtion is of the order of 10% and the incidence of ction due to recurrent factors is not much less than 1%, it is reasonable to conclude that the present figures dicate an effect of treatment. Should, however, the true cidence of "recurring" abortion be of the order of 01%, the present results could easily be attributed to ance. If the secondary habitual abortions are included e results are not materially affected.

*In calculating these probabilities we have assumed that all the tients referred to in Table I as having had four or more successive ortions had had four abortions. In fact, several had had five or ore, but there were not enough of these for separate consideration. his approximation results in the calculated probability being slightly gher than the real one, so that the test errs on the strict side.

Discussion

If there is a recurrent factor in habitual abortion it is obviously not easy to identify, and prophylactic treatment is therefore difficult to assess. Rest in bed, sedatives, correction of vitamin, nutritional, and thyroid deficiencies, and even psychotherapy, have been cited as useful prophylactic measures, apart from the administration of sex hormones. Smith (1948) has propounded the theory that many of the disorders of pregnancy, including habitual and threatened abortions, toxaemia, pre-eclampsia, and eclampsia, are due to an imbalance of placental hormones (excessive chorionic gonadotrophin and deficiency of oestrogen and progesterone), and that they can be counteracted by administration of oestrogens, and especially stilboestrol, in doses increasing from 5 mg. daily at the sixth week to 115 mg. daily at the 35th week, when treatment is discontinued. In a series of 127 patients with a history of habitual abortion (some of whom had previously had live births, and some of whom were treated for threatened abortion), she obtained the results shown in Table IV.

TABLE IV.—*Smith's Series*

Previous Abortions	No. of Cases	Carried to 28 Weeks	Live Babies
2	67	84%	81%
3	38	87%	87%
4	17	65 } 59%	59 } 50%
5	5	40 }	20 }
Total ..	127	80%	77%

It will be noted that this series (which is much larger than ours) has yielded substantially similar results. It was possible to obtain such a large number of cases by enlisting 117 obstetricians to co-operate in the study and to conform to certain standards in recording the results. Some doubt has been expressed, however, with regard to Smith's contention that stilboestrol stimulates the placenta to produce adequate quantities of oestrogen and progesterone (Davies and Fugo, 1947; Sommerville *et al.*, 1949), and it should be noted that this series of cases included both primary and secondary habitual abortions as well as cases of threatened abortion.

It has always seemed to us that the most important hormone for the maintenance of pregnancy is progesterone and that habitual abortion in many cases may be directly due to lack of this hormone. Attempts have been made in the past to counteract this deficiency by means of injections of progesterone given at intervals up to a week; indeed, some of the patients in the present series had been unsuccessfully treated in previous pregnancies with progesterone injections or ethisterone by mouth. We have been impressed, however, with the necessity for maintaining a constant level of exogenous administration. This can be achieved adequately only by means of pellet implantation, and it is for this reason that we have used this mode of administration. The choice of dosage has been arbitrary and may well seem to be low. It should, however, be pointed out that pellet implantation provides the most effective means of complete as well as constant absorption, and we feel that this route of administration may be more efficient than other methods of progesterone therapy.

The substantially similar results obtained by Smith (1948) and ourselves suggest the following possibilities: (1) That administration of oestrogen leads to adequate endogenous secretion of progesterone, and that a constant exogenous supply of progesterone is equally effective in preventing abortion due to recurrent factors. (2) That any therapeutic discipline will induce the patient to take the necessary precautions to prevent another abortion from occurring. (3) That each of the "successfully" treated pregnancies proceeded beyond the 28th week by chance.

The second possibility seems to us unlikely. The last suggestion has been fully considered above. As to the first possibility, our results would indicate that progesterone is the essential hormonal factor for maintaining pregnancy, and that adequate progesterone therapy should not be discounted as a method of preventing the recurrent factor in abortion sequences. The results certainly do not conform with Hamblen's (1939) warning that exogenous progesterone may hinder the intrinsic metabolism of progesterone, nor do they support the contention (Hoffman, 1944) that progesterone therapy should be employed only in cases in which the pregnanediol level has been shown to be subnormal.

Summary

A series of 45 cases of habitual abortion treated prophylactically with progesterone pellet implantation (six 25-mg. pellets) yielded successful results in 86% of the patients with a history of two previous abortions, 89% with three previous abortions, and 75% with four or more previous abortions.

The series was subdivided into "primary" habitual abortion (in which all previous pregnancies had resulted in abortion) and "secondary" habitual abortion (in which one or more previous pregnancies, but not those immediately preceding the treated pregnancy, had proceeded beyond the 28th week). In these groups the results for primary habitual abortion were: 90% success with two previous abortions, 88% success with three previous abortions, and 60% success with four or more previous abortions; and for secondary habitual abortion, 75% success for two consecutive abortions immediately preceding the treated pregnancy and uniform success for the four cases of three or more abortions.

If the true incidence of "recurring" abortion is not much less than 0.1% these results indicate that the treatment was of value.

Statistical Methods Used.—The probabilities of obtaining the observed number of successes and failures in each group have been calculated direct from the binomial theorem, using the three different sets of estimates of the expected success rates. The combined probabilities for each set of three groups have been calculated from the formula: $\chi^2 = -2\Sigma \log_e p$.

Our thanks are due to Professor A. Bradford Hill and Mr. P. Armitage for their interest and advice concerning the statistical methods used, and to members of the staff of the Chelsea Hospital for Women, who have referred many of the cases in this series to us for implantation.

REFERENCES

Bishop, P. M. F. (1937). *Guy's Hosp. Rep.*, **87**, 362.
—— (1949). *Practitioner*, **163**, 437.
Davies, M. E., and Fugo, N. W. (1947). *Proc. Soc. exp. Biol., N.Y.*, **65**, 283; **66**, 39.
Eastman, N. J. (1947). In Meigs and Sturgis's *Progress in Gynaecology*, p. 262. Heinemann, London.
Hamblen, E. C. (1939). *Amer. J. Obstet. Gynec.*, **38**, 557.
Hoffman, J. (1944). *Female Endocrinology*, p. 421. Saunders, Philadelphia.
Javert, C. T. (1948). *N.Y. St. J. Med.*, **48**, 2595.
Malpas, P. (1938). *J. Obstet. Gynaec. Brit. Emp.*, **45**, 932.
Papers of the Royal Commission on Population (1949). Vol. IV: Reports of the Biological and Medical Committee, p. 4. H.M. Stationery Office.
Smith, O. W. (1948). *Amer. J. Obstet. Gynec.*, **56**, 821.
Sommerville, I. F., Marrian, G. F., and Clayton, B. E. (1949). *Lancet*, **1**, 680.

The British Standards Institution has published a British Standard on "Industrial Safety-Gloves." The material, size, and dimensions of many types of safety-gloves are specified, and appendices list the information to be given when ordering the gloves. The specification is obtainable from the institution at 24–28, Victoria Street, London, S.W.1 (4s., post free).

HAEMATEMESIS AND MELAENA

BY

C. D. NEEDHAM, M.D., M.R.C.P.
Assistant Physician, Aberdeen Royal Infirmary

AND

J. A. McCONACHIE, M.B., Ch.B.
Registrar, Aberdeen Royal Infirmary

Widely differing opinions have been expressed concerning the risk to life which accompanies bleeding from non-malignant ulceration of the stomach or duodenum (Chiesman, 1932; Cullinan and Price, 1932; Burger and Hartfall, 1934; G. Gordon-Taylor, 1937; Hurst and Ryle, 1937; Andresen, 1939; Meulengracht, 1939).

Some of the fallacies which abound in the published statistics relating to this condition have been critically discussed by Smith (1945) and also by Avery Jones (1947), who treated a large series of cases in a special gastro-enterological unit, with a mortality of 7.8%. He considered that the mortality has declined to between 5 and 10% during the past decade, but Baker (1947), reporting a series of 576 cases treated in a general hospital, found a mortality of 13.4%, and a recently published series by Lewin and Truelove (1949) showed a mortality of 19.5%. These figures are more likely to be representative of the results obtained in most hospitals, and they show that the management of gastro-duodenal haemorrhage is still far from satisfactory, many patients dying and many more causing grave anxiety and uncertainty regarding the best course to be adopted in their treatment.

More precise knowledge of the features which are of value in assessing the prognosis of the individual patient under the usual routine treatment would be very useful in distinguishing at an early stage which patients are in grave danger of dying from the haemorrhage. Until this particularly serious group of patients can be distinguished it will often be difficult to know whether one can reasonably persist with the routine conservative regime, or whether some other form of treatment should be considered. Much useful information regarding prognostic indications may be obtained from a study of the many papers published on the subject, in particular, Cullinan and Price (1932), Rafsky and Weingarten (1942), Heuer (1946), Baker (1947), Avery Jones (1947), and Lewin and Truelove (1949). But we believe it to be useful to see what further information may be obtained from an analysis of a large series of patients treated recently in the North-east of Scotland, more especially since some characteristics of peptic ulceration—for example, G.U./D.U. ratio—vary with the geographical area (Jamieson, Smith, and Scott, 1949), and it is possible that some features of gastro-duodenal bleeding might vary in the same way.

Present Series

This is a consecutive series of 476 cases of haematemesis and/or melaena admitted as emergencies because of bleeding to the three general medical units of the Aberdeen Royal Infirmary from January, 1941, to December, 1948, inclusive. The series is presumed to include only patients bleeding from peptic ulcers or erosions, because the notes of all cases of haematemesis and melaena from all causes were reviewed, but all those where some other cause was found—for example, gastric carcinoma, portal hypertension with oesophageal varices, blood dyscrasia—

were excluded. Cases in which the notes gave no good evidence of recent appreciable blood loss were also excluded. The patients came from the city and surrounding country, none being refused on account of age or complications.

The mortality rates did not differ significantly in the three medical units despite some differences in the details of the conservative treatment employed.

Occupation.—The patients were drawn from the middle and lower classes. A study of the list of occupations of the patients failed to reveal any sort of predominance of class level or type of occupation within the series. Schanke (1946), in Northern Norway, found a high proportion of gastric ulcers among fishermen; in our series there were only seven fishermen, although there is a large fishing population in the region, and in only one of these was a gastric ulcer demonstrated, though another died and the site of the ulcer is unknown.

Case Records.—Detailed information about each case was obtained from a combination of the medical notes and the nursing charts, both being very full. The case notes of each of these patients have been extracted by one or other of us personally; as observed by Baker (1947) this personal scrutiny is absolutely necessary if the information obtained is to be reliable.

Diagnosis

A history of an ulcer shown by a previous barium meal examination or of an operation for perforation, stenosis, or ulcer pain was obtained in 127 patients (105 men, 22 women), and 157 had suffered a previous haematemesis or melaena. In 384 of the 410 surviving cases barium meal examination was carried out very soon after the test for occult blood in the stool became negative, but in the other 26 survivors it was omitted for various reasons. The results are shown in Table I.

TABLE I.—*Results of Barium Meal Examination*

Gastric ulcer	33
Duodenal ulcer	209
Gastric and duodenal ulcer	4
Jejunal or stomal ulcer	5
No ulcer seen	133
Total barium meals	384

Gastroscopy was never carried out during the bleeding, and in very few cases was it done at a later date. An ulcer was found at operation in 15 cases, and in every one of the 32 that came to necropsy. The situation of the bleeding-point is shown in Table II. Duodenal ulcer

TABLE II.—*Situation of Bleeding-point*

Site of Ulcer	Cases	Deaths
Gastric ulcer	46	11
Duodenal ulcer	240	30
Gastric and duodenal ulcer	5	1
Jejunal or stomal ulcer	7	2
Unknown site	178	22
All cases	476	66

was much commoner than gastric ulcer, which contrasts with the findings in series reported from London (Hurst and Ryle, 1937; Avery Jones, 1947; Tanner, 1949b), but agrees with the increased proportion of duodenal ulcers in Scotland found by Jamieson, Smith, and Scott (1949).

Mortality

Of the 476 patients 66 died (13.9%). This figure includes not only deaths due solely to exsanguination but also: (1) Those in which associated grave complications played a major part, since these complications would probably either not have occurred or else would not have proved fatal in the absence of bleeding (Table III). (2) Those due

TABLE III.—*Deaths Due to Bleeding Associated with Complications (16 Cases)*

Perforated duodenal ulcer following soon after the haemorrhage	4
Pulmonary embolism	3
Severe pyloric stenosis necessitating emergency operation	2
Cerebral thrombosis	2
Pneumonia	2
Congestive heart failure	2
Coronary thrombosis	1

to a haemorrhage in patients enfeebled by pre-existing disease (Table IV). We consider it unrealistic to exclude any of these deaths.

TABLE IV.—*Deaths from Bleeding Associated with Pre-existing Disease (5 Cases)*

Tuberculous right kidney and nephrotic left kidney	1
Coronary thrombosis	1
Paraplegia and general debility	1
Severe mental depression	1
Idiopathic steatorrhoea	1

For reasons to be considered later the series is divided into two groups—those in whom the bleeding recurred after medical treatment had been started following admission to hospital (recurrent), and those who did not suffer such a recurrence (non-recurrent). In only 11 of the 51 fatal cases of the smaller (124) recurrent group was there a major complication in addition to the bleeding to account for death, but in the larger (352) non-recurrent group no fewer than 10 out of the 15 deaths were due to or hastened by major complications.

Acute and Chronic Ulcers

It was not easy to decide which patients were bleeding from a chronic and which from an acute ulcer, but a rough estimate of the number suffering from chronic ulcer may be arrived at by adding together the following groups.

Barium meal showed ulcer crater present after bleeding had ceased	251
Chronic ulcer found at operation	13
Chronic ulcer found at necropsy	29
Some of the 44 patients in whom no direct evidence of the type of ulcer present was obtained—that is, 22 survivors who escaped having barium meal and 22 fatal cases subjected to neither operation nor necropsy. If we take note of the findings in groups 1 and 3 above we can estimate, by simple proportion, that 15 of the 22 survivors and 20 of the 22 fatal cases were suffering from chronic ulcer	35
Total chronic ulcers	328
Total acute ulcers (total cases minus chronic ulcers)	148

On the basis of this calculation 61 (18.5%) of the 328 patients suffering from chronic ulcer died, as opposed to 5 (3.4%) of the remaining 148 patients assumed to be suffering from acute ulcer. These figures are only estimates, but they agree with the findings of other observers (Avery Jones, 1947; Baker, 1947).

Length of Previous History

A previous history of indigestion, epigastric pain, melaena, and other symptoms suggestive of peptic ulcer of more than one year's duration was obtained in 379 cases (79.6%). In the other 97 cases (20.4%) such previous history was either absent or of less than one year's duration.

It is of interest to determine whether the length of history bears any significant relation to the mortality rate or to the type of ulcer present. Table V shows that there was no significant difference between the mortality rates for the two groups.

TABLE V.—*Effect of Length of Previous History*

	Cases	Died
History less than one year	97	11 (11·3%)
History more than one year	379	55 (14·5%)
Total	476	66 (13·9%)

The type of ulcer present is to some extent related to the length of history. Only 11.7% of patients with proved ulcers gave a history of less than one year, but this was obtained in 34.6% of those in whom barium meal failed to show an ulcer.

A dyspeptic history of one year's duration rather than a longer time—for example, five years—was taken as the best dividing-line for distinguishing between the "proved ulcer" and "unproved ulcer" groups at the onset of the bleeding, because it was found that although the number of negative barium meal cases having a history of less than one year—namely, 46 (34.6%)—increased to 66 (49.5%) with a history less than five years, yet the number of "proved ulcer" cases rose proportionately more—from 35 (11.7%) to 91 (30%)—so that the longer history was even less useful in deciding which patients would have a demonstrable ulcer. But the length of history gave little help in the individual case.

Age and Sex Incidence

A considerable proportion (53%) of the patients were aged 50 years or over, and it was in this age group that most of the deaths occurred (Table VI). Many authors take

TABLE VI.—*Age and Sex Incidence*

Age Group	Male		Female		Both Sexes	
	Cases	Died	Cases	Died	Cases	Died
<30	32	1	6	0	38	1
30–39	48	1	13	1	61	2
40–44	43	4	15	1	58	5
45–49	48	2	18	2	66	4
50–59	78	17	36	5	114	22
60–69	43	8	40	7	83	15
70–79	33	10	16	4	49	14
80+	3	2	4	1	7	3
All ages	328	45 (13·8%)	148	21 (14·2%)	476	66 (13·9%)
<50	171	8 (4·6%)	52	4 (7·7%)	223	12 (5·4%)
50+	157	37 (23·5%)	96	17 (17·7%)	253	54 (21·3%)

50 years as the point where the mortality rate rises rapidly, though Thorstad (1942) suggested 45 years, and Avery Jones (1947) found that 60 was a more critical age. The fifth decade of the present series was divided into ages 40–44 and 45–49 to see if any sharp rise of mortality occurred before 50, but this again shows 50 to be the critical point; furthermore, the mortality for the 60–69 age group is no worse than for the 50–59 group, but the figure rises sharply after that. The sex incidence of 69% male and 31% female is in agreement with most reported series; the mortality was roughly equal in the two sexes, and this was true through all the age groups.

Effects of Previous Haemorrhage

There is a difference of opinion whether the prognosis is worse if the patient has suffered one or more previous haemorrhages. This was not so in the present series (Table VII)—a finding in agreement with that of Lewin and Truelove (1949). Of the 26 patients who had had a gastro-enterostomy performed at some earlier date, no fewer than 20 had had at least one haemorrhage subsequent to the operation and previous to the haemorrhage necessitating the present admission—a much higher proportion than in any other group. In seven of these a stomal or jejunal ulcer was later demonstrated, and all of these patients had bled previously.

TABLE VII.—*Effects of Previous Haemorrhage*

	D.U.	G.U.	D.U. and G.U.	Jejunal or Stomal	No Ulcer Demonstrated	Total	Deaths
Had bled previously	92	12	1	7	45	157	21 (13·4%)
Had not bled previously	148	34	4	0	133	319	45 (14·1%)
Total	240	46	5	7	178	476	66 (13·9%)

Severity of the Haemorrhage

The amount of bleeding seen by the patient or attendants gave little help in assessing the actual blood loss. The pulse rate, the haemoglobin level, and the blood pressure have generally been used in attempts to express the patient's condition and progress in an objective manner, and a study of the hourly and half-hourly pulse charts confirmed the general view that a rising or maintained fast pulse rate usually indicated further bleeding, but it showed equally clearly that to wait till the pulse reaches 120 a minute (Baker, 1947; Cecil, 1947), or even 140 a minute (Dunlop, Davidson, and McNee, 1949) before deciding that the patient is ill enough to need transfusion is to wait too long in many cases (Table VIII).

TABLE VIII.—*Maximum Pulse Rate Attained in 66 Fatal Cases*

2 (3%)	failed to reach 100 beats a minute at any time before death
30 (45%)	" " 120 " " " " " "
53 (79%)	" " 140 " " " " " "
13 (21%)	reached 140 beats a minute before death

The well-recognized fall in blood pressure occurred in many cases, but the blood pressure was often well maintained even in the presence of serious haemorrhage, and in a few cases there was a deceptive temporary rise. As observed by Avery Jones (1939), blood transfusion raised lowered blood pressures (as was intended), but not to above normal levels.

It seems that delay in haemodilution following haemorrhage detracts greatly from the value of simple haemoglobin estimation, since in the two days after admission a further fall of 10–20% often occurred unaccompanied by other evidence of bleeding. The lowest haemoglobin level reached perhaps provides some measure of the severity of the bleeding in the group as a whole: in 243 (51%) of the patients it fell to 50% (Haldane) or lower; in 87 (18.3%) it fell to 30% or lower.

Recurrent Bleeding

If the age factor was excluded little guidance regarding the ultimate outcome could be obtained at the time of admission, however carefully the patient's history and condition were assessed. But the next few days after admission supplied a more definite guide. Brisk recurrent haemorrhage after admission to hospital has been generally recognized as being of serious prognostic significance. Of the 476 patients, 124 (26%) suffered a recurrence and 51 (41%) of these died; 352 (74%) did not bleed again, and only 15 (4.25%) of this group died. Table IX gives details of the combined effects of age and recurrence of bleeding, and Table X shows that sex had little influence on the mortality in either group.

The difference between mortality in the male and that in the female recurrent group is not statistically significant.

TABLE IX.—*Effect of Age and Recurrence of Bleeding*

Age Group	Non-recurrent		Recurrent	
	No. of Cases	Died	No. of Cases	Died
<30	29	0	9	1
30–39	47	0	14	2
40–44	45	1	13	4
45–49	50	1	16	3
50–59	77	3	37	19
60–69	61	3	22	12
70–79	37	5	12	9
80+	6	2	1	1
All ages ..	352	15 (4·25%)	124	51 (41·1%)
<50	171	2 (1·2%)	52	10 (19·2%)
50+	181	13 (7·1%)	72	41 (57%)
50–69	138	6 (4·5%)	59	31 (51·5%)

Table IX shows that it is the sudden worsening in the prognosis at the age of 50 years in the recurrent group which influences the mortality figures for the whole series, because the non-recurrent group does not experience a sharp rise in mortality until 20 years later. It seems to us that the high mortality in these two decades—which

TABLE X.—*Effect of Sex and Recurrence*

Sex	Non-recurrent		Recurrent	
	No. of Cases	Died	No. of Cases	Died
Male	237	10 (4·2%)	95	35 (38·5%)
Female	115	5 (4·3%)	33	16 (48·5%)
Both sexes ..	352	15 (4·25%)	124	51 (41·1%)

are of great domestic and economic importance—shows that a critical review of the usual methods of treatment is necessary, for this age group at least. Patients over 70 showed a still higher mortality, but this is not so disquieting as in younger age groups. The mortality under the age of 50 has sometimes been considered to be negligible, but this was certainly not true here if bleeding recurred; the youngest death was in a man aged 22 who died after many recurrences.

The mortality at all ages rises abruptly as soon as there is a recurrence of the bleeding (Table IX). Other authors have considered that the risk of dying is greater if there is more than one recurrence of bleeding (Cullinan and Price, 1932; Baker, 1947; Avery Jones, 1947); our figures show the same trend, but the number of such cases in any one series is small.

The risk is not to be estimated by a comparison of the mortality rates in the "single recurrence" and the "multiple recurrence" groups, because it is not known at the time of the first recurrence whether any given patient is going to suffer a further recurrence; what is known is that he now belongs to the "total recurrent" group, and so it is by a comparison of the mortality in this group with the mortality in the "multiple recurrence" group that the physician can decide whether he will obtain a more definite indication of the danger to his patient's life if there is a further recurrence. Table XI shows that the furtner rise in mortality in the "multiple recurrence" group is relatively small (it is not statistically "significant" even in the collected total of cases) compared with the very large increase in risk which the first recurrence indicated.

Although it has long been recognized that recurrent bleeding is of grave prognostic significance, it is probably not generally realized how little is to be gained by waiting to see if there is going to be a further recurrence before considering the question of surgical intervention. The importance of recurrent bleeding is more apparent when one recalls that grave complications were present in only 11 of the 51 patients dying from recurrent bleeding as opposed to 10 of the 15 dying from a first haemorrhage; thus if we deduct these cases from each of the two groups

TABLE XI.—*Effect of Recurrence (Various Authors)*

	Single Recurrence		Multiple Recurrence		Total	
	No.	Died	No.	Died	No.	Died
Cullinan and Price (1932) ..	18	4 (22%)	21	12 (60%)	39	16 (40%)
Baker (1947) ..	151	44 (29%)	34	14 (40%)	185	58 (31·4%)
Avery Jones (1947)	46	9 (20%)	57	17 (30%)	103	26 (25·3%)
Present series ..	83	32 (38·5%)	41	19 (46%)	124	51 (41%)
Total ..	298	89 (30%)	153	62 (40%)	451	151 (33·4%)

we obtain: 5 deaths (1.45%) in 342 patients without recurrent bleeding, and 40 deaths (35.4%) in 113 patients with recurrent bleeding.

This shows that, whereas recurrent bleeding by itself often causes death, a first haemorrhage is rarely fatal in the absence of complications.

Throughout all these years blood was readily available from the blood bank and was freely used. Not all fatal cases were transfused, because, as shown earlier, some were suffering from complications which would have made transfusion merely one further hazard. But, however much blood was used, there were some patients who bled so rapidly or so persistently that it was impossible to maintain an adequate circulation.

The reason for this was obvious at necropsy, which was performed in 32 of the 66 fatal cases. In every case an ulcer was found; two had perforated and so caused death, and in 24 of the remaining 30 an eroded artery was present in the ulcer base. In addition, spurting arteries in the ulcer base were seen at operation in two patients who recovered and in one who died but did not come to necropsy.

Surgical Treatment

There is general agreement that an eroded artery of some size is commonly found in the base of the ulcer in fatal cases (Heuer, 1946; Avery Jones, 1947). Conservative treatment of bleeding from a vessel in an ulcer probably immobile through adherence to other structures seems to us to be a hazardous procedure, depending for success as it does upon the formation of enough firm adherent clot at the bleeding-point. Not infrequently arrest of the haemorrhage does occur in this fortunate manner, and the patient recovers (if he does not bleed again); but often the bleeding does not cease. Therefore the question of direct operative attack on the bleeding-point must at least be considered when it is felt that the haemorrhage may be coming from an eroded artery.

In this hospital, as in most clinics, operative treatment for bleeding peptic ulcer was undertaken only after severe long-continued bleeding (11 cases with 7 deaths), or when some complication forced the issue (4 times for severe pyloric stenosis, once for perforated duodenal ulcer—all fatal).

Obviously these results in no way reflect the surgical risk involved in operating on patients who are not in such desperate straits. The mortality rate and necropsy findings in this and other reported series show that some cases at least must be treated surgically. The most pressing problem must be the group showing the highest mortality under the present methods of treatment—namely, those

who suffer a recurrence of bleeding, especially those aged over 50 (Table IX). Other reported series agree in showing an alarmingly high mortality in the "recurrent" group (Chiesman, 1932; Cullinan and Price, 1942; Avery Jones, 1947).

For several years Finsterer (1947) has strongly advocated early operation—immediate if the patient's history makes it probable that he is suffering from a chronic peptic ulcer, but after the first recurrence if there is no such history. More recently, Tanner (1949a, 1949b) has adopted this routine. Despite the good results obtained in their hands this seems inadvisable as a general policy, because most patients who are bleeding even from a known peptic ulcer are not in danger under conservative treatment. Even in the "recurrent" bleeding group those patients already known to be suffering from a peptic ulcer fared no worse than those with no definite history: among 39 patients known to be suffering from peptic ulcer there were 15 deaths, and among 85 not known to be suffering from peptic ulcer there were 36 deaths.

Sometimes the patient is bleeding from an acute ulcer, as indeed was the case in two of the men who were treated surgically; both survived, but both had bled very alarmingly for several days before operation was decided upon; Ives (1949) quotes two similar cases. In our series death was due to recurrent haemorrhage from acute D.U. in one man and acute G.U. in two women: eroded arteries were found in the base of two of these ulcers—a finding in agreement with Heuer (1946). Therefore, although it is true that haemorrhage from an acute ulcer is less likely to prove fatal than that from a chronic ulcer, it seems that this may be only because acute ulcers are less apt to cause severe recurrent haemorrhage; but when they do so they may cause death.

Analysis of the results in the present series shows that the first recurrence of bleeding was the real warning of the grave danger which threatened these patients (Table XI). Little further information could be obtained by waiting, or at least not until an almost terminal stage, which was too late to be useful. If operation is to be done it should be carried out as soon as the patient can be resuscitated from the shock of this first recurrence. The problem arises whether the risk of operating at the time of the first recurrence on all such patients, including those who would survive if treated medically, is outweighed by the gain in operating on all those who would die without surgical intervention.

We weighed up all the available information obtained from a careful study of the case notes of the 124 "recurrent" cases and found it possible to classify the patients into three groups as regards operability at the time of the first recurrence (Table XII).

In the group with the worst prognosis—namely, the 72 "recurrent" cases aged over 50, of whom 41 (57%) died—we find that 47 were certainly operable, and 24 of these died (but in 5 of these 24 fatal cases the bleeding was so rapid that only a speedy decision to operate could have prevented death). Operation at the time of the first recurrence should improve the results in this type of case. The indications in those aged under 50 are less definite.

TABLE XII.—*Operability at First Recurrence*

Age		Group 1: Operable	Group 2: Probably Operable	Group 3: Not Operable	Total
50 plus ..	Survived	23	6	2	31
	Died	24	7	10	41
Less than 50	Survived	42	0	0	42
	Died	9	1	0	10
Total ..		98	14	12	124

The question of what operation should be done depends to a great extent on the individual case, and must be left to the discretion of the surgeon at the time of operation, but it seems that the actual bleeding-point should be removed if at all possible, and partial gastrectomy, including removal of a duodenal ulcer, seems to be the operation of choice (Ives, 1949; Tanner, 1949b). Lesser measures, such as simple oversewing of the ulcer, cannot always be relied on to stop the bleeding (Heuer, 1946; Baker, 1947; Ives, 1949). If gastrectomy with removal of the part of the duodenum containing the ulcer is done and the patient survives, his future prospects of freedom from ulcer pains, haemorrhage, or perforation should be better than if the ulcer were still present. This would apply especially to the patient with a long-standing history of persistent pain, for whom partial gastrectomy is often done even apart from any question of haemorrhage. However, these are difficult cases requiring much experience in gastric surgery, and in the weaker patients Tanner (1949a, 1949b) advises that a modified procedure be used.

When a chronic ulcer is not found it would probably be wiser to do a partial gastrectomy (Ives, 1949), at least in patients over 50, and especially if there is a long history of dyspepsia. Operation will be done only in patients who have suffered recurrent haemorrhage, and, as we have seen, eroded arteries of some size may be found in small acute ulcers.

Associated Pyloric Stenosis.—Pyloric stenosis, by which we mean not merely transient pylorospasm, was present in 25 cases (5%), and proved to be a dangerous complication, as 12 of those 25 patients died. It occurred more commonly in the higher age group (age less than 50 years—4 cases, 1 death; age over 50—21 cases, 11 deaths). Operation was carried out in nine cases because of the combination of bleeding and stenosis, and six of these patients died. Of the 16 treated without operation six died. It seems unlikely that any of the nine patients operated upon would have survived without surgical intervention. The operative mortality was high, but since operation was done on the worst cases, excluding those actually moribund, the conservative and operative treatment cannot be compared.

Baker (1947) pointed out the poor prognosis which attends a combination of pyloric stenosis and recurrent haemorrhage; the present series bears this out (see above), and it seems that this is an added indication for operation at the time of the first recurrence.

Surgical Consultation

It has been suggested that cases of gastro-duodenal haemorrhage should be admitted direct to a surgical ward, but this view is not likely to gain general support, because in the majority of cases there is never any question of necessity for surgical treatment; moreover, medical wards are usually quieter and more restful than surgical wards, and quiet surroundings are important in the treatment of bleeding from peptic ulcer. But it is necessary to avoid delaying consultation with the surgeon until the patient is in a very weak state and appears about to die fairly soon under continued medical treatment. Surgical consultation should not automatically mean that an operation will be done. A reasonable arrangement, which would ensure that the surgeon's time is not wasted in seeing many patients unnecessarily, but which would enable him to see at an early stage those in whom operation must be

considered, would be to regard the first recurrence of bleeding in all cases, below 50 years of age as well as above, as an indication for joint medical and surgical consultation on immediate treatment. Furthermore, such a definite plan would make it possible to deal promptly with those patients who bleed rapidly at the time of the first recurrence.

Summary and Conclusions

An analysis of the case notes of the 476 patients admitted to the medical wards of the Aberdeen Royal Infirmary on account of haematemesis and/or melaena from peptic ulcer during the years 1941–8 inclusive is presented. Reference is made to some of the publications on this subject.

Sixty-six patients died: this mortality of 13.9% probably represents that obtained in most general hospitals; therefore many patients still die from this complication of peptic ulcer.

In the 298 cases in which the ulcer site was known, duodenal ulcer was found to be five times more common than gastric ulcer.

The difficulties in deciding whether the bleeding is coming from an acute or from a chronic ulcer are discussed. The risk of death from bleeding from an acute ulcer is less than when the bleeding is coming from a chronic ulcer, but is by no means negligible.

There was a sudden marked increase in the mortality at the age of 50; the next sharp rise did not occur until 70; 53% of the patients were over 50.

The mortality rate was not higher in the group of patients who gave a history of one or more previous haemorrhages.

It was difficult to judge the degree of the severity of the bleeding. The hourly pulse chart was a useful guide, but in many patients who died the pulse rate never reached even 120, much less the 140 beats a minute often considered to be an indication for starting blood transfusion.

Recurrent haemorrhage after admission to hospital was the most reliable warning of the serious nature of the bleeding in all age groups, the risk of dying being eight to ten times greater in the recurrent group. An eroded artery in the base of an ulcer is usually the source of this type of haemorrhage.

The limitations of medical treatment and the possibility of employing surgical measures for recurrent bleeding are considered, and it is concluded that surgical treatment is indicated in the majority of patients aged over 50 who suffer a further haemorrhage after admission to hospital.

A scheme for close co-operation between physician and surgeon over these cases is suggested.

We are indebted to Dr. R. J. Duthie, Dr. Ian Gordon, and Professor H. W. Fullerton for permission to make use of the case records from the medical wards.

REFERENCES

Andresen, A. F. R. (1939). *Amer. J. digest. Dis.*, **6**, 641.
Baker, C. (1947). *Guy's Hosp. Rep.*, **96**, 1.
Burger, G., and Hartfall, S. J. (1934). Ibid., **84**, 197.
Cecil, R. L. (1947). *A Textbook of Medicine*, p. 797. Saunders, Philadelphia.
Chiesman, W. E. (1932). *Lancet*, **2**, 722.
Cullinan, E. R., and Price, R. K. (1932). *St. Bart's Hosp. Rep.*, **65**, 185.
Dunlop, D. M., Davidson, L. S. P., and McNee, J. W. (1949). *Textbook of Medical Treatment*, p. 544. Livingstone, Edinburgh.
Finsterer, H. (1947). *Wien. med. Wschr.*, **97**, 3.
Gordon-Taylor, G. (1937). *Brit. J. Surg.*, **25**, 403.
Heuer, G. J. (1946). *New Engl. J. Med.*, **235**, 777.
Hurst, A. F., and Ryle, J. A. (1937). *Lancet*, **1**, 1.
Ives, L. A. (1949). Ibid., **2**, 644.
Jamieson, R. A., Smith, W. E., and Scott, L. D. W. (1949). *British Medical Journal*, **1**, 298.
Jones, F. Avery (1939). Ibid., **1**, 915.
—— (1947). Ibid., **2**, 441, 477.
Lewin, D. C., and Truelove, S. (1949). Ibid., **1**, 383.
Meulengracht, E. (1939). Ibid., **2**, 321.
Rafsky, H. A., and Weingarten, M. (1942). *J. Amer. med. Ass.*, **118**, 5.
Schanke, K. (1946). *Acta chir. scand.*, **94**, Suppl. 115.
Smith, D. (1945). *Glasg. med. J.*, **26**, 129.
Tanner, N. C. (1949a). *British Medical Journal*, **1**, 110.
—— (1949b). *Lancet*, **2**, 1135.
Thorstad, M. J. (1942). *Surgery*, **12**, 964.

HAEMORRHAGE FROM PEPTIC ULCER

A REPORT ON 170 CASES

BY

A. G. OGILVIE, M.D., F.R.C.P.

AND

I. O. B. SPENCER, M.B., M.R.C.P.

(From the Royal Victoria Infirmary, Newcastle-upon-Tyne)

The general trend of mortality from gastro-duodenal haemorrhage has fluctuated considerably since the beginning of the century. Mortality was relatively low at 4% to 7% during the first 20 years, but from 1920 to 1935 the reported figures showed a rise to 25%. More recently there has been a general fall to a level of 8% or below. The explanation of these variations has been considered in detail by Avery Jones (1947), to whose writings reference is advised.

The recent decline in mortality is generally attributed to the introduction of drip-transfusion by Marriott and Kekwick (1935), to the wider recognition of the need of these patients for an adequate fluid intake, and to the abandonment of complete starvation as a routine treatment. Lewin and Truelove (1949), however, seemed to sound a note of alarm. They reported a mortality of 16.6% in a series of 252 cases of haemorrhage from peptic ulcer admitted to the Radcliffe Infirmary over a period of 10 years (1938–47), and speculated on the advisability of gastrectomy as a prophylactic measure in patients of middle age with a known peptic ulcer.

The cases which we wish to record include all patients with gastro-duodenal haemorrhage encountered over a period of seven years (1941–8). This period is not a selected one; it is simply the time during which the wards concerned have been under the charge of one of us (A. G. O.).

The clinic serving these wards is a general medical clinic in a teaching hospital, and if it has a bias this is not in favour of gastro-enterology. Gastric cases receive ordinary and careful treatment (we believe), but no claim to any special interest or experience in this type of case is made. To our treatment of peptic haemorrhage the same remarks apply, and yet we have not found that this complication holds any remarkable terrors.

The general line of treatment may be briefly summarized. Morphine is administered on admission as a general rule and 6-oz. (170-ml.) milk feeds are given every two hours. Fluid by mouth is encouraged in addition to this, and little difficulty has been experienced in maintaining an adequate intake by this route. Magnesium trisilicate is given only if the patient complains of pain. A routine daily dose of 150 mg. of ascorbic acid was given (this was later increased to 500 mg). Iron is administered at a later stage if required for anaemia.

The criteria of the need for blood transfusion have been two in number—the hourly pulse rate and our personal assessment of the patient's condition and progress. The blood pressure and the haemoglobin level have been taken into account, but have not been allowed to deflect our judgment. The necessity for maintaining an adequate haemoglobin level as a condition of general recovery and local healing, as emphasized by Avery Jones, has been recognized. A study of the cases in retrospect has shown a tendency for transfusion to be employed more often in the treatment of those patients with low haemoglobin levels and low blood pressure, but patients with normal or slightly subnormal readings were among those in whom transfusion was regarded as necessary. Out of 170 cases 42 were treated by transfusion, or roughly one in every four.

Surgery was only occasionally employed. Only two patients were treated surgically on account of bleeding, though after recovery seven were operated on because of pyloric stenosis or large chronic ulcer. Surgical treatment on an extensive scale has recently been advocated (Tanner, 1949), but we feel that the mortality figures given do not compare favourably with our own or with other reported series treated mainly by medical means.

Diagnostic Criteria (Table I)

Every patient gave a clear history of the vomiting of bright or altered blood and/or the passage of definitely melaenatous stools. Cases in which the amount of blood lost was evidently small have been omitted. The diagnosis of peptic ulcer was based on a careful consideration of the history and on the general examination. Radiological examination was carried out in only 71 cases out of the 170, owing to the limitations imposed by wartime conditions. The results in these 71 cases are given in Table II.

TABLE I.—*Diagnostic Criteria in 170 Cases of Haemorrhage from Peptic Ulcer*

Criterion	Gastric Ulcer	Duodenal Ulcer	Site Uncertain	Total
Radiology ..	8	16	0	24
Operation ..	3	8	0	11
Necropsy ..	2	0	0	2
Clinical ..	0	0	133	133
Total ..	13	24	133	170

Note.—All the ulcers diagnosed radiologically or by other means were chronic ulcers, with one exception. Certain cases diagnosed radiologically were later operated on, the diagnosis being confirmed. These have been included under the head of "operation."

TABLE II.—*Radiological Diagnosis in 71 Cases of Haemorrhage from Peptic Ulcer*

Duodenal ulcer	16
Gastric ulcer	11
No abnormality	44

The length of the digestive history is shown in Table III. It will be observed that patients with a long history of indigestion predominated (more than five years in over half of the cases). It would not be right to assume, however, that this implies an equivalent preponderance of chronic ulceration. The age and sex distribution of our cases is shown in Table IV; and in Table V a comparison is made with the series of Avery Jones and of Lewin and Truelove.

TABLE III.—*Length of Digestive History*

Duration	No. of Cases
Less than 3 months	41 (20·6%)
3 months to 5 years	34 (23·5%)
Over 5 years (average 17·1 years)	95 (55·9%)

TABLE IV.—*Age and Sex Distribution in Present Series*

Age in Years	Males	Females	Deaths
Under 30	14 (8·2%)	6 (3·5%)	0
30–39	21 (12·4%)	7 (4·1%)	0
40–49	34 (20·0%)	17 (10·0%)	1
50–59	28 (16·5%)	16 (9·4%)	1
60–69	11 (6·5%)	13 (7·6%)	0
70 and over	2 (1·2%)	1 (0·6%)	2
Total ..	110 (64·8%)	60 (35·2%)	4

Note.—It is clear that the sex ratio is much the same as in other reported series.

TABLE V.—*Comparison with Other Series*

Age in Years	Present Series		Avery Jones		Lewin and Truelove	
	No. of Cases	Percentage of Deaths	No. of Cases	Percentage of Deaths	No. of Cases	Percentage of Deaths
Under 30 ..	20	0	40	2·5	20	0
30–39 ..	28	0	81	1·2	37	5·4
40–49 ..	51	2·0	146	4·1	58	6·9
50–59 ..	44	2·3	145	5·5	69	21·7
60–69 ..	24	0	108	12·5	46	30·8
70 and over ..	3	66·7*	75	21·3	22	31·8
All ages ..	170	2·4	615	7·8	252	16·6
Under 60 ..	143	1·4	412	3·9	184	11·4
Over 60 ..	27	7·4	203	15·6	68	30·9

* This value is not significantly different from the percentages of the other two series—that is, 2 deaths from 3 cases could occur by chance when the percentage fatality was either 21·3 or 31·8.

The Four Fatal Cases

Case 1.—A man aged 72 gave a 14-years history of intermittent epigastric pain, occurring three-quarters of an hour after meals and during the night. He had had an occasional vomit, but this had always been small in amount. He had lost 2 st. (12.7 kg.) in weight gradually over the two years prior to admission. Ten days before admission he vomited about a pint (570 ml.) of black fluid during a bout of severe pain. On the day of admission he vomited fresh blood. On examination his general condition was quite good. His pulse was 96 and his blood pressure 110/80; he was not obviously dehydrated, and no abnormality could be made out on cautious examination of the abdomen. He was treated on the general lines already mentioned, and his condition remained satisfactory, except for a single vomit of bile-stained fluid, until the fourth day after admission, when he died suddenly. Unfortunately permission for necropsy could not be obtained. Death was thought to have been caused by a coronary thrombosis.

Comment.—Coronary thrombosis is a recognized complication of haematemesis, but it is difficult to see how it could have been prevented in this case.

Case 2.—A man aged 77 had suffered perforation of a duodenal ulcer 30 years previously, and gastro-enterostomy had been performed. There was no history of any indigestion since that time, and in August, 1948, he was apparently in good health. He then vomited a "large" amount of blood, and was at once admitted to hospital. He was found to be wasted (weight 8 st. 9 lb. = 55 kg.) and dehydrated, but apart from this was in fairly good general condition (pulse 90, blood pressure 110/80, haemoglobin 109%). On the day after admission he vomited several times, but the vomitus contained no blood. One pint of saline and 2 pints (1.14 litres) of plasma were infused, but his condition deteriorated, and he died on the third day after admission. At necropsy an acute gastric erosion, pulmonary atheroma and anthracosis, and dilatation of the right ventricle were the only abnormal findings. Death was thought to have been caused by myocardial insufficiency and peripheral circulatory failure. There was no indication that the infusion had played any significant part in the fatal issue.

Comment.—This man was old and debilitated, and we think that these were the main factors preventing recovery from a haemorrhage which in itself was not particularly severe. Death was regarded as inevitable.

Case 3.—A woman aged 49 gave an eight-months history of abdominal pain, radiating to the left shoulder, occurring after meals and during the night. On March 4, 1946, while shopping, she vomited bright red blood, and a further haematemesis occurred after she reached home. On admission to hospital her general condition was found to be good. Transfusion did not seem to be required. She progressed satisfactorily on dietetic treatment until March 17, when a third haemorrhage took place necessitating a transfusion of 2 pints of blood. Three days later her haemoglobin level was 68%, and she seemed to be fit for operation. Surgical advice was sought on account of the repeated haematemesis, and laparotomy was performed on March 22, but no abnormality was discovered. Three days after operation a further bleeding occurred, and in spite of blood transfusion she died following a sudden collapse two days later. Necropsy showed a chronic gastric ulcer adherent to the pancreas, with an eroded artery in its base. A large amount of blood was present in the intestinal tract.

Comment.—This woman died of haemorrhage. The decision to operate was justified by the findings at necropsy and by the eventual fatal outcome. The patient was in good condition at the time of the operation, and had the ulcer been found she might well have been alive to-day.

Case 4.—A man aged 57 was admitted to a surgical ward on account of indigestion. A blood examination showed a red cell count of 5,000,000 per c.mm. and a haemoglobin percentage of 95. Next day he vomited bright red blood, and was transferred to the medical side. Further haematemesis occurred during the succeeding 48 hours, and he died on the fifth day after admission. Transfusion was carried out on the day of death, but without effect. Permission for necropsy was not obtained.

Comment.—The treatment in this case is open to criticism. Transfusion was too long delayed and no surgical opinion was sought. When the case is surveyed in retrospect it seems clear that prompt and adequate transfusion followed by operation would probably have saved the patient's life.

Discussion

The series is not a very large one, but it must be remembered that the cases were spread over seven years. The mortality has been very low over this period, and might have been even lower, as a study of our four fatal cases shows that in two of them errors of judgment were made.

The comparison of one series of haemorrhages from peptic ulcer with another is difficult and full of pitfalls, and it is perhaps tempting to avoid it by simply stating the results and leaving the conclusions to the reader. As, however, our object in reporting these cases has been to advance the conclusion to which our experience has led us—namely, that these patients can be successfully treated in an ordinary medical ward—we feel that such a comparison must be attempted.

Any series with a low mortality, such as ours, is open to four main suggestions or criticisms. First, that there may be an excess of females, with their lower mortality. This is disproved by the figures in Table IV, which show that our sex ratio is almost exactly that of Avery Jones, with his 615 cases. Secondly, it may be suggested that our low death rate may be due to the fact that we have met with a somewhat younger age group than either Avery Jones or Lewin and Truelove. We have, however, analysed our cases in age groups, and the mortality is seen to be lower in each age group than in either of the two quoted series, with the exception of the "over 70" group. The numbers here are, however, too small for conclusions to be drawn.

Thirdly, a much more serious criticism may be advanced. Avery Jones's figures show that the mortality of haemorrhage from chronic peptic ulcer is seven times that of the bleeding acute ulcer (12.3% as against 1.8%). Here our relative lack of radiological and complete lack of gastroscopic evidence may seem to be a grave defect. It has, for instance, prevented a reliable classification of our cases into acute and chronic ulceration. We regard the criterion of mere duration and periodicity, used by Lewin and Truelove, as insufficiently reliable. The only way in which accurate classification can be made is by the full investigation of each case as carried out by Avery Jones.

We see no reason why the incidence of acute ulcers in our series should differ widely from that of Avery Jones, but we cannot deny the possibility that we encountered a high proportion. This, however, does not in our view affect our main thesis as stated above. We have, after all, proved 36 chronic ulcers, in one way or another, as shown in Table I. (At necropsy one of our fatal cases showed an acute ulcer.) These 36 cases included one fatal case, and we are left with one known fatal acute ulcer and two fatal cases with no necropsy out of the remaining 134 cases. Even were we to suppose that all our unproved cases had bled from an acute ulcer, a hitherto unparalleled incidence, the mortality remains satisfactory (3% for chronic ulcers and 2.3% for acute ulcers).

The fourth and final criticism which we have to anticipate is that our series included an unduly large number of duodenal ulcers. Avery Jones has shown that the mortality of bleeding duodenal ulcers is only half that of the chronic gastric ulcers which bleed. It is indeed likely that this is so. The incidence of duodenal ulcer is much higher in the North of England than it is in London and the South. Strang and Spencer (1950), in a study of perforated ulcers admitted in one year to the Royal Victoria Infirmary, Newcastle-upon-Tyne, noted 145 duodenal ulcers and 43 gastric ulcers in 189 cases, a ratio of 3.4:1. A study of reported figures for London and the South shows that the incidence there is roughly equal, approaching 1:1.

Here again, however, the main argument regarding the mortality achieved in a general medical ward remains unaffected. We proved, in one way or another, as shown in Table I, 13 gastric and 24 duodenal ulcers, and we know that two of our fatal cases bled from gastric ulcers. Again making the most unlikely supposition that all our "unproved" cases bled from duodenal ulcers, we obtain a mortality of 15.4% for gastric ulcers and a mortality of 1.3% for duodenal ulcers, to set against the figures of 20% for chronic gastric ulcers and 9% for duodenal ulcers given by Avery Jones.

The *reductio ad absurdum* method of argument can of course be criticized. But, given our regrettable and unavoidable lack of radiological and gastroscopic evidence, we feel that no other method was open to us.

The series suggests that surgery has a small though important part to play in treatment. It is, however, essential that when necessary it must be utilized in good time. When it is clear that haemorrhage is continuing, or is recurrent, the surgeon must at once be called. He must of course be presented with a patient in reasonably good condition and with a haemoglobin of over 70%, or as near 70% as possible. It is unfair to ask a surgeon to operate on an anaemic wreck, thus forcing him to a hurried survey of the abdomen and a hasty operation.

We can see little indication that prophylactic gastrectomy is likely to reduce the mortality of a possible complication which in itself has a mortality as low as, if not lower than, that of the operation designed to prevent it.

The essentials of medical treatment seem to be replacement of fluid loss by mouth, regular fluid and thickened feeds at frequent intervals, and prompt, adequate, and accurately timed transfusion. This entails active observation and careful supervision of all cases; but it does not seem to call for very unusual skill or facilities. We have been impressed by the value of the hourly pulse chart, maintained for at least a week after cessation of bleeding, and by the need for frequent and regular consideration of the patient's general condition, if transfusions are to be timed and controlled properly.

We have admitted one medical failure, but submit that one failure in 170 cases in a period of seven years does not invalidate our claim that the ordinary medical ward is a suitable place for the treatment of haemorrhage from peptic ulcer. The other failure was surgical in the sense that the ulcer was not found at operation. We cannot judge of the advisability of gastrotomy in such a case, but to us the argument in favour of partial gastrectomy, even in the absence of a palpable ulcer, is supported by this example.

The opportunities which these cases provide for the teaching of students and the training of house-physicians seem to be an additional argument in favour of continuing the present practice of admitting the cases to general medical wards.

Avery Jones has emphasized the advantages of the concentration of all gastro-enterological emergencies into special wards as a means of reducing mortality. We are here concerned only with haemorrhage from peptic ulcer, but as our experience has not lent support to a widespread adoption of such a system we have felt obliged to report it.

The value of special gastro-enterological clinics is not in dispute. The work of Avery Jones and others is in itself a demonstration of it. We feel, however, that such clinics should be centres of research over the whole field of gastro-enterology and of the treatment of cases requiring special skill and facilities, and that the concentration of all gastro-enterological emergencies into special wards would be a mistake.

Finally, we believe that the figures presented show that haemorrhage from peptic ulcer is not the highly dangerous condition it is sometimes thought to be. In fact, we would contend that, with a few exceptions, patients under the age of 70 who bleed from a peptic ulcer should recover. Whenever a death occurs in a patient under this age it should stimulate a critical inquiry. If this were done, we think it would be found that the treatment was faulty in one or more respects, as we ourselves have discovered in two out of our four fatalities.

Summary and Conclusions

A series of 170 cases of haemorrhage from peptic ulcer with an overall mortality of 2.4% is reported. Although in the majority radiological evidence of the site and chronicity of the ulcers was lacking, the mortality was found to be low enough to compare favourably with other reported series, even if all our "unproved" cases are assumed to have been acute or duodenal ulcers with their generally accepted high recovery rate.

The patients were treated in a general medical clinic where the bias of interest was not in favour of gastro-enterology.

The treatment given was replacement of fluid loss by mouth (except in the occasional case in which special circumstances compelled the use of the intravenous route), regular fluid or semi-solid feeds at frequent intervals, and blood transfusions as and when required. Ascorbic acid was given as a routine, but magnesium trisilicate powder was given only to relieve pain, which it usually did.

There were only four deaths in the series, and of these two might possibly have been prevented. One was a medical failure, the other a surgical failure. Nevertheless, these results are regarded as a vindication of the general medical ward as a suitable place for the treatment of gastro-duodenal haemorrhage.

There were only two inevitable deaths in 170 cases: it is considered that this fact constitutes an argument against prophylactic operations.

It is suggested that whenever a patient under the age of 70 dies from peptic haemorrhage a critical review of the treatment is indicated.

The treatment demands strict attention to detail and close and continuous observation of the individual patient, but special experience and facilities are not essential.

The indications for blood transfusion used were the hourly pulse rate and a personal assessment of the patient's condition and progress.

Surgical aid was invoked on only two occasions, though it is now realized that in a third case an operation was indicated and might well have saved the patient's life. Of the two patients treated by operation, one recovered and one died.

We gratefully acknowledge the invaluable assistance given by Dr. C. Strang and by a succession of energetic and competent house-physicians in the medical treatment of the patients, and also the work of the late Sister M. Andrews, who was responsible for the nursing throughout the relevant period. We are also indebted to Dr. C. Strang and Dr. D. Maclean for their help in the not inconsiderable labour entailed in the analysis of the case records, and to Dr. W. J. Martin for statistical assistance.

References

Jones, F. Avery (1947). *British Medical Journal*, 2, 441, 477.
Lewin, D. C., and Truelove, S. (1949). Ibid., 1, 383.
Marriott, H. L., and Kekwick, A. (1935). *Lancet*, 1, 977.
Strang, C., and Spencer, I. O. B. (1950). *British Medical Journal*, 1, 873.
Tanner, N. C. (1949). Ibid., 1, 110.

VALUE OF TUBERCULIN-JELLY TEST

BY

W. POINTON DICK,* M.R.C.S., L.R.C.P.

(From the Tuberculosis Research Unit, Medical Research Council)

The tuberculin-jelly test to determine tuberculin sensitivity has gained considerable support in this country and abroad. It has been used in mass immunization campaigns to select persons suitable for vaccination with B.C.G. Its great advantage over the Mantoux test is that no injection is involved. In addition, its application is so simple that this can be entrusted to a wide range of personnel.

In the past, estimates of the equivalent of the jelly test in terms of old tuberculin injected intradermally have varied from concentrations of 1 in 50,000 to 1 in 100 (Wolff, 1934; Kereszturi, 1941; Holm and Holm, 1943; Grozin, 1943; Paterson, 1944; Climie, 1945). Doubts of the reliability of the test having been expressed, the following investigations were undertaken in order to find a type of jelly and a technique which would give a sufficiently high degree of accuracy and sensitivity in terms of the established Mantoux test. Part of this work was done prior to the Medical Research Council's Tuberculin Survey (now being completed). The technique subsequently used throughout the Survey was based on the findings reported here.

Three tuberculin jellies were compared. Each was made up with a tragacanth base and enough glycerin to bring the total concentration of the latter in the jelly to 40–50%. The first jelly contained 0.2% of purified protein derivative (P.P.D.)†; this concentration was chosen so that the jelly should be approximately equal in tuberculo-protein content to undiluted old tuberculin. The second jelly contained 60% of old tuberculin (O.T.) v/w, and the third 85% of O.T. v/w.

Techniques

Original Technique.—The skin over the interscapular region was cleansed by vigorous rubbing with acetone on cotton-wool and allowed to dry. Tuberculin jelly was then applied from a collapsible tube to the prepared area of skin to form a V with arms about 2 cm. in length and 2–3 mm. in width. This was covered with a strip of adhesive plaster measuring about 2 by 1 in. (5 by 2.5 cm.), and with its long axis parallel to the spine. The examinee

*Seconded from the service of the North-west Metropolitan Regional Hospital Board.

†I am indebted for the supply of this tuberculin to the Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, Surrey.

was instructed to remove the plaster after 48 hours and the test was read on the following day. This method will be referred to as the original technique.

Modified or Flourpaper Technique.—Deane (1946) modified the original technique by rubbing the skin with sandpaper after the cleansing with acetone and before application of the jelly. It has been found, however, that the grade of sandpaper, "O," recommended is too abrasive and can cause very severe reactions in persons with a high degree of sensitivity to tuberculin and with delicate skins. A type of fine abrasive paper, termed "flourpaper" in the trade, has therefore been substituted in the present work. This was used in 1-in.-wide strips, six *gentle* strokes being given. A new piece of flourpaper was used for each test.

Comparisons were made between the original and the flourpaper techniques and between the three types of jelly, the more promising being measured against intradermal O.T. Where two jelly tests were compared they were applied one on each side of the spine of each person examined. At the time of the reading of the tests one side would remain covered while the other was read. The tests were read 24 to 48 hours after the removal of the plaster—that is, 72 to 96 hours after the application of the jelly. Erythema was ignored. Four or more vesicles at the site of application of the jelly were read as a positive reaction. Less vesiculation was read as a doubtful reaction and classified as negative.

Evaluation of Flourpaper Technique

Comparisons of Jelly Tests With and Without Flourpaper

A total of 350 school-children aged 11 to 15 and 524 aged 14 to 19 received two tests, using the P.P.D. jelly. In one test the original technique was used, in the other flourpaper was applied as described above. On a further 339 children aged 11 to 15 and 338 aged 13 to 18 similar tests were performed, but using 60% O.T. jelly. The results of these tests are given in Table I. They show the marked increase in the number of positive reactions that were obtained following the use of flourpaper. With the P.P.D. jelly the number of positive reactions after the test with the original technique was in one group only 21% and in another group only 9% of the number obtained with the flourpaper technique. With the O.T. jelly the corresponding figures were 38% and 42%. All four differences were statistically highly significant.

From these results it was evident that preparation of the skin with flourpaper greatly increased the number of positive reactions obtained. It was essential to determine if these were true tuberculin reactions or false positives attributable solely to the abrasion.

TABLE I.—*P.P.D. and O.T. Jelly, With and Without Flourpaper*

Age in Years	No. Examined	Test A, with Flourpaper		Test B, without Flourpaper		Positives to B as Proportion of Positives to A
		Jelly Used	No. Pos.	Jelly Used	No. Pos.	
11–15	350	P.P.D. 2 mg./g.	62 (18%)	P.P.D. 2 mg./g.	13 (4%)	21%
14–19	524	,,	139 (27%)	,,	13 (2·5%)	9%
11–15	339	O.T. 60%	71 (21%)	O.T. 60%	27 (8%)	38%
13–18	338	O.T. 85%	197 (58%)	O.T. 85%	82 (24%)	42%

Note.—There were no cases giving a positive reaction to Test B but a negative reaction to Test A.

Comparison of Modified Jelly Test With Intradermal Test

Comparisons were now made between the modified jelly test, using flourpaper, and the Mantoux test, to check for the presence of false positive reactions and to assess the value of the flourpaper test in terms of the intradermal. The jelly test and the intradermal test were read by separate observers who had no knowledge of the result of the test they were not recording. The standard for a positive intradermal test was taken as 5 mm. or more of oedema after 72 hours. These results are shown in Tables II and III.

From Table II it would seem that, using flourpaper, the P.P.D. jelly is approximately equivalent, between the ages of 5 and 20, to an intradermal injection of 0.1 ml. of O.T. of strength 1 in 10,000, while the 60% O.T. jelly, using flourpaper, is equivalent to intradermal O.T. of strength 1 in 1,000.

TABLE II.—*Comparison Between Flourpaper Technique and Intradermal O.T.*

Age in Years	No. Examined	Test A, Mantoux		Test B, Jelly with Flourpaper		Positives to B as Proportion of Positives to A
		Strength of O.T.	No. Pos.	Jelly Used	No. Pos.	
5–7	219	1/1,000	10 (4·5%)	P.P.D. 2 mg./g.	8 (3·5%)	80%
8–10	279	1/1,000	39 (14%)	,, ,,	28 (10%)	72%
11–15	630	1/1,000	96 (15%)	,, ,,	79 (13%)	82%
15–20	143	1/10,000	44 (31%)	,, ,,	43 (30%)	98%
11–15	223	1/1,000	69 (31%)	O.T. 60%	66 (30%)	96%
15–20	124	1/1,000	46 (37%)	O.T. 60%	44 (35%)	96%

The 11 persons (Table III) who gave a positive reaction to the jelly test and a negative reaction to the intradermal test were retested with intradermal O.T. of strength 1 in 100. Nine were positive and two were negative. There were thus two apparently false positives by intradermal standards among a total of 224 positive to the modified jelly test—that is, rather less than 0.9%. It is fair to conclude that the great increase in positive reactions with the flourpaper technique as compared with the original jelly technique was a true increase of specific tuberculin reactions. This increase greatly enhances the value of

TABLE III.—*Detailed Results*

Age in Years	No. Examined	Tests Used	Jelly Neg., Intradermal Neg.	Jelly Pos., Intradermal Pos.	% with Identical Results	Jelly Neg., Intradermal Pos.	Jelly Pos., Intradermal Neg.	Retest Last Column with O.T. 1/100
5–7	219	P.P.D. jelly / O.T. 1/1,000	209 (95%)	8 (4%)	99%	2 (1%)	—	—
8–10	279	P.P.D. jelly / O.T. 1/1,000	240 (86%)	28 (10%)	96%	11 (4%)	—	—
11–15	630	P.P.D. jelly / O.T. 1/1,000	531 (84%)	76 (12%)	96%	20 (3%)	3 (0·5%)	Pos. 2; neg. 1
15–20	143	P.P.D. jelly / O.T. 1/10,000	94 (66%)	38 (27%)	92%	6 (4%)	5 (3%)	Pos. 5
11–15	223	O.T. (60%) jelly / O.T. 1/1,000	151 (68%)	63 (28%)	96%	6 (2·5%)	3 (1·5%)	Pos. 2; neg. 1
15–20	124	O.T. (60%) jelly / O.T. 1/1,000	78 (63%)	44 (35%)	98%	2 (1·5%)	—	—

the jelly test as a sieve to be used before proceeding to an intradermal test with O.T. of strength 1 in 100. If the original technique were used then a number of persons who would be positive to the flourpaper technique and yet have a relatively high sensitivity would give a negative reaction. On retesting these persons with O.T. 1 in 100 some extremely severe reactions might result.

The next step was to determine whether overuse of the flourpaper would produce any false positive reactions. With this in view, 327 children, aged 11–15, had two tests using flourpaper. In the second test the flourpaper was grossly overused. The results (Table IV) show that there was 99% agreement between the tests. Two persons who gave a negative reaction with the normal technique had a positive reaction to the overuse of the flourpaper. These were retested with intradermal O.T. strength 1 in 1,000. One was positive to this test and one was negative.

TABLE IV.—*Overuse of Flourpaper*

Age in Years	No. Examined	Negative Both Tests	Positive Both Tests	Pos. Normal Flourpaper; Neg. Overuse Flourpaper	Neg. Normal Flourpaper; Pos. Overuse Flourpaper
11–15	327	264 (81%)	59 (18%)	2 (0·5%)	2 (0·5%)

It should be noted that these tests were carried out by an experienced observer. In the hands of one less experienced there is a definite risk of false positive readings if the flourpaper be overused. For this reason it is essential to apply a control jelly, also using flourpaper, until reactions—e.g., scoring or abrasion, due to over-rubbing—are readily recognized.

Comparison of the Three Jellies Used

Two final comparisons, flourpaper being used, were now made. The P.P.D. jelly was compared with the 60% O.T. jelly, and the 60% O.T. jelly was compared with the 85% O.T. jelly. The results are given in Tables V and VI, and show (1) the marked superiority of the O.T. jelly over the P.P.D. jelly, and (2) that no advantage was gained by increasing the strength of the O.T. jelly from 60% to 85%.

TABLE V.—*Comparison Between P.P.D. Jelly and 60% O.T. Jelly*

Age in Years	No. Examined	Test A, with Flourpaper		Test B, with Flourpaper		Positives to B as Proportion of Positives to A
		Jelly Used	No. Pos.	Jelly Used	No. Pos.	
11–15	348	O.T. 60%	122 (35%)	P.P.D. 2 mg./g.	76 (22%)	62%

Note.—There were no cases giving a positive reaction to Test B but a negative reaction to Test A.

TABLE VI.—*Comparison Between 60% O.T. Jelly and 85% O.T. Jelly*

Age in Years	No. Examined	Negative Both Tests	Positive Both Tests	Positive O.T. 60%; Negative O.T. 85%	Negative O.T. 60%; Positive O.T. 85%
11–15	233	191	42	0	0

In the comparative tests between 60% O.T. jelly and 85% O.T. jelly agreement was complete; this also applied to the type and extent of the reactions from the two jellies in each individual tested. It is difficult to account for the superiority of the 60% jelly over the P.P.D. jelly, which was approximately equal in tuberculo-protein content to undiluted O.T. Differences in the physical characteristics of the two tuberculins may be responsible, P.P.D. being less easily absorbed through the skin, particularly when this is intact. Various substances, including lipoids, which are retained during the preparation of O.T. but excluded from P.P.D., could be expected to assist absorption. It is of interest that confirmation of this difference between the two jellies has been obtained at the Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, by Paterson (1950—personal communication) working with guinea-pigs. It must be stressed, however, that, when presented intradermally, P.P.D. gives similar results to O.T. of similar tuberculo-protein content.

Conclusions

The flourpaper technique described greatly increases the sensitivity of the tuberculin jelly test and extends its usefulness to include persons up to the age of 20 years. With an experienced observer there is little or no risk of false positive readings with the overuse of the flourpaper, but, until experience has been gained, a control flourpaper–jelly application is essential.

Where it is proposed to use the jelly test as a sieve before proceeding to an intradermal test with O.T. of strength 1 in 100 it is advisable to employ the flourpaper technique. Otherwise some extremely severe reactions to the intradermal test may result.

Using the flourpaper technique and a jelly containing 60% O.T., the proportion of positive reactions obtained will closely approximate, in the age group 5–20, to those obtained using intradermal international standard strength O.T. of dilution 1 in 1,000.

Using the methods and formulae described, O.T. is to be preferred to P.P.D. as the active component of the jelly.

The present method offers an alternative to the Mantoux test when this is contraindicated.

I wish to thank Dr. H. H. Green, of the Veterinary Laboratory, Weybridge, for his technical advice, particularly in regard to the tuberculo-proteins, and Professor A. Bradford Hill for his advice on the statistical aspects of this paper. Messrs. Allen and Hanburys very kindly prepared and supplied the tuberculin jellies used in the investigation.

Addendum

Notes on the Reading of the Test.—This should be done 24 to 48 hours after the removal of the plaster—that is, 72 to 96 hours after application. The longer period will give any pseudo-positive reactions time to fade and any delayed positives time to appear. In reading the test erythema should be ignored. A positive reaction will show vesiculation at the site of application of the jelly. There may be coalescence of the vesicles to form a V-shaped or heart-shaped area of induration. Fewer than four vesicles should be considered to indicate a doubtful positive, and either the test should be repeated or an intradermal test with O.T. 1 in 1,000 performed. Scoring of the skin is an indication of overuse of the flourpaper and can cause confusion in the reading of the test. For this reason it is essential, until the observer has become familiar with these reactions, that a control jelly, with flourpaper, should be applied to the opposite side of the spine.

REFERENCES

Climie, H. (1945). *Brit. J. Tuberc.*, **39**, 61.
Deane, E. H. W. (1946). *Lancet*, **1**, 162.
Grozin, M. (1943). *Amer. Rev. Tuberc.*, **48**, 241.
Holm, J., and Holm, M. (1943). *Ugeskr. Læg.*, **105**, 1256.
Kereszturi, C. M. (1941). *Amer. Rev. Tuberc.*, **44**, 94.
Paterson, D. (1944). *British Medical Journal*, **1**, 531.
Wolff, E. (1934). *Amer. J. Dis. Child.*, **47**, 764.

In token of their appreciation of gifts from overseas to old and distressed chemists, the Pharmaceutical Society of Great Britain has sent 100 guineas to the Lord Mayor's Thanksgiving Fund.

DIETARY TREATMENT OF HYPERTENSION

BY

H. UCKO, M.D.

Until recently there was a general consensus that hypertension was not benefited by diet unless it was due to or accompanied by renal disease or obesity. Kempner (1944a, 1944b, 1945, 1946, 1948) produced evidence that a diet consisting of rice, fruit, and sugar without the addition of other foodstuffs led to a reduction of the mean blood pressure by more than 20 mm. in 62% of cases of hypertension and caused marked improvement of the symptoms and signs of hypertensive disease. In some patients small amounts of non-leguminous vegetables, potatoes, lean meat, and fish can be added later, but this is often followed by a rise in blood pressure, which always occurs on return to normal food. Yet prolonged adherence to the strict diet may lead to a negative nitrogen balance (Schwartz and Merlis, 1948).

These results have in part been confirmed (Flipse and Flipse, 1947; Canter, 1948; Contratto and Rogers, 1948). In Page, Corcoran, and Taylor's (1949) series less than 20% of cases improved. The diet has also been found effective in dogs with experimental hypertension (Dick and Schwartz, 1947).

Some authors have attributed the results of the rice diet to starvation. If 10 oz. (280 g.) of rice and 5-6 oz. (140–170 g.) of sugar are eaten daily the caloric intake can be kept up to 2,000. Yet many patients prefer insufficient calories to the full ration. Starvation can reduce normal and high blood pressure (Lups and Francke, 1947; Brozek, Chapman, and Keys, 1948); this effect has been attributed to the deficient protein intake.

Kempner's rice diet contains as little as 150 mg. of sodium a day. It has experimentally been found that sodium chloride administration potentiates the hypertensive effect of deoxycortone (D.C.A.), while animals on a salt-free diet show no or a greatly reduced response (Knowlton, Loeb, Stoerk, and Seegal, 1947). On the other hand, sodium restriction is capable of reducing the blood pressure of hypertensive rats, and such animals choose a diet with a low sodium content (*Yearbook of Endocrinology, Metabolism, and Nutrition*, 1948). In the chicken, hypertension and reversible renal changes have been produced by the mere addition of salt to the drinking-water (Lenel, Katz, and Rodbard; 1948). It has been shown that the action of salt is due to its sodium ion (Friedman, Friedman, and Polley, 1948).

In human beings the pressor effect of D.C.A. on hypertensives (Perera, 1945; Goldman and Schroeder, 1948) can similarly be prevented by rigid salt restriction (Perera, 1945). While the addition of salt does not affect the blood pressure of normal people (Grant and Reischman, 1946), Goldzieher and Salmovitz (1943) observed salt retention in hypertensives and decrease in blood pressure after salt restriction and ammonium chloride medication. The latter is capable of preventing the effects of D.C.A.-overdosage in animals (H. Selye, 1946) and returns to normal the increased Na/Cl ratio in the serum of D.C.A.-treated animals (F. L. Selye, 1947). An increased Na/Cl ratio was found by the last-named author also in the blood of some hypertensive patients with high diastolic pressures, and Goldzieher and Stone (1949) have shown that sodium and chloride can be retained independently of each other. There is no other reliable evidence for the existence of sodium retention in essential hypertension, but Perera (1947) observed that the reaction of hypertensives to salt restriction differs from that of normal subjects.

The value of sodium restriction in the treatment of congestive heart failure and oedema has been established (Bridges, Wheeler, and White, 1946); Wheeler, Bridges, and White, 1947; Peters, 1948). Grollman (1946) reported good results in hypertensive disease from a diet with less than 500 mg. of sodium a day but not from moderate sodium restriction. Perera (1947) observed a decrease of the "resting" blood pressure by a diet containing 280–320 mg. of sodium. Bryant and Blecha (1947) found the disappearance of symptoms and a fall in pressure to or below 155/95 in 20% of cases on a diet containing 200 mg. of sodium. Successes were also reported by Rosenberg, Rosenthal, and Rosenbluth (1948) and by Schroeder (1948). Bang, Bechgaard, and Nielsen (1949) observed a decrease of blood pressure in 16 out of 26 patients with hypertension on a diet with less than 400 mg. of sodium. The addition of salt caused renewed rise of the pressure. In one case of chronic nephritis salt deprivation led to uraemia.

Present Investigation

Kempner's rice diet, a barley diet, and a low-sodium diet were tested on 14 unselected cases of hypertension—3 men and 11 women. The ages ranged from 35 to 72 years, the mean age being 54.5. Two patients, a man and a woman (Cases 6 and 9), suffered from chronic renal disease with albuminuria, cylindruria; and azotaemia; the male patient was also a moderate diabetic and had a trophic ulcer of the toe. The youngest female patient was a typical case of Cushing's syndrome. All other patients suffered from essential hypertension. In all cases hypertension had been present for many years.

The observation periods varied from one to eleven months. Only the "casual" blood pressures were recorded, as all patients were ambulatory and continued with their normal activities. No rest or change of life was enforced. Blood-pressure readings were taken on the same arm with the patient in the same position, and the mean value of four readings was recorded. When the blood pressure had not been observed for a long time before treatment, preliminary blood-pressure estimations were made on at least three different occasions. As an index of the sodium chloride intake the urinary chloride excretion was determined once a week. In cases with renal disturbances the blood urea was estimated before and during treatment. All patients were clinically examined and records of their heart silhouettes were taken at intervals.

Six patients were put on the rice diet; five of them continued on the low-sodium diet, one after an interval of several months. Four of the five patients on the barley diet continued with the low-sodium diet. Four patients were put on the low-sodium diet from the beginning.

Diets

1. Kempner's rice diet was used in its original form.

2. A barley diet was given which was identical with the rice diet, except that rice was replaced by pearl barley. According to McCance and Widdowson (1946), from whose publication the figures in this paper have been taken, pearl barley contains 2.6 mg. of sodium per 100 g., while rice contains 6.3 mg. per 100 g.

3. The following low-sodium diet was used. All food must be prepared without salt, and no self-raising flour, baking powder, or sodium-containing medicine must be taken.

TABLE I.—*Low-sodium Diet*

Daily Menu	Calories	Sodium (mg.)
100 g (raw weight)	190–250	40–90
sh, 75 g., raw weight)	(70–100)	(75–90)
, unsalted, 150 g.	390	4–6*
1½ 2 lb.	250–300*	(18) 12–16 (24)
ables, 360 g. (containing less than g. of Na per 100 g.)	20–160	Trace–24
es, 125 g. (preferably old)	100	4
barley, or tapioca, 100 g.	360	2·5–6
molina, 50 g.)	(176)	..
or margarine, 30 g. (unsalted) ..	240	3–11 (?)
15 g.	135	Trace
oil, 15 g.	140	..
60 g.	40	30
eam, 90 g.)	(360)	(28)
, jam, or marmalade, 15 g. ..	40	1·6–2
30–60 g.	120–240	Trace
ne (preferably not more than four s a week)	85	70
	1,800–2,400	156–262

* Approximate amounts.

Results

me fall in blood pressure occurred in all patients, but xtent varied. Tables II and III illustrate the findings. patients were on the rice diet for three to six weeks, for almost three months. Cases 1–4 had essential rtension, Case 5 suffered from Cushing's syndrome, Case 6 had chronic renal disease with azotaemia d urea, 90 mg. in 100 ml.). In only two patients s 4 and 6) did the blood pressure reach approximately al levels, though the diastolic pressure remained ly above normal. One was the patient with chronic nephritis and diabetes mellitus; his preliminary fasting blood sugar was 375 mg. in 100 ml., and the carbohydrates of the diet were covered by 32 units of globin insulin. The other patient had essential hypertension, no cardiac dilatation or ocular changes, but minimal albuminuria and slight oedema of the ankles. The variable loss of weight which occurred in the patients of this group bore no relation to the extent of the fall in blood pressure, but seemed to be greater in over-weight patients.

Comparable results were obtained in patients on the barley and low-sodium diets, except that the loss of weight was less marked in the latter group. Case 3 had normal food for five months after the rice diet. The blood pressure had risen to an average of 200/113 when the patient started the low-sodium diet. The average fall in blood pressure of the patients on the barley diet was higher than it was on the low-sodium diet and lower than on the rice diet, but the number of patients in each group is far too small for general conclusions to be drawn from these figures.

TABLE III

Case No.	Rice (R) or Barley (B) Diet: Duration (Weeks) and Nature of Diet	Rice (R) or Barley (B) Diet: Mean B.P.	Low-sodium Diet: Duration of Diet (Weeks)	Low-sodium Diet: Mean B.P.	Low-sodium Diet: Weight: Before Diet	Low-sodium Diet: Weight: After Diet
					lb. kg.	lb. kg.
7	5 (B)	220 / 97·5	25	214/ 95	134 (60·8)	−½ (0·23)
9	4 (B)	217·5/114	3	218/109	143½ (65·1)	−1½ (0·69)
8	9½ (B)	190 /117	16	177/111	108 (49)	−2 (0·91)
1	5½ (R)	180 /128	25	176/119	153½ (69·6)	−½ (0·23)
2	4½ (R)	183 /110	6	166/105	158½ (71·9)	+1 (0·45)
4	6 (R)	120 / 90	36	125/ 95	159 (72·1)	−2½ (1·13)
11	6 (B)	142·5/ 89	7?	169/106	115½ (52·4)	+1 (0·45)
6	3 (R)	133 / 94	3	135/ 84	178 (80·7)	No change
Mean values		170·7/104·9		172·5/103		

Table III shows the results obtained by the low-sodium diet in patients who started on the rice or barley diet and continued on the low-sodium diet. It is evident that the blood pressures of all the eight patients in this group were maintained satisfactorily; in most of them the pressure decreased even further. Case 11, the only one showing a rise in blood pressure, did not adhere strictly to the diet. She was the second case of chronic nephritis and showed marked improvement in general health; urinary protein and cylindruria decreased considerably, the blood urea fell from 150 to 50 mg. in 100 ml., and retinopathic changes of the ocular fundus regressed. All patients, except Case 7, felt better, oedema and slight albuminuria disappeared if present, and the heart size decreased slightly in patients with cardiac dilatation. The blood urea in Case 6 remained unchanged; his albuminuria diminished considerably, his fasting blood sugar dropped to 165 mg. in 100 ml., and the

TABLE II

Case No.	Sex	Age	Diagnosis	Duration of Diet (Weeks)	Weight: Before Diet lb. kg.	Weight: Loss on Diet lb. kg.	Mean B.P. Before Diet: Systol.	Mean B.P. Before Diet: Diastol.	Mean B.P. During Diet: Systol.	Mean B.P. During Diet: Diastol.	Decreased B.P.: Systol.	Decreased B.P.: Diastol.	Decrease in "Mean" Pressure: ⅓(Syst.+Diast.)	Decrease of Initial Pressure: Systol.	Decrease of Initial Pressure: Diastol.
									Rice Diet						
1	F	46	Essential hypertension	5½	164 (74·4)	10½ (4·8)	240	137	180	128	60	9	34·5	25·0%	6·5%
2	M	66	,, ,,	4½	165 (74·8)	6½ (2·9)	213	135	163	110	50	25	37·5	23·5%	18·5%
3	F	57	,, ,,	11½	122 (55·3)	2½ (1·1)	210	118	163	98	47	20	33·5	22·4%	17·0%
4	M	49	,, ,,	6	171 (77·6)	12 (5·4)	190	135	120	90	70	45	57·5	37·0%	33·3%
5	F	35	Cushing's syndrome	3	285 (129·3)	20 (9·1)	200	115	160	98	40	17	28·5	20·0%	15·0%
6	M	52	Chronic nephritis; diabetes	3	188 (85·3)	10 (4·5)	195	118	133	94	62	24	43·0	31·8%	20·3%
						Mean values:	208	126·3	153	103	55	23·3	39·1	26·6%	18·4%
									Barley Diet						
7	F	68	Essential hypertension; rheumatoid arthritis	5	140 (63·5)	6 (2·7)	267·5	112·5	220	97·5	47·5	15	31·2	17·8%	13·3%
8	F	49	Essential hypertension; lower body obesity	9½	122 (55·3)	14 (6·4)	254	135	190	117	64	18	41·0	25·0%	13·3%
9	F	59	Essential hypertension	4	152 (68·9)	8½ (3·9)	250	134	217·5	114	32·5	20	26·2	13·0%	15·0%
10	F	59	,, ,,	3	164 (74·4)	2½ (1·1)	206·5	105	171	98	35·5	7	21·2	17·1%	6·6%
11	F	51	Chronic nephritis	6	122 (55·3)	6½ (2·9)	234	120	142·5	89	91·5	−31	61·2	39·1%	25·8%
						Mean values:	242·4	121·3	188	103·1	54·2	18·2	36·2	22·4%	14·8%
									Low-sodium Diet						
3	F	57	Essential hypertension	22	126 (57·2)	2½ (1·1)	202	113	170	98	32	15	23·5	15·8%	13·3%
12	F	65	,, ,,	7	101 (45·8)	2 (0·9)	205	105	175	92	30	13	21·5	14·6%	12·3%
13	F	59	,, ,,	8½	162 (73·5)	3 (1·4)	197·5	107·5	167·5	91	30	16·5	23·2	15·2%	15·3%
14	F	73	,, ,,	7½	163 (73·9)	4 (1·8)	205	107·5	157	93	48	14·5	31·2	23·4%	13·5%
						Mean values:	202·4	108·2	167·4	93·5	35	15	24·9	17·5%	13·6%

ulcer of the toe healed. No signs of salt deprivation were observed, but some patients felt slightly weak at times; extreme coldness and blanching of fingers and toes occurred in two patients, and one patient (Case 4) had two attacks of faintness when the blood pressure was very low and the pulse pressure dropped to 25 mm. Gastric upsets occurred in several patients on the rice diet.

Two major incidents occurred which may not be related to the treatment. Patient 9 developed melaena after she had been on the barley diet for four weeks and on the low-sodium diet for three weeks. A cause for the bleeding was not found, but the diet was discontinued. Patient 2, who never kept rigidly to his diet and whose urinary chloride excretion ranged between 120 and 170 mg. per 100 ml., as compared with 20–60 mg. per 100 ml. in people who adhered strictly to the diet, had a coronary thrombosis 40 days after his return to normal food and died as the result of the thrombosis seven weeks later.

The results obtained from the low-sodium diet are of special interest, as it supplies an adequate amount of protein and includes leguminous vegetables and fat, which, according to Kempner, upset the effect of his diet.

A close scrutiny of the menus and the chloride excretion of the patients showed that the lowest observed blood-pressure levels were maintained only with a daily intake of under 250 mg. of sodium. It is also important to realize that the tendency of the hypertensive blood pressure to vary unduly during the day remains unchanged and that morning and evening pressures may therefore diverge considerably. The Chart illustrates these points. It is a typical example

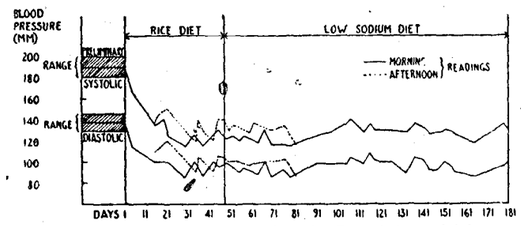


Chart showing blood-pressure readings in Case 4 (essential hypertension of many years' standing).

of the influence of dietary treatment, and shows the morning (not the resting) pressures of the best- and longest-observed patient (Case 4), and some of his afternoon pressures in comparison.

Discussion

The results indicate that the described diets are effective in reducing the blood pressure in hypertensive disease and in chronic renal disease, and they suggest that it is chiefly the low sodium content which is responsible for this effect. The fall in blood pressure is usually accompanied by improvement or disappearance of the hypertensive symptoms and signs and by improvement in general health. Though only a small number of patients seem to respond with normalization of the pressure, it appears that improvement of the hypertension is beneficial to the patient's health.

The figures in Tables II and III show that the systolic pressure after treatment was still well over 200 mm. in two patients and the diastolic pressure over 110 in two others. If one considers the wide daily variations and the effects of small deviations from the strict diet, it appears that only a certain number of patients will benefit enough from sodium restriction to warrant the institution of a regimen that can be upheld only with great personal and social inconvenience. In patients who respond well, however, sodium restriction may have important therapeutic consequences. It has benefited patients after unsuccessful sympathectomy (Bryant and Blecha, 1947) and may well be tried in selected cases before operation is considered. Decisive successes cannot usually be expected from mere salt restriction: the daily intake of sodium must not exceed 200 to 250 mg. The low-sodium diet is the diet of choice, as it provides the full supply of essential foodstuffs and so can be maintained for a long time; rice or barley days can be included.

The effect of sodium restriction on hypertension may have great theoretical significance. It appears that the body needs sodium for the production of hypertension and that its withdrawal may create a metabolic situation in which high blood pressure cannot be properly maintained. Sodium drainage may be the cause of the hypotension in Addison's disease. Black (1946) found hypotension, low serum sodium values, and an undue loss of sodium in the faeces in some cases of tropical and non-tropical sprue. Conversely, there is a tendency towards sodium retention in pregnancy toxaemia, in not too advanced chronic nephritis, and also in some cases of Cushing's syndrome; and drastic sodium restriction benefits the hypertension of all these conditions.

There is a striking similarity between D.C.A. intoxication and such diseases as essential hypertension, pregnancy toxaemia, and Cushing's syndrome. The part played by the sodium metabolism in these conditions favours the hypothesis that overproduction of adrenal mineralocorticosteroids may be one of their essential features. H. Selye (1946) has shown that "diseases of adaptation" may originate from a faulty mechanism of adaptation to unspecific damaging stimuli, and that overproduction of adrenal corticosteroids under pituitary stimulation constitutes one of the most important physiological events in the defence mechanism of the body. It is therefore conceivable that intoxication of the body with adrenal mineralocorticoids may occur as a result of maladaptation and that deficiency or loss of sodium may prevent or mitigate such an intoxication in the same way as it lessens the effect of D.C.A. intoxication. That sodium restriction does not affect the neurogenic component of hypertension is borne out by the observation that external and emotional stimuli influence the blood pressure of a patient who has responded to diet in the same way as that of an untreated hypertensive.

Summary

The results of Kempner's rice–fruit–sugar diet, of a barley diet, and of a low-sodium diet on 14 unselected cases of hypertension are described.

It is suggested that the effect of Kempner's rice diet is mainly due to its low sodium content.

The clinical effect of sodium restriction on hypertension and its theoretical consequences are discussed.

REFERENCES

Bang, H. O., Bechgaard, P., and Nielsen, A. Levin (1949). *British Medical Journal*, **2**, 1203.
Black, D. A. K. (1946). *Lancet*, **2**, 671.
Bridges, W. C., Wheeler, E. O., and White, P. D. (1946). *New Engl. J. Med.*, **234**, 573.
Brozek, J., Chapman, C. B., and Keys, A. (1948). *J. Amer. med. Ass.*, **137**, 1569.
Bryant, J. M., and Blecha, E. (1947). *Proc. Soc. exp. Biol., N.Y.*, **65**, 227.
Canter, H. E. (1948). *Penn. med. J.*, **51**, 1411.
Contratto, A. W., and Rogers, M. B. (1948). *New Engl. J. Med.*, **239**, 531.

Dick, G. F., and Schwartz, W. B. (1947). *Proc. Soc. exp. Biol., N.Y.*, **65**, 22.
Flipse, M. E., and Flipse, M. J. (1947). *Sth med. J.*, **40**, 721.
Friedman, S. M., Friedman, C. L., and Polley, J. R. (1948). *Amer. J. Phys.*, **153**, 226.
Goldman, M. L., and Schroeder, H. A. (1948). *Science*, **107**, 272.
Goldzieher, J. W., and Stone, Gilbert C. H. (1949). *J. clin. Endocrinol.*, **9**, 368.
Goldzieher, M. A., and Salmovitz, S. (1943). Ibid., **3**, 37.
Grant, H., and Reischman, F. (1946). *Amer. Heart J.*, **32**, 704.
Grollman, A. (1946). *J. Amer. diet. Ass.*, **22**, 864.
Kempner, W. (1944a). *N. C. med. J.*, **5**, 125, 273.
—— (1944b). *J. Amer. med. Ass.*, **125**, 48, 60.
—— (1945). *N. C. med. J.*, **6**, 61, 117.
—— (1946). *Bull. N.Y. Acad. Med.*, **22**, 358.
—— (1948). *Amer. J. Med.*, **4**, 545.
Knowlton, A. I., Loeb, E. N., Stoerk, H. C., and Seegal, B. C. (1947). *J. exp. Med.*, **85**, 187.
Lenel, R., Katz, L. N., and Rodbard, S. (1948). *Amer. J. Phys.*, **152**, 557.
Lups, S., and Francke, C. (1947). *Acta med. scand.*, **126**, 449.
McCance, R. A., and Widdowson, E. M. (1946). "The Chemical Composition of Foods," *Spec. Rep. Ser. med. Res. Coun.*, No. 235. H.M.S.O., London.
Page, I. H., Corcoran, A. C., and Taylor, R. D. (1949). *Postgrad. Med.*, **5**, 211.
Perera, G. A. (1945). *J. Amer. med. Ass.*, **129**, 537.
—— (1947). *Conn. med. J.*, **11**, 963.
Peters, J. P. (1948). *New. Engl. med. J.*, **239**, 353.
Rosenberg, B., Rosenthal, A. E., and Rosenbluth, M. B. (1948). *Amer. J. Med.*, **5**, 815.
Schroeder, H. A. (1948). Ibid., **4**, 578.
Schwartz, W. B., and Merlis, J. K. (1948). *J. clin. Invest.*, **27**, 406.
Selye, F. L. (1947). *Canad. med. Ass. J.*, **57**, 325.
Selye, H. (1946). *J. clin. Endocrinol.*, **6**, 117.
Wheeler, E. O., Bridges, W. C., and White, P. D. (1947). *J. Amer. med. Ass.*, **133**, 16.
Yearbook of Endocrinology, Metabolism, and Nutrition (1948), p. 354.

EFFECT OF VITAMIN B_{12} ON NEUROPATHY IN PERNICIOUS ANAEMIA TREATED WITH FOLIC ACID

BY

H. FULD, M.D., M.R.C.P.
Physician, Newsham General Hospital, Liverpool

The remarkable effectiveness of vitamin B_{12} in severe lesions of the central nervous system caused by folic-acid treatment of pernicious anaemia is well illustrated by the record of a patient who came recently under observation.

Case Report

A woman aged 74, whose previous history was one of good health, developed lassitude and dyspnoea on exertion about three years ago, when pernicious anaemia was diagnosed and confirmed by blood examination. Concentrated liver injections were given. After the third injection she developed a sensitization dermatitis, for which she was admitted to the skin department of a hospital on February 15, 1948—that is, four months after the onset of the skin disease. Apart from the dermatitis she appeared to be in good health and the case report did not record any neurological disorder. Her blood count on February 18 was: red cells, 3,690,000; white cells, 8,650; haemoglobin, 80%; colour index, 1.1. Her skin condition cleared up with local application and *x*-ray therapy, and she left hospital on February 25 with a haemoglobin level of 99%. Whilst in hospital, liver injections were stopped and she was put on 15 mg. of folic acid daily, which she had taken until her admission to this hospital.

In May, 1949 (after 15 months' folic-acid treatment), she complained of weakness and unsteadiness of her legs and loss of appetite. From August her diet consisted of bread, margarine, butter, and tea. She had an egg on rare occasions, but took practically no vegetables, meat, or fish. Towards the middle of October she became mentally deranged, bed-ridden, and incontinent.

On admission to the medical division of Newsham Hospital on November 8 her condition was as follows. She lay in a curled-up position, unable to give any history. She was disorientated about place and time, extremely restless, incontinent, delusional, and very dirty in her habits. There was no gross wasting. The skin was dry, with a scaly papular dermatitis of the lower third of both legs. There was angular stomatitis, and the tongue was glazed and beefy. The lymph nodes were not enlarged. Fibrillation was present. B.P. 90/60; chest clear. There was no enlargement of liver or spleen and no tenderness or any mass in the abdomen. The urine was normal. A blood count showed: red cells, 3,500,000; haemoglobin, 78%; colour index, 1.1; M.C.D., 7.8 μ (Eve). White cells, 4,000: lymphocytes 2,150 (54%), monocytes 50 (1%), polymorphonuclears 1,700 (42%), eosinophils 100 (3%). The blood film was consistent with treated pernicious anaemia.

Examination of the nervous system revealed no disorder of the cranial nerves, and the fundi were normal. Investigation of the upper limbs showed gross ataxia, brisk tendon reflexes, Hoffmann's sign present on left side, impaired superficial sensation, joint and vibration sense lost, and muscular power not grossly impaired; the abdominal reflexes were absent. The lower limbs showed gross ataxia, brisk tendon reflexes, bilateral extensor response, impaired muscular power, loss of vibration sense and joint sense, impaired sensation for touch and pain.

A diagnosis was made of neuropathy following folic-acid treatment of pernicious anaemia in a woman who also suffered from nutritional (vitamin B) deficiency.

On November 15, 2 ml. of "cytamen," containing an equivalent of 40 μg. of vitamin B_{12}, was injected. Subsequently 1 ml. was injected every third day until December 1, every fifth day until December 13, and every seventh day afterwards until February 28, 1950, when she was put on fortnightly injections of 2 ml. The total dose of vitamin B_{12} given was 0.5 mg.

Progress.—For five days she had to be fed on fluids only. Her appetite returned after the second injection. She remained incontinent until December 12, by which time she could sit on a chair. Towards the end of December walking exercises were started. On January 5 the ataxia of her upper limbs had disappeared. The reflexes of her lower limbs were still brisk and there was an extensor response on the left side. Superficial and deep sensation were both impaired in her legs. Her mental condition had greatly improved, and she was able for the first time to give a clear history of herself except for the period after August, 1949.

On January 21 the case record states: "Mentally alert and rational; lively sense of humour. Upper limbs—no weakness of either hand. Reflexes brisk; no impairment of superficial or deep sensations; vibration sense normal. Finger-nose test normal. Lower limbs—brisk tendon reflexes. Bilateral flexor response—some impairment of sensation to cotton-wool and pin-prick. No loss of muscular or joint sense. Vibration sense absent. Heel-knee attempt still poor. Gait unsteady but not spastic."

On February 7 she walked without help and was quite steady. There was still some impairment of deep sensation. On February 14 she walked quite normally and climbed two flights of stairs unaided. Her physical and mental condition was good. Blood examination showed normal values from December 13 onwards. The patient left hospital in March with a recommendation to her doctor for maintenance doses of 40 μg. vitamin B_{12} every fortnight.

Discussion

The above case record confirms the dangers of folic-acid treatment of pernicious anaemia pointed out by Israëls and Wilkinson (1949). The patient, who had had no previous neurological lesion, developed a severe neuropathy involving the brain, spinal cord, and peripheral nerves, in the fifteenth month of folic-acid treatment, during which period her blood remained at a fair level. The resulting psychosis and the neurological lesions were promptly arrested by

vitamin B_{12} and fully restored within three months, a period which, in an aged patient, seemed to be extraordinarily short.

Our observations confirmed the experiences of Berk *et al.* (1948), Hall and Campbell (1948), Hall *et al.* (1949), Mollin (1949), and Ungley (1949), who found vitamin B_{12} effective in the treatment of neurological complications of pernicious anaemia.

Summary

A case of severe psychoneuropathy in the course of folic-acid treatment of pernicious anaemia is reported.

Its complete and rapid restitution with injections of vitamin B_{12} is described.

My thanks are due to Glaxo Laboratories Ltd. for the generous supplies of cytamen.

REFERENCES

Berk, L., Denny-Brown, D., Finland, M., and Castle, W. B. (1948). *New Engl. J. Med.*, **239**, 328.
Hall, B. E., and Campbell, D. C. (1948). *Proc. Mayo Clin.*, **23**, 584.
—— Krusen, F. H., and Woltman, W. H. (1949). *J. Amer. med. Ass.*, **141**, 257.
Israëls, M. C. G., and Wilkinson, J. F. (1949). *British Medical Journal*, **2**, 1072.
Mollin, D. L. (1949). *Lancet*, **1**, 708.
Ungley, C. C. (1949). *British Medical Journal*, **2**, 1370.

Medical Memoranda

Prolonged Retention of Dead Foetus in Utero

A report of the following most unusual case is worth recording.

CASE REPORT

A Chinese 3-para, aged 47, was admitted to hospital on January 4, 1950, complaining of an abdominal lump which had been present for over two years and weakness and inability to leave her bed for two months. She had been pale for five months. Her youngest child was aged 20. In August, 1946, she became pregnant and, apart from the fact that the size of the abdomen led to a suspicion of multiple pregnancy, the antenatal period was uneventful. At term, in May, 1947, there was a little vaginal bleeding and she had pains resembling those of labour. Foetal movement ceased, the membranes did not rupture, and nothing was expelled. Menstruation returned and was normal and regular until four months before her admission to hospital. The abdomen varied in size, being smaller when the periods were regular and increasing when they ceased. There was some upper abdominal pain.

The patient was thin and pale, and looked ill. Her temperature was 97° F. (36.1° C.), pulse 78, and respirations 20. Her blood pressure was 82/58. The heart and lungs were normal. An abdominal tumour the size and shape of a 28-weeks pregnant uterus was found. It was much firmer than an ordinary pregnant uterus, but neither hard nor fluctuant. It was tender, fairly fixed, and resonant to percussion. There was shifting dullness in the right flank, but resonance in the left, even when the patient was lying on her left side. Vaginal examination revealed a firm effaced cervix with a closed external os and a hard mass like a small foetal head above it. The abdominal mass seemed continuous with the uterus. At a later examination it was thought that foetal parts could be palpated.

The urine was acid and contained albumin, a few pus cells, and red blood cells. A blood count showed: white cells, 15,850 (neutrophils 81%, lymphocytes 17%, monocytes 3%); red cells, 2,710,000; haemoglobin 52%. The Kahn reaction was +.

The patient was kept under observation for nine days, during which efforts were made to secure donors for blood transfusion. These were not forthcoming. Many of the Chinese peasants look upon their blood as their life, and do not feel called upon to give it even for a relative. In this case, however, the husband and daughter were willing, but were unsuitable. Eventually a lady missionary with poor and much-covered veins, but compatible blood, volunteered. Only a small volume was obtained, and this was given to the patient, whose condition was deteriorating. Her red count had fallen to 1,670,000 and her haemoglobin to 28%. She had spells of vomiting and was irrational in the evening. In spite of a warning that a fatal issue was likely, the relatives desired operation.

On January 13, using a rectus sheath field block and a small amount of intravenous thiopentone, a lower midline abdominal incision was made. Adhesions were so dense and extensive over the tumour that it was difficult to tell when the peritoneal layer had been penetrated. The incision was extended beyond the umbilicus in an unsuccessful endeavour to get above the adhesions. Palpation of the mass at this stage revealed unmistakable foetal parts, so the uterus was opened vertically. It contained a putrid mass comprising an apparently full-term foetus considerably decomposed. This was removed almost intact. There was some slight retraction of the uterus in the upper part only. On the lower posterior wall, and apparently covering the internal os, was a leathery mass which was taken to be the placenta, but as the patient was unable to stand further blood loss no attempt was made to disturb it. The uterus was irrigated with saline, a drainage tube was inserted, and the uterus and the abdominal wall were closed. Intravenous saline was administered throughout the operation and the patient was returned to bed in fair condition.

Next morning her condition was still fair, and there was a copious foul seropurulent discharge from the drainage tube. Through this, using a two-way metal catheter, a continuous drip lavage was instituted, but the patient gradually lapsed into coma and she died 40 hours later.

COMMENT

The special interest in this case centres round the length of time the dead foetus remained in the uterus. The dates given were according to the Chinese calendar, but there is no reason to doubt their accuracy. The positive Kahn test could account for the death of the foetus, but it is difficult to know why labour did not continue, and why there was not more distress at the time.

Many points made diagnosis difficult. The age of the patient, the fact that she had not been pregnant for 20 years, the length of time since the alleged pregnancy, and the history of subsequent normal periods made it hard to believe that she had been pregnant in 1946. The resonant percussion note with absence of bowel sounds over the tumour was puzzling. It was no doubt due to putrefactive gases in the uterus, though there was no special rush of these when the organ was incised. At the time of operation the provisional diagnosis was infected uterine fibroids.

The cause of death was not quite clear. It was to be expected that the patient would succumb during or soon after the operation, but her condition next morning was quite satisfactory. No facilities were available for blood chemistry tests, but the absence of any other obvious cause of coma suggested uraemia. This could have resulted from amyloid changes in the kidney after the long period of septic absorption. The vomiting and mental confusion prior to operation would support this diagnosis. No post-mortem examination was possible, as this procedure is unknown in rural China.

Mention might be made of the use of the rectus sheath field block anaesthesia according to the technique advocated by Minnitt and Gillies (1948). Owing to its easy administration and its complete lack of after-effects this has been found most satisfactory when patients are apparently *in extremis*. The relaxation it provides is fully adequate.

A. HALLAM HOWIE, M.B., Ch.B.,
China Inland Mission Hospital, Langchung, China.

REFERENCE

Minnitt, R. J., and Gillies, J. (1948). *Textbook of Anaesthetics*, 7th ed. Livingstone, Edinburgh.

Post-operative Paralysis of the Brachial Plexus

Several instances of post-operative injury to the brachial plexus have been reported recently by Ewing (1950) and by Kiloh (1950), and it seems reasonable that more publicity should be given to such an avoidable complication of surgical operation. The following two patients received a muscular relaxant, but it is considered a fallacy to associate the rising incidence of this complication entirely with the introduction of these drugs.

CASE REPORTS

Case 1.—A married woman aged 44 had a total hysterectomy performed on March 24, 1949. Anaesthesia was obtained by sodium thiopentone, nitrous oxide, and ether, and relaxation by "flaxedil" given into a right forearm vein, with the arm abducted to 90 degrees. The patient was tilted into a fairly steep Trendelenburg position, with padded shoulder-rests in support. The right arm was abducted for 100 minutes and the Trendelenburg position maintained for 50 minutes. On regaining consciousness the patient complained of generalized weakness of the right arm, with numbness of the right thumb and forefinger. There was a complete paralysis of the right deltoid, biceps brachii, and brachialis. In one month the arm had improved but elbow flexion and forearm supination were still weak, and the patient complained of some dull pain on the outer aspect of the shoulder and arm. She was discharged from hospital on April 28, and at the follow-up on July 26 the arm was quite normal.

Case 2.—A spinster aged 43 had a subtotal hysterectomy performed on July 29, 1949. Anaesthesia was obtained by sodium thiopentone and nitrous oxide, and relaxation by flaxedil given into a right forearm vein. The arm was abducted to 60 degrees, with slight external rotation and slight forearm supination. A fairly steep Trendelenburg position was maintained with padded shoulder-rests in support for some 65 minutes, and the arm was abducted in all for 104 minutes. On recovery from the anaesthetic the patient complained of generalized weakness of the right arm. There was complete paralysis of the right deltoid, biceps brachii, and brachialis, though the spinati were normal and enabled the patient to abduct her arm fully. There was also paresis of the radial nerve. Full normal against resistance being 5, thumb extensors were 4, finger extensors 2, and wrist extensors 2. Median and ulnar nerve supplies were normal, and there was no sensory loss. She was discharged home on August 18, the arm greatly improved with treatment, which she continued as an out-patient, and by mid-September the arm was practically normal.

MECHANISM OF INJURY

The first references to brachial plexus injury occurring at operation suggested a pressure injury when the plexus was nipped between the clavicle and the first rib (Büdinger, 1894), or between the clavicle and transverse processes of the fifth and sixth cervical vertebrae (Krumm, 1895), or by pressure of the plexus on the head of the humerus when the arm was in external rotation and extension (E. Braun, cited by Garrigues, 1897). Later, the theory that the plexus was injured under anaesthesia by traction of the nerves rather than by compression was suggested by Horsley (1899) and Stevens (1934). Clausen (1942) considered that the injury was essentially one of stretch.

Anatomically the nerves are fixed at the transverse processes by invaginations of the prevertebral fascia, and in the arm by the axillary fascia, and any structure tending to increase beyond normal limits the distance between the points of fixation of the nerves will cause injury. An example is the head of the humerus, which becomes more prominent in the axilla when the arm is in external rotation, abduction, and extension. Normally the head of the humerus is maintained in a neutral position on abduction of the arm by rotation of the scapula and an upward movement of the shoulder girdle. If a shoulder-rest prevents this upward movement of the shoulder, the humeral head is kept low and the neurovascular bundle, passing round this structure, is apt to be stretched. If now a Trendelenburg position is adopted the weight of the patient tends to slide down between the shoulder rests, which in turn push the shoulders towards the feet, and with the arm in abduction the head of the humerus becomes increasingly prominent in the axilla. It seems that abduction of only 60 degrees is enough to cause tension on the nerves in these circumstances (see above).

A conscious patient in this position will probably not suffer injury, provided that the protecting muscles do not tire. Under anaesthesia, however, the musculo-tendinous protection of nerves is partially or entirely absent, and the incidence and degree of injury will depend on the relaxation of the muscles, the steepness and duration of the Trendelenburg position, and to some extent on the weight of the patient. No doubt the relaxant drugs produce great flaccidity in these protecting muscles, but a similar relaxation is produced in deep general anaesthesia by ether (Clausen, 1942).

If the incidence of this unfortunate complication is on the increase it may be due to the more frequent use of this position of abduction of the arm, whether for intravenous anaesthesia or therapy. In particular, this vulnerable position of abduction of the arm should be avoided in the Trendelenburg position.

The injuries described are considered to be due to stretching of the nerves, and Denny-Brown and Doherty (1945) have said that in milder degrees of stretch there occurs damage to the epineurial vessels, with resultant patches of ischaemic changes in nerve fibres. After these ischaemic lesions one can expect efficient regeneration. Although the injuries discussed here are relatively mild, in that complete recovery is the rule, nevertheless they are avoidable and do cause unnecessary prolongation of convalescence.

My thanks are due to Dr. J. F. B. Wyper for his permission to publish these cases, and to Mr. A. M. Rennie for his clinical reports.

A. W. RAFFAN, M.B., Ch.B., D.A.,
Anaesthetist, Aberdeen General and Special Hospitals.

REFERENCES

Büdinger, K. (1894). *Arch. klin. Chir.*, **47**, 121.
Clausen, E. G. (1942). *Surgery*, **12**, 933.
Denny-Brown, D., and Doherty, M. M. (1945). *Arch. Neurol. Psychiat., Chicago*, **54**, 116.
Ewing, M. R. (1950). *Lancet*, **1**, 99.
Garrigues, H. J. (1897). *Amer. J. med. Sci.*, **113**, 81.
Horsley, V. (1899). *Practitioner*, **63**, 131.
Kiloh, L. G. (1950). *Lancet*, **1**, 103.
Krumm, F. (1895). *Samml. klin. Vortr.*, n.F. 139 (Chir. No. 38, 299).
Stevens, J. (1934). "Brachial Plexus Paralysis," in Codman's *The Shoulder*. Todd, Boston.

The Minister of National Insurance, Dr. Edith Summerskill, has completed the setting up of local advisory committees to advise her on questions relating to the local administration of the National Insurance Act. In all, 230 committees have been set up—186 in England, 26 in Scotland, and 18 in Wales. The committees consist of representatives of employers, employed persons, local authorities, and friendly societies. In addition, persons with special local knowledge likely to be of value to the committees have been appointed as members.

Reviews

PSYCHOLOGY AND DUODENAL ULCER

Duodenal Ulcer. A Sociopsychological Study of Naval Enlisted Personnel and Civilians. By Jurgen Ruesch, M.D., C. Christiansen, M.A., R. E. Harris, Ph.D., S. Dewees, M.A., A. Jacobson, M.D., and M. B. Loeb, M.A., in co-operation with the medical staff of the San Leandro Naval Hospital. (Pp. 118. £1 2s. 6d.) London: Cambridge University Press.

This study is one which others interested in psychosomatic medicine would do well to emulate. Two groups of patients with clinical and radiological evidence of duodenal ulceration were investigated; one consisted of forty naval ratings, and the other of twenty civilians. The problems studied were the particular social and psychological aspects of the patient with duodenal ulcer. It was hoped that the simplified environment of the Navy with its more or less known stresses would, by contrast with the more complex circumstances of civilian life, throw light on the situations which precede the appearance of symptoms.

The patients had an average age of about 30 years; their interests, hobbies, and intelligence were somewhat above normal level, and an unstable married life with a high rate of divorce was common. In the naval patients acute ulcers were more common than chronic; in civilians the reverse was true. Anxiety symptoms preceded those of ulcer in 69% of the first group and in 85% of the second. In many naval patients a situation of clear-cut psychological significance seemed to precipitate the breakdown; in 70% of civilians there had been a change in social or home environment.

The patient with duodenal ulcer was found to have a personality different from that of the general population; there were points of similarity to the hysteric, but the variations were more complex in the civilians than in the ratings. The patients were often younger or youngest children; they were dependent, conforming, overtly combative but covertly passive, and hungry for affection. Relations with parents differed in the two groups: the common pattern in the ratings was a dominant mother with an uninfluential father, and in the civilians an idealized mother with a punitive father.

Dr. Ruesch has made an interesting contribution to our knowledge of one of the commonest and most important latter-day diseases. He makes no claim that peptic ulcer is psychogenic; indeed, he is at pains to point out that the aetiology of ulcer must ultimately be explained in terms of tissue erosion and vascular changes. This careful and methodical study proves once again that in the treatment of the patient sick of a duodenal ulcer the physician must concern himself as much with social and psychological rehabilitation as with the control of gastric acidity.

R. BODLEY SCOTT.

THROMBOSIS IN THE LEG

Thrombosis in Arteriosclerosis of the Lower Extremities. By Edward A. Edwards, M.D., F.A.C.S. (Pp. 74; illustrated. 15s.) Oxford: Blackwell Scientific Publications.

This monograph is an addition to those on the circulation already published in the popular "American Lecture Series." In common with its predecessors it is beautifully printed and illustrated.

The author treats the subject from the clinical viewpoint, and illustrates the pathology with a number of excellent low-power photomicrographs. He points out that thrombosis is the most important accident that can befall the arteriosclerotic vessel and hopes that a greater awareness of its frequency will minimize its harmful effects.

The first three chapters cover aetiology and pathology, the clinical picture, and treatment. The author insists on the adequacy of clinical methods of diagnosis and is a firm believer in the value of immediate sympathectomy for the relief of ischaemia. In the last two chapters he presents a series of informative case reports illustrated by diagrams of the lesions concerned.

Most of the information about the state of the vessels has been obtained by examination of amputated limbs, and arteriography and other special investigations are not mentioned. This omission exemplifies the author's premise that clinical signs alone are quite sufficient to determine the probable progress of events in the severer forms of ischaemia, whatever the more precise interpretations of special methods may reveal.

The book is easy to read and is based on accurate clinical observation and sound judgment; it is stimulating and the material is concisely expressed. It will be valuable to all who are interested in the subject.

C. J. LONGLAND.

OBSTETRICS AND GYNAECOLOGY

Handbook of Obstetrics and Diagnostic Gynecology. By L. Doyle, M.S., M.D. Illustrated by Ralph Sweet. (Pp. 240. $2.) California: University Medical Publishers, Palo Alto.

This is a pocket-sized paper-backed synopsis, with the subject-matter presented in some detail but in note form. It will therefore appeal only to those who find such a style palatable for revision purposes. The obstetric section, well illustrated with line drawings, has much to commend it. Indeed, the chapters on the emotional aspects of pregnancy, the minor discomforts of pregnancy, analgesia in labour, and the care of the patient in the puerperium contain more useful information than do many of the larger textbooks.

Fewer than 40 pages are devoted to gynaecology—surely an exaggeration of the relative unimportance of this subject for the student and the practitioner. The adjective "diagnostic" does not mean that the author discusses only clinical methods, but that the chapters are classified according to symptoms rather than pathology. The most serious omission is a proper emphasis of the importance of genital carcinoma—the types, diagnosis, and treatment of growths at all sites being covered by one simple table.

T. N. A. JEFFCOATE.

COMPARATIVE ANATOMY

The Vertebrate Body. By Alfred Sherwood Romer. (Pp. 643; illustrated. £1 7s. 6d.) Philadelphia and London: W. B. Saunders Company. 1949.

The teacher who thinks of the broad education of his students is at a loss when asked to recommend a textbook of comparative anatomy. It is strange that no substitute has been found for the three German classics. Jeffrey Bell translated and Ray Lankester edited Gegenbaur's *Elements of Comparative Anatomy* in 1878, and W. N. Parker translated Wiedersheim's *Elements of Comparative Anatomy of Vertebrates* in 1886. G. B. Howes edited and annotated

the translation of Wiedersheim's *The Structure of Man* in 1895. These three books have dominated the teaching from 1880 to the present day. The two earlier compendia of English origin were too bulky and too encyclopaedic to influence teaching to the extent they deserved. Todd and Bowman's *Cyclopaedia of Anatomy and Physiology* (1835–59) in five volumes and Richard Owen's *The Anatomy of Vertebrates* (1866–8) in three volumes did not have the wide distribution and popularity of the later German texts. In a sense they were before their time.

The frank anatomical dissection of living forms was greatly influenced and modified by two antipodal factors. On the one hand the science of palaeontology founded by Baron Cuvier focused the mind of man on the anatomy of the forms of the past which had persisted as fossils. On the other hand the rapid strides in the study of embryology by Pander, von Baer, F. M. Balfour, and many others attracted students away from formal comparative anatomy. Human anatomy became the handmaiden of surgery and comparative anatomy became a hobby for museum minders.

This new book by the distinguished director of the Museum of Comparative Anatomy at Harvard is the work of a master of the subject who is deeply sensitive to the progress made in physiology, experimental embryology, and genetics. In the preface, which he calls his apologia, he gives six essentials for an adequate treatment of the subject. They are adequate illustration, truly comparative treatment, proper palaeontological background, a developmental viewpoint, inclusion of histological data, and consideration of function. This is a whole-hearted statement in the good Hunterian tradition.

Little time is wasted on conflicting theories, and so the ground is covered by unusually direct methods. He rids the student of the bugbear of nomenclature in a few lines and castigates the absurdities of the B.N.A. terminology.

The chapters on the skeleton and the muscles are refreshing, and his great palaeontological experience makes for a succinct presentation. It is a pity that the author has not the space to discuss some minutiae such as the epiphysis on the pisiform bone or to present the story of the development of the chondrocranium. Yet it is remarkable to see how closely he sticks to his six desiderata.

There is but little on the subject of man, the primates, and the endocrine glands, for, as he emphasizes, the knowledge of the endocrines is based almost entirely on man and a few laboratory animals. He prophesies that the lower forms will have their endocrine days later, and already the various attempts to control insect pests have directed attention to the internal secretions of these invertebrate forms.

The text and illustrations are excellent. There are three appendices of great value, particularly to the English-speaking student unversed in the classical tongues. The first gives a synoptic classification of vertebrates; the second is a working glossary designed to avoid mental indigestion, and gives the simpler Latin noun and adjective in declension form so that gender, number, and case can be free from hurtful errors. The third gives a select list of references in which the author has dared to sift the dross from the gold.

No teacher of zoology or anatomy can do without this sorely needed book. No medical student should fail to possess it in common with Dorland's *American Illustrated Medical Dictionary*. They will last a lifetime and continue to give pleasures untold.

H. A. HARRIS.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

My Life in Three Counties. By H. W. Pooler. (Pp. 247. 15s.) London: Christopher Johnson. 1950

Quakers in Science and Industry. By A. Raistrick, M.Sc., Ph.D. (Pp. 361. 21s.) London: The Bannisdale Press. 1950.

Clinical Examination of Patients. By J. Forbes, M.D., M.R.C.P., and W. N. Mann, M.D., F.R.C.P. (Pp. 323. 18s.) London: Edward Arnold. 1950.

Progress in Chromatography 1938-1947. By L. Zechmeister. (Pp. 368. 45s.) London: Chapman and Hall. 1950.

Bacterial Infection. By J. L. T. Appleton, B.S., D.D.S., Sc.D. (Pp. 644. 70s.) London: Henry Kimpton. 1950.

Urologic Roentgenology. By M. B. Wesson, M.D. 3rd ed. (Pp. 282. 52s. 6d.) London: Henry Kimpton. 1950.

Textbook of Bacteriology. By J. M. Dougherty, A.B., M.A., Ph.D., and A. J. Lamberti, B.S., M.S. 2nd ed. (Pp. 491. 40s.) London: Henry Kimpton. 1950.

Man in Danger. By "Credo." (Pp. 94. 2s. 6d.) London: Stanley Paul. 1950.

Common Diseases of the Ear, Nose, and Throat. By P. Reading, M.S., F.R.C.S. (Pp. 288. 21s.) London: Churchill. 1950.

Textbook of Gynaecology. By J. H. Peel, M.A., B.M., B.Ch., F.R.C.S., F.R.C.O.G. 3rd ed. (Pp. 477. 24s.) London: William Heinemann. 1950.

Cell Physiology and Pharmacology. By J. F. Danielli, Ph.D., D.Sc. (Pp. 156. 24s.) London: Elsevier. 1950.

Movable-Removable Bridgework. By J. O. McCall, D.D.S., F.A.C.D., F.A.A.P., and I. M. Hugel, D.D.S. (Pp. 221. 56s.) London: Henry Kimpton. 1950.

A Text-book of X-Ray Diagnosis. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., and P. Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E. Vol. 4. 2nd ed. (Pp. 592. 60s.) London: H. K. Lewis. 1950.

Bismuth. By L. Jaenicke, D.Ph. (Pp. 44. No price.) London: Mining and Chemical Products. 1950.

The Microscopic Diagnosis of Human Malaria. By J. W. Field. (Pp. 117. No price.) Malaya: Institute for Medical Research. 1948.

New Discoveries in Medicine. By P. R. Hawley. (Pp. 134. 16s.) New York: Columbia University Press. London: Geoffrey Cumberlege. 1950.

Personal Hygiene Applied. By J. F. Williams, M.D., Sc.D. 9th ed. (Pp. 471. 16s. 6d.) London and Philadelphia: W. B. Saunders. 1950.

Form- und Wachstumsgesetze Drüsenbildender Karzinome. By R. Böhmig. (Pp. 105. M. 14.) Stuttgart: Georg Thieme. 1950.

Personal and Community Hygiene Applied. By J. F. Williams, M.D., Sc.D., and G. G. Wetherill, M.A., M.D. (Pp. 610. 20s.) London and Philadelphia: W. B. Saunders. 1950.

Biology: The Human Approach. By C. A. Villee. (Pp. 580. 25s.) London and Philadelphia: W. B. Saunders. 1950.

Patients in Mental Institutions 1947. Prepared by C. C. Limburg. (Pp. 113. 50 cents.) London: Gerald Duckworth. Washington: Superintendent of Documents, U.S. Government Printing Office. 1950.

Einführung in die pathologische Physiologie. By F. Grosse-Brockhoff. (Pp. 645. M. 39.60.) Berlin: Springer. 1950.

The Genealogy of Gynaecology. By J. V. Ricci, A.B., M.D. 2nd ed. (Pp. 494. $8.50.) Philadelphia: The Blakiston Company. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JULY 15 1950

ABORTION

In a recent lecture[1] to the Royal College of Obstetricians and Gynaecologists Mr. Linton Snaith expressed the view that the problem of abortion had received inadequate attention, cases of abortion being almost excluded from the wards of the teaching hospitals. This may not be true of all teaching hospitals, but it is the fact that entirely different facets of the problem are presented by those cases admitted to teaching hospitals and the more numerous cases admitted to other hospitals. In the opening pages of this issue, in a survey of 2,665 cases falling into this second category, Mr. Albert Davis reaches the startling conclusion that probably 90% of these abortions were criminally induced, mostly by the patient herself. The woman admitted to the teaching hospital is much more likely to have been referred from the antenatal or the fertility clinic. The problems here, in teaching hospitals and from the point of view of Mr. Snaith, are concerned with the aetiology, prevention, and treatment of spontaneous, threatened, and so-called habitual abortion. The problem presented to the gynaecologist working in a non-teaching hospital is usually that of treating the complications of criminally induced abortion.

Mr. Davis has compiled statistics, dealing with many aspects of this problem, which are fascinating from the sociological as well as from the purely medical angle. Thus, his hospitals being situated in "respectable" neighbourhoods, no fewer than 2,350 of his patients were married; in other neighbourhoods of less "respectability" the proportion of unmarried patients might be as high as 50 to 65%. This factor is important because of the much higher incidence of complications in the unmarried: 14% as compared with 6% for married women. The commonest complication found by Mr. Davis was gross infection; there were five cases of septicaemia, one of pyaemia, and 118 with severe local sepsis. Haemorrhage requiring blood transfusion occurred in 68 cases, and there were four cases of traumatic rupture of the uterus. Six of his patients died, a mortality of 0.26%; two from *Cl. welchii* septicaemia, two from burns following local corrosive injections, and one from *Staph. aureus* septicaemia. A further patient, not included in the series, died from soap-bubble cerebral embolism, and this, Mr. Davis suggests, is the mechanism in most sudden fatalities, douching with soap solution being the commonest method of inducing abortion. Treatment, when the abortion was incomplete (84% of cases) or inevitable, was mainly directed to evacuation of the uterus, either medically or surgically, the superiority of active to conservative measures being shown by a lessened stay in hospital and by a lower incidence of complications. Chemotherapy was unavailing in the presence of retained infected products, except in a few rare instances, and peritonitis remained the most fatal complication.

If criminal abortion is largely a sociological problem, spontaneous abortion, and particularly recurrent spontaneous abortion, is essentially a problem of reproductive physiology. It is generally agreed that spontaneous abortion occurs in approximately 10% of patients who are clinically pregnant and is present, but unrecognized, in some patients complaining of sterility. Two explanations of this ovular wastage have often been put forward. Mall and Meyer[2] believed that an abnormal uterine environment was mainly responsible. Streeter,[3] on the other hand, considered that defects of the germ plasm were more important. Snaith discussed these two points of view, and found little reason to believe that Rh incompatibility or obvious seminal defects played any significant part aetiologically. He went on to say that though vitamin E and progesterone appeared to have little real value in the prevention or treatment of abortion, oestrogens, in the form of oral stilboestrol, seemed to be promising when treatment was started sufficiently early in the pregnancy. He admitted that one could do no more than speculate on the mechanism whereby this apparently beneficial result was achieved.

Cogent evidence for the "germ plasm defect" theory has recently been provided by the outstanding studies of Hertig and Rock.[4] Among 136 fertile patients, who had each had, on the average, nearly five pregnancies before being subjected to hysterectomy for some therapeutic reason, a search for conceptuses resulted in the discovery of 28, none older than 16 days. Twelve of these ova were abnormal and, of these, seven were certainly destined to abort; of the latter, four were so markedly abnormal that it is probable that no clinical evidence of pregnancy would have been observed. Thus, of these 28 potential pregnancies three would almost certainly have ended as spontaneous abortions—the same 10% as was mentioned before. The ova destined to abort, either with or without evidence of their ability to produce clinical pregnancy, showed fundamental defects such as multinucleated blastomeres, absence of embryonic disk, chorionic cavity, or of both, or there was profound hypoplasia of the future placental tissue. In all of the cases described the endometrium appeared to be entirely normal and the authors concluded that ". . . the evidence, such as it is, indicates that the defective fertilized ovum is due to intrinsic germ plasm quality rather than to its environment and is the main factor in the production of spontaneous abortion." If this view is indeed correct, then it follows that attempts to treat spontaneous abortion are not only largely doomed to failure but are an attempt to obstruct nature's own method of disposing of mistakes in the most satisfactory fashion. It is doubtful, however, whether most clinicians faced with patients complaining of threatened or habitual abortion would easily be persuaded of the rightness of this conclusion.

[1] *British Medical Journal*, 1950, **1**, 1316.
[2] *Publ. Carneg. Instn*, Pub. No. 275. Contrib. to *Embryology*, 1921, **12**, 1.
[3] *Scientific Monthly*, 1931, **32**, 495.
[4] *Amer. J. Obstet. Gynec.*, 1949, **58**, 968.

HAEMORRHAGE FROM PEPTIC ULCER

Two papers published in this issue are on the subject of haemorrhage from peptic ulcer. From Newcastle-upon-Tyne Drs. A. G. Ogilvie and I. O. B. Spencer report a mortality of only 2.4% in a series of 170 in-patients between 1941–8, whereas Drs. C. D. Needham and J. A. McConachie, from Aberdeen, report a mortality of 13.9% in 476 patients admitted to hospital during the same period for haematemesis and/or melaena from peptic ulcer. A number of papers already published provide information about the mortality of bleeding peptic ulcer in the past decade. In 1945 Smith[1] reported a mortality of 6% among 180 cases treated in Glasgow, and Avery Jones[2] in London found that 8% of 615 in-patients died. It seemed that liberal transfusions and adequate fluids and nourishment by mouth had brought down the mortality from the much higher rates recorded in the nineteen-thirties. Unfortunately further series in the past few years have disclosed higher figures. From Birmingham Baker[3] reported 576 cases with 77 deaths (13.4%) over a six-year period from 1940–5. Tanner[4] found there had been 62 deaths (10.5%) among 586 patients admitted to a south London hospital between 1941 and 1948. Lewin and Truelove[5] recorded a mortality of no less than 19% among 305 patients admitted to the Radcliffe Infirmary, Oxford, between 1938–47. These higher figures are confirmed in this issue by the Aberdeen authors but refuted by the experience at Newcastle.

How can such differences arise between hospitals to-day? Both the composition of the various series and the place of surgery in treatment must be considered when trying to find an answer to this question. Both Avery Jones and Tanner claim help from surgery in lowering mortality; without this help their series might have been on equal terms with those of Oxford, Birmingham, and Aberdeen, where comparatively little assistance was requested from the surgical units. There is also the question whether, apart from the frequency of surgical intervention, the quality of medical care can vary sufficiently to account for the large differences. The essentials of adequate medical care are a good blood bank, a registrar to back up the house-physician, a readily available consultant, satisfactory dietetic facilities, and good nursing care. But these are common to all these series. It would be convenient to attribute the low Newcastle figures to better-than-average medical care, but this cannot be the explanation, though it is certain that the patients were closely supervised and great attention was paid to detail. The alternative possibility is that the composition of the series is significantly different from others. Ogilvie and Spencer point out that they have been favoured by a low proportion of patients over 70 years of age and probably by a higher proportion of duodenal ulcers, which have a lower mortality than chronic gastric ulcers. Without doubt one of the most important variables is the age distribution. In patients over 50 the mortality rises appreciably, and it increases greatly in those over 70. In Ogilvie and Spencer's series there were three patients over 70 (1.8%), and two died. Smith was equally fortunate with only 1.5% of his patients over 70. On the other hand, in the series of Baker, Truelove, and Avery Jones the percentages of patients over 70 were 7, 8.5, and 12.2 respectively. It appears that the age of patients with bleeding peptic ulcer is rising, and Avery Jones[6] has reported a steady increase in his patients over 70—from 6.5% in 1940–1 to no less than 19% in 1947–8. It is also probable that Ogilvie and Spencer had a lucky sequence in the age group 60–69: no deaths among 24 in-patients cannot be equalled in any other series, and it can hardly be expected that their future experience in this age group will be quite so fortunate. The proportion of patients with chronic gastric ulcers cannot be compared in these series, but it seems probable that there may have been fewer of these cases in the Newcastle series, and this again would contribute to the excellent figures.

The authors of both papers in this issue stress the need for surgery in selected cases, and most clinicians will agree with Needham and McConachie's plea for closer co-operation between surgeons and physicians in order that operation may be considered especially in the patient with recurrent bleeding who is past middle age. They again demonstrate very clearly the risk of recurrent

[1] *Glasg. med. J.*, 1945, **144**, 129.
[2] *British Medical Journal*, 1947, **2**, 441, 477.
[3] *Guy's Hosp. Rep.*, 1947, **96**, 1.
[4] *British Medical Journal*, 1949, **1**, 110.
[5] Ibid., 1949, **1**, 383.
[6] *Proc. R. Soc. Med.*, 1950, **43**, 145.
[7] *British Medical Journal*, 1949, **2**, 630.

bleeding after admission to hospital, and a mortality of 50% in patients over 50 years of age considered, in retrospect, to be operable clearly provides ample scope for the surgeon. It is impracticable for the busy surgeon to see all patients admitted for haemorrhage, but he can be informed about every case which may need surgery if bleeding recurs, particularly when the patient is over middle age, probably has chronic ulcers, and is free from gross medical complications. Bleeding often recurs at a particularly awkward time: if the senior surgeon on call is aware of the possibility he can if necessary rearrange his work, and the danger of delay is thus reduced. If possible a partial gastrectomy undoubtedly provides the best protection for the patient against further complications, though difficulty often arises, as in the third case described by Ogilvie and Spencer, when an ulcer could not be found by the surgeon, yet at necropsy a chronic ulcer was demonstrated with penetration into the pancreas. The location of an ulcer at operation is not dependent on surgical skill and is at times impossible. In these circumstances, when the history points to a peptic ulcer, it is undoubtedly advisable to proceed to a partial gastrectomy. Whether this is necessary in the case of patients with no history of dyspepsia is still debatable.

In spite of the number of papers on gastro-duodenal haemorrhage in recent years there is still room for good clinical studies on the lines of the two papers published this week. The results of emergency surgery and the demonstration of geographical differences are particularly wanted: the figures quoted by Tanner[4] and by Bohn[7] were encouraging. Other subjects for study are the diagnosis on admission, prognosis, and indications for surgery. The initial diagnostic difficulties tend to get lost in tables of final diagnoses. In England and Wales there are probably between 20–30,000 patients admitted to hospital annually for gastro-duodenal bleeding, and nearly half the 5,000 deaths each year from peptic ulcer may be the result of this complication. Some reduction in this annual toll is practicable, but the closest liaison between physicians and surgeons is needed, and a definite policy has to be accepted. This is more important than the segregation of patients into one unit, though this automatically ensures a standard policy. Staff co-operation is aided by analysis and discussion of the local figures. It is not always appreciated how time-consuming these analyses can be and how greatly the work can be expedited by the skilled assistance of statisticians and clerical workers. Simple clinical research of this nature, even if not prepared for publication, pays handsome dividends in clarifying difficult therapeutic problems and thereby in assisting to reduce mortality. Such schemes deserve financial assistance from hospital management committees.

REHABILITATION OF THE TUBERCULOUS

The London County Council is considering what it can do towards providing better accommodation for tuberculous patients who, while well enough to be discharged from hospital and to work during the day, need lodging and facilities for rest under medical supervision. There are also other patients who can do little or no work, have infectious sputum, and live in overcrowded homes. It is estimated that 160 such persons are living in common lodging-houses in London. Before the National Health Service was introduced the council under its tuberculosis scheme arranged to accommodate such persons in small voluntary sanatoria, but it is now difficult to find room for them owing to the pressure on hospital beds for acute cases. The health committee of the council considers that the responsibility for providing such accommodation belongs to the regional hospital boards rather than to the local health authorities. The matter has been discussed with the four Metropolitan regional hospital boards, and it is proposed to ask the Minister of Health to receive a deputation to discuss the question.

One project of the council has been the erection of a night sanatorium and industrial workshops on the site of St. Peter's Hospital, Stepney, which was not transferred for hospital purposes and remains the council's property. It would be cheaper to demolish the existing building and rebuild for this purpose, instead of making adaptations, but the Minister will not pass the project. In his reply he says that, while he fully approves the provision of night sanatoria for the tuberculous and regards this as among the necessary developments of the tuberculosis services, he cannot allow additional expenditure in present circumstances. But the health committee of the council is going to press the Minister on this matter. Meanwhile the Minister has issued a memorandum (see page 162) to regional hospital boards and local health authorities suggesting ways in which more hospital beds may be used for the treatment of the tuberculous and drawing attention to a scheme now operated by the Central Middlesex Hospital and a neighbouring chest clinic whereby home treatment is supplemented by short periods in hospital. The resettlement of the tuberculous patient no less than his treatment is the concern of the chest physician. Local health authorities, chest physicians, and officers of the Ministry of Labour are urged to work closely together in order to find a satisfactory occupation for the patient who cannot enter, or is not suitable for, a village settlement.

THE TUBERCULIN-JELLY TEST

After half a century of tuberculin testing no satisfactory simple technique has yet been evolved. The Pirquet test, the intradermal Mantoux test, and the percutaneous tests have been used with many variations, but the intradermal test remains the most satisfactory, being the most exact because controllable. The percutaneous tests have the advantage of being easily applied and of not requiring injections, but there have been growing doubts whether a percutaneous test can reveal most positive reactors.

Dr. W. Pointon Dick reports in this issue an investigation of the tuberculin-jelly test. He has demonstrated that this test as generally applied detects only a small proportion of tuberculin-positive individuals, and he recommends a technique of skin preparation which makes the test approximately equivalent to the intradermal injection of old tuberculin in a 1/1,000 dilution. The reading of the test requires some experience if false positive readings are to be avoided, but it is certainly an advance in the use of the jelly test. Without the recommended skin preparation the jelly test, if used alone, is quite inadequate, and a severe reaction may occur if an intradermal test with a 1/100 dilution of old tuberculin is given afterwards. The technique of tuberculin testing has become a more important matter now that B.C.G. is being used in this country, and the question remains whether the intradermal test with a 1/1,000 dilution of old tuberculin or an equivalent percutaneous test as recommended by Pointon Dick is adequate to separate positive from negative reactors for the purposes of vaccination. In the past only those negative to 1/100 dilutions of O.T. have been considered definitely tuberculin negative. Unless there is proof that this dose causes non-specific reactions in many cases (as Scandinavian workers have suggested), that standard should probably be maintained in preference to running the risk of inoculating with B.C.G. children who may be tuberculin-positive.

PHYSIQUE OF LONDON'S CHILDREN

One of the duties of medical officers of health is to supervise the health of school-children and to study the way in which their physique may have reacted over the years to changes in the conditions of life, particularly the changes caused by war. In such supervision statistical methods can be invaluable, and the recent report[1] on the height and weight of London school-children by Sir Allen Daley is an excellent example of their use. For many years records have been kept of the height and weight at different ages of children in the L.C.C. area. In the interpretation of the results of current surveys it is essential to take into account long-term changes which have taken place, and comparisons between pre-war and post-war years can be made with confidence only when the results are truly representative of all children in the London area at the appropriate point in time. By the procedure described in Sir Allen Daley's report it was possible to obtain both speedily and economically representative samples of the school population in 1949. The results show that the improvement in physique—measured in terms either of average height or average weight at each age—which took place between 1905 and 1938 was maintained in 1949. Between 1938 and 1949 the average height for London school-children between 5 and 15 years of age increased by about three-quarters of an inch (1.8 cm.), and the average weight by about one and three-quarter pounds (800 g.). This increase has been consistent for both boys and girls and within each age group in each sex. There is indeed a remarkable stability in the results which is typical of the statistical description of all natural phenomena. As in 1938, boys are heavier and taller than girls up to the age of 11 years, but the position is reversed from 11 to 14; after 14 years of age the boys resume their lead. Again, although the average height and weight have both increased they have done so in step, and the height–weight ratio was the same in 1949 as it was 10 years before. In short, the London school-child of to-day has an overall physique equal to that found in children three months his senior in 1938.

The disparity of physique between children attending school in different parts of London which was noted before the war still persists. Broadly speaking, the advantage lies with those who live south of the Thames. Fortunately surveys of children's physique were continued on a restricted scale throughout the war in typical south-western and north-eastern London areas. By 1943 there was an all-round increase in height and weight in the south-west, but in the north-east the 1938 standards in height were barely maintained and there was a slight loss in weight. By 1946 the progress in the south-west slowed down, while in the north-east there were, in many age groups, further reductions in weight. These north-eastern areas were, of course, the areas of London most severely affected by the war, and it is perhaps significant that although there has been in the past two years a definite improvement in these areas the greatest improvement in physique has been observed in the south-western parts of the county. Precise knowledge about these trends among children in the different social classes is lacking. The continued superiority in physique of the children in the south-western areas, even with rationing and school meals, shows that this is a subject worth studying.

[1] *Report on the Heights and Weights of School Pupils in the County of London in 1949.* Published by the London County Council, 1950.

SYPHILIS IN GREENLAND

To judge by a recent report,[1] the history of syphilis in Greenland and the sex habits of the Greenlanders are both remarkable. To all intents and purposes syphilis does not exist in Greenland, though gonorrhoea was first noted in 1864 and occurred epidemically after 1913. The country escaped the European syphilis pandemic which followed the return of Columbus, and only sporadic cases introduced by seamen were seen till 1872, when the local population was infected by workers in a cryolite mine near by. Half the population of about 100 contracted syphilis between 1872 and 1890, but the disease gradually died out. It was not seen again until 1947, when a man with secondary syphilis from a near-by meteorological station infected four of seven women with whom he had had sexual intercourse. Energetic contact tracing and the imposition of quarantine limited the epidemic to five cases of the acquired disease and one case of congenital syphilis. No doubt poor communications and the relative immobility of the population contributed to this result, since there were no fewer than 52 "contacts." The authors of the report state that the explanation lies in "chance biologic factors" rather than immunity, for which no evidence was discovered. This investigation revealed the fact that, though promiscuity and

[1] Marcussen, P. V., and Rendal, J., *Amer. J. Syph.*, 1950, **34**, 144.

extramarital intercourse are not common, premarital sexual intercourse is the rule. This may be explained by the relatively late age of marriage, poor housing, lack of amenities, and limited communications, and is in keeping with the marked frankness in sexual matters which was noted. It seems all the more surprising that Greenland is the only country in the world where syphilis has not gained a footing.

ANTIHORMONES AND A.C.T.H.

The development of "antihormones" in response to the prolonged injection of certain hormones has been a subject of interest and controversy since the phenomenon was first reported from Collip's laboratory in 1934.[1-3] It is now well known that the repeated injection of thyrotrophic or pituitary or chorionic gonadotrophic hormone into animals of different species induces a refractory state in which the animal becomes resistant to further injections of the hormone.[4] Antihormones can be demonstrated in the serum after the development of this refractory state, which may be passively transmitted to a test animal by injecting it with serum from the resistant animal. Experimental evidence suggests that the hormone behaves as an antigen and that its antihormone has many of the properties of an antibody. The injection of homologous trophic hormones does not ordinarily give rise to antihormone formation, and when this does occur the resistance is much less marked. It has been difficult to draw conclusions from these observations because the trophic hormones used have been crude and the antihormones observed in other species have been attributed by some to the presence of impurities in the hormone preparation.

In 1934 Thompson and Cushing[5] tried to produce Cushing's syndrome in a puppy by injecting large doses of crude sheep's pituitary extract. The failure of this attempt was attributed to the formation of an anti-adrenocorticotrophic hormone. Recently the preparation of "purified" hog adrenocorticotrophic hormone (A.C.T.H.)[6] and its extensive use in clinical research has renewed interest in the subject of antihormones. Chase[7] injected mice with 50 mg. of A.C.T.H. over a period of 25 days. When the serum from these animals was injected into rats it prevented the increase in weight of the rats' adrenals normally caused by injections of A.C.T.H. Chase was able to demonstrate *in vitro* a precipitin reaction between the specific mouse antiserum and the A.C.T.H., and also an agglutination reaction if the A.C.T.H. was first absorbed on to collodion particles, so that the antigen (A.C.T.H.) was made macroscopically visible when agglutinated. Working independently, Gordon[8] has obtained similar results. He injected rats for seven weeks with an amount of A.C.T.H. proportionately similar to that used by Hench[9] for the treatment of rheumatoid arthritis in man. These rats became resistant to a test dose of the hormone which consistently depleted the ascorbic-acid content of the adrenals of control rats. The serum from the resistant animals contained a substance which when injected into hypophysectomized rats reduced the fall in adrenal ascorbic-acid concentration which normally occurs after administration of A.C.T.H. Although the number of animals used by both workers was small, adequate control experiments were carried out, and it seems probable that after prolonged injection purified hog A.C.T.H. induces an antihormone in rats and in mice.

The significance of these findings in relation to the administration of A.C.T.H. to man is not clear. So far no observations appear to have been made to discover whether or not an antihormone develops in the serum of patients given prolonged A.C.T.H. treatment, nor has any refractory state been ascribed to this cause. Perhaps the duration of treatment has been too short. In a recent report from the Mayo Clinic[10] the average duration of treatment with A.C.T.H. lasted four weeks (range 12–87 days). Nevertheless resistance to treatment or decreased responsiveness to A.C.T.H. may prove to be due to the development of a refractory state, and further evidence on this point must be awaited.

[1] Collip, J. B., *Ann. intern. Med.*, 1934, **8**, 10.
[2] —— ibid., 1935, **9**, 150.
[3] —— and Anderson, E. M., *Lancet*, 1934, **1**, 76.
[4] Thompson, K. W., *Physiol. Rev.*, 1941, **21**, 588.
[5] *Proc. Roy. Soc. B.*, 1934, **115**, 88.
[6] Sayers, G., White, A., and Long, C. N. H., *J. biol. Chem.*, 1943, **149**, 425.
[7] *Endocrinology*, 1949, **45**, 96.
[8] Ibid., 1949, **45**, 571.
[9] *Proc. Mayo Clin.*, 1949, **24**, 181.
[10] Sprague, R. G., *et al.*, *Arch. intern. Med.*, 1950, **85**, 199.

THE B.M.A. WAR MEMORIAL

An appeal has now been sent to members of the B.M.A. asking for contributions to the fund being raised to honour the memory of the medical men and women who fell in the second world war. Though the memorial will be dedicated to the 493 members of the Association who died, it will stand also as a tribute to all those of our profession in the British Commonwealth and Empire who lost their lives. A fountain with symbolic figures, designed by Mr. James Woodford, R.A., will be erected in the Court of Honour at B.M.A. House, and the surplus funds will be used to assist in the education of sons and daughters of members of the profession. An illuminated roll of honour like that for the first world war will also be displayed at the Association's house, a page being turned daily in perpetuity. The cost of the fountain will be about £10,000, but it is hoped that a much greater amount will be subscribed, so that there may be both an enduring witness to the sacrifice of those who died and substantial help available for their children. Contributions to the fund should be sent to the Chairman of Council, Dr. E. A. Gregg, B.M.A. House, Tavistock Square, London, W.C.1.

On July 8 the honorary degree of LL.D. of the University of Liverpool was conferred on Sir Henry Cohen, Professor of Medicine in the University and President-Elect of the B.M.A.; on Dr. E. A. Gregg, Chairman of Council of the B.M.A.; and on Dr. C. O. Stallybrass, former Deputy Medical Officer of Health for the City and Port of Liverpool.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

DIAGNOSIS AND TREATMENT OF PERNICIOUS ANAEMIA

BY

RONALD BODLEY SCOTT, M.A., D.M., F.R.C.P.

Physician to H.M. Household; Assistant Physician, St. Bartholomew's Hospital

Addisonian pernicious anaemia is the commonest and most important member of a group of diseases known as the megaloblastic anaemias. In pernicious anaemia the primary fault lies in a failure of gastric function. The mucosa of the stomach normally contributes a secretion (the intrinsic factor) which modifies, or combines with, a dietary factor to produce the anti-anaemic principle which is absorbed from the alimentary tract and stored in the liver. Pernicious anaemia arises when the glands of the gastric mucosa fail to secrete the intrinsic factor: its anatomical basis is an atrophy of the mucosal lining of the stomach.

Diagnosis

The importance of precise diagnosis before treatment is carried out cannot be overemphasized, for it may be impossible later. An incorrect diagnosis may mean that some other condition is overlooked until it has progressed beyond the possibility of cure; or, at best, that the patient is sentenced unnecessarily to regular injections for the rest of his life.

The logical steps in establishing a diagnosis of pernicious anaemia are to prove, first, that the anaemia in question is of the megaloblastic variety, and, secondly, that it has originated from failure of gastric function. Megaloblastic anaemias are characterized by a reduction of the red blood cell count proportionately greater than the fall in the haemoglobin level, and thus by a colour index greater than 1. Inspection of stained films of the blood will reveal variation in the size of the red blood cells, many of which will be abnormally large (megalocytes). This megalocytosis is shown by an increase in the mean corpuscular volume, an easily estimated index, of which the normal value lies between 75 and 95 μ^3.

In pernicious anaemia the figure is almost always above 100 μ^3 and usually in the range 110–140 μ^3. The leucocyte count is usually reduced, figures of 3,000 per c.mm. being common; the differential count shows no characteristic changes, but it is the rule to find some neutrophils whose nuclei have undergone abnormal segmentation to give rise to five or even six lobes. Complete proof that the anaemia is megaloblastic is given by examination of the bone marrow by puncture biopsy. Films of the aspirated material will show an increased cellularity with a predominance of megaloblasts. Although this investigation is always desirable, because its results are conclusive, it is not essential unless the diagnosis is in serious doubt.

Addisonian pernicious anaemia accounts for more than 90% of megaloblastic anaemias met with in this country, and is thus by far the most probable cause of any instance seen in practice. Probability is made virtual certainty by establishing the absence of other possible causes; by demonstrating gastric achlorhydria; and by the presence of signs indicating subacute combined degeneration of the spinal cord.

Megaloblastic anaemia occurs also as a result of tropical sprue, idiopathic steatorrhoea, and other variants of the sprue syndrome; it may be due to dietary deficiency (nutritional megaloblastic anaemia), or to various disorders of the alimentary tract, such as intestinal stricture and regional ileitis. It may occur in pregnancy or the puerperium; it may follow operations on the stomach and particularly total gastrectomy; it has been reported in infants, probably due to nutritional causes. A few questions put when taking the history will help to exclude these uncommon conditions. Collateral evidence of impaired gastric function will be provided by the fractional test meal: the diagnosis of pernicious anaemia should never be entertained unless achlorhydria after injection of histamine is established. Finally, subacute combined degeneration of the spinal cord accompanies pernicious anaemia in 40–50% of cases, but it is very rarely associated with other megaloblastic anaemias; thus evidence of this disease provides strong support for the diagnosis.

In brief, it may be said that a megalocytic anaemia with achlorhydria is probably pernicious anaemia. The diagnosis is made more probable by the presence of signs indicating subacute combined degeneration of the spinal cord. It is established beyond doubt by the demonstration of a megaloblastic bone marrow or by the presence of megaloblasts in the circulating blood, and by the exclusion of other causes of anaemia of this type.

Initial Treatment

The patient with severe anaemia should be at rest in bed, and it is wise to insist that he should remain there until the haemoglobin level has risen above 65% (Haldane). An exception must be made of those patients in whom there is evidence of disease of the spinal cord, for their disability is increased by prolonged immobilization.

It has long been known that certain foods are particularly favourable to blood regeneration: highest in the list are liver and kidney; apricots, peaches, grapes, and apples have considerable potency; while in this respect green vegetables, dairy products, and the farinaceous foods rank low. The immediate importance of these foods in pernicious anaemia, for which a specific therapeutic agent exists, is not great; nevertheless, a well-balanced diet, containing a liberal supplement of vitamins and a representative selection of the articles mentioned, should be prescribed. Bread, cakes, pastry, potatoes, and fats should be taken only in moderation and to ensure an adequate calorie value, for in excess they diminish the appetite for more valuable foods.

Blood transfusion is now seldom required in the patient with pernicious anaemia. The indications are anaemia severe enough to constitute an immediate danger to life; the presence of an infection or other process likely to interfere with the adequate response to specific treatment; and the urgent necessity for raising the haemoglobin level rapidly when, for example, immediate surgical operation is necessary. It is not easy to give a precise figure for the haemoglobin level below which transfusion is essential. Some patients with a reading as low as 20% (Haldane) are obviously not in immediate danger, while others with a level of 30% (Haldane) as clearly require transfusion.

Mental disturbance due to cerebral anoxia, extreme venous congestion, and generalized puffy oedema afford the clearest indications for transfusion of blood. This must be undertaken with extreme caution, for circulatory overloading is particularly prone to occur in the gravely anaemic patient : not more than 1,200–1,500 ml. should be given at a time, and the rate of administration should not exceed 1 ml. per kg. body weight an hour.

Specific Treatment

The specific treatment of pernicious anaemia consists of the administration of the anti-anaemic principle. Many effective preparations are available. Of these, raw liver and the liquid extract of liver for oral administration have little more than historical interest.

Proteolysed Liver for Oral Administration.—This is a powder obtained after papain digestion of liver : 1 g. contains the product of about 5 g. of the original liver. It is believed to contain substances which are needed for the repair of some of the less common megaloblastic anaemias but are removed in the preparation of refined extracts. It is an active and satisfactory preparation, and the first choice in the treatment of pernicious anaemia when parenteral injection is refused or contraindicated. A dose of one teaspoonful two or three times daily is usually adequate.

Liver Extracts for Parenteral Injection.—In general, two varieties are available,—crude and refined. Crude extracts have undergone the minimum of processing necessary to make them safe for injection, and contain a large amount of material other than the active principles. Each millilitre is derived from 2.5 to 10 g. of original liver. Refined extracts are derived from crude extracts by further purification, and the quantity of inert material they contain is less. Each millilitre is derived from 50 to 200 g. of liver. These definitions do not mean that the crude or refined extracts of different manufacturers are strictly comparable. It was long believed that crude extracts contained substances, removed during further purification, which made them more effective in some megaloblastic anaemias. It has often been stated that they should be employed when subacute combined degeneration is evident, but there is no foundation for this belief. Intramuscular injection of a refined liver extract of known potency is a completely effective method of treating pernicious anaemia, whether neural degeneration is present or not. Dosage varies with the product used. There is no indication for the use of crude extracts in treating pernicious anaemia.

Vitamin B_{12}.—Vitamin B_{12} appears to be the anti-anaemic principle of liver; it has proved as effective in the treatment of pernicious anaemia and subacute combined degeneration of the spinal cord as liver extract. When *Streptomyces griseus* is grown in fluid media it elaborates a substance as active therapeutically as the vitamin B_{12} obtained from liver and probably identical with it. This product of the *Streptomyces'* metabolism is marketed as vitamin B_{12}.

It is probable that vitamin B_{12} will replace liver extracts in the treatment of pernicious anaemia; it is cheaper, apparently as effective therapeutically, and never gives rise to the allergic complications which may follow prolonged use of liver extract.

The vitamin is given by parenteral injection: 20 μg. weekly is sufficient for the initial treatment of an average case; if signs of neural degeneration are present the dose should be raised to 40 μg. weekly.

Desiccated Hog's Stomach for Oral Administration.—This is, in a sense, the most logical remedy for pernicious anaemia, because it contains the intrinsic factor which the patient lacks. It is prescribed as a dry powder with an unpalatable taste, and the dose required is one to two tablespoonfuls daily. Some authorities believe it to be particularly indicated in the presence of subacute combined degeneration of the cord, although this view has not gained general acceptance. It is fully effective in the treatment of pernicious anaemia, but it is not to be recommended as a routine method. It is useful, as an alternative to proteolysed liver, when parenteral injection is impossible.

Folic Acid.—Pteroylglutamic acid, or folic acid, is effective in raising the blood levels in pernicious anaemia, but it has been found to exert no control on the nervous degeneration. In fact, its administration is often followed by the explosive onset of nervous symptoms which progress rapidly even while the anaemia is improving. Further, it has been shown that folic acid is not always able to maintain the haemoglobin reading and red blood cell count at normal levels. For these reasons folic acid must in this respect be regarded as a dangerous drug which has no place in the treatment of pernicious anaemia.

Dosage

The problem of dosage in using liver extracts and related preparations has always been difficult. There is no officially recognized "unit" of activity in this country, although the *United States Pharmacopoeia* has attempted to define one. The practitioner is forced to take the recommendations of the manufacturer until he has used one preparation long enough to be familiar with its potency. Recently it has become the practice for preparations to bear a statement of the number of microgrammes of vitamin B_{12} contained in a millilitre. This figure may well be fallacious because of technical difficulties in estimating the vitamin B_{12} content of liver extracts. For these reasons it is unwise to accept such figures as indicating with any precision the potency of a liver extract.

At present the method to be recommended is the intramuscular injection of a refined liver extract of proved potency or of vitamin B_{12}. In the first case dosage varies with the product, but, on an average, 1–2 ml. at intervals of 7–14 days will procure a maximal effect. If vitamin B_{12} is used, 20 μg. at intervals of 7–14 days is adequate. The response is easier to follow if daily reticulocyte counts can be made; a peak, the height of which is inversely proportional to the original red blood cell count, is reached between the fourth and ninth days after the initial injection. Thus a satisfactory response is indicated by a reticulocyte peak of about 40%, with an initial red blood cell count of 1,000,000 per c.mm.: with counts of 2,000,000 and 3,000,000 per c.mm. figures of 19% and 6.5% respectively would be anticipated. The increase in red blood cells follows hard on the reticulocytosis, and, whatever the initial count, a level of about 5,000,000 per c.mm. should be reached by the eighth week of treatment.

It is generally thought to be advisable to increase the dose of liver extract or vitamin B_{12} if subacute combined degeneration of the spinal cord is present. It is reasonable to give twice the quantity which would otherwise have been prescribed.

Inadequate response raises three possibilities. First, the preparation may be inactive: this should not arise if a reputable product with which the practitioner is familiar is employed, for most manufacturers subject each batch to clinical trial before it is marketed. Secondly, the diagnosis may be incorrect: this will require careful revision, and further investigation may be necessary. Thirdly, some condition known to impair the effect of the liver principle may be present. Infective processes are of particular importance in this respect. The most frequent is chronic infection of the urinary tract, which should always be excluded. Myxoedema and advanced arteriosclerosis are additional causes of an unsatisfactory response to liver.

Maintenance Treatment

When a normal blood picture has been restored the task of maintenance treatment is to preserve it. It is important to have exact criteria by which to judge normality, and the aim should be to keep the red blood cell count above 4,500,000 c.mm., the haemoglobin level above 90% (Haldane), and the mean corpuscular volume below 100 μ^3. Adequate control is possible only by means of regular examinations of the blood, and these should be made at least once in three months. At most clinics undertaking the treatment of pernicious anaemia a count once a month is the routine. The dosage required and the interval between injections vary with the patient; in the great majority 3–4 ml. of a refined extract or 40 μg. of vitamin B_{12} once a month will maintain a normal blood picture. If nervous symptoms are present it is advisable to give this quantity once a week for six months to a year. In any patient the dose should be increased if there is complaint of paraesthesia or sore tongue.

At the onset it is advisable to warn patients that they will require injections at regular intervals of a month for the rest of their days.

Complications of Liver Treatment

The only complication of parenteral injection of liver extracts is the occasional development of hypersensitivity. A small proportion of patients will complain, after a period, of collapse, sweating, vomiting, palpitation, skin rashes, or asthma immediately following an injection. When such symptoms appear parenteral injections of all liver extracts must be stopped, because hypersensitivity is seldom limited to one proprietary brand. Oral treatment with proteolysed liver or desiccated hog's stomach may be substituted. In some cases desensitization to liver extract is worth consideration; but the alternative, which will probably prove most satisfactory, is to continue with parenteral injections of vitamin B_{12}, to which no such reactions occur.

Adjuvant Treatment

It is rare to encounter patients in whom any symptoms, other than nervous, remain after effective liver treatment. The exceptions are those in whom some dyspepsia persists : in these, dilute hydrochloric acid (*B.P.*) in doses of 15–30 min. (0.9–1.8 ml.) three times a day in water or fruit juice is usually successful in relieving symptoms. Medication with iron is quite unnecessary unless a complicating iron-deficiency exists.

It should be noted that carcinoma of the stomach is at least three times as common in patients with pernicious anaemia as in the general population. The appearance of dyspeptic symptoms, loss of weight, or hypochromic anaemia should always arouse this suspicion. A radiological examination of the stomach once a year is a wise precaution.

Physiotherapy, and sometimes the assistance of the orthopaedic surgeon, will be needed in the treatment of patients with subacute combined degeneration of the spinal cord. It is usually found that symptoms and signs referable to peripheral neuritis improve rapidly, and usually vanish within two years of starting liver treatment. Damage to the cord becomes arrested, but little improvement is to be anticipated.

INCIDENCE AND TREATMENT OF NEUROSIS IN INDUSTRY

BY

T. M. LING, D.M., M.R.C.P.
Medical Director

J. A. PURSER, M.B., B.S., M.R.C.P.
Boots Lecturer in Occupational Health

AND

E. W. REES, M.R.C.S., L.R.C.P., D.P.M.
Senior Physician

Roffey Park Rehabilitation Centre, Horsham, Sussex

It is becoming increasingly recognized that psychiatric and psychosomatic conditions comprise many of the recurring and chronic forms of illness, but their occupational aspects are still insufficiently appreciated. Characteristically, these disorders incapacitate rather than kill, so that morbidity statistics should provide the basic source of information. Unfortunately, emphasis in the past has been placed on mortality rather than morbidity as a criterion of national health, so that relevant figures are lacking. This paper is designed to bring some aspects of industrial neurosis to the general notice and to suggest measures for dealing with the problem.

The incidence of neurosis among working groups of the population has been investigated from time to time by different workers. Culpin and Smith (1930) examined 1,000 people, including factory, clerical, technical, and administrative workers, by means of a planned interview and specific psychological tests. They found the incidence of nervous symptoms or emotional maladjustment was not confined to any one group, sex, or age. Approximately 16% had serious emotional difficulties and a further 20% had minor difficulties. Comparable figures were found by Halliday (1935), Bashford (1940), Collier (1943), Stocks (1945), and Wyatt (1945). Figures of the incidence of neurosis in the Services are in general conformity with these findings. More recently, Russell Fraser *et al.* (1947) carried out a survey on a sample of 3,000 male and female workers employed in 13 light and medium engineering factories situated mainly in the Birmingham region. They showed that 9.1% of the men and 13% of the women had suffered from definite and disabling neurotic illness, and a further 19% of the men and 23% of the women from minor forms of neurosis during the course of six months. Neurotic illness caused between one-quarter and one-third of all absence from work due to ill-health.

Prevention of Neurosis in Industry

Clearly the incidence of neurosis in industry is influenced by working environment, both physical and psychological, so it is essential that both doctors and industrial management should have a satisfactory understanding of these problems. Evidence of the need for training at this level is shown in a recent report of a committee set up by the Minister of Education. The suggested syllabus of training includes such subjects as personnel selection, placement, health, welfare, and safety; general psychology and psychiatry; the measurement of intelligence, attainments, and special aptitudes; social psychology, including the human factor in industrial relations, rehabilitation, individual and group morale, and the psychological basis of morale.

Stewart (1948) points out that it is not clear who is to provide teaching of this type, which is preventive work in the sphere of mental health. A beginning has been made in the resident training department at Roffey Park, where already 540 works managers and supervisors and 122 doctors have received teaching in human relations in industry in the past two years. It is to be hoped that, in the future, postgraduate departments of occupational health and social medicine will interest themselves in this important field. Psychiatry should give a lead and not leave these biological problems to be elucidated by laymen. An important field of prevention obviously lies in the factory, and this is largely a matter of the health of groups of people. In effect, the problem is not dissimilar to the situation found in the war, where, as J. R. Rees pointed out, happy ships and good regiments had a low incidence of neurosis, while unhappy ships and poor regiments engendered a sense of insecurity that led to neurotic breakdown or various forms of antisocial behaviour.

A hundred years ago this country was faced with serious epidemics of disease, a high infant mortality rate, and a high death rate among low-income groups—interrelated problems produced by rapid urbanization and industrialization. To-day the country is faced with a similar challenge in the field of mental health, and once again emphasis must be placed on prevention and public education rather than *ad hoc* treatment of the casualties.

Out-patient Departments

Since the publication of the Blacker Report in 1946 there has been a substantial increase in psychiatric clinics, an increase greatly accelerated since July, 1948. Thus in the four Metropolitan regions there are now 137 out-patient clinics, which are doing much to decrease neurotic illness. Nevertheless, in an industrialized society, whose prospects of survival as an independent power depend on national productivity, it is surprising that so few systematic attempts are made by medical schools to provide an understanding of industrial conditions for those who will be doing out-patient work. Here again Service example, with its introductory courses for all doctors, seems far ahead of civilian practice.

In-patient Treatment

As in other branches of medicine, in-patient facilities are necessary for cases needing intensive treatment, especially if this involves rehabilitation after a spell of sickness absence. A number of neurosis centres were established by the Services during the war, with the emphasis on early return to duty where possible and making full use of various social techniques in addition to individual treatment. Comparable facilities for industrial neurosis cases were non-existent before the war and are still much below current needs.

For the long-standing unemployed case, a 100-bed in-patient unit was established at Sutton Neurosis Centre in 1947, and is dealing with a difficult problem with vision and courage. Selected patients go out to part-time work in neighbouring factories and shops, thus helping to bridge the gap between hospital and work. Roffey Park at Horsham, with accommodation for 120 patients of either sex, provides treatment and resettlement facilities for early cases of neurosis in which employment seems a relevant factor. Special emphasis is placed on the morale-structure of the whole centre in the belief that this is an important therapeutic weapon, perhaps the best form of treatment for many psychosomatic conditions when the individuals have become "desocialized." Neurosis is characterized by a *failure to adjust to the environment*, and the restoration of this adjustment is essential for recovery. This morale-structure can be built up, given time and considerable thought, and it involves active participation by those involved. This is helped by the layout of the centre, and more particularly by the joint participation encouraged in all activities. The patients have their own elected *committee and meet weekly to offer* suggestions, elect representatives, and plan leisure-time activities. The daily routine includes practical occupational therapy in workshops or gardens, *directed towards the welfare* of the group, together with graded physical training. The whole emphasis is towards return to work, and the staff's regular contacts with industrial medical officers and personnel *managers attending refresher* courses give practical help in this connexion. The D.R.O. spends one day a week in the centre in co-operation with the medical staff and the industrial *psychologist to secure suitable placement.*

Not least of the centre's functions is the assessment of those cases unlikely to benefit from short-term treatment and advising upon their appropriate disposal. Psychotherapy *is directed along eclectic lines* and purposely kept at a fairly superficial level. Emphasis is placed upon the elucidation of relatively recent factors which have prevented the patient's successful adaptation to life and thus brought him under medical care. "Talking out" of problems, "counselling" techniques, and narco-analysis are extensively employed. Electric convulsion therapy, modified *insulin therapy, and other physical methods* of treatment are utilized where necessary. The average duration of treatment is from six to eight weeks, and this period is rarely exceeded, thereby minimizing the loss of confidence which prolonged stay in hospital may engender. On the patient's discharge the doctor referring the case receives a report in which detailed recommendations upon placement and *future handling form an essential feature.*

Treatment of the individual without appropriate modification of his environment is often only of transitory value, and this modification can be carried out only when *there is mutual understanding* between the industry and the hospital. A happy relationship has been built up over the last five years between Roffey Park and over 150 industrial *organizations, and this is augmented* by the fact that many of these companies send members of their staff on training courses in human relations to Roffey, where the preventive aspect of these problems is stressed.

Selection of Cases

Cases are referred by full-time industrial medical officers and by out-patient psychiatrists, and the majority of patients live in the Metropolitan hospital regions. Selection of suitable material for such *treatment is highly important*, but—it is necessary to be clear—selection for what? Should preference be given to the mild case that may well recover spontaneously or to the really difficult case that is a *major problem to the community* and that may well prove intractable? Should the skilled man with a good work record have priority over the unskilled man with a poor work record? *Should apparently unemployable cases* be admitted at all?

These are highly relevant problems that are shared with sanatoria and other special hospitals, and the answer involves *various ethical and economic questions.* It is pertinent, in these days of shortages of skilled man-power and of money, to inquire whether the individual is more important than the community. Clearly, during the war the individual was subordinated to the community, and in the Services emphasis was placed on employability. Again, priorities change. To-day industrial medical officers state that much time is lost and man-power wasted through *patients* having to wait many months for admission for hernia operations which will restore the man to full working capacity, probably for life. In the hospital world hernias have a low priority, as they are non-fatal and uninteresting, which is one of the reasons for the long waiting period.

Again, should hospital doctors and social workers devote considerable time to rehabilitation and resettlement, or should they leave these biological subjects to be undertaken by the Ministry of Labour, whose staff, of necessity, lack the clinical experience for work of this type? It would appear that these medico-social problems will become of increasing importance as the Health Service settles down and economists start asking what the community is receiving in exchange for the very substantial outlay.

At Roffey Park the admission rate is approximately 900 cases a year, those being selected who present serious occupational problems in the form of obvious maladjustment or long absence from work but who appear to have fundamentally good personalities. In general, the cases referred by industrial medical officers have better basic personalities than those referred by hospital psychiatrists. This is probably because the former are more concerned about those who have a good work record. It may be of interest to compare the work record, as judged by the medical staff, of those patients coming direct from industrial medical officers with that of those from other sources.

	Industrial M.O.	Other Sources
Good work record	64% (54 cases)	26% (111 cases)
Average work record	28% (24 ,,)	46% (195 ,,)
Poor work record	8% (7 ,,)	28% (116 ,,)

These differences would appear to be significant. Curran and Guttmann (1943) have also emphasized the importance of a good work record as evidence of temperamental stability.

Results of Treatment

To determine accurately the end-results of treatment in medicine is never easy, and it is especially difficult in morbid disorders where the alternatives of life or death are not relevant. Ross (1936), in a series of 1,186 patients, found 45% recoveries and 25% much improved when followed up one year after discharge. Knight (1941), combining experience at the Menninger Clinic with the results of various analytic institutions, analysed a composite series of almost 1,000 cases and found that 63% of the psychoneurotics had apparently recovered or had very much improved. Slater (1943) reported an improvement rate of 60 to 70% in his cases of war neurosis. Lewis (1943) reviewed the social and economic effects of neurosis in a series of 120 soldiers discharged from the Army on account of neurotic illness and subsequently treated in a neurosis centre. He found that 15 were unemployed and that 39 were socially unsatisfactory otherwise than in their occupations.

The after-effects of treatment of cases at Roffey Park seems to be of interest and has been analysed for 1948, the postal follow-up system being used. Individual follow-up by a social worker is impracticable owing to lack of staff and to high cost. All patients who leave hospital are followed up by letter at six-monthly, yearly, and two-yearly intervals, in which they are asked to comment on their state of health and working capacity. Adequate information was obtained regarding 512 patients, all of whom had been discharged between six and twelve months. The results were: much improved, 33.8% (173 cases); improved, 44.7% (229 cases); unimproved, 21.5% (110 cases).

It is difficult to determine occupational capacity from written replies from individual patients, therefore the follow-up reports of 85 cases which were obtained direct from full-time industrial medical officers of certain firms are of particular value. Clinically, these cases were recorded by the industrial medical officers as follows: Much improved and working full time, 54.1% (46 cases); improved and working full time, 37.7% (32 cases); unimproved or had left the company, 8.2% (7 cases).

In 28% of the cases in which follow-up inquiries were made we received no reply. Obviously some of these ex-patients are unlikely to be well, but some who are now well wish to forget their nervous illnesses and will not answer, as they desire to sever contact with the hospital. The same situation arises in connexion with the follow-up of ex-sanatoria patients. It is to be hoped that, in the future, social workers will be available to carry out personal follow-ups on random samples of all hospital populations and also survey their adjustment to work.

One of the important lessons learnt at Roffey Park is the necessity that hospital out-patient staffs, both general and psychiatric, should have a better understanding of the occupational problems of their neighbouring industries. If this understanding existed—and there is reason to believe that there is a closer link in provincial centres than in London—there would be fewer instances of requests for "light work" and other indeterminate recommendations, and there would be a better appreciation of the social responsibilities of contemporary medicine.

Summary

A review of recent trends in morbidity is given and reference is made to the interrelationships of psychosomatic conditions and the working environment.

A description of treatment and some follow-up results of 512 cases at Roffey Park are reported.

The necessity for a comprehensive preventive programme is reviewed, and it is emphasized that all doctors should have an understanding of the occupational background of their patients.

This paper would not have been possible without the co-operation of a considerable number of full-time industrial medical officers, to whom our thanks are due.

Bibliography

Bashford, H. (1940). *J. R. sanit. Inst.*, **60**, 360.
Blacker, C. P. (1946). *Neurosis and the Mental Health Services.* Oxford University Press, London.
Collier, H. E. (1943). *British Medical Journal*, **2**, 461.
Culpin, M., and Smith, M. (1930). "The Nervous Temperament." Ind. Hlth Res. Bd. Rep. No. 61.
Curran, D., and Guttmann, E. (1943). *Psychological Medicine.* Livingstone, Edinburgh.
Fraser, Russell, *et al.* (1947). "The Incidence of Neurosis Among Factory Workers." Ind. Hlth Res. Bd Rep. No. 90.
Halliday, J. L. (1935). *British Medical Journal*, **1**, Suppl., p. 85.
Knight, R. P. (1941). *Amer. J. Psychiat.*, **98**, 434.
Lewis, A. (1943). *Lancet*, **1**, 167.
Rees, J. R. (1945). *The Shaping of Psychiatry by War.* London.
Ross, T. A. (1936). *An Enquiry Into Prognosis in the Neuroses*, Cambridge University Press.
Slater, E. (1943). *J. Neurol. Psychiat., Lond.*, **6**, 1.
Stewart, D. (1948). *Lancet*, **1**, 737.
Stocks, P. (1945). *Mon. Bull. Min. Hlth*, **4**, 119.
Wyatt, S. (1945). "A Study of Certified Sickness Absence Among Women in Industry." Ind. Hlth Res. Bd. Rep. No. 86.

TREATMENT OF TUBERCULOSIS

MORE BEDS TO BE PROVIDED

The following memorandum has been sent by the Minister of Health to regional hospital boards and local health authorities.

The Minister has sought the views of his Tuberculosis Standing Advisory Committee on the operation of the National Health Service in connexion with tuberculosis. They have made certain recommendations which he feels it would be possible to act upon forthwith, as matters of organization, without going beyond the limitations which the present need for economy imposes. These are dealt with in the following memorandum, which the Minister is sending also to local health authorities, having regard to the responsibilities of both in different aspects of the tuberculosis services and to the necessity for the closest co-operation between them if these are to work efficiently as an essential entity. The importance of the part to be played by general practitioners in the campaign against tuberculosis also needs to be borne in mind.

In-patient Beds

The most pressing problem is the long waiting-list for institutional treatment and the consequent lapse of time between diagnosis and admission to such treatment. Many more beds must be made available quickly, without waiting on progress in making good the lack of staff which is a major cause of the present shortage of accommodation. The Minister, with the agreement of his advisory bodies, deems it necessary to augment the insufficient resources of sanatoria and tuberculosis hospitals by using a proportion of beds in general hospitals for tuberculosis cases. He therefore asks regional hospital boards and boards of governors to apportion for the admission of respiratory tuberculosis patients as many beds as reasonably possible in suitable general hospitals. It is desirable that they should be in a separate section or block, and in any event in separate wards. Boards are also asked to consider to what extent they can arrange to use beds in isolation hospitals not required as essential epidemic reserves. The Minister would propose to invite reports from boards in due course about the arrangements they have been able to make in these matters.

With the present shortage of beds the available accommodation must clearly be used as advantageously and economically as possible. The use of beds should be limited as far as practicable to recoverable cases. Patients for whom further active treatment is unlikely to be of avail, but whose condition or circumstances do not permit of discharging them, should if possible be provided for in accommodation distinct from that for cases under active treatment; but this should be only an administrative distinction, with discretion in giving effect to it so that difficulties do not arise from overt classification of certain cases as beyond remedy.

It will assist in making the full and best use of institution beds if there is central oversight of admissions and discharges by headquarters medical staff of the regional board through a bed-bureau system. In some parts of the country (notably the London area) inter-regional organization will doubtless need to be considered.

There should be a check on any tendency to retain patients in institutions longer than is justifiable. Regional boards should consider whether they have adequate arrangements for keeping under expert medical review the length of stay in their several sanatoria or tuberculosis hospitals.

Boards should make themselves familiar with a scheme at present operating in connexion with the Central Middlesex Hospital and a neighbouring chest clinic which combines rest and collapse therapy in the home with short periods of in-patient treatment. A system of this kind depends on local conditions and resources, but it is clearly one which may prove suitable in some areas as an expedient for alleviating a local insufficiency of institutional beds.

The Minister has sought the views of the appropriate standing advisory committees on the arrangements which might be made to second student nurses to sanatoria and any further advice which can be given to safeguard the health of nurses engaged in the nursing of tuberculosis, and hopes that he may be able shortly to issue further guidance to hospital authorities based on their advice.

Chest Clinics

Attention should be given to ways in which the work of chest clinics can help to relieve the pressure on institutional beds. A high standard of clinical judgment is necessary to avoid recommendation of institutional treatment for cases in which it is not essential and for which domiciliary care would suffice. Selection at this stage should be aimed at using the special treatment available in institutions only for those cases best able to benefit from it and so avoiding the use of such treatment when consequential complications may only protract the stay in the institution.

Every effort should be made to discover active tuberculosis at the earliest stage and to give the closest attention to contacts and the ascertainment among them of non-reactors to tuberculin with a view to raising their immunity by B.C.G. vaccination. Chest physicians will recognize that it is important to concern themselves no less with prevention and aftercare than with their clinical work; and that it is necessary to give sedulous attention to case-finding and the supervision of the tuberculous family, including visitation in the home.

Mass Radiography

Mass radiography is of first importance in case-finding and in discovering latent infective cases among groups of the population so as to check the spread of infection. There should be the closest co-operation between regional boards and local health authorities in applying mass radiography to groups in which significant tuberculosis is most likely to be found. A local health authority should be informed by the board of all surveys arranged in the authority's area and also of the general results of the surveys. There should also be co-operation with regard to propaganda regarding mass radiography.

The system should not be regarded as a diagnostic service independent of the chest clinic service, and the medical officer in charge of a mass radiography unit should be on the staff of a chest clinic with responsibility for clinical sessions there. It is desirable that a period of duty with a unit should form part of the training of a chest physician.

So far as resources permit the work of a mass radiography unit should include periodical repeat examinations of selected groups.

Resettlement of the Tuberculous

The occupational resettlement of the tuberculous is part of their aftercare. It needs to be closely co-ordinated with the treatment of the individual case and, therefore, to be no less the concern of the chest physician than the clinical management of the case. The value of village settlements in this field has long been recognized; but the extent to which the need can be met in this way is limited, and other methods also need to be followed. Local health authorities, with the participation of chest physicians in their preventive and aftercare functions, can do much by closely associating themselves with the work of Ministry of Labour and National Service officers in connexion with the Disabled Persons (Employment) Act.

There is no better way of consolidating the good effects of sanatorium treatment than for the patient to undertake work under sanatorium conditions. Tuberculous persons should therefore be considered wherever possible in staffing tuberculosis institutions. The Minister hopes that he may shortly be able to issue further guidance as to the terms on which ex-patients not yet capable of full-time work may be engaged.

Open-air Schools

The scope of prevention and rehabilitation extends to children who are, or are at risk of being, tuberculously affected. In this field a particularly important part can be played by open-air schools whether residential or for day scholars, provided that the right type of case is admitted to them, which depends on skilled diagnosis and accurate assessment of the clinical needs of the individual child coming to the notice of the chest clinic. Co-operation between the hospital paediatric service, the general-practitioner service, child-welfare authorities, and education authorities is essential.

Nova et Vetera

EARLY DAYS OF GYNAECOLOGICAL SURGERY

The Development of Gynaecological Surgery and Instruments. By James V. Ricci, M.D. (Pp. 594; illustrated. $12.) Philadelphia and Toronto: The Blakiston Company. 1949.

This book purports to give an account of gynaecological procedures and instruments "from the Hippocratic dawn to the antiseptic age." Not unnaturally a full half of the volume is devoted to the pre-Listerian nineteenth century, for gynaecology as we now know it is almost entirely the product of the last hundred and fifty years, and the growth of the knowledge and the art of treating "the diseases of women" was meagre in all the previous centuries. Nevertheless there is a great deal of picturesque, interesting, and occasionally valuable information to be extracted from the earlier literature about what would be called gynaecological treatment, the instruments and appliances used, and the men who used them. In this province Professor Ricci is obviously quite at home. His sixteen hundred references are remarkable, many of them containing long verbatim extracts from the original sources. For checking these the author gives credit to Dr. Curt Proskauer, who deserves this tribute for the fine accomplishment of a Herculean labour. There are numerous but unnumbered reproductions of old illustrations; their usefulness would be greatly increased by being numbered and more specifically related to the text.

Unquestionably America made a great—perhaps a disproportionately great—contribution to the early development of gynaecology, but, while this work rightly receives full consideration, the author has by no means neglected the contemporary work that was done on this side of the Atlantic. Professor Ricci disclaims any attempt "to explain why or how gynaecology originated," or any intention "to dwell upon what has been designated the 'philosophy' of medical history." Although, as a matter of fact, he does not keep within his self-appointed limits, there is no reason to complain. He has made his work primarily and predominantly factual, and as such it is a volume to be consulted rather than read. It may well be called a mine of information, fully documented; and it will be a most helpful guide to all who have either the desire or the occasion to delve into the early history of the subject. The book will prove a useful addition to all medical libraries.

R. W. JOHNSTONE.

A circular from the Ministry of Health to hospital boards and committees discusses the use of duty-free spirits in hospitals and hospital stills. Full duty is payable on potable spirits. Rebate of duty may be obtained on spirits used in the manufacture of certain medical and surgical preparations. Applications for rebate should normally be made once a quarter to the local officer of Customs and Excise, who can supply full details about the scheme. The arrangements for supplying duty-free spirits have been revised. The Commissioners of Customs and Excise have in certain cases required the enactment of a bond before authorizing the receipt of duty-free spirit by a hospital. This requirement can now be dispensed with, and the Ministry advises hospitals to end any existing arrangements with sureties. This concession obtained by the Minister is made in the form of an individual authority granted to the management committee or board of governors concerned. To obtain the authority the secretary or a responsible member of a committee or board should send Customs and Excise Form Ex.240 to the local officer of Customs and Excise.

Correspondence

Auto-antibody Formation and Disease

SIR,—This letter is stimulated by the very interesting report by Keith Ball on "Abacterial Form of Endocarditis with Necrosis of the Ears" which appeared in the *British Medical Journal* of May 27, 1950 (p. 1236).

In the absence of knowledge concerning aetiology and pathogenesis there is a tendency to lump together different diseases on the basis of similar clinical manifestations or post-mortem findings. Contrariwise, a disease with manifold clinical and pathological manifestations may be divided into several categories until the common aetiological agent is discovered. Thus it was not until isosensitization to the Rh factor was demonstrated that it was possible to connect with certainty the diverse manifestations of erythroblastosis foetalis.

According to the principle of "horror autotoxicus" enunciated by Ehrlich it was believed that antibodies are never produced which are directed against substances which are normal constituents of the body. It has been found, however, that certain individuals exist who have a remarkable propensity to form antibodies and can even form auto-antibodies. When the newer sensitive techniques for demonstrating univalent Rh antibodies, such as the conglutination and anti-globulin tests, or tests with enzyme-treated red cells, are applied in such cases, the presence of auto-antibodies against the erythrocytes can readily be demonstrated in the serum of such individuals. In this way it has been possible to explain certain cases of acquired haemolytic anaemia.

It seems that there are a number of other clinical syndromes which were formerly considered to be unrelated which can be explained by the same mechanism. This explanation would apply, for example, to the syndrome designated as thrombotic thrombocytopenic purpura. This almost uniformly fatal condition shows at post-mortem examination multiple thrombi which have been interpreted on the basis of their staining reactions to be platelet thrombi.[1] A more reasonable interpretation[2] of these lesions is that the thrombi consist of lysed and autoconglutinated red cells. The theory that these lesions are due to autosensitization seems plausible, and this would also account for the frequently associated haemolytic anaemia.

Autosensitization appears to play a part also in the ill-defined syndrome designated as disseminated lupus erythematosus. In a case recently seen by the writer, by using trypsinated test cells, there was no difficulty in demonstrating auto-antibodies in the serum of the patient, who also exhibited purpura and haemolytic anaemia. The so-called L.E. inclusion phenomenon of Hargraves *et al.*[3,4] can probably be explained as due to coating of the patient's red cells by auto-antibodies followed by phagocytosis of the sensitized cells by leucocytes. Thus in the writer's opinion the inclusion bodies probably do not consist of nuclear material, but of damaged red cells. The remarkable propensity of patients with lupus erythematosus to form antibodies in general is illustrated by the interesting case report of Callender and Race.[5]

It is tempting to apply the same explanation to explain the case of Keith Ball. Autosensitization could account for the rapidly developing anaemia which the patient exhibited. The necrotic lesions in the ear could be explained by the blockage of the circulation by autoconglutinated cells. The disseminated nature of the condition was demonstrated by the presence of similar infarcts in the heart, kidneys, and brain. The fact that no bacterium could be isolated seems to refute the diagnosis of endocarditis. It is unfortunate that no tests were made for auto-antibodies, and it would be interesting to determine the results of such tests in future cases of so-called abacterial endocarditis.

Sensitization of type Rh$_1$ individuals by type Rh$_2$ or type Rh$_1$Rh$_2$ blood either by pregnancy or by transfusion is rare. We have encountered six anti-rh″ sera from such individuals, and in every case tested we were able to demonstrate the presence of auto-antibodies with the aid of trypsinated red cells, while two of the patients were also sensitized to the hr′ factor.[6,7,8] Moreover, in three cases of haemolytic anaemia with serological evidence of autosensitization, sensitization to the hr′ factor occurred following blood transfusion. Yet hr′ is a poor antigen, as shown by our experience with normal male volunteers.[9] In such individuals sensitization to the Rh$_0$ factor is readily induced by two or more injections of small amounts

of blood, but attempts to induce hr' sensitization have so far been unsuccessful. Our observations therefore tend to support the concept of the existence of rare individuals with a striking constitutional ability to form antibodies.[10] Further evidence is provided by the remarkable case reports of Collins *et al.* and Malone and Cowen in the *British Medical Journal* of June 3, 1950.[11] One can predict that in these cases, also, suitable tests would demonstrate the presence of autosensitization. In the cases of rh" sensitization mentioned above the auto-antibodies present in the patients' sera were apparently doing no harm. It remains to be seen whether or not the presence of auto-antibodies demonstrated with the aid of enzyme-treated red cells is a warning that some time in the future the patients may develop haemolytic anaemia, lupus erythematosus, or some other clinical sequel of autosensitization.—I am, etc.,

Brooklyn, New York. ALEXANDER S. WIENER.

REFERENCES

1 Singer, K., Motulsky, A. G., and Shanberge, J. N., *Blood*, 1950, **5**, 434.
2 Wiener, A. S., *Exp. Med. Surg.*, 1949, **7**, 200.
3 Hargraves, M. M., Richmond, H., and Morton, R., *Proc. Mayo Clin.*, 1948, **23**, 25.
4 Berman, L., Axelrod, A. R., Goodman, H. L., and McClaughry, R. I., *Amer. J. clin. Path.*, 1950, **20**, 403.
5 Callender, S. T., and Race, R. R., *Ann. Eugen., Camb.*, 1946, **13**, 102.
6 Wiener, A. S., and Brancato, G., *Anesthesiology*, 1948, **9**, 175.
7 Wiener, A. S., *J. Lab. clin. Med.*, 1948, **33**, 985.
8 Wiener, A. S., Unpublished observations.
9 Wiener, A. S., *Proc. Soc. exp. Biol., N.Y.*, 1949, **70**, 576.
10 Wiener, A. S., Silverman, I. J., and Aronson, W., *Amer. J. clin. Path.*, 1942, **12**, 241.
11 Leading article. *British Medical Journal*, 1950, **1**, 1308.

General Adaptation Syndrome

SIR,—In your leading article of June 17 (p. 1410) you eulogize the work of Dr. Hans Selye in terms that cannot fail to have their influence on future textbooks. You say that his work was neglected until "in 1949 the application of his work to the treatment of rheumatoid arthritis suddenly changed neglect into enthusiasm." May I ask you, Sir, in all humility just how the work of Selye applies to the effects produced by A.C.T.H. and cortisone in rheumatoid arthritis? Is it his experimental or theoretical contribution that most impresses you? Among much published experimental work, possibly his most striking report was that rats deprived of one kidney, fed salt, and injected with 11-desoxycorticosterone, developed an arthritis. There was little in this to suggest, at the time, that a suprarenal corticoid might relieve rheumatoid arthritis. Is it not, therefore, a little fanciful to describe, as you do, the distinguished chemist and physician at the Mayo Clinic who made this great discovery as "decorators" of Selye's building—the General Adaptation Syndrome which he invented? It is presumably this theoretical contribution that you think most significant, since you say, "No theory in living memory has possessed these virtues . . . etc." Of what does this theory consist?

The general idea, as I understand it, is that the body reacts to all forms of stress in a general non-specific way; but unfortunately no one can define precisely what that way is, because the response is always complicated by "conditioning" factors, including the local effects of the particular "stressor." We get few clues about the precise nature of this general response from the published account of Selye's Heberden Oration (p. 1383) except that "the systemic defence measures . . . are co-ordinated through the hypothalamic vegetative centres and the hypophysis" and "all stressors cause an A.C.T.H. discharge." This naturally makes it plain that whenever A.C.T.H. is discharged or, by implication, in any disease that responds to A.C.T.H., the general adaptation syndrome is at work and that stress has set the process in motion. It does not seem to matter that some of these "defence measures" are positively harmful, such as impairment of wound healing and the diminished resistance to infections induced by A.C.T.H. These, you say, are "because the derailment of the defence mechanism is on the other side of the track." Personally I don't know what this means, but I am sure that you do.

Obviously this is a comfortable new theory that helps us to think that we understand what we are doing in the practice of medicine, and allays some of our uncertainties and unquiet thoughts. My chief complaint against it is that it overlooks one of the basic rules of science. Admittedly, there have been rare occasions when science has been helped forward by brilliant deductive intuition, but its solid splendour has been founded on the less spectacular process of induction: observing the particular phenomenon, "asking Nature simple questions one at a time," and finally arriving at a tentative hypothesis that provisionally explains the observed facts. In my view, the theory of the general adaptation syndrome has not been subject to this discipline; it has been arrived at by the opposite intellectual process—that of deduction, from the general to the particular. A simple diagram may make my meaning clear:

General Over-all Direction
↓
Hypophyseal Stimulation
↓
General Adaptation Syndrome
↓
Several Possible Unborn Deductive Speculations

The theory of the general adaptation syndrome having been postulated, it was, in Selye's words, "tempting to survey all diseases of unknown aetiology from this new point of view and to determine whether those among them which apparently can be caused by a variety of agents belong to the category of diseases of adaptation." He adds: "This has been accomplished." Thus, we are confronted on p. 1389 with what you yourself call an "astonishing list" of diseases, including agranulocytosis, blepharitis, and nasal polyps in which A.C.T.H. is said to do good, and adding acne and others in which it is said to be harmful; is it implied that these are all "diseases of adaptation"? If so, where is the evidence that they have been initiated by stress?

I think, Sir, that we would do well to remember that, through deductive speculation, civilized society was once plunged into the Dark Ages, from which it was rescued only by the inductive reasoning of Harvey, Descartes, and their contemporaries. We are now constantly threatened by the possibility of a new Dark Age; this time dressed up in all the outward trappings of science rather than of religion. Some signs of this have already come from elsewhere—in the field of genetics. A book that would give us a comforting and apparently satisfactory explanation of a host of obscure diseases, under a "general" all-embracing theory, might serve very well the same purpose that Galen's book did in the former Middle Ages. As Selye himself says, "It will take many years, indeed many generations, before the details of the general adaptation syndrome are satisfactorily elucidated." Finally, imagination boggles at his implication that the health services of the future should include "the specialist in stress and adaptation."—I am, etc.,

Edinburgh. A. P. MEIKLEJOHN.

Poliomyelitis and Fatigue of Travel

SIR,—In the poliomyelitis outbreak of 1947 one feature was the apparently capricious selection of victims. A common occurrence was the simultaneous appearance of cases in a locality in such a way as to suggest widespread infection which was intense enough only to cause a few cases. Why were the victims chosen and others—many in the same households—left unharmed?

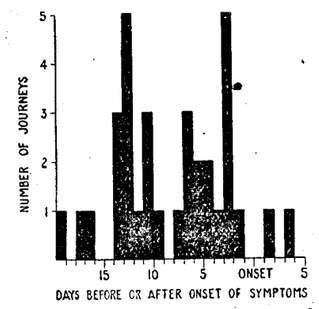
Russell (1947 and 1949) demonstrated in a number of cases a causal relationship between muscular effort and intramuscular injection on the one hand and the onset and severity of paralysis in cases of poliomyelitis. Hargreaves's (1948) results bear out this observation. Nisbet (1949) in a small series of cases found no correlation between muscular effort and the onset of paralysis.

In a series of 84 confirmed cases occurring in Moray and Nairn over the three years starting in 1947, confirmatory evidence of the findings of Russell and Hargreaves has largely been lacking. In no instance was the onset of paralysis specially linked with muscular effort. In one instance, a journey made on the second day after the onset of symptoms was associated with fatal bulbar paralysis. In the other case where the patient

indulged in travel after the onset no paralysis ensued. Many of the cases received intramuscular penicillin into the gluteal region. Equally, many of the cases so treated developed no paralysis, and in no case could it be determined that paralysis of the gluteal musculature was associated with injection.

The foregoing is not to be taken as a statement of disbelief in the findings of these two observers, but merely that their good fortune in securing evidence on the point has not been shared. This is made particularly clear, because evidence which suggests that fatigue may favour the onset of poliomyelitis, paralytic and otherwise, and that in particular the fatigue of travelling may do so, has been secured and is now set out.

In correlating the evidence concerning the movements of patients and their contacts it was noted at an early date that in quite a number of instances the patient had travelled during the two or three weeks immediately before the date of onset. This led to further inquiry into the incidence of travel, and the results are here expressed graphically, 33 journeys made by 21 patients being recorded. The term "journey" is perforce an elastic one, varying as it does from a day of travel from Surrey to Elgin to relatively short bus journeys within the area of the county. None of the journeys were features of the daily lives of the persons who made them; similarly, 63 other patients in the series were not regular travellers.



Travelling in relation to the onset of poliomyelitis.

One-quarter of all cases in the series made journeys. I cannot but treat this as a fact of significance. Further, a substantial preponderance of these journeys was made between the thirteenth and tenth days prior to onset, both days included, and similarly between the sixth and second days prior to onset.

There appears to be an association between the journeys made longer before onset and the date of infection. This supposition tallies fairly well with the theory of Casey (1942) concerning the length of the incubation period, particularly with the formula 12.2 ± 1.1 days.

If the supposition that travel coinciding with exposure to infection predisposes to infection is accepted as a hypothetical *terminus ad quem*, it then follows that the vehicle employed for travel is a place particularly favourable to the passage of infection, or that by travel the bodily threshold of resistance is lowered, so that an otherwise unrecognizable infection becomes clinically recognized. The latter supposition is the more likely. The most likely effects of travel appear to be excitement and fatigue, both of which are phenomena pertaining to the nervous system. It seems therefore not too far-fetched a theory to propound that the excitement or fatigue of travel, coinciding with infection, predisposes towards an attack of poliomyelitis.

Journeys made in the period immediately before the onset are less likely to be associated with the date of infection. Study of the diagram will show that a peak is reached two days before the onset. The shortest period of incubation for which authority has been found is three days. Hypothetical explanations for this phenomenon are put forward as follows. In the case of journeys made four or more days prior to onset, the arguments already advanced hold good, and the occurrence could be due to infection and predisposition at that date. Alternatively, the effect of travel, fatigue, and excitement is so to alter the physiological reactions of the nervous system that the incubation period is shortened. Thirdly, the effect of travel with its attendant fatigue is to bring to clinical levels a pre-existing infection; the condition may be aggravated but not caused by the travel. This last supposition appears to be the most likely, though a naturally short incubation period is a possibility which cannot be entirely ruled out.

To summarize, therefore, evidence has been set out to show an association between the date of onset and the patient's travelling. The most probable explanations for the occurrence appear to be conditioning the body to the reception of infection, and, nearer the moment of onset, to aggravate the virus potency for harm in its victim. This conditioning or aggravation is most probably due to the lowering of the resistance of the nervous system to the virus through the agency of fatigue.

I desire to express my indebtedness to the Senatus Academicus of the University of Edinburgh for permission to use the subject matter of this letter for publication.—I am, etc.,

Elgin, Morayshire. I. C. MONRO.

REFERENCES

Casey, A. E. (1942). *J. Amer. med. Ass.*, **120**, 805.
Hargreaves, E. R. (1948). *British Medical Journal*, **2**, 1021.
Nisbet, B. R. (1949). *Health Bulletin*, **7**, 73.
Russell, W. Ritchie (1947). *British Medical Journal*, **2**, 1023.
—— (1949). Ibid., **1**, 465.

Crisis in Tuberculosis

SIR,—In your important leading article under this heading (July 8, p. 92) you suggest that the Scottish proposal to bring unused beds in infectious diseases hospitals into the tuberculosis scheme is only a partial solution, as many of these beds could only be used for "untreatable tuberculous patients." This is probably true if bed rest with care and attention no longer ranks as treatment. It seems to me, however, that with the greatly increased possibilities of active treatment there is a tendency to shelve the untreatable case who needs admission so badly, not only on humanitarian grounds but even more because of his potential danger to others. Surely he is the greatest spreader of tuberculosis except the chronic ambulant sputum-positive case, known or unknown. The problem of the latter is a difficult one, but must be tackled more conclusively in any really effective attack on this disease. No scheme, however, can be called effective which does not provide almost immediate admission for the open case desiring and requiring hospitalization, and the isolation hospital seems particularly appropriate for this purpose.

Surely the first plank in any campaign to deal with tuberculosis should be the creation of a large pool of beds which are frankly only suitable for routine treatment. These are more easily provided, need a smaller proportion of trained staff, and are not necessarily permanently dedicated to tuberculosis. They might be graded for advanced, intermediate, and convalescent cases. Only in this way can we make full use of the available treatment beds. The teaching hospitals can hardly be expected to take their proper share in the treatment of emergency tuberculous patients and cases for assessment or special treatment without a guarantee that they will be promptly relieved of cases which reach the routine bed-rest level. The higher grade sanatorium could save innumerable bed-weeks if the system was sufficiently fluid to allow easy transfer of treatable patients during the considerable periods when their treatment may be said to descend to the routine, with, of course, arrangements for taking them back when required.

Lastly, one might suggest that those institutions which remain on a somewhat lower level of medical and nursing provision might well be compensated by special efforts to secure a high level of comfort, catering, occupation, and interest. While this entails expenditure, it need not make demands on trained nursing staff, and it is good treatment.—I am, etc.,

London, S.W.1. IAN S. THOMSON.

SIR,—As your leading article (July 8, p. 92) so rightly says, there is a crisis in tuberculosis; how to provide beds and how to staff them is the fundamental question. There is in Montana, Switzerland, a British sanatorium, fully equipped for treatment of every type of tuberculosis, which is at the moment only occupied by twenty patients instead of the hundred which it is capable of taking. The reason for this is partly that most patients cannot afford the fees which now have to be charged, since the sanatorium is only quarter full. Before 1948 the majority of patients were subsidized by their local health authorities, which in most cases were only too glad to pay a proportion of the fees when they saw the opportunity of getting

these cases into a sanatorium within reasonable time. There seems now little opportunity of getting patients into sanatoria within reasonable time unless such a place as Montana Hall is utilized.

Eighty beds may be only a drop in the ocean of beds required, but at least it is a drop.—I am, etc.,

Sidmouth, Devon. A. H. DUNKERLEY.

Inoculation and Poliomyelitis

SIR,—The recent indication of association between inoculation and poliomyelitis (July 1, p. 1) raises the question whether this is yet another manifestation of the stress and general adaptation syndrome (Selye, June 17, p. 1383).

It seems possible that, during the incubation phase of an infection with the poliomyelitis virus, the body is in a state of stress comparable with that called by Selye the "alarm reaction." During this phase the individual is more sensitive to conditioning factors, such as an inoculation. This may explain why many cases of poliomyelitis do not reach the stage of paralysis, as in them there has not been any antecedent selective conditioning factor. Theoretically, conditioning factors of many types such as inoculation, tonsillectomy, exercise (Ritchie Russell), or even severe mental strain may play a part in the aetiology of each case of poliomyelitis showing paralysis.

If this hypothesis is correct, it should eventually be possible to treat, by the injection of adrenal hormones (corticoids), cases of poliomyelitis in the early stages, either to prevent the onset of paresis or to halt its course. It is believed that A.C.T.H. has no helpful effect on poliomyelitis, but other corticoids with theoretically a similar action on the general adaptation syndrome may be synthesized in the near future. It would seem well worth while to subject them to prolonged clinical trial on a disease which so far has no specific therapy.—I am, etc.,

London, S.W.7. JOAN LLEWELYN.

Chloromycetin and Typhoid Haemorrhage

SIR,—This report of the timely arrival of "chloromycetin" in saving the life of a moribund patient with daily typhoid haemorrhages is considered worthy of record.

On December 7, 1949, a young Arab of Bahrain aged 20 was admitted to the Bahrain Government Hospital with a 3-day pyrexia of acute onset. On admission he had a temperature of 103° F. (39.4° C.) and pulse of 108. Patient was quiet. The abdomen showed no definite signs other than an enlarged spleen. The chest was normal. There was a leucopenia of 3,200. The urine was normal.

During the first week the pyrexia ran the usual high intermittent course of 103°–104° F. (39.4°–40° C.), and the pulse was 108–118. On the tenth day of the disease the Widal reaction showed a high positive for *S. typhi* of 1/250. By then the abdomen was distending with right-iliac-fossa tenderness and tympanites. The general condition was that of a restless early delirium. After reaching a peak temperature of 104.6° F. (40.3° C.) on the tenth day a slow lysis took place during the second week, where it settled at 102° F. (38.9° C.) well into the third week. The general condition was now deteriorating. His bowels, loose at the onset, then confined, became again active.

On the twenty-first day four roundworms were passed. Early the next morning 2–3 oz. (55–85 ml.) of dark red blood was passed. Morphine was given, ice bags were applied to the abdomen, and intravenous saline therapy was at once adopted. After a pause of one day a specimen stool showed a large quantity of blood, about 10 oz. (280 ml.), and two roundworms. More rigorous saline treatment was given, and also nikethamide. The pulse rate did not rise above 120, and the temperature remained at 102°–103° F. He was weakening fast, with high delirium. He was not expected to live more than another two days, and with tense anxiety we were awaiting the arrival of chloromycetin.

The following morning the drug arrived on the twenty-fourth day of the disease. A course was planned as follows: first day, 4 g.; second day, 4.5 g.; third day, 4 g.; fourth day, 3.5 g.; fifth and half the sixth day, 5 g. A total of 21 g. was therefore given over five and a half days. Dosage was 0.5 g. and 0.25 g. alternately every two hours the first two days; 0.5 g. two-hourly the third day, and 0.5 three-hourly and then four-hourly for the remaining time.

Intravenous saline therapy, ice to abdomen, and nikethamide were also kept on for four days of the chloromycetin treatment, because two subsequent small haemorrhages, each of 2 oz., occurred during the next two days. Three more roundworms were also passed.

Results of Treatment.—First day: temperature dropped to 101° F. (38.3° C.); haemorrhage. Second day: temperature 101° F.; pulse 118 all day; delirium improving; haemorrhage. Third day: temperature 101° F.; pulse 118; speech rational, and patient aware of his surroundings; bowels not open. Fourth day: the same. Fifth day: temperature 100° F. (37.8° C.); pulse 112; abdominal distension greatly diminished; mental condition normal; sleeping all day. Sixth day: temperature lysing; bowels still confined.

Two days after cessation of the chloromycetin treatment the temperature was normal and the pulse was 100. After four days of constipation from the last haemorrhage, enemas were given every second day. Twelve days from the last haemorrhage solid diet was begun, and progress thereafter has been excellent and uneventful, without relapse.

There was no dramatic fall of temperature till the sixth day of chloromycetin treatment, presumably because of the widespread involvement of the lower small intestine. The subacute abdominal signs improved progressively daily despite the two haemorrhages after the start of treatment. The most dramatic effect was the mental change from high delirium and restlessness to quiet awareness in three days.—I am, etc.,

Bahrain, Persian Gulf. R. H. B. SNOW, State Medical Officer, Government of Bahrain.

Treatment of Reiter's Syndrome

SIR,—Dr. O. B. Appleyard's report of a case of Reiter's syndrome (June 17, p. 1435) clearly demonstrates all the yet unsolved riddles, clinical, aetiological, and therapeutic, connected with this fascinating problem. I have read his notes with great interest, but I would like to correct his statement that the case reported is the first one to be treated with streptomycin and "sulphamezathine." Soon after Powell and his co-workers (1946) and Bushby (1947) had made known their results on the action of streptomycin on "L" organisms, which are believed to play an important part in the causation of Reiter's syndrome (Harkness and Henderson-Begg, 1948), clinical trials with the antibiotic were undertaken. Warthin (1948) reported four cases and Dienes *et al.* (1948) published the results obtained in six cases.

My earliest personal experience with the antibiotic in Reiter's disease goes back to 1948, when the first two patients were treated at St. Charles's Hospital; both received 10 g. of streptomycin (0.25 g. six-hourly for ten days). The results have been reported and commented on elsewhere by Harkness (1950), who also mentions a third case treated with 20 g. of streptomycin (0.5 g. six-hourly), which is of special interest because the patient developed typical lesions of keratodermia blennorrhagica during treatment, thus demonstrating the inability of the drug to overcome the disease. On the other hand, another patient, aged 35, in a severe relapse of Reiter's disease was treated in July, 1949, with 18 g. of streptomycin (0.5 g. four-hourly for six days) and completely recovered. Although he developed a toxic skin eruption after the last dose, this cleared with antihistamine drugs in thirty-six hours and the patient was discharged home a week after completion of treatment.

However efficacious such treatment may be, such large doses of streptomycin, even for a short period of time, are obviously dangerous. An interesting point mentioned by Dr. Appleyard is the rise in the erythrocyte sedimentation rate during streptomycin therapy, when a fall would be expected. I can confirm this paradoxical finding in four streptomycin-treated cases of Reiter's syndrome, and Dienes has made the same observation. Moreover, the temperature may behave in a similar fashion and not return to normal till some time after the injections have been discontinued.

The most urgent problem in connexion with Reiter's syndrome is, to my mind, the elucidation of its aetiology. The first step in this direction must be the co-operation of clinicians and bacteriologists in the investigation of all cases of Reiter's syndrome and, furthermore, the realization that nearly all cases of so-called gonococcal rheumatism or gonococcal polyarthritis are really cases of the incomplete form of Reiter's syndrome. It is also important to recognize that the syndrome is either of the dysenteric or venereal type and that the latter is a true venereal disease with all its epidemiological implications. Harkness (1949) suggested the name "venereal syndrome" for the condition following sexual intercourse, and "dysenteric syndrome" for the disease described originally in 1916 by Reiter, and he holds the view that the infective agent in both conditions is probably the same, the portal of entry in the first condition being the urethra and in the second the bowel (Harkness, 1949 and 1950).

Recent advances in the study of the venereal syndrome as described by Harkness include the microscopical demonstration of a virus in the scrapings from the urethra, conjunctivae, and skin lesions. Attempts to infect suitable laboratory animals and isolate the virus are proceeding, and from the therapeutic point of view preliminary results with aureomycin are so far very encouraging. Recently two patients admitted to St. Charles's Hospital in the acute stage of Reiter's disease (venereal syndrome) were treated with 23 g. of aureomycin (0.5 g. six-hourly) and improved in an almost spectacular way. It is hoped that a detailed report will be published later.—I am, etc.,

St. Charles's Hospital, W.10. A. I. SUCHETT-KAYE.

REFERENCES

Bushby, S. R. M., 1947, cited by Harkness in *Non-gonococcal Urethritis*, p. 125, E. & S. Livingstone, Edinburgh, 1950.
Dienes, L., Ropes. M. W., Smith, W. E., Madoff, S., and Bauer, W., *New Eng. J. Med.*, 1948, **238**, 509, 563.
Harkness, A. H., *Brit. J. vener. Dis.*, 1949, **25**, 185.
—— *Non-gonococcal Urethritis*, 1950, p. 125, E. & S. Livingstone, Edinburgh, 1950.
—— and Henderson-Begg, A., *Brit. J. vener. Dis.*, 1948, **24**, 50.
Powell, H. M., Jamieson, W. A., and Rice, R. M., *Proc. Soc. exp. Biol., N.Y.*, 1946, **62**, 8.
Warthin, T. A., *Amer. J. Med.*, 1948, **4**, 827.

Morphine and Histamine in Bronchial Asthma

SIR,—In their letter (May 20, p. 1199) Drs. Feldberg, Paton, Nasmyth, and Stewart say that histamine is released by morphine in isolated perfused mammalian tissue. They suggest that the strong reaction of patients with chest trouble to morphine may be due either to the fact that they release more histamine after morphine has been given or to their increased sensitivity to histamine. I have not much doubt that the second suggestion is the correct answer. Recently I have compared the response of asthmatic subjects and normals to histamine aerosol and found, as others have done before, that very small doses produce a violent bronchial obstruction in asthmatics, whereas in normal subjects much larger amounts caused only mild responses. Moreover, in normal subjects systemic effects of histamine appeared before or together with a bronchial response, while in most asthmatics no systemic effects were observed: the small amount given was sufficient to cause a strong local bronchial effect but not large enough to produce a systemic one.

Most of your correspondents have come to the conclusion that in the circumstances the use of morphine in asthma should be abolished. I am not sure that this rigid attitude is justified. There are some cases of asthmatic state in which sedation is urgent but barbiturates have not the desired effect. In such cases I have given morphine together with adrenaline or isoprenaline, often with success, but I have never seen ill effects from it. This absence of ill effects is easily understandable, as adrenaline and its relatives have a strong antihistaminic action and can neutralize any histamine released by the morphine. I think morphine should be given only in those cases in which it is really necessary, and never without adequate cover by adrenaline.—I am, etc.,

London, W.C.1. H. HERXHEIMER.

Case-finding in Pulmonary Tuberculosis

SIR,—The importance of case-finding in the control of pulmonary tuberculosis is well recognized, and mass radiography has been used on a wide scale for this purpose. However, mass radiography is not easily available to all sections of the community and other methods of case-finding must be employed.

It is now realized that pulmonary tuberculosis is more common among the middle-aged and elderly, especially males, than was formerly believed. The predominant symptoms of cough, sputum, and shortness of breath suggest a diagnosis of chronic bronchitis and emphysema, and often no investigations are made to exclude more serious disease. It is quite possible that some of these patients may, in fact, be suffering from pulmonary tuberculosis and be a potent source of infection to the general community. Most of these patients will escape a mass-radiography survey as many will be retired or unfit for serious employment, but many of them have sputum for testing, and if this were done on a wide scale a surprising number might be found to be positive for tubercle bacilli. In view of the cheapness and ease with which it can be done it would seem to be the first examination that should be made in cases of this type in order to arrive at a correct diagnosis.

While the disposal and treatment of such cases as are found to be positive constitute an enormous problem, yet identification of the disease is an essential preliminary to eradication, and sputum-testing is the cheapest and easiest method of doing this and is particularly applicable to the older patient.—I am, etc.,

Frodsham. M. B. PAUL.

Spontaneous Dehiscence of Coverings of Incisional Hernia

SIR,—From time to time cases are encountered of ulceration of the skin over the fundus of a large hernial sac, and occasionally spontaneous faecal fistulae may occur from the contained intestine. Unheralded and spontaneous external rupture of an incisional hernia would appear to be a very rare complication, and the whole chain of events in the following case is unusual enough to be worthy of record.

A woman aged 74 was first admitted to Tindal General Hospital, Aylesbury, in November, 1942, under the care of Mr. G. C. Laurie Pile. Three weeks before admission she had complained of repeated bouts of abdominal pain and vomiting, and had noticed the appearance of a lump in her left groin. The lump had increased in size, and throughout the following period she had had intermittent attacks of abdominal pain, vomiting, and a tendency to constipation. Finally, she had gone to her doctor and drawn his attention to this swelling. On admission she had had no bowel action for three days. She was a frail, thin old lady, moderately dehydrated and in a good deal of pain. Her abdomen was distended and tympanitic, with increased peristaltic sounds. In her left groin was a large, tense, inflamed, and irreducible swelling. It was considered that she was suffering from a strangulated femoral hernia, probably of the Richter category, with abscess formation over the femoral canal.

Operation was undertaken on November 24, 1942, by Mr. Pile under gas, oxygen, and ether anaesthesia. The mass in the groin was incised, several pints of faecal pus were drained, and a good deal of necrotic omentum was removed. The problem at the time was whether (1) to risk retraction of the strangulated loop into the abdomen, and hope that a faecal fistula would form; or (2) to proceed to immediate laparotomy and resection. The former course was considered the wiser and appears to have been correct in the light of subsequent events.

After the operation a faecal fistula developed at the site of incision, and continued to discharge for the following six weeks, in which time, under treatment, the patient's condition improved greatly.

After this period laparotomy was performed through a left paramedian incision. The affected portion of small intestine was freed from the femoral canal, resected, and side-to-side anastomosis carried out to establish continuity. Apart from some superficial wound sepsis recovery was uneventful, and the patient was discharged from hospital four weeks later.

After this remarkable episode she was lost sight of until July, 1949, when, at the age of 81, she returned to the out-patient department. She had a large incisional hernia through her paramedian wound with a neck to the sac of some 2½ in. (6 cm.) in diameter, situated just below the level of the umbilicus.

The skin over the fundus of the sac was parchment-like, and visible peristalsis was obvious within the hernia. The skin itself showed a little superficial reddening, suggestive of external abrasion from her clothes. A surgical corset was immediately ordered, and she was advised to rest as much as possible at home until this was available. However, two months later, she was seated on the lavatory one morning, and, while straining, the fundus of the sac gave way. According to her statement she precipitated several coils of small intestine into the lavatory—but possibly she exaggerated. There had been no premonitory symptom to herald this event, and there was no suggestion that the hernia had strangulated or that any gross skin sepsis had occurred before the incident.

She was admitted to hospital two hours later, and, in spite of her age and the nature of her complaint, was in a reasonably good condition. Through a small defect over the fundus about four feet of small intestine had extruded themselves on to the abdominal wall.

Operation was undertaken within an hour of admission (heavy nupercaine spinal analgesia, by Dr. R. B. Clayton). The extruded bowel was returned to the abdomen, and through a transverse

incision the hernial sac and redundant skin were excised. A formal repair of the hernia was carried out. All the abdominal parietes were thin and papery, and a stainless steel wire darn was incorporated in the anterior rectus sheath as reinforcement.

Recovery from this operation was uninterrupted, and the patient was discharged home on the twelfth post-operative day.

I am indebted to Mr. G C. Laurie Pile for permission to quote from his old notes on the case, to Mr. R. H. Gardiner, under whose care the case was admitted, and to the medical superintendent, Dr. R. H. M. Stewart, for permission to publish the case record. —I am, etc.,

Aylesbury, Bucks. RICHARD R. L. PRYER.

Treatment of Arterial Thrombosis

SIR,—Professor A. M. Boyd and Mr. R. P. Jepson in their article describing two cases of external iliac artery thrombosis in the *Journal* of June 24 (p. 1457) rightly stress arterial block rather than angiospasm as the cause of claudication. While the arteriectomy and sympathectomy done on each of their patients produced improvement, yet by doing both procedures together they missed the opportunity of testing the theory of reflex vasospasm initiated by an artery locally blocked, and this theory still requires proof before it is tenable.

The increase in peripheral pulsation produced in both patients is small, and, as the authors state, the ultimate prognosis may not be good. Endarteriectomy rather than arteriectomy with or without sympathectomy might have given better results. The lesions were small in extent and the patients young, and the photogravures show a thrombus almost asking to be shelled out of an artery which has a good wall. Dr. Henri Reboul, of Paris, has recently shown me some of his work on endarteriectomy, and the main purpose of this letter is to draw attention to important publications on this subject.[1 2]

The didactic quality of the statement by Boyd and Jepson, quoting Ratcliffe and Jepson that only by removal of the first lumbar ganglion can a high thigh denervation be obtained, is not sustained by the preceding sentence, where it is stated that "the diaphragmatic crus is split to ensure section of the highest lumbar ganglion": this description might be interpreted to mean that the chain runs through the crus (which it does not) rather than underneath the internal arcuate ligament (which it does in very nearly all cases, though sometimes in the substance of psoas[3]).

Assuming that the word "acral" used in discussing the onset of thrombo-angiitis obliterans is not a misprint, I think I have gathered the meaning after considering possible derivations of the word: a common word or phrase instead of acral would be better.—I am, etc.,

Leeds. H. S. SHUCKSMITH.

REFERENCES

1 Bazy, L., *J. Int. Chir.*, 1949, 9, 95.
2 Lemaire, A., Reboul, H., and Loeper, J., *Bull. Soc. méd. Hôp. Paris*, 1949, 65, 656.
3 Hovelacque, A., *Anatomie du Système Sympathique*, 1927, Doin, Paris.

*** Dorland's *Medical Dictionary* defines "acral" thus: "Pertaining to or affecting the extremities."—ED., *B.M.J.*

Ankle Amputation

SIR,—In view of the renewed interest in Syme's amputation of the ankle, I thought it worth while to send you a summary of the operation described in J. M'Lachlan and A. A. Scot Skirving's *Applied Anatomy*, fourth edition, 1908. The book was published by Messrs. E. and S. Livingstone, Edinburgh. It is now out of print, but they have kindly lent me a copy from their library of old publications.

A special knife is used—"Syme's knife"—with a stout blade some four inches long, with a still stouter handle. Foot is held at right angles, and sole cut made down to the bone. Careful reflection of the heel flap till the prominence of the os calcis is turned and the tendo achillis visible. Keep close to the bone. Foot extended, and cut in front of ankle made down to the bone, and probably opening the ankle joint. Disarticulation, dividing the lateral ligaments from within. Removal of foot by section of the tendo achillis. Clearance of the ends of the tibia and fibula; removal of the malleoli and articular surfaces.

The sole incision starts at tip of external malleolus and ends at a point exactly opposite it on inner side.

In making the second incision across the ankle joint, the operator unites the two ends of the first incision, forming an angle of 45° to the sole of the foot and long axis of the leg. In other words, he cuts straight across the front of the ankle down to bone, dividing all the tendons, nerves, and vessels.

—I am, etc.,

Newton Abbot, Devon. W. H. STEELE.

Time and the Doctor

SIR,—I was extremely interested in Dr. Joan Malleson's able letter (June 24, p. 1487), but I think she is mistaken in the cause of what she writes about. *Surely it is not because the* symptoms are not serious enough that doctors will not trouble to treat menopausal disorders, but because in most cases they have not got the time to spend in thorough investigation of cases of this sort. Here is the real bed-rock of the trouble—most men would like to be good clinicians if they could afford it, but at the present rate of remuneration of general practitioners it is the time factor that counts. Might I be allowed to quote from my letter in the *Lancet* of May 6, 1950, p. 883?

"Unless the doctor is the fortunate possessor of private means, he is nowadays forced to be a head-hunter in order to live, pay his way, and maintain his wife and family. . . . *To meet his commitments* the practitioner needs a minimum of 2,250 on his list at the present rate of remuneration; and any doctor who has that number is likely to be required to supply, on average, 45 items of service per day—slightly less in the summer, and slightly more in the winter. If he has children to bring up he will require more money and must therefore collect more heads and get through more work."

There is the *real* answer to Dr. Malleson's complaint: relieve the doctor of financial anxiety; *give him the time to regain his* lost status, the time to become a clinician instead of a head-hunter for a living; and a new dawn of hope instead of despair will spread like a prairie fire throughout the profession.—I am, etc.,

Worthing, Sussex. HAROLD LEESON.

Revaluing the Levators in Colporrhaphy

SIR,—It is usual in prolapse cases to have an abnormal gaping between the levatores ani muscles, which form the greater part of the pelvic diaphragm. This may be due to low function in these muscles, or to their lateral anchoring by fibrotic tissue following parturient injury, or to development of a hypertrophic bulge in the walls of the enclosed viscera. Reasonably, therefore, gynaecologists have for half a century included mid-line suturing of the levators, *between the rectum and vagina*, as an essential feature in the operation of colpoperineorrhaphy. At its termination the reconstituted perineum can be felt as an impressive wedge, a large portion of this mass consisting of the surgically opposed levatores ani.

During the years when I followed the orthodox technique I noticed that the perineal wedge *diminished in size during convalescence*, but felt fairly confident that this was not due to faulty technique or to mild sepsis, and, as the final result appeared to be quite satisfactory, I ceased to worry about this phenomenon, though I kept it in mind. I could find no reference to it, or explanation, in gynaecological literature. In later years, when I had appreciably altered my operative procedure, the same feature persisted.

By bi-digital examination of the recto-vaginal septum in normal nulliparae while the levators were being contracted I had already noted the apparent absence of any levator muscle in the septum above the level of the sphincter ani externus; careful dissection at operations also confirmed the absence of any macroscopic muscle fibres in the septum. The occasionally described pubovaginalis ends by being inserted into the fascia on the lateral wall of the vagina. An examination of the septum, comparable to the above, after the formation of a new well-formed perineum, can best be performed by "opposable" palpation, using thumb and index finger, and this method eventually supplied me with the explanation of the perineal shrinkage phenomenon. Contrary to expectation, the levators, in the majority of cases, retract to a lateral position soon after the chromic catgut sutures dissolve. In the meantime they have served the useful purpose of acting as a splint while the reconstituted posterior vaginal wall and adjacent fascia have been healing and consolidating. The degree of retraction is limited by the soundness of the excision of the visceral bulge.

On several occasions I have had the opportunity of confirming that the same levator divagation had occurred in quite successful

colporrhaphies performed by other gynaecologists, and this will continue to occur unless unabsorbable suture material, such as nylon, is substituted for chromic catgut. The operative results are, however, so good that nylon might be necessary only for operations involving the rectum, and could be avoided when pregnancy and delivery by the natural passages is anticipated. Comparable observations by proctologists and urologists should be interesting.

The levator retraction stimulated my views about the importance of fascial conservation in colporrhaphy, especially in regard to the lateral recto-vaginal fascial bands (see my letter in the *Journal* of May 13, p. 1142). These bands can more easily be brought into perspective and their outer borders defined if gentle forward tension is applied intermittently at their insertions into the posterior vaginal wall; but during this process of dissection it is necessary to keep a protective coating of perineal tissue in position around their friable inferior fringes. Unlike striped muscle in other parts, the substance of the levators presents normally the same dull-grey look as the adjacent fascia.

Digging into their substance during orthodox colpoperineorrhaphy prevents the demonstration of these bands, by shredding them to bits, and is comparable to a similar process in the base of the broad ligaments[1-3] which prevented the identification of its sustentacular (Bonney, 1914)[4] ligaments for about three decades.

I have had opportunity, at secondary operations, to observe the substantial fibrosis that can occur in the extrapelvic perineal extension of the endopelvic fascia—an effective support that will, however, soften temporarily in response to the normal hormones of pregnancy, making caesarean section unnecessary, with certain exceptions.—I am, etc.,

London, W.1. E. HESKETH ROBERTS.

REFERENCES

1 Ovenden, E. G. A., *J. Anat. Physiol.*, 1907, 41, 308.
2 Spencer, H., *Proc. R. Soc. Med.*, 1908, 1, Obst. Sect., Discussion, p. 60.
3 Fairbairn, J. S., *Gynaecology with Obstetrics*, 1928, p. 50. London.
4 Bonney, Victor, *J. Obstet. Gynaec. Brit. Emp.*, 1914, 25, 328.

British Spas and Health Resorts

SIR,—A few meetings have been called at 11, Chandos Street for the revival of the pre-war British Health Resorts Association. The physicians who took part in these meetings, although rendering homage to the efforts of the late Dr. Fortescue Fox and of Dr. Alfred Cox, considered that the revival of that association was not indicated, but that a new association for the scientific study and development of the British spas and climatic health resorts was necessary. I was entrusted with the task of ascertaining the views of the medical profession on this subject, and the following is the result of this small referendum.

The association to be created should be on strict scientific lines and centred on the physicians of the health resorts. It should encourage these physicians to study their particular hydromineral or climatic therapeutical agent. It should organize lectures by these physicians to various schools and societies on their particular spa or climatic health resort. It should collaborate with the civic authorities so as to develop the therapeutical installations, and to afford facilities to the physicians for their hydrological or climatological studies. It should encourage visits to these health resorts by students and physicians so that they may obtain direct information about the special balneological and climatological methods, and, last but not least, it should endeavour through various publications to bring these methods and their results to the notice of medical men in this country and abroad. This association should include all those interested in British spas and health resorts, and thus non-medical as well as medical men and women. Medical work is not the exclusive privilege of those possessing a medical diploma, because medicine is not only a natural science but also a social science.

The policy delineated above is followed with success by the British Spas Federation, but unfortunately only for eight spas, whereas other spas and the numerous and important climatic health resorts are not included. A more complete organization is indicated and can be in fact obtained by enlarging the scope of the British Spas Federation. Such a comprehensive organization would be not only more effective but also more powerful scientifically and politically.

Notwithstanding the great discoveries of specific remedies the constitutional methods of treatment remain the most important for the majority of diseases, particularly for the chronic and degenerative diseases which dominate our contemporary pathology. Spa and climatic treatments represent probably the most powerful constitutional therapeutical procedures, and those who, like myself, have studied health resorts on the Continent as well as in England realize that this country is second to none in wealth of such centres of physical medicine, centres of which many possess remarkable installations. It is time to set aside all ideas of local interest so as to place the British spas and health resorts on a comprehensive scientific basis for the benefit of our patients.

Who is going to take the lead in this movement, so important from a national as well as from a medical point of view?—I am, etc.,

London, W.1. A. P. CAWADIAS.

Tuberculosis Service in Scotland

SIR,—In a footnote to the Report on Tuberculosis Service in Scotland published in the *Journal* of July 8 (p. 61) my name is given among the members of the Subcommittee nominated by the Tuberculosis Society of Scotland. The word "resigned" appears in parentheses after my name. May I state that my resignation took place in the very early days of the subcommittee's deliberations and that I had no part in the preparation of the report?—I am, etc.,

Edinburgh, 9. CHARLES CAMERON.

The G.P. at the Crossroads

SIR,—Has nobody a good word for general practice? I deny none of the recent complaints—in fact, can contribute my own. I find the excessive number of "services" for trivial departures from health the most trying single new factor. This is a matter that could be controlled not by charging for prescriptions—a most difficult plan to implement—but by charging a given total sum for the first so many services rendered to an individual in any financial year. Details and exceptions could be worked out. Incidentally, this sum could be used to implement the Spens Report without further cost to the Treasury, and there is not the slightest doubt that general practitioners are inadequately paid for the amount of work they are doing.

However, my present purpose is to put in a word for general practice. Most G.P.s did not choose this province of medicine with the intention of making a lot of money. It was to them, in a greater or less degree, a vocation. If not, then they were not likely to be happy anyway.

The varieties of general practice are many; for myself I would not exchange the life of a country-town and country doctor for that of a specialist. Country practice is a way of life, and it still has its compensations even in the midst of present-day uncertainties. Remember that many of the trials and frustrations of which we complain are not peculiar to the medical profession but in some comparable guise are common to other walks of life and are due to the times.

In a practice of this nature, if one were adequately paid, then 2,500 persons per doctor is the ideal maximum if one wishes really to know one's patients, continue to look after them well, and be a "family doctor." Life is more pleasant with a compatible partner or partners. My partners and I are still regarded as "family doctors" by the majority of our patients. Many still honour us by coming for advice other than strictly medical. One is not too old to be flattered by the child who calls out as one passes, "Hello, Doctor!" and announces to his companions, "That's my doctor." There at least is one who will not be frightened if by chance he has to be examined in acute illness. In fact to us these are people, not mere cases.

It is a delight to motor round the countryside on a spring morning (I know all about the other sort of day, but just now I wish to show some random good things). There are many other attractions of a similar nature in the country. In the summer in a well-arranged partnership there is off-time for

sport and country pleasures. In fact, in spite of the increased tempo and other adverse conditions, I believe I can get away from work more easily than my grandfather did. I do not see that he *ever* got away except when he was ill—though the spending value of his financial reward was very much greater. For those who are not attracted to the country, cannot some town G.P. name a few amenities to show that his life is not all purgatory?

As for this grouse that a general practitioner has become a mere forwarding agent—that depends on the individual. If he has, it is unnecessary, his own fault, and he ought to be ashamed of himself. Admittedly there are many things at one time done by the G.P. and now done better or more conveniently by the hospital and laboratory. After the first war there was a crop of ex-wartime surgeons who went into general practice inadequately experienced for the operations they assayed. Is it a loss to general practice that such a type is unlikely now? What is it the G.P. feels he is deprived of? Does he want to do his own blood examinations? Is it not satisfying to find one's clinical suspicions confirmed and to take charge of the treatment? Is it not satisfying to collaborate with one's colleagues on the staff of the local or other hospital? I expect the consultant to know far more than I do about his subject, but possibly there is much on other aspects of disease where I know more than he, and especially about the personality and background of the patient. The infinite variety of general practice remains a constant interest and challenge throughout one's practising life.

If there is loss of prestige, then either a majority of G.P.s are not giving of their best or an inferiority complex is at work somewhere. I have never felt any sense of humiliation in my contacts with specialists (I *have* felt ashamed of failures in diagnosis or treatment where they were my fault), nor have I noticed that reputable consultants treat one as an inferior being. On the contrary, it is most rare to receive other than consideration and courtesy. There is still dignity in general practice, and if pomposity has gone out of it that is all to the good. Let us hope it has been replaced by a sense of humour.

Do not mistake me. I am not saying that general practice is Utopia—far from it. What I wish to say to the young graduate is that general practice is not as black as many people are painting it. It is a way of life, hard, not yet adequately paid, not without its constant trials, but teeming with its own peculiar interests. It is going through a crisis which I believe will be successfully negotiated. Do not enter it unless you are prepared to bring something to it in the way of service; then its rewards can be most satisfying.—I am, etc.,

Maldon, Essex. IVAN PIRRIE.

SIR,—It would appear from the correspondence following Dr. E. Anthony's letter (May 6, p. 1077) that it is realized that the lowered status of the average G.P. since the inception of the N.H.S. is due to the fact that he must pander to a blackmailing public in order to maintain an adequate panel list and ensure a reasonable income—a system endured in industrial areas from N.H.I. days. One way to break this stranglehold would be by the much-maligned State-salaried service, which was rejected on the grounds that it would lead to control of the profession by Government Departments, but in the light of present events it would seem that our position could not be much worse.

Freed from the domination of the public, we could give patients the treatment, medicines, etc., they require, not what they think they require, without fear of loss of patients and income. Authoritative direction and control of patients in medical matters would be re-established—essential in my view—for on such matters they are extremely ignorant, though they do not believe this, and treatment is unduly prolonged in some cases through unwillingness to follow instructions. Dispensing costs would be cut, as trivial prescriptions could be refused; the strain on hospital out-patient departments would be reduced, as only those requiring investigation would be sent, and not the demanding neurotics; and a general tightening up of the efficiency of the N.H.S. in general would result.—I am, etc.,

Kelty, Fife. A. SANJANA.

Obituary

G. R. B. PURCE, *M.C.*, M.Ch., F.R.C.S.Ed.

Mr. G. R. B. Purce, of Belfast, who in 1948 was elected president of the Association of Thoracic Surgeons of Great Britain and Ireland, died on June 29 at the age of 59. George Raphael Buick Purce, the eldest son of the late Mr. James Purce, was born in Ballyclare, Co. Antrim, and educated at Coleraine Academical Institution and the Queen's University of Belfast. There he gained a number of scholarships and prizes, and was soon marked out as a man of exceptional promise. After graduating M.B., B.Ch., B.A.O. with honours in 1914 he was for some months house-surgeon in the Royal Victoria Hospital before joining the R.A.M.C. As regimental medical officer to the 8th Bn., Royal Ulster Rifles in some of the worst fighting on the Western Front his personal gallantry and resourceful skill won for him a Military Cross and a name which is still gratefully remembered by many veterans. In the 110th Field Ambulance and the 48th C.C.S. he rapidly gained a wide experience of surgery. On his return to civil life he took the M.Ch. of Queen's University in 1920 and the F.R.C.S.Ed. a year later.

One hospital after another soon availed itself of his services. The Ulster Volunteer Force Hospital, the Ulster Hospital for Children and Women, and the Royal Victoria Hospital demanded much of his time, and he was also consulting surgeon to the County Antrim Infirmary, the Down County Infirmary, the Massereene Hospital, Antrim, the Benn Ophthalmic Hospital, and the Samaritan Hospital, Belfast. For many years Purce was interested in thoracic surgery, of which he was the pioneer in Northern Ireland, and he became increasingly preoccupied with this specialty in the Forster Green Hospital and in the Municipal Sanatorium, Whiteabbey, as well as in his own unit at the Royal Victoria Hospital. This valuable work was recognized by his election in 1948 to the office of president of the Association of Thoracic Surgeons of Great Britain and Ireland. He was also president of the Ulster Medical Society, and gave the Robert Campbell Oration in 1944. He was a past-president of the Ulster Tuberculosis Association and a member of the British Medical Association.

R. M. writes: Purce was a surgeon of amazing versatility. Like his famous predecessors, MacCormac and Fullerton, his experience in war served him well in peace. At the Ulster Hospital he had a long apprenticeship in paediatric and orthopaedic surgery, and for many years was responsible for almost all the neurological surgery in the province. Younger surgeons found him a mine of information, and he knew who was responsible for the origin and subsequent modification of every surgical instrument in ordinary use. Then if need arose he would improvise his own instruments in his own workshop. During his last illness he wrote in the *British Medical Journal* of his friend and teacher, the late Mr. Howard Stevenson (April 29, p. 1010), that "he had the gift of making a difficult procedure appear simple," and that "he was incapable of intrigue." These words were as true of the pupil as of the teacher. It was not only to the observer that difficult things became easy, for patients found that confidence and gentleness robbed bronchoscopy and even thoracoplasty or pneumonectomy of their terrors.

Of his personal qualities it is difficult to write without emotion. His search for perfection revealed itself even in his recreations. In his early days he played hockey for Ireland. Each hobby that absorbed him filled his shelves with expert literature embracing in turn golf, badminton, fly-fishing, shooting, the navigation of small craft, and, more recently, reflecting a remarkable proficiency in rifle-shooting and the study of ballistics. It is not surprising that his distaste for the careless and inaccurate use of words almost equalled his dislike of lightning diagnosis and slovenly surgery.

"Barney" Purce had the qualities of greatness. His judgment was not confined to surgical problems nor was it uttered without consideration of the issues at stake or the feelings of others: it was therefore the more highly valued. He never sought applause, for the sound of it seemed to embarrass his ears. He never knew the place he had won in the life of our community and in the hearts of his friends. We shall not look upon his like again. Many of us felt that he never recovered from the bereavements he sustained in the death of his elder son, who was killed when serving in the R.A.F. in 1944, and that of his wife, who died in 1946. He is survived by his daughter, Mrs. William Wagener, and by his son George, a student of medicine.

G. W. writes: Much will be written by others of the academic attainments and long, useful service to medicine of John Forbes Ward. I write of him purely as a friend—and was he not a friend to everybody young and old alike, and of whatever station? It was one of the greatest privileges of my life to have known John Ward so intimately for 46 years and to have profited so much personally from his guiding philosophies. In my long knowledge of him I have never heard one wrong or hurting word said of him. He was a faithful, honest soul without an enemy, and he was a man with many friends who will always think of him in their hearts with the deepest affection and regard.

Dr. RODERICK MACLEOD died at Hetton-le-Hole, Co. Durham, on May 13 at the age of 73 years. Born at Gairloch, Rossshire, he was a Gaelic speaker, and first learned English at school. He won his way to Glasgow University, where he had a distinguished career, obtaining the class medal in medical jurisprudence and public health. He graduated M.B., Ch.B. in 1904, and eventually settled in Hetton-le-Hole, where for 38 years he gave unstinted service to his patients. He was one of those rarities, a man completely happy in his lot. His sole aim and ambition was the well-being of his patients and the happiness of his home. He held that good housing was one of the corner-stones of good health, and he was a pioneer in slum clearance and an untiring advocate for higher standards in council housing. He took his D.P.H. in 1921, and for over 25 years was medical officer of health for Hetton Urban District Council. In 1941 the council made him a presentation to mark their appreciation of his services. Part of his duty was to act as medical superintendent of the Rainton Bridge Isolation Hospital and the conjoint Hetton and Houghton-le-Spring Smallpox Hospital. At this latter hospital he looked after more than 1,300 cases of smallpox during the years 1925 to 1928. Dr. MacLeod was also the local police surgeon and colliery doctor. A keen St. John's man, he lectured the ambulance class at Elemore Colliery for over 30 years. He was made first an Officer and then a Serving Brother of the Venerable Order of St. John. In his early days he had been a ship surgeon, and never failed to attend the functions of the Blue Funnel Club at Newcastle-upon-Tyne, of which club he was a past chairman. After the 1914–18 war he was made an honorary captain in the 8th Battalion (Volunteer) Durham Light Infantry. During the 1939–45 war he was responsible for organizing the A.R.P. casualty services in the area, and was a member of the local medical war committee. He was chairman of the Sunderland Division of the B.M.A. in 1928–9, and assistant secretary in 1933–4. He was a member of the Association's Committee on Anaesthetics in Midwifery, 1929–30. A fellow and past-president of the Society of Medical Officers of Health (Northern Branch), he had written several papers on housing problems. He never forgot his Northern origin and was an annual visitor to Glasgow Highland gatherings and a keen supporter of the Northumberland and Durham Caledonian Society. He was never happier than when he was at home, and the sympathy of all his colleagues will be extended to his widow and daughter.—J. M. H. R.

Mr. CHRISTOPHER JOSEPH SHORTALL died at Newry on June 15. Born in 1905, he graduated with first-class honours at the National University of Ireland in 1928. He was at once appointed to the extern department of St. Vincent's Hospital, Dublin. He took the F.R.C.S.I. in 1931, the M.Ch. a year later, and he proceeded M.D. in 1933. He was appointed surgeon to the Daisy Hill Hospital in Newry, County Down, in 1935. Here he covered a vast district, and by his own ability, his endless energy, his personal charm, and his honesty of purpose he readily built up a large surgical practice. Fifteen months before the war he joined the R.A.F.V.R., and so he was called up at the outset of hostilities, being finally demobilized with the rank of wing-commander, after serving in Egypt, Aden, Palestine, and Cyprus. Shortall rarely spoke about his war experiences, and few people ever knew that he had been shot down off Portugal and with difficulty escaped with his life. Despite his extensive surgical commitments he was a regular attender at all meetings of the B.M.A. His opinion was often sought by the committee of the Northern Ireland Branch. On this and other committees there was no one more admired by his colleagues. He was a man of his word, without bias, and all that mattered to him was to do the right thing. Many people in Ulster will mourn his death from leukaemia, and to his widow and their four boys the deepest sympathy of his colleagues and friends will be extended.—I. F.

Medico-Legal

TRESPASS BY A HOUSE-SURGEON

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

A Folkestone antique dealer suffered from hernia, and at the end of 1947 his general practitioner advised him to consult Mr. Hickman W. L. Molesworth, senior surgeon at the Royal Victoria Hospital, Folkestone. He did this and was admitted to the hospital and operated upon on March 23, 1948, with complete success, but by the house-surgeon, Mr. L. P. Ribet, not by Mr. Molesworth. When he discovered this fact he took the view that he had been wrongfully treated, and brought an action[1] against Mr. Molesworth for breach of an alleged oral agreement to operate, and for procuring a trespass upon him by the house-surgeon. He did not sue Mr. Ribet.

In evidence before Lord Justice Singleton in the King's Bench Division on June 7 the plaintiff said that he had told Mr. Molesworth that he would prefer the operation to be performed near home, and the surgeon had said that he could arrange for him to go into the local hospital and could "do the job" there for him. The patient said he had agreed to the fee of 25 guineas. He had entered the public ward, and after the operation he had begun to suspect that Mr. Molesworth had not operated. When the surgeon had spoken to him some days after the operation he had not answered, and from that time they had ignored each other. He said he had been shocked that an apprentice had practised his skill on him without his consent when he had engaged a craftsman. He had been worried and anxious for a considerable time.

Mr. Molesworth, also giving evidence, said that Mr. Ribet had been trained at Guy's and was a very able young man. He himself had never charged a fee to a patient in a public ward. At the consultation he had said that his minimum fee in a private ward would be 25 guineas, but there were no private wards in Folkestone, the nearest being in Canterbury

[1] *Folkestone Herald*, June 9, 1950.

or Ashford. He thought he had made it quite clear to the patient that he would be in a public ward in the Folkestone hospital. He had undertaken no personal obligation in the case. On the day before the operation, and near the patient's bed, he had told the house-surgeon in an ordinary tone: "You will do this one."

Judgment

The Lord Justice, in giving judgment, remarked that the patient had had the benefit of an entirely successful operation by a competent surgeon for no charge, so that he was £26 5s. better off than he might have been. Accepting the evidence of the surgeon against that of the patient, he found that there had been no breach of contract by the surgeon to perform the operation. Mr. Molesworth was a man of honour and a witness of truth, and probably had not realized on the day before the operation that the patient expected him to perform it. He had not led the patient to think he would operate. When stating his fee he had been considering an operation in a private ward of another hospital, and that fee had had no reference to an operation in the public ward at Folkestone. The patient's right to choose his own surgeon had not been challenged.

On the other hand, Mr. Ribet had operated without the patient's consent or "leave or licence," and the form of consent to the operation which the patient had signed did not bar his right to bring an action of trespass. For an unauthorized person to do, in a highly competent manner, an act that another was authorized to do was a highly technical form of trespass. The patient had been treated everywhere with consideration, and the surgeon had behaved properly in accordance with his duties and his high professional standing. Nevertheless there had been a technical trespass, for which the patient would be awarded the nominal damages of 20s. The surgeon won his counterclaim for three guineas, the fee for the consultation, which was not contested.

His lordship added that the action ought not to have been brought. The patient had received excellent treatment at the hospital, and might well have remembered that he had received it for nothing and that the medical and surgical profession were working for the good of the people generally. He might have recognized that their time could be better spent than in resisting claims of this nature. He did not allow the patient costs on his claim, but did not think it would be right to order him to pay any part of the surgeon's costs, except appropriate costs of the counterclaim.

Medical Notes in Parliament

Silicosis in Cornwall

Mr. HAYMAN asked the Minister of Fuel and Power on June 26 how many fresh cases of silicosis were reported among miners employed in Cornish tin mines during each of the last five years.

Mr. PHILIP NOEL-BAKER stated that the figures were as follows: 1945, 12; 1946, 23; 1947, 13; 1948 and 1949, taken together, 22.

Specialists in Ministry of Pensions Hospitals

Sir IAN FRASER asked the Minister of Pensions on June 27 when it was proposed to apply the scales of remuneration authorized by the Minister of Health to specialists employed in Ministry of Pensions hospitals.

Mr. MARQUAND said that the question of the remuneration of specialists in the Ministry of Pensions Hospitals was being remitted to an independent committee set up in accordance with the recommendations of the Chorley Report, which would review the pay and grading of all medical officers in the Civil Service.

Sir IAN FRASER said that many of these specialists, who were doing comparable work, were being paid less than half what was paid to similar grades in the National Health Service, and the position was so bad that the *British Medical Journal* refused to advertise for these grades.

Mr. WALTER ELLIOT asked when the Minister expected the committee to report. There was a serious drain on the Service owing to the difference in the conditions between the two Ministries.

Mr. MARQUAND said that he was not aware of any serious drain. The committee was just beginning its deliberations, and it would really be for the Financial Secretary to the Treasury to answer questions about the date of the report.

Fainting as a Military Crime

Major H. JOHNSON asked the Secretary of State for War on June 27 if he was aware that a guardsman was put on a charge for fainting during the Trooping the Colour rehearsal on May 29, and received punishment of five days' extra drill; and what action he proposed to ensure that fainting on parade ceased to be treated as a punishable offence.

Mr. STRACHEY said that while each case of fainting was investigated, no charge was preferred unless the man had fainted as a result of some action or negligence on his part which had rendered him unfit for parade. This guardsman was not guilty of such an act, and was not put on a charge. King's Regulations provide that if in the opinion of the authorities the fainting has been due to some negligence on the part of the man or officer then a crime might be committed, but this did not arise in this case.

Mr. SOMERVILLE HASTINGS asked what were the conditions which could be prevented by the individual and which might give rise to fainting?

Mr. STRACHEY said three conditions had been given to him, one of which was being out late at night on the eve of the parade.

Merit Awards

Mr. MARLOWE asked the Minister of Health on June 29 upon what considerations the medical committee of a hospital was expected to make recommendations to the Distinction Awards Committee; what qualities in a doctor were to be regarded as justifying a recommendation for merit money; upon what grounds the medical committee was to grade those recommended for the highest, the second, and the lowest rate of merit money; and whether the decisions of the Awards Committee would be published.

Mr. BEVAN said that a medical committee, like any other body wishing to make a recommendation, would no doubt form its own judgment on these matters, and he did not intervene. He had not yet received any recommendations of the Awards Committee, and it was too early to decide about the desirability of publication.

Mr. MARLOWE: Does the Minister realize that he is asking medical committees to express an opinion on matters about which they knew practically nothing, a course which they found very difficult?

Mr. BEVAN: There is not the slightest need for that supplementary question. This is a very competent medical body, which is deciding upon the merits of members of its own profession, and I do not propose to intervene. I will pronounce no judgment whatever on the awards that it makes.

Mileage Allowances for Country Doctors

Dr. A. D. D. BROUGHTON on June 29 asked the Minister of Health whether he would increase the mileage allowance for general medical practitioners in rural areas to compensate for the rise in the cost of petrol. Brigadier MEDLICOTT asked if the Minister was aware that the rise in the cost of petrol had added appreciably to the expenses of general medical practitioners in country districts; and if he would arrange for an appropriate increase in their mileage allowance.

Mr. ANEURIN BEVAN replied that he is always ready to discuss with the profession any ideas for the better distribution of the total moneys available for general practitioners. But he could not regard the imposition of a new tax as justifying any addition to the total amount.

Dr. BROUGHTON said that much of the help the Minister gave to rural practitioners by increasing the mileage allowance a short time ago had been counteracted by the rise in the cost of petrol.

Mr. BEVAN said that if every time a new tax was imposed reliefs were given to meet it there would be no revenue from new taxation.

Mr. A. E. BALDWIN said that there might be greater difficulty in getting doctors for scattered areas as a result.

Hospital Beds for Tuberculosis

Brigadier MEDLICOTT asked the Minister on June 29 whether, in view of the fact that 11,000 people suffering from tuberculosis were awaiting hospital beds, he would give favourable consideration to the suggestion that a minimum of 10% of the beds in general hospitals should be set aside for tuberculosis cases.

Mr. BEVAN said that he was doing so, but that there could clearly be no set rule about it.

Urine-testing Sets for Diabetics

Mr. W. TEELING asked the Minister of Health on June 29 what steps he had taken to implement his promise to make "clinitest" sets and tablets for diabetics available under the National Health Scheme; and whether he was aware that it was over two months since he had answered a question on this subject by saying something would be done immediately.

Mr. BEVAN said that he was anxious not to make a series of regulations. If a regulation were made about this it would stand by itself, and he wanted to accumulate a number of regulations in one Order. That situation had now been reached, and he was doing it shortly.

Difficulties of Entry into Practice

On July 7, Dr. A. D. D. BROUGHTON drew attention to the difficulties being experienced by young doctors wishing to enter general practice. He said there was comparatively little difficulty in obtaining openings as assistants, but after a period the majority wanted greater security. The attempt to enter by means of a partnership presented many difficulties. Vacancies were advertised by executive councils, but there were surprisingly few. In the current issue of the *British Medical Journal* there were three. A practice with a list of reasonable size could attract more than 50 applicants; only one could be successful. After a number of failures some young men felt a sense of inferiority; the majority blamed the executive councils, and claimed that 90% of the openings were "fixed." He did not share that view, but he could readily understand men being driven to believe it.

The difficulties of entering general practice by means of executive council appointments were so great that most people tried to enter as partners with established practitioners. This method had now become far from easy. All too often it was found by applicants that they were up against what could only be called a racket. The principal could not sell his practice, but there was nothing to prevent a principal insisting that the partner should occupy a certain house, and no limit was fixed on the price that could be charged for it. A medical man of his acquaintance answered an advertisement for a partnership. He received no reply from the doctor, but received a communication from a house agent in which it was stated that the partnership was conditional on the purchase as a place of residence of a small bungalow at the price of £6,500; further, during the first three months of the partnership additional expenses would have to be incurred to the amount of £2,500, making a total of £9,000. Certainly, said Dr. Broughton, not all doctors were trying to rob new entrants into general practice in that manner, but he believed that far too many of them were doing this. It was still far more difficult than it should be for young men and women to gain a foothold in general medical practice.

Dr. BARNET STROSS said the problem was not less disturbing because evidence of it might be confined to a few examples. Anything the Minister of Health could do to ensure that there was not this back-door way of making men pay twice for a medical practice would be welcomed.

Mr. BLENKINSOP said that, although there might be only few cases, the matter was a serious one. Opportunities for young men to enter medical practice should be made more available, and not less. There had been many changes to the benefit of the intending practitioner. For example, the valuable effect of reducing the maximum number of patients on a doctor's list; and the defining by the executive councils of different parts of the country as "under-doctored" or "over-doctored" areas, which had encouraged intending doctors to concentrate attention on those areas where medical attention was needed. There was no doubt that this had been an encouragement in easing the entry of doctors into practice.

There was no special problem about assistantships. The Ministry shared the view put forward in the first report of the Medical Practices Committee that preliminary apprenticeship as an assistant was still the best method of entry, and had done everything they could to encourage that. There was much greater opportunity for entry by merit to-day as a partner or as a sole practitioner than by the chance contact and succeeding to a practice as in the past. There had been criticisms of particular appointments, but on the whole the procedure adopted by the executive councils had brought comparatively little complaint, and was widely regarded as a desirable method of appointing new practitioners. There had been the encouragement of the building up of new practices by payment of a basic salary, and there was the further consideration that claims could be made on the special inducement fund by doctors in particularly difficult areas.

Even so there were still very real difficulties. The problem of accommodation was very difficult for the young doctor. If the house included the surgery accommodation, clearly it should come within section 35 (3) of the Act, and if an excessive price was being charged it was an attempt to evade the Act and should be reported to the Medical Practices Committee. Where the house was separate from the surgery, the position was more difficult to define. It was a matter which was largely one of professional conduct, where they would hope to get the co-operation of the medical profession in insisting that this was a type of conduct that should be condemned. They would like to secure the co-operation of the B.M.A. in trying to secure the ending of this practice by voluntary action. It might be rather difficult to interpret the Act in such a way as to bring the ordinary living accommodation of a doctor within its confines if the accommodation was distinct and separate from the surgery, but he was prepared to examine the matter further.

The difficulty of doctors being appointed to a practice and not being able to take it up because of the lack of accommodation was already being discussed with the B.M.A., and he hoped they might be able to find some way round it. They were most anxious to try to help in every way possible, and to encourage in every way they could the setting up of additional practices, either by means of partnerships or sole principals, in the many areas which had been judged open areas where extra medical help was badly needed and existing lists were far too high.

Universities and Colleges

NATIONAL UNIVERSITY OF IRELAND

On July 3 the honorary degree of D.Sc. was conferred on Sir Alexander Fleming, F.R.C.P., F.R.C.S., F.R.S., Professor of Bacteriology in the University of London and Principal of the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

On July 6 Mr. A. Hedley Whyte, Mr. E. W. Riches, and Sir Arthur Porritt were elected members of the Council of the College. The result of the poll was as follows:

	Votes
Elected	
Angus Hedley Whyte (Royal Victoria Infirmary, Newcastle-upon-Tyne)	904
Eric William Riches (Middlesex Hospital)	831
Sir Arthur Porritt (St. Mary's Hospital)	691
Not Elected	
Ian Aird (Postgraduate Medical School of London)	679
Robert Leech Newell (Royal Infirmary, Manchester)	661
Victor Wilkinson Dix (London Hospital)	398
Nils Lovold Bjarne Victor Eckhoff (Guy's Hospital)	296

In all 1,709 Fellows voted; in addition 25 votes were found to be invalid.

No. 25

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 24.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	36	3	11	1	2	22	2	18	2	1
Deaths	—	—	—			—	—			
Diphtheria	39	1	8	2	1	82	10	28	5	10
Deaths	—	—	—	—	—	—	—	1	—	1
Dysentery	213	13	128	2	—	57	5	29	1	2
Deaths					—				—	—
Encephalitis, acute	5	—	—		—	—	—	—	—	—
Deaths		—		—			1			
Erysipelas			19	7	1			22	5	2
Deaths							—			
Infective enteritis or diarrhoea under 2 years				34					44	
Deaths	13		2	2	—	33	1	4	1	1
Measles*	9,086	645	556	286	123	9,152	908	419	259	132
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	43	17	10	2	—	39	4	6	3	—
Deaths										
Paratyphoid fever	9	—	—	—	1	38	1	—	—	—
Deaths	—		—		—	—	—	—		—
Pneumonia, influenzal	344	20	4	—	1	426	18	6	3	6
Deaths (from influenza)‡	3	—	—	1	—	4	—	1	—	—
Pneumonia, primary										
Deaths	101	10	124	¶ 4	1	159	31	147	23 8	5
Poliomyelitis, acute	142	13	37	3	13	38	6	2	2	—
Deaths§	14	2		—		5	—			
Puerperal fever		—	9				—	2		
Deaths										
Puerperal pyrexia‖	78	9	10	—	2	99	13	5	1	—
Deaths							—			
Relapsing fever	—	—				—	—	—		—
Deaths										
Scarlet fever	973	58	127	64	66	930	73	196	74	53
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	13	—	2	1	1	8	5	—	—	1
Deaths	—	—	—		—	1	1	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,746	211	320	81	38	2,253	111	101	100	83
Deaths	3	—	1	—	1	5	—	2	1	—
Deaths (0–1 year)	205	32	30	11	2	256	32	46	33	4
Deaths (excluding stillbirths)	4,068	586	551	160	99	4,193	619	623	171	94
Annual death rate (per 1,000 persons living)			11·1					12·5	10·6	
Live births	7,044	1140	933	459	220	8,201	1307	968	395	249
Annual rate per 1,000 persons living			18·7					19·4	24·5	
Stillbirths	189	27	28			188	27	21		
Rate per 1,000 total births (including stillborn)			29					21		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Food-poisoning at Horden

Horden is a Durham mining town with a population of about 13,000. A firm of three doctors there was at work almost continuously from late on Saturday, July 8, attending patients complaining of diarrhoea and vomiting of varying severity. Food-poisoning was early suspected, and it seems likely that the vehicle of infection was pork sandwiches.

More than 300 people have been affected in this outbreak, but at the time of going to press, though some of them were regarded as very ill, none had been admitted to hospital and there had been no fatalities. By the time an investigation was initiated on the Sunday all the suspected pork sandwiches had been sold, but it was possible to obtain for investigation the remainder of the carcass from which they had been prepared. The usual bacteriological investigations are under way but are not yet completed.

Poliomyelitis

The incidence of poliomyelitis is still highest in the three adjacent counties of Staffordshire, Worcestershire, and Warwickshire. Notifications in this area were 30 more than in the preceding week: Warwickshire 45 (Birmingham C.B. 41); Worcestershire 14 (Dudley C.B. 2, Halesowen M.B. 8, Oldbury M.B. 2); and Staffordshire 9 (Smethwick C.B. 4, Rowley Regis M.B. 2).

London with 13 notifications (Woolwich 5, Deptford 2, Greenwich 2) became an important centre of infection during the week. Three cases were notified in Yorkshire West Riding. Baildon U.D., Middlesex, Uxbridge U.D., and Essex, Thurrock U.D. There are indications, too, that a rise has begun in other areas. A comparison of the trends of the notifications during the first twenty-five weeks of the year for the past four years may be of interest.

Region	Year	Weeks 1–5	6–10	11–15	16–20	21–25
London	1947	12	3	7	4	13
	1948	22	17	6	7	17
	1949	13	6	19	6	17
	1950	22	18	11	9	31
South-east counties	1947	10	5	4	6	22
	1948	31	23	10	5	4
	1949	19	12	10	6	23
	1950	42	26	9	9	24
South-west counties	1947	4	2	0	2	2
	1948	27	12	9	6	5
	1949	8	5	1	7	17
	1950	13	12	2	5	10
South midlands	1947	4	7	3	7	13
	1948	35	22	7	9	11
	1949	18	9	11	6	19
	1950	35	20	19	12	21
Eastern counties	1947	3	3	4	4	2
	1948	15	7	8	5	5
	1949	6	7	4	5	11
	1950	20	27	10	10	19
West midlands	1947	9	13	4	8	21
	1948	33	21	9	14	17
	1949	12	10	10	7	18
	1950	33	24	25	19	187
North midlands	1947	3	1	3	6	5
	1948	9	4	9	10	5
	1949	12	8	6	4	5
	1950	16	6	10	10	17
North-west counties	1947	2	6	3	6	27
	1948	32	11	13	10	16
	1949	10	11	4	13	14
	1950	23	19	10	15	34
Yorkshire	1947	6	8	2	6	20
	1948	10	7	2	8	17
	1949	8	6	7	4	12
	1950	34	16	14	19	26
Northern counties	1947	0	7	2	2	10
	1948	8	3	7	3	3
	1949	3	2	6	4	1
	1950	7	5	2	5	18
Wales	1947	2	5	0	0	1
	1948	5	1	4	9	3
	1949	7	6	3	1	7
	1950	9	10	4	9	9

Notifications of poliomyelitis in the week ended July 1 were: paralytic cases 124 (104), non-paralytic cases 36 (38). Figures for the previous week are shown in parentheses.

Discussion of Table

In *England and Wales* increases were recorded in the notifications of measles 229, scarlet fever 123, and whooping-cough 97. There were decreases in the incidence of dysentery 138, acute pneumonia 87, and diphtheria 12.

The largest fluctuations in the local incidence of measles were increases in Kent 117, London 116, Cheshire 89, Gloucestershire 87, and Lincolnshire 83; with decreases in Lancashire 177, Sussex 90, Warwickshire 74, and Northumberland 62.

A small rise in the incidence of scarlet fever was general except in London and the south-east and south-west counties, where there was a decrease of 31. Notifications of diphtheria were the lowest ever recorded. The chief features of the returns for the week were a rise of 5 in Durham and a fall of 8 in Warwickshire. Only small variations were noted in the local incidence of whooping-cough.

Notifications of dysentery were the lowest for 21 weeks, but the incidence continues at a high level. The chief centres of infection were Yorkshire West Riding 75 (Sheffield C.B. 23, Leeds C.B. 11, Batley M.B. 9, Bradford C.B. 7); Lancashire 42 (Oldham C.B. 11, Preston C.B. 10); Durham 26 (South Shields C.B. 12, Stanley U.D. 11); Essex 15 (Wanstead and Woodford M.B. 8); and London 13.

A large outbreak of food-poisoning, with 309 cases, was reported from Surrey (Guildford R.D. 154, Hambledon R.D. 142).

In *Scotland* there were decreases in the notifications of measles 279, whooping-cough 60, and dysentery 15. There was a rise in the incidence of acute poliomyelitis 20. Only 8 cases of diphtheria were notified. The fall in the incidence of measles was mainly due to the experience of Glasgow.

The incidence of dysentery is still at a high level. During the week falls in the number of notifications were reported from the south-eastern area 23 and the western area 13, but there was a rise of 21 in the combined north-east and eastern area; the largest returns were Glasgow 57 and Paisley 12. The areas where more than one case of poliomyelitis was notified were the cities of Glasgow 15, Aberdeen 6, and Edinburgh 4: two cases were notified from Paisley, from Airdrie, and from Aberdeen county.

In *Eire* there were increases in the notifications of measles 20 and diarrhoea and enteritis 15, the latter rise being contributed by Dublin C.B., where the notifications rose from 10 to 24. The increased incidence of measles was due to an outbreak of 30 cases in Dublin, Dun Laoghaire U.D.

In *Northern Ireland* the notifications of measles decreased by 20 in Belfast C.B. but rose by 22 in County Antrim. An increase in the notifications of scarlet fever was reported from Belfast C.B. 12 and County Tyrone 9.

Week Ending July 1

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,085, whooping-cough 3,920, diphtheria 46, measles 8,918, acute pneumonia 335, acute poliomyelitis 160, dysentery 262, paratyphoid 17, typhoid fever 7.

Medical News

Protection of Children from Tuberculosis

The Minister of Health has agreed to certain recommendations made by the Joint Tuberculosis Council on the protection of organized groups of children against risk of infection from tuberculous adults, and he has notified local health authorities of them. They are as follows:

(1) No person with respiratory tuberculosis should be engaged for employment which involves close contact with groups of children unless and until the disease is certified as arrested. A candidate for such employment should therefore not be engaged without a medical examination, including an *x*-ray examination of the chest.

(2) Persons whose employment brings them into close contact with groups of children should have an *x*-ray examination of the chest annually.

(3) If a person while thus employed is found to be suffering from respiratory tuberculosis, such employment should at once cease, and not be resumed until two consecutive medical certificates are given, the first stating that the disease is no longer active, and the second (after a further interval of six months) stating that the improvement in the general and local condition has been maintained—both certificates being based on *x*-ray and bacteriological, as well as clinical, investigation. After resumption of employment similar investigations should be carried out at three-monthly intervals for the first year and at six-monthly intervals for the next two years.

(4) If any unusually high incidence of respiratory or non-respiratory tuberculosis occurs in an organized group of children, a full investigation of the staff employed should at once be undertaken.

Medical Research in Scotland

The Secretary of State for Scotland has appointed an Advisory Committee on Medical Research in Scotland. Its purpose will be to see that, with the close co-operation of the Medical Research Council, suitable facilities and opportunities are available to make the Scottish contribution to the advancement of medical science as full as possible. It will advise the Secretary of State on the "initiation, direction, co-ordination, and conduct of medical research." The committee's appointment follows discussions with the principals of the universities, the deans of faculties of medicine, and the presidents of the Royal Scottish Medical Corporations. Besides advising the Secretary of State on research projects and recommending financial aid, the committee will be available to give advice to regional hospital boards, local health authorities, and any other organization which feels it could benefit by it. Close contact will at all times be maintained between the committee and the Medical Research Council, representatives of which are included in the committee's membership. The new committee will concern itself mainly with investigations that can best be done within the framework of the health services in Scotland.

Membership of the new committee is as follows:

Sir Edward V. Appleton, F.R.S. (chairman); Professor T. Ferguson, Professor of Public Health, Glasgow University (vice-chairman); Professor D. Baird, Professor of Midwifery, Aberdeen University; C. A. Bignold, Medical Officer of Health, Ayr County; Professor N. Feather, F.R.S., Professor of Natural Philosophy, Edinburgh University; Professor T. Ferguson Rodger, Professor of Psychological Medicine, Glasgow University; Professor J. H. Gaddum, F.R.S., Professor of Materia Medica, Edinburgh University; Professor R. C. Garry, Regius Professor of Physiology, Glasgow University; Professor S. Graham, Professor of Child Health, Glasgow University; H. P. Himsworth, Secretary of the Medical Research Council; Professor Sir James R. Learmonth, Professor of Surgery and Regius Professor of Clinical Surgery, Edinburgh University; Professor J. W. McNee, Regius Professor of Practice of Medicine, Glasgow University; Professor W. J. Tulloch, Professor of Bacteriology, St. Andrews University; Professor C. H. Waddington, F.R.S., Professor of Animal Genetics, Edinburgh University.

F. J. C. Herrald, of the Medical Research Council, and J. M. Johnston, of the Department of Health for Scotland, will be joint secretaries of the committee. Communications should be sent to Dr. Johnston.

At the first meeting in St. Andrew's House on July 4 the committee considered the uncompleted work of various subcommittees of the Scottish Scientific Advisory Committee whose functions are included in the wider remit of the new body. The committee also agreed on procedure and discussed methods of handling new projects.

Child Welfare

The International Union for Child Welfare—the body which unites the "Save the Children" movements in various countries—held its Grand Council in London from July 6 to 12. The Union, whose headquarters are in Geneva, was formed in 1946 by the merging of the Save the Children International Union, founded in Geneva in 1920, and the International Association for Child Welfare, founded in Brussels in the following year. This is the first occasion on which it has met outside continental Europe. The present number of member organizations is 53, representing 36 different countries in Europe, Asia, Africa, and North and South America. The conference was opened in St. Pancras town hall by H.R.H. the Duchess of Kent, with the Countess Mountbatten of Burma in the chair, and short

addresses of welcome were given by Mme. Gordon Morier, of Geneva (president of the International Union), the Lord Mayor of London, and the mayor of St. Pancras.

Honorary Fellowship

The Honorary Fellowship of the Royal College of Surgeons of Edinburgh was conferred by the President, Mr. W. Quarry Wood, on Dr. Donald Church Balfour, director of the Mayo Foundation and past president of the American College of Surgeons, and on Dr. Arthur Wilburn Allan, a former president and now chairman of the Board of Regents of the American College of Surgeons, during their recent visits to Edinburgh.

Bagdad Appointment

Dr. A. Michael Critchley, a Principal Medical Officer at the Ministry of Supply, is being seconded to the Iraqi Government to take up the post of professor of public health at the Royal University of Bagdad and adviser in public health to the Ministry of Social Affairs.

Pharmaceutical Society

Mr. Adam Meldrum, of Aberdeen, has been elected president of the Pharmaceutical Society and Mr. Frank Wilson vice-president.

National Institute for the Deaf

At the annual general meeting of the National Institute for the Deaf on July 5, when Lord St. Audries, vice-president of the institute, presided, Dr. Charles Hill said that the problem of deafness had never been sufficiently recognized. It was not to the public mind as dramatically moving as some other disablements. Most of the registered blind were regarded as unemployable; even those totally without hearing would regard themselves fit for work if they had learned to speak. Greater understanding of the problem was needed from the Government, the public, and every agency in this field. The institute had the job of co-ordinating the work of many separate bodies, of giving advice to Governments, local authorities, welfare societies, and special schools. It could look back on a history of achievement since it was founded in 1911 and of a promise of further achievement. A particularly difficult field was deafness in children. The institute was doing much work here; so also was the Deaf Children's Society. Education of the deaf should begin very early in life, but it had been stated recently in the House of Commons that there was still a waiting-list of 450 to get into deaf schools. The Minister of Education had promised that everything possible was being done to increase accommodation in the next year or two. This should be pressed on with.

Register of Chiropodists

The 1950 edition of the *Register of Chiropodists* has now been published by the Board of Registration of Medical Auxiliaries, and medical practitioners may obtain copies free of charge on application to the registrar of the board, Tavistock House North, Tavistock Square, London, W.C.1.

COMING EVENTS

Princess Tsahai Memorial Hospital

It is hoped that the Princess Tsahai Memorial Hospital will begin work this year, but some of the equipment has still to be paid for. A garden party will therefore be held on behalf of the hospital fund on July 26 at 3.30 p.m.–9.30 p.m. at "The Holme," York Gate, Regent's Park, London. The speakers include Brigadier G. S. Parkinson, formerly of the London School of Hygiene and Tropical Medicine. The cost is 2s. 6d. Donations to the fund will be gratefully acknowledged by the honorary treasurers, Lord Horder and Lord Amulree, c/o Messrs. Gould and Prideaux, 88, Bishopsgate, London, E.C.2.

Homoeopathic Congress

A Joint Congress of the Council of the International Homoeopathic League, the Faculty of Homoeopathy, and the British Homoeopathic Congress will be held on July 26–28 at the Royal London Homoeopathic Hospital, Great Ormond Street, London, W.C.1. The congress fee is four guineas. Particulars may be obtained from the Medical Secretary, Dr. W. Lees Templeton, 146, Harley Street, London, W.1.

The British Association

The annual meeting of the British Association for the Advancement of Science will be held at Birmingham on August 30–September 6. The preliminary programme may be obtained from the secretary, the British Association, Burlington House, Piccadilly, London, W.1.

Congress of Pathology

The First Argentine Congress of Pathology will be held in La Plata, Buenos Aires, on August 24–27 under the auspices of the Argentine Ministry of Public Health and Social Welfare. Particulars may be obtained from the secretary of the Centro Medico Argentino-Britanico, Buenos Aires, Argentina, South America.

SOCIETIES AND LECTURES

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

Tuesday

EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, July 18, 5 p.m., "*Benjamin Rush, M.D.: His Edinburgh Student Days and What Came of Them*." Macarthur Postgraduate Lecture by Dr. G. W. Corner (Baltimore, U.S.A.).

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Edgware General Hospital, July 18, 5 p.m., "*Success*," John Tate Lecture by Sir Alexander Fleming, F.R.S.

SOCIETY FOR THE STUDY OF ADDICTION.—At 11, Chandos Street, Cavendish Square, London, W., July 18, 4 p.m., "*Biochemistry and Alcoholism*," by Mr. Leslie D. Macleod, B.Sc. A discussion will follow.

Friday

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, University New Buildings, Teviot Place, Edinburgh, July 21, 11 a.m., 288th meeting.

Saturday

KENT PAEDIATRIC SOCIETY.—At Star Hotel, Maidstone, Kent, July 22, 2.30 p.m., "*Mental Deficiency as a Social Problem*," by Dr. L. T. Hilliard.

APPOINTMENTS

Dr. H. T. P. Young, O.B.E., has been appointed Inspector of Retreats, under the Inebriates Acts, 1879 to 1898.

BRAMWELL, J. B., M.B., B.Chir., D.P.H., Medical Officer of Health and Area Medical Officer, Southern Area, Warwickshire.

HAMILTON, JOSEPH STEWART, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, City of Stoke-on-Trent.

HOWAT, D. D. C., M.B., D.A., Consultant Anaesthetist, Thoracic Surgery Unit Nottingham Group.

SHEPLEY, WILLIAM HADFIELD, M.D., D.P.M., Consultant Psychiatrist, Warlingham Park Hospital, Warlingham, Surrey. (*Corrected announcement.*)

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bartlett.—On June 9, 1950, at Bristol, to Anne (formerly Cousins), M.B., wife of Charles Bartlett, F.R.C.S., a daughter—Alice.

Burfield.—On July 3, 1950, at Shifnal Cottage Hospital, to Phemie, wife of Dr. George Burfield, a daughter.

Charlton.—On July 2, 1950, to Dr. Phoebe Charlton, wife of E. F. Bradford, Esq., Orchard House, Castleton, North Yorkshire, a daughter.

Evans.—On July 3, 1950, at 387, Queen's Road, New Cross, London, S.E., to Alexa (formerly Mitchell), wife of Dr. Carlton John Evans, a daughter—Alexa.

Porritt.—On July 6, 1950, at the Lindo Wing, St. Mary's Hospital, London, W., to Kay, wife of Sir Arthur Porritt, K.C.M.G., a son—Jonathon.

Saunsbury.—On July 7, 1950, to Lorna, wife of Edward Saunsbury, M.B., Ch.B., 57, Walsall Road, Lichfield, Staffs, a daughter.

Thomas.—On June 20, 1950, at Nuffield House, Guy's Hospital, London, S.E., to Jane McQueen, wife of Richard Sevmour Thomas, M.R.C.S., L.R.C.P., of 207, Hither Green Lane, London, S.E.13, a son—David Richard Moore.

Tighe.—On June 23, 1950, at 101, Ashted Row, Birmingham, to Nora (formerly Cregan), S.R.N., S.C.M., wife of John Robert Tighe, M.R.C.S., L.R.C.P., a son—John Kevin.

DEATHS

Cameron.—On July 2, 1950, at Exeter, Colin John Norman Cameron, M.R.C.S., L.R.C.P., of Moyvanine, Raddenstile Lane, Exmouth, Devon.

Cooper.—On July 4, 1950, at The Royal Portsmouth Hospital, Duncan Gordon Cooper, M.D., Major, I.M.S., retired, of Ravelston, 125, London Road, Waterlooville, Portsmouth, Hants.

Dutton.—On July 5, 1950, at Taplow, Bucks, Hugh Reginald Dutton, C.I.E., F.R.C.P., D.T.M.&H., Lieutenant-Colonel, I.M.S., retired.

Flintoff.—Suddenly, at The Mill House, Pateley Bridge, Yorks., Charles Ashley Flintoff, M.R.C.S., L.R.C.P., aged 71.

Any Questions?

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

Reducing Infant Mortality

Q.—*A recent article ended with the following: "... The vital role of a highly organized and efficient health service in reducing infant mortality has been amply demonstrated in Chicago." Is it possible to give a summary of this work, with references?*

A.—The most common causes of death during the first year of life are infective conditions, prematurity, birth injury, and congenital malformations; a marked reduction of the infantile mortality rate would result from the prevention or satisfactory treatment of the first two of these conditions. In 1922 a premature-baby unit was established in Chicago, and in 1932, owing to the demand, a further unit was opened. As a result of the reduction of the mortality rate in these two units the board of health in Chicago in 1935 inaugurated a scheme to cover the whole city. A regulation was passed requiring a report of premature births within one hour by telephone and within 24 hours in writing. The plan also provided for a specially equipped ambulance service available at all hours, adequate hospital accommodation (6% of all newborn infants are premature), a field nursing service for instruction of the mothers, a supply of heated cots for home nursing of premature babies, breast milk supplied free of charge, and adequate follow-up arrangements. In 1935 standard regulations for all nurseries for all newly born babies (mature and premature) in Chicago were drawn up by the Joint Maternal Welfare Committee; they were put into operation in 1937.

The infantile mortality rate in Chicago in 1934 was 47.7 per 1,000 live births and in 1945 it had fallen to 29.6 per 1,000. In 1935 the mortality rate among 1,862 premature infants was 42.6% and in 1945 the rate among 3,716 premature infants was 30.7%. There was also a striking reduction in morbidity among premature infants, particularly with regard to infections of the eyes, skin, respiratory system, and gastro-intestinal tract. Further studies of the causes of infantile deaths have been undertaken during the past three years, and Fitzgerald and Sanford consider that the situation with regard to premature infants in Chicago is "being handled as well as possible and needs no study," so that the efforts of the paediatricians are now being directed towards the prevention and treatment of congenital defects and other conditions. Programmes with similar objectives have been introduced elsewhere, notably in this country in Birmingham, where in 1931 a unit for the care of premature babies was established. The results of a planned programme, so far as the mortality rate is concerned, have been similar to those obtained in Chicago.

REFERENCES

Crosse, V. M. (1945). *The Premature Baby*, J. & A. Churchill Ltd., London.
Fitzgerald, J. E., and Sanford, H. N. (1949). *Amer. J. Dis. Child.*, **78**, 134.
Hess, J. H. (1947). Ibid., **73**, 697.
Weinfeld, G. F. (1949). Ibid., **78**, 815.

"Golf Elbow"

Q.—*Is there such a thing as "golf elbow"? The pain in the cases I have seen seems to be localized to the epitrochlear region. What is the cause, what is the precise lesion, and what is the treatment?*

A.—Pain at the outer aspect of the elbow may follow a variety of activities, including golf. The symptoms and physical signs are identical with those of "tennis elbow." The point of greatest tenderness is over the anterior aspect of the lateral epicondyle. Diffuse radiation of the pain towards the back of the forearm is often complained of by the patient. The cause and the exact pathology of the condition are not known with certainty. It is believed that the lesion is an incomplete rupture of some of the fibres of origin of the extensor muscles of the forearm. Usually no pathological lesion can be demonstrated macroscopically when the site of pain is exposed at operation. In the treatment of this type of painful elbow many different measures have been advocated, but none, with the possible exception of operation, can be relied upon to afford relief in every case. It is usual to start with the simplest measures, such as short-wave diathermy, deep massage, and faradism to the extensor muscles of the forearm. If these are unsuccessful the injection of a solution of local analgesic into the exact site of tenderness may occasionally give dramatic results. It is worth while repeating the injection if the first is incompletely successful. If this also fails the effect of immobilization in plaster should be tried. The plaster should extend from the upper arm to the metacarpal heads and should hold the elbow at an angle of 90 degrees. Immobilization should be maintained for six to eight weeks, and is successful in a fair proportion of cases. Manipulation under anaesthesia (local or general) is also worth a trial in obstinate cases.

As a last resort operative treatment may have to be considered, but as tennis elbow, or "golf elbow," will almost invariably resolve spontaneously if given sufficient time (often 12 months or more), operation should not be advised unless the condition is so severe as to be the cause of significant incapacity. The operation consists in raising the humeral origin of the forearm extensor muscles from the bone. This is the most certain way of relieving the symptoms within a reasonable time, and in some cases it should perhaps be advised in preference to the more time-consuming conservative methods, simply on economic grounds.

Vomiting and Menstruation

Q.—*Is vomiting at each menstrual period common? What is the treatment in an Indian girl, aged 14, suffering from severe vomiting at each period, particularly at the beginning, but continuing through the time menstruation lasts? She is otherwise quite normal for her age.*

A.—Vomiting in varying degrees and circumstances is by no means an uncommon association of menstruation in young girls. Most often it is seen with spasmodic dysmenorrhoea, when it is probably the result of the intense colicky pain; it disappears once the dysmenorrhoea is cured, by pregnancy or dilatation of the cervix, for example. Vomiting may also occur without dysmenorrhoea and is then the result of some as yet undefined disturbance in the autonomic nervous system, other manifestations of this being colonic spasm, a change in bowel habit (constipation or diarrhoea) and flatulence. Such upsets are sometimes described as part of the menstrual tension state, and nearly always there is an important underlying psychological factor. The case in question calls for a careful inquiry into the background and a sympathetic explanation of the significance of the menstrual function. Apart from that, treatment may be as for the menstrual tension state with a restricted intake of fluid and sodium for 10 days premenstrually. Alternatively the case may be treated as for spastic colon with a low residue diet and tinct. hyoscyamus or one of the proprietary antispasmodic preparations.

Tuberculin Testing

Q.—*Is there any place in a country practice for a skin test for tubercle applicable by the general practitioner? If so, could details be given?*

A.—There is no reason why any general practitioner should not carry out tuberculin tests provided he has received instruction in the technique and, most important of all, in the reading of the result. There are three methods of tuberculin-testing that can be used in a country practice: the adrenaline Pirquet test, the jelly patch test, and the intradermal Mantoux test. All of these are simple procedures, but reading the result and determining whether a person is tuberculin-positive or negative requires a certain amount of experience. It is probable that this experience in reading the result can be obtained at the local chest clinic. Details of the technique of the tests are

given in most textbooks on pulmonary tuberculosis and in a Ministry of Health memorandum (322/B.C.G. 1949). The materials for carrying out the test can be obtained from most reputable pharmaceutical chemists. (The tuberculin-jelly test is discussed on pp. 141 and 154 in this issue.)

Normal Variations in Blood Pressure

Q.—*Is it possible to explain the wide variations in diastolic readings in the same individual on different occasions? Would you suspect an error by the observer if I found, say, 165/98 mm. Hg, and later my partner recorded the blood pressure in the same patient as 135/85 mm. Hg?*

A.—A variation of blood pressure from 165/98 to 135/85 mm. Hg is perfectly normal, although it suggests that the patient is a hyper-reactor and is therefore more likely to develop permanent essential hypertension than a hypo-reactor. The nature of the stimulus matters very little, but in day-to-day life it is of course emotional. It is hard to define arbitrarily the limit of such variation, but in nervous subjects with a normal basal pressure of 120/75 casual readings of 160/90 are extremely common, and the upper range may certainly reach 170/100.

Prolapse of an Ileostomy

Q.—*What are the methods available for the treatment of persistent prolapse of an ileostomy performed for ulcerative colitis? The use of special belts has so far been unsuccessful. Are there any special techniques in the performance of the original ileostomy to prevent prolapse occurring?*

A.—Prolapse of an ileostomy is a troublesome and difficult condition to deal with. Usually the best treatment is to control the projection by means of an anti-prolapse disk, such as that devised by Donald Rose for use in conjunction with his pattern of ileostomy bag or box. This might be tried in the first instance. Operative treatment is generally unsatisfactory. Simple amputation of the prolapse, as in rectosigmoidectomy for rectal prolapse, is soon followed by recurrence. Probably the most effective measure is to fix the ileum just proximal to the ileostomy securely to the anterior parietal peritoneum by multiple sutures, closing the opening in the abdominal wall round the bowel as tightly as possible compatible with its viability. It would be wise to follow this with the regular wearing of an anti-prolapse disk. As for prevention, no operative technique that has yet been devised for the performance of ileostomy can guarantee freedom from prolapse. Fixation of the ileum to the abdominal wall by sutures is generally avoided at the original operation because of the very real risk in these debilitated patients of the stitches cutting out and causing tiresome and dangerous subcutaneous fistulae. Suture of the ileal mesentery alone to the peritoneum is powerless to prevent the development of a subsequent prolapse.

Cracked and Painful Fingertips

Q.—*What is the treatment for painful splits of the tips of the fingers or thumbs in a man of 57? These used to occur only at long intervals and in cold winters, but are now becoming commoner and persist into the summer.*

A.—In the absence of any circulatory, metabolic, or hormonal dysfunction and of any general skin disease such as xerodermia, psoriasis, or eczema, it may be assumed that the cracks result from increased susceptibility to the effects of exposure and external irritants. Prophylaxis should include the appropriate use of gloves, emollients, barrier creams when gardening or undertaking dirty work, and the avoidance of unnecessary washing. It is helpful sometimes to fill cracks with "durofix" or some similar fixative. It is probable that circulatory tone plays a part, and small doses of thyroid or of thyroid and phenobarbitone with local treatment by *x* rays, light, heat, or wax baths may be of value temporarily. An affection of this kind is sometimes a local expression of chronic eczema, lichen simplex, or psoriasis, and there may be some constitutional background factors which should receive attention.

Tuberculous Prostatitis and Vesiculitis

Q.—*What are the symptoms of tuberculosis of the prostate and seminal vesicles? How is the diagnosis made and what is the treatment?*

A.—Tuberculous prostatitis and vesiculitis are rarely primary; they are almost always associated with a tuberculous epididymitis. It is the swollen epididymis, therefore, which calls attention to the fact that something is wrong. The central lesions in the prostate and vesicles give rise to few symptoms beyond a little frequency sometimes and perhaps pain on micturition. In advanced cases the disease may spread to the bladder, and these symptoms are then much increased. The urinary tract must be investigated fully and acid-fast bacilli sought for in the urine. Treatment is directed primarily to the lesions associated with the prostatitis and the vesiculitis. If these are satisfactorily dealt with, by, say, an epididymectomy, followed by measures to improve the general health, the disease in the prostate and vesicles is arrested An operation has been evolved for the complete removal of the genital tract, but it is seldom carried out at the present time. Streptomycin may also be helpful, but it should be borne in mind that an ordinary pyogenic vesiculitis or prostatitis is often diagnosed as tuberculous.

Guanidine in Myasthenia Gravis

Q.—*Is guanidine, in conjunction with prostigmin, of any value in the treatment of myasthenia gravis? What are its toxic effects and where can it be obtained?*

A.—Guanidine hydrochloride has been used in the treatment of myasthenia gravis with some success. It is more effective when given in conjunction with prostigmin, although it has been found effective alone in some cases. It is prescribed in the form of 125-mg. tablets by mouth. The dose has to be regulated by the therapeutic effect and by the disagreeable symptoms which it may cause. The latter are similar to those which occur with prostigmin but are often more troublesome. Guanidine also tends to cause paraesthesiae around the mouth and in the fingertips. Guanidine hydrochloride is obtainable from most of the larger drug houses.

Tuberculosis and Occupation

Q.—*Are there any figures for the mortality rates of pulmonary tuberculosis in relation to occupation?*

A.—Yes. Almost all the standard textbooks on tuberculosis publish tables showing the mortality rates in relation to occupation. The figures are what one would expect from the nature of the disease. Apart from special hazards, such as dust inhalation, the dangerous occupations are those which involve conditions liable to lower the resistance—long hours, mental strain, poor working conditions, heavy physical work, and low economic standards. The most favourable jobs are those which are sedentary and well paid.

NOTES AND COMMENTS

Mosquito Bites.—Dr. MARY VOIGT (Gibraltar) writes: I see the local treatment suggested to prevent irritation by bites ("Any Questions?" June 17, p. 1445) places reliance on sodium bicarbonate solution or calamine lotion. Eucalyptus oil is an effective remedy in preventing or relieving local irritation from mosquito or other insect bites, both in children and adults.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Alitology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Mediseca, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 22 1950

British Medical Association

ONE HUNDRED AND EIGHTEENTH ANNUAL MEETING, LIVERPOOL AND SOUTHPORT, 1950

President's Address

MEDICINE, SCIENCE, AND HUMANISM

REFLECTIONS ON THE FIRST HALF OF THE TWENTIETH CENTURY

BY

Sir HENRY COHEN, M.D., LL.D., F.R.C.P.

Professor of Medicine, University of Liverpool; Senior Physician, Royal Infirmary, Liverpool

My first duty, and it is most agreeable, is to express my heartfelt gratitude to the Association, and especially to my colleagues in Liverpool and Southport, for the honour they have done me in choosing me as their President. Can any man's ambition desire more than the affirmation by his professional colleagues of his title to fill an office which in the past has been held by such giants as Stokes and Acland, Ferguson and Russell Reynolds, Clifford Allbutt, Macewen, and Dawson of Penn? It is heartening to be assured that, despite the conflicts which are the inevitable accompaniments of our professional life in these days of change and confusion, there exists a bond of fellowship and community of spirit and understanding which softens the asperities and survives the dissonances.

My second duty is to welcome you all on behalf of my local colleagues to Liverpool and to express to them my thanks and yours for having provided for this meeting a fare, both social and intellectual, which is so rich in variety and, even at this early stage, so warmly acceptable.

My third duty is that, prescribed by custom, of delivering a Presidential Address. There is a danger, of which history gives ample warning, that at so early a stage in office a President may by high promise encourage hopes which will too often dwarf the performance. Indeed, the longer I reflect the deeper is my conviction that the appropriate time for this address is at the end of the President's year of office, when he might reasonably be called upon to give an account of his stewardship. I propose, therefore, to emulate Sir Charles Hastings in his inaugural address to this Association and to eschew current medico-political controversies. The closing year of the first half of a century is a fitting time in which to take stock. I have therefore chosen in this address to reflect on the changing order in the first half of the twentieth century and to note its influence on medical practice, training, and research. For a profession contemptuous of its own history runs grave dangers.

Changes have occurred in the pattern of disease in the past fifty years which appear to have been beyond our control. For example, chlorosis has virtually disappeared; scarlet fever has changed both in character and in severity; epidemics of encephalitis lethargica have appeared and recrudesced; and there has been an increased incidence of cancer of the bronchi and lungs which yet may prove to be a by-product of the manners and customs of our age—for cigarette-smoking, the fumes of motor exhaust pipes, and the surface tarring of roads have all been arraigned. But in their ultimate analysis the changes in medicine which have occurred in the first half of the century will be found to result from two major influences; first, from the rapid and vast expansion of knowledge and technical skills in the cognate sciences; and, secondly, from the evolution of our ideas of social responsibility.

A Change in Outlook

At the beginning of the century medicine was still essentially the art of healing (*ars medendi*), and empiricism played the major part both in diagnosis and in treatment. It is true that in the last decade of the nineteenth century important advances in bacteriology and biochemistry had been made and *x* rays had been discovered, but these had not yet significantly influenced the practice of medicine. The practitioner still wore his frockcoat and silk hat, too often symbols of his dogmatic pretensions. But there was then a much more intimate relationship between doctor and patient: the doctor was in truth a guide, philosopher, and friend, and he held a unique position of leadership, especially in the smaller communities. The era of specialization was still remote.

Man continued to be regarded as greater than the sum of his parts and as a member of a family and of society. The doctor entered his patients' homes and there saw the effects of overcrowding and ill-ventilation, the undernutrition occasioned by poverty, the effects on family life of chronic illness in the wage-earner and the moral cankers of unemployment, and he realized from daily example the part which these play not only in causing disease but in preventing better standards of health. Moreover, even when he developed an interest in, and practised, a special branch of medicine he continued in general practice. At the beginning of this century there were in Liverpool no doctors, not even surgeons, who confined themselves solely to their specialty. In brief, the doctor's outlook at the birth of this century was, to

use Smuts's phrase, "holistic." Man was regarded by his doctor as a whole human being, in health and disease, and his reactions to and on his environment were not overlooked.

The March of Scientific Medicine

Then came the scientific age. Not that medicine had neglected science and the scientific method in earlier centuries. There can be few, if any, more striking examples of the application of scientific method than Harvey's demonstration of the circulation of the blood over three centuries ago. But as the twentieth century advanced, the torrent of scientific discovery rushed on so impetuously that it all but engulfed the humanism of medicine. In the pursuit of knowledge man was fragmented and his organs, tissues, cells, and secretions were subjected to intensive study. For science concerns itself with isolates and ponderables. It detaches from the tangled skein of nature a thread which it can examine and measure untrammelled. And its prophets have declared that "only when natural phenomena can be measured are they to be clearly apprehended."

If achievement be the measure of their contribution it is difficult to resist the claim of the basic sciences to the leading position in the vanguard of medical discovery. Almost before they have cooled, the newly forged weapons of science have been applied to the mysteries of medicine with almost unqualified success. The secrets of nutrition and of metabolic processes, and the agents which govern them, have been in large part revealed, so that there are now no medical obstacles to the proper feeding of the people. Hormones and vitamins have been isolated and synthesized; indeed, chemists have improved on Nature and given us agents which perform her work more simply and satisfactorily. Drugs have been produced in the laboratory which have all but replaced the old galenicals. The sciences of bacteriology and protozoology have concerned themselves not only with discovering the organismal causes of disease but with devising measures for increasing individual immunity to infectious diseases and of preventing their spread; and astounding success has attended their efforts both in temperate and in tropical climes. Bacteriologists have combined forces with the chemists and chemical manufacturers in producing remedies such as the newer antimalarials, sulphonamide drugs, and antibiotics which have revolutionized our treatment of established disease and altered its clinical pattern; they have been associated with engineers in improving methods of sanitation, ventilation, and food preservation.

Improvement in the techniques of radiology, especially the use of contrast media, has enabled us to visualize indirectly practically every crevice and cavity of the body and has advanced accuracy in diagnosis to an almost incredible degree. But it has in consequence whetted the appetites of those with the "penny-in-the-slot" type of mind who seek short cuts to diagnosis, and who have forgotten, if they ever appreciated, that "it takes a man and not simply a machine to understand a man." Radioactive isotopes promise to solve many fundamental problems in physiology, biochemistry, and pathology and to add to our diagnostic and therapeutic implements. Physics, by devising electrical instruments of such precision that infinitely small variations of voltage can be measured and recorded, has led to an extended knowledge of the mechanisms of the heart, of muscle, and of brain and nerve, and of disease of these organs which results in disturbances of normal function. At the beginning of the century the simple ophthalmoscope and laryngoscope, illuminated indirectly, represented the sole members of their class. Ingenious arrangements of mirrors and lenses, and electrical illumination, have in the past few decades given us direct visual access to the bronchi, oesophagus, stomach, peritoneum, rectum, and bladder, and even to the spinal theca and ventricles of the brain, and have led to the construction of cameras which will make permanent records of our findings.

Indeed, practically no advance in the fundamental sciences is without its influence on medical research and practice. Surgery has not modified its aims. It still seeks to repair the injured, to reconstruct the deformed, and to ablate diseased structures, but its operations can with safety be bolder and more daring through advances in diagnostic accuracy, in the design of instruments, in anaesthesia, and in measures for combating infection, shock, and haemorrhage. The successful extension of surgery to the brain, the lungs, and the heart in the last forty years bears irrefutable testimony to the shortsightedness and ineptitude of some of the great surgeons of the past in their assertions that the craft of surgery had reached its zenith in their day.

The nineteenth century had been dominated by the morbid anatomists: the structure of the diseased body was the focal point of pathological research. Improvements in microscopy, in microtomes, and in the methods of staining tissues had led to valuable additions to our knowledge both of morbid histology and haematology. But this century, which has seen the mass invasion of medicine by physics, chemistry, biology, and even mathematics (for, despite its more than a century-old history, medical statistics has come into its own only in the past fifty years), has reorientated its lines of advance. Functional conceptions of disease have gradually replaced the structural. Tests have been devised which will assess the functional efficiency of practically all the organs and tissues of the body. Moreover, this emphasis on function has led to a wider appreciation of the influence of psychological factors in the genesis of somatic disease and has added strong support to the view that, whatever its philosophical status, dichotomy of body and mind in medicine is untenable.

Some Examples of Progress

It may be of interest to illustrate by detailed examples what half a century of scientific endeavour has contributed to human welfare. Since the beginning of the century the expectation of life at work has increased for the male by 18½ years and for the female by over 20 years; the man of 40 to-day can expect to live another 31 years and the woman 35 years, as compared with 25½ and 27¾ years a half-century ago. In 1901 in each thousand of the population there were only 47 persons over the age of 65; in 1947 there were 105. In the first five years of the century out of every thousand live births 138 infants died before reaching one year of age; in 1948 only 34 succumbed. The death rates per million of the population were reduced between 1898 and 1948 for typhoid fever from 182 to 1, for scarlet fever from 113 to 1, for whooping-cough from 124 to 17, and for diphtheria from 244 to 4. Indeed, the total deaths from zymotic disease in 1898 amongst the 31½ million inhabitants of England and Wales were 86,755; in 1948, when the population had increased to 43½ millions, the total deaths were 7,490 from the same causes. In the South African War the annual incidence of typhoid fever per thousand troops was 105, with a death rate of 40.6; in the first world war vaccine prophylaxis had reduced the incidence to 2.35 and the death rate to 0.139. The antibiotic chloramphenicol now gives promise of cure in the typhoid infections. In the early part of the 1914–18 war passive immunization by antitetanic serum diminished the incidence of tetanus, but in the early stages it was still 15 to 30 per thousand wounded; this dropped to less than 1 per thousand when the serum was generally used. In the second world war, however, with active immunization against tetanus the incidence dropped to about 1 in twenty thousand wounded. A striking example of profitable co-operation between the general practitioner and the preventive-medicine service is seen in Detroit, where in 1927, before immunization against diphtheria was introduced, 270 deaths occurred from the disease; in 1947, after immunization was general, there were but three deaths from diphtheria, and in the first six months of 1948 none. This is no isolated instance; analogous figures may be quoted for other localities.

Sulphonamides; Antibiotics; Insulin

As an example of the benefits which recent therapeutic advances bring to the individual patient rather than the community, let me quote first the effects of sulphonamides in pneumonia. Flippin *et al.* reported in 1943 that of 1,906 cases of pneumonia treated before sulphonamides were introduced the mortality was 40.1%; of 1,635 cases treated after the introduction of sulphonamides only 10.6% died. In another series recorded by Ungeleider and his colleagues in the same year the pneumonia mortality-rate for 1935 to 1937 before sulphonamides were used in treatment was 20.8%. In 1938 the case mortality was 79 per 100,000. In the period 1938 to 1942 the case mortality had been reduced by the use of sulphonamides to 3.9%, which represented for 1942 a death rate of 32 per 100,000. Thus in the United States alone 25,000 lives had been saved yearly by the sulphonamide drugs, and the reduction in the length of illness resulting from treatment had added at least a million days to the working capacity of the nation. In the American Civil War the death rate from meningococcal meningitis was estimated at about 90%; towards the latter part of the first world war, when antimeningococcal serum became generally available, the mortality was reduced to about 30%; in the second world war treatment with sulphonamides reduced the mortality to under 3%, and in many epidemics where efficient treatment was instituted early no life was lost. The importance of early diagnosis, which depends more on human skill and judgment than on laboratory tests, is strikingly demonstrated by the fact that in the first month of one outbreak 12.8% of the victims died, in the second month 7.3%, and in the later four months only 2.25%. Familiarity with the clinical manifestations of the disease had in the later period led to much earlier diagnosis.

The triumphs of penicillin and other antibiotics have been too recent in the memory to justify repetition, and as yet only the fringe of their potential usefulness appears to have been reached. If an example need be chosen to illustrate the benefits of chemotherapy few would be more informative than that of puerperal sepsis. Before the sulphonamide era the puerperal sepsis crude death rate was 154 per million; in 1939, when sulphonamides were in general use, this rate dropped to 63; in 1947, when penicillin was readily available, the rate had fallen to 16—a decrease of nearly 90% in less than fifteen years.

It is not only in the field of infectious disease that such victories have been gained. Before the days of liver therapy over 80% of the victims of pernicious anaemia died within twelve months of the recognition of their disease, and only occasionally did the patient live for more than three years. Yet in 1949 Wilkinson was able to record that, of 1,480 patients treated with liver since 1929, 1,179 were still alive; of the 301 who died, 149 had lived more than five years, 51 more than 10 years, and 12 from 16 to 20 years. How often do we mark the *total* effect of the discovery of insulin on the welfare of the diabetic patient? Before 1922 the expectation of life of a diabetic child of 10 was about fifteen months; to-day it is over 45 years. Even at the age of 30 the diabetic before insulin could expect to live only about four to six years, and this with the strictest dietetic control; now his expectation of life is over 30 years, only a little short of the normal average. Translate these facts in the light of the known incidence of diabetes mellitus—in the United States alone over 700,000—and you will have some measure in terms of the saving of life brought about by one therapeutic agent.

These examples—and hundreds of others could be quoted—reveal how great are the reductions in the incidence, morbidity, and mortality from disease brought about in the past fifty years by measures directed towards the community as a whole, such as improvements in housing, ventilation, sanitation, or the supplies of pure water and uncontaminated food; by preventive measures applied to the individual, for example, immunization against diphtheria, smallpox, typhoid, and tetanus; by recent therapeutic agents and by improvements in personal hygiene. The cure of disease has always been more spectacular than its prevention, and public imagination has been fired by the triumphs of chemotherapy and modern surgery. The greater victories of preventive medicine have too often passed unheeded and unsung.

That Essential Humanity

What has been the effect of this almost whirlwind advance in our scientific knowledge of disease, its prevention and control? It has tended to change the orientation and ambit of medical research; it has modified the structure of medical practice and changed the face of disease; and it has provided many lessons for those entrusted with the training of the doctor. But before discussing these in their wider aspects let me reiterate, since it must pervade and transcend other considerations, that the achievements of science have too often led us to forget that essential humanity which is indispensable to the best practice of medicine. For medicine is not all science. There are indeed many medical problems which defy measurement. Human life is full of imponderables, for man is not a physical being only. He has emotions and appetites which cannot be measured though they profoundly influence his physical welfare. Bodily disturbances may be, and commonly are, the expression of his loves and hates, his passions and fears, his worries and anxieties: the thumping heart, the cold sweat, the weak and tremulous knees of fright are but simple examples of this unity of body and mind.

The greatest danger to which medicine in the scientific era has been exposed is that of overlooking that men, both patient and doctor, are sentient social beings, and of forgetting that, however sensitive and specific our laboratory tests and however elaborate and complicated our instrumental methods of investigation may be, they are not ends in themselves. When Moynihan declared that "we have made surgery safe for the patient; we must make the patient safe for the surgery," he little thought that the ensuing few years would bring the achievement so close to his goal. Yet I venture to suggest that these great advances in surgical craftsmanship and technical skills, and of measures to control infection, shock, and haemorrhage, will avail but little if they obscure the need to foster sympathy and kindness, without which no surgeon is safe for

the patient. Recent years have given the doctor increasingly more potent weapons of diagnosis and treatment; but it is by the understanding and wisdom with which he uses them that he will be judged.

The poet has written:

> "True it is Nature hides,
> Her treasures less and less; Man now presides,
> In power, where once he trembled in his weakness;
> Science advances with gigantic strides."

Yet we must not neglect Wordsworth's added caveat:

> "But are we aught enriched in love and meekness?"

Medical Education

Medical research, practice, and education are closely interrelated. Indeed, over a wide territory they overlap, but I propose to discuss medical education first because I believe that in the long run it is standards of medical education which determine standards of practice. Buildings and instruments are indispensable, but they do not create a health service. In the practice of medicine men count more than materials. The Association has devoted both time and energy to the problem of medical education. As chairman of both the committees charged with the tasks of reviewing medical education in the light of modern requirements, and in particular of the needs of the general practitioner, you will, I trust, forgive me if I devote a little time to these topics. It is not always appreciated that the statutory aim of undergraduate medical education remains that of 1886, when the Medical Act provided that, for registration as a legally qualified practitioner, candidates shall show a standard of efficiency at their final examination which shall "be such as sufficiently to guarantee the possession of the knowledge and skill requisite for the efficient practice of medicine, surgery; and midwifery." This year may well see an additional requirement—a period of residence in hospital in a responsible appointment before registration is granted.

A careful study of the detailed curricula of our medical schools shows that, despite the vast corpus of knowledge and the consequent changes in the scope and emphasis of medical practice, the goal at which their undergraduate course aims is that on its completion the student shall be fitted to begin independent general practice. The B.M.A. Committee on the Training of a Doctor took a different view, which they asserted was dictated by the inexorable circumstance of the rate and extent of advancing medical knowledge. The undergraduate curriculum, they held, cannot now embrace even a tithe of the theory and practice of medicine. Its aim should be limited to laying foundations; it should be concerned, not with presenting masses of facts, but with indicating the scope, potentialities, duties, and responsibilities of medicine, both curative and preventive. It should illustrate those basic principles which are indispensable to all forms of medical practice by apt and sapient examples which will implant an appreciation of the methods of medical practice and research. It is not concerned with minutiae. The student is to be trained in reading the map of medicine, but the scale should be three miles and not three yards to the inch. The details must be left to special postgraduate study, and in this category, as our later report emphasized, general practice takes its place among the other specialties.

Basic Principles

It may well appear paradoxical that expanding knowledge should have affected medical education adversely. The explanation is to be found in the inevitable specialization which followed. The various subjects of the curriculum have developed as autonomous independent compartments of knowledge; yet for medical education they must be viewed primarily as different facets of the same subject. We have failed to secure coherence, continuity, and interdependence in our teaching. New developments and techniques in radiology, psychiatry, orthopaedic surgery, and social medicine, for example, have been forcibly fitted into, rather than integrated with, the existing curriculum. Snippets of allegedly necessary information have been added to an already congested syllabus, so that too often it justifies the taunt with which Cromwell castigated the laws of England: "A tortuous and ungodly jumble." And, perhaps most serious of all, narrower and more rigid specialization in practice has led to the evils which cannot be dissociated from increasing compartmentalism in teaching. Textbooks are rarely imbued with a general philosophy of medicine; they have become accretions of monographs by different authors into which only a stern and exacting editor can instil some semblance of unity of purpose. Too often books and courses of study are things of "shreds and patches" instead of being tapestries of clearly evident and purposive design.

Again, the population of our teaching hospitals reflects in increasing degree the rarer maladies. The interests of our consultants are becoming more and more confined, so that in many teaching hospitals whole wards are occupied by patients all of whom are suffering from the same type of disease. We may well have to ask ourselves in the near future if the narrow specialization in our teaching hospitals which results in this segregation of groups of disease is in the best interests of basic medical education, whatever other advantages it may carry. Some have urged that the student will gain most by pursuing intensively one special branch. This view is wholly indefensible. Its dangers for all learning have been denuded by many scholars. Asquith, in his Rectorial Address delivered before the University of Glasgow in 1907, referring to the study of history, speaks of both teacher and student as being "peculiarly exposed to the risks of specialism, and of the morbid excesses to which specialism leads—pedantry, want of perspective, over-emphasis of the unimportant, the passionate pursuit of small game which is not worth the efforts of the chase." And with peculiar appropriateness to medicine he said, "The mind of the . . . student is indeed in danger . . . of becoming a kind of pantechnicon, in which every sort of furniture is heaped and packed together, instead of being a habitable home where things useful and beautiful are arranged in their proper places, and in due relation to their special purposes."

Man is neither a pantechnicon nor a robot. His various organs and tissues, and his body and mind, are so closely knit in maintaining or restoring health that our medical teaching must be pervaded by a "synoptic" view. Unless basic medical training be directed to the study of the *whole* man, in relation to his external and internal environments, it will be misconceived in aim, in structure, and in balance. Theory and practice must be closely integrated; for without theory practice lacks a guiding hand, and without practice theory wilts. Nor must we forget, as Sir Richard Livingstone wrote, that "the prior task of education is to inspire and to give a sense of values and the power of distinguishing in life, as in lesser things, what is first-rate from what is not"; and, "the test of a successful education is not the amount of knowledge that a pupil takes away from school, but his appetite to know and his capacity to learn."

These were the liberal principles which my committee believed should guide the basic vocational training in medicine, and by detailed example ways were suggested by which they might be translated into practice. These were not intended to be rigid syllabuses, for we were by long experience alive to the dangers of attempting to stereotype methods of teaching or the content of the curriculum, of reducing medical education to a formula. Students vary in their capacity to learn and to be taught; they are as little suited to a uniform regimen of study as to uniformity of diet, exercise, or hobbies. Hence the need for individual tuition. No one should pretend that they can all be treated by the same method, unless he be a quack, or possessed of that demon of planning and uniformity which used to make the Minister of Education across the Channel reflect with complacent satisfaction that, at a particular minute of a particular hour of a particular day in the year, every schoolboy in every school of France was being informed of the same fact in Roman history.

Training after Graduation

The report on "General Practice and the Training of the General Practitioner" carried to its logical conclusion the recommendation of the earlier committee and emphasized the need for special training after graduation if the general practitioner was to fulfil his purpose and achieve his proper status in the field of medical practice. The general practitioner has with good reason long become increasingly suspicious and indeed resentful of the lip-service paid to him in such phrases as the "backbone of the profession," the "front line of defence," and the "flower of our profession." He must have been heartened at the reception which this report had from the national press, which appreciated, in the words of *The Times* leader, that the proposals it put forward would not only go far to bring about the betterment of the practitioner but would also make for economy, since an "efficient front-line service would relieve the more expensive services in the rear." The committee was "not unaware of the idealistic trends of its recommendations and of the criticisms to which it may in consequence be exposed." But ideals often create machinery, and machinery without ideals rusts into decay. Until we have so reformed the conditions of general practice that students of merit will wish to enter it we shall not have achieved our objective.

I need say but little of medical research. I have already pointed to its major achievements, but on the human side I welcome most cordially the signs which indicate a bridging of that breach between laboratory and clinical research which developed in the earlier part of our century and gradually widened. It stemmed from the differing public prestige and the lower material rewards of the laboratory worker. In the past few years the economic injustices have been partly redressed and there has been a wider realization of the lesson of history, that practically all research fruitful for medicine has begun by clinical observation and has achieved its ultimate successes by the combined efforts of laboratory worker and clinician. The whole story of the hormones, from the description of Addison's disease to the discovery of cortisone, is an arresting illustration of their fertile partnership.

Social Responsibilities

The second of the two influences which have fashioned the medicine of the last half-century is the evolution of our attitude as physicians to our social responsibilities. There has been increasing recognition that the perceptions and tasks of the physician of the twentieth century must be shaped by his function as a citizen, and that we must look upon the society in which we live, and our responsibilities to it, as parallel to our responsibilities to our individual patients. This is no new doctrine. It was towards the latter part of the eighteenth and the early part of the nineteenth century that humanitarian trends in their wider social implications began to influence the practice of medicine. Doctors and clergy in their everyday work were brought face to face with the sufferings of the poor, and it was natural that they should take a leading part in ameliorative movements. But, whilst the parson was more concerned with spiritual and moral welfare, the doctor sought to improve the physical amenities of the people, for he clearly apprehended the relationship between poverty and health and disease. Hence it was that in the forefront of social reform in the nineteenth century which led to the social security of the twentieth were two distinguished medical men.

One of these, Sir John Simon, wrote in his *English Sanitary Institutions*, "If given wages will not purchase such food and lodgement as were necessary for health, the ratepayers, who sooner or later have to doctor or perhaps bury the dead labourer when starvation or filth have laid him low, are in effect paying the too late arrears of wages which must have hindered the suffering and sorrows." The other, Dr. Southwood Smith, indignant at the continued indifference of Parliament to the conditions of the working classes, wrote over a century ago: "For every one of the lives of these 15,000 persons who have thus perished during the last quarter, and who might have been saved . . . those are responsible whose proper office it is to interfere and endeavour to stay the calamity—who have the power to save, but who will not use it. But their apathy is an additional reason why you should rouse yourselves. Let a voice come from your streets, lanes, alleys, that shall startle the ear of the public and command the attention of the legislature."

Is it then surprising that, since the practice of medicine reflects the social philosophy of its time, there should have grown with the years an increasing demand for social security which culminated in that National Health Service Act which will influence, for good or evil, all our lives, be we doctors or patients? I have already promised to refrain from provocative reference, but I would venture to make one or two comments outside politics. A national health service must take due cognizance of the nation's resources both in skilled workers and in materials; it therefore behoves not only the doctors to play their part but also the public, who must be educated either by persuasion or by retribution not to make unnecessary demands on doctors or on hospital services. In such education, however, we must avoid producing a nation of hypochondriacs, for that will aggravate the situation rather than remedy it. I would plead also that there should be within the service the opportunity for experiment. There is a real, and I believe increasing, danger of rigidity and inflexibility; indeed, we run the risk, despite varying needs and widening horizons in medicine, that our hospital system will fail to reflect the changes. And I need hardly re-emphasize that prevention is better than cure, and that a service which maintains health is to be preferred to a service which promotes doctoring.

I am not one who subscribes to the view that in the changing conditions of medical practice doctors will lose pride in their vocation and faith in their future. Whatever career in medicine we are destined to follow, as practitioners, teachers, or research workers, the same motives

which guided our predecessors will yet guide us, for our purpose is to help our fellow man, and the fulfilment of that purpose should be our most satisfying reward. Research workers will still find intellectual relish in gratifying their innate and compelling curiosity, and not a few will advance the frontiers of medicine. Many will leave behind something of permanent value for suffering mankind.

"Here on the level sand,
Between the sea and land,
What shall I build or write
Against the fall of night?
Tell us of runes to grave
That hold the bursting wave,
Or bastions to design
For longer date than mine."

The teacher of medicine may be fortunate enough to see the fruits of his labours, but the most precious are those which he may never see, for they are hidden in time and in the remoter corners of the earth. The practitioner, despite the overwhelming burden which is imposed by conditions which leave him so often frustrated, can still be the leader and the friend of his fellow citizens. Changing conditions provide not only a challenge but also an opportunity. Let us grasp it firmly, for through it we may more richly and abundantly keep faith with our ideals.

The Association's Work

In all the work which I have touched upon the B.M.A. has played a noble part. It has necessarily been concerned with medical politics, but, since the events of recent years have unduly illuminated in the public mind this aspect of its tasks, let me adjust the balance. That it has satisfied the needs of its members in bulk, if not always individually, is shown by the fact that in 1900 its membership was 18,500 at one guinea subscription, whilst in 1950 it has 60,000 members at four guineas subscription. During the half-century it has co-operated with practically every Government department, giving advice when sought and occasionally offering unsolicited advice which has not always proved welcome. It has had fruitful and friendly associations with the Trades Union Congress, with local authorities, and with its sister professions of law, nursing, veterinary science, and pharmacy. It has created a library of 50,000 volumes which, in co-operation with the Royal Society of Medicine, has provided all the needs of the inquiring practitioner. It publishes a weekly medical journal which has deservedly a world-wide circulation, and in recent years it has been responsible for the production of special journals which are the envy of other countries. Moreover, no other medical association or society in this country has combined with its annual meetings four days of concentrated scientific work covering all branches of medicine, where a galaxy of our brightest medical stars strive with current medical problems.

The Association has issued reports on medical topics which have profoundly affected medical practice. Among them may be mentioned those on ophthalmia neonatorum, and the early recognition of uterine cancer; on puerperal morbidity and mortality, and on the medical aspects of abortion; on the treatment of fractures and rehabilitation. It early influenced, in the light of modern developments, hospital policy and the problem of the out-patient, and long before there was wide recognition of the need it had proposed a general medical service for the nation and a national maternity service. The many victories over disease, and the preventive measures which have led to the rapid increase of the aged in our population, led to a report on the Care of the Elderly and Infirm which has formed the basis of all subsequent recommendations. Its reports on psychiatry and the law, on nutrition, and on medical ethics deserve approbation, and its exposures of "secret remedies" and the unfounded claims of the unqualified practitioner have had beneficent national repercussions. The Association, too, has by its scholarships and prizes encouraged the early work of those who have later carved a permanent niche in the medical Hall of Fame. Among these (and it would be invidious to mention the more recent) are to be found the names of Watson Cheyne, Priestley, Waller, Starling, Leathes, Elliot Smith, Major Greenwood, Charles Bolton, and A. J. Clark.

There is one other characteristic of the Association which has impressed me deeply in the years that have just passed, years fraught with difficulties. For, when decisions of great moment have to be taken, differences of viewpoint and conflicting policies must inevitably emerge, and rightly so; for history reveals that unanimity of opinion in an assembly is the forerunner of its decline. But in the B.M.A. these differences can be expressed without the fear that they will be translated in terms of personal malice and venom; and so we remain staunch and sincere friends throughout the vicissitudes of our differing medico-political outlooks.

"Combined Operations"

And so it should be. Our design is not victory in the debating chamber, but the conquest of disease. If we aim at lessening physical distress in others we should refrain from inflicting mental distress by the harsh and unguarded word or, worse, by intrigue and malice. For we are still far from many of our goals. We have not yet conquered some of our most prevalent ills, such as influenza and the common cold; and our ageing population has thrown into relief many of our failures, for the operative secrets of cancer and arteriosclerosis—now the captains of the men of death—still elude us. Many of the disabling diseases, too, such as peptic ulcer, rheumatism, and the visceral neuroses, await a satisfactory therapy. But advances will and must continue. No one can predict, with confidence, the limits of future achievement in curative, preventive, and social medicine and social welfare if all branches of medicine work in harmony among themselves and collaborate with colleagues in other scientific fields; for "combined operations" may well provide the answer to many of our problems—scientific, social, and humanitarian. The record of medicine in the first half of the twentieth century has been fortunate beyond belief; a greater duty remains, and it is shared by every doctor—to see that the future is not unworthy of the past. For, as Walt Whitman wrote in the copy of *Leaves of Grass* which he sent to Emerson, "We have not come through centuries, to halt in this land of ours."

Conclusion

May I in concluding this address express again my warm appreciation of the honour you have done me in inviting me as President to address you. I would remind you of the words used to describe his audience on the occasion of the inaugural lecture some sixteen years ago, by the then Professor of Poetry in the University of Oxford. He described that audience as "the most accomplished and exacting in the world, which no excellence can surprise, for which nothing is too good or possibly good enough." I am convinced that my audience does not fall short of that standard. I have therefore prayed that your tolerance might equal your accomplishments.

A POSSIBLE MODE OF TRANSFER OF INFECTION BY SYRINGES USED FOR MASS INOCULATION

BY

R. J. EVANS, M.B., B.S.

AND

E. T. C. SPOONER, M.A., M.D.

(From the London School of Hygiene and Tropical Medicine)

A common mass-inoculation technique (M.R.C., 1945) employs a separate sterile needle for each injection, but does not sterilize the syringe, which contains several doses of inoculum, between injections.

Accidental infections attributable to this practice do not seem to have been described, and experience generally suggests that the technique is, so far as any injection technique can be, a safe one. We do not wish to suggest that the experiments to be described mean that this "separate needle, common syringe" procedure carries a high risk; if a fresh sterile syringe cannot be used for each subject, we think it is the best technique at present available for mass-inoculation purposes.

It seemed, however, worth while to investigate the advantages of using a fresh needle for each injection, partly because of the observations of Hughes (1946), discussed below, and partly because of the association of poliomyelitis with prophylactic inoculation (McCloskey, 1950; Bradford Hill and Knowelden, 1950). It seems unlikely that the transmission of poliomyelitis virus by syringe can account for this association; other hypotheses are more probable in the light of our present knowledge. But, clearly, if there is any risk at all of syringe transmission, the possibility, however remote, should be evaluated as accurately as circumstances permit.

Experiment 1

This first experiment was therefore made with mice and virulent pneumococci. The virulence of a smooth strain of *Streptococcus pneumoniae* Type I was assured by three mouse-to-mouse passages. Twenty-four mice were then inoculated intraperitoneally with diluted peritoneal washings from a dead animal. Next day nine were dead and the remainder were sick. Thirteen which appeared moribund were killed and used immediately in the experiment.

The plan was to fill a sterile syringe with 1 ml. of sterile broth, to inject 0.1 ml. intraperitoneally into one of the recently killed pneumococcal mice, to change the needle and to inject 0.2 ml. of broth into a normal mouse, and then, the needle having been changed again, to inject 0.5 ml. into the same infected mouse's peritoneal cavity; finally, after a third needle change, to inject the remaining 0.2 ml. into a second normal mouse. One normal mouse was therefore injected from a syringe which had delivered 0.1 ml. into an infected animal, and a second normal mouse from the same syringe after delivery of 0.1 and 0.5 ml. into the infected mouse. Two normal mice and one infected mouse were thus injected from one syringe, the needle being changed after each injection.

This procedure was adopted because it was thought that the second injection of 0.5 ml. into the infected mouse might produce a higher intraperitoneal pressure and so a bigger change of reflux of infected fluid into the syringe.

Nine 1-ml. syringes of various makes were used, and 40 needles, sizes 15 and 17. All were oven-sterilized initially; resterilization during the experiment was achieved by boiling. In order to minimize as far as possible the risk of cross-infection occurring between the infected and the normal mice, the conduct of the experiment was divided into three tasks, each of which was performed by one operator alone.

The first operator killed the infected mouse by breaking its neck, and pinned it out belly upwards on a cork mat ready for the second operator.

The second operator handled the syringes and made all the injections. He performed the following operations in strict sequence: (1) filled a sterile syringe to the 1-ml. mark with sterile broth; (2) injected 0.1 ml. of broth intraperitoneally into an infected mouse; (3) disconnected the needle from the syringe and placed it in the sterilizer; (4) fitted a sterile needle to the same syringe and then injected 0.2 ml. of broth intraperitoneally into a normal mouse; (5) discarded the second needle into the sterilizer, fitted a fresh sterile needle to the syringe, and injected 0.5 ml. of broth intraperitoneally into the same infected mouse as at stage 2; (6) discarded the third needle to the sterilizer, and, after fitting a fresh sterile needle to the syringe, injected the final 0.2 ml. of broth intraperitoneally into a second normal mouse; and (7) discarded the syringe and needle to the sterilizer.

The sequence of operations was repeated for each of the 13 infected mice, and, in all, 26 normal mice were inoculated in this way. No attempt was made to clean or sterilize the belly walls of the mice. Injections were made in the usual manner. Care was taken not to withdraw the plunger of the syringe after giving the injection. No reflux into the syringes was observed.

The third operator handled the normal mice, holding them for injection, and placing them after injection into cages so that mice inoculated at stage 4 were caged together, labelled "0.1 ml.," and those inoculated at stage 6 were caged together, labelled "0.5 ml."

By the morning after injection, five of the 26 "normal" mice were dead. Fourteen more died in the course of the next 48 hours. The distribution of dead mice between batches is shown in Table I. Blood-agar cultures and stained films prepared from the heart blood of each dead mouse showed abundant pneumococci. The seven surviving experimental mice were alive and in apparently good health three days after injection.

TABLE I.—*Experiments with Pneumococcal Mice*

Experiment	Batch	No. of Mice Injected	No. of Mice Developing Pneumococcal Septicaemia
1 ..	"0·1 ml."	13	8
	"0·5 ml."	13	11
	"Record" control	5	0
2 ..	"Record" test	10	8
	"Tuberculin" control	5	0
	"Tuberculin" test	10	8

It appeared from this experiment that a change of needle gave very little protection against the carry-over of infection from infected to normal mice.

Experiment 2

Later, the experiment was repeated, using mice of a different strain and four 1-ml. glass-metal Record syringes together with five 1-ml. all-glass tuberculin syringes. One of the Record syringes was re-boiled during the experiment and used a second time. In this second experiment procedure was simplified, the steps of the operation being

as follows: (1) Record syringes were sterilized by boiling, all-glass syringes by hot-air sterilization; (2) the syringe was filled with 1 ml. of sterile broth; (3) 0.1 ml. of broth was injected intraperitoneally into a normal control mouse; (4) 0.1 ml. of broth was then injected intraperitoneally into a "pneumococcal" mouse killed immediately beforehand by neck-breaking; (5) the used needle was removed and discarded and a fresh sterile needle fitted to the syringe; and (6) 0.1 ml. of broth was then injected intraperitoneally into each of two normal mice.

As they were injected the mice were caged in six separate groups of five mice—"Record" and "tuberculin" controls, "Record" and "tuberculin" first and second test mice.

During the next 48 hours all control mice remained in good health, but 16 of the 20 test animals developed a fatal pneumococcal peritonitis and septicaemia, which was confirmed by culture and smear. The result is shown in Table I.

These mouse experiments were intended to simulate the ordinary technique of mass inoculation carefully performed. As a test of transfer of infection they were, however, very sensitive, because the number of virulent organisms needed to produce pneumococcal septicaemia in the mouse is very small, and the peritoneal cavities of the pneumococcal mice used contained very large numbers of pneumococci.

An attempt has therefore been made to assess the risk of carry-over of micro-organisms in the "separate needle, common syringe" technique of inoculation by means of quantitative experiments using bacterial cultures instead of pneumococcal mice.

Experiments 3 to 5

These were performed with an "artificial mouse" consisting of a length of glass tubing bent at a right-angle, the shorter arm being fitted with a 2-in. (5-cm.) length of rubber tubing, plugged at the far end with a glass rod (Fig. 1). Overnight broth cultures of *Shigella flexneri* (Y6R or NCTC 4832) were pipetted into the tube, filling the rubber and the horizontal glass limb, and rising in the vertical limb to a height which determined the hydrostatic pressure inside the rubber tube. Six syringes were employed in each of these experiments—1-ml. all-glass "tuberculin" syringes in experiments 3 and 4, and, in experiment 5, four 1-ml. "Record" syringes and two all-glass "tuberculin" syringes.

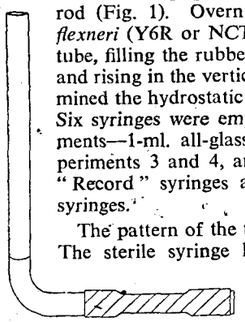


FIG. 1.—"Artificial mouse." A length of glass tubing bent at right angles: the shorter arm is fitted with a 2-in. length of rubber tubing, plugged at the far end with a glass rod.

The pattern of the three experiments was the same. The sterile syringe having been filled with sterile broth, 0.1 ml. was injected through the rubber tube into the "artificial mouse." The needle was then withdrawn. It was changed and not changed on alternate syringes, even-number syringes not having their needles changed, odd-number syringes receiving a fresh sterile needle before the next step in the experiment, which was to discharge 0.2 ml. of broth from the syringe into each of three tubes containing 0.8 ml. of sterile broth. From these tubes suitable dilutions were prepared, and six-plate surface counts (Miles and Misra, 1938) of their contained bacteria were made.

Table II shows the result of these experiments in terms of the number of colony-producing bacilli contained in each of the successive 0.2 ml. volumes of broth discharged from the syringe after injection of 0.1 ml. into the "artificial mouse," with and without intervening changes of needle.

TABLE II.—*Results of Experiments 3 to 5*

Experiment	Needle Change	Syringe No.	Bacterial Counts per 0·2 ml. Volume		
			Vol. 1	Vol. 2	Vol. 3
3 ..	Not changed	1	4,000	0	0
	,, ,,	3	22,500	33	0
	,, ,,	5	8,200	8	25
	Changed	2	2,000	791	292
	,,	4	5,700	1,191	225
	,,	6	1,000	200	191
4 ..	Not changed	1	6,165	0	0
	,, ,,	3	180,833	890	316
	,, ,,	5	29,000	2,166	458
	Changed	2	540	83	50
	,,	4	3,583	600	225
	,,	6	0	0	0
5 ..	Not changed	1 "R"	8,750	66	
	,, ,,	3 "R"	5,083	25	
	,, ,,	5	9,333	116	
	Changed	2 "R"	266	58	
	,,	4 "R"	391	25	
	,,	6	0	0	

R = Record glass–metal 1-ml. syringe.

Two of the nine tests in which the needle was changed showed no carry-over of infection, but in the remaining seven change of needle showed very little advantage over the nine tests in which the needle was not changed.

The height of the fluid column in the vertical limb of the "artificial mouse" in these experiments varied between 2 and 6 cm. There was no apparent correlation between height of fluid column and result. However, it seemed possible that the positive pressure against which the first injection was made might be forcing culture along the needle, although no plunger movement was evident. To test this, another experiment was performed.

Experiment 6

In this experiment the procedure was similar except that, instead of injecting through rubber into culture under a few centimetres head of pressure, the first injection was made into a small volume of culture held in a small bottle, the point of the injecting needle being held one or two millimetres below the surface, and the syringe necessarily at an angle with the horizontal, such that the pressure on the broth in the syringe must throughout have been greater than the pressure in the culture around the needle point. The result of this experiment is shown in Table III. One

TABLE III.—*Result of Experiment 6*

Needle Change	Syringe No.	Bacterial Counts per 0·2 ml. Volume		
		Vol. 1	Vol. 2	Vol. 3
Not changed	1	83,333	1,083	4,083
,, ,, ...	3	45,000	1,250	300
,, ,, ...	5	31,666	1,916	216
Changed	2	0	0	0
,, ...	4	25,000	2,146	893
,, ...	6	0	0	0

out of three syringes in which the needles were changed still showed a considerable carry-over of bacteria. In this experiment, as in all the preceding ones, the injection into the infected mouse or culture had been made without emptying the syringe. It seemed possible that, unless the plunger were pushed home against the bottom of the syringe, small plunger movements might cause a reflux into the needle.

Experiment 7

In this experiment injection was not made into the infected material. Instead, each sterile syringe was first washed out with a small volume of sterile broth and

emptied. The point of the needle was then dipped into a culture of *Sh. flexneri* to a depth of one or two millimetres, after which it was withdrawn and the needle was changed. A small volume, up to 1 or 2 ml., of sterile broth was drawn into the syringe through the new needle. Three drops were then expelled on to an agar plate and spread with a sterile spreader.

Sixteen syringes were used, ranging from 1 ml. to 10 ml. in capacity, and of various makes. They were fitted with needles of differing lengths and bore. Next day two of the 16 plates showed numerous colonies of *Sh. flexneri*, the remaining 14 showing none.

This experiment shows that if the needle point is contaminated, even when the syringe is empty and with the plunger pushed home and not moved, and even when there is no appreciable pressure forcing infected fluid back into the needle, it is still possible for the syringe to become contaminated when the needle is changed. It is clear, however, that the frequency of such contamination was less than in those experiments in which the plunger was moved, or in which injections were made into infected fluid under a small head of pressure.

Experiment 8

A final experiment was performed to help separate these two factors of plunger movement and pressure of infected fluid. The "artificial mouse" used in experiments 3 to 5 was employed again, but this time the injecting syringe contained only about 0.1 ml. of fluid, the whole of which

TABLE IV.—*Experiment 8*

Syringe No.	Syringe Description	Height of Fluid Column: Before Injection (cm.)	Height of Fluid Column: After Injection (cm.)	Plate Result: Colonies
1	"Tuberculin" 1 ml.	1·5	2·0	++
2	All-glass 10 ,,	2·0	3·0	13
3	,, 2 ,,	3·0	3·5	++
4	,, 2 ,,	3·5	4·2	6
5	,, 5 ,,	1·5	2·0	0
6	"Tuberculin" 1 ,,	2·0	2·5	+++
7	,, 1 ,,	2·5	2·9	+++
8	All-glass 5 ,,	2·9	3·2	26
9	,, 5 ,,	1·8	2·1	+++
10	"Tuberculin" 1 ,,	2·1	2·6	+++
11	All-glass 2 ,,	2·6	3·0	0
12	,, 2 ,,	3·0	3·7	0
13	,, 1 ,,	1·5	1·8	+++
14	,, 5 ,,	1·8	2·2	10
15	,, 10 ,,	2·2	2·7	21
16	,, 1 ,,	2·7	3·1	47

++, +++ = Large numbers of colonies, not counted.

was injected through the rubber, so that at the end of the injection the plunger was "home" against the bottom of the syringe.

One "artificial mouse" was used to test four syringes. Sixteen syringes in all, of various sizes and patterns, from 1 ml. to 10 ml. in capacity and fitted with various needles, were tested, using four "artificial mice." The order of procedure was: (1) Sterile broth was drawn into the syringe and discharged until about 0.1 ml. remained in the syringe. (In 1-ml. and 2-ml. syringes this volume could be measured easily. In 5-ml. and 10-ml. syringes it was judged by eye, and checked by the change in height of fluid column noted after its injection into the "artificial mouse.") (2) This terminal volume of broth was then injected through the rubber into the culture of *Sh. flexneri* and the rise in height of fluid column noted. (3) The needle was then discarded, being replaced by a fresh sterile needle. (4) About 0.5 ml. of broth, sterilized in a small individual tube, was then sucked into the syringe through the new needle. (5) Three drops were then discharged on to the surface of an agar plate and spread with a sterile glass spreader.

Next morning, after overnight incubation at 37° C., three of the 16 plates showed no growth, but the remaining plates showed colonies of *Sh. flexneri*, checked by slide agglutination, varying in numbers from six to several hundreds, as is shown in Table IV.

Discussion

Syringes used for intravenous injections often become contaminated with blood (Salaman *et al.*, 1944; Droller, 1945; Mendelssohn and Witts, 1945; Darmady and Hardwick, 1945; Morton, 1948) and may, therefore, transfer infection if used on more than one subject without intervening sterilization. Hughes (1946) demonstrated that the nozzles of syringes used to administer intramuscular injections to human subjects often become contaminated with red corpuscles. He found that the drop of fluid on the end of the syringe nozzle after removal of the needle contained red corpuscles after 15 out of a total of 27 injections made into contracted muscles, and after two out of a total of 12 injections into relaxed muscles.

The experiments here reported show that contaminants on the needle point, even when no injection is made and when the contamination is derived from fluid under negligible hydrostatic pressure, may travel back along the needle and contaminate the syringe when the needle is removed from it. Without further extensive quantitative experiments, it would not be possible to assess the frequency with which this happens; probably the pattern of syringe and of needle would affect the degree of risk.

It is likely, from the experiments reported, that small movements of the plunger and the hydrostatic pressure around the needle tip are factors which increase the risk of syringe contamination, and, of course, both of these factors are involved whenever any injection is given.

If, as appears from experiments 6 and 7, contamination of the needle tip can lead to contamination of the syringe, though the pressure around the needle tip is not significantly raised, then some explanation of the passage of the contaminant back from the needle tip to the syringe nozzle must be sought. The most probable explanation seems to be that offered by Hughes: that withdrawal of the nozzle of the syringe from the socket of the needle may suck fluid back from the lumen and point of the needle to contaminate the point of the syringe nozzle. Measurement of the length and internal diameter of some of the needles used in these experiments indicated that the lumen volume varied between 2.5 and 5.8 c.mm. for small needles of the kind usually employed for subcutaneous and intramuscular injection. These

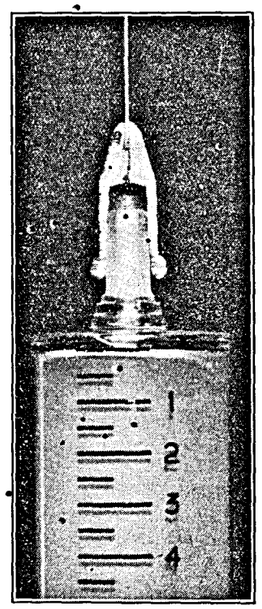


FIG. 2.—Needle cut in half longitudinally and fitted to syringe.

volumes are probably smaller than the displacement volume of the syringe nozzle in the needle socket. Fig. 2 shows a needle which has been cut in half longitudinally and then fitted to a syringe. The displacement volume of the nozzle in the socket is of the order of 100 c.mm.

It seems clear, then, that the "separate needle, common syringe" technique might transfer infection from one subject to the next if the tissue into which the first injection was made were itself infected. Our experiments indicate, however, that syringe contamination does not always follow removal of a contaminated needle, and therefore the "separate needle, common syringe" technique is safer than the use of one needle and syringe for inoculation of several subjects.

The actual risk of syringe transmission of infection during mass immunization is evidently a very small one, because it depends not only on the imperfection of the syringe technique but also on the probability that muscle, skin, or subcutaneous tissue may harbour an infective agent capable of being transmitted.

Where bacterial infections are concerned the risk is probably very small. An injection made into a subject with an undetected incipient septic lesion might cause, by syringe contamination, lesions in several subjects subsequently inoculated, and all the lesions, including that which in fact caused the infections, might be wrongly attributed to prior contamination of the injection material. Several mass-inoculation accidents, such as the Ring disaster of 1939 (Report, 1939) in which multiple tuberculous abscesses followed inoculations with T.A.F., remain unexplained. Bigger, Blacklock, and Parish (1940) draw attention to the risk of transferring infection from a subject who already has some small infective lesion in his muscle or fascial planes.

Virus infections are more difficult to discuss, for knowledge about the distribution of viruses in tissues is very inadequate. Serum hepatitis is clearly apt to be passed by a faulty injection technique (Hughes, 1946), or even by imperfect sterilization of blood guns used for collection of blood samples in diabetic clinics (Malmros, Wilander, and Herner, 1948). Among neurotropic viruses, the group of encephalitides transmitted by insect bite and due to viruses recoverable from the blood may be important in some parts of the world. Hughes (1944) has drawn attention to various neurological complications which may follow inoculations and which might conceivably be syringe-transmitted. The possibility that poliomyelitis or other neurotropic viruses may exist in relatively high local concentrations in the nerves lying in muscles or in skin or subcutaneous tissues cannot, in our view, be entirely excluded, although on the evidence available this seems an unlikely explanation of the association between poliomyelitis and inoculations.

The hazards of the "separate needle, common syringe" technique may well be greater in countries where malaria and blood-borne viruses are more frequent.

Conclusion

The common practice of giving multiple injections from one syringe is not made entirely safe by using a separate needle for each injection, even when the injection is given into a tissue other than a vein; but this technique is safer than is the use of a single needle for injection of several subjects. The risk probably lies in aspiration of fluid along the needle by suction created when the nozzle of the syringe is withdrawn from the socket of the needle.

REFERENCES

Bigger, J. W., Blacklock, J. W. S., and Parish, H. J. (1940). *British Medical Journal*, **1**, 79.
Darmady, E. M., and Hardwick, C. (1945). *Lancet*, **2**, 106.
Droller, H. (1945). *British Medical Journal*, **1**, 623.
Hill, A. Bradford, and Knowelden, J. (1950). Ibid., **2**, 1
Hughes, R. R. (1944). *Lancet*, **2**, 464.
—— (1946). *British Medical Journal*, **2**, 685.
McCloskey, B. P. (1950). *Lancet*, **1**, 659.
Malmros, H., Wilander, O., and Herner, B. (1948). *British Medical Journal*, **2**, 936.
Medical Research Council (1945). War Memorandum No. 15, "The Sterilization, Use, and Care of Syringes." H.M.S.O.
Mendelssohn, K., and Witts, L. J. (1945). *British Medical Journal*, **1**, 625.
Miles, A. A., and Misra, S. S. (1938). *J. Hyg., Camb.*, **38**, 732.
Morton, R. S. (1948). *British Medical Journal*, **2**, 938.
Report (1939). Ibid., **1**, 480.
Salaman, M. H., King, A. J., Williams, D. I., and Nicol, C. S. (1944). *Lancet*, **2**, 7.

DIPHYLLOBOTHRIUM INFESTATION AND ANAEMIA IN GREAT BRITAIN

BY

J. C. HARLAND, M.D., M.R.C.P.
Senior Medical Registrar, Westminster Hospital

J. G. HUMBLE, M.R.C.S., L.R.C.P.
Haematologist, Westminster Hospital

AND

P. G. MANN, M.B., B.Ch.
Assistant Pathologist, Westminster Hospital

Diphyllobothrium latum, the fish tapeworm, is uncommon in the British Isles, although cases occur from time to time among the inhabitants of the lake districts of western Ireland. In 1944 Duguid and Sheppard found the trout and sticklebacks of a reservoir in South Wales heavily infested with the plerocercoids of *Diphyllobothrium dendriticum*, and Hickey and Harris (1944) found the adult worm in seagulls in Ireland. Human infestation is virtually unknown in Great Britain, though it is prevalent in other parts of the world, including the United States of America, where it has been introduced by immigrants. In 1924 Passay and Braine referred to an Estonian seaman who expelled a worm in hospital in Aberdeen, and Duguid and Sheppard mention a Belgian soldier who was found to be a carrier. Otherwise no case has been published in this country.

The associated megaloblastic anaemia is remarkable in that it is almost entirely confined to the Finnish race, although there are many other nationalities equally heavily infested with the worm. Even in Finland it is uncommon. Ehrström (1926) stated that it occurred in only one of every 5,000–10,000 carriers, but later workers have found it more frequently. The case recorded below is notable not only on this account but because of its haematological interest and because it raises an important public health problem.

Case Report

A Finnish domestic servant aged 22 had lived in England for two years. Her health had always been good until six to seven months before admission to hospital on July 7, 1949, when she began to notice increasing tiredness, followed later by breathlessness and occasional morning vomiting. She had attended another hospital in May, 1949, where a tentative diagnosis of pernicious anaemia was made and an injection

of liver was given. It was stated that a reticulocytosis occurred five days later. She received no more liver injections, as she then left that neighbourhood.

Apart from obvious pallor there were no abnormal physical signs. Her nutritional state was good. Haematological examination showed the following: haemoglobin, 60% (8.2 g.%); red cells, 2,500,000; colour index, 1.2; packed cell volume, 30 ml.%. The Price-Jones curve (Humble and Belyavin, 1948) showed (Fig. 1, Curve II): mean corpuscular diameter, 8.34 μ; standard deviation 0.9 μ; megalocytosis, 36%. The mean corpuscular volume was 120 μ^3; mean corpuscular haemoglobin, 32.8 $\mu\mu$g.; mean corpuscular haemoglobin concentration, 27.3%; white blood cells, 5,600 (normal differential count). The sternal marrow showed an excess of nucleated red blood

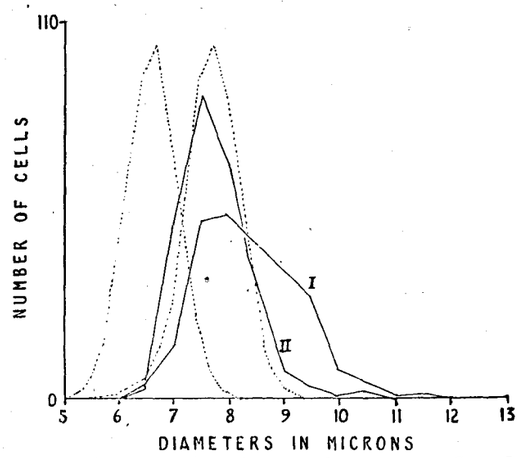


FIG. 1.—Price-Jones curves before and after treatment. Curve I: June 15, 1949. Curve II: November 25, 1949.

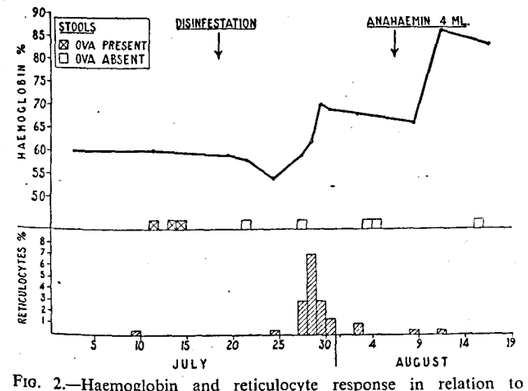


FIG. 2.—Haemoglobin and reticulocyte response in relation to treatment.

cells, most of which could be classified as macronormoblasts. A feature of the films was a large number of fully mature (orthochromic) late normoblasts. Many definite megaloblasts were seen in various stages of development. The appearances were not those of classical Addisonian anaemia.

A histamine-fast achlorhydria was present. The faecal fats were within normal limits, and occult blood was not found in the stools. There was no radiological evidence of pulmonary disease.

When considering the differential diagnosis steatorrhoea was excluded, and it was felt that pernicious anaemia was unlikely on account of the patient's youth. Because of her nationality, diphyllobothrium anaemia was suggested, and three successive stool examinations revealed diphyllobothrium ova.

On July 18 she was given 90 min. (5.4 ml.) of extract of male fern in divided doses of 30 min. (1.8 ml.), having previously been starved for two days. After a dose of magnesium sulphate two hours later, two adult worms were expelled, one with the head intact, which were identified as a species of diphyllobothrium. No further treatment was given, and on July 27 a reticulocytosis began; this continued for the next four days, reaching a maximum of 7% on July 28 (Fig. 2). An injection of 4 ml. of "anahaemin" on August 6 produced no more reticulocytes, but the anaemia was improving rapidly, and on August 11 the haemoglobin amounted to 86%. Ova were not found in the stools examined between disinfestation, and the patient was discharged from hospital on August 19. In November, 1949, she was well and her stools were free from ova. The histamine-fast achlorhydria was still present. Her haemoglobin was 105% and the Price-Jones curve showed: M.C.D., 7.71 μ; standard deviation, 0.59 μ. Megalocytosis was 4.4% (Fig. 1, Curve II).

The atypical bone-marrow appearance can probably be attributed to the liver injection given two months earlier. Also, this case emphasizes the inadvisability of diagnosing true pernicious anaemia in a young person without considering all the possible aetiological factors.

Helminthology

The identity of the tapeworm in this case was determined from specimens of ova and an adult worm. The ova were ellipsoids, measuring about 68 by 48 μ and having



FIG. 3.—*Diphyllobothrium latum*. Two ova, one ruptured to show operculum. (× 150.)

an operculum which was readily opened by applying gentle pressure to a coverslip over a wet film. The embryo appeared as a cluster of granular cells occupying most of the egg. Some specimens showed a small nodular thickening opposite the operculum (Figs. 3 and 4). The adult worm was six metres long (Fig. 5) and was composed of typical proglottides having a central rosette-shaped uterus with genital and uterine pores on the ventral surface (Fig. 6). The testes were not continuous across the mid-line. The scolex was smooth and elongated, was marked

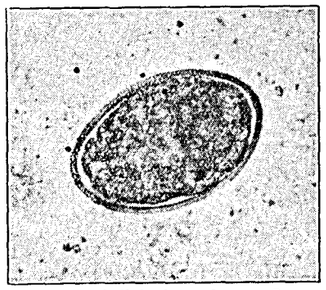


FIG. 4.—*Diphyllobothrium latum*. Ovum. (× 450.)

by two grooves (bothria), but had no hooklets or suckers.

Members of the Diphyllobothriidae have a complex life-cycle, requiring two intermediate hosts as well as the definitive host. On hatching, the eggs liberate a small ciliated spherical larva or coracidium. This develops in

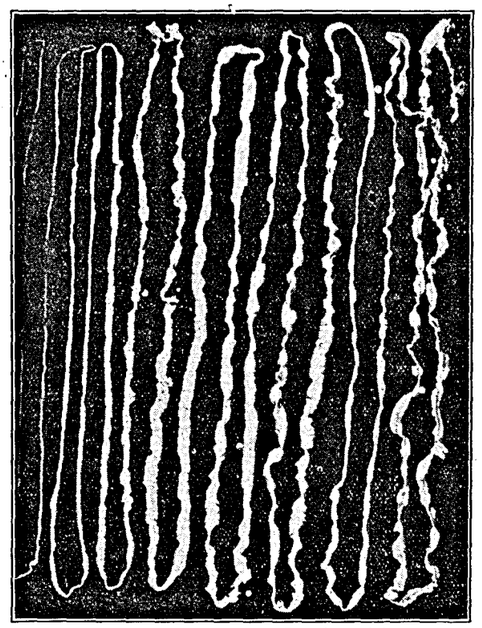


FIG. 5.—*Diphyllobothrium latum*. Complete adult tapeworm. ¼ natural size.

the body cavity of a water-flea, usually *Cyclops* or *Diaptomus*, into a hexacanth form known as a procercoid. When infected water-fleas are swallowed by fish the procercoids pass through the wall of the alimentary canal into the body cavity of the fish, where they develop into plerocercoids, which are small unsegmented worms, some 1–10 cm. long, possessing a deeply grooved scolex. The fish most commonly infested include the stickleback and those species that prey upon it, such as perch, pike, and trout. Fish such as the grayling, which are only spasmodically carnivorous, are much less commonly infested (Unsworth, 1944).



FIG. 6. — *Diphyllobothrium latum*. Unstained segments to show general outline and central uterus. (× 1½.)

If the infested fish is eaten raw or partially cooked by a suitable host the adult worm will develop. The definitive host for *Diphyllobothrium latum* may be the cat, dog, bear, or man. There are also a number of species of diphyllobothrium which infest sea-birds, such as the cormorant and gull, as reported by Hickey and Harris (1944). The outbreak among fish in a reservoir in South Wales described by Duguid and Sheppard (1944) was probably due to this group (Baylis, 1945). It is noteworthy that the avian parasites require the same intermediate hosts as *Diphyllobothrium latum*, and that one species, *Diphyllobothrium dendriticum*, has been reported to have produced human infestation (Talysin, 1932; Markowski, 1950).

Symptoms

The diphyllobothrium tapeworm can be found in man at all ages, but is less common in children than in adults. The worm is acquired by eating raw or partially cooked or cured fish infested with the plerocercoids. The roe as well as the flesh may be affected, and many cases have occurred from eating caviar. Properly cooked or cured fish is harmless. Most carriers have good health, but bowel irritation may cause such symptoms as nausea, vomiting, colicky abdominal pain, and diarrhoea. There is no foundation for the majority of abdominal and nervous symptoms ascribed to the worm. Stomatitis and glossitis occasionally occur, and are certainly common in anaemic cases. Achlorhydria is no more common in the non-anaemic carriers than in the general population (Grönburg, 1912, cited by Birkeland, 1932). Eosinophilia is occasionally found, but is inconstant. When anaemia occurs the symptoms do not differ from those of other anaemic states.

The terminal proglottides are not shed as in taeniasis, and the host may notice nothing unusual in his stools although more than a million ova a day are being discharged. It is common, however, for varying lengths of the worm to be passed from time to time. The life span is not easy to determine, as the worms are often multiple and reinfestation may be continuous, but Leiper (1936) has shown that the worm can live many years. It can be removed by anthelmintic treatment in the usual manner.

The Anaemia

Until recently the characteristic anaemia had been considered a rare manifestation. Birkeland (1932) could find only 544 recorded cases. Of these, no fewer than 391 were of Finnish stock, and the relative tendency of Finns to develop the anaemia compared with other races is very striking. Tötterman (1939) and von Bonsdorff (1948) have indicated that when systematic blood counts are performed the frequency of the anaemia is much greater than Ehrström's (1926) estimation.

The anaemia is commonest in the third and fourth decades—a younger age-group than in Addisonian anaemia (Lindström, 1930)—but is very uncommon in childhood. The blood and bone-marrow appearances are identical with those of the other megaloblastic anaemias. The anaemia is fatal unless treated, but responds well to either liver therapy or disinfestation. No satisfactory evidence has ever been produced that spinal cord degeneration occurs.

Achlorhydria occurs in about 80% of cases, but hydrochloric acid may return to the gastric juice when the worm is expelled. This has not so far happened in our patient. Hernberg (1947) has found that even when hydrochloric acid returns the acidity is diminished, and there is a reduced secretion of gastric juice in response to histamine. From this he infers that tapeworm anaemia occurs in those with a constitutionally defective gastric secretion.

Recent work on the pathogenesis of this anaemia has shown that the intrinsic factor is present. Hernberg (1941) found that an incubated mixture of meat and gastric juice from a patient with diphyllobothrium anaemia will produce a reticulocyte response in patients with true pernicious

anaemia in relapse. Deficiency of the extrinsic factor is not usually present, but the incidence of anaemia seems to have been particularly notable in Finland in 1942, a year when the food situation, especially protein deficiency, was very serious. The anaemia will not clear up after the worm is expelled if the extrinsic factor is deliberately withheld from the diet, indicating that the liver stores of haemopoietic principle are depleted.

In tapeworm anaemia the administration of meat and healthy gastric juice mixtures, whether fresh or incubated, will not produce a remission until the worm is expelled. There is no impairment of absorption in such cases, for folic acid and liver given by mouth are as effective as liver injections. It therefore seems that the worm in some way interferes with the interaction between the extrinsic and intrinsic factors.

Incubating dried or emulsified worm with liver extracts will not reduce their anti-anaemic effect. Nor does the mixture of meat and gastric juice from worm-anaemia patients have any lessened effect in pernicious anaemia if fresh or dried worm extracts are added. Neither does the worm extract, fed to an anaemia patient after the worm is expelled, in any way prevent recovery from occurring.

The available evidence indicates quite clearly that it is the live worm in the intestine which causes anaemia by inhibiting the formation of haemopoietin. How this happens is not yet clear, but von Bonsdorff (1948), in an admirable review of this subject, has suggested that the position of the worm in the ileum may determine the onset of anaemia. By passing a tube into the small intestine he has found that diphyllobothrium ova can usually be withdrawn at a distance of 100–150 cm. from the mouth in anaemic patients. In non-anaemic patients the distance is usually more than 150 cm. The more proximally the worm lies in the ileum the more likely is anaemia to occur. Moreover, by administering a partial vermifuge von Bonsdorff has been able to produce a remission in an anaemic carrier without killing the worm—presumably by causing the worm to retreat once more to the distal part of the small intestine.

If von Bonsdorff's work is confirmed it will explain the following facts: (*a*) A person can be a worm carrier for many years before becoming anaemic—presumably because his worm inhabits the distal rather than the proximal ileum. (*b*) Persons with tapeworm anaemia who recover after expulsion of the worm do not necessarily become anaemic when they are reinfested. (*c*) The presence of anaemia is not related to the intensity of infestation. (*d*) Worms removed from anaemic patients are often discoloured and decomposed, owing to the powerful digestive action of enzymes in the upper ileum. (*e*) Spontaneous remissions occasionally occur without the worm being expelled.

Geographical Distribution

Diphyllobothrium latum is widely distributed throughout the temperate regions of the world wherever there are rivers and lakes well stocked with fish. It is uncommon in the Tropics, where the anaemia is unknown (Manson-Bahr, 1940). Of the three main endemic areas, one is in the Far East, with its centre in Japan. The second area comprises eastern Scandinavia and the Baltic States. The rate of infestation here is high. Birkeland (1932) states that in Finland it is probable that 25% of the population (some 500,000–750,000 people) are carriers of the worm. Figures are not available for the other Baltic countries, but the carrier rate may well be of the same order. From this region the worm has spread to other countries in central and eastern Europe, where the disturbance of the late war has no doubt increased its prevalence.

The third area where the parasite is often found is in North America—in Minnesota and adjoining States in the U.S.A. and Canada. The geographical conditions here are suitable for the propagation of the worm, and, in addition, many of the inhabitants are of Scandinavian descent. Magath (1933) states that there is no evidence that the worm has been indigenous to this area for more than a short time, and there seems little doubt that it was brought there by immigrants from the Baltic States, and now appears to be ineradicable. Essex (1938) found that the proportion of infested fish in Long Lake, Minnesota, was the same in 1937 as in 1929.

Diphyllobothrium in Great Britain

This American experience is worth noting. Duguid and Sheppard (1944) and Hickey and Harris (1944) have shown that fish tapeworms related to *Diphyllobothrium latum* and affecting the same intermediate hosts have already appeared in this country. Although fresh-water fish is not a common article of diet, it has recently been estimated (*The Observer*, December 11, 1949) that there are about two million amateur fresh-water fishermen in Great Britain, who presumably handle and consume what they catch. No doubt human infestation has not previously occurred in this country, as visitors from affected areas have not been numerous in the past. Since the end of the war, however, the position has altered. On April 1, 1942, the number of Estonian, Latvian, and Lithuanian nationals living in this country was 3,212. By the end of October, 1949, this number had increased to 26,745. Similarly the number of Finns living here has increased from 447 in 1939 to 1,208 on July 31, 1949 (figures kindly supplied by the Aliens Department, the Home Office).

These immigrants have come from areas heavily infested with *Diphyllobothrium latum*, and there are probably many carriers among them. If such persons should live in rural areas where sanitation is often primitive there would be a grave risk of sewage containing diphyllobothrium ova being discharged into a fish-bearing river or lake and ultimately causing human infestation. Further investigation of this problem by the public health authorities would appear to be desirable.

Summary

A case of megaloblastic anaemia caused by diphyllobothrium infestation, the first to be recorded in this country, is presented. It is emphasized that a diagnosis of idiopathic pernicious anaemia should not be made under the age of 30 years without considering all the possible aetiological factors.

The appearance and life history of the parasite and symptoms caused by human infestation are discussed. Diphyllobothrium anaemia is also described, and its predilection for the Finnish race is pointed out. The anaemia seems to be caused by the live worm inhabiting the proximal part of the ileum and thus interfering, in some way as yet unknown, with the interaction of the intrinsic and extrinsic factors.

An account is given of the geographical distribution of the worm, and it is pointed out that, as in America, there seems to be a risk of the worm becoming indigenous to Great Britain owing to large-scale immigration from the heavily infested Baltic States since the end of the war.

ADDENDUM

Since the preparation of this paper a further case of diphyllobothrium infestation has been observed.

A married Finnish lady aged 34, who had lived in England for three and a half years, attended the out-patient department

on January 16, 1950. She stated that since the age of 10 she had often been infested with tapeworms. She had noticed worm segments in her stools on one occasion a year previously, and again in September, 1949. For a fortnight before coming to hospital she had suffered from postural dizziness, a symptom she associated with the presence of worms. Apart from slight abdominal discomfort, she had no other symptoms of note. On examination there were no abnormal physical signs. Her blood count was normal. Diphyllobothrium ova were present in the stools. Disinfestation has not yet been carried out.

We are grateful to Sir Arnold Stott for permission to publish this case. We are also indebted to Dr. A. J. Shinnie, medical officer of health for the City of Westminster, and Professor J. J. C. Buckley, of the London School of Tropical Medicine and Hygiene, for help and advice. We wish to thank Professor N. F. Maclagan and the staff of the Biochemical Department, Westminster Hospital, for performing the fractional test meals.

REFERENCES

Baylis, H. A. (1945). *Ann. trop. Med.*, **39**, 41.
Birkeland, I. W. (1932). *Medicine, Baltimore*, **11**, 1.
Bonsdorff, B. von (1948). *Blood*, **3**, 91.
Duguid, J. B., and Sheppard, E. M. (1944). *J. Path. Bact.*, **56**, 73.
Ehrström, R. (1926). *Acta med. scand.*, **64**, 29.
Essex, H. E. (1938). *Minn. Med.*, **21**, 254.
Hernberg, C. A. (1941). *Acta med. scand.*, **123**, 255.
—— (1947). Ibid., **129**, 12.
Hickey, M. D., and Harris, J. R. (1944). *British Medical Journal*, **2**, 310.
Humble, J. G., and Belyavin, G. (1948). *J. clin. Path.*, **1**, 77.
Leiper, R. T. (1936). *J. Helminth.*, **14**, 127.
Lindström, E. (1930). *Acta med. scand.*, **73**, 71.
Magath, T. B. (1933). *J. Amer. med. Ass.*, **101**, 337.
Manson-Bahr, P. H. (1940). *Manson's Tropical Diseases*, 11th ed., p. 821. Cassell, London.
Markowski, S. (1950). *J. Helminth.*, **23**, 107.
Passay, R. D., and Braine, J. C. (1924). *Guy's Hosp. Rep.*, **74**, 329.
Talysin, T. (1932). *Z. Parasitenk.*, **4**, 722.
Tötterman, G. (1939). *Acta med. scand.*, Suppl. 104.
Unsworth, K. (1944). *Ann. trop. Med.*, **38**, 213.

A SPECIFIC SEROLOGICAL TYPE OF BACT. COLI FOUND IN INFANTS' HOME IN ABSENCE OF EPIDEMIC DIARRHOEA

BY

A. M. M. PAYNE, M.D., M.R.C.P.

AND

G. T. COOK, M.D.

(From the Public Health Laboratory, Oxford)

During the past few years attention has been drawn to the association of a particular serological type of *Bact. coli* with outbreaks of infantile diarrhoea and vomiting and with intercurrent attacks in hospital wards (Bray, 1945; Bray and Beavan, 1948; Giles and Sangster, 1948; Giles *et al.*, 1949; Holzel *et al.*, 1949; Taylor *et al.*, 1949). The symptoms of cases excreting this organism have often been severe, and a number of outbreaks have shown a high mortality rate.

In contrast to the frequency with which these observers isolated the organism from infants with symptoms of gastro-enteritis, a very low incidence has been reported among control groups of symptomless children. These control observations to determine the incidence of the organism among healthy children have been carried out on single samples from hospital patients suffering from other conditions and from babies attending welfare clinics and in residential homes.

The present investigation developed from the isolation in a residential babies' home of a strain of *Bact. coli* reported by Dr. Joan Taylor as serologically identical with *Bact. coli* D 433 (Taylor *et. al.*, 1949), and the organism will be described as such in this paper. In view of the control observations made by previous workers on a single sample, it was decided to examine rectal swabs for *Bact. coli* D 433 from all babies in the home at frequent intervals for an extended period. Throughout this time, a period of one year, the clinical condition of the babies was kept under constant observation by one of us (A. M. M. P.).

The purpose of this paper is to give an account of the incidence of *Bact. coli* D 433 during this survey, and to relate its occurrence in babies to the presence of gastro-intestinal symptoms.

Previous Infection in the Home

The home is a private residential one with a training school for nursery nurses. It takes up to 18 infants at a time, the ages ranging from a week or two to 2 years. Most children are from a few weeks to a year old. They are usually admitted singly at an average rate of about one a week. The majority are admitted from the London boroughs, having been abandoned, for adoption, or because of the illness of the parents. Some are "private" residents admitted during the illness or absence of the parents. There is no distinction between the two groups in the home. The home is well run and the children are happy and well cared for. Almost all infants are bottle-fed.

In the winter of 1943–4 there was a sporadic outbreak of infantile diarrhoea and vomiting with five deaths spread over a period of four months. Ever since then there have been frequent attacks of diarrhoea with offensive motions, sore buttocks, vomiting, and loss of weight lasting about a week. Almost every child has been affected more or less, usually soon after admission and sometimes more than once. In June, 1948, two children (twins) were seriously ill, and this was the immediate cause of a request to this laboratory for assistance.

Present Investigation

The home was first visited on June 23, 1948. It was found that one infant (T. H.) was ill with diarrhoea and vomiting of moderate severity, and, since it appeared likely that she might need intravenous therapy, her admission was arranged to the Hospital for Sick Children, Great Ormond Street. Her twin sister (M. H.) was convalescent from a moderate attack of diarrhoea and vomiting. No other children had had significant symptoms during the previous month. Rectal swabs were taken on June 23 from all infants and from the three permanent staff. Including both T. H. and M. H., five out of sixteen infants were found to be excreting *Bact. coli* D 433. The organism was also isolated from T. H.'s vomit. None of the other three children had suggestive symptoms, but one of them (L. M.) developed symptoms on June 24 compatible with a mild attack of infantile diarrhoea and vomiting. The other two had no previous history suggestive of infantile diarrhoea and vomiting, and remained well. These four children were isolated, with separate staff and equipment. No further children were found to be excreting *Bact. coli* D 433 or had developed symptoms. Rectal swabs taken on July 5 showed that one of the two symptomless infants and M. H. were then free from the organism, and on July 15 all swabs were negative. On her return from hospital on July 24 a swab from T. H. was also negative.

Since then all infants have had rectal swabs examined for the presence of *Bact. coli* D 433 on admission and at intervals of two to four weeks up to the end of December, 1948. During January, 1949, few swabs were taken owing to shortage of agglutinating serum, but from February to June, 1949, swabs were taken from all children at intervals of one to two weeks. Records were kept of all gastro-intestinal symptoms. These varied from mild feeding difficulties to attacks of infantile diarrhoea and vomiting. The symptoms have been divided into two groups: (1) intestinal symptoms associated with feeding difficulties, and (2) infantile diarrhoea and vomiting. In some cases it was difficult to decide into which category the symptoms should be placed. The criteria adopted were as follows:

Feeding Difficulties.—A mild disturbance associated with fretfulness; colicky pains; slight looseness of the motions, not more than three or four daily, which might be tinged with green and contain curds or undigested fat with traces of slime; failure to gain weight, or the loss of up to about 4 oz. (113 g.); no temperature; excoriation of buttocks not prominent; no dehydration; responding in a few days to reduction in strength of feeds.

Infantile Diarrhoea and Vomiting.—A definite illness, usually of sudden onset, with frequent loose motions with or without slime, frequently green and offensive, and often associated with vomiting; loss of weight, usually more than 4 oz., with or without obvious dehydration; excoriation of the buttocks; reluctance to feed; some fretfulness when disturbed, but as a rule lethargy; temperature sometimes raised, especially at the onset; colicky pain not marked.

Diarrhoea associated with parenteral infection is excluded, but this did not occur in the presence of *Bact. coli* D 433.

Bacteriological Investigation

Since Bray (1945) first reported the occurrence of serologically homogeneous strains of *Bact. coli* var. *neapolitanum* among infants suffering from "summer diarrhoea" a varying nomenclature has been adopted by subsequent workers for the same serological strain of *Bact. coli*. The position has recently become more confused by the isolation of a new type of *Bact. coli*, also frequently associated with infants suffering from gastro-enteritis and called the β-type (Giles *et al.*, 1949; Smith, 1949). This type differs from the original or α-type antigenically and in certain of its cultural characteristics. Both types were also recognized among the cases studied by Holzel *et al.* (1949).

A summary of the names by which the α-type of *Bact. coli* has been previously described is given in Table I. A study of the literature reveals that all these strains are, in fact, antigenically identical (though different from the β-type), and they are the same as that described in this paper. It must be emphasized that the identity and similarity of the strains depend primarily on serological behaviour, though they can be regarded as a serologically homogeneous group of coliform organisms usually having the biochemical reactions ascribed to *Bact. coli* var. *neapolitanum*.

TABLE I.—*Nomenclature Used by Previous Authors for Strains of Bact. coli Serologically Identical*

Author	Nomenclature
Bray (1945)	*Bact. coli* var. *neapolitanum*
Bray and Beavan (1948)	
Giles and Sangster (1948)	*Bact. coli* (later referred to as α-type)
Giles *et al.* (1949)	
Holzel *et al.* (1949	*Bact. coli* var. *neapolitanum*
Rogers *et al.* (1949)	*Bact. coli* B.G.T. (Bray–Giles–Taylor)
Smith (1949)	*Bact. coli* α-type
Taylor *et al.* (1949)	*Bact. coli* D 433

Methods

During the period of 12 months that this investigation was being undertaken 337 rectal swabs from babies were examined. In the absence of symptoms, each swab was inoculated on to a layered horse-blood/digest-agar plate and a MacConkey plate, both of which were incubated aerobically at 37° C. Swabs from babies with symptoms of gastro-enteritis were also inoculated on to desoxycholate citrate agar and on to Wilson and Blair's medium, both directly and after enrichment in Kauffmann's tetrathionate broth and in selenite F. Non-lactose fermenters and suspicious colonies on Wilson and Blair's medium were further investigated.

The first five strains of *Bact. coli* D 433 isolated were identified from blood-agar plates sent to Dr. Taylor for investigation. The remaining strains were recognized in this laboratory as a result of slide agglutination of at least four colonies from the primary blood-agar or MacConkey plate. Except in two instances, when first isolated from a baby each positive strain was inoculated into a set of "sugars" and also sent to Dr. Taylor for serological confirmation. In subsequent isolations the identification of *Bact. coli* D 433 was made by slide agglutination only.

Results

Bact. coli D 433 was isolated from 40 of the 337 rectal swabs examined. It was often present on the primary blood plate as a practically pure growth, and in 24 of the 40 cases 75% or more of the colonies tested gave a positive agglutination result. The 40 positive swabs were obtained from 17 of the 60 babies investigated. Strains from 15 of these 17 babies were examined biochemically and showed similar reactions.

All these strains were non-motile when grown in broth at 37° C., were indole-positive, and failed to produce H_2S. All fermented lactose, glucose, mannitol, and maltose with acid and gas production after overnight incubation at 37° C. except one strain which did not ferment maltose till the third day. Fermentation of sucrose and salicin was usually delayed for 48 hours and fermentation of dulcitol for four days. Rarely sucrose, salicin, or dulcitol was not fermented. The strains were M.R.-positive, V.P.- and citrate-negative, and gave acid and gas in MacConkey broth at 44° C. All strains were agglutinated to titre by *Bact. coli* D 433 K and O sera. No member of the *Shigella* or *Salmonella* group was isolated from any of the babies with symptoms of gastro-enteritis.

Use of MacConkey Agar

During most of the course of this investigation MacConkey agar was used in parallel with blood agar. It was hoped that on those plates where *Bact. coli* D 433 formed only a small proportion of the total growth the colonies might be more readily recognized on MacConkey agar than on blood agar. It was found, however, that the relatively small colonies of *Bact. coli* D 433 were usually overgrown or suppressed by the heavier growth of other intestinal organisms.

There was reasonably good correlation between the results on blood agar and on MacConkey agar. Of 28 instances in which a positive result was obtained, both media were positive in 24, blood agar only in three, and MacConkey agar only in one. The blood-agar plate on this occasion was overgrown by a spreading *Proteus*. When a *Proteus* strain rendered the blood-agar plate unsuitable for examination, slide agglutination was done on colonies from the MacConkey plate.

In view of the occasional failure to isolate the organism from MacConkey agar when the blood agar was positive, it is possible that slightly better results might have been obtained by using chloral hydrate blood agar as an alternative medium. The proportion of blood-agar plates

contaminated by spreading *Proteus* strains was not large—24 out of 337. A few babies consistently produced *Proteus* organisms, and the 24 strains isolated were, in fact, all obtained from 12 of the 60 babies examined.

Epidemiological Findings

The epidemiological results are summarized in Tables II, III, IV, and V.

TABLE II.—*Incidence of Bact. coli D 433 Related to the Number of Examinations Made*

No. of Examinations per Infant	No. of Infants Examined	No. of Infants Excreting *Bact. coli* D 433 on One or More Occasions
1-2	23	0
3-11	25	6
12 and over	12	11
Total	60	17

TABLE III.—*Incidence of Bact. coli D 433 and Associated Symptoms Among 17 Babies in Age Groups*

Age in Weeks when *Bact. coli* D 433 First Isolated	Infantile Diarrhoea and Vomiting	Intestinal Symptoms Associated with Feeding Difficulties	No Symptoms	Total
0-5	0	0	2	2
6-11	2	1	2	5
12-23	3	0	5	8
24 and over ..	0	0	2	2
Total ..	5	1	11	17

TABLE IV.—*Duration of Excretion of Bact. coli D 433 and Associated Symptoms*

Duration of Excretion of *Bact. coli* D 433 in Weeks	Infantile Diarrhoea and Vomiting	Intestinal Symptoms Associated with Feeding Difficulties	No Symptoms	Total
0-2	1	0	6	7
3 and over ..	4	1	5	10
Total ..	5	1	11	17

TABLE V.—*Incidence of Bact. coli D 433, February–June, 1949*

	Date in Months and Weeks												
	Feb.		March					April		May			June
	3	4	1	2	3	4	5	2	4	1	3	4	1
No. of infants examined ..	14	15	15	15	13	14	17	15	15	16	16	15	17
No. of positive *Bact. coli* D 433 ..	4	6	8	7	2	1	0	0	1	0	4*	0	0
No. of new positives ..	4	2	3	1	0	0	0	0	1	0	1	0	0
No. of cases of infantile diarrhoea and vomiting	0	2	2	0	0	0	0	0	0	0	0	0	0
No. of new cases ..	0	2	0	0	0	0	0	0	0	0	0	0	0

* Three of these had been positive in February–March.

During the course of the investigation rectal swabs were examined from 60 infants, and it was found that 17 of these excreted *Bact. coli* D 433 on one or more occasions. The number of examinations made on each infant varied considerably, and Table II shows the association between this and the incidence of *Bact. coli* D 433. The organism was isolated from as many as 11 of the 12 infants examined on twelve or more occasions, but from none of the 23 infants examined once or twice only.

Symptoms of infantile diarrhoea and vomiting were observed among only 5 of the 17 infants with positive swabs and 11 infants had no symptoms at all while excreting *Bact. coli* D 433. Four of these 11 infants were under 3 months old (Table III) and five infants continued to excrete the organism for at least three weeks (Table IV). The frequency of symptoms among those infants who were not excreting *Bact. coli* D 433 at the time is not shown in the tables. In the course of the year six of these developed infantile diarrhoea and vomiting, and symptoms associated with feeding difficulties occurred on 13 occasions.

When *Bact. coli* D 433 was first recognized in the home in June, 1948, it was isolated from five babies. The organism was not detected in any of these babies after the beginning of July and, in fact, was not again isolated in the home until the third week of February, 1949. It then spread rapidly through the home, and during the next four weeks was isolated from 10 of the 15 infants at risk, though only two of these developed symptoms of infantile diarrhoea and vomiting (Table V).

Weight charts were kept for all infants throughout the year, and it was thought that irregularity of the charts might provide a more sensitive indication of the effect of carriage of *Bact. coli* D 433 than the presence of intestinal symptoms. It was found, however, that all 11 infants who did not develop symptoms while excreting *Bact. coli* D 433 continued to gain weight steadily.

Discussion

It can be seen from the findings of some previous observers (Table VI) that the incidence of this serological type of *Bact. coli* among the healthy infants forming the control groups is low. These control infants were taken from a number of different environments, and the results are based on single examinations of different infants.

TABLE VI.—*Relationship Between a Specific Serological Type of Bact. coli and Symptoms*

Reference	Infantile Diarrhoea and Vomiting		Diarrhoea—Unclassified, Doubtful, or Due to Other Causes†		Controls (Infants Only). No Gastro-Intestinal Symptoms	
	No. Examined	% Pos.	No. Examined	% Pos.	No. Examined	% Pos.
Bray (1945) ..	50	95	—	—	100*	4
Bray and Beavan (1948) ..	40	87·5	—	—	80*	4
Giles *et al.* (1949) ..	207	94·7	208	9	271*	2·6
Holzel *et al.* (1949) ..	79	63	—	—	—	—
Taylor *et al.* (1949) ..	54‡	96	52§	21	208¶	0

* Mainly hospital patients, including "healthy" contacts. † Includes groups A to E (*loc. cit.*). ‡ Includes groups F, G, and H (*loc. cit.*). § Infants in residential and day nurseries.

Recent findings by Smith (1949) and Rogers *et al.* (1949) cannot be tabulated in the same way, but both confirm the frequent association between a specific serological type of *Bact. coli* and infantile diarrhoea and vomiting. Smith also describes the occurrence of a different serological type of *Bact. coli*, known as type β, in cases of diarrhoea and vomiting. This type was not looked for in the present investigation. Rogers *et al.* (1949) found that 25 out of 86 infants excreting *Bact. coli* B.G.T. (see Table I) did not develop symptoms. The remaining 61 developed gastro-intestinal disturbances which varied from severe gastro-enteritis to a mild diarrhoea with or without vomiting. It is worthy of note that 82 of these infants acquired the organism after admission to hospital.

In the present investigation the infants were selected by the fact that they were in the home, and not because of any symptoms. Therefore the best estimate of the general incidence of *Bact. coli* D 433 must include all positive results irrespective of the presence of symptoms. Sixty babies were examined and 17 of them were found to be excreting *Bact. coli* D 433 on one or more occasions in the course of a year. It appears that the frequency of isolation of *Bact. coli* D 433 is related to the number of times the infants were examined (Table II). However, the relatively high incidence among babies examined on twelve or more occasions may equally well be due to the length of their stay in the same semi-closed community resulting in an increased risk of exposure.

In many intestinal infections some susceptible children may excrete the causative organism for a short period without developing symptoms. Prolonged excretion without symptoms is, however, unusual. In the course of this investigation five infants were found to be excreting *Bact. coli* D 433 in large numbers for three weeks or more and yet did not develop symptoms. One further infant had very mild symptoms due to feeding difficulties during a long period of excretion. The ages of these six infants at the time were 4, 8, 8, 12, 16, and 20 weeks. Adequate past histories were obtained for all these children and only one had had infantile diarrhoea and vomiting. She was under observation in the home at the time and was not excreting *Bact. coli* D. 433. Breast-feeding is widely accepted as affording a degree of protection from infantile diarrhoea and vomiting, but none of these six infants was breast-fed at the time of excreting the organism and four of them had never been breast-fed. Eleven infants developed infantile diarrhoea and vomiting during the year, but only five of them were excreting *Bact. coli* D 433.

These findings, and the fact that 11 of the 17 children excreting the organism did not develop symptoms at the time, do not support the hypothesis that there is an aetiological connexion between *Bact. coli* D 433 and infantile diarrhoea and vomiting, though they are compatible with such a theory. However, the figures of previous workers summarized in Table VI strongly suggest some such connexion unless an alternative explanation of the very high incidence among ill children is found. It has already been suggested that the incidence among healthy babies may be higher than earlier results have shown. The present methods of isolating the organism cannot be considered satisfactory, and in the absence of selective media it is probable that scanty infections might be missed.

In this survey the organism was not isolated from any infant for more than four weeks at a time. The strain then died out or was present in the faeces in insufficient numbers to be detected. In the latter case it is possible that the appearance of the organism in the home in May was not due to a fresh introduction from outside, but to its persistence in small numbers in the stools of one or two children. In this event some unknown factor may have caused rapid proliferation of the organism. The fact that three of the four babies excreting the organism in May are known to have previously excreted it in February and March might be regarded as supporting this suggestion. No evidence of the possible nature of this factor was found. It is not necessary for the stools to be loose for the organism to flourish. Further work is necessary to determine whether such a factor exists.

The part played by *Bact. coli* D 433 in the aetiology of infantile diarrhoea and vomiting remains uncertain, but it has been shown that an outbreak of infantile diarrhoea and vomiting did not follow the spread of the organism among a group of infants, the majority of whom were presumed to have been susceptible to the disease.

Summary

A clinical and bacteriological investigation of infants in a residential home was carried out for a period of one year. Sixty infants came under observation.

A specific serological type of *Bact. coli* identified as D 433 (Taylor *et al.*) was isolated from 17 infants on one or more occasions. Eleven of these infants had no symptoms, one had slight symptoms associated with feeding difficulties, and five had infantile diarrhoea and vomiting. Six infants developed infantile diarrhoea and vomiting in the absence of *Bact. coli* D 433.

At one time as many as 10 out of the 15 infants in the home were excreting *Bact. coli* D 433, but no outbreak of infantile diarrhoea and vomiting occurred.

The aetiological relationship between *Bact. coli* D 433 and infantile diarrhoea and vomiting is discussed.

We are indebted to Dr. Joan Taylor for identifying the first five strains of *Bact. coli* D 433 reported in this paper, for confirming the identity of strains isolated subsequently, and for the supply of agglutinating serum. Our thanks are due to the matron and staff of the home for their whole-hearted co-operation.

REFERENCES

Bray, J. (1945). *J. Path. Bact.*, **57**, 239.
—— and Beavan, T. E. D. (1948). Ibid., **60**, 395.
Giles, C., and Sangster, G. (1948). *J. Hyg., Camb.*, **46**, 1.
—— —— and Smith, J. (1949). *Arch. Dis. Childh.*, **24**, 45.
Holzel, A., Martyn, G., and Apter, L. (1949). *British Medical Journal*, **2**, 454.
Rogers, K. B., Koegler, S. J., and Gerrard, J. (1949). Ibid., **2**, 1501.
Smith, J. (1949). *J. Hyg., Camb.*, **47**, 221.
Taylor, Joan, Powell, B. W., and Wright, Joyce (1949). *British Medical Journal*, **2**, 117.

BACT. COLI D 433 IN CASES OF DIARRHOEA IN ADULTS

BY

JOHN S. STEVENSON, M.D.

Department of Bacteriology, Stobhill Hospital, Glasgow

Recent investigations concerning the causal factors of diarrhoea and vomiting in infants have indicated that the disease is very often associated with the presence in the intestine of a particular variety of *Bact. coli*. An organism of this nature (*Bact. coli* var. *neapolitanum*) was isolated by Bray (1945) from over 90% of cases of summer diarrhoea; Giles and Sangster (1948) isolated a similar organism from over 90% of cases occurring in an outbreak in 1947. Taylor *et al.* (1949) described the isolation of a non-motile variant of *Bact. coli*. (D 433) from a large number of cases occurring in eight outbreaks of infantile diarrhoea and vomiting, and identified this organism with that previously isolated by Giles and Sangster.

In order to investigate strains of *Bact. coli* encountered in this laboratory from cases of infantile diarrhoea and vomiting, D 433 antiserum was kindly supplied by Dr. Joan Taylor. At the time the investigation was begun, however (April, 1949), there were few cases of infantile gastro-enteritis, and it was decided in the first place to confine attention to adults and establish a routine method of procedure which could be used in the summer months if and when outbreaks developed.

Procedure

Specimens of faeces arriving at the laboratory for routine investigation were inoculated on to blood agar, MacConkey, and Difco "bacto S.S." agar. The plates were inoculated

by the usual stroke method and incubated overnight. The following morning two colonies of coliform organisms from each plate were picked off into peptone water and incubated at 37° C. for six hours—that is, six colonies from each specimen of faeces were isolated. From the peptone waters the routine sugar media and an agar slope were inoculated and incubated for 18 hours; the agar slope growths were then tested by slide-agglutination against D 433 antiserum.

In this way coliform organisms from the faeces of 72 adults were examined over a period of several weeks, and it was with some surprise that positive slide-agglutination reactions were obtained with two cases on the first day of the investigation. Further positives were encountered within a few days, and over a period of three weeks a total of 14 was reached. Brief details of these cases are set out in the Table. The 14 strains isolated were sent to Dr. Taylor for confirmation; all 14 were identified as *Bact. coli* D 433. No members of the *Salmonella* or *Shigella* groups were isolated from any of these patients.

Details of Cases

Case No.	Sex	Age	Clinical Notes	Diagnosis	D 433 Isolated	Contact with Children
1	F	25	Admitted 12/3/49. Diarrhoea 7 weeks' duration. Jaundice developed 6/4/49. Died 26/5/49	P.M. "Intestinal polyposis. Carcinoma of duodenum with secondary spread"	2/4/49	Not known
2	M	69	Admitted 15/3/49. Cough, haemoptysis, diarrhoea 3 weeks. X-ray showed gastric ulcer. Partial gastrectomy. Discharged 19/8/49	Gastric ulcer	2/4/49	None
3	F	72	Admitted 21/2/49. Jaundice. Diarrhoea developed in hospital. Discharged 1/6/49	Infective hepatitis	4/4/49	None (nor with other cases of this series)
4	F	53	Admitted 11/2/49. Diabetes and diarrhoea. Discharged 30/4/49. Readmitted 16/6/49. No diarrhoea. Discharged 12/7/49	Diabetes mellitus	4/4/49	Not known
5	F	30	Admitted 3/4/49. Pregnant. Diarrhoea. Slight bronchitis. Discharged at own request 9/4/49	Bronchitis	5/4/49	One child aged 4 years. Well
6	M	50	Indian seaman. Admitted 29/3/49. Pneumonia; jaundiced; slight diarrhoea. Discharged 11/5/49	Lobar pneumonia	5/4/49	None
7	F	12	Vomiting and diarrhoea for 24 hours. Temperature 104° F. (40° C.). Speedy recovery	Enteritis. ? food-poisoning	12/4/49	Not known
8	F	72	Admitted 23/3/49. Diabetes and diarrhoea, with severe colic. Discharged 1/7/49	Diabetes mellitus	13/4/49	None
9	M	42	Admitted 24/3/49. Diarrhoea for several weeks; blood and mucus for 6 days. Died 17/4/49	Ulcerative colitis (no necropsy)	13/4/49	2 children—6 and 8 years. Well
10	F	5	Admitted 10/4/49. Abdominal pain, diarrhoea, and vomitting. Discharged 7/5/49	Mild appendicitis	14/4/49	Not known
11	F	12	Admitted 4/4/49. Acute rheumatism with diarrhoea	Acute rheumatism	14/4/49	" "
12	F	59	Admitted 5/1/49. Diarrhoea with blood and mucus; rheumatoid arthritis. Discharged 7/6/49	Non-specific "dysentery"	18/4/49	None
13	F	43	Admitted 11/3/49. Asthma and severe diarrhoea for several days. Discharged 22/6/49	Asthma; colitis	18/4/49	Not known
14	F	23	Admitted 20/4/49. 28 weeks pregnant—vaginal bleeding. Diarrhoea 2 days. Slough of bowel passed 25/4/49	Pregnancy; colitis	21/4/49	2 children—3 and 2 years. Well

In this way coliform organisms from the faeces of 72 adults were examined over a period of several weeks, and it was with some surprise that positive slide-agglutination reactions were obtained with two cases on the first day of the investigation. Further positives were encountered within a few days, and over a period of three weeks a total of 14 was reached. Brief details of these cases are set out in the Table. The 14 strains isolated were sent to Dr. Taylor for confirmation; all 14 were identified as *Bact. coli* D 433. No members of the *Salmonella* or *Shigella* groups were isolated from any of these patients.

Further investigations were carried out during May, 1949, but no more instances of D 433 in adults were encountered. Pressure of work unfortunately made it impossible to continue the work during the summer months. During September and October over 60 more cases of adult diarrhoea were investigated, with negative results so far as the isolation of D 433 was concerned.

Discussion

These brief notes are not intended to be in any way the results of exhaustive research, but are presented merely to draw attention to a possible reservoir of *Bact. coli* D 433. It is difficult to assess the importance, if any, of the present findings, but it is thought that the following points may be of interest.

1. All the patients had diarrhoea. In some it was of trifling severity, but was marked in others. Several of the latter, notably Cases 1 and 9, were the seat of pathological processes which could explain the diarrhoea without the intervention of an infective agent.

2. Eleven of the patients were females. In such a small series it is to be doubted if much significance can be placed on this finding, but there remains the fact that women are in contact with young infants to a greater extent than men, and thus are more prone to infection from, or to infect, babies than are males.

3. Of three patients with jaundice, two had definite liver damage.

4. So far as could be ascertained, none of the patients had direct contact with young infants, and no cases of "gastro-enteritis" could be traced to their homes. In the series described by Taylor *et al.* (1949), D 433 was recovered from the faeces of 4 out of 84 adult contacts of infantile diarrhoea and vomiting. None of these four cases had suffered any intestinal upset.

While it cannot be stated that D 433 is a likely cause of the diarrhoea in even some of these 14 cases, it may be that the reverse is true—that is, that the washing-down effect of the diarrhoea caused the organism to be present in the faeces. This suggests the possibility that D 433 is a normal inhabitant of the adult duodenum or jejunum, and would to some extent explain the presence of the organism in cases of such diverse diagnoses.

I wish to thank Dr. Joan Taylor for her interest and help during this investigation; my thanks are also due to the medical superintendents of Stobhill and Southern General Hospitals, Glasgow, for permission to make use of the clinical details of the patients concerned.

REFERENCES

Bray, J. (1945). *J. Path. Bact.*, **57**, 239.
Giles, C., and Sangster, G. (1948). *J. Hyg., Camb.*, **46**, 1.
Taylor, J., Powell, B. W., and Wright, J. (1949). *British Medical Journal*, **2**, 117.

In recent years evidence has accumulated of the rapid external corrosion of cast-iron and spun-iron pipes used for water supply, especially those laid in clay subsoils containing sulphates. In view of the large number of bursts and premature replacement of mains which had resulted, the Minister of Health set up a Departmental Committee in December, 1948, to investigate the matter. This committee has now issued its *Interim Report of the Departmental Committee on the Deterioration of Cast Iron and Spun Iron Pipes* (H.M.S.O., 3s. 6d.). It covers the scientific and technical aspects of corrosion, deals with the extent of the problem and its implications, and suggests measures for protecting pipes in areas where the soil formation is known to be corrosive.

BONE-MARROW INFUSIONS: INTRATIBIAL AND INTRAVENOUS ROUTES COMPARED

BY

L. W. C. MASSEY, M.B., B.S.

From the Gastro-enteritis Unit, South-western Hospital

The bone marrow as an alternative to the venous route for injections and infusions in man was described by Henning (1940) in Germany and by Tocantins (1940) in the U.S.A. In this country the method was recommended by Barford (1943) and by Bailey (1944), and a suitable needle was devised for use in infants by Gimson (1944). Since then a large number of workers have used the method, and it was found that the intrasternal route was suitable for adults, though there was some danger of perforating the sternum, and the intratibial route for infants. Many cases of osteomyelitis were described as following bone-marrow infusions, and in a review of the literature up to 1945 Quilligan and Turkel (1946) concluded that the bone marrow should be used only as an "emergency" route for parenteral fluids.

In this country, however, Ellison (1944) and Gunz and Dean (1945) regarded the method as a satisfactory alternative to the intravenous route, while in the U.S.A. Elston *et al.* (1947) came to the same conclusion, stating that the incidence of complications is "very low."

Further favourable reports have come from Higgins *et al.* (1947), Sutton and Kelley (1947), Williams and Lockhart (1948), and Texter and Kaump (1948) in the U.S.A., Couder (1948) in France, and from Heinild *et al.* (1947) in Denmark after experience with nearly 1,000 infusions.

The reported series of bone-marrow infusions in the literature together with the incidence of osteomyelitis have been compiled in Table I.

TABLE I.—*Incidence of Osteomyelitis after Bone-marrow Infusions*

Author	Total in Series	No. of Cases of Osteomyelitis
Arbeiter and Greengard (1944)	35	0
Bailey (1944)	60+	0
Behr (1944)	60+	0
Bielstein (1944)	58	0
Clément *et al.* (1947)	65	3
Couder (1948)	100+	0
Ellison (1944)	130+	5
Elston *et al.* (1947)	112	0
Gunz and Dean (1945)*	35 -	1*
Heinild *et al.* (1947)	982	5
Higgins *et al.* (1947)	120	0
Meola (1944)	326	0
O'Neill *et al.* (1942)	116	0
Quilligan and Turkel (1946)	45	1
Romero Alvarez (1945)	77	0
Rooney (1944)	100	2
Sutton and Kelley (1947)	200	0
Texter and Kaump (1948)†	383	2†
Williams and Lockhart (1948)	138	1
Present series	72	1
	3,214	21

* Gunz and Dean refer to two further cases of osteomyelitis which they do not include in their series.

† Texter and Kaump gave more than one infusion through the same needle (325 punctures were made).

The small series have not been included—for example, 20 intrasternal blood transfusions without osteomyelitis reported by Giraud *et al.* (1945). A series of over 400 reported by Tocantins and O'Neill (1945), in which it is not made clear how many, if any, cases of osteomyelitis resulted, is also omitted.

Comparison of the Two Methods

Both intratibial and intravenous infusions have been used at this hospital for some years. In January, 1948, a ward for gastro-enteritis in infants was opened and both methods were used in the treatment of cases with clinical signs of dehydration. By June, 1948, 72 infusions of each kind had been successfully performed. The two series of infusions were comparable in that they were carried out by the same staff and on similar patients. Often the same patient would be treated by both methods.

The fluids used were Hartmann's solution, glucose-saline, "casydrol," diluted plasma, and blood. Our previous experience had shown that the latter two were not very satisfactory for intramedullary use, so that blood was always, and plasma usually, given intravenously. The fluids were delivered by the standard "drip" method, and in most cases the infusion was allowed to run for as long as possible.

Intratibial Series

Method.—Gimson's (1944) method was used: a local analgesic was infiltrated down to the periosteum at a point medial and below the tibial tubercle, a Gimson needle was pushed in through the cortex of the bone, a little marrow aspirated, and the needle attached to a continuous-drip apparatus. One infusion was omitted from the series because of insufficient data and 12 because there was failure to perform the bone puncture or the "drip" failed to run. These failures were in some instances due to the use of too short a needle and were unusual in the case of the more experienced operator.

Complications (Table II).—A mild periostitis was seen in all cases examined radiologically but caused no trouble. On three occasions some necrosis of the bone was seen on the film, described by Tocantins as "pressure necrosis," but this also required no treatment. One case of osteomyelitis occurred and was transferred to surgical care. The child was not operated on, and is reported to have been discharged cured. In another case regarded as a failure the shaft of the needle broke off while being inserted and was left embedded in the bone for five months with no ill effect. For some months after the infusion most cases were left with a little nodule in the skin adherent to the bone at the site of the puncture, as noted by Elston *et al.* (1947). A small slough at the site of the puncture was seen four times; this was due to pressure on the skin by the needle guard where too short a needle was used. Seven other cases showed a mild infection of the puncture wound.

TABLE II.—*Complications*

	Intratibial	Intravenous
Leaking connexions of the apparatus	3	4
Needle loose or dislodged	5	11
Local oedema	12	28
General oedema	4	8
Inflammation of wound or puncture	7	7
Endocarditis	0	1
Small slough at puncture site	4	Nil
Periostitis	1	"
Necrosis of bone and periostitis	3	"
Osteomyelitis	1	"
Thrombophlebitis	Nil	6
Abscess in track of vein	"	3

Intravenous Series

Method.—The saphenous vein at the ankle was usually employed; it was exposed by a small incision under local analgesia and a double needle of the Bateman type tied in. The lumen of the vein was frequently so small that only the fine inner needle could be used.

Omitted from the series were 17 instances in which there was failure to perform the attempted infusion or in which the "drip" failed to run.

Complications (Table II).—In most of the cases some degree of phlebitis could be detected clinically in that the vein was thickened and tender on palpation. This was thought to be a physiological response. Thrombophlebitis was manifested by signs of phlebitis extending along the

course of the vein accompanied by red, swollen, and tender areas of overlying skin. It occurred in six instances and subsided rapidly. A mild infection of the incision was found seven times.

Discussion

An examination of the records of the infusions showed that by the intratibial route an average of 40 oz. (1.14 litres) of fluid was given (Table III). The duration of the infusion

TABLE III

	Intratibial	Intravenous
Total fluid given in series	2,873 oz. (81·6 l.)	3,046 oz. (86·5 l.)
Average amount given	40 ,, (1·14 l.)	42 ,, (1·2 l.)
Average time	34 hours	42 hours

was anything from 12 hours to four or five days (average 34 hours). By the intravenous route an average of 42 oz. (1.2 litres) was given, and the duration of the infusion ranged from 12 hours to three or four days (average 42 hours). It also appeared that the maximal rate of flow of the intratibial "drip" was almost as good as that of the intravenous and quite adequate for infusions at the rate we required.

In none of the cases of intratibial or intravenous infusions were embolic or septicaemic complications noted, with the exception of one case in which the patient died after an intravenous infusion and in which "agonal endocarditis" was found at necropsy.

Local oedema occurred round the site of the intratibial needle in 12 cases and round the intravenous needle in 29 cases towards the end of the infusion. In the former the cause is probably due to fluid leaking back along the needle when it has been in the bone for some time and becomes loose, while in the latter it is probable that the needle is pushed through the vein while adjustments are being made to it or the baby is being moved for nursing purposes.

The intratibial needle is more firmly held in place than the intravenous needle and became loose in only five instances, while the latter was dislodged 11 times.

It would seem that the advantages of the intratibial method are "ease and speed in introducing the needle and its firm fixation" (Behr, 1944), while, on the other hand, the intravenous method is better for blood or plasma. It was also often found to be possible to deliver fluid at a faster rate by the intravenous route, though this was seldom required.

The disadvantage of the intratibial method is the occasional osteomyelitis, as compared with the complication of thrombophlebitis or abscesses in the track of the needle in the case of the intravenous method.

By improvements in technique and by removing the needle earlier it may be possible to reduce all these complications, and it should be noted that the reports in the literature indicate that the osteomyelitis is usually amenable to treatment, since it is provided with an artificial sinus by the needle puncture (Ellison, 1944).

However, it would be best to reserve the intramedullary infusion for those occasions when, for various reasons, the technical difficulties of the intravenous method are too great for the operator.

Summary

The literature on bone-marrow infusions is briefly mentioned and the incidence of the complication of osteomyelitis is assessed (approximately 1 in 150 cases).

Seventy-two intratibial infusions are compared with the same number of intravenous infusions.

One case of osteomyelitis is reported in the intratibial series, and the intratibial method is recommended as very satisfactory for the administration of the parenteral fluid in infants when difficulty is found with the intravenous method.

My thanks are due to Dr. J. C. Blake, physician-superintendent, for his advice and permission to use the hospital records, and to my colleagues for permitting me to include their cases in the infusion series. I wish also to thank the librarian of the Royal Society of Medicine, and Miss Helen Bayne, of the Library of the New York University, Bellevue Medical Centre, for assistance with the list of references.

REFERENCES

Arbeiter, H. I., and Greengard, J. (1944). *J. Pediat.*, **25**, 1.
Bailey, H. (1944). *British Medical Journal*, **1**, 181.
Barford, L. J. (1943). Ibid., **1**, 581.
Behr, G. (1944). *Lancet*, **2**, 472.
Bielstein, C. M. (1944). *J. Okla. med. Ass.*, **37**, 243.
Clément, R., Gerbeaux, J., and Bouveau, G. (1947). *Arch. franç. Pédiat.*, **4**, 531.
Couder, R. (1948). *Pr. méd.*, **56**, 4.
Ellison, J. B. (1944). *British Medical Journal*, **1**, 266.
Elston, J. T., Jaynes, R. V., Kaump, D. H., and Irwin, W. A. (1947). *Amer. J. clin. Path.*, **17**, 143.
Gimson, J. D. (1944). *British Medical Journal*, **1**, 748.
Giraud, G., and Desmonts, T. (1944–5). *Sang*, **16**, 437.
Gunz, F. W., and Dean, R. F. A. (1945). *British Medical Journal*, **1**, 220.
Heinild, S., Sondergaard, T., and Tudvad, F. (1947). *J. Pediat.*, **30**, 400.
Henning, N. (1940). *Med. Klinik*, **36**, 724.
Higgins, J. M., Motsay, D. S., and Bailey, J. F. (1947). *Guthrie clin. Bull.*, **17**, 15.
Meola, F. (1944). *J. Pediat.*, **25**, 13.
O'Neill, J. F., Tocantins, L. M., and Price, A. H. (1942). *N.C. med. J.*, **3**, 495.
Quilligan, J. J., and Turkel, H. (1946). *Amer. J. Dis. Child.*, **71**, 457.
Romero Alverez, A. M. (1945). *Sem. méd., B. Aires*, **2**, 609.
Rooney, E. F. (1944). *Arch. Pediat.*, **61**, 611.
Sutton, M., and Kelley, G. P. (1947). *N. Orleans med. surg. J.*, **100**, 266.
Texter, E. C., and Kaump, D. H. (1948). *J. Mich. med. Soc.*, **47**, 1002.
Tocantins, L. M. (1940). *Proc. Soc. exp. Biol., N.Y.*, **45**, 292.
—— and O'Neill, J. F. (1945). *Ann. Surg.*, **122**, 266.
Williams, J. C., and Lockhart, J. (1948). *Penn. med. J.*, **51**, 767.

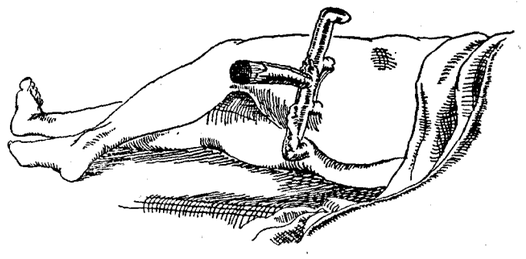
Medical Memoranda

Transfixion by a Muck Fork

Accidental transfixion by a muck fork or similar tined implement is not uncommon in country districts. The following case is reported in order to stress the importance of leaving the implement *in situ* until the patient reaches hospital.

CASE REPORT

The patient, a lad of 16, was admitted to the County Infirmary, Louth, at 6 p.m. on September 19, 1949. At 5 p.m. he had fallen off a lorry load of straw on to the



points of a muck fork. When seen just after admission he was lying on his right side with the business end of the fork transfixing him from behind forwards as in the accompanying drawing. The fork was thickly coated with manure. At the

suggestion of the doctor who was called to the accident, the wooden shaft had been sawn through just above the metal, for ease of transportation.

The upper tine had missed him but the three others had passed right across the buttocks and groins. The second in series entered the left buttock as shown, passed lateral to the femur, and lay with the point just under the skin of the front of the thigh. The third in series entered the posterior surface of the left buttock, passing medial to the femur, and emerged between femoral artery and vein, with the point pushing forward the overlying skin about 2 in. (5 cm.) without piercing it. The lowest tine passed deeply across the right thigh, medial to the femur, emerged momentarily in the right groin, entered the scrotum after ¼ in. (0.6 cm.), and appeared just below the pubic ramus, protruding through the skin at the base of the penis and apparently transfixing the urethra. There was no clinical evidence of sciatic-nerve involvement and the patient's general condition was good.

The four entry holes and the two exit holes were "ringed" with gentian violet for ease of identification. Catheterization revealed no blood and the urethra was assumed to be undamaged. Under general anaesthesia (Dr. Swallow) at 7 p.m. (that is, two hours after the accident) the fork was extracted—a strong pull being required. All the puncture wounds were excised within ellipses of skin as far as the deep fascia, and the tracks were enlarged slightly and generously powdered with sulphathiazole and penicillin powder; ¼-in. diameter drainage tubes with holes cut at ¼-in. (1.25-cm.) intervals all along were then put into most of the length of each track. The patient received 6,000 I.U. of tetanus antitoxin and 2 ml. of polyvalent gas-gangrene antitoxin pre-operatively. The tetanus antitoxin was repeated on the third day and the A.G.G.S. on the third and sixth days. He received 1 ml. of tetanus toxoid on the seventh day. Procaine penicillin, 600,000 I.U., was administered twice daily for seven days. The bacteriological report on the manure removed from the implement was as follows: "Culture—a proteolytic anaerobe morphologically typical of *Clostridium tetani* was cultured."

Convalescence was uninterrupted. The tubes were removed on the fourth post-operative day, and secondary closure of the wounds was made on the 15th day. The patient was discharged from hospital with all wounds healed on the 36th day.

Not a single drop of blood escaped until the fork was withdrawn, when the entry holes bled briskly. If a tine had entered the femoral artery or other large vessel, premature withdrawal would have complicated the issue by probably producing internal haemorrhage. Had some well-intentioned person removed the fork before admission to hospital the difficulties of visualizing each track and its relation to important structures would have been greatly increased.

My thanks are due to Mr. N. J. Nicholson, consulting surgeon to this hospital, for permission to publish this case and for advice; to Dr. W. J. Mozdzierz for his assistance; and to Nurse Pope for the drawing.

CHRISTOPHER CUMMINS, F.R.C.S.Ed.,
Surgical Registrar, County Infirmary, Louth, Lincs.

Chronic Myeloid Leukaemia and Pregnancy

The association between chronic myeloid leukaemia and pregnancy is rare. McGoldrick and Lapp (1943), in an exhaustive review of world literature (94 references), could find only 41 substantiated cases for statistical use. They quote a maternal mortality of 36.5% and a foetal mortality of 16.4%. Li, McBride, and Mettier (1947) recorded four cases and Williams (1948) a further seven cases, with a maternal mortality of *nil*, bringing the total up to date, of this variety of leukaemia, to 52.

CASE REPORT

A woman aged 25 was first seen at hospital on June 23, 1947, complaining of swellings of the legs. On examination these swellings were seen to be subcutaneous haemorrhages and the spleen was found to be enlarged, extending for 10 in. (25 cm.) below the xiphisternum. The blood count was: haemoglobin, 67%; red cells, 3,200,000; colour index, 1.04; platelets, 84,000; white cells, 188,800. The diagnosis of chronic myeloid leukaemia was established. She was admitted to hospital and treatment with urethane was begun. During the remainder of 1947 and 1948 she continued to work, and the white cell count was kept under control with urethane.

On November 9, 1948, her blood count showed the haemoglobin to be 72% and the red cells 2,950,000, but the white cells had risen to 202,000. She was referred to the radiotherapy department for *x*-ray treatment of the spleen, which reached to the iliac crest and almost to the midline. From December 15 to January 19, 1949, a total of 900 r to the skin over the spleen was given, reducing the white count to 6,800. The blood count on April 25, 1949, was: haemoglobin, 62%; white cells, 8,200.

On July 8 she was referred for a gynaecological opinion as she had noticed a swelling of the lower abdomen; she was otherwise symptom-free and was at work in a factory. On examination the uterus was found to be the size of a 28-weeks pregnancy and the foetal heart could be heard; the spleen was palpable, extending for 4 in. (10 cm.) below the costal margin. The patient, still unmarried, did not know she was pregnant and could only give the date of her last menstrual period as some time in January. The blood count on July 11 was: haemoglobin, 60%; red cells, 3,620,000; white cells, 33,200. No myeloblasts were seen.

On September 19, with a normal delivery, she gave birth to a living female infant weighing 6 lb. 12 oz. (3.1 kg.). The placenta was expelled with a total blood loss of only 8 oz. (230 ml.). The placenta contained numerous infarcts. The infant, which appeared to be a full-term child, had a spina bifida and myelocele extending for 3 in. (7.5 cm.) over the lumbar region associated with a spastic paraplegia. The infant's blood count was: haemoglobin, 128%; red cells, 6,350,000; white cells, 10,400 (polymorphs 60%, lymphocytes 30%, monocytes 10%). The baby died on September 26.

Post-mortem Report (Dr. A. J. McCall).—The body was that of a female infant apparently full-term with a swelling over the sacrum about 2 by 3 in. (5 by 7.5 cm.) in diameter. The skull was normal except for an unusually large gap between the two frontal bones. There was intense engorgement of the leptomeninges, and the cerebrospinal fluid in the ventricles was obviously purulent. Examination of the pus revealed numerous *Bacterium coli*. The lungs were congested and oedematous. There was a defect in the lower lumbar and sacral vertebrae due to spina bifida. The skin over the swelling had not ulcerated but the cavity contained pus. Histological sections from the lung, kidney, suprarenals, liver, spleen, and one rib showed no evidence of leukaemia. Death was due to *Bact. coli* meningitis from infection of a spina bifida.

The puerperium was uneventful and involution satisfactory. The mother's blood count on September 21 was: haemoglobin, 54%; red cells, 3,840,000; white cells, 74,000. On September 27 it was: haemoglobin, 62%; red cells, 3,410,000; white cells, 110,000. Moderate hypochromasia, anocytosis, and poikilocytosis were present. There were over 600 normoblasts for every million red cells, and rare myelobasts were found. She remained symptom-free and returned to work.

L. M. EDWARDS, M.D., M.R.C.O.G.,
H. D. FREETH, M.R.C.O.G.,
North Staffordshire Royal Infirmary.

REFERENCES

Li, J. G., McBride, A., and Mettier, S. R. (1947). *Blood*, **2**, 592.
McGoldrick, J. L., and Lapp, W. A. (1943). *Amer. J. Obstet. Gynec.*, **46**, 711.
Williams, J. A. (1948). Ibid., **55**, 967.

Reviews

MODERN DERMATOLOGY

Modern Practice in Dermatology, 1950. Edited by G. B. Mitchell-Heggs, O.B.E., M.D., F.R.C.P. (Pp. 836, with 319 figures and 7 colour plates. £3 3s.) London: Butterworth and Co. (Publishers), Ltd.

This imposing volume has been planned to meet the needs of general practitioners, medical officers in the Services, and medical advisers to commercial organizations. Not only does it fulfil satisfactorily the purpose for which it was designed, but it can be recommended to senior students who want to possess a conspectus of dermatology. There are fifty chapters, most of them written by different authors. Three are on maladies which are of paramount importance in tropical countries, so the work will have a wider appeal than most books which emanate from the temperate zone. The editor has introduced certain innovations which are likely to influence the planning of other textbooks, for he has included chapters on disorders of the skin with ocular involvement, cutaneous manifestations of general diseases, pharmacy, social aspects of dermatology, and psychosomatic disorders—matters which hitherto have not been given much space in the average standard work on skin diseases.

In reviewing a book to which so many have contributed it would be invidious to select certain chapters for commendation and others for dispraise, but—as is inevitable—some are considerably better than others; nevertheless, only a few fall below a high level of merit. Most of the distinguished contributors have loyally obeyed the editor's injunction to keep "small-print information" to a minimum, and most have succeeded in the difficult task of keeping their contributions at the correct standard for most of their readers.

The publishers are to be congratulated on the lay-out, the generous use of expensive paper, and on the excellence of reproduction of the many illustrations. This is a notable contribution to British dermatological literature

R. M. B. MACKENNA.

CROHN'S DISEASE

Regional Ileitis. By Burrill B. Crohn, M.D. (Pp. 229; illustrated. £1 10s.) London: Staples Press. 1949.

A few months ago a reviewer in these columns admitted a penchant for monographs. He can be recommended to include this book in his collection. It is seldom that such an authoritative work appears, and rarer still for an author to display the modesty which prevents Dr. Crohn from mentioning that the complaint in question is universally known as Crohn's disease.

The author reports an analysis of 298 private cases which he had treated himself and whose course he has followed during the past 18 years. Of these, 222 were examples of chronic regional ileitis, 16 of acute ileitis, 38 of ileojejunitis, and 22 of ileitis combined with disease of some part of the large bowel. Because it is more common, the first group has the greatest interest. The aetiology, pathology, and clinical picture are considered in great detail and reviewed in the light of the many relevant publications. He insists on the necessity for surgical treatment, strongly favouring ileo-colostomy with exclusion. In the hands of his colleagues at the Mount Sinai Hospital, New York, this procedure has carried no operative mortality, and has had a lower rate of recurrence than any other operation.

Acute regional ileitis, he believes, is related to the chronic form, but as there is a strong tendency to spontaneous resolution he regards operation as inadvisable. The book ends with chapters on ileo-jejunitis and ileo-colitis in which the difficulties of treatment are fully discussed.

The volume is patently the fruit of many years' patient and careful study of this group of diseases; it is balanced and exhaustive, as well as authoritative; and it will be an essential addition to the library of the physician interested in gastro-enterology.

R. BODLEY SCOTT.

RADIOGRAPHIC TECHNIQUE

Atlas of Roentgenographic Positions. By V. Merrill. Volumes 1 and 2. (Pp. 664; fully illustrated. £7 10s.) London: Henry Kimpton.

Miss Vinita Merrill has written an elaborate work—in two large volumes—on radiographic technique, designed as a practical reference book for radiographers. It will be found of great value in the *x*-ray room, since the technique of *x*-raying patients is described in minute detail. Indeed, the main criticism in this respect is that too many methods for each examination are given—an *embarras de richesses* that may confuse the less-experienced radiographer. In a future edition—and one will surely be called for—a division of these methods into two classes, standard and special, would increase the value of the work.

The price will probably place this publication beyond the reach of most radiographers, but it is to be commended to hospitals for use in their *x*-ray departments.

S. COCHRANE SHANKS.

SCHISTOSOMIASIS

Schistosomiasis in South Central Africa. A Clinico-Pathological Study. By Michael Gelfand, M.D., M.R.C.P. (Pp. 240; illustrated. £1 5s.) Capetown and Johannesburg: Juta and Co. London: H. K. Lewis and Co. 1950.

This book is a thesis which has justly been accepted for a higher medical degree. Careful editing before publication would have reduced its length and might have increased its value. It is based on an extensive pathological and clinical experience in Salisbury, Southern Rhodesia. After an introductory chapter, which includes brief historical and biological summaries, the author considers the incidence of schistosomiasis and calls attention to the much more frequent finding of ova after the digestion of organs obtained at necropsy than from examination of excreta during life.

He then discusses urinary schistosomiasis and finds that in Africans urinary symptoms are often absent. Sandy patches were the most frequent lesion. He emphasizes the value in diagnosis of small fragments of mucosa snipped from the bladder or rectum when other examinations are negative. Unless albumin and red cells are present in the urine, it is unlikely that ova will be found in that specimen. Vesical calculus was rare. Calcification of the bladder was found in 17% of adult Africans with *S. haematobium* in the urine. Lesions of the ureters were present in about a third of the cases with bladder lesions. From a general consideration of the incidence of bladder cancer in Europeans and in Africans in areas infected with and free from schistosomiasis he suggests that there is need for further evidence on the causal relationship of the infestation to the malignancy.

Intestinal schistosomiasis is next considered. In many cases no lesions are visible through the sigmoidoscope. The examination of rectal snips for ova is of value in diagnosis. From his findings schistosomiasis of rectum or colon does not appear to predispose to malignant disease, appendicitis, portal cirrhosis, or primary cancer of the liver. Chapters, each a short article in itself, are devoted to schistosomiasis of lungs, liver, pancreas, gall-bladder, brain, spinal cord, and female genitalia, and also to diagnostic aids. He regards the cercarial antigen skin test as a diagnostic aid which cannot replace the finding of ova. In well-developed infections the eosinophils in the blood were less than 4% in over half the cases.

This book will be of value for the clinical and pathological material to all interested in schistosomiasis and to all medical practitioners over a wide area of Africa.

C. J. HACKETT.

STRUCTURE OF BACTERIA

The Cytology and Life-History of Bacteria. By K. A. Bisset, Ph.D. (Pp. 136; illustrated. 18s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

The average medical bacteriologist knows little about the minute structure of bacteria beyond the fact that some possess capsules, spores, or flagella. The granules in diphtheria bacilli are of interest to him only as an aid to identification. It is to this end only that his staining methods are adapted, but other methods have now been introduced by bacterial cytologists which reveal the existence of a cell wall, cell membrane, division into septa, and nuclei. It has been shown that reproduction may be sexual, at least in the sense that cells within a rod-shaped organism undergo fusion in the course of it. The appearances of colonies can be explained in terms of the structure of the cells composing them. Of these and other related matters this book is a simple, straightforward, and authoritative account, well illustrated by line drawings and photographs. The author suggests that on a morphological basis the classification of bacteria requires radical alteration and simplification.

L. P. GARROD.

A PAEDIATRIC SYNOPSIS

The Compleat Pediatrician. Practical, Diagnostic, Therapeutic, and Preventive Pediatrics. By Wilburt C. Davison, M.A., D.Sc., LL.D., M.D. Sixth edition. (Pp. 256. £1 18s.) Durham, N.C.: Duke University Press. London: Cambridge University Press. 1949.

For those who do not know *The Compleat Pediatrician* by Professor W. C. Davison, now appearing in a sixth edition, it is necessary to explain that this is a remarkable reference book resembling, as the author remarks, a telephone book or a mail-order catalogue. It began as a notebook of easily forgotten facts and methods during a vintage period at the Johns Hopkins Hospital and it now is based upon nearly 20,000 authoritative articles. Essentially this is a skilfully cross-referenced synopsis. A typical entry describes the disease, lists the causes, and then summarizes laboratory investigations, treatment, prognosis, and prevention. It is necessarily dogmatic, although its very completeness tends to eliminate any personal prejudices. Many who have at first recoiled from such a volume have come to use it frequently. Casting for a fish is always rewarded (provided the index and the other devices are intelligently used), but any resemblance to Izaak Walton's classic is limited to one-third of the title.

ALAN MONCRIEFF.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Radiographic Atlas of Skeletal Development of the Hand and Wrist. By W. W. Greulich, M.A., Ph.D., and S. I. Pyle, M.S. (Pp. 190. 80s.) London: Geoffrey Cumberlege. 1950.

A Pocket Obstetrics. By A. C. H. Bell, M.B., B.S., F.R.C.S., F.R.C.O.G. 2nd ed. (Pp. 156. 7s. 6d.) London: J. and A. Churchill. 1950.

Recent Advances in Pharmacology. By J. M. Robson, M.D., D.Sc., F.R.S.Ed., and C. A. Keele, M.D., F.R.C.P. (Pp. 418. 24s.) London: J. and A. Churchill. 1950.

Disorders of the Blood. By Sir Lionel Whitby, C.V.O., M.C., M.A., M.D., F.R.C.P., D.P.H., and C. J. C. Britton, M.D. 6th ed. (Pp. 759. 42s.) London: J. and A. Churchill. 1950.

Autobiography of a Yogi. By P. Yogananda. (Pp. 403. 21s.) London: Rider. 1950.

Handbook for the Identification of British Insects. By R. L. Coe and others. Vol. 9. Part 2. (Pp. 216. 20s.) London: Royal Entomological Society of London. 1950.

Human Growth. By L. F. Beck, Ph.D. (Pp. 124. 6s.) London: Victor Gollancz. 1950.

Dental Mechanics for Students. By J. Osborne, Ph.D., M.D.S., F.D.S. 3rd ed. (Pp. 400. 30s.) London: Staples Press. 1950.

Seventy-five Vegetarian Savouries. By Ivan Baker. (Pp. 46. 1s.) Manchester: The Vegetarian Society. 1949.

An Introduction to Medical Photography. By J. Hunt, S.R.N., S.R.C.N., F.I.B.P., F.R.P.S.(Medical). (Pp. 243. 30s.) London: Staples Press. 1950.

A Medical Handbook for Athletic and Football Club Trainers. By W. D. Jarvis. (Pp. 144. 10s. 6d.) London: Faber and Faber. 1950.

Verruca Pedis: Methods of Treatment. By P. J. Read, F.Ch.S. (Pp. 44. 3s. 6d.) London: The Actinic Press. 1950.

The Proper Study of Mankind. By S. Chase. (Pp. 288. 16s.) London: Phoenix House. 1950.

Hypnotism and Self-Hypnosis. By R. Slater. (Pp. 80. 5s. cardboard cover, 7s. 6d. cloth cover.) London: Gerald Duckworth. 1950.

Aids to Psychiatry. By W. S. Dawson, M.A., D.M., F.R.C.P., F.R.A.C.P., D.P.M. 6th ed. (Pp. 329. 6s.) London: Baillière, Tindall and Cox. 1950.

Aids to Surgical Anatomy. By J. S. Baxter, M.D., M.Sc., F.R.C.S.I. 3rd ed. (Pp. 203. 5s.) London: Baillière, Tindall and Cox. 1950.

Sir William Macewen's Contribution to Neuro-Surgery and its Sequels. By Geoffrey Jefferson, C.B.E., F.R.S., F.R.C.S. (Pp. 36. 3s. 6d.) Glasgow: Jackson. 1950.

Atlas of Drawings for Chordate Anatomy. By S. Eddy. (Pp. 189. 28s.) London: Chapman and Hall. New York: John Wiley. 1950.

The Merck Manual of Diagnosis and Therapy. 8th ed. (Pp. 1,592. $5.) New Jersey: Merck. 1950.

Die Hauttuberkulose und ihre Therapie. By G. Riehl and O. Köpf. (Pp. 202. M. 18.) Vienna: Wilhelm Maudrich. 1950.

Die epidemische Kinderlähmung und ihre Behandlung mit hohen Dosen Pyramidon. By H. Deuretsbacher. Vol. 2. (Pp. 95. M. 10.) Vienna: Wilhelm Maudrich. 1950.

Die Gewebsmastzellen im menschlichen Knochenmark. By P. Bremy. (Pp. 78. M. 7.20.) Stuttgart: Georg Thieme. 1950.

Die Funktionen der gesunden und kranken Niere. By E. Frey and J. Frey. (Pp. 168. M. 19.60.) Berlin: Springer. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JULY 22 1950

THE PRESIDENTIAL ADDRESS

The local habitation of the British Medical Association is London, but the meeting of its general assembly, the Representative Meeting, is held each year not in London but in different places in Britain. This is a constant reminder of the fact that it was in the provinces that the B.M.A. had its birth. There is virtue in this, and still more in the custom that the place of the meeting should, out of its medical population, provide a President for the coming year. Last year the Liverpool Division put forward the name of Professor T. P. McMurray as President-Elect—a fitting choice because of the great contributions of the Liverpool School of Medicine to orthopaedic surgery. After the widely regretted death of Professor McMurray, the Liverpool Division was happily able to call upon one of our most distinguished physicians to fill the gap thus unhappily made. Accepting this new obligation towards an Association for which he has already done so much, Sir Henry Cohen has quickly shown himself to be a worthy successor to many notable forerunners, and not least in the admirably phrased and thoughtful address which he delivered at the Adjourned Annual General Meeting on Tuesday of this week. It is printed in the opening pages of this issue.

Sir Henry Cohen, in taking stock of the first 50 years of this century, sees Medicine subjected to two major influences: first, the expansion of knowledge and technical skills in the basic sciences; secondly, the evolution of ideas of social responsibility. There is a certain paradox in Sir Henry's view that the latter was coincident with the "all-but" engulfing of the humanism of medicine by discoveries in science. The increasing application of techniques in Medicine accelerated the growth of specialism, with its appeal to those unfortunate enough to possess what Sir Henry calls the "penny-in-the-slot type of mind." This has to some extent led to a neglect by doctors of the patient as a whole person. Too often the patient has been looked upon as a parcel of the results of special investigation, and in this strange and unnatural metamorphosis has been so presented to the student. But for the doctor as for the poet the proper study of mankind is man, and the medical mind, distracted from its holistic approach to the individual, has, by way of compensation, sought a wider synthesis in a study of the impact of the environment on the individual and of the effect of individuals upon each other. This has found its expression in the somewhat ill-defined concept of "social medicine," more succinctly described by Cambridge as human oecology. It is possible to see in Sir Henry's approach to his theme a protest against the replacement of the consultant by the specialist. The posterior triangle of the neck and the mediastinum seem, indeed, to be the only parts of the body which have not as yet a corps of specialists devoted to them. But just as the hand lens has had to make way for the electron microscope, so too has the general physician to yield in part to the specialist. It would be foolish to ignore the benefits and discoveries of specialism. The danger lies in the slavish use of the instrument and the neglect of method. The more the doctor allows "special investigations" to come between him and the clinical examination of the patient the more will he cease to be a practical exponent of his craft. What is needed in Medicine to-day is a return of the general consultant, to adjust the balance against the atomization of medical practice into an ever-increasing series of small specialties.

One effect of specialization is that it has become difficult for anyone to be appointed to the staff of a teaching hospital unless he has devoted himself to the study of one of the "-ologies." It is not surprising, therefore, to hear the complaint of examiners that students at their final examination will display the latest knowledge of electrocardiography but be unable to make a clinical diagnosis of mitral stenosis. It is in the teaching hospitals that the influence of the general consultant is most needed and now least manifest. Sir Henry Cohen has been chairman of two B.M.A. committees whose published reports on medical education have come as an inspiration to those who have read them. As he says in his presidential address: "Medical research, practice, and education are closely interrelated." And he summarizes the aims of student education in this memorable sentence: "The student is to be trained in reading the map of medicine, but the scale should be three miles and not three yards to the inch." It is significant that after surveying some of the outstanding results of 50 eventful years of medical progress Sir Henry should concentrate his attention on medical education. It has not kept pace with medical research and practice. Medical research has caused a revolution in medical practice, but there has been no corresponding revolution in medical education. Here, if anywhere, is the need for experiment, for innovation—and for the teacher who can inspire his students with something other than the mere aim of passing the next examination. Sir Henry applies to the teaching of medicine the observations made in 1907 by Asquith on the teaching of history: "The mind of the student . . . is indeed in danger . . . of becoming a kind of pantechnicon, in which every sort of furniture is heaped and packed together, instead of being a habitable home where things useful and beautiful are arranged in their proper places, and in due relation to their special purposes." Medical students should be taught to observe and to think; too often they are encouraged to do neither.

Sir Henry Cohen has avowedly eschewed medical politics in his presidential address. But in referring to the influence on Medicine of the growing awareness of social responsibility he puts this question: "Is it then surprising that, since the practice of medicine reflects the social philosophy of its time, there should have grown with the years an increasing demand for social security which culminated in that National Health Service Act which will influence, for good or evil, all our lives, be we doctors or patients?" It is indeed necessary to see the National Health Service in the perspective of the social evolution of the past hundred and more years. Sir Henry sounds the one warning note that is needed when he says that in the Service "there is a real, and . . . increasing, danger of rigidity and inflexibility. . . ." But, as his presidential address shows, we have men in our profession whose power of intellect and force of character are the safeguards against this. Under his presidency the B.M.A. may, during the coming year, face the problems it has to tackle with confidence that it will be helped by someone who will bring to bear on them a mind that is constructive and fully possessed of the highest ideals of an ancient profession.

STUDIES ON STREPTOMYCIN THERAPY

The body is not a test-tube, and, though the laboratory's aid is essential in assessing the action of antibiotics, the results of laboratory tests in relatively simplified conditions should not be applied too rigidly to disease. Jensen,[1] for instance, has pointed out how the tissues may influence the action of streptomycin in tuberculosis. For some years he and his colleagues have been studying tuberculosis in guinea-pigs infected by inhalation of bacilli, and they have now applied this technique to the study of the action of streptomycin. A number of guinea-pigs were infected in this way and a group of them was treated with streptomycin. Two treated and two control animals were killed at intervals and counts were made of the numbers of tubercle bacilli in the tissues (such quantitative studies have proved difficult in the past,[2] and it is unfortunate that no details of technique are given in this paper). It was found that up to the thirteenth day after infection the bacilli seemed to be multiplying at the same rate in the treated and in the control groups. This corresponded to the pre-allergic phase. After the thirteenth day, when the animals had become allergic, the counts continued to rise in the control group, but in the treated group the number remained steady for a few days and then fell. In some animals treatment was stopped after six weeks. For 28–38 days after this there was little change in the counts; then the bacilli began to multiply rapidly.

In the pre-allergic phase mononuclear cells crowded with tubercle bacilli were found on histological examination in both treated and control groups. At the beginning of the allergic phase nodules appeared in the lungs of the control animals, with extensive inflammatory changes around numerous tubercle bacilli scattered throughout the nodules. Similar changes were noted in the treated animals, except that the tubercle bacilli were confined to a few large mononuclear cells in the centre of the nodules. A little later abscesses appeared in the centre of the nodules in the controls, and innumerable tubercle bacilli were seen. In the treated animals a few leucocytes were seen but no abscess formation, and there was great destruction of tubercle bacilli. Jensen points out that at the time when the animals became allergic there were as many tubercle bacilli in the treated as in the control animals, but that the histological changes differed: those in the treated guinea-pigs resembled the reactions to infection of animals previously immunized with B.C.G. With continued treatment the tendency was at first towards productive lesions and later towards regression, though even after 180 days occasional tubercle bacilli could still be detected. If treatment was stopped after six weeks little change was noted at first, but after three weeks or so there was a slight increase in the numbers of tubercle bacilli and a tendency to abscess formation. After this the pathological changes progressed more rapidly than the bacilli increased. Jensen emphasizes the divergence between the numbers of bacilli and the histological appearances, and he suggests that streptomycin may specifically inhibit the formation by tubercle bacilli of a toxin which causes necrosis. Alternatively, streptomycin may have a specific anti-allergic effect: guinea-pigs under treatment became less sensitive to tuberculin, although a significant number of bacilli were still demonstrable.

A third possibility might be suggested. Eagle[3] has shown that bacteria exposed to penicillin lose their virulence temporarily and become more susceptible to the defences of the host. It is reasonable to suppose that these temporarily attenuated organisms may act as powerful immunizing agents. Such an immunizing effect is suggested by some of the experiments of Schmidt and

[1] *Acta tuberc. scand., Suppl.* XXI, 1949, 42.
[2] Rich, A. R., *The Pathogenesis of Tuberculosis*, 1944, Springfield, p. 453.
[3] *J. clin. Invest.*, 1949, **28**, 832.
[4] *J. Pharmacol.*, 1949, **96**, 258.
[5] Barski, G., *Ann. Inst. Pasteur*, 1948, **74**, 1.

his colleagues[4] with differing penicillin dosage schemes. Other observations of Jensen support this view. He found that, after allergy had developed, the histological appearances in the treated animals resembled those in animals immunized with B.C.G. and later infected with virulent tubercle bacilli. When immunized guinea-pigs so infected were treated with streptomycin there was much less initial multiplication of the bacilli than in unimmunized animals. But it may be that in unimmunized animals in the pre-allergic phase streptomycin fails to prevent the multiplication of tubercle bacilli not because the drug requires the supporting action of immune processes but because it does not reach the bacilli. Bacillary multiplication in this phase is intracellular, and there is some evidence from studies in tissue culture that streptomycin does not penetrate the cells, or at any rate does not affect tubercle bacilli within them.[5] Thus in the earlier stages of streptomycin treatment the differences between the bacillary counts in the animals immunized with B.C.G. and in those unimmunized would be due solely to the immune processes in the former; the inhibitory action of streptomycin would become apparent only when the bacilli had burst out of the cells. These experiments are an indication of the complexity of chemotherapy in tuberculosis.

SYRINGE STERILITY

During the past 20 years there has been an enormous increase in the number of doses of drugs and other materials given by injection. From time to time what should be an aseptic injection conveys infection, which is usually pyogenic, but others so conveyed have been gas gangrene, epidemic hepatitis, and even tuberculosis. Most of the graver accidents on record have been due to gross failures in technique, but others have been attributable to methods of sterilization in common use; inherent in these there is a slight risk, of which such accidents are examples. Such a method is the use of spirit, which will not in fact sterilize a contaminated syringe and may indeed itself contain living sporogenous bacteria. These facts led the Medical Research Council during the war to appoint a committee to consider methods of syringe sterilization, and their report[1] is now recognized as the authoritative guide in this matter, though it has not been accepted altogether without criticism. This has been of two kinds: most critics complain that the methods advocated, although ideal, are impracticable in some circumstances, but a commission of the Swiss Society of Surgery, whose conclusions were reported by Baumann,[2] regard the precautions suggested as not stringent enough. These two opposite views may not perhaps cancel each other, but they suggest that the report is at least a reasonable compromise.

Several pages of the M.R.C. report deal with mass inoculation technique—i.e., the procedure to be followed when large numbers of persons are given injections of the same material, such as a toxoid or vaccine. There is clearly some risk in using the same needle and syringe for a series of injections, but it has usually been considered perfectly safe to use the same syringe if a fresh needle is fitted to it for each injection, and this is the method described in the report. Some doubt was first cast on the safety of this method by the observations of Hughes[3] in this *Journal*, who found red blood cells in the fluid in the nozzles of syringes when the needle was removed after an intramuscular injection. By counting these cells after injections made in different conditions, Hughes concluded that the pressure produced, especially by a rapid injection into contracted muscle, may force a little fluid back into the nozzle of the syringe. No suggestion is offered in his paper that any other mechanism may be concerned. That a syringe may be so contaminated is confirmed by the observations, published in this issue, of Dr. R. J. Evans and Professor E. T. C. Spooner; in an ingenious series of experiments they have proved that the reflux of fluid has another, perhaps more obvious, and certainly more inevitable, cause. Having first imitated the conditions of Hughes's experiments by injecting against pressure, they eliminated this factor and the possible one of plunger movement and found that bacteria in the tip of the needle were still made to enter the syringe nozzle by the mere act of removing the needle. It is thus fairly evident that the negative pressure induced as the needle is detached causes fluid to traverse the entire length of the lumen, which has a very small cubic capacity relative to the space behind it. There seems to be no way of avoiding this if the usual practice is followed, and therefore there is a risk of conveying micro-organisms in small numbers from the tissues of one person to those of another.

It must be very uncommon for an immunizing injection to be made into an area of cellulitis, although this is a possibility. It is also exceedingly unlikely that transmission of this kind has anything to do with post-injection poliomyelitis, since this virus is not found in the blood and tissues generally, but confined to the nervous system. On the other hand, the virus of infective hepatitis could well be so transmitted, and there are other possible risks which are discussed in Evans and Spooner's paper. It is no easy matter to decide whether mass injection methods ought to be changed in view of these findings. The dangers are in ordinary circumstances remote, and it is tempting to take the view that there must be lengths beyond which doctors cannot be expected to go in safeguards of this kind because the expense and trouble are out of all proportion to the results achieved. This is perhaps a dangerous doctrine, but if the existing rigid safeguards in all kinds of clinical proceedings are contrasted with the far greater and ever-present dangers from infection in everyday life, of which the average person is oblivious, it does seem that caution can be carried to almost fantastic lengths. If the lesson of these experiments is to be applied in inoculation clinics two methods can be considered: one is the use of platinum needles, which can be flamed between one injection and the next; the only other is the use of a separate syringe and needle for every injection made.

[1] *The Sterilization, Use, and Care of Syringes*, 1945, London.
[2] *Sterilisation und Sterile Aufbewahrung von Spritzen und Hohlnadeln*, 1948, Basle.
[3] *British Medical Journal*, 1946, **2**, 685.

BACT. COLI AND DIARRHOEA

There have been many reports, both in this country and abroad, of the isolation of certain serological types of *Bact. coli* from babies suffering from infantile and neonatal diarrhoea. As Drs. A. M. M. Payne and G. T. Cook mention in their paper published elsewhere in this issue, there is some confusion in the nomenclature of these types; the serological type *Bact. coli* D 433 has been called *Bact. coli neapolitanum*,[1,2] *Bact. coli* var. *neapolitanum*,[3,4] *Bact. coli* serological type,[5] *Bact. coli* α-type,[6,7] *Bact. coli* B.G.T.,[8] *Bact. coli* D 433,[9,10] *Bact. coli* Bray,[11] and *Esch. coli* O group 111 (one hundred and eleven).[12] In addition a different serological type of *Bact. coli*, also associated with infantile diarrhoea, has been described by Giles and his colleagues,[6] Smith,[7] and Holzel, Martyn, and Apter[4] and referred to as *Bact. coli* β or *Bact. coli* beta, and also by Kauffmann and his colleagues[12] as *Esch. coli* O group 55. None of the names is entirely satisfactory. *Bact. neapolitanum* was used by Winslow and his co-workers[13] as the name for a variety of *Bact. coli* identifiable by biochemical tests; this is composed of many different serological types and should not therefore be limited to one serological type. The term α was used by Stamp and Stone[14] as a name for a labile antigen sometimes present in certain strains of *Bact. coli* as well as in other enterobacteria. This antigen has no relationship to the *Bact. coli* α of Giles. The term β has been used by Mushin[15] to indicate a labile antigen found in some strains of *Bact. coli* and other enterobacteria: this is serologically distinct from *Bact. coli* β of Giles. Thus the symbols α and β have each been used for two unrelated antigens in *Bact. coli*. In the classification of the *Bact. coli* group by Kauffmann,[16] based on the identification of the somatic (O), the surface (K), and the flagellar (H) antigens, *Bact. coli* D 433 has the O symbol 111 and *Bact. coli* β the O symbol 55. Even though Kauffmann's method of classification may be modified in the light of increased knowledge, his notation could be adopted with advantage for the sake of international understanding and clarity.

The papers referred to emphasize the close association, which is statistically significant, between infantile diarrhoea and *Bact. coli* O groups 111 and 55. This association, first recognized in this country, has now been noted in Sweden, Denmark, Holland, and the U.S.A., but the exact role which these types play in the causation of the disease is not clear. Payne reports the isolation of *Bact. coli* O group 111 on many occasions from healthy babies of a susceptible age; possibly a precipitating factor, or some property of *Bact. coli* that has not yet been determined, may be responsible for the onset of clinical disease. In another paper appearing in this issue Dr. J. S. Stevenson reports the isolation of *Bact. coli* O group 111 from adults suffering from diarrhoea in the course of other debilitating diseases; only one had no known contact with other patients. Most outbreaks of infantile diarrhoea affect only babies, but it may be that *Bact. coli* O group 111 is able to cause diarrhoea in the debilitated adult, or, as Stevenson suggests, diarrhoea of unknown origin may cause an organism normally present in the small bowel to be detected in the faeces. The belief that *Bact. coli* O group 111 and O group 55 cause infantile diarrhoea at present rests only on epidemiological evidence; there is little support for the theory from other methods. Some investigators are not convinced that antibodies, as shown by the agglutination reaction, are present in the serum of recovered cases, and the technique used for the isolation of these organisms may not be sensitive enough to show them in small numbers. Several authors in the U.S.A. have referred to a possible virus cause of this disease,[17-20] but it is well to remember that it may be caused by more than one agent and that these may differ in this country and in the U.S.A. The work that has been done on infantile and neonatal gastro-enteritis is most valuable, but there is no real proof that the cause has been found.

[1] Bray, J., *J. Path. Bact.*, 1945, **57**, 239.
[2] Magnusson, J. H., Laurell, G., Frisell, E., and Werner, B., *British Medical Journal*, 1950, **1**, 1398.
[3] Bray, J., and Beavan, T. D., *J. Path. Bact.*, 1948, **60**, 395.
[4] Holzel, A., Martyn, G., and Apter, L., *British Medical Journal*, 1949, **2**, 454.
[5] Giles, C., and Sangster, G., *J. Hyg., Camb.*, 1948, **46**, 1.
[6] —— —— and Smith, J., *Arch. Dis. Childh.*, 1949, **24**, 45.
[7] Smith, J., *J. Hyg., Camb.*, 1949, **47**, 221.
[8] Rogers, K. B., Koegler, S. J., and Gerrard, J., *British Medical Journal*, 1949, **2**, 1501.
[9] Taylor, J., Powell, B. W., and Wright, J., ibid., 1949, **2**, 117.
[10] Magnusson, J. H., Laurell, G., and Frisell, E., *Svenska Lakartidn.*, 1949, **46**, 2533.
[11] Beeuwkes, H., Gijsberti Hodenpijl, A. K. A., and Ten Seldam, R. E. J., *Maandschr. Kindergeneesk.*, 1949, **17**, 195.
[12] Kauffmann, F., in press.
[13] *J. Bact.*, 1919, **4**, 429.
[14] *J. Hyg., Camb.*, 1944, **43**, 266.
[15] Ibid., 1949, **47**, 227.
[16] *J. Immunol.*, 1947, **57**, 71.
[17] Buddingh, G. J., and Dodds, K., *J. Pediat.*, 1944, **25**, 105.
[18] Light, J. S., and Hodes, H. L., *Amer. J. publ. Hlth*, 1943, **33**, 1451.
[19] —— —— *J. exp. Med.*, 1949, **90**, 113.
[20] Keitel, H. G., *J. infect. Dis.*, 1950, **86**, 219.

HORMONAL TREATMENT OF PEPTIC ULCER

Both gastric and duodenal ulcer are now commoner in males of all ages than in females. Peptic ulcer as a complication of pregnancy is very rare, and even when a woman with an established ulcer becomes pregnant spontaneous regression generally occurs.[1] The presence of fat in the upper intestinal tract leads to liberation of a chalone, enterogastrone, which inhibits gastric secretion and motility. Enterogastrone can be extracted from intestinal mucosa, while urogastrone, which has a similar action, can be obtained from normal human urine.[2] These observations have led to suggestions that gastroduodenal ulceration might be treated successfully with hormones. Salzstein and his colleagues[3] recently reported the results of an investigation in which 374 dogs were subjected to the Mann–Williamson operation, in which the duodenum is isolated and anastomosed to the ileum and the pylorus anastomosed to the jejunum, which is thus exposed to acid secretion.[4] After this operation ulcers almost invariably form just beyond the pylorus, and in fact all untreated control animals in this series died of ulcer within 135 days of operation, few of these ulcers showing any microscopic evidence of healing. Of the preparations used in the treatment of the dogs with ulcers so induced commercial extract of human pregnancy urine gave the most benefit. Significant increase in survival time, in the proportion of dogs dying without ulcer, and in the incidence of ulcers

[1] Sandweiss, D. J., Salzstein, H. C., and Farbman, A. A., *Amer. J. digest. Dis.*, 1939, **6**, 6.
[2] Sandweiss, D. J., *Gastroenterology*, 1945, **5**, 404.
[3] Ibid., 1949, **12**, 122.
[4] Mann, F. C., and Williamson, C. S., *Ann. Surg.*, 1923, **77**, 409.
[5] *Amer. J. Obstet. Gynec.*, 1948, **56**, 973.
[6] *Arch. Surg., Chicago*, 1948, **56**, 372.
[7] *Gastroenterology*, 1948, **11**, 842.

with microscopic evidence of healing were observed after its administration. Less marked benefit was obtained from extracts of normal male and female urine given parenterally, while extracts from the urine of patients with peptic ulcers had little, if any, effect. Some improvement was obtained with the follicle-stimulating hormone, but none with posterior pituitary extract, oestrone, or progesterone. No improvement was observed after vagotomy, and enterogastrone was also without effect. It is worth noting that Bernstein and Friedman,[5] who emphasize the rarity of ulcers during pregnancy, have observed the complication of bleeding peptic ulcer during pregnancy in four patients. All four had been treated with progesterone to combat threatened abortion, and they therefore suggest caution in the use of this hormone in women with suspected peptic ulceration.

Pollard and his colleagues[6] gave enterogastrone to 17 patients with peptic ulcers, but were unable to demonstrate clinical improvement or alteration in fasting secretion, volume of HCl, pepsin concentration, or response to the caffeine test meal. Using an extract of pregnant mare's urine Page and Heffner[7] treated, over a period of 20 months, 26 patients with chronic duodenal or jejunal ulcer who had previously failed to respond to a prolonged period of "conventional ulcer therapy" or Sippy regime. All other treatment was discontinued and a normal schedule of meals established, though intermediate feeds were still permitted. These authors claim that all except three patients improved considerably, but their period of observation was too short to permit of definite conclusions, and the absence of control cases further reduces the value of the experiment. Some of these observations throw light on the physiology of the alimentary tract and its disorders, but as yet there is little prospect of their leading to new and generally applicable methods of treating peptic ulcer. The results obtained in experiments on dogs submitted to the Mann–Williamson operation are perhaps significant, though the lesion so caused differs from spontaneous human peptic ulcer in its fatality rate, in the absence of healing and remission, in the accompanying great nutritional disturbance, and, presumably, in its freedom from psychogenic aggravation. The psychosomatic changes of pregnancy are not confined to the endocrine system, and it may be too much to hope that hormone therapy can give the male duodenum that immunity from ulcer apparently developed in the female during normal pregnancy.

IMPORTED HELMINTHIC INFECTIONS

About 90% of the known species of human helminths are excluded from Britain by such factors as climate, hygiene, and sanitation, and by the absence of the appropriate intermediate hosts which are essential for the life cycle and transmission of many of these parasites. These factors do not of course exclude the importation of adult parasites into Britain by persons who have acquired them in foreign countries (these may be retained by their hosts for many years); rather they act as a check on the survival of the parasites' offspring, which, on departing from the parental host, find themselves in an unfriendly environment, lacking either an intermediate host to nurse them through their early growth or a benign climate to permit their development to an infectious stage in the soil. Thus during and after the war many exotic helminths, such as bilharzia, hookworm, and filarial worms, were unwittingly smuggled into Britain by returning troops, displaced persons, or prisoners-of-war. The carriers of such foreign parasites are fortunately a menace only to themselves, not to the local community, for the eggs or larvae they disseminate are not immediately infective to man and are doomed to perish before they can attain infectivity and another human host. An interesting exception was formerly provided by the hookworm, which succeeded in overcoming Britain's climatic barrier and established itself in Cornwall—but only by going underground in the tin mines, where the conditions of temperature and moisture proved admirably suited for development and transmission of larvae.

It is questionable whether the normal incidence of human infestation in Britain by such well-known species as *Ascaris lumbricoides, Trichuris trichiura, Enterobius vermicularis,* and *Taenia saginata* would be affected by an influx of infected persons from abroad. Factual evidence about the first three species is not easily obtainable, but the possibility of increased transmission must at least be admitted. Many believe, however, that in post-war years infestation of beef with the larval stages, *Cysticercus bovis,* of the beef tapeworm (*T. saginata*) has been increasing in many parts of Britain and that this could be accounted for by an increase in the number of tapeworms imported from abroad by prisoners-of-war and others, who have contaminated pasture land and infected the cattle. There is little evidence of increase in the cattle-to-man part of the life cycle of this tapeworm. The inquiries of Seiler and Norval[1] in Edinburgh, where an upward trend in the incidence of *Cysticercus bovis* was observed in the abattoir during the period 1948 to 1949, suggest that there was no corresponding increase in tapeworm infection in the human population. On the other hand, Jepsen and Roth[2] record that in Denmark during the period 1941 to 1947 there was a rapid rise in the number of patients admitted to hospital with *T. saginata* infestation together with a rising incidence of *C. bovis* in the slaughterhouses. A similar survey carried out in British hospitals might prove equally informative.

In a third category of imported helminthic infections are those which are potentially indigenous in Britain but are apparently non-indigenous at the present time. These are few in number, and the outstanding representative is the fish tapeworm, *Diphyllobothrium latum,* which is a parasite of temperate regions and is indigenous in parts of Ireland, where it was first recorded over 100 years ago. Besides being widely distributed elsewhere in Europe it is now firmly established in parts of the northern United States and Canada. The possibility of its establishment in this island is by no means remote, because of the large numbers of displaced persons and foreign workers who have arrived in recent years; some of these have undoubtedly brought with them this unwelcome "fellow traveller." Elsewhere in this issue Drs. J. C. Harland, J. G. Humble, and P. G. Mann describe the clinical and epidemiological aspects of this infection, and they rightly emphasize the need for further investigation by the public health authorities.

[1] *Hlth Bull., Edinb.*, 1950, **8**, 46.
[2] *Proceedings of the International Veterinary Conference*, London, 1949.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE PROBLEM OF PSORIASIS

BY

R. M. B. MacKENNA, M.A., M.D., F.R.C.P.

Physician (in charge), Dermatological Department, St. Bartholomew's Hospital

The principal difficulty in regard to psoriasis is that we still do not know the cause of the malady; therefore theories concerning the aetiology abound and become more numerous and more complex as the years pass, while treatment remains empirical. Nevertheless, despite this empiricism, treatment is not so hopeless a proposition as *some would have us believe,* although we still have to tell our patients that no one can guarantee that they will not suffer from future attacks of the eruption.

Aetiological Factors

The incidence is said to be higher in cold than in warm climates, but psoriasis has been noted in almost all races; it is rare, however, in pure negroes. It is suggested that the reason for this geographical selectiveness is that a psoriatic skin requires a certain amount of exposure to sunlight for its full health, and that in countries where the inhabitants have to keep themselves muffled up for many months of the year the apparent incidence of the malady is higher than elsewhere. This, however, is not the whole story: during the recent war we learned that in some cases the climatic benefits might be nullified by environmental factors, and that heavy physical work in conditions of dry heat and much dust, with often little opportunity for ablutions, could provoke severe exacerbations. The lesson to be drawn from this appears to be that if a patient asks, "Would I be less troubled with psoriasis in a warmer country?" the answer should be, "Probably, provided you abstain from hard physical work." It may be noted here that when psoriasis relapses severely in hot countries the lesions tend to be very troublesome in the flexures and thus lead to incapacity for work.

It is usually agreed that psoriasis is slightly more common in men than in women, the ratio in Europe being 3:2. The malady tends to occur in certain families, but the genetic factors are little understood; for practical purposes, when asked about the matter of inheritance, Jonathan Hutchinson's dictum is worth quotation: "Psoriasis does not very often affect several brothers and sisters, but it frequently seems to be transmitted from parent or grandparent. Thus it may persist through many generations, but still affect very few individuals." There is considerable variation between the figures given by leading authorities concerning the familial incidence of psoriasis in those who demand treatment, but probably less than 50% can state that the malady has occurred in other members of their family.

The age of onset varies considerably. Psoriasis begins most often at puberty or in adolescence, but has been noted in infants and is not uncommon in children. It is unusual for a first attack to develop after the patient has reached the age of 45.

Whilst the patient with psoriasis is usually robust and often heavy-set, in some cases the malady is associated with progressive arthritis deformans of the rheumatoid arthritis type. This arthritis may be very severe. For this reason dermatologists are at the moment alert concerning "compound E," for they feel that there may well be some factor of adrenal metabolism that is associated with the disease.

There is some dispute concerning the factors which, in susceptible persons, precipitate the attacks of psoriasis. Many regard the malady as a "type reaction" which occurs in certain predisposed skins. They consider that the reaction may be provoked by certain stimuli, of which two have received some attention—namely, absorption of toxins, particularly from streptococcal foci of infection, and mental worry and overstrain. It is worth noting here that psoriasis may be persistent in neurotic persons.

Köbner's phenomenon has attracted some attention in recent years, although the matter was first discussed in 1878. Köbner was apparently the first to note that, during the active phase, minor types of physical injury sustained by unaffected skin are followed by the appearance of the eruption on the injured part. It is now known that the provoking agent can be mechanical, physical, or chemical, that the injury must involve the papillary layer of the skin, and that the phenomenon cannot be produced in the cleared centre of a patch of psoriasis. This matter is of practical importance, for, in the active phase, pressure of clothing or the injudicious use of a bath-brush may cause an efflorescence of the lesions. Patients should be warned of this matter, and women should be told of the advisability of discarding tight belts or corsets whenever this is practicable.

Köbner's phenomenon has been invoked to explain the distribution of the eruption on various "sites of election," such as the anterior aspects of the knees, the posterior aspects of the elbows, and over the sacrum. This may well be disputed; so far as the knees are concerned, the suggestion may be valid, but *inter alia* it should be remembered that the scalp is also one of the elective sites, and one has yet to meet the psoriasis patient who emulates one of the athletic feats of Father William.

The Eruption

At the outset one should strip the patient properly, and decide whether the eruption is mild, severe, or grossly exfoliative, and whether it is in the acute, involuting, or chronic stage.

In most cases the lesions consist of circumscribed red areas covered with dry silvery scales; not infrequently each is surrounded by a narrow zone of unaffected integument which is paler than the normal hue of the individual's skin. The lesions vary from a few millimetres in diameter to great plaques involving large areas; sometimes, as they spread, their central portions become clear so that rings are formed. The distribution tends to be symmetrical, and the extensor surfaces are more affected than the flexor. Usually—but not invariably—the exposed areas of the hands and face are not involved.

Certain difficulties in diagnosis may be noted: occasionally the eruption consists of hundreds of small puncta, or of small lesions that are scattered like drops on the skin; if the patient bathes frequently there may be but little scaling. In these cases one usually discovers an aggregation of lesions on the classical sites at the elbows and knees which clinches the diagnosis (Fig. 1).

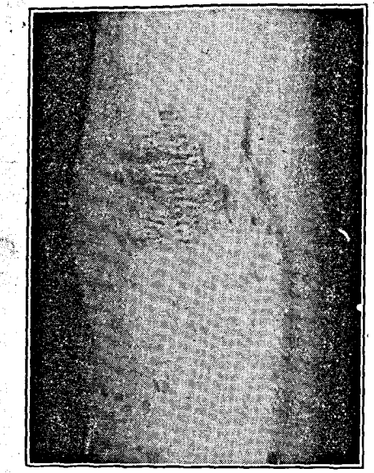


FIG. 1.—Typical psoriasis plaque on the extensor surface of the elbow.

Flexural psoriasis occurring as part of a typical attack gives rise to little difficulty in diagnosis, but occasionally an intractable erythematous eruption develops on a flexural surface, particularly in the crutch, with little or no involvement of the skin of other areas. Unless the area has been made sore by rubbing it has a characteristic dryness which is suspicious. In these cases the scalp should be carefully examined, for here there may be some discrete scaling areas which may confirm one's suspicion of psoriasis.

Psoriasis of the scalp can often be more easily felt than seen : if one rubs one's finger-tips over the head the lesions are firm and hard, so that one notes a sensation akin to that obtained from pressing the fingers across a relief model of a continent studded with low mountains. There are few occasions on which a similar sensation arises from touching the lesions of other maladies ; having noted the distribution one can then turn the hair aside and see the silvery scaling, which can be levelled down without any bleeding or oozing until the last scale of all is removed. The hairs grow freely through the piled-up masses, and the patient can be reassured if she is apprehensive about possible loss of hair, for baldness is not a complication of psoriasis.

In many cases pin-point pitting of the finger-nails—particularly of the third finger—can be noted, but sometimes some or all of the nails of the hands and feet are severely affected (Fig. 2). Usually there are lesions elsewhere on the body, but occasionally only the nails are involved ; diagnosis is then very difficult, but it is worth remembering that, as contrasted with many other forms of onychia, the change is usually first noted in the distal portion of the nails. The affected areas lose their translucency and polish and become white, and the distal part of the nail plate becomes separated from the nail bed by a whitish granular mass. The process slowly extends upwards. Eventually the nails may become discoloured, eroded, and fractured.

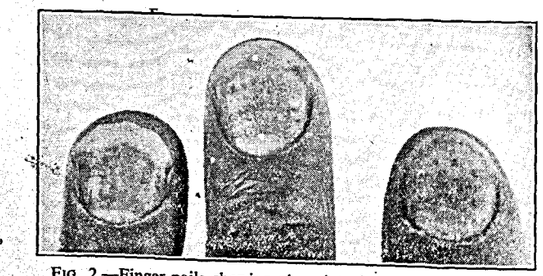


FIG. 2.—Finger-nails showing pin-point pitting; also, on the left, the development of another type of abnormality due to psoriasis at the distal third of the nail.

A Note on Symptomatology

That the lesions of psoriasis do not itch is a well-established and completely fallacious aphorism. Admittedly, in most cases the patient does not suffer from this symptom, but sometimes, particularly in the early stages of a widely efflorescing eruption, the itching may be severe. It seems probable that itching is most often a symptom in those cases in which the eruption develops as a reaction to nervous stress.



FIG. 3.—Arthropathic psoriasis.

Flexural psoriasis involving the vulva may cause pruritus. As already stated, this form of the malady may cause incapacity, particularly in hot climates, because the areas become sore, macerated, and sometimes infected.

Arthropathic psoriasis usually begins with involvement of the joints of the terminal phalanges ; the symptomatology is the same as that of rheumatoid arthritis complicated by the disfigurement—and sometimes the itching—caused by the eruption ; often the psoriasis is intractable (Figs. 3–5).

Treatment

Psoriasis is extremely variable in the severity and frequency of its attacks. Probably many people suffer occasionally from mild degrees of redness and scaliness on the knees and elbows, with some lesions in the scalp, but never experience a widespread attack and never seek medical advice ; others suffer from widespread eruptions occasionally : others, again, experience them frequently. In many cases the eruption may involve a twentieth of the body surface when at the height of its efflorescence : in others, nine-tenths of the surface may be covered and the patient be in jeopardy of developing a generalized exfoliative dermatitis. As already stated, treatment must be adjusted in accordance with the phase and severity of the eruption ; further, there is much more in treating psoriasis than merely ordering appropriate dermatological remedies. One should always attempt to discover the precipitating factor of the attack, in the hope that the patient may be enabled to avoid relapses in the future. Owing to our lack of knowledge, this may be disappointing, but always it is advisable to search for foci of sepsis (which may be treated when the eruption wanes, for it is inadvisable to deal with them during the acute phase). A careful discussion with the patient may reveal psychological factors which demand the assessment of a reliable psychologist.

Of the drugs which may be used for treatment, chrysarobin, dithranol, tar, resorcin, salicylic acid, and ammoniated mercury still hold pride of place. Arsenic is passing through a phase of unpopularity, but sedatives, particularly phenobarbitone, are now prescribed for many cases. Ultraviolet, roentgen, and Grenz rays, and thorium X have their uses. Recently undecylenic acid taken in large doses by the mouth has been advocated by Perlman (1949), but this observation has not been widely confirmed.



FIG. 4.—Arthropathic psoriasis. Note spread of lesions around sites of election on the lumbar area and at the elbows.



FIG. 5.—Arthropathic psoriasis. Note swelling of right hand. In the groins the eruption is affecting the flexures.

For the treatment of chronic lesions on limited areas of the trunk and limbs there is no more satisfactory remedy than the unpopular chrysarobin. Advise the patient to rub the areas gently with ung. chrysarobin, 5%, at night : after the inunction let him leave a thin smear of the ointment on each lesion, and cover it with gauze and a bandage. In the morning the dressing and ointment are removed, and the lesion left untreated through the day. Increase the concentration slowly to 10% or even 15% and persevere with treatment until affected parts are smooth and the surrounding skin slightly inflamed. Then soothe the areas with zinc or cold cream. Some are allergic to chrysarobin, so that treatment should be cautious at first. Warn the patient that the ointment permanently stains garments and sheets a dirty blue shade and that if any reaches his eye it will cause conjunctivitis. Some prefer dithranol to chrysarobin : usually this is employed (with the same precautions) in an ointment of 0.5%–3% concentration, and it is sometimes preferable to use Halden's emulsifying base instead of soft paraffin as a base. Dithranol has most of the disadvantages of chrysarobin, but stains less severely.

The great error that is usually made when dealing with more extensive cases is that, because the patient is not ill in the accepted sense of the word, he is seldom confined to bed. There are always scores of persons attempting to continue at work with widespread psoriasis—wastefully, ineffectively, and messily applying their remedies when opportunity serves—who could be relieved of much distress if their medical attendants would insist that they retired to bed. As a general rule, most persons with efflorescing psoriasis should be confined to bed, kept on a light diet, given small doses of phenobarbitone—e.g., ½ gr. (30 mg.) twice daily—and treated with mild remedies such as calamine liniment or zinc cream, each containing 3%–5% ichthammol. When the psoriasis reaches the chronic stage, or if when the patient first presents himself his eruption is in this stage, more active measures are pursued ; then, under home conditions, he may be kept in bed, given sedatives in mild doses, and twice daily have one of the following ointments well rubbed into his lesions :

℞
Ung. picis liq. ... ...
Ung. hydrarg. nit. dil. ... ... } āā 1 oz.
Ung. acid. salicyl. ... ...
Ung. glycerin. plumb. subacet. ...
M.

℞
Resorcin ... ... 10 gr.
Oil of birch tar ... ... 30 m.
Zinc oxide ... ... 1 dr.
Lanolin ... ... 2 dr.
Soft paraffin ... ... to 1 oz.
M.

℞
Ung. hydrarg. ammon. et pic. carbon. c. acid. salicyl. (*National Formulary*, 1949.)

He should be instructed to have a daily bath, and twice a week should receive autohaemotherapy (5–10 ml.). Lesions in the scalp should be treated by washing the hair twice a week with spiritus saponis kalini and using the following ointment twice daily :

℞
Ammoniated mercury 2%
Liq. picis carbonis 12%
Salicylic acid 2%
Halden's emulsifying base 30%
Water ... ... to 100%
M.

The majority of severe cases will respond to these measures within three or four weeks. Usually the only complication to be feared is that the lesions may extend and alter their character somewhat, and thus a generalized exfoliative dermatitis may develop; this disaster, which is rare, demands admission to hospital under specialist care.

Probably the Goeckerman regime is the most successful routine therapy for hospital use; it depends chiefly on the photosensitizing effect of applications of tar. For the treatment of those who resolutely refuse to retire to bed, Ormsby and Montgomery (1948) have suggested a modification which may appeal to practitioners, and the reader who is interested should obtain the details from their textbook. Very briefly, a 2–4% crude tar paste is applied thickly at night and removed next morning with liquid paraffin. The patient then attends the surgery and receives an adequate exposure to ultra-violet rays, going on to a suitable establishment—or to his home—and having a bath; he may then attend to business. The treatment has to be given daily for 6–8 weeks, and is reinforced by autohaemotherapy, which is given twice weekly on eight occasions.

The clamour for elegant and cosmetic-like local applications is understandable. The formula given above for treatment of the scalp is satisfactory for application—twice daily—to lesions on the body and limbs, but very occasionally enough mercury may be absorbed to cause haemorrhagic colitis. An alternative formula is a modification of ung. cocois co. of the pharmacopoeia of St. John's Hospital for Diseases of the Skin:

℞

Liq. picis carbonis	10%
Hydrarg. ammon.	2%
Salicylic acid	2%
Emulsifying wax	3%
Paraff. mollis flav.	20%
Ol. cocois nuciferae	ad 100%

M.

Some patients prefer to use "paints." Of these, a varnish containing thorium X is the most efficient, but as the thorium X depends for its action on the emission of radiations its use is a matter for special study. "Tar dermament" (Parke, Davis and Co.) or an 8% suspension of crude coal tar in chloroform, applied twice daily, is sometimes satisfactory. Fox suggested a paint containing 10 parts of chrysarobin, the same amount of salicylic acid, 15 parts of ether, and 10 parts of flexible collodion.

In the treatment of flexural psoriasis of the groins and adjacent parts a sitz bath made by adding an ounce of liq. picis carbonis to four pints of hot water, and followed by the application of zinc cream with 4–6% liq. picis carbonis, is satisfactory in the first stages of treatment, and as the condition improves stronger remedies may be employed: chrysarobin and dithranol are usually too irritating to be employed on these areas.

Psoriasis of the nails usually responds best to a combination of *x*-ray treatment locally and arsenic internally. As in other forms of psoriasis, Asiatic pill is probably the best method of administering the drug. (Note here that in all cases arsenic should be employed only in the chronic stage of psoriasis.)

When *x*-ray treatment is not obtainable the nails may be treated by applying dithranol 0.5–1% in Whitfield's ointment twice daily; this stains the nails, and an ointment consisting of equal parts of ung. acid. salicyl. and ung. hydrarg. ammon. dil. may be preferred.

The treatment of arthropathic psoriasis is a matter for a specialist. *X*-ray treatment to the joints usually gives the most satisfactory results.

Conclusion

There is so much to be said about psoriasis that in writing this paper it has been more difficult to know what to omit rather than to decide what to include. I hope that those who have little leisure to read textbooks will find here one or two suggestions which will be helpful in their practices; I would like to suggest to those who have a little more time that they should fill the many gaps in this presentation by reading the chapter on psoriasis in one of the larger textbooks that are now available. But, whatever course the reader takes, there is one final principle concerning the treatment of this malady which must be emphasized; it was formulated many years ago and experience confirms its validity: in all cases treatment should be continued until the last lesion disappears, for if even a few areas remain recurrence will ensue more rapidly than if the patient is encouraged to persevere until his skin regains its normal appearance.

I am indebted to the photographic department of St. Bartholomew's Hospital and Medical College for Figs. 1, 3, 4, and 5.

REFERENCES

Ormsby, O. S., and Montgomery, H. (1948). *Diseases of the Skin*, 7th ed. Henry Kimpton, London.
Perlman, H. H. (1949). *J. Amer. med. Ass.*, **139**, 444.

THE CHILD AND HIS ENVIRONMENT

MATERNITY AND CHILD WELFARE CONFERENCE

The annual conference arranged by the National Association for Maternity and Child Welfare was held at Friends House, London, on the last three days of June. Nearly 100 local health authorities and 50 infant welfare services were represented among the 700 delegates. The general subject was "The Child and His Environment." On the first day addresses were given on various phases of the subject; on the second day the Conference broke up into six groups for separate discussions, and in another plenary session on the third day reports were presented by the leaders of the groups.

The Influences of Heredity

The subject of eugenics and heredity was introduced by Dr. FRASER ROBERTS, of the London School of Hygiene and Tropical Medicine. He said that despite the great reduction in the infant death rate during the last 50 years deaths from two causes—birth injury and congenital malformation—showed no diminution. Congenital malformations were not all due to heredity, but some of them were, and an even higher proportion were due to a combination of hereditary and environmental factors. As conditions improved, and life and health were better preserved, there remained a hard core of really intractable cases largely composed of hereditary disease or undue hereditary susceptibility. While much ill-health of children had been reduced, there was no reason to suppose that club-foot or hare-lip was less common, or that mental deficiency showed any decline in incidence. The proportion of blind children of school age had been much reduced during the last 25 years, but whereas 25 years ago little more than one-third of the blindness was due to congenital and hereditary disease two-thirds of it was now due to such causes.

In a number of simple inherited diseases, each individually rare or very rare, general eugenic measures offered little of value even were it practicable to apply them, but in some cases the chances for further children could be worked out and parents told of the risks. But in many instances the advice given could be encouraging. The people who sought advice were usually conscientious folk who wanted children and had a good home waiting for them, and it was a pleasure to assure them, as one often could, that the risk was very small. Speaking generally, the trouble was not so much that people tended to have too many children as that they tended to have too few. Social measures to encourage parenthood were not outside the realm of practical discussion. If the average age of the mother at the birth of the child were reduced by five years the incidence of mongolism would be cut to less than half, and there would be an appreciable reduction, even if not so striking, in a number of other congenital defects, such as hydrocephalus.

Sometimes a knowledge of genetics could be of direct and positive assistance. The rhesus factor was a case in point. About one child in every 150 was born with haemolytic disease because it had inherited from the father an antigen not present in the mother. Ten years ago at least half these babies died. To-day, thanks to the knowledge of the genetics and serology of the condition, and the preparations for replacement of the baby's blood by donor's blood, the death rate had been cut from one-half to one-tenth.

Pulmonary Tuberculosis

Dr. Fraser Roberts added that under present conditions of life the hereditary constitution was an important factor in determining whether or not a person contracted pulmonary tuberculosis. No family history of tuberculosis, however bad, was a good reason for refraining from having children, though if the prospective parents themselves were affected it might be a different matter. People with a bad family history, however, should be discouraged from entering the tuberculosis nursing service. On the average it was a bad plan for a patient to be nursed by a sister; it was much safer for a wife to nurse her husband. Children likely to be susceptible for genetic reasons should be carefully watched. They formed one group of persons for whom periodical mass radiography was desirable. He noted that in the *British Medical Journal* of June 24 (p. 1487) Dr. W. H. Bradley had advanced the same argument for rheumatic fever. He believed that a considerable proportion of those genetically predisposed could be detected on the basis of family history, and that it was practicable to protect them from the streptococcus that initiated the disease.

The opinion of the group which later discussed this question was that the majority of cases of miliary tuberculosis and tuberculous meningitis in infants were due to contact with infected relatives, usually living in the same house. It was felt that far too little was done to prevent such contacts, and that further priority should be given to infants who were awaiting hospital or sanatorium treatment and were in contact with tuberculous infection in their own homes.

Fundamental Psychological Needs

Dr. EMANUEL MILLER said that the psychological needs of the child varied with each age group. From birth to the weaning period the child needed conditions in which bodily and mental interests were inseparable. The second phase, from weaning to walking, required special attention to the benign acquisition of habits. Where the mother-and-chiid relation was good the training would be easy. Many character peculiarities might grow upon too rigid and too hasty a training regime. The third period, up to talking, was one during which the infant saw persons and things as wholes, and therefore intellectual needs must be safeguarded. The reality and fantasy needs of the child must be encouraged together, so that the child could check its wishes against hard facts.

The group which considered this subject, as reported by Miss DINGWALL, considered that there was far too little breast-feeding in this country. Between 30% and 50% of infants were breast-fed at the beginning, and after a few months the proportion was very much smaller. One of the reasons was the poor propaganda for the breast and the good propaganda for artificial feeding. We had not adopted the American slogan, "Breast-fed is best fed."

Between 70% and 80% of children were born in hospitals or nursing-homes, in many of which there was excessive routine with segregation of mother and child. The child—a tightly wrapped up cocoon—was brought at stated intervals to the mother, who was instructed to feed it. This brought worry and discomfort for the mother, and it was not surprising that there was frequent failure to feed the child successfully. Retraining of midwives, general practitioners, and others so that they understood the psychological significance of feeding was suggested to deal with the problem. The group was glad to learn that at one large teaching hospital undergraduate students were already being trained in the needs of the healthy child, with special attention to the psychological side of feeding and the attitude of the mother both during pregnancy and after the child was born. It was suggested that there might be a rearrangement of hospital routine so that the mother and child relationship was assisted from the very beginning. Training for motherhood should begin long before marriage. There was a place for such training in secondary schools, youth clubs, and elsewhere. The proper place for a child to be born in was not the hospital but, given decent housing conditions, its own home. Mothers of young children should not be encouraged to work away from home. This problem pertained to country districts as well as to towns, although in the country the work tended to be seasonal, and in the towns continuous.

The Delinquent Child

Mrs. DERMOT MORRAH, chairman of London Juvenile Courts, said that she found it difficult to believe that delinquency was a symptom of abnormality, that character was but a product of environment, that the terms "conflict" and "maladjustment" could be substituted for "crime," and that the criminal was a sick person in need of therapy. Most offences were due to bad training and lack of religious and moral background, and consequently to failure in self-control and discipline. Sometimes the psychiatrist's advice at the court was invaluable, and in a difficult case might make all the difference between failure and success; but more often than not the treatment he recommended was not available, and, if it were, goodness only knew whether it would be successful. Quite the most important part of rehabilitation was to enable the child to cure himself; true regeneration was from within. Probation was one of the court's most potent weapons when used judiciously; when used indiscriminately it was a menace. The child must be made to understand that, no matter how much help was given, the ultimate success could depend only on his own personal effort. If the child were excused by reason of his background or his physical defects, the result would be to fill him with self-pity instead of teaching him to face life in a realistic way.

Among other speakers at the Conference were Professor R. S. ILLINGWORTH, of Sheffield University, who dealt with physical development in the first years of life; Dr. JOHN BOWLBY, of the Tavistock Clinic, who discussed parental influence, and Dr. DOROTHY MAKEPEACE, of the Home Office, whose subject was the child in the welfare State.

The closing address was given by Mr. CHUTER EDE, M.P., the Home Secretary, who spoke of the Home Office concern for children who for one reason or another were not in a normal relationship with their environment. The right place for a child to grow up, he said, was in its own home. When, unhappily, this was not possible, the best substitute was the right foster home, carefully selected to suit the child. But some children would have to live for a time in a residential nursery, and individual care was nowhere more important. The routine of the nursery should be such that the child had time to experiment in doing things for himself, but those in charge must make sure that he had his outdoor exercise and proper times for sleep and rest and ate adequate meals.

The Children Act, 1948, said Mr. Ede, was not the end of the story. It opened the way to developments which would go on for a number of years, and the Home Office, local authorities, and voluntary organizations were working in the closest collaboration to this end.

An exhibition of *x*-ray, electro-medical, and other apparatus will be held in conjunction with the Sixth International Congress of Radiology on July 24–28 at the Royal Horticultural Society's Halls, Vincent Square, London, S.W.1. The exhibition is not open to the public, but members of the medical and ancillary professions may obtain tickets on sending a stamped addressed envelope to the Exhibition Manager, International Congress of Radiology, 32, Welbeck Street, London, W.1.

THE LISTER INSTITUTE

Some interesting investigations, especially in the fields of biochemistry and bacteriology, are recorded in the annual report of the governing body of the Lister Institute, of which Sir Henry Dale, O.M., F.R.S., is chairman. The Institute still accommodates the Blood Products Unit, the Blood Group Research Unit, and the Blood Group Reference Laboratory of the Medical Research Council, but the Bacterial Chemistry Unit has been transferred to the Council's new establishment at Mill Hill, and the National Collection of Type Cultures, which has been housed at the Institute for 30 years, has now been installed at the Central Public Health Laboratory, Colindale.

The Blood Products Unit continues to produce dried human plasma and plasma fractions for the Ministry of Health. During the year 18,500 bottles of plasma have been prepared and dried. The plasma fractions prepared and distributed amounted to 900 ampoules of fibrinogen, 3,300 bottles of fibrin foam, 3,800 bottles of thrombin, and 3,700 ampoules of gamma globulin. Half the batch of gamma globulin has been concentrated by drying from the frozen state in bulk, reconstituted in smaller volume, bottled to give 250 mg. in each ampoule, and held as a liquid; the other half has been put in ampoules before drying in the ordinary way, in quantities of 250 mg. A clinical trial will be made to establish a comparison in potency between the material held in the liquid and the dried state. This will be done by the Public Health Laboratory Service.

The Blood Group Reference Laboratory selects, prepares, and supplies blood grouping sera of all kinds to users in Great Britain and abroad. It is stated that there has been a considerable increase in the number of sera examined from cases of suspected immunization by pregnancy and transfusion. Further examples of very rare types of antibody have been detected and the sera containing them made available for use in research.

The Vaccinia Virus

One of the studies undertaken in the bacteriological department of the Institute concerns the properties of vaccinia virus. The influence of B.A.L. (*2,3-dimercaptopropanol*) *on the copper* content of the tissues and on the proliferation of the virus has been particularly studied. Will deprivation of copper interfere *with the proliferation of the virus?* Preliminary experiments indicate that intramuscular injection into rabbits of the maximum tolerated dose of B.A.L. over a period of 10 days significantly increases the urinary excretion and the serum content of copper and reduces the amount of that element in the viscera; but intramuscular and intravenous injections of B.A.L. over this period do not significantly affect the development of lesions of vaccinia. On the other hand, local inunction with B.A.L. ointment has been found to diminish the vaccinal reaction as compared with lesions similarly treated with capsicum ointment and plain lanoline. Inunction with B.A.L. causes a paradoxical local increase in the concentration of copper in the skin, which is presumably bound and is not available to the virus. The histology of these vaccinal lesions is being studied. The *in vitro treatment of vaccinia virus with* B.A.L. reduces the copper content of the virus but does not diminish its infectivity when it is subsequently inoculated in a normal animal or in the "*embryonated*" egg.

Another investigation which is proceeding at the Institute concerns the factors influencing the survival of vaccinia virus under different conditions of storage, such as temperature, type of suspending medium, *p*H, the influence of drying from the frozen state, and the atmosphere in which dried preparations are stored.

Blood Group Lewis

It was reported a year ago that Lewis-positive adult persons are "*non-secretors*" *within the ABO classification.* But a recent study shows that Lewis-positive persons secrete a specific water-soluble gene-product; there are no non-secretors, and all persons secrete one or more of their blood-group factors in a water-soluble form. It is suggested that the Lewis genes and the genes of secretion probably belong to one genetical system. A determination of the precise differences in these closely related gene-products is necessary to the understanding of gene action, and it is hoped to make in this direction a useful contribution to the biochemical aspects of human genetics.

The Institute is also engaged on various nutritional studies, including the effect of streptomycin treatment on the intestinal flora of tuberculous patients and on the nicotinamide status in man. No decisive results can so far be recorded except that during streptomycin administration the intestinal flora is affected significantly in all cases, the coliform bacteria disappearing.

HOW AMERICA FIGHTS CANCER

PUBLICITY AND RESEARCH

The campaign against cancer in the United States is characterized by the briskness which attaches to all American propaganda. Many years ago, when a lecturer to a British audience began by saying, "One in seven of you will die of cancer," this approach was deprecated. The American Cancer Society, however, puts out such slogans as "Every three minutes a cancer patient dies," and argues that it is not wrong to promote fear and disquiet, provided that at the same time a basis for action and a reason for hope are presented.

These slogans do not appear to remain in the memory. After a national advertising campaign only one person in ten interviewed could recall even one slogan; 80% were said to show no morbid reaction to cancer as a result of the propaganda. Of 272 members of the American Board of Psychiatry and Neurology only one-third believed that cancer publicity had increased public anxiety and only 11% that such publicity had done more harm than good.

The American Cancer Society was reorganized five years ago to make a broad national attack on cancer. It has 28 directors-at-large and a similar number of directors for the various *regions, which cover every State.* In 1949 some 200,000 persons died of cancer, and 600,000 were said to be under treatment. A public opinion survey gave 80% of adults as declaring cancer to be the most dangerous disease in the country; 52% had known someone with cancer, and 20% had had it themselves or in their family.

Since the inauguration of the Society the number of cancer detection centres has risen to 251 and of cancer clinics to 570; postgraduate and refresher courses have been established in 51 schools. Pages of the latest report are occupied with "high lights" of the Society's doings. New York City "continues to dramatize the *importance of early detection and to support* cancer research with a total of 64 individual projects under way." In the State of Michigan, 337 women's organizations *helped to make 85,000 dressings* for cancer patients. A mobile diagnostic unit in Kentucky visited 25 counties in mountainous and rural areas and saw 11,612 patients in 744 clinic sessions. In Iowa educational displays were given at 80 county fairs. Every library in the State of Colorado is being converted into a cancer information centre. In Louisiana a total of 12,886 column inches of newspaper space and 40,000 dollars worth of radio time were purchased. In Maine five new airliners carried literature and speakers to the principal towns. In New Mexico some 350 full-blooded Indians were among the thousands attending a cancer film show.

Behind all this far-ranging *publicity the Society is doing a* great deal for research. It has contributed 13 million dollars to a research programme which it has inspired, and which is *being assisted also by the National Cancer Institute,* the Atomic Energy Commission, and private philanthropic organizations. Scientists have been attracted into the field of cancer research by means of fellowships, and generous institutional grants-in-aid have been made. The Society claims—and not without reason—to have put into operation a truly national machine for cancer control based on short-term and long-term research, on education of doctors and laymen, and on service to cancer patients.

Reports of Societies

STREPTOMYCIN IN OTOLARYNGOLOGY

This subject was discussed at the summer meeting of the Sections of Otology and Laryngology of the Royal Society of Medicine, held at Cardiff on July 1.

Professor F. C. ORMEROD reviewed the additional knowledge gained about tuberculosis of the upper air passages during the past 15 years, including its treatment recently by streptomycin. He said that from about 1930 onwards there had undoubtedly been a drop in the incidence of tuberculosis of the larynx and of the upper air passages. At Brompton Hospital in 1929 there were over 300 such cases, but in 1949 *there were only* 23 new patients. Workers in other countries reported a similar decline. The reasons for this fall were a matter of conjecture: one of the main factors might be the *better feeding of the population,* especially in the younger ages; and advances in thoracic surgery had played a great part.

From 1920 down to well in the 'forties the treatment of tuberculosis of the larynx had not changed very much. Reliance was placed on silence, the application of the galvanocautery, and instillation of various drugs. Injections of gold salts and various types of vaccines were tried without any notable effect. *It used to be said that the expectation of life in the case of* laryngeal tuberculosis could be measured in months, except indeed in cases which were successfully treated by collapse therapy of the lungs. Streptomycin was isolated in 1944, and *from about 1947 it began to be used in cases of tuberculosis* of the lung, and in America, where better supplies were available, in some cases of tuberculous laryngitis. In this country *there was difficulty in using it except for research until 1948.* But during the last 18 months or so it had been available for tuberculous laryngitis, and now supplies were such that it could be bought in the open market, and patients could have as much as was necessary.

The Americans, in their first use of it, were a little over-enthusiastic and gave excessive doses. British laryngologists had the benefit of that experience, and, when they started, gave safer doses, with more satisfactory results. Experience, both here and elsewhere, was not yet extensive, and while the literature bristled with articles on the toxicity of streptomycin little was written about its good effects. Many of the cases treated were due to have surgical treatment, and thoracic surgeons now hesitated to operate unless they had the benefit of the "umbrella" *of streptomycin therapy.* Care had to be taken not to present for surgery a patient whose bacilli had become resistant to the effect of streptomycin. Para-aminosalicylic acid (P.A.S.) given concurrently guarded against this, and made it possible to use streptomycin in many cases where otherwise it would be forbidden. He had found that streptomycin in 1 g. daily doses had a rapid effect on dysphagia; within three or four days the patient lost his pain and was able to swallow quite comfortably. There was rapid improvement in the first three weeks, but it might be six weeks or three months before the larynx returned to normal. It was hardly ever necessary to give analgesics, and it was some time since he had had to inject alcohol.

In the Brompton series he described some 34 completed cases. Eighteen *of the patients had returned to normal,* and 12 were very much improved—that is to say, the disease had ceased to be active, though the larynx had not returned to normal. Two further *cases remained quiescent in the sense that the condition,* while not improving, had not got worse.

Toxic Effects of Streptomycin on the Vestibular Nerve

Dr. J. A. B. THOMAS said that, beginning in 1947, streptomycin was given to a number of patients at Brompton Hospital. The patients were examined at monthly intervals, and a final examination was made after completion of treatment. The symptoms and signs of toxicity were vertigo, nystagmus, and changes in the caloric reactions. It was found that patients receiving 2 g. streptomycin a day were four times more likely to become giddy than those receiving 1 g. a day. The giddiness continued severely in two patients who were over 45; others complained of vertigo after sudden movement, but this symptom usually disappeared after a few months. Nausea was less frequently experienced among the lower dosage group. Nystagmus occurred in 14 out of 22 patients taking 2 g. a day, while out of 43 patients taking 1 g. a day only 7 had nystagmus.

It was impossible to obtain a month-by-month picture of the changes in the caloric reaction. Some of the patients were *very ill; some were transferred to sanatoria,* or had operations; but, where possible, an estimation of the caloric response changes was made at the end of the third month. It appeared *that* 1 g. a day given over a long period produced definite vestibular disturbances, and in these cases the absence of response to slight caloric reaction was the earliest and most frequent change. None of the patients complained of loss of hearing, or of tinnitus, and the upper tone limits remained unchanged throughout the treatment.

Discussion had centred on the site of the lesion, and whether there was recovery from the vestibular damage. Unsteadiness was only experienced by these people when walking in total darkness, or with the eyes shut; some of them had difficulty in making sudden changes of posture. The site of the damage was still unidentified; the signs and symptoms were not typical of either a peripheral or a central lesion. Histological changes had been found in animals given large doses of streptomycin, but further pathological study of the human labyrinth was needed. There was some evidence of partial recovery in a few cases examined 18 months or more after cessation of treatment.

Streptomycin in Pulmonary Tuberculosis

Dr. J. R. BIGNALL said that patients whose bacteria developed resistance were the greatest potential source of spread of the disease. When P.A.S. was given concurrently with streptomycin it greatly increased the value of this antibiotic in the treatment of pulmonary tuberculosis, but *resistance* still occurred in a small proportion of cases and limited chemotherapy. The toxic effects of the combined treatment could *not be ignored, and gastro-intestinal symptoms were common.* Vestibular disturbances, rashes, and fever occurred not infrequently. Appetite was disturbed, and reduction of weight might *continue for as long as P.A.S. was given.* A less toxic and cheaper substitute would be welcome.

Streptomycin was of proved value in acute bronchopneumonic and miliary tuberculosis, and in tuberculosis of the trachea and bronchi. Chronic lesions of the lungs, however, were little affected, and cavities seldom closed with rest in bed and chemotherapy alone. The use of streptomycin in the less severe types of pulmonary tuberculosis could be risky.

The sulphones and thiosemicarbazones—the latter were used extensively on the Continent—had not yet been adequately investigated. At present they appeared to possess no advantage over P.A.S., were less effective than streptomycin, and it was possible that bacterial resistance to them might develop. It was doubtful whether at present their use, other than experi*mentally, was justified. The function of* chemotherapy was not to treat far-advanced disease, or to prepare the patient for operation; it was to eradicate the disease at the earliest stage *at which it could be diagnosed and make present treatment* obsolete. That goal was still very far away.

In some general discussion Mr. GAVIN YOUNG said that he was asked to see a patient who was suffering from a laryngeal condition with apparently extensive tuberculous involvement. It was arranged that he should have a course of streptomycin, and when he saw him again six or eight weeks later the condition had cleared, and the larynx had become practically normal except for the thickening of one cord. He thought it advisable to do a biopsy, and an early carcinoma was revealed. This was something to be kept in mind; it presented an unhappy *problem.*

Mr. J. F. LIPSCOMB gave an account of the treatment of 14 cases of laryngeal tuberculosis with streptomycin in 1948–9. Of

these, 13 were improved and eventually entirely relieved of pain. In some cases the larynx became normal; in others there was thickening. One case did not respond even after 29 g. The dosage was 1 g. a day, given as a single injection. The development of resistant organisms in the treatment of laryngeal tuberculosis was very worrying. He thought that if treatment could be concluded within six weeks—preferably four weeks—resistance was less likely to appear.

Mr. F. C. W. CAPPS said he appreciated Dr. Bignall's warning against indiscriminate use of these potent drugs. He asked whether Professor Ormerod would withhold the use of the drug if the patient was improving by ordinary methods. In cases which were improved but were left with the thickening which had been described, could secondary infection from the upper respiratory tract play some part in keeping up the condition? If the tuberculosis was apparently quiescent, was it permissible to deal with an infected tonsil or sinus?

Mr. A. M. ZAMORA said that there was a danger of being intimidated by the scientific work which was being done on toxicity. He pleaded for the laryngologist to have the full use of this valuable drug.

After some further discussion by Mr. MACKENZIE ROSS, Mr. T. BOYLE, Miss DIX, Mr. E. D. D. DAVIS, and others, Professor ORMEROD, in reply, said that the majority of patients of whom he had spoken were ambulatory; they took home a supply of streptomycin in distilled water, and the doctor in charge or the district nurse did the injections. The patients did perfectly well; there was no need for them to be in hospital, and they came up in three weeks for inspection. Some did return after an interval of some months with signs of recurrence. So far these had been but few, but as the treatment was really only 18 months old it was too soon to say very much. The condition in which the lungs were left made it not impossible that the disease would come back and would be difficult to treat because of a possible minor degree of resistance. With regard to early diagnosis, if the idea could be inculcated, especially in the minds of young people, that continuous hoarseness was a dangerous symptom, perhaps these cases would be seen earlier.

BRITISH NEUROLOGICAL SURGEONS

The Society of British Neurological Surgeons held its forty-first meeting at Manchester on May 19 and 20, 1950, under the presidency of Professor Lambert Rogers. There was a large attendance, including visitors from the United States and several European countries who contributed interesting comments to the discussions. These were on a variety of neurosurgical subjects: "The Late Results of Cordotomy," by J. C. White, of Boston; "Suprasellar Meningiomas," by F. C. Grant, of Philadelphia; and "The Localization of Brain Abscess by Electroencephalography," by G. K. Tutton and Mrs. Whittaker. A notable contribution was a preliminary paper by Sir Hugh Cairns and Dr. Honor Smith on the use of intrathecal tuberculin in the treatment of tuberculous meningitis by streptomycin. Exhibitions of Miss Davison's drawings of pathological specimens and operations, of photographs by the hospital's photographic department, and of angiograms of aneurysms and tumours by Dr. Reid were on view in the new neurosurgical operating and *x*-ray block at the Royal Infirmary.

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY

At a meeting held in Newcastle-upon-Tyne on Friday, June 2, 1950, with the president, Mr. H. Harvey Evers, in the chair, Professor E. FARQUHAR MURRAY reported a case of von Recklinghausen's disease associated with pregnancy. Mr. FRANK E. STABLER then described two cases of recovery from acute yellow atrophy of the liver. Both of these patients had been very ill, and each had been treated with large doses of vitamins given intravenously. An intravenous cocktail consisting of normal saline 1 pint (560 ml.), glucose 10%, aneurin 50 mg., nicotinamide 100 mg., and riboflavin 50 mg. had been administered. Three pints a day of this solution and one pint of saline alone were given. Both patients had made most dramatic recoveries. It was interesting to note that a shrunken liver could increase in size with great rapidity, and it was thought that in this condition individual liver cells could shrink and re-expand. Mr. T. G. ROBINSON described an interesting case of extra-ovarian Brenner tumour. This was at first thought to be a fibroid growing from the left broad ligament, but there was no doubt about its pathology after microscopic slides had been examined. The site of the tumour threw an interesting light on the origin and histogenesis of this condition. Mr. F. J. BURKE read a paper describing 585 cases of vaginal hysterectomy.

Nova et Vetera

A MEDICO-HISTORICAL PILGRIMAGE

At a recent meeting of the Scottish Society of the History of Medicine Professor Richard Shryock, of Baltimore, gave an account of the events which led to the foundation of Johns Hopkins University in that city. He traced the varying attitude towards medical education and practice in the United States during the eighteenth and nineteenth centuries, emphasizing the conflicts between utility and culture and, later, between administration and teaching. The difficulty of securing funds for the establishment of universities could not be solved until the captains of industry became convinced of the utility of such institutions. The cultural value of learning did not impress them. The second conflict, which still existed, arose from the fact that administrators ranked more highly than teachers in both salary and prestige. The establishment of Johns Hopkins University was a brave effort to raise the cultural level and to promote learning for its own sake and not merely for the sake of material gain.

Professor Whitfield Bell, of Philadelphia, then read a paper on the life and work of John Morgan, who, after studying in Edinburgh and on the Continent, returned to the U.S.A. full of honours in 1765 and established the first medical school in the University of Pennsylvania.

The Society, whose president is Dr. Douglas Guthrie, made a pilgrimage to the grave of William Cullen at Kirknewton, to the early home of Robert Liston at Ecclesmachan, and to the Preceptory of the Knights of St. John at Torphichen. Dr. William Cullen, who founded the medical school of Glasgow and later succeeded John Gregory as professor of medicine at Edinburgh, had his country residence near Kirknewton. In recent years his tomb was renovated by the Royal College of Physicians of Edinburgh. Liston, the son of the parish minister of Ecclesmachan, attained great distinction as an anatomist and surgeon. While assisting John Barclay in teaching anatomy at Edinburgh he took part in various "resurrectionist" activities. As the present minister, the Rev. R. L. Pinkerton, explained to the Society during the visit to the church, some evidence of his work came to light during structural repairs to the roof of the manse a few years ago. A young workman fell through some decayed timbers above the attic and, to his surprise and horror, found himself in the arms of a skeleton. He fled from the scene and did not stop running until he reached his home at Linlithgow. The skeleton was afterwards decently interred in the churchyard. The final objective of the pilgrims was Torphichen Priory, now scheduled as an Ancient Monument. Although little of the original building remains, the crossing and transepts, surmounted by a bell tower, still represent the Preceptory, which was established in 1124 and became the chief seat of the Knights Hospitallers of St. John in Scotland. In 1547 the building was transferred into the hands of the Government by the last Preceptor, Sir James Sandilands, an ancestor of the present Lord Torphichen.

Correspondence

Stress and the General Adaptation Syndrome

SIR,—May I congratulate Dr. Ff. Roberts (July 8, p. 104) on another of his masterly displays of the clear, logical mind in action? I must confess that although I have read, as they appeared, most of Professor Hans Selye's articles his last effort (June 17, p. 1383) left me in some mental confusion. It was therefore with relief that I read Dr. Roberts's letter, with its clear analysis of the sources of my confusion. I will not anticipate Professor Selye's reply except to remark that probably one reason for some of the lack of clarity was the close condensation of material, which has by now required a large book to embrace it.

I would take this opportunity of enlarging on one of the points brought out in Dr. Roberts's letter. He remarks on the close identity of diseases responsive to cortisone and *x* rays, and that we could not therefore rationally conclude that *x* rays produced their effects through the hypophysis. Incidentally, the relationship is closer than he states, for A.C.T.H. and cortisone do have a definite though transient action on some forms of malignant disease, particularly leukaemia and Hodgkin's disease. To my mind the striking point is that all these diverse therapeutic agents in these diverse diseases are agents capable of diminishing cell proliferation. In a recent short paper in this *Journal* (May 20, p. 1165) I put forward the hypothesis, on the basis of experimental work, that A.C.T.H. might produce its therapeutic effect by damping down mitosis in the affected tissues. Its apparently ubiquitous action therefore depended on one common factor in the pathology of all the conditions responsive to this therapy—i.e., excessive cell proliferation. In putting forward this hypothesis I had also in mind the therapeutic action of ionizing radiations, particularly of *x* rays, in the various skin disorders accompanied by excessive hyperplasia, and in the local treatment of various types of "rheumatic" joint. The anti-mitotic and mutagenic properties of *x* rays are their only biological actions established with certainty and the only basis on which at present we can begin to formulate a mechanism of their therapeutic action. I also had in mind the effective symptomatic treatment of gout with both colchicine and A.C.T.H. The only known biological effect of colchicine is in its powerful anti-mitotic action. The effect of anti-mitotic agents on neoplastic proliferation is not particularly relevant to the present argument, since excessive proliferation is an accepted main feature of its pathology. The fact that cortisone has also some inhibitory effect here does, however, give further support to its role as an anti-mitotic agent. (I would emphasize, however, that there is no present indication that it is of practical clinical value in this respect.)

If this hypothesis can be raised to the level of a theory then it would alter the whole approach to the mechanism of A.C.T.H. and cortisone therapy in these multifarious diseases. All having one factor—i.e., excessive cell proliferation—in common respond symptomatically in varying degrees to any agents capable of depressing mitosis in the particular tissue or tissues concerned in the pathological reaction. A few such important agents have been mentioned, but others will no doubt spring to mind. For instance the therapeutic effect of coal-tar in skin diseases in which excessive epithelial proliferation is a feature probably depends on its local anti-mitotic effect.

I write thus not primarily to air my own pet hypothesis but to show that the therapeutic action of the gluco-corticoids may depend on a mechanism far removed from and not covered by Professor Selye's concept of the general adaptation syndrome. This would not matter except that he has recently built up further support for his concept largely on the basis of the therapeutic effect of these cortical hormones. As far as I understand it the remainder of the argument derives from the pathological effects in rats of large doses of desoxycorticosterone acetate in the presence of excessive tissue sodium, findings which are of great interest, but in isolation could hardly be used as a basis for a firm aetiological approach to a great mass of human disease. No one can deny that the mineralo-corticoids may be concerned in one or all the diseases mentioned in his article, but I do not imagine that Professor Selye himself would have more than tentatively suggested this as an experimental approach if the dramatic effects of A.C.T.H. and 11-oxysteroid therapy had not been revealed.

As Dr. Roberts states, the general adaptation syndrome is a bold attempt at a monistic pathology. We in Sheffield are very interested in the mechanism of the general reaction to injury, for which we still retain the simple work "shock," and we believe that a precise definition of this word will ultimately be possible from systematic studies of the mechanism of this reaction. When these early stages of the reaction to injury (or stress) are more fully understood, it may then be possible to catch a glimmer of the later stages (if any) embraced by Professor Selye's hypothesis. From what we already know I doubt whether Professor Selye's more recent ideas, even born as they are out of prodigious labours, will survive, *in their present form*, for very long. Nevertheless, his own justification that they will stimulate much new and fruitful work will undoubtedly be realized.—I am, etc.,

Sheffield. H. N. GREEN.

Vaccination and Inoculation Certificates

SIR,—The writer, who has recently returned from a world tour, has realized, as the result of somewhat inconvenient personal experiences, the necessity of paying strict attention to the various regulations made by Eastern governments regarding vaccination and inoculations.

Instructions regarding this matter are being constantly altered without notice, and it is time that some uniform system should be evolved. I understand that this is a matter to which W.H.O. is giving some attention. In addition to vaccination some governments insist on protection against yellow fever and typhus. Therefore it is probably safest to be protected against them all. As regards cholera, it should be emphasized that the Egyptian Government lays more stress upon this than any other and may, on occasions, actually segregate a person who is not thus protected. This inoculation must have been performed six days before landing on Egyptian territory. These regulations apply to passengers in transit as well as visitors to Egypt. On the other hand, little or no attention is paid to inoculation against typhoid, but vaccination is considered to be of paramount importance.

Many governments require inoculation and vaccination certificates to be authenticated and stamped by a Government medical officer or medical officer of health. The reason for this is to ensure that the certificate has been issued by a reputable qualified doctor. As it is not always certain at any time which governments do insist upon this authentication, it is in the passenger's interests for all certificates to be officially stamped.

In view of these complications I think it advisable that the B.M.A. secretariat should maintain an up-to-date dossier of information on the requirements of all the various governments. They would then be in a position to advise medical practitioners about the instructions they should give to their patients prior to their departure abroad by sea or by air.

I also suggest that some notice on the lines of my third paragraph should be widely distributed to all doctors for their information.—I am, etc.,

London, W.1. PHILIP MANSON-BAHR.

Intravenous Morphine

SIR,—Morphine is a drug which is usually administered for the rapid alleviation of pain, or because some degree of mental tranquillity is required. The result of the usual subcutaneous injection of morphine is a gamble, as the amount absorbed in a given time depends among other factors on the dose employed, the depth of subcutaneous fat, and the condition of the circulation.

During the "flying bomb" era a robust man of 40 was admitted to hospital under my care suffering from a severe crush injury of the right leg. He was given morphine ¼ gr. (30 mg.) subcutaneously before the leg could be released. About an hour later the debris was removed, and he was carried to an ambulance; as he was still moaning, another half-grain was administered. Owing to road blocks

and the blackout the journey to hospital (of less than a mile) took about an hour, and on admission he was somewhat restless and in obvious pain, so another half-grain of morphine was injected subcutaneously. When I examined him about half an hour after admission the primary shock was apparently subsiding, as his pulse and blood pressure were approximately normal, but his respirations were eight to the minute, and his pupils pin-point. Amputation was performed without the necessity of an anaesthetic, and the patient made an excellent recovery.

In all probability the absorption of an overdose of morphine when the shock subsided did this patient no harm at all, but had he been suffering from a head or chest injury the effects might have been disastrous. The slow and variable absorption of a subcutaneous injection compares unfavourably with intravenous injections, a fact which is demonstrated in the following case.

I was recently asked by a practitioner to see a feeble old man with bronchitis and myocardial degeneration who had a few hours previously strangulated his right inguinal hernia. On examination the patient was vomiting, groaning with pain and anxiety, and the pulse was barely perceptible. The tense and tender hernia was the size of a coconut, and any attempt at manipulation caused further distress and resentment. Obviously he was in no condition to stand a journey to hospital, and still less was he fit for an operation. An intravenous dose of a quarter of a grain of morphine was administered, and within five minutes the patient was comparatively quiet and co-operative and his musculature was relaxed. A determined attempt at taxis was successful, and a welcome gurgle indicated reduction of the bowel. Recovery was uneventful.

Morphine is a potent drug, and its effects should be controlled as far as possible. Intravenous injection guarantees rapidity of effect, which is commensurate with the condition of the patient and the dose administered. It is therefore urged that the controllable intravenous administration should be used, wherever possible, in preference to the usual problematical subcutaneous injection.—I am, etc.,

London, W.1. R. J. MCNEILL LOVE.

D-tubocurarine Salts and Derivatives

SIR,—Your annotation (June 3, p. 1309) pointed out that the dimethyl ether of D-tubocurarine iodide has some slight advantages over the parent phenolic alkaloid when used to produce muscular relaxation. The paper by Dr. H. O. J. Collier and Mr. R. A. Hall in the same issue (p. 1293) contains some significant facts which appear to have been overlooked in your discussion.

The potency of the dimethyl ether is the problem. It is commonly expressed in terms of the potency of the better-known D-tubocurarine chloride. That the ratio:

$$\frac{\text{potency of dimethyl ether salt}}{\text{potency of D-tubocurarine salt}}$$

varies greatly from species to species is not surprising, as the two substances are of different structures, albeit closely related. The ratio also varies within one species when different methods of testing are used to determine potency—e.g., Collier and his colleagues (1948) give the ratio, determined by abolition of the righting reflex in the rat, as 4, whereas they found it to be 2.4 when determined by toxicity. Of more significance, however, is the fact that the ratio appears to vary within species even with the same type of test. The following are examples of the ratio determined by estimation of LD 50 values in the rat by intravenous and intraperitoneal injection:

I.V. Collier, *et al.* (1948)	2.4
I.V. Glock *et al.* (1948)	3
I.P. Marsh *et al.* (1948)	8.4
I.V. Swanson *et al.* (1949)	3.1
I.V. Unpublished	4.68
I.P. „	4.35

The ratio given by Glock and her colleagues was determined by intravenous injection in small rats of 50–100 g. weight: the actual figure obtained was 2.91 with p95 limits of 2.57–3.29. In large rats of approximately 400 g. we obtained a ratio of 4.68 (p95 limits 3.20–6.85). The last ratio quoted above had p95 limits of 3.72–5.08. Unfortunately we did not note the weights of the rats used in this experiment, for at that time we were not aware of the significant difference which exists between the toxicity of both D-tubocurarine and its dimethyl ether in large and small rats, but we are fairly confident that they were on the large side.

The ratio given by Marsh and his colleagues is obviously about twice any of the others. Of course the rats used by different investigators may have been of different sensitivity to the drugs, but it is unlikely that those who got results of the same order—i.e., ratio of 2–4—used the same strain of rats. It is improbable that the difference is due to variation in absorption, because our results were almost the same whether we used the I.V. or I.P. routes of injection (when the rats were of the same size). The more ominous explanation is that the materials used by different investigators may not be the same substance.

In this connexion it may be of value to record a finding made here some years ago. A sample of material reputed to be D-tubocurarine-O-O-dimethyl ether iodide, made by Dr. Dewing, when examined on the isolated rat diaphragm proved to be slightly more than twice as potent as other samples. Chemical and physical analyses failed to distinguish this extra-potent sample. It was prepared by methylating the crude mother liquors, and not in the more usual way of treating crystalline D-tubocurarine chloride.

The molecule of D-tubocurarine (or its dimethyl ether) is large. It consists of two benzyltetrahydroisoquinoline moieties joined by two ether links. There are two asymmetric carbon atoms, of which one is dextro- and the other laevo-rotatory. These two centres of asymmetry permit the existence of four optical isomers—viz., D- and L-tubocurarine and the metho-salts of D- and L-bebeerine (or, synonymously, D- and L-curine). It is, however, possible to construct more than four forms of this molecule using Fisher–Hirschfelder–Taylor atom models. For each of the four enantiomorphs there are at least two forms, since the bonds of the ether oxygen atoms can occupy different spatial positions and so alter the shape of the molecule. These variations would be difficult to detect by ordinary chemical and physical means.

It is imperative that the utmost caution should be exercised when using a derivative of D-tubocurarine like the dimethyl ether because (1) slight alterations in the structure of this complicated molecule may have profound effects on its biological activity; (2) the ratio of potency of any two derivatives is not necessarily the same for all species; and (3) even in the same species and by the same test the reported activity of the (?) dimethyl ether derivative of D-tubocurarine shows wide variation.—We are, etc.,

The Wellcome Research Laboratories, Beckenham, Kent. G. A. MOGEY. J. W. TREVAN.

REFERENCES

Collier, H. O. J., Paris, S. K., and Woolf, L. I., *Nature, Lond.*, 1948, **161**, 817.
Glock, G. E., Mogey, G. A., and Trevan, J. W., ibid., 1948, **162**, 113.
Marsh, D. F., Sleeth, C. K., and Tucker, E. B., *J. Pharmacol.*, 1948, **93**, 109.
Swanson, E. E., Henderson, F. G., and Chen, K. K., *J. Lab. clin. Med.*, 1949, **34**, 516.

Domiciliary Care of Premature Babies

SIR,—In recent years much stress has been placed on the care of premature babies, particularly since it has been realized that deaths among these infants are a major factor in the total infant mortality. Great emphasis has been placed rightly on the provision of specialized premature-baby units in hospitals. There are, however, circumstances when a premature baby has to be nursed at home, primarily due to the limited hospital accommodation available. The facilities provided by county borough and county councils for domiciliary care have varied considerably, and it is probably true to say that county councils with widely scattered populations have experienced the greatest difficulty in providing additional care for these babies.

It may therefore be of interest to county councils to outline the scheme introduced by Glamorganshire. The problem has been approached from two aspects: (1) provision of specially trained midwives; and (2) provision of additional equipment. In the training of staff the county council is greatly indebted to the Sorrento premature baby unit at Birmingham, where arrangements have been made for midwives to receive instruction during a month's residence at this unit.

Following very considerable discussion, the special equipment provided is of the simplest type and is enclosed in what appears to be a suitcase (24 in. by 12 in. by 6 in.), but which unfolds to become a draught-proof cot. The cot is reinforced by thin metal sheets and has a washable lining. The contents are as follows:

1 sorbo mattress	2 mucus catheters
3 wool cot-blankets	1 Jacques catheter with graduated pipette for feeding
3 rubber hot-water bottles	8 oz. of olive oil
8 oz. of white lint	3 thermometers (cot, rectal, room)
2 measures for dried milk	6 face-masks
1 liquid measure	
8 oz. of cotton-wool	
1 Belcroy feeder	

It is not suggested that this affords a comprehensive list of requirements for the nursing of a premature baby, but it does form a nucleus of essentials, and, what is of considerable importance in a wide area, it is very easily transportable. It may in fact be regarded largely as first-aid equipment, sufficient to care for a baby who has arrived before the normal preparations have been made.

Having available specially trained staff and having provided additional equipment, there still remained administrative difficulties in putting the scheme into operation. It was not considered feasible that a midwife should be concerned only with premature babies, so it was decided that she should retain a small "normal" midwifery practice, but in addition she would be responsible for the premature births for a wider area within a radius of approximately ten miles from her centre.

When a premature baby is born the attending midwife calls in a colleague who has had the specialized training and who also holds the premature baby outfit. Thereafter the specially trained midwife takes complete charge of the case, mother and baby, under, of course, the direction of the general practitioner whose aid must, by regulation, be sought in the case of a premature birth. Whenever feasible the specially trained midwife is called in to carry out the delivery.

A premature baby requires the attendance of the midwife for longer than the usual 14 days—the duration being decided upon by the progress of the infant, and not by its age or weight. Health visitors are encouraged to pay periodic visits to such infants, and in any case their first visit is not delayed until the midwife has completed her period of responsibility.

In practice the scheme works. Midwives have been most ready to work as a team and have suppressed their natural desire to nurse the premature babies occurring in their own districts. It is to be hoped that in the not too distant future all midwives will receive instruction in the modern methods of care of the premature baby, either in their basic training or in postgraduate courses.

It would be difficult to obtain statistical evidence of the value of the scheme in the reduction of infant mortality, but if in the County of Glamorgan one child is saved each year then it can be regarded as a success.

My thanks are due to Ferris and Co., Ltd., Bristol, for their co-operation in the making of the outfit, and also to Dr. W. E. Thomas, County Medical Officer, for permission to publish this account.

—I am, etc.,

Cardiff. R. T. BEVAN.

Carcinoma of the Stomach

SIR,—I was very interested by Mr. H. C. Edwards's paper on carcinoma of the stomach (April 29, p. 973). In a very general manner most of his conclusions are in agreement with our findings published in 1939. In our book there is to be found a detailed study of the many aspects of the fascinating problem that constitutes on one hand the well-established and rather advanced case of gastric cancer, with its peculiar evolution, sometimes rapid and silent and at others noisy and slow, and on the other hand the initial stages of the disease—i.e., ulceriform cancer, transformed ulcer, gastritis and cancer, etc. Exceptional types described as muco-erosive cancers with slow evolution are worthy of note. In this type the malignancy remains localized in the mucosa, spreading very slowly superficially but not in depth, comparable in some ways to the rodent ulcer of the face.

Mr. Edwards's Case 3 (Plate, Fig. 1b)—"The earliest carcinoma of the stomach that he has ever seen"—although sufficiently recent, appears advanced in comparison with many of our early cases diagnosed as cancers pre-operatively. Although it is difficult to be affirmative from only a low-power magnification, it appears that in this case the muscular layer is already involved by malignancy. I am frankly in disagreement with his statement that the differential diagnosis between a benign and a malignant ulcer of the pyloric antrum is pre-operatively impossible. The diagnosis rests, as is developed in our publications, on perfect radiographs taken at regular intervals combined with the clinical symptomatology. A great degree of suspicion is already given in the first series of radiographs by the radiological signs we have described. At the second series, taken after a three- or four-weeks interval, the suspicion generally becomes a certainty, If necessary a third series is taken. A pathognomic sign of malignancy is, in our opinion, the disappearance of the clinical symptoms with the persistence or increase of the radiological signs. Had there been radiographs taken at more frequent intervals in Mr. Edwards's Cases 4, 6, 7, and 8, it is possible that they would have been diagnosed earlier on. I am of the impression that gastric cancer from its start has a rather slow evolution, or at least many forms of it have.

Mr. Edwards is to be congratulated for the stand he makes regarding radical excision for those cases considered inoperable by others. If the operation is not performed the patient has nothing to gain but a few more months of misery. Taking into account the recent advances in abdominal surgery, every hope for a long and useful life is permissible. No one suffers except the surgical statistics, and the advanced cases of gastric cancer should be included in a different group. I hope that Mr. Edwards will forgive my criticisms, as they come from my deep interest in the subject.—I am, etc.,

Limassol, Cyprus. T. J. PERISTIANY.

BIBLIOGRAPHY

Gutmann, R. A., Bertrand, I., and Peristiany, I. J., *Le Cancer de l'Estomac au Début*, 1939. Paris.
Peristiany, T. J., *Le Cancer Ulcériforme de l'Estomac*, 1937, Thesis, Paris.
Gutmann, R. A., report, International Congress of Gastro-enterology, 1937.
Bertrand, I., report, International Congress of Gastro-enterology, 1937.
Gutmann, R. A., and Peristiany, T. J., *Bull. Mém. Soc. Rad. Méd. France*, Jan., 1937, p. 5.

Hodgkin's Disease and Pregnancy

SIR,—We were interested to read the correspondence on Hodgkin's disease of pregnancy (May 13, p. 1142; June 3, p. 1322; July 1, p. 47) and would like to quote the following case.

In April, 1949, one of us (J. R. H.) saw a European woman of 25 years who gave a history of nine weeks' amenorrhoea. Pregnancy was diagnosed on examination. It was also noticed that the second and third ribs bulged parasternally, and this area was dull to percussion. The right external jugular vein was filled. Three rubbery glands were felt in the right posterior triangle. The liver edge was palpable, but the spleen was not felt.

She gave a history of having enlarged cervical glands for two years; one of these glands had been taken for biopsy in Europe (result not known). She also said that there had been a shadow in the upper part of the right lung, on x-ray examination. An x-ray film of her chest in April showed a large mediastinal mass. Her blood count was as follows: Hb, 88%; R.B.C., 4.3 million per c.mm.; W.B.C., 5,800 per c.mm. (polymorphs 60%, lymphocytes 34%, eosinophils 2%, monocytes 4%).

A clinical diagnosis of Hodgkin's disease was made. In view of the fact that she had been married only three months and that both she and her husband wanted a child, it was decided to allow the pregnancy to continue. During the course of her pregnancy she developed several brown patches on her right upper arm and right knee. The patches were sharply demarcated, not raised or infiltrated or scaling. They did not disappear on pressure. They were more or less circular in shape and varied in size from ¼ in. to 1 in. in diameter (1.3 to 2.5 cm.).

On August 23 she developed severe pain in the back in the region of the 2nd to 4th ribs posteriorly and down the outside of the right arm. On examination the right biceps reflex was diminished and there was a slight hypoalgesia of the fourth and fifth fingers. It was decided to attempt relief by irradiating the mediastinal mass. The treatment was undertaken by one of us (J. W. W.). After one week's irradiation the pain had completely disappeared, although observation of the mediastinal mass then and during the following

months showed little alteration in size. The mass on screening did not appear to encroach on the brachial plexus.

The remainder of the pregnancy was uneventful except that she remained at the same weight the whole time. Three weeks before term she had a slight loss of blood per vaginam, which did not recur. At term she was delivered normally of an 8 lb. (3.6 kg.) male child, which was weaned from the breast and is now eight months old, weighing 18 lb. (8.2 kg.).

After delivery a large mass of glands appeared on the left side of the neck, rapidly increasing in size. During February and March, 1950, a further course of treatment was given to the mediastinal mass and to the cervical glands. The latter regressed completely, but again there was little observable effect in the mediastinal mass. At the beginning of June, 1950, the pain in the right arm reappeared and a small freely movable gland became palpable on the right side of the neck anteriorly. This is at the moment being irradiated. The mediastinal mass is apparently unchanged. No glands are palpable apart from the small one in the right cervical region.

Two interesting points which this case illustrates are: first, the fact that pregnancy in Hodgkin's disease is usually associated with mediastinal involvement; secondly, that during the whole of the pregnancy no exacerbation of symptoms occurred.—We are, etc.,

J. R. HARRIES.
J. W. WINCHESTER.

Singapore.

Norms of Cerebrospinal Fluid

SIR,—The paper by Mr. W. R. Henderson and Dr. C. G. de Gutiérrez-Mahoney *on cerebrospinal fluid in 302 cases of intracranial tumour, abscess, and subdural haematoma* (June 24, *p. 1461*) *is interesting* in many points. The authors emphasize quite rightly that a pathological cerebrospinal fluid may be only "characteristic" of a tumour, etc., without being "specific," but emphasize that an examination of the fluid as a preliminary investigation has nevertheless its value, in order to confirm or exclude a possible organic disorder of the nervous system. This is a very important point indeed, but I find it rather difficult to agree to their statement that the total protein content of a cerebrospinal fluid may be as high as 60 mg. per 100 ml. According to Mestrezat (1912), one of the pioneers in the field of research on the cerebrospinal fluid, the upper limit of total protein is usually 25 mg. per 100 ml., and only in very exceptional circumstances it may be 30 mg. (but one wonders whether the three persons quoted by him as such exceptions were "normal"). Hewitt (1927) thinks that the normal protein content is about 23 mg. per 100 ml. Lange (1939) and Neel (1939) assume that 25 mg. per 100 ml. is the upper limit, and my own experience agrees with these figures. If one accepts them it will be seen that only very few patients referred to in Table I by Henderson and Gutiérrez-Mahoney had normal cerebrospinal fluids.

It may be worth while to mention on this occasion that the cell content of a normal cerebrospinal fluid is one in 3 c.mm. (Neel), three in 3 c.mm. (Lange). I find that four cells in 3 c.mm. is the upper limit of the norm. Such a low "normality" for total protein and cells is possibly too rigid a measure for the neurologist; for the psychiatrist it is a necessity.—I am, etc.,

H. H. FLEISCHHACKER.

Shenley, near St. Albans.

REFERENCES

Fleischhacker, H. H. (1945). *J. ment. Sci.*, **91**, 353.
Hewitt, L. F. (1927). *Brit. J. exper. Path.*, **8**, 84.
Lange, C. (1939). *Amer. J. Syph.*, **23**, 638.
Mestrezat, W. (1912). *Le Liquide Céphalo-Rachidien.* Maloine, Paris.
Neel, A. V. (1939). *The Contents of Cells and Proteins in the Normal Cerebrospinal Fluid.* Levin and Munksgaard, Copenhagen.

Premedication for Gastroscopy

SIR,—The ideal preparation for gastroscopy is a matter about which there are many opinions. For a long time I was in the habit of using morphine 1/6 gr. (11 mg.) one and a half hours before gastroscopy, but for the last 130 cases I have used pethidine 100 mg. with scopolamine 1/150 gr. (0.4 mg.) intramuscularly. (In either case a tablet of "decicain" 50 mg. is given under the tongue half an hour before gastroscopy.)

I have found this latter method of premedication preferable to any other so far tried inasmuch as it produces sufficient sedation and relaxation to make instrumentation generally easy without depriving the patient of the ability to co-operate during endoscopy or rendering him so drowsy afterwards that any untoward post-endoscopy symptoms might be late in appearing. Furthermore it is entirely suitable for out-patients, who can leave the hospital within three hours of gastroscopy.

The number of patients (roughly 5%) in whom oesophageal spasm precludes gastroscopy is about the same in my series whatever method of sedation is used.—I am, etc.,

C. F. J. CROPPER,
Senior Physician.

Ministry of Pensions Hospital, Worcester.

The Dumping Syndrome

SIR,—I have read with very great interest Mr. Thomas O'Neill's communication (*July 1, p. 15*) *on the* "Dumping *Syndrome*," and I would like to endorse his remarks that the condition presents a serious challenge to all who practise the *operation of partial gastrectomy. In the assessment* of cases it is very difficult to differentiate between organic and functional symptoms. I think, however, that no advance can be made until two distinct syndromes are recognized:

1. *An early syndrome*—which occurs during or immediately after a meal and is believed to be mechanical in origin. This rarely follows gastro-enterostomy but is seen in 10% to 15% of cases after gastrectomy. This particular variety of the syndrome may persist for many years and presents the major problem.

2. A delayed syndrome—which occurs during the second or third hours following meals and is considered to be due to and coincident with reactive hypoglycaemia. This is less frequent than the early syndrome and does not present such a problem, as the condition tends to disappear spontaneously. Almost half the patients who exhibit this syndrome after gastrectomy have similar symptoms before operation.

With regard to the operative procedure described by Mr. O'Neill, surely it is the original procedure performed by Hoffmeister in 1908—a valvular anastomosis with a central stoma?

Finally, "dumping" is essentially a radiological term, and I do not think that there is any justifiable pathological basis for its use to describe a clinical syndrome the cause of which is probably not due to any single factor.—I am, etc.,

T. J. BUTLER.

Bristol.

Obstetrical Anaesthesia

SIR,—In regard to Dr. A. H. Morley's letter (July 1, p. 47) in criticism of Professor Jeffcoate's statement that "light chloroform anaesthesia has much to commend it for easy low forceps delivery in domiciliary practice," may I be permitted a few disjointed comments? He asks, "How many expert anaesthetists would choose to administer chloroform for any operative procedure during labour?" My comment would be that I have administered chloroform in all minor and major operative procedures in labour conducted by myself, all in the left lateral position—and a goodly number to wit—and the results show not one single case of primary cardiac failure in the whole series. One case collapsed following a difficult delivery due to the use of pituitary extract, and this was in 1926.

What are the criteria for care in chloroform anaesthesia? Training in the use of the drug, appreciation of any dangers which might occur, and correct treatment when you are unfortunate enough to meet misfortune. What is the alternative to chloroform in the case of the usual domiciliary midwifery where a fire is burning—the fire not only for heating the room—and the practitioner single-handed? Are patients in better condition after ether, can it be used with an open fire, and is it easy to administer single-handed and still conduct a difficult delivery? Trichlorethylene might take its place, but how shall we obtain relaxation, which is surely a necessity if the labour is really difficult and we are to do as little damage as possible? N_2O has the same objection, while thiopentone is surely contra-indicated in this type of work if for only one reason alone—the ease of vomiting occurring with thiopentone, with no warning in patients strongly addicted to this process.

I would commend Dr. Morley's positioning in domiciliary midwifery, particularly in general anaesthesia, as sound and proved by experience. In regard to chloroform in these same conditions, has it not also passed the test of time? It is agreed that the pregnant woman takes chloroform well, and having seen neither cardiac failure nor liver toxicity following the use of this agent in home midwifery I feel we should be careful before we condemn and before we can give the G.P. an agent which is as safe, as easy to give, or as effective. Perhaps Dr. Morley could suggest a simple technique which could replace chloroform in midwifery, and if so we would all be glad to hear from him.—I am, etc.,

J. G. WARNOCK,
Senior Anaesthetist, Tees-side Group.

Middlesbrough.

SIR,—A great deal has been written of late regarding anaesthesia in caesarean section, and both mother and baby have benefited greatly by the strides that have been made in this field. The advent of curare and similar muscular relaxants, with their reluctance to cross the placenta, have greatly decreased the chance of depressing the infant's respirations, by enabling a much lighter plane of anaesthesia to be maintained. Even in the occasional case where mild depression still occurs, the improved methods of resuscitation have greatly lessened the hazard. However, in all the recent literature on the subject we see little emphasis being placed upon the matter of speed in carrying out the operation, and I regard this factor as being of paramount importance.

In this department, which deals with most of the abnormal obstetrics in Herefordshire, our success as borne out by our figures is in my opinion mostly due to a complete understanding and teamwork between obstetrician and anaesthetist. The patient is brought conscious into the theatre, a procedure which in my experience causes no mental disturbance whatever, provided it is not clumsily handled. While the towels are being placed in position the anaesthetist is quietly chatting to the patient and making use of whatever personality he or she may have. When the stage is set, anaesthesia is established with a mixture of thiopentone and "syncurine" intravenously, and controlled respiration is established, using pure oxygen and avoiding any carbon dioxide absorption. The knife, already poised, can make its first incision in about one minute from now, and on the average a loudly complaining infant is handed to the waiting nurse two minutes later. It seems that the infinitesimal quantity of thiopentone that crosses the placenta in these three important minutes is of no significance to the infant. All (except the mother) can now breathe freely, and the second part of the operation can be concluded as a leisurely laparotomy, preferably under cyclopropane, to assist the uterine contraction.

The reasonable operation speed mentioned is not achieved by haste but by wasting no time, and by the avoidance of the following delays: (1) tying-off clamped blood-vessels on the way in; (2) any unnecessary packing; (3) any unnecessary conversation, including detailed lectures and demonstrations to juniors during the vital minutes. This must not be construed as a criticism of surgical technique, but as an attempt to emphasize the vital importance of cutting down to the absolute minimum the time during which an anaesthetic agent is mounting an offensive against a babe unborn.—I am, etc.,

THOMAS F. HEAVEY,
Anaesthetist.

County Hospital, Hereford.

Failed Forceps

SIR,—May I make two comments on Dr. Derek Freeth's interesting paper (July 1, p. 18)?—one in agreement, one not. Dr. Freeth ascribes prolapse after failed forceps to undue stretching of the "uterine supports, particularly Mackenrodt's ligaments," which, he says, "not infrequently . . . remain permanently stretched" so that "prolapse follows." The idea that extrusion of viscera is permitted by the pelvis in virtue of some lesion of the paracervical tissue is, of course, not new. It was put forward by Salmond and Dearnley in 1935,[1] and much earlier by W. E. Fothergill,[2] with whom I had a great battle.[3] The idea, however, is highly imaginary and quite unscientific. It does not fit in with the common occurrence of prolapse latish in life—about 50—the predisposing cause of which certainly is a confinement occurring perhaps twenty-five years before. And am I not right in stating that Mackenrodt's "ligaments" only simulate ligaments in the non-pregnant, and that in late pregnancy all the pelvic visceral connective-tissue thickenings disappear, becoming succulent and loose, thus explaining the mobility of all the pelvic viscera so that the bladder during labour is easily displaced from the pelvis into the lower abdomen?

After forceps delivery under spinal anaesthesia, episiotomy having been performed on one side and perhaps on both, with the patient in the lithotomy position, I have not infrequently seen the cervix presenting as a fringe almost within the now extremely big and even frightening introitus. Next morning, however, the picture is changed. The levator ani muscles, paralysed by the spinal, which after the delivery permitted the introitus to look so terrible, so that at times two fists in apposition could with ease be thrust through into the pelvis, have now regained their tone, and are behaving as in the normal. One advantage of spinal is that these muscles, paralysed, yield during the extraction and thus are less likely to get torn; whereas with most other anaesthetics their resistance to distension is not always in complete abeyance, so that they tear rather than yield.

Inguinal, femoral, obturator, umbilical, lumbar, incisional, and diaphragmatic hernia—not one of these is determined by a relaxation or an undue stretching of the connective tissue attachments of the visceral part involved. When will obstetricians realize that genital prolapse is a hernia?

My other comment is to say how whole-heartedly I endorse Dr. Freeth's plea for the performance of lower segment caesarean section in cases of failed forceps. But here, also, is a fly in the ointment. He appears to base his recommendation on the use of chemotherapy: I do so on the free use of chlorine as a wash and a douche. Semmelweiss cut down the maternal mortality by a half or more by using chlorine, or a solution acting in virtue of it. He did so by making his students wash their hands in such a solution before they examined the patients. I have kept my mortality and morbidity down by thoroughly douching the vagina with chlorine, both in the ward and sometimes again in the theatre before operation; and, after the operation, twice a day for three days and once a day for the rest of the week. Naturally, I use this most effective and precious stuff in my cases of forceps delivery, before and after, voluminously and repeatedly. My results in both cases justified my procedure.

I must cut short my letter. There are two things to say. One, that the advent of chemotherapy, not available when I started, is likely to make obstetricians less strict with their asepsis; and two, that in midwifery with chlorine, and the other usual measures, provided the patient is not already dying and has not some internal lethal state, one can do anything.—I am, etc.,

R. H. PARAMORE.

Rugby.

REFERENCES

1 Salmond, M., and Dearnley, G., *J. Obstet. Gynaec. Brit. Emp.*, 1935, **42**, 623.
2 Fothergill, W. E., *Proc. roy. Soc. Med.*, 1908, **1** (Obst. & Gyn. Sect.), 43.
3 Paramore, R. H., ibid, 1908, **1**, 195.

Dangerous "Prams"

SIR,—I am becoming increasingly concerned about the number of accidents to babies which occur as a result of the construction of the "pram." Mothers are constantly bringing bruised and shaken babies to me because the pram has tipped up with the baby inside. I feel that the very short wheelbase of the pram is the causative factor: very often the wheels actually overlap, and it seems that the more expensive the pram the shorter the wheelbase and the greater consequent liability to accident.

Perhaps it would be going too far to demand a Board of Trade certificate of pavement-worthiness, but I do feel that the safety of our babies should be more adequately considered.—I am, etc.,

DAVID THOMAS.

London, S.W.3.

St. John's Hospital, Lewisham

SIR,—St. John's Hospital, Lewisham, which has been for nearly 70 years a complete general hospital, serving a population of a quarter of a million, is now threatened with dismemberment. This means that St. John's will lose in-patient facilities for six departments of medicine and surgery—viz., gynaecology, dermatology, urology, orthopaedics, E.N.T., and psychiatry; and, in addition, children's beds are to be reduced by over half. Apart from the elimination thereby of its role as a general hospital, its efficiency and ultimate survival are menaced, and the

community will be deprived of that free and alternative choice of opinion and treatment which it has hitherto enjoyed. This step is at complete variance with the promise of the Minister and his instructions to the regional board (R.H.B. (49) 132).

This is no isolated threat, but one that confronts many hospitals of similar size throughout the country. Such hospitals as St. John's have performed useful work to the community because of their completeness. Dismemberment can only be a retrograde step and should be energetically resisted. I urge these hospitals to take action before they are destroyed.—I am, etc.,

London, W.1. JOHN HOWKINS.

POINTS FROM LETTERS

Inoculation and Paraplegia

Dr. C. H. REINHOLD (Colonel, I.M.S., retired) writes: The article and leading article on "Inoculation and Poliomyelitis" in the *Journal* of July 1 reminds me of a parallel case in India fifteen or more years ago, though the victim then was an adult and the inoculation was the prophylactic for rabies. The patient was not mine and I did not see him during the illness, so I do not know all the details, but both he and his wife were treated as a precautionary measure when their dog got rabies and was tended by them both with great devotion. The lady had no ill effects, but her husband developed a paraplegia and was gravely ill for several days and bed-ridden for months. He has made a slow but steady recovery, and can now walk without a stick, though he easily tires, and has put in many years of useful work since. . . . Can this case in any way be squared with the researches recorded in the interesting paper by Professor Bradford Hill and Dr. Knowelden?

Smallpox in the Unvaccinated

Dr. W. A. MACKAY (Southport) writes: With passing years memory and, perchance, mentality depreciate, and I trust I am not doing Dr. J. S. Gemmill (July 8, p. 107) injustice when I demur strongly to his statement "haematemesis at the outset of her illness did not justify a diagnosis of smallpox even to be entertained in the first instance." About 1892, and by the bedside in the Glasgow Smallpox Hospital, Dr. R. S. Thompson taught me that smallpox might have a petechial rash—the variolar triangle with its base across the lower abdomen—and not the usual eruption, and might be accompanied by various bleedings. Further, in French's *Index of Main Symptoms* (third edition, p. 265) malignant variola is noted as a cause of haematemesis.

The General Adaptation Syndrome

Dr. A. WESLEY HILL (Wrexham) writes: One question I should like to ask is, Why is damage divorced from stress and coupled with defence? I think that stress means nothing from the point of view of organized response, apart from the damage it causes. To me stress is a mental concept to which I am comparatively indifferent until it begins to produce in me damage. There appears to me, therefore, no sense in calling stress the interaction between damage and defence . . . it seems to me that the plain biological meaning of stress is that it can cause damage, and that only when it does cause damage does the living organism react as best it can. In the next place I would not include "alarm reaction" and "stage of exhaustion" in the general adaptation syndrome. So far as I can understand the oration, "alarm reaction" is not reaction at all but the biological retreat before a sudden onslaught of damaging stress. It is then that the damage caused by stress takes place, because the organism has not yet arrayed its forces and adapted them to the battle.

Naming of Cancer Hospitals

Dr. BENTLEY PHILLIPS (London, W.1) writes: I should like to bring to your notice on humanitarian grounds the unnecessary anxiety which is bestowed upon patients by bad psychology in the naming of hospitals which specialize in the treatment of neoplastic growths. A highly unpleasant shock is administered to the average patient when told that he or she is being referred to a cancer hospital. The result generally calls for a considerable amount of discussion, "hedging," and reassurance by the doctor referring the case for examination and diagnosis, but in spite of this I am of the opinion that the majority of patients are convinced that the doctor is "breaking it gently" and that in actual fact a death-warrant is being issued. . . . Could not a name such as "radium and *x*-ray hospital," "radiotherapy hospital," or "tumour clinic" be substituted? . . . The real answer to this problem is, of course, better education of the public in order to eradicate the fear of cancer, but until the welcome arrival of that era I contend that it is an unnecessary cruelty to retain the fearsome name "cancer hospital."

Obituary

H. C. BAZETT, C.B.E., *M.C.*, M.D., F.R.C.S.

Dr. H. C. Bazett, Professor of Physiology at the University of Pennsylvania since 1921, died on July 12 on board the *Queen Mary* bound for Southampton. Dr. Bazett was 65.

Henry Cuthbert Bazett was born at Gravesend in 1885, the son of Dr. Henry Bazett. He was educated at Dover College, at Wadham College, Oxford, and at St. Thomas's Hospital. He took his B.A. in 1908 and graduated B.M., B.Ch. two years later, proceeding D.M. in 1920. He took the F.R.C.S. in 1911. At St. Thomas's Hospital he won the Cheselden Medal, and he was successively house-surgeon, casualty officer, and clinical assistant to the throat and ear department. After completing his next appointment as demonstrator in physiology he won the Radcliffe Travelling Fellowship in 1912 and spent twelve months doing postgraduate work at Harvard. He returned to this country not long before the outbreak of the 1914–18 war and became a demonstrator in pathology at Oxford. Subsequently he served in France with the R.A.M.C. and was awarded the M.C. and three times mentioned in dispatches. He was demobilized with the rank of major and he was also awarded the O.B.E. From 1919 Dr. Bazett was the Christopher Welch lecturer in clinical physiology at Oxford, and then in 1921 he was appointed professor of physiology at Pennsylvania University, the post which he still held at the time of his death.

During the recent war Professor Bazett was given leave of absence and acted as visiting professor of medical research at the University of Toronto from 1941 to 1943. He was in charge of aviation medical research there after the tragic death of Sir Frederick Banting. Professor Bazett was an authority on problems of temperature control and blood circulation. He was himself the subject for much of the detailed work he did on human physiology. When he was studying the control of temperature in relation to changes in the peripheral vessels he often affixed a number of thermocouples to his own arm, each of them being attached to a different galvanometer. He contributed the section on circulation to *Macleod's Physiology in Modern Medicine* in 1938 for the eighth edition and in 1941 for a later edition. He had acted as consultant to the Military Planning Division of the Office of the Quartermaster-General in Washington, and in Canada and the United States he served on a number of important wartime committees on physiological problems. In 1944 he was temporarily attached to the Medical Research Council in this country, and he undertook some special duties for the Admiralty, visiting India in this connexion. He was also at the Royal Aircraft Establishment, Farnborough, for a time, again working on some of the aviation problems which had first engaged his attention at the end of the 1914–18 war. He was awarded the C.B.E. in 1946, and other honours and distinctions came his way in the years immediately following the war.

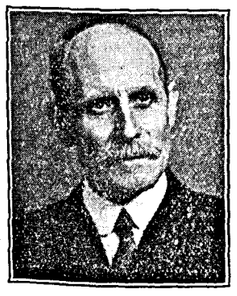
In 1917 he married Miss Dorothy Rufford Livesey, who survives him with one son and one daughter.

J. G. G. writes: May I add a word of personal appreciation of a man whose friendship I valued highly. I first met Cuthbert Bazett during the retreat from Mons in 1914, and remember well the stimulus that his bright, courageous spirit brought to our tired and dispirited field ambulance. Soon after this, during the fighting on the Aisne, our C.O., the late Colonel G. T. K. Maurice, said of him: "Bazett is the most gallant fellow I have ever met." On a later occasion, in the loose fighting near Béthune, he went out on a bicycle, armed only with a whistle, and collected two fully armed Uhlans who had got cut off behind our front line. He seemed entirely fearless, but never reckless, though sometimes, when trying to follow him on horseback or later when driving with him in his baby Morris car, one was tempted to think otherwise. It was characteristic of him that, in spite of his special surgical qualifications, nothing less than an appendicular abscess could dislodge him from the perilous job of battalion M.O. in front of Ypres. Later in that war he did valuable work on the physiology of flying at high altitudes. His main academic work, the application of physiology to clinical problems, found a fitting culmination in the work he did during the last war in Canada, England, and India. During those years his spirit seemed as young and his mind as active as ever, but physically he was older and felt the strain of long journeys and tiring days. Conversation with Bazett was always stimulating. His mind was teeming with fresh ideas which he never seemed to have quite time to express fully. His views on any subject were always original and worth serious consideration even when they were put forward in a witty phrase or two. He was a wise counsellor whose advice was sought by old and young alike, and the complete sincerity of his nature made his friendship specially valued by his younger colleagues. His was an unusual and altogether delightful character.

EDWIN MATTHEW, M.D., F.R.C.P.Ed.

Dr. Edwin Matthew, who died at his home in Edinburgh on July 7, was appointed to the Moncrieff Arnott chair of clinical medicine in the University of Edinburgh in 1935. A native of Aberdeen, he took his M.A. at the university there in 1899, but thereafter his life was spent in Edinburgh.

At the close of a notable undergraduate career, which included a Vans Dunlop Scholarship, Edwin Matthew graduated M.B., C.M. with first-class honours in 1897, obtaining the much-prized Ettles Scholarship, which is awarded to the best student of the year. After qualification he held the posts of house-physician in Edinburgh Royal Infirmary, under Professor Sir Thomas Fraser, and in the Edinburgh Royal Hospital for Sick Children. He proceeded M.D. in 1908 with the added distinction of a gold medal, and in 1906 he had been elected a Fellow of the Royal College of Physicians of Edinburgh. For nearly 20 years he was physician to Leith Hospital and afterwards physician consultant. He became an assistant physician at the Edinburgh Royal Infirmary in 1909, and physician from 1921 to 1934. Then for a further two years he held the Moncrieff Arnott professorship in clinical medicine, in succession to Professor Edwin Bramwell. For several years he was an examiner in medicine in the University of St. Andrews, and for five years from 1933 he was a member of the General Medical Council.



Matthew was a staunch individualist and a strong upholder of the extramural Edinburgh School of Medicine of the Royal Colleges, giving the systematic lectures on medicine for many years. He possessed a singularly acute mind, with an unusual power of rapid mental assimilation. He once said, not in a boastful spirit but rather as deprecating any personal credit for a natural gift, that on reading once his lecture notes as a student, or a chapter in a book, the contents were fixed in his memory. He was a very successful clinician, with a large following of students, who appreciated the clearness and decisiveness of his teaching. His residents and students knew, often gratefully from practical experience, that they could count upon his support at any time, and that he would never "let them down" if he could possibly avoid it. He was emphatic that every physician should maintain a wide knowledge of general medicine. He was especially interested in the problems of kidney disease and of hypertension, and he inspired the work of many of his assistants in these directions. Matthew had a large private consulting practice in spite of, or perhaps to some extent because of, a dictatorial manner, for his patients recognized his excellence as a physician and his character as a man. He was responsible for numerous acts of generosity, which he tried, often successfully, to conceal.

He is survived by a widow, a daughter, and two sons, one of whom is also a physician.

Dr. JAMES CARSLAW, of Glasgow, died on April 14. For some years he had been living in semi-retirement, though many friends and colleagues still sought his opinion from time to time on particularly obscure cases. Dr. Carslaw was born in 1868, the third son of the late Rev. W. H. Carslaw. He was educated at Larchfield School, Helensburgh, and at Glasgow Academy. At the University of Glasgow he had an exceptional career, graduating M.A. and M.B., C.M. with honours in 1892. He spent a year in the Western Infirmary as a resident, first with Sir William Gairdner and then with Sir Hector Cameron. Thereafter he went to Paisley as assistant to the late Dr. Fraser. Soon, however, his clinical and teaching abilities were recognized by Sir William Gairdner, then regius professor of medicine, and he made Carslaw one of his assistants at the University and in his wards at the Western Infirmary. On Sir William's retirement he became assistant to Professor Ralph Stockman and worked with him until he was given wards of his own in succession to Dr. William McLennan. In the 1914–18 war Dr. Carslaw served as a captain, R.A.M.C., attached to the Scottish General Hospital at Stobhill. In the 1939–45 war he gave help to a number of medical boards, and it was characteristic of the man that he returned to teach at the Western Infirmary where the staff had been much depleted. His mental activity and acute clinical acumen and judgment were greatly admired by all who worked with him then. Tall, and invariably immaculately dressed, Dr. Carslaw had a commanding presence and striking personality. The first impression of austerity was quickly dispelled by his keen yet kindly sense of humour. Painstaking and intensely thorough in all that he did, he demanded a high standard from his staff. He showed an infinite capacity for kindness and generosity to all under his care which endeared him to his colleagues and made him beloved by his patients. Dr. Carslaw's eminence was largely due to his profound knowledge of the art of clinical medicine; a knowledge which he had acquired from his long experience with Sir William Gairdner and from his own acute observation and wide reading. His reputation spread far beyond Scotland, and for many years he was responsible for the organization of postgraduate medical study in Glasgow. He did not write much for the journals, but what he did write was always based on most careful clinical studies. His chief interests lay in disorders of the liver and spleen and of the blood. From his association with Professor Stockman could be traced his great interest in, and knowledge of, the rheumatic diseases. In speech he was slow but to the point, and the

Association of Physicians of Great Britain and Ireland always listened with close attention whenever he spoke. He was a fine physician, and learned in the older and now almost unused medical languages—Latin and Greek. His use and pronunciation of these languages was meticulous, as his staff soon learnt. He belonged to an age of culture which developed the use of the fingers, ears, and eyes to the highest levels of skill; which observed, learned, and thought, and built up a tradition much to be honoured. His widow survives him, and to her and their family the sympathy of all his friends will be extended.—D. S. S.

Dr. HENRY GEORGE BIDDLE, of Stradbroke, Diss, Norfolk, died at his home on June 7 at the age of 83. Dr. Biddle was typical of the old school of family doctor, a beloved friend to his patients and to his colleagues, a genial personality who will always be remembered with affection. Belonging to a family of doctors, he was the son of Dr. Henry Cooper Biddle, of Edmonton. He was educated at Charterhouse and Guy's Hospital, where he qualified in 1892. Before going to Stradbroke in 1913 he was in practice at Broadstairs, and was medical officer to the Whittuck Convalescent Home for Children. He had been a member of the British Medical Association for many years, and in 1922 he was chairman of the South Suffolk Division. Outside his work, lawn tennis was a life-long interest, and first as player and later as an official he was a familiar figure at Suffolk tournaments and county meetings.—W. P. G.

Mr. GEORGE MUNN GRAY, who died in London on June 16, was one of the most distinguished medical men who have ever practised in Nigeria. A graduate of Glasgow University in 1904, he proceeded M.D. in 1909 and took the F.R.C.S. two years later. Soon after joining the West African medical staff he was posted to Southern Nigeria. After serving for two terms there he returned and went into private practice in Lagos, then the capital of Southern Nigeria, where he built a hospital. Gray's success was immediate, and he built up a large practice as his reputation spread throughout Nigeria and the adjoining territories. After the 1914–18 war he took a partner, Mr. Aitken, who unfortunately lost his life whilst bathing in the surf at Lagos about 1930. Gray and Aitken were both skilled and successful surgeons, and the Government of Nigeria recognized this by appointing them consultants and later by taking over the private hospital Gray founded, now known as the Creek Hospital, Lagos. Mr. Gray left Nigeria shortly before the outbreak of war in 1939.

E. C. B. writes: Not only was Gray a most skilled surgeon who will long be remembered by a very large number of grateful patients, including the writer, he was also a most generous and lovable man, and he had hosts of friends in Nigeria and elsewhere. He was a prominent freemason and held high office, being Grand Master of Nigeria at one time. We mourn the loss of a truly great man.

Dr. EDWARD LOUIS VINCENT FITCH, of Cleator Moor, Cumberland, lost his life in a boating accident on June 17. A student of University College, London, and Liverpool University, he took the conjoint diploma in 1938 and was for a time casualty officer at the Royal Infirmary, Preston. Subsequently he was a medical officer with the Friends' Relief Service and with Unrra.

J. S. writes: Dr. Louis Fitch was one of a party bird-watching in a small boat on June 17, when an engine failure led to shipwreck and disaster. Dr. Fitch was able to get ashore, but returned to the boat to rescue others and then lost his life. His manner of dying was in the character of his living. As a practitioner he worked ceaselessly and devoted all his great energy to a people still suffering from the after-effects of pre-war poverty, unemployment, and social neglect. It is gratifying to be able to record that his patients had quickly learned to appreciate and love their new doctor, for Fitch had only been in Cumberland some two or three years. He was a man of wide interests and deep culture: music, literature, and the natural sciences all had their place in his busy life. As a friend he was a great stimulus to all who knew him. Our profession has lost a man who was one of its ornaments, and we, his friends, have suffered a bitter loss.

Dr. WILLIAM HENRY O'GRADY, of Louisburgh, County Mayo, died on June 22 at the age of 66. He was the son of the late William and Mrs. O'Grady of Louisburgh, and he was educated at St. Jarlath's College, Tuam, and Prior Park, Bath. A student at University College, Dublin, and at Edinburgh, he qualified in 1914. He went to Louisburgh as medical officer of health, a post which he held until his death. In addition he was medical officer of health of Clare Island until a year ago. In 1915 he was decorated by the Danish Government for the help and assistance he gave to Danish seamen on Clare Island.

D. F. McC. and C. B. O'H. write: Seldom have we known a man so universally loved and respected as Dr. O'Grady. He was held in the highest esteem by colleagues and patients. He never spoke an unkind word of anybody, and his kindness and charity were unbounded. He was known far beyond the confines of his district, and we all enjoyed his hospitality, his kindly humour, and his fund of anecdotes. On many occasions he risked his life to attend to Clare Island patients in rough seas and gales, though he made little of the risk involved. His chief hobby was his work, but he was also keenly interested in fishing and gardening. He is survived by his wife and his only daughter, to both of whom we offer our sympathy. He was a doctor of the old school, and one whom it will be impossible to replace.

Dr. HENRY JAMES THOMSON, who died suddenly when on holiday at Spey Bay on July 4, was a student at Aberdeen University. He graduated M.B., Ch.B. in 1910, proceeding M.D. in 1924, and took the M.R.C.O.G. in 1933. Soon after qualifying, Dr. Thomson acted as house-surgeon to the late Professor Stevenson. In 1918 he was appointed child-welfare officer to the County of Lanark, the first appointment of this character in Scotland. In the following year an obstetrical service was established in the county, and Dr. Thomson became physician superintendent of this service, a position he held until his death. At the outset the prospects of success were not encouraging, and only six patients were confined in the hospital at Bellshill during the first year. As time went on, however, the women in the area realized how much skilful attention was being offered them, and the numbers increased until over 2,000 confinements a year were conducted at Bellshill alone, while another 1,000 maternity cases were admitted to associated hospitals. The success of this department of public health was due to the foresight and unflagging interest which Dr. Thomson took in the work of the institutions with which he was associated. The welfare of the patients and the nursing staff was his constant consideration. He displayed remarkable judgment in estimating the essential requirements of a rapidly expanding maternity service. He realized that many patients were at a serious disadvantage when they lived in remote parts of the county, and consequently in the year 1932 he instituted a "flying squad" service, this being a pioneer effort in Scotland. By this form of domiciliary treatment he succeeded in further reducing maternal mortality, especially in cases of eclampsia. At the same time Dr. Thomson arranged to supply to practitioners and midwives for the modest sum of 5s. a sterilized obstetrical outfit which was soon being used by everyone engaged in obstetrical practice throughout the county. Dr. Thomson was an able administrator, and he had an extensive knowledge of practical obstetrics. He was called upon, over a period of many years, to deal with the management of the emergencies of midwifery practice. In treating these cases he exercised sound judgment and skilful manipulation. Even when the hospital had attained such proportions that the resident and visiting staff had greatly increased, he continued to take an interest in the clinical work. His death will be mourned by many nurses and house-surgeons, who received from him a training in the essentials of obstetrics that has proved invaluable in practice. The sympathy of his colleagues and friends will be extended to his wife, son, and daughter in their sad loss.—S. J. C.

Medical Notes in Parliament

MEDICAL BILL IN COMMITTEE

The Committee stage of the Medical Bill was begun in the House of Commons on July 14, and when the discussion was adjourned at the end of the sitting the fifteenth of the 36 clauses was under examination and the bulk of the work had been done.

Clause 1 was agreed to, and on Clause 2 Sir HUGH LUCAS-TOOTH moved an amendment to secure that no order should be made requiring a period of intern service as a prerequisite to full registration until the order had been approved by resolutions of both Houses of Parliament.

Mr. ANEURIN BEVAN, Minister of Health, said he would make the orders subject to affirmative resolution by Parliament, instead of using the negative procedure, by moving an amendment at the Report stage.

Mr. BEVAN moved an amendment to subsection (4) providing that

> where, during any period of employment in an approved hospital or institution, an applicant who has been engaged in medicine has also been engaged in surgery or midwifery or both, or an applicant who has been engaged in surgery has also been engaged in midwifery, the period should be apportioned by the body granting the qualifying diploma.

He said that as the clause stood it provided for the way in which a doctor was to have his period of intern service divided into so much time on medicine and surgery, or medicine, surgery, and midwifery. It made no provision for the doctor who engaged in work which combined only medicine and midwifery or surgery and midwifery. The amendment ensured that the same arrangement should operate in all four cases. The difficulty was that it could not be said that the intern was having proper experience if most of it was confined to one specialty, and it was necessary that there should be a proper division of time over the whole of the work in order that he might take full advantage of the intern service. This was the reason they attached such great importance to the inspection of hospitals where the intern service was given. It was essential that the intern's experience should be spread as far as possible and not confined to a group of beds dedicated to only one specialty.

The amendment was agreed to.

Mr. SOMERVILLE HASTINGS moved a new subsection:

> Where physical disability renders an appointment in surgery or midwifery impossible the Council may accept an equivalent period of satisfactory service in medicine or in a health centre in lieu thereof.

Mr. BEVAN said he was prepared to accept this in principle, and it was accordingly withdrawn.

In the general discussion on the Clause, Commander A. H. P. NOBLE expressed anxiety about those whose medical studies had been interrupted by war service and who might otherwise have qualified before the Bill came into force. They were keen to get into practice as soon as possible, and were worried that they might now be held up by an unexpected period in hospital.

Provision for Opting Out

Dr. BARNET STROSS agreed that present-day students were a little disturbed, and he hoped the Minister would give them an opportunity of opting out of this provision. Apart from that, students were being offered full employment at what he hoped would be a suitable rate of remuneration. But he felt it important to remember that not all medical students were alike, and where a man was going into a sister profession, such as physiology, and not intending to practise, he should not have to register fully. Further, it was not possible to get an actual definition of "satisfactory service," and the individual should have a right of appeal against a decision that his service was not satisfactory. Teachers were human beings, and sometimes showed favouritism or bias, and there should be some safeguard for the man who had done his full year.

Mr. H. N. LINSTEAD said that the Minister must make his intentions clear to the profession to remove present misunderstandings.

Dr. A. D. D. BROUGHTON pointed out that the British Medical Students' Association desired that all present medical students should be exempted from the provisions of Clause 1 and Clause 2. He thought this unnecessary, but there should be some right of appeal.

Dr. H. B. W. MORGAN said the grant of a right of appeal to all medical students who were alleged not to have rendered satisfactory service during their intern year was a necessary safeguard so that the student might have the opportunity of answering the case against him. Further, there were not likely to be sufficient hospitals into which these men could go. He asked if they were to be kept waiting for an appointment.

Mr. I. MACLEOD said that when the period of intern service started there would be a wastage for one year at least of general practitioners entering the National Health Service, and he wondered if we could afford this wastage. It might be expedient for a limited period to allow doctors who had completed their training to go into under-doctored areas, or as assistants to group practices—although he admitted the disadvantages of such a course. The question of salaries was extremely important, and there was some anxiety about it. The Goodenough Committee recommended that free board and lodging and something between £75 and £100 should be paid. In terms of the value of money to-day that might be £150 to £200. Even that was considerably below the amount paid to someone holding a house appointment. Nothing would do more to remove uneasiness than a clear statement about salaries. He endorsed the suggestion that those at present engaged in medical training should not have this extra year put on to them.

Mr. SOMERVILLE HASTINGS, as one who had spent the greater part of his life training house-surgeons, said there would be very few cases in which a surgeon or physician in charge would feel justified in saying that a man's service was unsatisfactory, and if the right of appeal were agreed to there would be even fewer. One must remember that if the right of appeal were granted the chief would be put into the witness-box, presumably, and asked all sorts of questions about his house-surgeon, and possibly even submitted to an action for libel. He could remember only one case in which the service of a house-surgeon was really unsatisfactory. He thought the right step would be to let the house-surgeon have another try at another hospital. Even if a house-surgeon had fallen down once, that was not sufficient to prevent his becoming a registered medical practitioner. He hoped that this point would be left as vague as possible, and that it would be for the medical or surgical chief to say whether the service was satisfactory.

Keeping an Even Balance

Mr. BEVAN, replying to the debate, said he would at the outset try to get rid of the idea that the Minister of Health was here accepting responsibility for the content and management of medical education. He was not. That was still being entrusted in part to the Privy Council and in part to the medical corporations, all of them acting jointly, and especially in regard to inspection in later parts of the Bill.

It was necessary to keep an even balance between the legitimate affairs of the medical student and the requirements of the public. In the House of Commons they were the trustees of the public, and their duty was not to let loose upon the community what might be regarded as under-educated doctors, nor to protect individual doctors from what might appear to be hardship. On the other hand, implementing the Goodenough proposals did mean that the State intervened and altered the plans that the private individual made for himself when he intended to go in for medical training. Therefore they must try to mitigate the hardship as much as possible, and see that the arrangements made bore as little harshly upon the citizen as was consistent with the public interest.

In the first place this was not going to be sprung upon the student immediately. It would take between one and two years to make these arrangements, because it would be quite improper for the State to say that a doctor could not be fully registered and enter into general practice unless he had an intern year

in an approved establishment if they had failed to provide such a place for him. They could not fix the period when this would start to operate until they had reviewed the establishments and made these posts available.

They must also see that the hardship was mitigated as much as possible on the financial side. It was therefore proposed to create posts carrying £350 a year for the first six months and £400 a year for the second six months, with a deduction of £100 for board and lodging. He thought the House would agree that those were fairly generous sums.

In reply to a question by Sir HUGH LUCAS-TOOTH, Mr. BEVAN said that there would be no marriage allowances; but he could assure Dr. CHARLES HILL that doctors provisionally registered would be employees of the hospital, and their term of service in the National Health Service would therefore date for superannuation purposes from the beginning of the internship.

Continuing, he said that some people had questioned whether it was fair to a person who had made his plans on one assumption to add another year. But they must start at some point if they were to carry out the recommendations of the Goodenough Committee. The suggestion that they should begin with the student coming in meant that the scheme would not come into full operation for seven or eight years. That was going too far. He hoped he would not be pressed to give concessions on grounds of hardship. Why should the House send out into general practice one who was less well trained than they thought he ought to be? When the date fell, it should fall on all medical students, otherwise some would go through life with a black mark. It would not be wise to invite the medical student, because of some temporary embarrassment, to handicap himself by not having the benefit of the one year.

There was a good deal of anxiety about the "satisfactory service." He was informed that it was similar to the signing of certificates now required to show satisfactory attendance at courses of instruction before a student could sit for an examination. These certificates covered conduct as well as attendance. They represented the opinions of all the people under whom the student had worked. Similarly, certificates of satisfaction would reflect a number of opinions, and there should be no possibility of victimization by a single individual on personal grounds. The certificate itself was given by the licensing body—the medical corporation immediately concerned. There could be no possibility of a superintendent of a hospital who might have developed a "grouch" against an intern reporting on him unsatisfactorily, because he would surely have the collective opinions of all with whom the provisional doctor had worked in the whole of the year. He hoped therefore that he would not be pressed to give a right of appeal. With whom could an appeal lodge? They could not have an appeal against a board of examiners.

When a person reached this stage he was provisionally registered. The intention was not to put up another hoop through which he had to jump; the intention was to give him a year's experience in association with specialists and with a diverse kind of hospital work, so that when he went out into the world he would be a better craftsman. It was intended to be the consummation, as it were, of his general medical training.

Mr. I. J. PITMAN asked if it would be possible for an intern who got an unsatisfactory report to seek another post at which he could have a second year.

Mr. BEVAN replied that there was no reason at all why not. He also said that he could not see how the arrangement for this coming into operation at different times at different places could be made to work, or how it was going to operate with reference to reciprocity with Eire. The present intention was to bring it into operation everywhere at once. The power to vary the period was merely for the purpose of emergency.

In answer to Surgeon Lieutenant-Commander BENNETT, who mentioned the "deviationists" who went into biochemistry and other things, Mr. BEVAN said they could not possibly exempt such men from the intern year because they did not want to practise clinically. They could not frame an Act which would put such people in suspense. They must come down on one side or the other, otherwise they might have some who did and some who did not intend to go into clinical practice, and some who did not but might.

Employment in Health Centres

On Clause 3, in the course of discussion of an amendment moved by Mr. SOMERVILLE HASTINGS but later withdrawn, Mr. BEVAN said that he had accepted with considerable misgivings the provision (inserted in the House of Lords) by which the intern year could be spent in a health centre. It was the hope, though they must keep some sense of proportion about it, that subsequently most general practitioners would be engaged in group practice and would be operating from a building which might be described as a health centre. But health centres could be variously defined. Some of them might merely be associations of general practitioners, and the intention of the Bill was to give the provisionally registered man a year's experience of hospital medicine and not of group general practice. On the other hand there might also be big polyclinic centres in which there was a considerable variety of diagnostic facilities alongside maternity and child-welfare centres, dental and ophthalmic services, and the whole range of personal medical services outside the hospitals. It might be possible to find a health centre of that sort as a place where the year of intern service could be served. But there were none of them at the moment, and it would be a very long time before the country had them, if it ever did. He was extremely doubtful about this proposal, and he hoped that when these institutions came to be approved it would be done with extreme frugality.

The Clause, and Clause 4, relating to the experience required for holders of Commonwealth or foreign diplomas, was agreed to.

Registration

Mr. BEVAN moved on Clause 5 a series of amendments designed to facilitate provisional registration and subsequent consolidation by altering the nomenclature: the amendments were agreed to.

Mr. SOMERVILLE HASTINGS moved to insert the following new subsection:

> A person provisionally registered under this Act shall have all the duties and privileges of a registered medical practitioner but only while serving in an approved hospital or institution as defined in Section 1.

He urged that it should be made clear what a provisionally registered doctor could do. While this man was serving in hospital he should have the full powers and duties of a medical practitioner, particularly in ordering dangerous drugs and in signing death certificates.

Dr. CHARLES HILL emphasized that the intern year must be regarded as an essential part of medical education. To equate the provisionally registered with the permanently registered man, merely leaving an interval of time to pass between them, seemed to suggest that the standard of registration was reached with provisional registration and that the final year was a kind of burden or testing-time imposed by the State. He doubted whether they would be in a position to decide what privileges should go with provisional registration until they saw how the additional year worked.

Mr. BEVAN agreed that unless they were exceedingly careful the intern year would lose its status as the final equipment of the general practitioner. For the purposes of his intern year the man was a fully qualified doctor, but outside it he could not act as a fully qualified practitioner.

The amendment was withdrawn.

In the discussion on the clause as a whole, Dr. CHARLES HILL drew attention to the point that, as it was worded, after passing his examinations the individual was first required to apply for and obtain a post before he could seek provisional registration.

Mr. BEVAN agreed that, especially in the case of a man going in for research and not clinical practice, there was some substance in the argument that his future rights needed some protection. The man ought to be able to complete his training at some future period if he so wished. He would look into the matter to see if this would be covered.

Relations with Ireland

On Clause 6 an amendment was moved by Mr. BEVAN, and agreed to, extending to the Republic of Ireland the same provisions that had been made in respect of health centres in England and Wales.

Surgeon Lieutenant-Commander R. F. B. BENNETT asked for an assurance that the Republic of Ireland would be altering its medical curriculum in step with ours, so that the Clause might have full application.

Mr. A. BLENKINSOP, Parliamentary Secretary to the Ministry of Health, said he understood that was the position. Answering other questions, he said the assumption was—and they had an undertaking that this would in fact be carried out—that there would be provisional registration in Ireland as it would be provided here.

Dr. BARNET STROSS moved amendments to include on the General Medical Council two elected Irish representatives, one resident in the Republic of Ireland and one in Northern Ireland. Dr. A. D. D. BROUGHTON supported the amendments.

Mr. I. MACLEOD opposed the amendments, stating that there was already one representative of the whole of Ireland, and almost the only other example of such agreement was in their rugby football team, which they selected jointly.

Mr. BLENKINSOP said it had always been the case that Ireland had been a unity in respect of medical education. The Republic of Ireland was fully satisfied with the present arrangement.

The amendments were withdrawn, and the Clause agreed to.

Disciplinary Committee of the G.M.C.

On Clause 13, by which it is proposed to transfer the functions of the Council or a Branch Council under Sections 26 and 29 of the Medical Act, 1858, to the newly constituted Medical Disciplinary Committee, Dr. H. B. W. MORGAN moved an amendment, which was negatived, to replace the Disciplinary Committee by a Penal Cases Committee. The G.M.C. should not have powers of discipline and be able to try a man and ruin his career, but, he said, should merely investigate penal cases to discover whether there was a prima facie case to answer.

Dr. CHARLES HILL said that on the contrary the recasting of the disciplinary machinery, and the establishment of a smaller body than the General Medical Council for this purpose, were among the most important parts of the Bill, and should be left untouched. When Dr. MORGAN accused him of speaking against a committee of his own organization he replied that he was expressing the views he held, however they might conflict with those of anybody else, and in his opinion the structure under which the penal cases committee sorted out the complaints against the practitioners, and in addition to which there was a separate body which heard the cases, represented a considerable advance in the technique and methods of the General Medical Council.

In the general discussion on the clause, Mr. J. HAY urged that it was inappropriate that the decisions of the committee, which might result in the barring of a practitioner from carrying out the duties of his profession, should be majority decisions of the members present. The law required the unanimous verdict of 12 people, and it was wrong in his view that a person should be debarred from his profession by a mere majority vote.

Mr. BEVAN said that if the principle of unanimity were introduced, and one person disagreed, the committee could not do its work of protecting the public. If the majority of a man's peers considered him guilty, the principle of unanimity would mean that one person could deny the protection the public ought to have. That tilted the whole balance the other way. He thought the individual was adequately protected. The clause was agreed to.

G.M.C. and Cases with no Complainant

Dr. CHARLES HILL moved to insert the following new subsection:

> For securing that no complaint or information investigated by the Penal Cases Subcommittee, other than a decision in a court of law, shall be referred to the Committee for adjudication unless the circumstances upon which such complaint or information is founded shall have been verified by statutory declaration of the person making the same, or, where such complaint is made or such information submitted by any public department, authority, or other body, by statutory declaration of an officer of such public department, authority, or other body, duly authorized for the purpose.

He said that his purpose was to secure that the almost uniform practice of the G.M.C., that there must be a statement by the complainant, became the uniform practice. He said "almost uniform" because there had grown up in recent years a habit on the part of Government departments, including the Ministry of Health, of not complaining but of sending the papers along in the hope that the G.M.C. might do something about it. All he wanted to secure was that, whether the complainant was an individual body or a Government department, there was a complainant, and that there was a formal complaint which went on to the G.M.C.

Mr. BEVAN said the suggestion meant, for example, that the disciplinary tribunal under the National Health Service could not call the attention of the G.M.C. to evidence placed before it unless it itself made a complaint. That was an exceedingly dangerous thing to suggest. It meant that the disciplinary committee of the Council would be an arbitrator between the doctor and a Government department. It did not follow that the Ministry of Health should come to a conclusion about a doctor at all. It merely meant that, in the exercise of the administrative duties placed upon it by the health statutes, the tribunal had brought to light evidence that would appear, on the surface, to be evidence that the G.M.C. should see in order to make up its mind whether or not it should consider putting its disciplinary machinery into motion. That was reasonable protection for the public.

The National Health Service was concerned with the contractual obligations of a general practitioner, and not with his status as a doctor; that was the concern of the G.M.C. The Minister ought not to be asked to load the case against the general practitioner by so formalizing it as to investigate, for example, a charge of drunkenness arising out of evidence given during a complaint to an executive council, assembling all the papers and evidence, and thus becoming an accuser of the practitioner before the G.M.C. Once they asked a Government department to formalize evidence against a general practitioner they were discriminating against the practitioner in a most dangerous way.

The amendment was still under discussion when the sitting ended, and the proceedings were adjourned until July 21.

Work for Epileptics

Mr. SOMERVILLE HASTINGS asked the Minister of Labour on July 4 what provision he had made for the employment of manual and clerical workers who suffered from epilepsy but were otherwise capable of taking their normal part in industry.

Mr. GEORGE ISAACS replied that sufferers from epilepsy could readily get advice and guidance from disablement resettlement officers, who had been able by special approach to employers to place a considerable number in suitable employment. He added that, to assist in this work, explanatory notes about epilepsy had been issued to employers by the Ministry. A number of the more severe cases had been placed in employment under sheltered conditions in Remploy factories.

B.C.G. Vaccination

Dr. CHARLES HILL asked the Minister of Health on July 6 how many local health authorities were in possession of adequate supplies of B.C.G.; and whether he was satisfied that this method of prevention was being made available on an adequate scale and as rapidly as the paramount necessity of preventing tuberculosis demanded.

Mr. ANEURIN BEVAN replied that 116 out of 145 authorities in England and Wales had so far had arrangements approved for B.C.G. vaccination at the discretion of chest physicians; the vaccine was received as needed, since it could not be stored.

Domiciliary Treatment of Tuberculosis

Dr. CHARLES HILL also asked the Minister whether he would instruct regional hospital boards to arrange for the home treatment of tuberculous patients, for whom there were no sanatorium beds vacant, by making available to them in their homes the services of chest specialists, portable *x*-ray facilities, and any other facilities necessary for adequate and continuous treatment.

Mr. ANEURIN BEVAN said that it was part of the normal work of the boards' chest specialists, with the resources of the hospital service available to them, to take part in the home treatment of tuberculosis patients.

Dr. HILL then pointed out that in only relatively few areas were the resources of the tuberculosis services made available in the homes. Tuberculosis was five times as common among contacts as among the population, and this was an urgent national situation, not only for the sufferers from tuberculosis but for their families as contacts.

Mr. BEVAN said he was well aware of this, and in the next few weeks instructions would be issued dealing with these points (see also *Journal*, July 15, p. 162).

Disinfectants

Dr. CHARLES HILL also asked the Minister of Health on July 6 if he would consult the Medical Research Council with a view to taking steps to ensure that disinfectants produced by manufacturers satisfied minimum standards of efficacy.

Mr. BEVAN replied that he was already in touch with the Medical Research Council, but it was a very difficult and technical subject, and although this matter had now been pursued for nearly five years no standards had yet been achieved.

Clinical Assistantships for G.P.s

Mr. READER HARRIS asked the Minister of Health on July 6 if he was aware that regional hospital boards had not yet begun to offer clinical assistantships to general practitioners, and what action he proposed taking.

Mr. BEVAN said that appointments of this kind had been offered where the needs of the service demanded it.

Mr. SOMERVILLE HASTINGS asked if the Minister realized how important it was from everybody's point of view to keep general practitioners in close contact with their local hospital.

Mr. BEVAN said he was very well aware of that, and part of the difficulty was to try to bring about a reconciliation between the conflicting claims of the G.P. on the one hand and the specialist on the other.

Distinction Awards

Colonel M. STODDART-SCOTT asked the Minister of Health on July 6 how long the committee which dealt with merit awards for medical consultants had been sitting, how many times it had met, who was its chairman, and the salary or fee he had been paid.

Mr. BEVAN replied that the committee was appointed on December 23, 1948. It had held 24 meetings, with Lord Moran of Manton as its chairman. He had received 3,000 guineas for the first year's service, and would receive 2,500 guineas for the second year.

The Services

A Supplement to the *London Gazette* has announced the following awards:

"4 Clasps" to Territorial Efficiency Decoration.—Major (Honorary Colonel) J. C. Alexander, T.D., R.A.M.C.

"3 Clasps" to Territorial Efficiency Decoration.—Colonel J. L. Hamilton, M.C., T.D., late R.A.M.C.

"1st Clasp" to Territorial Efficiency Decoration.—Majors J. Cohen, T.D., and J. B. Mackay, T.D., R.A.M.C.

Territorial Efficiency Decoration and 1st Clasp.—Major (Temporary Lieutenant-Colonel) E. A. Cormack, and Majors R. A. P. Gray and C. H. Imrie, R.A.M.C.

Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) R. E. Norrish and Major J. B. Schofield, R.A.M.C.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

In Congregation on June 21 the degree of D.Sc. was conferred on Geoffrey Wingfield Harris, M.D.

Professor Homer Smith, of New York University, will deliver a lecture on "Development of Modern Renal Physiology" in the Physiological Laboratory theatre on Monday, July 24, at 5 p.m. The lecture is open without fee to all members of the University.

The following appointments, all from October 1, are announced: *Reader in Clinical Psychology*, D. Russell-Davis, M.D. *University Lecturers in Anatomy*, J. W. Millen, M.D., H. Butler, M.B., B.Chir., and M. Harty, M.B., B.Ch. *University Demonstrators in Anatomy*, W. M. Keynes, M.B., B.Chir., J. D. Lever, M.B., B.Chir., D. Bulmer, M.B., B.Chir., and W. J. St. E. G. Rhys, M.B., B.S.

UNIVERSITY OF GLASGOW

The following degrees were conferred on July 8:

M.D.—[1]L. R. C. Agnew, R. D. C. Brackenridge, [2]*J. C. P. Logan*, D. L. Mackenzie, [1]J. H. Ramage, [1]J. MacK. Sutherland, [3]T. Symington.

CH.M.—R. A. R. Taylor.

M.B., CH.B.—James Adam (Troon), James Adam (Blairgowrie), Elizabeth J. F. Anderson, J. Anderson, T. Anderson, F. A. Arcari, Margaret S. Baillie, W. H. Bain, Mary M. S. Bannatyne, J. Barker, J. R. Barr, T. B. Begg, J. I. Bennet, W. P. Black, N. J. *Blacklock*, I. A. Boyd, Jessie M. McM. Boyd, R. J. I. Boyd, J. P. Boyle, M. T. D. Braide, E. Brookes, W. C. Brown, J. C. Bryce, Isabella R. Buchanan, H. Budge, T. Burnet, J. L. Cameron, D. A. F. Campbell, J. B. Campbell, Margaret R. Campbell, F. J. Cherington, J. A. Clark, Elizabeth J. Coulter, Winifred Coutts, Ann C. Coyle, A. P. Crawley, Margaret W. Devlin, Evelyn J. W. Dobson, W. P. Duguid, A. Edgar, R. F. Edington, B. D. *Fairgrieve*, W. *Ferguson*, A. G. Findlay, F. B. Findlay, I. W. Fingland, W. L. Flanagan, J. G. Fraser, Diana M. Game, I. A. M. Gibb, W. M. Gilmour, Ellen W. Givens, C. Gold, D. P. Gourlay, A. C. Gow, P. A. Graham, A. D. Hally, Katherine M. Harvey, Margaret T. Harvey, J. W. D. Henderson, R. V. Henderson, Eileen E. Hill, Ruby D. McI. Holms, C. C. Hosie, Dorothy W. Hunter, D. C. Hutchison, A. E. Ikomi, Hazel E. Jackson, J. Jamieson, Constance M. Jarvie, B. A. Johnson, H. B. Kennedy, Joyce C. Ker, Elaine H. M. Kerr, Mary C. W. Kerr, W. Lang, Mary R. Lindsay, N. H. Logan, E. O. Lundholm, Helen S. McArdle, Katherine M. McArthur, Mary H. McArthur, J. A. C. MacAuley, Helen M. M. McCallum, I. S. Macdonald, Jessie Macdonald, Margaret M. Macdonald, A. I. Macdougall, Norma M. C. A. McFarlane, T. Macfarlane, D. D. Macfie, Margaret R. MacD. *McGilvary*, D. D. R. *McInroy*, J. Macintyre, K. S. Mackenzie, J. A. McKinnon, W. P. Maclay, Margaret E. Maclean, I. S. McLeish, Elizabeth J. *McLelland*, Aileen C. McMillan, J. McNeill, Mary R. Mactaggart, J. MacVicar, Agnes J. H. McWilliam, Agnes J. H. Malcolm, J. G. Mann, J. P. Masterton, I. D. Melville, R. S. Miller, J. G. Mone, J. D. Murchison, Margaret R. H. Murray, J. W. Nudelman, J. Patterson, R. T. Pettigrew, R. Pringle, E. G. Ramsay, A. M. Rankin, J. P. Reid, T. M. Rein, H. Richmond, A. R. Robertson, I. P. C. Robertson, L. D. S. Rogen, A. A. Schwarz, J. S. Scott, D. A. *Seaton*, D. Sherret, Janet A. Sinclair (neé Kilpatrick), A. C. Smith, G. L. Smith, R. G. Sommerville, D. McD. Sproull, J. H. Stewart, W. N. Stirling, H. M. Strathern, N. W. Struthers, Audrey J. C. Symons, A. M. Thomson, J. Thomson, J. R. Thomson, J. Torley, Julia Torrance, J. D. Tripney, Dorothy M. B. Ward, W. C. Watson, A. W. G. Weir, Jessie M. R. Weir, A. W. O. Williams, R. E. D. Williams, G. Wilson, Helen C. Wright, W. B. *Wright*, R. *O. Wynn*, L. W. McK. Yelland, A. B. Young, N. Young.

[1]With high commendation. [2]With commendation. [3]With honours.

UNIVERSITY OF EDINBURGH

On July 6 the honorary degree of LL.D. was conferred on Professor Robert William Johnstone, Professor Emeritus of Midwifery and Diseases of Women in the University, Honorary Consultant in Obstetrics and Gynaecology to the Royal Infirmary, Edinburgh, and Consultant Adviser in Obstetrics to the Department of Health for Scotland.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

Frederick Stanley Stewart, M.D., M.R.C.P.I., has been appointed to the Chair of Bacteriology and Preventive Medicine in succession to Professor J. W. Bigger, who retires at the end of September.

Dr. Stewart graduated M.B., B.Ch., B.A.O. at the University of Dublin in 1942 and proceeded M.D. two years later. In 1946 he took the M.R.C.P.I. For seven years he has been Assistant and Lecturer in *Bacteriology* at Trinity College and has published papers on Rh immunization and on the antigenic modification of red cells by periodate.

The following medical degrees, etc., were conferred on July 5:

M.D.—L. A. Kerwood, D. E. Mellon.

M.CH.—D. S. Quill.

M.A.O.—M. T. S. Conradie, H. FitzGibbon, M. Ll. McCauley.

M.B., B.CH., B.A.O.—J. N. Adair, R. A. L. Agnew, T. M. Bamford, Reva Berstock, Germaine H. Boland (formerly Ross), K. F. X. *Bourke*, Doris B. Brownell, S. H. Buchalter, A. M. Cantor, G. Caplin, Anne L. J. Cusack, P. A. H. Davis, K. K. O. Bentsi-Enchill, Renee A. Fleury, Jane C. Gatliff, M. J. H. Hamilton, Mabel M. H. Hodgins, D. A. A. Lane, Sylvia Lath, Phyllis M. Lee, C. D. Levis, J. W. Lewis, W. C. McCord, F. J. McHugh, J. C. McLean, Helen P. Manning, E. A. Martin, R. Nelson, Hilary G. Orr, H. Parsons, Pauline M. Poole, Elinor D. U. Powell, J. A. N. Poynton, V. P. O'Sullivan Quinn, Anna I. Roberts, W. B. Seale, A. A. Sweeney, Annie M. G. Troughton, Mildred Vilensky, Margaret P. Wallace.

LICENCE IN MEDICINE, SURGERY, AND OBSTETRIC SCIENCE.—D. Miller.

UNIVERSITY OF DURHAM

George Algernon Smart, M.D., M.R.C.P., lecturer in medicine in the University of Bristol, has been appointed to the Readership in Medicine at Newcastle.

UNIVERSITY OF LONDON

Professor A. A. Moncrieff has been appointed representative of the University at the sixth International Congress of Paediatrics to be held at Zurich from July 24 to 28.

The following have been appointed, or nominated for appointment or reappointment, as representatives of the University on the governing bodies indicated in parentheses: Dr. R. A. Willis (Royal Cancer Hospital); Professor J. M. Mackintosh (Council of Management, Slough Industrial Health Service, Ltd.); Dr. C. E. Newman (West London Hospital Medical School).

The list of approved institutions for the purposes of the M.D. and M.S. degrees under the revised regulations will be as follows: Charing Cross Hospital and Medical School; Guy's Hospital and Medical School; King's College Hospital and Medical School; London Hospital and Medical College; Middlesex Hospital and Medical School; Royal Dental Hospital of London and School of Dental Surgery; Royal Free Hospital and School of Medicine; St. Bartholomew's Hospital and Medical College; St. George's Hospital and Medical School; St. Mary's Hospital and Medical School; St. Thomas's Hospital and Medical School; University College Hospital and Medical School; Westminster Hospital and Medical School; Hammersmith Hospital and the Postgraduate Medical School of London.

The appointments of house-physician and deputy resident medical officer at St. James's Hospital, Leeds, have been approved for the purposes of the M.D. examination, Branch I.

The Netherne Hospital, Coulsdon, Surrey, and the Belmont Hospital, Sutton, Surrey, have been added to the list of recognized mental hospitals for the M.B., B.S. degrees.

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY (DIAGNOSIS).—*Part I:* A. K. Banerji, P. Purcell, H. Ward.

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN BACTERIOLOGY.—J. D. Abbott, B. E. Andrews, S. M. H. Bokhari, Naomi Datta, A. D. Evans, C. R. Knappett, G. L. Le Bouvier, Elinor W. McCloy, J. P. P. Mackey, G. B. B. White.

ACADEMIC POSTGRADUATE DIPLOMA IN PUBLIC HEALTH.—K. J. Adams, A. S. Beadel, *H. E. A. Carson, H. D. Conway, P. R. Cooper, D. Crichton, C. C. Draper, J. J. Duffy, *M. Gelfand, F. C. Griggs, Ll. F. Gunaratna, F. J. Ingham, S. I. Kadama, Doreen Landreth-Smith, *M. M. Lewis, Low Chin Seang, Muriel J. Lowe, *R. W. McConnachie, Alison D. McDonald, R. Malan, F. W. Mount, K. C. D. Perera, W. S. Perera, H. T. Phillips, Eileen M. Ring, Lore M. Schulte-Frohlinde, W. D. L. Smith *G. H. Stuart, Ping-Ming Teng, D. A. Thamotheram, J. D. Tonkinson, W. C. Turner, J. M. Urquhart, *P. A. M. van de Linde, P. H. Vernon, J. L. Walsh, F. L. Wheaton, W. A. Young.

*Awarded a Mark of Distinction.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

M.D.—H. J. Beard, D. L. Chadwick (with commendation), H. Lempert, Helen E. Smith, A. B. White.

FINAL M.B., CH.B.—*Old Regulations:* R. M. Ashton, H. G. Fleetwood, Jean M. Halliwell, G. M. Ingall, G. Jessup, B. P. Jones, Margot Nelken, A. Noar. *New Regulations:* B. L. Alexander, R. D. Atherton, W. de C. Baker, Flora M. Bisset-Smith (distinction in surgery), S. M. Broman, P. Burgess, Muriel D. Carr, Barbara M. Couldwell, E. J. Epstein, J. D. Evans, M. C. Flasher, M. Fox, G. Garrett, F. G. Hardman, B. Higgins, S. G. Jeffs, W. Kerns, P. B. Lees, B. J. Leonard, M. A. Lerner, W. H. Lyle, Maria R. Mackay (with honours and distinction in surgery), Nancy Parkin, R. Price, G. V. Purnell, K. L. Purnell, J. Robinson, Dora M. J. Rosbotham, R. Schofield, S. Shubert, Beatrice M. Swift, Hazel W. Symon, G. M. Watson, Sheila M. E. West, A. M. Womack.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*Part I:* L. G. Nicol, T. P. Smith.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—A. Ansell, K. Dumbell, T. R. Littler, R. Marcus, P. W. Robertson, G. D. Scarrow.

PH.D.—*In the Faculty of Medicine:* Margaret E. Hayward.

M.RAD.—*Part II (Old Regulations):* J. Ainsworth, Constance M. Davis, G. J. M. Teunon.

M.B., CH.B.—[1] [2]Kathleen Byrne, [1] [2]B. L. Evans, [1] [3]J. P. Stanfield, Rosie Ali, Barbara E. Batty, F. H. Beddow, J. J. Cameron, D. H. Carr, Sheila R. Clarke, S. W. J. Coventry, W. K. Cowan, J. L. Donovan, Joan M. Duncan, Sheila H. E. Fairweather, A. K. Frazer, Lavinia Freeborough, J. N. Gaskell, [4]P. H. Grace, [2]Winifred J. A. Graham, D. R. W. Haddock, Kathleen E. C. Hamilton, Muriel Henshall, Betty E. Hodgkinson, Doreen Jacobs, H. M. Johnson, G. Jones, C. R. Kay, Mimi Keidan, Margery J. King, K. M. Loebenstein, Eileen P. McLeavey, A. C. Macartney, W. Melrose, Jean M. Naylor, E. A. Nieman, J. Parkhouse, Brenda M. Price, Jean A. Raffle, T. D. Reilly, H. Riad, Joan Richardson, Mona V. Rivlin, Blodwen E. J. Roberts, Hilary G. Rubin, Gwendoline D. Salter, R. W. Saul, Beryl M. Sheffield, H. A. D. Shirlaw, R. Steinberg, June Stevenson, J. S. V. Surman, J. Thompson, E. Toke, H. Wilson.

D.P.H.—L. N. Gould, A. Haji Alias, J. T. O'Sullivan, H. N. Singh, L. S. Stephens.

[1]With second-class honours. [2]With distinction in surgery. [3]With distinction in obstetrics and gynaecology.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on July 7 Charles Scott Russell, M.B., Ch.B.Ed., F.R.C.S.Ed., M.R.C.O.G., was appointed to the newly created full-time Chair of Obstetrics and Gynaecology in the University of Sheffield. In 1946 Mr. Russell was appointed Assistant Director in the Department of Obstetrics and Gynaecology of the University of Manchester and resident obstetrician and gynaecologist at St. Mary's Hospitals and in 1949 became Reader in Obstetrics and Gynaecology. Other appointments were made as follows: *Lecturer in Medicine*, W. Whitaker, M.D., M.R.C.P. *Assistant Lecturer in Physiology*, R. Crampton, M.B., Ch.B. *Part-time Lecturer and Clinical Teacher in Chest Diseases*, C. S. Darke, M.D., M.R.C.P. *Part-time Lecturer and Clinical Teacher in Venereal Diseases*, D. J. Campbell, F.R.C.P.Ed., D.P.H.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—[1]R. J. Ancill, [1] [2]W. A. W. Dutton, [1] [2]M. D. Turner, P. J. D. Benjafield, H. J. Bland, [4]Margaret H. Buston, E. R. Duchesne, F. V. Eastman, Doreen A. Ellis, C. C. Ewing, Z. Fluss, J. C. Gregg, R. Hill, E. A. W. Houghton, G. A. K. M'C. Jahans, Megan, D. M. Johnson, [3]H. I. Leigh, G. Lucas, Jean M. Menzies, G. W. B. Peel, [3]Barbara M. Philpott, L. P. Spence, L. A. D. Tovey, Joan Walker. *Passed in Group II only:* C. E. Dickson, H. Maxwell.

DIPLOMA IN PUBLIC HEALTH *(Part II)*.—A. J. Board, E. L. Fawssett.

DIPLOMA IN PSYCHOLOGICAL MEDICINE *(Part II)*.—M. W. Annear, J. A. Bickford, R. M. Ellison.

[1]With second-class honours. [3]With distinction in obstetrics. [4]With distinction in public health. [4]With distinction in child health.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The following received the Fellowship of the College on July 7:

J. D. Cunningham, J. Conroy, D. J. F. Devane, T. J. Mills, J. P. O'Neill, A. T. S. Paul, D. L. Robinson.

No. 26

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 1.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	30	1	15	1	4	26	3	16	2	—
Deaths		—	—				—	—		
Diphtheria	46	2	13	1	—	73	17	24	6	5
Deaths	2	—	—	—	—	2	1	—	—	1
Dysentery	262	9	113	—	—	66	7	43	—	—
Deaths					—				—	—
Encephalitis, acute	5	—	—		—	—	—	—	—	—
Deaths		1		—			—			
Erysipelas			33	1	4			18	3	3
Deaths							—			
Infective enteritis or diarrhoea under 2 years				31					39	
Deaths	17		4	2	2	17	1	4	—	—
Measles*	8,918	626	405	291	106	6,863	613	301	200	153
Deaths†		—	—	2	—			1	—	—
Ophthalmia neonatorum	29	1	14	—	—	52	4	10	—	—
Deaths										
Paratyphoid fever	17	3	—	2(B)	—	31	1	—	—	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	335	12	4	—	6	334	25	3	10	4
Deaths (from influenza)‡	4	—	—	—	1	7	—	1	—	—
Pneumonia, primary			159	¶				153	25	
Deaths	108	17		5	8	111	17		9	4
Poliomyelitis, acute	160	13	47	4	10	52	6	2	3	—
Deaths§	11	1		—		3	1			
Puerperal fever		—	7				—	6		
Deaths										
Puerperal pyrexia‖	70	10	7	—	—	88	3	3	1	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,085	63	131	67	57	1,137	76	175	68	57
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	7	—	1	2	1	8	2	2	1	—
Deaths		—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,920	234	287	95	41	2,181	90	57	87	82
Deaths	5	—	—	—	—	8	2	—	1	—
Deaths (0–1 year)	215	27	38	25	14	216	25	38	18	11
Deaths (excluding stillbirths)	4,081	636	491	159	110	4,183	616	561	154	116
Annual death rate (per 1,000 persons living)			9·9					11·3	9·5	
Live births	7,050	1151	885	422	249	7,666	1197	1010	425	251
Annual rate per 1,000 persons living			17·8					20·3	26·3	
Stillbirths	186	19	22			193	26	29		
Rate per 1,000 total births (including stillborn)			24					28		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Food-poisoning at Horden

The outbreak of food-poisoning at Horden was briefly reported in these columns last week (July 15, p. 174). At 11 p.m. on Sunday, July 9, the medical officer of health of Easington R.D.C., to whom we are indebted for this information, was told by the senior partner in a practice of five doctors in the village of Horden that a large number of patients had been seen during the week-end complaining of symptoms which were suggestive of food-poisoning. The doctors concerned thought that the food responsible was probably some pork.

Early on Monday, July 10, the whole of the senior sanitary inspector's staff was put to work on the investigation. A rapid survey of 15 households, in which there were 28 patients, showed that the doctors' suspicions were probably correct, and that the vehicle of infection was pork which had been eaten in the form of sandwiches, sausages, pies, pigs' cheek, and also used as an ingredient of pease-pudding. A visit was immediately paid to the butcher's shop by the senior sanitary inspector, who was unfortunately unable to obtain even a fragment of the cooked meat but was able to secure the remainder of the suspected carcass. Portions of this carcass were immediately dispatched to the Public Health Laboratory, Newcastle-upon-Tyne, for bacteriological examination. During the Monday afternoon one specimen of faeces and one specimen of vomit from patients were also sent to the same laboratory. Further specimens were sent on Tuesday. By that afternoon Dr. R. Norton, the bacteriologist, had obtained colonies of organisms, both from the suspected pig carcass and from the faeces and vomit of two patients, which he thought were probably of the salmonella group. On the morning of Wednesday, July 12, he was able to state that these organisms were salmonella and probably of the Newport type. This has since been confirmed. Detailed investigation suggested that the number of persons involved in the outbreak was between 450 and 500. The infected pork in its various forms was on sale throughout Friday and Saturday, July 7 and 8, and the first cases appeared to have been taken ill about midday on Saturday. The interval between consuming the infected food and the onset of symptoms varied considerably, being from 18 to 96 hours.

The predominant symptoms were headache, severe generalized pains, shivering, and sweating, together with pyrexia, followed by vomiting, diarrhoea, and colicky abdominal pains. The duration of the attack also varied, some patients recovering fairly rapidly and returning to work on the morning of Thursday, July 13, while in others the illness lasted several days. Five patients were admitted to the Sunderland Infectious Diseases Hospital.

Subsequent investigation into the history of the infected pig carcass showed that it was received into the Ministry of Food slaughterhouse at Station Town, Wingate, on July 3 as a dressed carcass of sow pig unaccompanied by pluck, stomach, or intestines. The carcass was that of a well-nourished animal, was well bled, and was free of any visible abnormality in the musculature. Lymph glands and serous membranes were normal, but it was observed that the kidneys were paler than usual and there was some superficial scarring of the teats. The carcass had set well, and in the absence of any positive evidence of disease the kidneys and scarred belly tissues were removed and the carcass passed for human consumption. It was then delivered to the butcher the following day.

Between July 4 and 6 he prepared a mould of pig cheek and a quantity of pork pies and pease-pudding, the latter being enriched by pork stock. Approximately 40 lb. of pork sausage was made from one loin, and the two shoulders were boned, boiled, and finally baked for sale in the form of sandwiches. The remainder of the carcass, which involved one loin and both legs, was reserved for manufacture and sale the following week and was in a refrigerator on the premises at the time of the inspector's first visit on July 10.

Later inquiries revealed that the pig had been bought by a local pig-keeper six months previously for breeding purposes. Following the birth of a litter on June 13 the pig suckled its young for two weeks and then gradually went off its food. A veterinary surgeon brought in by the pig-keeper at this stage suspected intestinal obstruction, but in the absence of any appreciable improvement in the animal's condition the owner decided to slaughter it, and on the afternoon of Saturday, July 1, this was done by a local slaughterman, who personally examined the intestines in detail in an effort to trace the suspected obstruction. Under the mistaken impression that the pluck, stomach, and intestines were of no value the owner buried them. According to the statement of the owner, the slaughterman who killed and dressed the animal, and the veterinary surgeon who previously treated it and who saw the carcass, were satisfied that apart from some enlargement of the liver the pluck and intestines were normal in all respects.

All the nine specimens of stools from patients sent to the laboratory on Tuesday, July 11, were reported to be positive, as were also the stools from the five members of the butcher's family and staff. Every member of the latter, with the exception of the butcher himself, had eaten some portion of the infected pork. The positive result from the butcher himself is not easy to explain, but in view of the fact that he handled both the infected carcass and the products therefrom it seems likely that he infected himself from them. At present it is thought that the origin of the outbreak was the infected pig carcass rather than any contamination by a carrier. Further bacteriological investigations, however, are still being carried out on the remains of the pig carcass.

Poliomyelitis

The numbers of notifications of poliomyelitis in the week ended July 8 were: paralytic cases 139 (124), non-paralytic cases 73 (36). Figures for the previous week are given in parentheses. Although the total increase is a considerable one —from 160 to 212—it is largely due to the doubling of the notifications of non-paralytic cases. This suggests that practitioners are being particularly vigilant at the present time. The highest incidence is still in the Midlands, although the figures for Warwickshire have declined a little. The principal increases were in Worcestershire, London, and Lancashire.

Discussion of Table

In *England and Wales* there were increases in the notifications of whooping-cough 174, scarlet fever 112, dysentery 49, and acute poliomyelitis 18; the only decrease of any size was in the incidence of measles 168.

The largest falls in the incidence of measles were Kent 117, Warwickshire 104, Durham 103, and Middlesex 92; the largest rises were Yorkshire West Riding 105 and Lancashire 90. The south-eastern counties, with an increase of 56 notifications, accounted for half the increase in the incidence of scarlet fever. The largest increase in the notifications of whooping-cough was Northumberland 36. There was very little variation in the local returns of diphtheria.

The largest returns of dysentery were Yorkshire West Riding 74 (Bradford C.B. 30, Shipley U.D. 16, Sheffield C.B. 8); Lancashire 48 (Preston C.B. 18, Oldham C.B. 6, Liverpool C.B. 6); Staffordshire 26 (Coseley U.D. 13, Smethwick C.B. 6, Bilston M.B. 6); Durham 23 (Stanley U.D. 13); Surrey 11 (Croydon C.B. 8); and Yorkshire East Riding 10 (Kingston-upon-Hull C.B. 10). The largest outbreak of food-poisoning during the week was in Staffordshire, Wednesbury M.B., where there were 120 notifications.

The largest rise in the notifications of acute poliomyelitis was Staffordshire 9. The largest returns were Warwickshire 47 (Birmingham C.B. 41); Staffordshire 18 (Rowley Regis M.B. 9, Sedgley U.D. 3); London 13 (St. Pancras 3, Woolwich 3); Worcestershire 11 (Halesowen M.B. 5); and Lancashire 11 (Liverpool C.B. 3). Apart from these centres the largest notifications came from Sussex, Brighton C.B. 4, and Middlesex, Uxbridge U.D. 3.

In *Scotland* there were decreases in the notifications of measles 151, whooping-cough 33, and dysentery 15, with increases in the incidence of acute primary pneumonia 35 and acute poliomyelitis 10. The largest returns of dysentery were Glasgow 65, Edinburgh 13, and Dundee 11; each of these cities, in contrast to the trend for the country, showed a slight increase in incidence. The chief feature of the returns for diphtheria was a rise of 8 in Glasgow; only one case was notified in this city in the preceding week. Of the 47 cases of poliomyelitis 27 were notified in Glasgow, 12 more than in the previous week.

In *Eire* a rise of 14 in the notifications of whooping-cough was the largest fluctuation in the trends of infectious diseases. This increase was contributed by the country districts; in Dublin C.B. a decrease of 11 was reported.

In *Northern Ireland* a fall of 17 in the notifications of measles was the only variation of any size in the returns of infectious diseases. This decrease occurred mainly in Belfast C.B. Of the 10 cases of poliomyelitis 8 were notified in Belfast C.B., an increase of 2 over the preceding week.

Week Ending July 8

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,031, whooping-cough 3,934, diphtheria 63, measles 8,955, acute pneumonia 281, acute poliomyelitis 212, dysentery 278, paratyphoid fever 15, typhoid fever 2.

Medical News

International Congress of Ophthalmology

The Duke of Gloucester opened the sixteenth International Congress of Ophthalmology in London on July 17, and scientific and social meetings were held throughout the week. Sir Stewart Duke-Elder presided at the opening ceremony, which was attended by over 1,000 ophthalmic surgeons from all over the world. The Gonin Medal, which is awarded at each congress to the individual considered by the International Council of Ophthalmology to have made the greatest contribution to ophthalmology, was presented to Dr. H. Arruga, of Barcelona. Demonstrations of eye operation by television were given by surgeons at Moorfields Eye Hospital. Delegates to the congress made good use of B.M.A. House, where the Great Hall was available as a lounge and social centre. The President and Council of the B.M.A. gave a reception for the delegates on July 19. A report of the scientific meetings will appear in a later issue.

International Federation of Physical Medicine

At a meeting recently held in London it was decided to constitute the International Federation of Physical Medicine. The objects of this body are to promote on an international basis the study and practice of physical medicine, the term being used in the widest sense, and to hold international conferences in this subject. An interim committee was appointed as follows: chairman, Dr. Frank Krusen (Mayo Clinic, U.S.A.); vice-chairman, Dr. Svend Clemmesen (Copenhagen); honorary secretary, Dr. Philippe Bauwens (London); other members: Dr. W. S. Tegner (London) and Dr. Hugh Burt (London). The temporary headquarters of the federation will be in London (c/o The British Association of Physical Medicine, 45, Lincoln's Inn Fields, London, W.C.2), and it is hoped to hold the first congress of the federation in London in July, 1952.

British Surgeon in Turin

At a meeting of the Società Piemontese di Chirurgia on June 24, Mr. W. Alexander Law, of the London Hospital, spoke on "Athroplasty of the Hip" and "Spinal Osteotomy," and operated in the surgical clinic of the University of Turin.

London County Medical Society

There will be no clinical meeting of the London County Medical Society during August. An announcement will be made giving full details of the next clinical meeting.

Smallpox Research Grant

Dr. C. W. Dixon has been awarded a Leverhulme Research Fellowship to study the epidemiology of smallpox and the control of variola minor. Dr. Dixon is lecturer and chief assistant in the department of preventive medicine and public health, Leeds University.

Wills

Major-General Sir Charles Gordon Gordon-Watson, K.B.E., C.M.G., formerly consulting surgeon to St. Bartholomew's Hospital, left £34,122. He left £100 each to St. Bartholomew's Hospital, St. Mark's Hospital, the British Empire Cancer Campaign, the Research Department of the Royal College of Surgeons of England, and the Royal Medical Benevolent Fund. Sir Thomas Houston, of Belfast, the well-known bacteriologist, who left £40,831, bequeathed £1,000 to Queen's University, Belfast, to be used under the direction of the Medical Faculty of the University, and £1,000 to the Royal Victoria Hospital, Belfast, to be devoted to the equipment and furnishing of the laboratory at the Institute of Pathology there. Mr. Herbert Ernest Batten, formerly consulting orthopaedic surgeon to Charing Cross Hospital, left £16,267; Dr. Ludford Cooper, formerly of Rochester, Kent, £34,918, bequeathing £1,000 to St. Bartholomew's Hospital, Rochester; Dr. Robert Walpole Murphy, of Middleton-in-Teesdale, Durham, £15,119; and Dr. John Lawson Dods-Brown, of Wisbech, Cambridgeshire, £6,431.

COMING EVENTS

Banting Memorial Lecture

Dr. Maurice Krahl, of St. Louis, U.S.A., will deliver the Banting Memorial Lecture at the Medical School, University of Birmingham, on Friday, July 28, at 11 a.m. His subject is "Hormonal Regulation of Glucose Utilization by Tissues."

Medico-Legal Society

The Annual General Meeting of the Medico-Legal Society will be held at 26, Portland Place, London, W., on Thursday, July 27, at 8 p.m., when Dr. R. Sessions Hodge will read a paper on "The Hormone Treatment of the Sexual Offender."

Harben Lectures

Sir Leonard G. Parsons, F.R.S., will deliver the Harben Lectures, on "Studies on Child Health," at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W., on Monday, Tuesday, and Wednesday, December 11, 12, and 13, at 4.30 p.m. Admission is free, without ticket, but those who wish to attend the lectures should notify the secretary of the institute at the above address.

Refresher Course in Tuberculosis

The Tuberculosis Educational Institute (Tavistock House North, Tavistock Square, London, W.C.) has arranged a refresher course in the pathology and immunology of tuberculosis to be held at the Sir William Dunn School of Pathology, Oxford, on September 19, 20, 21, and 22. The programme is as follows: September 19, 10 a.m., inaugural address by Dr. A. Q. Wells; 10.15 a.m., Dr. W. T. U. Pagel, "Primary Infection—Immunological and Pathological Responses"; 11.45 a.m., Dr. J. W. Clegg, "Superinfection and Reinfection—Pathological Aspects"; 2.30 p.m., Dr. J. W. Crofton, "The Theoretical Basis of Chemotherapy in Tuberculosis." September 20, 10 a.m., Dr. D. Barron Cruickshank, "The Tubercle Bacillus—Clinical Bacteriology and Methods of Demonstration"; 11.45 a.m., Dr. M. Stacey, D.Sc., "The Tubercle Bacillus—Chemical Structure"; 2.30 p.m., Dr. S. Roodhouse Gloyne, "Morbid Anatomy and Bacteriology of Apparently Healed Cavities." September 21, 10 a.m., Dr. V. H. Springett, "Superinfection and Reinfection—Clinical Aspects"; 11.45 a.m., Dr. J. A. H. Wylie, "Relationship of the Reticuloses to Tuberculosis"; 2.30 p.m., Dr. Honor Smith, "Some Effects of Intrathecal Tuberculin in the Streptomycin Treatment of Meningitis"; September 22, 10 a.m., Dr. A. Q. Wells, "Vaccination in Tuberculosis and its Problems—Pathological Aspects"; 11.45 a.m., Dr. I. Mills Hall, "Vaccination in Tuberculosis and its Problems—Clinical Aspects"; 2.30 p.m., Dr. C. M. Fletcher, "Lung Changes Due to Inhalation of Dust." The fee for the course is £5 5s. and for accommodation £4. Remittances should be sent to the secretary of the institute at the above address.

Congress of Cardiology

An International Congress of Cardiology will be held in Paris on September 3–9 under the patronage of the President of the French Republic. It is being organized by the Société Française de Cardiologie on the initiative of the International Committee of Cardiology. Full information may be obtained from the secretary, 19, Rue Hautefeuille, Paris, 6e.

SOCIETIES AND LECTURES

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

Monday

CAMBRIDGE UNIVERSITY.—At Physiological Laboratory Theatre, Cambridge, July 24, 5 p.m., "*Development of Modern Renal Physiology*," by Professor Homer Smith (New York).

Friday

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, Cavendish Square, London, W.—July 28, 7.30 p.m., 29th annual general meeting. "*Random Reflections*," Presidential address by Dr. Robert Lees.

APPOINTMENTS

CULLEN, S. V., M.B., Ch.B., School Medical Officer, Isle of Man.

LEWIS, J. K., M.B., Ch.B., D.A., Consultant Anaesthetist, West Cornwall Clinical Area.

MEREDITH, DAVID ERYL, M.D., M.R.C.P., Consultant Physician to the Clwyd and Deeside Hospitals, North Wales.

NORMAN, A. P., M.B.E., M.D., M.R.C.P., D.C.H., Visiting Physician to Hospital for Sick Children, Great Ormond Street, London, W.C., and Deputy Director of the Institute of Child Health.

ROBSON, T. W., M.B., Ch.B., D.P.H., Medical Officer of Health and School Medical Officer, County Borough of Dewsbury.

SUTHERLAND, MARY, M.R.C.S., L.R.C.P., Orthopaedic Registrar, York County and City Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bury.—On July 13, 1950, at The London Hospital, to Sylvia, wife of Dr. J. D. Bury, a son.

Copp.—On July 6, 1950, at Brighton, to Peggy, wife of Dr. T. A. Copp, a daughter.

Crossfield.—On June 1, 1950, at 1015, 7th Avenue West, Calgary, Alberta, Canada, to Isobel, wife of P. O. Crossfield, M.D., M.R.C.P., D.C.H., a daughter—Fiona June.

Elliman.—On July 5, 1950, at St. David's Wing, Royal Northern Hospital, to Hazel (formerly Brown), wife of Dr. H. Elliman, M.D., a daughter.

Hart.—On July 11, 1950, at Westminster Hospital, to Maureen (formerly Tully), wife of Dr. Frank Dudley Hart, a son.

MARRIAGE

Arthurton—Edmonds.—On July 15, 1950, at Banstead, Malcolm William Arthurton, M.R.C.P., to Evelyn Florence Edmonds.

DEATHS

Bazett.—On July 12, 1950, Henry Cuthbert Bazett, C.B.E., M.C., M.D., F.R.C.S., of Philadelphia, U.S.A., aged 65.

Bone.—On July 9, 1950, at Four Winds, Frimley Green, Surrey, Elizabeth Honor Bone, M.D., formerly of 86, Porchester Terrace, London, W.

Dawson.—On July 9, 1950, at Rayleigh, Essex, Reginald Branch Dawson, M.R.C.S., L.R.C.P., late of Leigh-on-Sea.

Dixon.—On June 6, 1950, at Lindo Wing, St. Mary's Hospital, Paddington, London, W., Joyce Dixon, M.B., B.S., aged 28.

Hainsworth.—On July 14, 1950, John William Hainsworth, M.B., Ch.B., of Newcastle-upon-Tyne, late of Greengates, Bradford, aged 83.

Ham.—On July 2, 1950, at Coventry, Constance Irene Ham, M.D., F.R.C.S.Ed.

Hutson.—On March 29, 1950, at Pine Hill, St. Michael, Barbados, B.W.I., Sir John Hutson, O.B.E., V.D., M.B., C.M., D.P.H., aged 91.

Kerr.—On July 13, 1950, at Ardfenaig, Argyll, Neil Thomson Kerr, M.B., C.M.

Lane.—On July 7, 1950, at The London Hospital, Harold Dunmore Lane, M.C., M.R.C.S., L.R.C.P., of 56, London Road, Twickenham, Middlesex.

McGrenahan.—On July 4, 1950, at 6, Cleveland Road, Wolverhampton, William Patrick McGrenahan, L.R.C.P.&S.Ed., L.R.F.P.S.Glas.

McMurdo.—On July 8, 1950, at Addlestone, Surrey, Fergus William Hamilton McMurdo, M.B., Ch.B.

Matthew.—On July 7, 1950, at 9, Walker Street, Edinburgh, Edwin Matthew, M.D., F.R.C.P.Ed.

Mott.—On July 8, 1950, at 5, Wellington Road, Parkstone, Dorset, Raymond Culver Mott, M.B., B.Ch., aged 73.

Naismith.—On July 8, 1950, Robert Turnbull Easton Naismith, M.B., B.S., of Colne House, Slaithwaite, Yorks, aged 54.

O'Grady.—On June 22, 1950, William Henry O'Grady, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of Tooreen Lodge, Louisburgh, Co. Mayo, aged 66.

Any Questions?

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

Reactions to Pertussis Vaccine

Q.—*In an annotation on "Pertussis Vaccination and Encephalopathy" (January 14, p. 110) you state, ". . . If the child has had previous convulsions or has any reaction to the first injection attempts at vaccination should be abandoned." What constitutes a reaction? I have used two types of combined diphtheria and pertussis vaccine, and with both a fairly high proportion of the children injected showed one or both of the following reactions within six to twelve hours: (1) local swelling and pain at the site of injection; and (2) pyrexia varying from 100° F. (37.9° C.) to 104° F. (40 C.), usually accompanied by no local reaction. In the child with the temperature of 104° F. this temperature was reached six hours after the first injection and did not return to normal for four days. In none of these cases were any nervous symptoms observed. Is a pyrexial reaction after the first injection a contraindication to further injections? If so, is it safe to continue with diphtheria prophylactic alone?*

A.—Reactions to pertussis vaccine may be either local (swelling and pain at the site of injection) or systemic (some degree of pyrexia with general malaise). Local reactions have been quite rare among the large number of children given plain or alum-precipitated pertussis vaccine in the recent trials in this country. Local reactions have been reported more often with the combined diphtheria and pertussis prophylactic, but this type of reaction can usually be minimized by giving the prophylactic intramuscularly or deep into the subcutaneous tissues. The occurrence of a local reaction would not be regarded as a contraindication to further injections. But there is a risk particularly associated with intramuscular injection of the combined vaccine—the rare occurrence of paralysis in the inoculated limb due to poliomyelitis. It might therefore be wise not to use the available combined diphtheria pertussis vaccines during a period when poliomyelitis is occurring in the district. Although the danger of encephalopathy following injections of pertussis vaccine must be extremely small in Britain, it may not be so negligible in countries where various forms of virus encephalitis are endemic. In any case, it is better to avoid giving injections to an infant with a history of recent convulsions, or when a child is teething or is suspected of incubating an infectious disease. A severe systemic and unexplained reaction to a first injection should be regarded as a contraindication to further combined prophylactic inoculations, but small doses of each reagent could be given separately.

Poliomyelitis and Physical Activity

Q.—*It would appear to be important that the physical activity of a child who has possibly been infected with the poliomyelitis virus should be restricted. Does this consideration also apply to mental activity? As it is practically impossible to achieve either of these objects in a young child, say of 4 years, by ordinary means, can some form of sedation be recommended?*

A.—This is an important question which cannot be answered with great confidence. It has been fully confirmed that physical activity of any kind after the onset of the pre-paralytic (meningitic or major) stage of poliomyelitis is highly dangerous, as it seems to render the spinal cord motor cells more vulnerable to the virus. During the epidemic months for poliomyelitis, therefore, minor illnesses in children should be treated carefully by rest in bed with perhaps ½ gr. (32 mg.) of phenobarbitone twice daily to reduce restlessness. Analgesics should also be prescribed if there is pain in the head, limbs, or spine. As the nerve cells concerned with mental activity are little involved in poliomyelitis, it seems unlikely that mental activity is directly harmful, except that in the child excitement leads to all kinds of spontaneous movements, which should be kept minimal.

Another aspect of this question is concerned with the possibility that severe physical activity in a child without symptoms may convert an abortive infection with the virus into a major or paralytic form of the disease. This is specially important in view of the likelihood that most children are infected with the virus during an epidemic even though very few have a recognizable illness. This question, too, cannot be answered with any confidence, but it seems reasonable to advise the parents to take some trouble to reduce the excessive activities indulged in by many children during summer months. A rest in bed after lunch is good for all young children and can be encouraged by ¼ to ½ gr. (16 to 32 mg.) of phenobarbitone. This may add considerably to the resistance of motor nerve cells to the virus of poliomyelitis.

Treatment of Whitlows

Q.—*What is the approved modern treatment for an early whitlow? At what stage should incision be undertaken?*

A.—If by whitlow is meant felon or the infection of a pulp space by trauma, the treatment consists in the intensive use of the antibiotics combined with suitable incision where necessary. Early drainage is more important here than elsewhere in the finger, as tissue tension rises very quickly in the small fascial compartments of the pulp and leads to early spread either to the interphalangeal joint or to the flexor tendon sheath. Incision therefore should not be delayed, even if full penicillin therapy has been instituted previously, unless the signs of inflammation disappear within 24 to 48 hours. A unilateral incision starting ¼ in. (6 mm.) distal to the terminal interphalangeal joint line and extending up just short of the apex of the pulp affords the best drainage. If free pus is obtained counter drainage from the opposite side and a penicillin gauze wick for two to three days is indicated. A horseshoe incision should be avoided except in cases of obvious disease of the terminal phalanx. Immobilization in slight flexion or a digital plaster slab, the avoidance of moist dressings, and the continuation of penicillin therapy constitute the basis of the after-treatment.

Prophylaxis against Syphilis

Q.—*Some textbooks state that the application of 30% calomel ointment more than two hours after an infective coitus may merely delay the development of a primary sore, and modify it to such an extent that the diagnosis may be missed. Is this true? What is the maximum time that should elapse between coitus and adequate prophylaxis? What is the best method of prophylaxis?*

A.—The application of calomel ointment more than two hours after exposure with a person suffering from infectious syphilis may destroy surface spirochaetes and either prevent the development of a chancre or modify it. Spirochaetes may enter the blood stream and lymphatics within a very short time after surface inoculation (perhaps within an hour) so that late local prophylaxis may kill those on the surface but fail to affect those that have penetrated more deeply; as a result the syphilitic infection may be entirely asymptomatic or signs and symptoms may be delayed considerably. Obviously the earlier local prophylaxis is applied the more effective is it likely to be. At no time is it completely effective, but if applied efficiently and within, say, one hour, it should be effective in a high proportion of cases.

The "best" prophylaxis against syphilis is such treatment as has been proved to cure seronegative primary syphilis in a very high proportion of cases—for example, 4 million units of penicillin. However, much less than this often proves effective, and even 200,000 units to 300,000 units taken by mouth within a few hours has been reported as preventing infection. There is little doubt that thorough washing with soap and water immediately after exposure is very effective, otherwise many syphilologists would acquire infection through their hands.

Unilateral Recurrent Irritation of the Tongue

Q.—*I should be grateful for an indication of the possible causation and treatment of unilateral recurrent irritation of the tongue. The condition has been said to be possibly aphthous ulceration, but few textbooks seem to have much detail on the subject. A careful routine physical examination has not revealed any abnormality and I wonder whether the condition is possibly due to some dietary deficiency.*

A.—Unilateral recurrent ulceration or irritation of the tongue suggests a mechanical cause, possibly in the form of repeated traumata from a denture or a tooth. It would be advisable for the patient's dentist to exclude these possibilities. The sore tongue of nutritional deficiency is usually affected symmetrically. Deficiency of several members of the vitamin-B complex is associated with sore tongue; this symptom has been relieved, in different patients, by nicotinic acid, riboflavin, pantothenic acid, "marmite," and injections of liver extract. Thus, even if the clinical phenomena are not characteristic, it is worth giving treatment by the vitamin-B complex a trial. There are a number of ill-understood conditions in which recurrent ulceration of the mouth and tongue have been noted. The condition is sometimes associated with a cyclical granulocytopenia.

Gin and Benedict's Solution

Q.—*A patient who is a severe diabetic, recently stabilized in hospital, is on the following dosage of insulin taken at 8.15 a.m.: 60 units protamine zinc insulin; 40 units soluble insulin. In spite of this, his urine, tested four times daily, showed, on testing with Benedict's solution, light or heavy green or yellow coloration. He is normally abstemious, but a week ago he was persuaded to take two small gins in the evening. His urine the next day showed no reaction with Benedict's solution. Since then he has taken ½ to 1 oz. (14 to 28 ml.) of gin at midday and at 7 p.m., and tests with Benedict's solution have been completely negative. What is the explanation of this phenomenon?*

A.—In order to offer an explanation more information is required about the level of the blood sugar when sugar was being excreted in the urine before the gin was taken and its level now. It is possible, but unlikely, that the blood sugar is now lower than it was, though alcohol is not known to have this effect. The more likely explanation is that the threshold of the kidney is now higher than it was and sugar is not excreted for this reason. Estimations of the blood sugar should be made now in order to ascertain whether it is above the threshold value of 180 mg. per 100 ml.; if it is, the urine tests are now misleading.

Intravenous Salicylates

Q.—*Is intravenous sodium salicylate useful for rheumatism, myalgia, lumbago, etc.? There is a Chinese preparation of sodium salicylate 5%, sodium iodide 5%, in a 20-ml. solution for intravenous injection, and a similar Indian preparation. Both seem to be better than sodium salicylate mixture by mouth. Would it be harmful to continue these injections, and could they be used, say, in acute rheumatic fever?*

A.—The analgesic effect of salicylates in the symptomatic treatment of the conditions named is undoubted. As salicylates are rapidly absorbed from the jejunum nothing is gained by giving them by injection. Repeated injections of sodium salicylate in the high concentrations mentioned will cause sclerosis of the veins. In the treatment of acute rheumatism an adequate blood concentration of salicylates is achieved by regular four-hourly oral therapy. Gastric irritation can nearly always be avoided by diluting the medicine with water and adding sodium bicarbonate, 10 gr. (0.65 g.) to every 20 gr. (1.3 g.) of sodium salicylate. For the very occasional patient who is unable to tolerate the drug by mouth, 1,000 ml. of a 1% solution can be given by slow intravenous drip infusion. The intravenous administration of such large amounts of fluid to patients with an acute rheumatic infection, however, carries with it the danger of overloading the right side of the heart.

Plasma-cell Myeloma

Q.—*What is the treatment and what is the prognosis in a case of plasma-cell myeloma? This was responsible for a pathological fracture of the femur just over a year ago in an elderly woman. Should stilbamidine be given? Is any vitamin therapy likely to be helpful? What other methods of treatment might be tried?*

A.—Plasma-cell myeloma is, in almost every instance, a diffuse neoplastic disease of the bone marrow. An occasional case of a solitary tumour has been reported. It is assumed that the patient in question has the usual type of multiple myelomatosis referred to in the opening sentence. This disease is always fatal, the average period of survival being between two and three years from the first appearance of symptoms. Vitamins have no effect on the course of the disease; stilbamidine and pentamidine have proved disappointing in most cases although they sometimes relieve pain; antimonials, such as "neostibosan," are no more efficacious. If there is an apparently solitary lesion which has led to pathological fracture and is causing pain, local irradiation is most useful, although giving only symptomatic relief. There is no treatment which favourably influences the progress of the disease.

NOTES AND COMMENTS

Intra-articular Injections for Arthritis.—Dr. LESLIE HARTLEY (Camberley) writes: I was very surprised at the answer in "Any Questions?" (May 13, p. 1156) on intra-articular injections for arthritis, and I was very pleased to see Mr. Grant Waugh's comments (July 1, p. 60). As a patient who has been treated for arthritis by this method, the answers I would give are: (1) The results obtained have been excellent in most cases. (2) The technique for the knee-joint is very simple. An injection of 5 ml. of lactic acid (and not 10 to 20 ml. as suggested in the answer) is given into the knee-joint with a No. 20 needle 2 in. long of the same type as used in ophthalmic surgery for a retrobulbar injection, and it is given with the knee in a flexed position. It is not necessary to inject procaine into the skin or into the synovial membrane, as, with a needle of this type, the procedure is practically painless. Actually, each injection is less painful than the previous one, owing to the beneficial effect of the lactic acid on the synovial membrane. (3) Any case of arthritis is likely to benefit, possibly osteoarthritis coming first. It is of particular value in cases of arthritis of the hip and prevents ankylosis of the joint if given in time, but this injection is difficult and requires the skill of an orthopaedic surgeon. (4) The best mixture to use is lactic acid (*p*H 5.4 to 5.8) with or without procaine 2%. Your answer stated that in practice it was of no value except perhaps as a placebo, but I feel that this technique can hardly be compared with some coloured water in a medicine bottle given to quieten a neurasthenic patient. It is not claimed by Mr. Grant Waugh, who has been the pioneer in this work, that it is a cure for arthritis or that its value is anything except local. On the other hand, there are many patients who have been incapacitated or rendered immobile by an arthritic joint which has not responded to rest, heat, etc., but has recovered either partially or fully after six or more weekly injections of lactic acid. It is quite true that after a year or two it may be necessary to have further injections, but, again, any arthritic patient is grateful for any restoration of function, even if it is only temporary, particularly so in a disease like arthritis where nobody can claim any permanent cure; and this applies to the new cortisone, which must be given daily. Finally, your opinion is not shared by our Continental colleagues—otherwise they would not have invited Mr. Grant Waugh to Paris to lecture and to demonstrate his technique to the Académie Nationale de Médecine.

Correction.—Relying upon what is usually a trustworthy source of information, we stated in error in last week's *Journal* that the honorary degree of LL.D. of the University of Liverpool had been bestowed on Dr. E. A. Gregg and Dr. C. O. Stallybrass. The degree conferred was M.D.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 5 1950

REFLECTIONS ON CRIMINAL CONDUCT AND ITS TREATMENT*

BY

Sir DAVID K. HENDERSON, M.D., F.R.C.P.
Professor of Psychiatry, University of Edinburgh

It has seemed to me that the problem of how best to deal with the sick society which exists in our midst to-day has not been discussed comprehensively by anyone who has already given evidence before the Royal Commission. Punishment by any violent and arbitrary method—for example, hanging or flogging—to be administered fairly should be considered in relation to the medical, social, and economic problems which exist. If this is not done then we merely dispose of and deal with a few "tigers" without influencing the tiger problem as a whole. We know that the human race is loaded with imperfections, and in consequence we are not likely to obtain a better-organized society until we have improved the quality of the people who constitute it.

Our mental hospitals and colonies for the mentally defective are crowded to overflowing, and further provision is an urgent necessity. In addition, however, the amount of mental and emotional unrest and instability in the population is increasing rapidly. This is due to the fact, in part at least, that the poorer stocks are increasing while the healthier stocks are tending to diminish, and in consequence a dysgenic situation has arisen whereby the weakly and those potentially liable to mental and nervous upsets are surviving to a much greater age than was the case previously. Socially, the position is complicated by the fact that so many married women are employed in industry. The wastage turnover is high, and leads to unrest, instability, and irritation not only in the factory but in the home. A state of licence and freedom from restraint exists which previously was not the case. The position is complicated by inadequate housing and by the high divorce and illegitimate rate.

Economically, the high cost of living and the state of uncertainty and insecurity in which people live are, I believe, tending to affect the general position and indirectly are influencing the emotional instability which is so prevalent. I believe that it is only by an improvement of the above-mentioned conditions that we are likely to see a better-ordered society. The violent methods of punishment and retribution which have received such universal approval in legal and public circles have little or no constructive value, and make no contribution towards social reformation. The fundamental problem facing everyone interested in human betterment is the improvement of the quality of the race.

*Memorandum submitted to the Royal Commission on Capital Punishment, and published by permission of the Controller of H.M. Stationery Office.

Disorders of Conduct

My interest and experience in relation to the criminal law dealing with persons accused of murder or other serious offences has extended over many years, and has concerned itself essentially with those who, for one reason or another, have been regarded as nervously or mentally abnormal, or at least where doubt has been cast on their sanity. I believe it is generally agreed, medically, that a transitory or more permanent disturbance of the mental faculties of some type or degree plays a significant part in many forms of criminal conduct—for example, murder, suicide, sexual offences, writing threatening letters, fire-raising, etc. Legal and public opinion, however, in judging such offences is apt to adopt a moralistic rather than a medical code and to be sceptical of the findings of the psychiatrist; in consequence, when a medical opinion is submitted it should be stated in terms which can be easily understood and should deal with the actual facts.

Medical theorizing, especially in the witness-box, is as much to be condemned as the hypothetical questions of the lawyer. The estimation and elucidation of a state of nervous or mental disorder—its nature, its severity, its causation and recoverability—is a matter of the greatest complexity which may require repeated examinations, and preferably a period of skilled psychiatric observation, by both doctors and nurses under far better conditions than at present exist. The reason for that statement is because the signs and symptoms of the disorder are so often entirely subjective, and because neither the cell of the accused nor the prison governor's orderly-room or office provides a neutral enough atmosphere for so serious and skilled an examination. Neither the prisoner nor the examining doctor is entirely at his ease.

During the past fifty years our medical knowledge in relation to the various types and categories of nervous and mental illness has been greatly extended, and methods of treatment have been introduced which effect recoveries which border on the miraculous—for example, in syphilitic disorders of the nervous system, pellagra, states of exhaustion and anoxaemia, profound depressive, delusional, and obsessional states. Gaps in our knowledge still exist, but

as our methods of investigation become better defined those gaps should gradually be bridged over, and the how and why of conduct disorder associated with an involvement of the mental faculties may become more fully understood.

One of our great difficulties is that in nervous or mental cases we cannot, except rarely, point to any specific causation as in the case of physical illness. We require to content ourselves with saying that the personality of the individual has become twisted or distorted as the result of a constellation of factors involving the development or lack of development of instinct, hereditary or genetic factors, environmental surroundings, or perhaps more personal matters of a physical or emotional nature. We never can divorce the offence from the life history of the individual. The setting or background in which the crime occurs is an important part of the total picture.

Even with all those points in mind, however, it may still prove extremely difficult to say where sanity ends and insanity begins. The dividing-line is narrow. Sanity and insanity are essentially legal terms which have never been accurately defined. There are many sane persons whose conduct is extremely eccentric and foreign to social custom, whereas there are many technically insane persons whose conduct may never lead them into any serious trouble. In such circumstances we must continue to try to approximate medical and legal opinion, so that, in combination, we can do what is best for the welfare of the individual, whether that involves treatment or punishment.

The legal outlook, in my opinion, is too greatly dominated by an intellectualistic and moralistic point of view, by the concept of reason and free will, and by lack of appreciation of the fact that conduct is motivated by instinctive drives which operate at a much less conscious level. On the other hand, it may be argued that the medical point of view is too liberal-minded, concerns itself too greatly with the individual, and does not fully appreciate its duty to society. But yet it is only by realizing that individualization is the dominant truth of modern medical science, whether applied to disease or to crime, that we look forward more hopefully to the future. The large army of recidivists is the best answer to the arbitrary-sentence methods at present in vogue.

The above general statements may now be applied to the groups of persons with whom I have been particularly concerned : (*a*) those of unsound mind ; (*b*) mental defectives ; (*c*) psychopathic states (character anomalies) ; and (*d*) psychoneuroses.

Persons of Unsound Mind

I am one of those who believe that in cases involving a capital charge the plea of mental disorder in bar of trial or sentence is submitted too frequently. Such a defence is to be deplored in those cases in which there is no special redeeming feature, and when the defence of insanity is really a plea *ad misericordiam* rather than anything else. Doctors and lawyers are equally to blame : doctors because they are too much influenced by sympathy and theory ; lawyers because they have been educated to present every case in as favourable a light as possible. In cases of a less serious type the plea of mental disorder is not submitted often enough, largely because the accused would prefer to serve a defined prison sentence than undergo prolonged treatment in a mental hospital. The danger of such a situation is self-evident, because it is just those cases which merely swell the ranks of the recidivists. Furthermore, it is rare for criminal conduct to be the first sign or indication of mental disorder. The mentally disordered criminal is a person who for years, or months, or weeks beforehand may have given evidence of his mental abnormality, and in numerous cases medical advice may have been sought beforehand. When this has been so it constitutes strong presumptive evidence of the bona fides of the case.

In British courts the method in use of testing the truth of the plea of mental disorder allows both the prosecution and the defence to submit independent medical evidence. There is much to be said in favour of such procedure ; it helps to maintain the liberty and independence of the subject, and as a rule it operates with fairness. Unfortunately in some cases it leads to unseemly wrangling, to a clash of medical opinion, and to a consequent lack of confidence on the part of the public. It was the desire to obviate that state of affairs which led, many years ago, to the introduction of the Briggs Law of Massachusetts. The court appoints a panel of experts to submit a report on the state of mind of the accused, and that report is accessible both to the prosecution and to the defence. It is a method which is worthy of careful consideration. If the panel should fail to agree, then the case goes forward to trial on its merits irrespective of whatever medical evidence there may be.

The M'Naghten Rules

It is cases of psychosis or unsoundness of mind which come into the ambit of the M'Naghten rules. The M'Naghten case is so well known, and the rules have been so fully discussed, that no useful purpose would be served by again considering them in detail. I may, however, be allowed to make certain observations and suggestions. In their day and time the formulation of the M'Naghten rules constituted a definite advance in legal thought and practice ; they set a standard, and they were more or less in conformity with medical knowledge. Now the position has been greatly altered. The M'Naghten rules are no longer in harmony with medical knowledge, and, furthermore, judges themselves vary widely in their interpretation of the rules. This position is greatly to be deplored, because it leads to irritation, which in an indirect way may be vented on the prisoner at the bar. The only way I see of getting round this is by improving the professional training of both the lawyer and the doctor and by the development of medico-legal societies.

In my opinion it is impossible to define degrees of unsoundness of mind—one person is not necessarily more mad than another—but there are many different forms of mental disorder, all of which equally should exonerate a person from a charge of criminal conduct—for example, melancholia, schizophrenia, paranoid states, general paralysis, senile dementia, epilepsy with insanity, and many others. In many of the above cases the individual's mind is sufficiently clear to know what he is doing, but at the same time the true significance of his conduct is not appreciated in relation either to himself or to others. Persons who are proved to be insane in a medical sense are, in my opinion, not legally responsible for the crime which they may commit. I would agree with Lord Justice Clerk Inglis when he said : "In a strictly legal sense there is no insane criminal. Concede insanity and the homicidal act is not criminal. The act of the insane, which in the sane would be criminal, lacks every element of crime."

On the above evidence I believe the M'Naghten rules have introduced a rigid categorizing which may appeal to certain types of mind, but they make the position too academic, and in some respects too easy, so that full effect

is not given to the very special and individual aspects which are present in every case. For instance, most people can understand what is meant by the "nature" of the act, but the "quality" of it can be defined either as synonymous with the physical quality or with the broader concept of "significance." The mentally disordered in many cases realize the physical quality of the act, but they never do realize the full significance of their criminal conduct.

The further moralistic issue of "right and wrong" is hardly ever applicable. In cases in which such a serious issue as capital punishment is involved there is surely little place for rules and formulae, and instead of introducing others, or of adding to or polishing up those already in being, I would suggest that they should be dispensed with altogether. I feel sure that every thoughtful judge who has been trained in criminal law procedure is well qualified to put the issue involved before the jury in such a comprehensive way that every case will be judged on its individual merits rather than in terms of a formula which cannot do complete justice to the individual aspects of each case. It has been said with approval that the M'Naghten rules constitute a yardstick for both judge and jury ; but a yardstick is too rigid an instrument when an individual's life is at stake.

While I have always been greatly impressed by the scrupulous care with which a criminal trial is conducted, and by the fact that almost invariably the prisoner is given the benefit of any doubt which may exist, yet that is not to say that conditions could not be improved. I believe, for instance, that in every case involving capital punishment a psychiatric examination would be advisable, just as it is in cases of attempted suicide : the destructive motive is the same in both instances even though the object may be different.

For those persons who have been adjudged as of unsound mind I would advocate :

1. Care and treatment in a special type of mental hospital independent of a prison regime. Provision should be made whereby every method of psychiatric treatment was readily available. Failing acceptance of the above suggestion, then a modern psychiatric department should be established within the prison system.

2. Parole might be used more frequently.

3. Transfer to civil hospitals should be made more often, and dangerous patients in civil hospitals should be more easily and readily transferred to the prison psychiatric unit.

4. Remedial workshops equipped with modern machinery would be a valuable aid in the rehabilitation of such cases.

5. I would suggest that those cases which require observation and a detailed psychiatric report before trial should be transferred, for the time being, to a suitable psychiatric clinic or to a special ward in a mental hospital.

Mental Deficiency

This condition may be defined as a state of retarded development which has been present from birth or an early age and has prevented the individual from keeping pace with his fellows. It may be of various forms and degrees, which to a certain extent dovetail into one another. It constitutes a serious disorder which for all practical purposes is incurable. But yet, curiously enough, the law refuses (except in the most gross cases) to allow mental deficiency to be utilized as a defence in bar of trial or sentence. In many tragic cases in which I have been willing to certify the prisoner as a mental defective I have been informed that "the prisoner is merely mentally defective" and therefore he must stand his trial in a public court just like anyone else accused of a criminal act. Such an outlook constitutes a grave injustice, and the time is long overdue for a recasting of the criminal law in relation to such persons. A prison sentence, long or short, in such cases has no deterrent or remedial effect ; it merely adds insult to injury, embitters the enfeebled person still further, and renders him more liable to continue in a career of crime rather than to conform to society. Is it not a complete travesty to suggest that persons who can be certified as mentally defective should be allowed to plead to the charge against them, should be considered capable of instructing their defence and of being able to follow the evidence submitted to the court ?

My point of view can be supported by the following cases.

Illustrative Cases

1. An unmarried woman aged 36, who had had two illegitimate children, murdered her third child by drowning shortly after its birth. She was a simple-minded, facile, mentally defective person, who had felt the strain of the childbirth and at the time of the crime was exhausted, sleepless, and distraught. She was subjected to a trial by jury, who found that she had committed the acts charged against her and was mentally defective. The court was then adjourned so that the procurator-fiscal might present a petition for a judicial order committing her to a certified institution.

The necessity for court proceedings under such circumstances seems entirely redundant.

2. An unmarried woman aged 24 murdered her newly born baby by inserting scissors or other sharp instrument into the mouth and throat of the child. The prisoner when 7 years old had already been certified as a mental defective. My examination showed her to be a feeble-minded person with marked intellectual and emotional impairment. As, however, she was "merely feeble-minded," she was regarded as fit to plead, and was tried in the usual manner. It was in this case that the Lord Justice Clerk (Aitchison) made the scathing comment: "If the law had kept pace with medical practice this prosecution would never have arisen. On the medical evidence this woman should never have been brought to trial." The opinion of the Lord Justice Clerk may not have conformed to the letter of the law, but it showed humanity and understanding.

3. An unmarried woman aged 36 cut the neck of her newly born child. The prisoner was a simple-minded, facile person who had not had sufficient realization or understanding to make any preparation for the birth of the child. After the fatal act she was quite unmoved by the tragic situation in which she was placed. The case went to trial and eventually the advocate-depute accepted a plea of culpable homicide to which she pleaded guilty. In this case the Lord Justice Clerk (Aitchison) took the view that she had already been three months in prison and that she could now be safely looked after in her father's home. She was accordingly discharged.

These cases illustrate the unfortunate and pitiful state which still exists. The legal procedure in such cases is antiquated and chaotic, and should be brought more into harmony not only with medical but with public opinion.

My contention is that mental deficiency of whatsoever degree should be regarded as an adequate defence in bar of trial or sentence, and that mentally defective persons who have committed criminal acts should be cared for under hospital or colony conditions until they can be discharged with benefit to themselves and with safety to the public.

Suitable provision for such cases is an urgent necessity, but at present we have neither the buildings nor the necessary medical or nursing personnel to cope with them. I do not ask for leniency in relation to them, but for greater understanding. It should always be remembered that they are mentally defective, that mental defect is one of the most prolific factors in criminal conduct, and that repetition of the offence is frequent. In consequence a return

to social and family life should always be regarded with meticulous care, and should not be considered advisable until a sense of social responsibility has been built up.

Psychopathic States (Character Anomalies)

The individuals who form this group constitute the biggest, most serious, and most controversial medico-legal and social problem. They are social misfits in every sense of the term, persons who have never been able to adapt themselves satisfactorily to their fellow man and appear to be entirely lacking in altruistic feeling. Their life histories are illuminating, and show how, from a tender age and from a variety of causes, they have proved a problem to themselves as well as to the world at large. They are the "sports" of the human race. The more I see of them or read about them or deal with them, the more confirmed I become that they are persons who have failed in the psycho-biological development. Such a failure may not be due to any fault in their environment or education, although that possibility should always be considered, but it is essentially constitutional, something which is inborn, something which is akin to the lack of intellectual development which characterizes the mental defective.

Irrespective of all the efforts which are made to assist them, often from their earliest days, they remain at an immature, individualistic, egocentric level. On this account they fail to appreciate reality; they are fickle, changeable, lack persistence of effort, and are unable to profit by experience or punishment. They are dangerous when frustrated. They are devoid of affection, are cold, heartless, callous, cynical, and show a lack of judgment and forethought which is almost beyond belief. They may be adult in years, but emotionally they remain as dangerous children whose conduct may revert to a primitive subhuman level. Neville Heath and John George Haigh are extreme examples.

On the surface they can behave as ordinary, likeable, attractive human beings, but they harbour in their inner depths instinctive forces which on occasions overwhelm them. In conversation and under controlled conditions no special flaw may be discovered to enable medical certification to be effected; it is impossible in such cases to define sanity or insanity, but it is surely obvious to everyone that we are dealing with conduct abnormality of such a degree and type as to constitute the greatest potential danger to the individual and his victim. They are in the most deplorable of all conditions—not sane enough to be at large and not insane enough (in terms of certifiability) to be suitable for Bedlam.

If our ethical code feels justified in sending them to the gallows then let it be so, but at the same time let us clearly understand that such persons are driven by what may be called their collective unconscious to deeds of violence which are as uncontrollable as a tidal wave. Are we justified, in such circumstances, in attempting to control the conduct of our fellow men by imposing capital punishment in the case of those we do not fully understand? I doubt whether we are. We merely add something to the satisfaction of the murderer, and, paradoxically enough, capital punishment may, instead of deterring others, encourage them to follow the same course.

This was the type of case which Lord Alness had in mind when he promulgated the doctrine of limited or modified responsibility which has been generally accepted by our Scottish courts. May I remind you of Lord Alness's words: "Formerly there were only two classes of prisoner—those who were completely responsible and those who were completely irresponsible. Our law has now come to recognize in murder cases a third class—those who, while they do not merit the description of being insane, are nevertheless in such a condition as to reduce their act from murder to culpable homicide. . . . There must be a weakness or aberration of mind; there must be some form of unsoundness; there must be a mind so affected that responsibility is diminished from full responsibility to partial responsibility; the prisoner in question must only be partially responsible for his action." That is an admirable statement, one to which I can heartily subscribe, and which meets the situation in most such cases. I believe it could be applied with justice to a much wider range of cases—for example, assault, sexual offences, and so on.

During the next fifteen years no capital sentence was carried out in Scotland, and, so far as I know, during that period the homicide rate in Scotland did not increase. While I agree with the position taken by Lord Alness, yet this does not mean that I believe that such cases should be treated more leniently. On the contrary, I believe they should be treated not necessarily with greater severity but under more specialized conditions and for such time as to prevent a possible recurrence of the offence. My plea is for an indeterminate sentence until a sense of social responsibility becomes established. Furthermore, they require to be cared for in a special institution or colony such as has been established in Denmark at Herstedvester, near Copenhagen (see Appendix).

Psychoneuroses

The persons who constitute the various clinical groupings of the psychoneurotic state are those who, while suffering from a vast number of nervous symptoms, are at the same time able to conduct their lives at a reasonable level and even continue at their work. Their number is legion, but their involvement in criminal conduct is comparatively infrequent. For the most part they seem able to exercise sufficient control and understanding whereby in time of stress or conflict they are able to go to someone for help, or else develop in themselves ways and means by which their emotions or disturbing thoughts are kept in check.

It is, however, important to understand that all the vagaries of conduct exhibited by the hysteric, the neurasthenic, the anxiety state, or the obsessive-compulsive are conditions which are not mere foolishness and something which the individual can control. Such states are the result of inner conflicts and emotional disturbances which are overpowering. The medical profession generally subscribe to the view that the signs and symptoms constituting the conduct disorder of the psychoneurotic are determined at a subconscious or unconscious level and are the result of the constant conflict which exists between the good and the evil, between one's conscience and one's instincts. When such conflicts can be resolved the patient may lead a moderately happy and contented life, but otherwise nervous fears, strange thoughts, compulsive acts, may take the field in an attempt, distorted though it may be, to bring matters to a solution. There are some who are willing to go so far as to say that all criminal acts must be determined on the basis of conflict, and that therefore the criminal person should be regarded as a sick person and not as a delinquent. That, however, is an extreme view and one which, in the present state of our knowledge, would not gain general acceptance. I would rather put it in this way—that the conflict which produces criminal acts in the case of delinquents is very much the same type as that which produces psychoneuroses. The problem may be the same, but the reaction is different, depending upon the structure or make-up of the individual. I have never known a pure obsessive-compulsive state lead to a homicidal attack, but sexual offences are not uncommon.

Conclusion

In summing up the whole of this discussion I would like to say emphatically that I do not believe that medical men, whether psychiatrists or not, have ever wished to take over the functions of judge and jury, or even unduly to influence them in relation to any opinion they may come to. We wish to work in association with the law, because we believe we are able to make some contribution, small though it may be, to the elucidation and understanding of criminal conduct. We are primarily interested in doing everything we can to benefit, to care for, and even in some instances to cure the person affected, but we are likewise concerned with the welfare of society and the preservation of the lieges, and are as anxious as anyone else to live with a sense of security.

I would advocate that the legal and medical professions, so specially concerned in dealing with the disordered group of humanity, should be willing to appreciate each other's point of view and thus avoid scathing comment and criticism, especially in a court of law. It is the purpose of all engaged in the difficult task of estimating human conduct to do what we can to help those who have been unable to help themselves. Great advances can be made if together we are determined to understand and investigate more thoroughly the causes of criminal conduct and how they can be eliminated. Fundamentally this would take us back to a consideration of genetic and environmental factors—for example, housing, education, marriage, and so on—but, while such preventive and eugenic measures should be kept in mind, yet in practice we should, within our prison and legal system if thought advisable, build up an organization whereby the mind and spirit of the offender will come in for consideration to a far greater extent than previously. The essentials are:

1. Good psychiatric units, where satisfactory examination and observation can be carried out previous to trial, and where suitable cases could have adequate treatment after trial.

2. A well-qualified medical and nursing personnel, who, along with social workers and those with an aptitude for research, might bring an investigative spirit to bear on this most difficult problem.

3. An efficient aftercare organization.

4. Discharge to be determined on the basis of social stability. An elastic scale might be devised with minimum and maximum periods—but personal preference is for the introduction of an indeterminate sentence.

5. A special colony establishment under psychiatric control for psychopathic states; the improvement of working conditions and the use of modern machinery.

6. A judiciary imbued with a remedial outlook and able to think in terms of illness and disease which may be entirely subjective.

7. Modesty on the part of the psychiatrist in relation to his ability to attain cures in the case of individuals who are so grossly and seriously involved.

APPENDIX

I have prepared a short abstract of an article by Dr. G. K. Sturup on the treatment of psychopathic criminals in Denmark. Dr. Sturup is the medical superintendent of the Herstedvester Institution.

The Danish Criminal Law (1930) does not utilize the M'Naghten rules, but states that no person who has committed a crime shall be subject to any punishment if, at the time of the deed, he was irresponsible on account of insanity or a similar condition of mind, or a high degree of mental deficiency. Those cases may be admitted to ordinary mental hospitals.

Herstedvester was established in 1933. There is accommodation for 180 males and 20 females. The period of detention is indefinite. The institution is neither a hospital nor a prison. It is described as a unique social-psychiatric department. Its problem is twofold: to effect satisfactory preventive detention, and to treat patients according to their psychical needs so that they may return to a normal life: detention is described not as punishment but as a security measure.

The majority of the patients are relapsed criminals who have committed serious offences—for example, murder, robbery, incendiarism, rape, indecency to boys or girls—or drug addicts. The detainees vary in age from 18 to 70 years.

The same court which has passed sentence decides whether the detainee may be released, and release is always on a parole basis. Supervision while on parole is effected by officers specially trained by the institution.

There is very close co-operation between the court and the psychiatrist. The medical superintendent is counsellor to the Ministry of Justice, and thus is able to assist or advise every prison medical officer in difficult cases.

In addition to the main institution, a farm near Copenhagen has been developed as a market garden with accommodation for 20 detainees. Some of these detainees have been castrated, because it is believed that after such treatment those guilty of repeated sexual offences can be released on parole with much greater safety.

The staff consists of psychiatrists, nurses, teachers, a sociologist, and warders who have been trained in mental hospitals. Careful medical and social histories of each patient are compiled, and treatment of all kinds is utilized. Trades and occupations such as gardening, printing, bookbinding, joinery, toymaking, and tailoring are engaged in. The detainees work an eight-hour day, and are paid 10 kr. a week; some earn more. They are allowed to spend half the amount they earn, and the remainder is saved until release is effected.

There is a lively club life, with sport, stamp-collecting, chess, and bridge. Study circles are formed, and in certain subjects correspondence courses are available.

It is asserted that 50% of the detainees go back to normal life in the community. Sturup believes his results can be improved upon.

Speaking at a scientific meeting of the Zoological Society of London on June 13 Dr. J. F. G. Wheeler gave an account of some poisonous fish and said that these were of two types, those which when eaten were followed by internal disorders, and those bearing spines capable of causing poisoned wounds. The first type presented a curiously baffling subject of investigation because the symptoms were not manifested until the cause had disappeared. In the Tropics fish-poisoning was a matter of economic importance. In Mauritius a large number of fishes, especially red fishes, were suspected of poisonous qualities and barred from the markets. According to the account of Charles Grant, published in 1801, fish-poisoning caused the failure of Admiral Boscawen's invasion of Mauritius in 1748. Some of the earlier Dutch seamen calling there referred to poisoning by fish but others mentioned eating fish reported to be poisonous without suffering any ill-effects. With the possibility of fishery development on the vast ocean banks like the Saya de Malha, the assertion that 80% of the fishes caught there belonged to a species (*Lutianus civis* C & V.—locally called Vara Vara) known to be poisonous was not encouraging and called for investigation. In the course of a two-year Fisheries Survey the scientists and crew of "M.F.R.V. No. 1," now renamed *Research*, have discounted these legends.

REACTIONS PRODUCED BY ARTHROPODS DIRECTLY INJURIOUS TO THE SKIN OF MAN*

BY

R. M. GORDON, M.D., Sc.D., F.R.C.P.

Professor of Entomology and Parasitology, University of Liverpool

During the past few years my colleagues and I have been investigating the reactions shown by the mammalian host to the bites and stings of certain tropical and non-tropical arthropods (Gordon and Crewe, 1948; Crewe and Gordon, 1949), and since these reactions are often, although by no means always, confined to the skin we thought it might be of interest to present some of our findings. Before doing so, however, it is necessary to emphasize the fact that we have studied only a few representative species of medically harmful arthropods, and it would therefore be unwise to draw any far-reaching conclusions from such limited data.

Our observations suggest that the pathogenic effects produced by arthropods directly injurious to man fall into certain well-defined groups and can usually be classified in one of four categories: (1) lesions due to mechanical trauma; (2) lesions due to secondary infections; (3) lesions due to the injection of substances which are normally harmless, but to which the host has become sensitized as a result of previous exposure; and (4) lesions due to the injection of directly injurious substances. Although these pathogenic effects are considered separately, they may, and often do, occur in conjunction—a fact which is sometimes overlooked by the clinicians.

Lesions Due to Mechanical Trauma

In the case of the puncture or abrasion made by a blood-sucking arthropod, the extent of the lesion produced will depend on the size and nature of the insect's mouth-parts and the manner in which they are used. Some blood-sucking insects, such as the mosquito, with long and delicate mouth-parts, may feed with the proboscis in the lumen of a capillary; whereas the proboscis of larger flies, such as the tsetse (*Glossina* sp.), are too bulky to enter the lumen and are used to suck up the blood which results from the repeated laceration of small subcutaneous vessels. It is, of course, obvious that the large and relatively clumsy skin-piercing organs of some of the "horse-flies" or "clegs" (*Tabanidae*) will produce a more extensive wound than will the small and delicate mouth-parts of the midges (*Culicoides*); but the difference in the final result is not so great as might be expected, since both insects tend to probe the tissues until a pool of blood, more than sufficient for their purpose, has been produced. From the clinician's point of view, however, it would seem that the uncomplicated trauma produced by any type of blood-sucking arthropod is seldom severe enough to cause any serious disturbance in the host.

When, however, the parasitic arthropod extends its activities from blood-sucking to tissue invasion the resultant trauma may be more extensive. Thus, in the Tropics, myiasis caused by the larvae of certain flies, such as the "Berne fly" (*Dermatobia hominis*), may result in the deep invasion of the subcutaneous tissue by a number of larvae, each of which is more than 1 in. (2.5 cm.) in length, while the invasion of the turbinal mucous membrane, or even of the frontal sinuses, by the so-called "screw-worm" larvae of other flies, such as *Cochliomyia* sp. or *Chrysomyia* sp., may produce even more serious injury: extensive invasions by such large arthropods are obviously not only painful but are bound to interfere seriously with health.

On the other hand, the invasion of the host's tissues by a parasite so minute as *Sarcoptes scabiei*, and one which never penetrates below the stratum corneum, cannot be regarded as causing any serious mechanical trauma, and the extensive lesions sometimes associated with its presence must be ascribed to some other cause. Between these extremes there are a host of tissue-invading parasites, mostly larvae of two-winged flies which in the Tropics and, more rarely, in this country cause varying degrees of mechanical trauma in the tissues of their host.

As already mentioned, a few species of myiasis-causing larvae may produce serious lesions, but with these exceptions, and in the absence of complications, most of the tissue-invading arthropods, so long as they confine themselves to the tissues of their normal host, seldom produce a degree of trauma sufficient to interfere with general health. Occasionally, of course, an invading parasite finds itself in the tissues of the wrong host, as happens in the case of the so-called "larva migrans," and in such instances both parasite and host may behave abnormally. In this case the lesion was probably caused by the larva of an ankylostome normally parasitic in dogs in the Tropics; but almost precisely similar lesions occur in this country after the penetration of the human skin by the larva of the warble fly (*Hypoderma* sp.), the usual host of which is cattle, or by the larva of the bot-fly (*Gasterophilus* sp.), which is normally parasitic in equines.

Lesions Due to Secondary Infections

It has been shown that the larvae of a few, mainly tropical, species of two-winged flies (Diptera) may produce considerable mechanical trauma. Usually, however, the most serious results of myiasis are those which follow the subsequent invasion by bacteria of the wound previously made by the parasite, and the term "myiasis" generally conjures up a picture of a septic lesion for the cause of which bacteria are more responsible than Diptera.

It sometimes happens that such organisms are introduced by the parasite when piercing the skin, but it seems to be more usual for them to gain access after the abrasion has been made, and such abrasions do not appear to be any more prone to infection than similar lesions caused by other means. In any case, lesions due to secondary infections can scarcely be regarded as being the responsibility of "arthropods directly injurious to the skin of man," and I therefore propose to pass on to my next category.

Lesions Due to Injection of Normally Harmless Substances into a Previously Sensitized Host

The picture which we have just presented of a more or less trivial traumatic injury which may or may not be followed by a more serious bacterial infection is often thought to be further complicated by the injection by the parasite of a substance inimical to the host, the responsible substance usually being thought to be derived from the salivary glands of the parasite, although some workers believe that it originates from some other part of the insect's digestive tract.

*Read in opening a discussion at a combined meeting of the Sections of Dermatology and Tropical Medicine at the Annual Meeting of the British Medical Association, Liverpool, 1950.

Our own observations do not support this view; they suggest, rather, that only a very limited number of parasitic arthropods secrete a substance of a toxic nature, and when this does occur, as sometimes happens in the case of mosquito bites, the reaction produced is delayed and trivial and never results in the immediate well-marked weal so often associated with the bites of parasitic arthropods.

My colleagues and I have fed a varied assortment of blood-sucking creatures on human volunteers, and, so long as these volunteers have never previously been exposed to the bites of the particular kind of arthropod under investigation, either no reaction has occurred or it has been so slight as to be negligible so far as the clinician is concerned. Of course, it is difficult to ensure that the individual has never previously been exposed to any particular parasite; but this difficulty can be overcome by importing tropical insects, such as the tsetse-fly, and by feeding them on persons who have never visited the Tropics.

As regards the source of the irritating substance, we have been able to show that, in the case of the tsetse-fly at any rate, it must be derived from the salivary glands. This fact has been demonstrated by removing the salivary glands from the living insect and then feeding it on a person who is known to react violently to the bite of the normal insect. In these circumstances the fly feeds to repletion but the host shows no subsequent reaction.

I have just mentioned that persons living in this country and not previously exposed to the bites of the tsetse show no reaction when these insects are fed on them for the first time; the question now arises of what happens if you continue to feed tsetse-flies on such persons. We can answer that question, so far as our observations have gone, by saying that if the flies continue to be fed on such an individual at regular intervals he will remain free from any reaction, but that if the flies are fed at irregular intervals the majority of individuals on whom the flies are fed develop a reaction which may or may not be severe in character.

So far my remarks have been concerned mainly with the tsetse-fly, but we have repeated some of these observations on persons exposed to the bites of mosquitoes, sand-flies (*Phlebotomus* sp.), midges (*Culicoides* sp.), and bed-bugs, and the results obtained have been similar to those following tsetse-fly bites. In addition, we have been able to confirm that these reactions are often highly specific, and that persons who react to one species of insect do not necessarily react in a similar manner when bitten by a different species, although both may be so closely related as to belong to the same genus. These findings may explain why it is not unusual to encounter persons who state that, although they sometimes react violently to flea-bites, at other times they remain unaffected, or that they react to the bites of mosquitoes in one part of the country but not in another.

As regards desensitization, we have not carried out any experiments on the value of antigens prepared from the insects responsible for the reaction, but we have been able to show that, in persons who have become sensitized to the bites of mosquitoes, the reaction diminishes after continued regular exposure, and that this desensitization is usually specific, so that the person who has been desensitized to the bites of one group of mosquitoes, such as the culicines, may still be sensitive to the bites of another group, such as the anophelines.

Perhaps I might summarize the conclusions arrived at by my colleagues and myself concerning parasitic arthropods by saying that, like poor relations, they try to get as much food and shelter as they can from their host, but are scrupulously careful to avoid causing him any unnecessary pain or inconvenience, since the results of such actions are usually detrimental not only to the host but also to the parasite.

It is true that the observations which I have described refer only to a limited number of common parasites; but, so far as those are concerned, it seems reasonable to consider that any immediate and severe reaction associated with their bite or with their invasion of the tissues is due to previous sensitization on the part of the host and not to the injection of any poisonous or toxic substance by the parasite.

Lesions Due to Injection of Directly Injurious Substances

The association between man and arthropod so far considered has been that of host and parasite, and we have shown that, since it is always to the disadvantage of the parasite to cause any serious injury to its host, most of the injuries resulting from this association have been in the nature of accidents caused by secondary infections or following the injection by the parasite of a normally harmless substance into a previously sensitized host. On the other hand, certain arthropods which are non-parasitic and in no way dependent on man for their existence have developed weapons of offence, in the form of secretions which they use to kill or paralyse their prey, while others have developed defensive secretions which they use to protect themselves from interference. These offensive and defensive secretions resemble each other in many respects, and in some instances are used for dual purposes; but generally they differ in their virulence.

In the case of arthropods, such as scorpions and spiders, which have developed predatory habits and which secrete poison that is to be used to kill or paralyse their normal prey, the venom secreted is usually of a high virulence and when injected into man may produce serious general as well as local effects. In the case of other venomous arthropods, such as bees, which have not developed predatory habits, the venom secreted is not intended to kill but merely to produce a sufficiently quick and painful reaction to deter the intruder from any further interference; and in such instances the poison, although quick-acting, is usually of a milder character, the reaction produced tending to remain localized. It must not be forgotten, however, that the stings or bites of usually only moderately poisonous arthropods may take on a serious aspect if inflicted on a previously sensitized person, in whom the result of even a single sting may be followed by severe and sometimes fatal consequences.

The literature concerning the venom of scorpions and bees contains a great number—in the case of bee-venom one might term it a vast number—of papers dealing with the chemical structure and physiological effect of these poisons, together with an almost equally large literature describing the clinical manifestations which have been observed to follow the stings of these creatures; but there seems to be no account of the histological lesions produced. As my colleagues and I wished to compare these lesions with those produced by blood-sucking insects, we undertook a limited number of experiments in which a scorpion or bee was allowed to sting a guinea-pig, the tissues being removed from different animals at various times after the infliction of the sting and then sectioned and examined.

The results of this investigation showed, as might be expected, that, whereas the uncomplicated bites of blood-sucking insects never cause any inflammation and are comparable to the injury which might result from the probing of a surgical needle beneath the skin, the stings of scorpions and of bees result in a very marked inflammation. In the case of the bee, the sections showed oedema, marked cellular infiltration, and some necrosis of the underlying muscle layer, which was followed within 24 hours by a walling-off of the damaged tissue by a palisade of inflammatory cells. In the case of the scorpion sting, the reaction was somewhat similar, though more severe, and was associated with an extensive coagulative necrosis of the underlying muscle.

"Immunity"

There remains one aspect of the association between the skin-piercing arthropod and its host to which, so far, no reference has been made. It is not unusual to encounter individuals who declare that a particular venomous arthropod, such as a bee, will not sting them, or that certain blood-sucking fleas or flies do not bite them. The first group of persons seem to depend for their immunity on their power to handle particular arthropods—in this case bees—without alarming them. The second group is more difficult to explain; unquestionably there are persons who are not so attractive to lice or mosquitoes as their less fortunate fellows, but in our experience such cases are rare, and we have not yet encountered a case of complete immunity.

Pepys—you may remember—declared that while at Portsmouth he shared a bed with a certain Dr. Clarke, and that the fleas bit the doctor but not the diarist, a happening which seems to have pleased the latter "mightily." Pepys's statement can never now be substantiated, but we have carried out a number of experiments in which persons who stated that they were seldom bitten by mosquitoes, together with controls claiming no such privilege, introduced their hands and forearms into a large cage containing many hungry mosquitoes. The cage was arranged in such a way that, though the observer could see what was going on inside, the persons volunteering for the experiment could not. Under these conditions the results of individual experiments were always similar; the persons claiming immunity continued to maintain that they were not being bitten, but the impartial observer recorded in his notebook that the mosquitoes were unimpressed by such an assertion and were biting the "immunes" as readily as the "non-immunes."

It would seem, therefore, that the majority of individuals who believe that they are relatively immune from the bites of a particular species of insect are mistaken, and that their apparent immunity is the result of their failure to notice the insect during the time that it is biting. This failure is due either to the individual's not having become sensitized to the species in question, or because, although previously sensitized, he has become desensitized as a result of regular and prolonged exposure.

Summary

The pathological effects produced by arthropods directly injurious to man—as distinct from those which as transmitters of diseases are regarded as indirectly injurious—can usually be classified in one of four categories.

1. Lesions due to mechanical trauma, in which the damage done is usually severe only when it is caused by certain of the larger species of myiasis-producing larvae or when an abnormal host is attacked.

2. Lesions due to secondary infections—these include the more serious effects of myiasis which follow the infection by bacteria of wounds previously made by invading arthropods.

3. Lesions due to the injection of substances which are normally harmless but to which the host has become sensitized as a result of previous exposure. Recent research suggests that any immediate and severe reaction associated with the bite of parasitic arthropods or with their invasion of the tissues is due to previous sensitization of the host. Such reactions are usually highly specific.

4. Lesions due to injection of directly injurious substances. Certain predatory arthropods, such as scorpions and spiders, secrete venom usually of high virulence which, when injected into mammals, causes both generalized symptoms and an extensive coagulative necrosis of the underlying muscle. In the case of non-predatory insects, such as bees, the reaction tends to be mild and to remain localized.

REFERENCES

Crewe, W., and Gordon, R. M. (1949). *Ann. trop. med. Parasit.*, **43**. 341.

Gordon, R. M., and Crewe, W. (1948). Ibid., **42**, 334.

DIVISION OF POPLITEAL VEIN IN THE TREATMENT OF SO-CALLED VARICOSE ULCERATION*

BY

GUNNAR BAUER, M.D.

Chief Surgeon to the General Hospital, Mariestad, Sweden

Non-specific ulcers of the lower leg have for a long time been termed varicose ulcers, evidently because varices of the subcutaneous veins were thought to be the cause of the ulcer formation. To-day, however, we know that this is only part of the truth and that the root of this evil goes much deeper. Knowledge of the normal and pathological physiology of the veins of the lower extremity has made very considerable progress during the past decade. Modern investigation tends to regard the entire vascular system of the leg as one system, similar to a U-shaped communicating glass vessel. The aorta and the large arteries form one branch of the vessel, the capillaries the bottom, and the large vein trunks and the vena cava the other branch. Being completely filled with fluid, this system is in perfect hydrostatic equilibrium. If a quantity of blood is introduced into one side of the system, as is the case each time the heart stroke pours blood into the aorta, an equal amount of blood flows out of the other end of the system, from the vena cava into the right side of the heart. This explains how the venous blood is made to return from the lower extremity irrespective of the body's position.

However, when the body is brought into the vertical position another factor is added. It is a well-known fact that in this position, because of the action of gravity, a large quantity of blood assembles in the lower parts of the leg. To explain this it is necessary to remember that the human U-shapel vessel, unlike those made of glass, does not have rigid and impermeable walls. Instead, the blood vessels, especially the veins, have elastic coats which are apt to give way under high pressure. The lumen widens and an ever-increasing amount of blood can accumulate. After some time a condition of pronounced venous stasis is created.

To get rid of this surplus of blood the healthy human being is in possession of a highly efficient auxiliary

*Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Liverpool, 1950.

mechanism, consisting of the action of the muscle masses of the calf. When these muscles contract, as in walking, they act as a sort of peripheral heart, squeezing considerable amounts of blood from the lower leg up into the popliteal and femoral veins. From there the blood cannot return because of the action of the valves in these large veins.

It is not difficult to imagine what would happen if those important valves for one reason or another were no longer able to function properly. The blood that was squeezed out of the lower leg would return the moment the muscles relaxed, and no amount of walking or muscle movements would be able to rid the lower leg of stagnating blood. The venous stasis would steadily increase and oedema would soon begin to develop. If prolonged for weeks or years, graver tissue changes, such as induration and even ulceration, would set in, and, as a result of anoxaemia, there would be aching or pain.

It is impossible not to be struck by the fact that the pathological changes just described constitute the exact image of what is to be observed in cases of lower-leg ulcers. An ulcer is hardly ever found quite alone. It is nearly always accompanied by chronic pitting oedema and by large areas of brawny and indurated skin, and the patient generally complains of a dull aching or bursting pain whenever the leg is in the vertical position. In fact, these symptoms constitute the components of what may be called the "lower-leg-stasis syndrome."

The grave circulatory disturbances evidently underlying this syndrome caused me and my co-workers, about four years ago, to start an investigation into the conditions prevailing in the large deep veins of the entire leg. The results of this work have been described in detail elsewhere (Bauer, 1948, 1950a). Using a special phlebographic technique in which the contrast was introduced into the proximal end of the femoral vein, a large series of cases was studied. In practically all cases with a pronounced stasis syndrome the femoral and popliteal veins were found to be in a pathological condition, the main feature of which consisted in the complete, or nearly complete, absence of normally functioning valves.

The aetiological factor in many cases was found to be a previous deep venous thrombosis. When a vein trunk is recanalized after having been obliterated by thrombotic clots, the result is a thick-walled rigid tube without even traces of valves. In an even larger group, however, the valvular insufficiency was caused by phlebosclerotic or similar changes, and might be called idiopathic.

The conclusion was reached that the stasis was caused by this pathological condition of the valves. Later experience from several hundred cases entirely corroborated this view.

Treatment of Venous Overloading

The main problem when trying to devise a suitable therapy appeared to us to be this: in what way would it be possible to assist the action of the peripheral heart, or, in other words, by what action could we prevent the blood that is squeezed out from the lower leg by muscular contraction from flowing back again?

It seemed to us that if the large avalvular vein trunk was permanently blocked at its lower end, in the popliteal region, this would prevent the possibility of back-flow. Division of the popliteal vein was performed in a few cases, and the results were encouraging. The patients improved, and it could be demonstrated radiographically that after operation the calf-muscle contractions drove the blood through numerous fine-calibred channels into the muscle veins of the thigh, and that no back-flow occurred.

It thus appeared as if a suitable form of treatment might be within reach, and ligation and division of the popliteal vein was taken up as a routine procedure and has remained so for more than three years.

Indications for Popliteal-vein Division

At the Mariestad Hospital, up to the time of writing, 245 popliteal-vein divisions have been performed in cases of proved valvular incompetence. The symptoms present at the time of operation are given in Table I. It will be

TABLE I.—*Leg Symptoms in 245 Patients Before Popliteal-vein Division*

Symptom	No. of Cases in which Present
Bursting pain	243
Oedema	244
Induration	236
Open ulceration	180
History of repeated ulceration but no ulcers open at the moment	33

seen that pain, oedema, and indurative skin changes were present in practically all the cases, and that open ulcers or a history of repeated ulceration were observed in seven-eighths of the patients.

During the first year of this work all cases were examined by retrograde phlebography before being subjected to popliteal-vein division, because a need for further study was felt. To-day we feel convinced that in practically all cases with a clear-cut stasis syndrome there is also deep valvular insufficiency, and we do not hesitate to operate on the strength of an ordinary careful clinical examination alone, without recourse to phlebography.

In a fair number of cases there will be found, in addition to the typical syndrome, the well-known signs of incompetence of the great saphenous vein or of incompetence of one or two of the large communicating veins arising out of the depths in the lower third of the thigh. In these cases there is every indication to divide and inject or strip these veins as well. It is our belief that no good can possibly come from any vein with a retrograde blood-flow, and it has been our practice for a long time to deal with these veins at the same time as we are doing the popliteal-vein division. We have seen no harm arise from this.

Now and then there come under observation borderline cases in which some of the components of the syndrome are not very well marked and in which, at the same time, a large, tortuous, and incompetent great saphenous vein is demonstrated. In such cases the question may arise whether the lower-leg changes are caused by the saphenous alone or whether there may not, in addition, be a deep insufficiency. In these circumstances phlebography is indicated. The examination should, however, not be done by puncture of the femoral vein. It is much easier to introduce the contrast medium *via* the saphenous vein. This vein must in any case be exposed at its upper end and tied. After tying the lower ligature, but before applying the upper one, the needle of a syringe containing 20 ml. of diodone ("diodrast") (35%) is introduced into the saphenous vein. Before injecting, it is absolutely necessary to make sure that the valves in the superficial femoral vein, if any, are closed at the moment when the dye runs into the vein. According to our experience this can best be done, and the most uniform results obtained, if the foot

end of the operating table upon which the patient lies is suddenly lowered to 45 degrees or more. Then, but not until then, should the injection be made, occupying about thirty seconds. At the end of that period the *x*-ray exposure is made.

If with this technique the contrast medium is seen to have run down into the femoral vein and to have passed the knee level, indications for popliteal vein division are present. If, on the other hand, this technique is not strictly followed, the contrast medium, which is heavier than the blood, may sometimes be observed to trickle downwards for some distance, even in persons in whom there exists no valvular incompetence. Instances are known in which this phenomenon has caused some observers to doubt the value of the method.

At this point it should be mentioned that we have devised a method to make absolutely sure, on the operating table and before actually dividing the popliteal vein, that the femoral vein is incompetent. After exposing the popliteal vein a loosely tied ligature or a clamp is applied on the distal end of the exposed vein. After that, we insert in the vein, proximal to the ligature, the needle of a manometer similar to that used in lumbar puncture but with a much longer glass tube. The foot end of the table is then slowly lowered to 45 degrees. If blood enters the glass tube and rises to a level of 40 to 60 cm., which, incidentally, corresponds to the level of the patient's heart, this is a sure sign that the femoral valves are incompetent.

Results

There were no post-operative deaths among the 245 cases operated upon. No complications were observed, with the exception of slight wound haematomas in five cases. In no case was there any demonstrable harm to the circulation in the lower leg as the result of the operation.

A marked improvement was observed in all the patients. The aching or bursting pain was relieved almost at once. The ulcers generally healed in a shorter time than might have been expected with conservative treatment.

Follow-up Examination

It is a well-known fact that patients with leg ulcers nearly always show a considerable improvement after an interval of hospital care, whatever treatment is given. The utmost care must therefore be exercised when the effect of an additional new form of therapy is to be evaluated. A considerable period of time, preferably several years, must be allowed to pass before final judgment can be pronounced.

In the Mariestad Hospital material only one patient has been observed for more than three years and only 55 have passed the two-year mark. Nevertheless, in order to obtain a preliminary idea of what may be expected after popliteal-vein division, follow-up studies were made of all those cases, 196 in number, in which the time of observation was at least six months. It was found very informative not merely to examine all the patients at a given date but also to follow the course of their illness in detail from the time of operation up to the present (Table II).

TABLE II.—*Post-operative Course After Popliteal-vein Division in 196 Cases. Time of Observation: Six Months to Three Years*

	No. of Cases
Uneventful post-operative course. Steady progress towards complete recovery	165 (84%)
Intervals of recurrence	31 (16%)

In 165 patients the post-operative course was entirely uneventful. These patients were relieved from their previous bursting pain and enjoyed instead an unaccustomed feeling of lightness and comfort in their legs. They had, as a rule, no demonstrable oedema; in a few cases there were at times traces of it in the evening. In all cases the ulcers had completely healed, and remained healed, often leaving no traces. The indurative changes showed considerable regression and in many cases had entirely disappeared. In short, there existed in this group a steady progress towards what looked like complete recovery.

In 31 cases the post-operative course was disturbed by shorter or longer periods of recurrence. These cases were made the object of careful analysis in order to ascertain why recurrence had occurred and how it might be avoided (Table III).

TABLE III.—*Recurrence of Leg Symptoms After Popliteal-vein Division in 31 Cases*

Reason for Recurrence	No. of Cases
Persisting insufficient venous channels	18
Superimposed arterial disease	11
Other reasons	2

It was observed that in not a single case had the major stasis phenomena returned. All of the 31 cases were free from the bursting pain they had had before operation, and with very few exceptions the oedema of the whole lower leg also failed to return. Ulcers, on the other hand, had reappeared at the old site or in a new place.

Upon careful examination the reason for recurrence in 18 cases was found to be the existence of *untreated venous channels showing signs of evident insufficiency*. In some cases these had been overlooked at the time of the operation on the popliteal vein. In another group, with incompetence of the great saphenous vein, this had been noted from the beginning, but no treatment had been instituted because, during the first period of popliteal treatment, some doubt was felt about the wisdom of dividing both the popliteal and the great saphenous veins at the same time. Out of the 18 patients in this group, seven were healed after division of the great saphenous vein and six after leaking communicating veins in the lower third of the thigh had been dealt with. In four patients improved bandaging was sufficient to secure a good result, while one patient remains unhealed.

In another group of 11 patients a very interesting reason for the recurrence of the ulceration was found—namely, *superimposed arterial disease*. In these cases examination showed that the popliteal division had eliminated the previous symptoms of venous stasis and that the recurrence of ulceration was instead caused by obliterative changes in the major arteries of the lower leg, generally at about mid-calf level or higher. A characteristic feature of these cases was the extreme painfulness of the ulcers. While there was none of the old aching all over the lower part of the leg, which had been most pronounced in the daytime, there was a sharp pain, especially marked at night. These ulcers were also found to be extraordinarily slow in healing. The blood pressure in general showed a considerable increase and the pulse in the dorsalis pedis artery was absent. A more detailed report of this condition, which hitherto does not seem to have been sufficiently taken into consideration, has been given elsewhere (Bauer, 1950b).

Treatment with antispasmodic drugs had a favourable effect in two cases only. One patient was healed after repeated sympathetic blocking. In six cases lumbar sympathectomy resulted in very rapid healing. This operation is probably the treatment of choice.

Post-operative Treatment

This report must not be concluded without a few words on the importance of careful after-treatment. It must be remembered that after popliteal-vein division the blood that is being squeezed out of the lower leg by muscular contractions has to find its way to the thigh through a number of rather fine-calibred veins passing the knee level. Until these veins have enlarged and become fully capable of taking over the entire blood flow there is the risk that some blood may be forced from the depth, through incompetent communicating veins, into the surface veins of the lower leg. To counteract this it is necessary to keep the subcutaneous veins in a state of compression for some time. It is our custom to make all patients wear some kind of supporting bandage for at least two months after the operation. After that time a large proportion of them have been allowed to discard these bandages. Others are instructed to wear them whenever the day's work involves much standing or walking. A small proportion do not seem able to carry on without continuous support.

Summary

So-called varicose ulceration is nearly always found to be connected with chronic oedema, indurative skin changes, and bursting pain. Together, these components form what may be termed the lower-leg-stasis syndrome.

The erect position in man causes a certain amount of venous overloading in the lower parts of the leg. In healthy individuals this superfluous blood is easily removed by contractions of the calf muscles, which act as a peripheral heart. This mechanism postulates normal functioning of the valves in the femoral and popliteal veins.

In patients with the lower-leg-stasis syndrome it has been demonstrated that the above-mentioned large veins are incompetent, their valves having been destroyed by previous thrombosis or by phlebosclerotic processes. In such cases superfluous blood cannot be effectively removed by contraction of calf muscles, every relaxation of these muscles being immediately followed by a back-flow of blood down the valveless main trunk. This results in permanent venous stasis, and in due time is followed by pain and tissue changes.

A remedy for this condition has been devised at the Mariestad Hospital in the form of blocking of the main deep trunk in the popliteal region. After this operation the calf-muscle contractions drive the blood through numerous fine-calibred channels into the muscle veins of the thigh, and no back-flow can occur.

Popliteal-vein division has been performed 245 times. The operation seems to be entirely free from risk. There were no deaths and no complications. The immediate results were favourable. The post-operative observation time is too short to allow a final evaluation of the late results to be made. However, a follow-up examination of 196 cases after six months to three years showed that 165 patients (84%) remained healed and without stasis symptoms. In 31 patients (16%) intervals with recurring symptoms were observed.

REFERENCES

Bauer, G. (1948). *J. int. Chir.*, **8**, 937.
—— (1950a). *Angiology*, **1**, 1.
—— (1950b). *Acta chir. scand.* In press.

The Association of British Insecticide Manufacturers has published (price 1s., from 166, Piccadilly, London, W.1) a chart summarizing the laws relating to the sale of poisons used to kill weeds, rats, moulds, etc. It is issued in a folder and is suitable for pinning on a door or wall.

TOXIC EFFECTS IN ANIMALS AND MAN AFTER TETRAETHYLAMMONIUM BROMIDE

BY

ALEXANDER J. P. GRAHAM, M.B., B.S., F.R.C.S.

(From the Wilkie Surgical Research Laboratory, Department of Surgery, University of Edinburgh, and the Royal Infirmary of Edinburgh)

Tetraethylammonium bromide (T.E.A.B.) is a quaternary ammonium compound introduced into medical investigation as a vasodilator. It acts by blocking the transmission of vasoconstrictor impulses in autonomic ganglia, and has been used in cases of peripheral vascular disease to assess the capacity for vasodilatation.

Dangerous reactions following its administration have been reported, but do not appear to be sufficiently appreciated. During the course of recent experimental investigations on the action of this drug in animals and man certain toxic effects were observed.

In Animals

During an investigation of changes in peripheral blood pressure following arterial ligation in dogs a 10% solution of T.E.A.B. in doses of 2.5 mg./kg. was given intramuscularly and repeated half-hourly for two and a half to five hours. Preliminary trials had shown that with the animal supine this dosage was just insufficient to cause a fall of blood pressure of more than 10 mm. Hg. Total doses administered before toxic effects developed ranged from 100 to 240 mg., depending on the weight of the animal. For a man weighing 70 kg., doses over similar periods would be 475–1,200 mg. The usual single intravenous dose in man is 400–500 mg. (Boyd *et al.*, 1948). Other doses recommended in the literature are 4–7 mg./kg. (Birchall *et al.*, 1947) and 4–6 mg./kg. (Hayward, 1948), whereas Berry *et al.* (1946) have used 20 mg./kg. intravenously to a total of 1–1.2 g. Therefore although the individual dose per kilogram used in this experiment was well on the safe side, the sum of the half-hourly doses was two or three times that usually given.

In 7 out of 20 dogs toxic effects were noted. The first signs of these appeared after T.E.A.B. had been given for a period of two to three and a half hours: paralysis of intercostal breathing developed, and respiration continued with irregular diaphragmatic movements of diminished strength and frequency. Prominent features were bradycardia and hypertensive change with increased pulse rate—characteristics of the effect of anoxia in dogs. Cyanosis was also apparent. In two animals, when T.E.A.B. was stopped a gradual return to the previous state occurred over a period of one to one and a half hours. The remaining five died. In three of them normal respirations almost ceased, an anoxic hypertensive state followed, and death occurred 15, 20, and 60 minutes later respectively; during this time the few respiratory efforts were feeble and jerky in nature and entirely diaphragmatic, but as a result of movements of the heart some diffusion of air in and out of the lungs occurred. In the other two a slow rise in systemic blood pressure and in pulse pressure was followed by sudden respiratory failure and death. At post-mortem examination the only positive finding was gross dilatation of the heart and large veins.

In Man

Seven subjects undergoing investigation (Burt and Graham, 1950) were given T.E.A.B. intravenously in doses of 250–500 mg. in two to four minutes. In six no abnormal reactions occurred. The remaining subject, a healthy woman aged 22, developed paralysis of curariform type after being given 300 mg. of T.E.A.B. intravenously over two minutes. The pulse rate immediately rose from 70 to 80. After 15 minutes she became drowsy, was unable to speak or to raise her upper eyelids, and showed loss of power in neck and arm muscles with periodic twitchings of limb muscles. There was paralysis of intercostal respiration; diaphragmatic respiratory movements increased in magnitude, affecting blood-flow tracing in the foot, and the respiratory rate rose from 18 to 30 a minute. The skin colour remained good. The drowsiness deepened into a state in which there was no response to questions or commands. When the eyelids were lifted up the pupils were found to be moderately dilated with loss of light reflex, and both eyes rolled irregularly. During this time the blood pressure rose from 126/86 to 136/90, and there was a rise both in blood flow and in skin temperature in the hand, and a transient but not marked rise in the foot. An hour after injection the subject could partly open her eyes, and after tilting her head backwards could count fingers. Power of hand muscles and of speech was returning, though cerebration was still very slow. Two hours after injection walking was possible. There were no further after-effects.

Discussion

Previous reports of toxic effects following the use of tetraethylammonium compounds suggest that these are similar in man and in animals. Marshall (1912, 1913) demonstrated the curariform actions of the quaternary ammonium salts in animals. Birchall *et al.* (1947) produced alarming curariform effects in man with doses of 32 mg./kg. of tetraethylammonium chloride. Artificial respiration was required to compensate for the intercostal nerve paralysis and insufficient diaphragmatic breathing. Asthmatic subjects seem particularly prone to respiratory distress after the administration of T.E.A.B.

Schwartz (1949) found that asthma was aggravated in four out of seven cases; one subject "became pulseless, gasped for breath a few times, stopped breathing, became unconscious," and died after only 230 mg. of T.E.A.B. Schwartz believed that the most likely explanation was "a sudden excessive hypotension due either to lowering of the blood pressure or to ventricular fibrillation analogous to the paroxysmal tachycardia" observed by Friedlich *et al.* (1948). Their case was also an asthmatic, and developed ineffectual gasping respiration of an alarming nature, followed by hyperventilation. However, the mode of death in the case reported by Schwartz is similar to that of the animals in the present report, which is attributed to respiratory failure.

Although Lyons *et al.* (1947) believe that large doses of T.E.A.B. cause death from central respiratory depression without curariform paralysis of respiratory muscles, the evidence presented above suggests that the latter effect is the more common. The close similarity between the toxic effects of T.E.A.B. in animals and those in man has not been sufficiently stressed, and indicates that curariform paralysis is a danger to which both are prone.

Summary

Toxic effects in animals and man following the administration of tetraethylammonium bromide are reported. Out of 20 dogs to which T.E.A.B. was administered in large doses seven died—five from curariform paralysis of intercostal and diaphragmatic muscles, and two probably from central respiratory paralysis. A similar but not fatal curariform paralysis in man is reported.

REFERENCES

Berry, R. L., Campbell, K. N., Lyons, R. H., Moe, G. K., and Sutler, M. R. (1946). *Surgery*, **20**, 525.
Birchall, R., Taylor, R. D., Lowenstein, B. E., and Page, I. H. (1947). *Amer. J. med. Sci.*, **213**, 572.
Boyd, A. M., Crawshaw, G. R., Ratcliffe, A. H., and Jepson, R. P. (1948). *Lancet*, **1**, 15.
Burt, C. C., and Graham, A. J. P. (1950). *British Medical Journal*, **1**, 455.
Friedlich, A. L., jun., Chapman, W. P., and Stanbury, J. B. (1948). *New Engl. J. Med.*, **238**, 629.
Hayward, G. W. (1948). *Lancet*, **1**, 18.
Lyons, R. H., Moe, G. K., Neligh, R. B., Hoobler, S. W., Campbell, K. N., Berry, R. L., and Rennick, B. R. (1947). *Amer. J. med. Sci.*, **213**, 315.
Marshall, C. R. (1912). *Rep. Brit. Ass.*, **82**, 641.
—— (1913). *Pharm. J.*, **36**, 622.
Schwartz, M. (1949). *Lancet*, **1**, 1001.

THE MANAGEMENT OF HEAD INJURIES FROM THE ANAESTHETIST'S POINT OF VIEW

BY

R. BRYCE-SMITH, M.A., B.M., B.Ch., D.A.

First Assistant, Nuffield Department of Anaesthetics, University of Oxford

The anaesthetist has much to contribute to the care of the unconscious patient, no matter what the cause may be. In respect of their management, patients suffering from barbiturate poisoning, poliomyelitis, and acute head injuries have much in common, though the last group provides the greatest variety of problems.

Factors Against a Clear Airway

The maintenance of a clear airway is the immediate consideration, since this may be menaced by any of four factors or by a combination of them.

1. *Depression of Reflexes.*—Quite apart from the fact that in any unconscious patient the tongue may fall back and cause a respiratory obstruction above the glottis, a head injury may be severe enough to obtund reflexes essential to life. If the cough reflex is in abeyance the trachea is no longer protected from invasion by foreign bodies.

2. *Gastric Motility.*—War injuries repeatedly showed that injury reduces gastric motility, and as a result the stomach will retain its contents for many hours afterwards (Macintosh, 1949). Since so many head injuries occur on the roads after "closing-time," a full stomach must be expected. If the patient remains conscious this offers no danger to life, but in one whose reflexes are depressed, as a result of either a head injury or a general anaesthetic, vomiting may lead to a fatal respiratory obstruction.

Case 1.—A man aged 69 was admitted to hospital with a compound fracture of the frontal bones, the result of being knocked off his bicycle. In the casualty department he was deeply unconscious, but his general condition was satisfactory and his airway good. He was therefore sent direct to a ward. After he had been lifted into bed it was noticed that his respiration was stertorous. He was then slightly cyanosed and his pulse rapid and feeble. An anaesthetist was called, but by this time respiration had stopped. A laryngoscopic examination revealed a considerable quantity of stomach contents in the pharynx and trachea. This was aspirated immediately and artificial respiration started, but the patient died within ten minutes. At necropsy the lungs were found to be full of vomitus.

3. *The Direct Results of Injury.*—These include fractures of the mandible, which make it difficult to retain the tongue forward, and bleeding from the mouth, nose, tongue, or from the base of the skull. In an unconscious patient particularly, these can lead to a serious respiratory obstruction.

4. *Pulmonary Oedema of Central Origin.*—Although this complication is more common some days after injury it may develop almost immediately, and it is most frequently associated with injury to the mid-brain. Experimentally, the condition, which resembles the pulmonary oedema of heart failure, has been reproduced in animals by the injection of fibrinogen into the fourth ventricle. Cameron (1948) reports that at necropsy pulmonary oedema was found in 67% of patients with non-traumatic intracranial haemorrhages and in 63% of patients with fractured skulls. He believes that the condition is due to a disturbance of intracranial pressure.

The treatment of the patient unconscious as a result of a head injury is important, for not only may it be life-saving but it may also influence the later management of such cases.

Immediate Treatment

A stomach tube should be passed at the earliest possible moment. There is no justification for not doing this, for even if the stomach is empty no harm can result. The procedure may be of inestimable value, particularly when the patient is to be moved any distance, short or long, for during transit skilled attention and facilities for treatment are unlikely to be at hand.

An adequate airway may be maintained by (*a*) posture, (*b*) manual control of the jaw and tongue, or (*c*) artificial airways; but even an endotracheal tube is not foolproof unless properly supervised; nor, unless a means of suction is at hand, can it overcome the respiratory embarrassment caused by excessive bronchial secretion or blood. Case 2 illustrates four undesirable sequelae of intubation in an attempt to ensure an airway.

Case 2.—A man aged 42 was found unconscious on the roadside after a motor-cycle accident. He was taken to the local cottage hospital, where he was intubated through the mouth with a No. 8 Magill tube before being transferred to a larger centre. When I first saw this patient, 14 hours after injury, his respirations were rapid and stertorous, and he was slightly cyanosed. Respiratory obstruction was suggested by indrawing of the chest wall on inspiration, and this was confirmed by the character of the breath sounds through the tube, which showed that the latter was not fulfilling its function. The tube was therefore removed, and under direct vision a quantity of thick purulent mucus was aspirated from the pharynx and trachea. The cords were seen to be ulcerated and there was a gross tracheitis. Forty-eight hours later the patient died, and at necropsy the ulceration of the posterior borders of both cords was confirmed and a tracheitis which amounted to frank ulceration extended to the carina. The trachea was full of purulent mucus.

Examination of the endotracheal tube after its removal showed that it was so long that the tip must have entered a bronchus: this was not diagnosed during life, as the clinical picture was complicated by multiple fractured ribs. The lumen of the tube was greatly reduced by mucopus, which had become so inspissated and adherent to the inner wall of the tube that it could not be removed by aspiration. A transverse marking on the concave border of the tube was probably the result of repeated kinking caused by movement of the patient's head during the ambulance journey. Finally, the severity of the tracheitis suggested that the irritation might be chemical rather than mechanical, and suspicion became a strong probability when the fumes of formalin detected by the nose were strong enough to cause lacrimation.

Despite its limitations, I believe that an endotracheal tube may be recommended as a means of retaining an airway, provided that the dangers are fully recognized, and provided that a proper airway cannot be maintained by simpler measures—that is, manual control, a Waters airway, or correct posture. The last-named is, in any case, of the greatest importance. The supine position must be condemned not only because it permits the tongue and jaw to fall back and occlude the pharynx but also because the direction of the trachea prevents drainage of secretions from the lungs and encourages blood and vomit to run down the respiratory tract. The presence of an endotracheal tube does not prevent this, since it does not occlude the glottic opening in the deeply unconscious patient, whose cords may be widely separated. Thus the semi-prone or "tonsil" position with a head-down tilt should be adopted, for this encourages drainage from the trachea, prevents the inhalation of foreign bodies, and allows the jaw and tongue to hang forwards (Macintosh and Bannister, 1947).

Management in the Later Stages

This period starts as soon as the patient is in bed in a ward and continues until consciousness is regained. Once more the overriding consideration is that of maintaining an airway, because even a minor degree of obstruction, if allowed to persist, may lead to pulmonary oedema and cardiac failure (Macintosh and Mushin, 1946). It is well known that an endotracheal tube will cause ulceration of the cords and trachea if left *in situ* for a long time. What period may elapse before harm results is unpredictable, but I consider that twenty-four hours should be regarded as the time limit. It is therefore essential to make an assessment of the probable period of unconsciousness as early as possible. This estimate may be wide of the mark, but an opinion should be formed whether the patient is likely to regain consciousness in a few days or only after a matter of weeks.

In cases of prolonged unconsciousness an endotracheal tube is out of the question, and with the best will in the world manual control of the jaws is inefficient, especially as this duty is commonly relegated to a junior nurse. Further, the longer the patient remains unable to clear his own secretions by coughing, the more essential does it become to remove them by other means. Pharyngeal toilet alone can never be completely effective, and, since repeated intubation is both undesirable and impracticable, an early tracheotomy is indicated.

Tracheotomy

Not many years ago oxygen was administered, not for any therapeutic value, but as an inevitable last rite to the dying. To-day tracheotomy is regarded in much the same light, and the advantages it has to offer are never seen, because more often than not the operation is performed on a moribund patient. A timely tracheotomy, in fact, ensures a safe airway and a ready access for tracheo-bronchial toilet, without which the patient will assuredly die from a combination of asphyxia and lung infection. A minor operation in the hands of a competent surgeon, tracheotomy is a small price to pay for the

advantages it bestows. To regard tracheotomy as too drastic an undertaking shows a failure to appreciate the gravity of the issues at stake. All too frequently patients with head injuries die, not from their primary injury, but from a chest complication which might have been avoided altogether, or at least mitigated, if efficient bronchial drainage had been established early.

A tracheotomy by itself is not sufficient. It must be combined with frequent changes of posture, at least hourly, to allow secretions from the various lobes of the lungs to drain into the more accessible bronchi or trachea, from which they may be removed by suction. A warning is necessary if a tracheotomy is considered only after an endotracheal tube has been in place for a long time. If there is any degree of tracheitis or ulceration of the cords there is a risk that the tracheotomy wound may become infected, and this in turn will lead to fibrosis, and possibly to stenosis of the glottis and a permanent tracheostomy.

Case 3.—A man aged 28 was admitted to hospital with a severe head injury as a result of a road accident. He was intubated soon after arrival, and except for short intervals the tube remained in position for four days. By this time his cords were ulcerated and an attempt was made to maintain an airway by a relay of nurses holding his lower jaw forward. After three days a tracheotomy was performed. A clear airway was assured, and the patient, though remaining unconscious, was kept free from lung complications for a whole year. The improvement of his cerebral condition was slight, but as the cough reflex returned an attempt was made to close the tracheotomy; this had to be abandoned because of a complete stenosis of the glottis. The criticism here is not that a tracheotomy was performed but that it was performed too late.

Bronchoscopy is a valuable manœuvre, and should be performed if there is evidence of atelectasis or if secretions cannot be removed by "blind" aspiration. The importance of early bronchoscopy must be stressed, for it will be of little value if withheld until secondary changes appear in the lungs as the result of infection or obstruction of the bronchi. By itself it is only a temporary measure, and must therefore be used as an adjunct to the general treatment already described.

The previous cases show the pitfalls which abound for those concerned with the management of the unconscious patient. Case 4 is included, therefore, to show how satisfactory the result may be when the treatment as advocated in this paper is followed and is instituted at the correct time.

Case 4.—A man aged 66 was admitted to hospital after a fall from his bicycle. He was unconscious and a diagnosis of subdural haemorrhage was made. In spite of a decompression he remained unconscious. Twelve days after the accident, during which time he had become increasingly "chesty," he developed a left lower lobe atelectasis. The temperature rose to 101° F. (38.3° C.), pulse to 110, and respirations to 30. He was slightly cyanosed. Bronchoscopy was performed and a quantity of mucopus was aspirated, mainly from the left side. A tracheotomy was performed the same day, and a further quantity of mucopus was removed. Changes of posture to encourage drainage from the lungs were made more frequently, and on the following day the temperature had fallen to 99° F. (37.2° C.), the pulse to 90, and the respirations to 25. Six weeks after injury the patient was co-operative and making a good recovery. The cough reflex had returned and the tracheotomy was therefore closed.

REFERENCES

Cameron, G. R. (1948). *British Medical Journal.*, **1**, 965.
Macintosh, R. R. (1949). *Brit. J. Anaesth.*, **21**, 107.
—— and Bannister, F. B. (1947). *Essentials of General Anaesthesia*, 4th ed., p. 270. Oxford.
—— and Mushin, W. W. (1946). *Physics for the Anaesthetist*, p. 203. Oxford.

CONGENITAL ATRESIA OF THE OESOPHAGUS

BY

R. H. R. BELSEY, M.S., F.R.C.S.
Consultant Thoracic Surgeon, Frenchay Hospital, Bristol

AND

C. P. DONNISON, M.D., M.R.C.P.
Consultant Paediatrician, Cheltenham General, Eye, and Children's Hospital

Congenital atresia of the oesophagus is commoner than is generally realized, and if recognized early can be amenable to surgical treatment. The condition is very readily overlooked, but if the possibility is borne in mind it can be diagnosed without difficulty. The purpose of this article is to report a series of cases in support of these statements and to describe the technique of treatment that has been carried out at the Department of Thoracic Surgery of the Frenchay Hospital.

Incidence

The incidence of congenital atresia of the oesophagus has been stated to be about 1 in 2,500 births (Franklin, 1947; Grey Turner, 1949). In our experience the incidence is much greater than this, presumably because many cases are not recognized and deaths are regarded as having been due to atelectasis or pneumonia.

One of us is a consultant paediatrician to a clinical area with a population of about 100,000 in which there are approximately 2,000 births annually. He has seen five cases during the course of two years. The first was in May, 1948, and the patient was 6 days old and very ill with pneumonia, which terminated fatally before surgical treatment could be arranged. The diagnosis was confirmed at necropsy. The remaining cases are described below, being Nos. 2, 4, 7, and 10.

The incidence of cases in this clinical area in which the diagnosis was confirmed was thus 1 in 800 births. It is not to be assumed that all such cases were referred for consultation or that they were diagnosed if so referred. Hence it is reasonably certain that the incidence is distinctly greater than 1 in 800. There is no justification for believing there may be a special incidence of the condition in the area where these observations were made. No epidemic of rubella or other disease that might cause it has been recognized and there has been no undue incidence of other congenital abnormalities.

It is easy to understand how the condition can be overlooked. It presents no easily recognized signs. The infant brings up some frothy mucus during the first day or two of life. Attempts at feeding lead to regurgitation, choking, and probably cyanosis. These events in a newly born infant may call for no special concern on the part of the nurse. By the third day chest symptoms are developing which are attributed to infection, and all further feeding difficulties and respiratory distress are attributed to pneumonia. This terminates fatally when the infant is about a week old, and the cause of death seems obvious. If a necropsy is performed the oesophageal condition is very easily overlooked.

In our cases we have noticed that the condition is often associated with atelectasis, particularly of an upper lobe. The reason for this is not altogether clear, but it may arise from inhalation of saliva, the right upper lobe being a common site for any inhalation phenomenon. Inhalation of feeds is not necessarily an explanation, since in two cases the atelectasis had been recognized before any feeds were given. This may explain why some cases are overlooked. The atelectasis is recognized, and is regarded as the explanation of the infant's condition. The oesophagus is not examined.

We want to emphasize that congenital atresia of the oesophagus probably has an incidence comparable to that of congenital heart disease. Unlike the latter condition, no infant can survive without the prompt aid of the surgeon. Early diagnosis is essential, and if this is to be achieved it is imperative that all concerned with the care of infants during the first few days of life should be aware of the condition and understand when its presence should be suspected.

Pathology

In most cases the anatomical abnormality conforms to the pattern described by Vogt (1929) as Type 3 (b). There is a complete and considerable gap in the intrathoracic oesophagus; the upper segment ends blindly at the level of the superior thoracic inlet, is dilated, and is often densely adherent to the posterior wall of the trachea. The lower segment is narrow and poorly developed, and opens into the posterior wall of the trachea by a vertical slit just above the bifurcation. Rarely, the lower segment is deficient or entirely absent, and there is no tracheo-oesophageal fistula (Vogt Type 2). The extent of the defect in the viscus varies from a thin mucosal obstructing web to complete absence. The position of the tracheo-oesophageal fistula is also variable, and may involve the upper segment or, occasionally, both segments. Cases of tracheo-oesophageal fistula without atresia have been described.

Other congenital abnormalities may be present, but these are rarely incompatible with life. In our own cases the commonest coexisting abnormality has been multiple accessory auricles.

Clinical Manifestations

Most articles published on this condition give rather inadequate descriptions of the clinical manifestations and describe as the typical symptom attacks of cyanosis and choking on attempting to feed. We venture to suggest that this is comparable to describing faecal vomiting as the typical symptom of intestinal obstruction. Feeding these infants is bound to lead rapidly to inhalation pneumonia, and we consider that it is most desirable, and often possible, to recognize the condition before any feeding is attempted. Such recognition before feeding would be achieved more often if midwives and nurses were aware of the condition.

A characteristic feature in most cases is that these infants bring up froth. This has not received adequate recognition in the literature. Many infants will produce some bubbly mucus for a few hours after birth. In contrast the infant with oesophageal atresia brings up a froth comprised of rather smaller bubbles, and this continues or increases. Occasionally the froth is bile-stained. Any infant that is bringing up frothy mucus 24 hours after birth should be investigated for possible oesophageal atresia. Furthermore, no feed should be given until this condition has been excluded by passage of a catheter into the stomach.

Respiratory distress and signs of atelectasis may present themselves before a feed is given. The infant's condition may then be attributed to the atelectasis, which is thought to be an explanation for the subsequent developments. Any infant that is reasonably mature and for no adequate reason presents signs of atelectasis should have a catheter passed into the stomach to exclude possible oesophageal atresia.

A further important sign of the condition is a distended and tympanitic abdomen; the distension, moreover, tends to increase whenever the infant cries or strains. In most cases a lower oesophageal segment is present and communicates with the trachea through a fistula situated just above the bifurcation. Any rise in the intrathoracic pressure forces air through the fistula into the lower oesophagus and thence into the stomach. In the rare case of complete atresia, in which no tracheo-oesophageal fistula is present, the abdomen is dull and no gas can be demonstrated in the intestines on *x*-ray examination.

In every case the infant must be carefully examined for other congenital abnormalities.

Diagnosis

Once suspected, the diagnosis can be quickly and easily confirmed by passing an adult-size rubber catheter into the upper oesophagus. An obstruction is encountered 3 to 3½ in. (7.5 to 8.8 cm.) from the gums. If a thin catheter is passed it may coil up in the blind oesophageal pouch and give the impression that it is passing into the stomach. If an obstruction is suspected all feeds by mouth are withheld, and 15,000 units of penicillin are given by injection immediately, and repeated three-hourly. Survival of the infant is dependent upon early diagnosis, early admission to hospital, and early operation before the lethal complications of the condition have supervened.

A trained nurse armed with a catheter and some means of applying suction—a rubber-bulb Dakin syringe is probably the best, as it can be used with one hand—should accompany the infant to hospital in the ambulance, so that the pharynx can be kept clear of mucus.

On admission to hospital penicillin administration is continued, and mucus is aspirated from the pharynx as quickly as it accumulates. If the lungs are wet and the infant cannot be induced to cough by passing the aspirating catheter down to the epiglottis, postural drainage is employed by placing the infant in the face-down head-low position and gently slapping it on the back.

As the emphasis is on quick diagnosis and early operation to restore bowel continuity, it is questionable whether any time should be devoted to attempts at restoring fluid balance by giving subcutaneous salines, unless the infant is remarkably dehydrated. In our experience this is unusual in the first three days of life.

Without delay an antero-posterior film of the chest and abdomen is taken to reveal the extent of the pulmonary atelectasis and to confirm the presence of gas in the intestine. If no gas is present the inference is that there is no tracheo-oesophageal fistula, and in all probability the lower segment is deficient or absent. In these circumstances immediate restoration of bowel continuity is probably impossible and the surgical treatment has to be modified. The catheter is again passed into the upper oesophagus, and 0.5 ml. of iodized oil is injected and its progress viewed under the fluorescent screen. It is unnecessary and dangerous to inject larger quantities. Barium must never be used owing to the risk of its entry into the lungs. After antero-posterior and lateral radiographs have been taken, the iodized oil is immediately aspirated again.

The radiological confirmation of the diagnosis by the method outlined should be undertaken only in the unit where surgical treatment can follow immediately. It cannot be stressed too often that this condition is an acute surgical emergency, and any step that may delay operation should be avoided; this applies especially to the repetition of diagnostic procedures in the various hospitals through

which the infant may pass before reaching the operating theatre.

No case is too hopeless for operation, but we have reason to believe that some cases are never referred to the surgeon, "because they appear moribund." The worse the condition of the infant the greater the indication for immediate action.

Treatment

Chemotherapy, pharyngeal aspiration, and postural drainage are continued while the above investigations are being carried out. A slow-drip blood transfusion is begun and an injection of atropine given. The infant's colour and general condition will probably have improved since admission as a result of the removal of secretions from the air passages.

The success of surgical treatment depends to a large extent on the skill of the anaesthetist, who should preferably have special experience of both thoracic surgery and anaesthesia in infants.

The technique of the operation performed in this unit differs in detail from the procedure normally adopted. Under intratracheal ether anaesthesia the fifth rib on the right side is resected subperiosteally and the right pleural cavity is widely opened. The mediastinal pleura is incised, the azygos vein is ligated and divided, and the upper and lower oesophageal segments are identified and dissected from the surrounding mediastinal structures. The upper segment may be densely adherent to the posterior wall of the trachea. The lower segment is divided close to the trachea and the fistula closed. The next step is of great importance: the upper end of the lower oesophageal segment derives some or all of its blood supply from the trachea, and after closure of the fistula cyanosis of the cut end of the oesophagus is usually present. Even though it increases the gap between the two oesophageal segments and renders the subsequent anastomosis more difficult, the cyanotic tissue must be trimmed back until free bleeding from the cut edge is seen. Omission of this step was probably responsible for the breakdown of the anastomosis and the death of three infants in this series.

The blind upper segment is opened, drawn down to the shortened lower segment, and an end-to-end anastomosis performed with one row of interrupted 45-gauge stainless-steel-wire sutures. The mediastinal pleura is not sutured. The lung is re-expanded by the anaesthetist and the chest closed without drainage. During the operation 200 to 300 ml. of blood is given and the drip continued with N/5 saline for the next 12 hours. The infant is placed in an oxygen tent. The pharynx is aspirated frequently to remove excess mucus and to stimulate the infant to cough.

No gastrostomy or jejunostomy is performed. Feeding by mouth begins 24 hours after operation, and ½-oz. (14-ml.) feeds of sterile water are given every two hours.

In those rare cases in which no tracheo-oesophageal fistula is present and the lower segment is deficient the operative technique is modified. The blind upper segment is brought out to the surface on the left side of the neck and is opened to allow buccal secretions to escape, to prevent their aspiration into the lungs. The deficient lower oesophageal segment is dissected free from the mediastinum and pushed down into the peritoneal cavity; the oesophageal diaphragmatic hiatus is then closed. The abdomen is opened, and, after freeing the upper half of the stomach by division of the left gastric artery and gastro-splenic omentum, the lower stump of the oesophagus is brought to the surface as a gastrostomy. An immediate cervical oesophago-gastric anastomosis is not attempted, but the procedure is deferred till a later date.

Results of Treatment

The many surgeons in this country now interested in this problem almost certainly have a few successes to their credit, and the time has come for the pooling of information regarding not only the survivors but the failures as well, to stimulate physicians and midwives to consider the diagnosis earlier and to take the necessary steps to have it confirmed.

Ten cases have been treated surgically in this unit. Of these patients five are alive and well and five died after operation. There have been two deaths in the last seven cases. In all instances a right transpleural thoracotomy was performed under intratracheal ether anaesthesia; in nine the fistula was closed and bowel continuity restored by an end-to-end anastomosis; in the remaining case no anastomosis was possible, owing to the absence of the lower oesophageal segment, and the infant is thriving on gastrostomy feeds pending a cervical oesophago-gastric anastomosis at a later date. No late complications have been encountered in the survivors.

A brief review of the fatal cases is instructive. One infant, in whom the diagnosis was not made till the fifth day of life, when bilateral bronchopneumonia was already present, died 12 hours after the operation from the lung infection. Another patient, a puny premature infant of 4 lb. (1.8 kg.), 2 days old and almost moribund on admission, died 10 hours after operation from extensive pulmonary atelectasis, which, after recovery from anaesthesia, developed owing to the infant's inability to cough. This infant might have been saved by bronchoscopy.

The three remaining patients all died of infection resulting directly from a leak at or near the site of the anastomosis. In none of these three was the blood supply to the lower segment safeguarded by trimming back the cyanotic upper end. In the light of our more recent experience it is not unreasonable to assume that these three might well have survived if this most important factor had received due consideration.

Case Records

Case 1.—A male infant 5 days old was admitted on October 18, 1946. Since birth there had been regurgitation, frothing, and cyanosis. His general condition was very poor, with evidence of bilateral bronchopneumonia. Gas was present in the bowel. Operation was carried out immediately without blood transfusion. The fistula was closed and an end-to-end anastomosis done. He was dyspnoeic and cyanosed for a considerable time during induction of anaesthesia and died 12 hours after operation from bronchopneumonia.

Case 2.—A male infant 5 days old was admitted on June 28, 1948, with a similar history. His general condition was poor; the lungs were very wet; the right upper lobe was collapsed; and the abdomen was distended with gas. Immediate operation was performed, with blood transfusion. The fistula was closed and end-to-end anastomosis done without trimming back the ischaemic lower segment. Evidence of a leak at the anastomosis appeared two days after operation. Gastrostomy and drainage of right pleura by intercostal catheter were carried out. He died on the eighteenth post-operative day with bronchopneumonia, undrained loculated basal empyema, oesophago-pleural fistula, patent ductus, and patent foramen ovale.

Case 3.—A male infant 4 days old was admitted on December 1, 1948. He had had cyanosis and regurgitation since birth and his general condition was poor. The right middle lobe was collapsed, and gas was present in the bowel. Blood transfusion and immediate operation were performed, with closure of the fistula and end-to-end anastomosis. The infant died on the fifth post-operative day with tension pyopneumothorax due to a leak at the anastomosis. The ischaemic lower segment of the oesophagus was not trimmed back in this case.

Case 4.—A male infant aged 2 days, admitted on December 18, 1948. No feeds had been given owing to frothing since birth. The right upper lobe was collapsed and the abdomen distended with gas. His general condition was fairly good. Blood transfusion and immediate operation were done; the fistula was closed and end-to-end anastomosis performed after resecting the upper centimetre of the lower segment. Convalescence was uneventful. He was fed by mouth from the second post-operative day. A post-operative barium swallow showed a well-functioning anastomosis.

Case 5.—A male infant 3 days old was admitted on April 24, 1949, with a characteristic history. He was very dehydrated, his general condition was poor, and he was passing no urine. The right upper lobe was collapsed and the abdomen distended. Blood transfusion and operation were carried out, the fistula was closed, and end-to-end anastomosis performed with great difficulty, as the upper segment was very short and only just reached the apex of the chest. The lower segment was cyanosed, but had it been resected the gap could not have been bridged. There was evidence of a leak on the fifth post-operative day; the empyema was drained and gastroscopy performed. He died on the ninth post-operative day from suppurative pericarditis.

Case 6.—A male infant 2 days old was admitted on August 29, 1949. No feeds had been given on the first day owing to frothing. On the second day two feeds were given and both were regurgitated; cyanosis was present after the second. His general condition was good. The lungs were dry and there was no gas in the intestines. Blood transfusion and operation were performed: no fistula was present and no anastomosis was possible, as the lower segment was deficient and extended only 2 cm. above the diaphragm. The chest was closed and cervical oesophagostomy and gastrostomy were performed. Convalescence was uneventful. The infant is now thriving on gastrostomy feeds; for restoration of bowel continuity later.

Case 7.—A female infant 2 days old was admitted on September 18, 1949. She frothed copiously two hours after delivery and her lungs were very wet. All feeds were returned, but there was no cyanosis. The right upper lobe was collapsed, and the bowel contained gas. Blood transfusion and operation were performed, the fistula was closed, and end-to-end anastomosis made. Convalescence was uneventful. Mouth-feeding began on the second post-operative day. The infant is now progressing normally.

Case 8 (Figs. 1 and 2).—A male infant 3 days old was admitted on October 2, 1949. Frothing, regurgitation, and cyanosis had been present since birth. The diagnosis was missed at one hospital owing to the use of a fine catheter, which coiled up in the oesophagus. The lungs were wet, and the abdomen distended with gas. Blood transfusion and operation were performed; the fistula was closed and end-to-end anastomosis performed with difficulty, as the upper segment was short and the gap to be bridged was formidable; nevertheless the lower segment was trimmed back and a satisfactory anastomosis finally achieved. Convalescence was normal. Mouth-feeding was started on the second post-operative day. The infant is now well and is feeding normally.

Case 9.—A female infant, admitted when 7 days old, had vomited every feed since birth. There had been frequent attacks of cyanosis, and frothing was continuous. She was very dehydrated, but the lungs were wet. Admission to hospital had been delayed "because the infant appeared to be moribund." The abdomen was distended. The birth weight was 6 lb. (2.7 kg.), and at the time of operation was 3½ lb. (1.6 kg.). Blood transfusion and operation were performed, with closure of the fistula and end-to-end anastomosis after

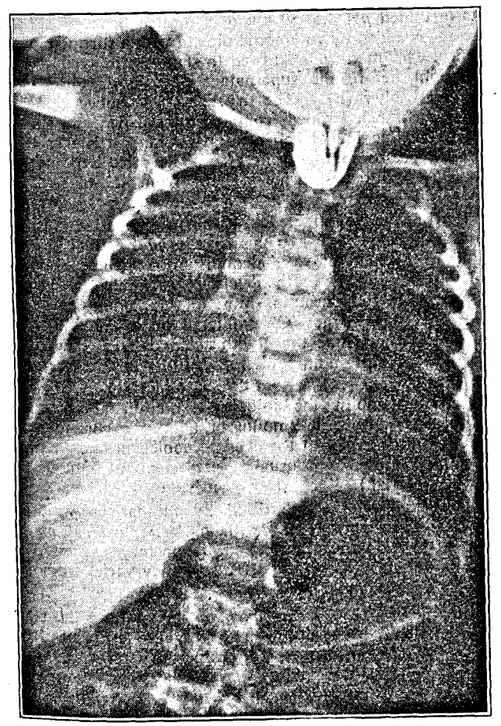


FIG. 1.—Case 8. Pre-operative film showing very short upper segment outlined with lipiodol, and pressure of gas in intestines.

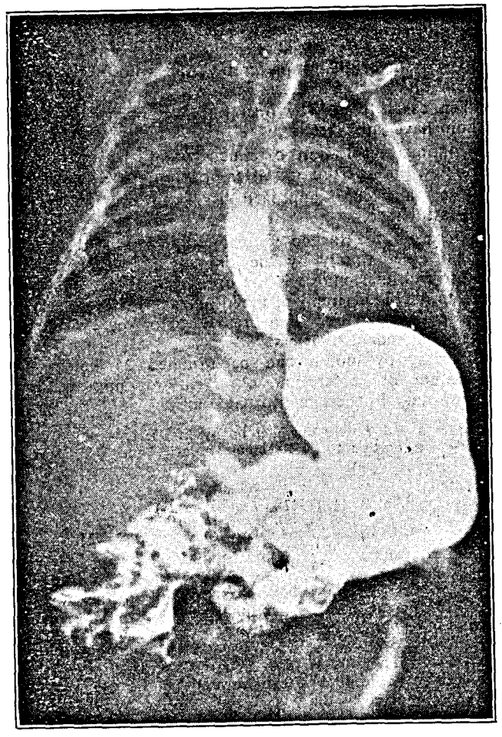


FIG. 2.—Case 8. Barium swallow five weeks after operation.

trimming back the lower segment. Mouth-feeding began on the second post-operative day, and convalescence was uneventful.

Case 10.—A female infant was admitted on February 5, 1950, when 2 days old. Pregnancy had been terminated at 38 weeks owing to severe pre-eclamptic toxaemia. Birth weight: 4 lb. 11 oz. (2.1·kg.); on admission 4 lb. 4 oz. (1.9 kg.). The lungs were wet; there was no cough reflex; and she was cyanosed and frothing. The case had been diagnosed elsewhere as "atelectasis of the left lower lobe," and a tracheal catheter had been passed for aspiration. Mucus aspirated from the pharynx was blood-stained. Blood transfusion and operation were performed; the fistula was closed and end-to-end anastomosis done after trimming back the lower segment. Her post-operative condition was satisfactory at first, but the cough reflex never returned, and she died 12 hours later with atelectasis of both lungs. Both bronchi were full of blood clot and mucus.

Conclusions

Congenital atresia of the oesophagus is commoner than is generally realized, the incidence probably being at least 1 in 800 births. Cases are missed clinically or at necropsy because they are considered to have developed pneumonia or to have atelectasis.

Diagnosis is easy once the condition is suspected. An infant that brings up an undue amount of mucus, particularly as a fine froth, for several hours after birth should be suspected of atresia, and such an infant *should not be fed by mouth until the condition has been excluded.* Diagnosis can easily be confirmed by passage of a medium-sized rubber catheter.

Operation holds out good prospects of cure if these cases are diagnosed early and operated upon promptly. Operation is hardly worth attempting unless there is available an anaesthetist with special experience in connexion with thoracic surgery, and preferably one who has made a special study of anaesthesia in infancy.

Ten cases treated by operation are recorded, five of whom have survived.

Continual aspiration of mucus from the mouth and pharynx, both before and after operation, is necessary.

The transpleural approach has been used in all five successful cases.

Closure of the tracheo-oesophageal fistula and restoration of bowel continuity by the simplest form of one-layer end-to-end anastomosis is the operation of choice. Attention to the blood supply of the lower segment should reduce considerably the risk of a breakdown of the anastomosis and its attendant disasters.

Feeding by mouth can be resumed 24 hours after operation, or earlier, and a gastrostomy appears to be unnecessary in the uncomplicated case.

Cases 3 and 7 were operated on by Mr. J. L. Griffith, second surgeon to the South-west Regional Thoracic Unit.

REFERENCES

Franklin, R. H. (1947). *Lancet*, **2**, 243.
Turner, G. Grey (1949). *Proc. R. Soc. Med.*, **62**, 511.
Vogt, E. C. (1929). *Amer. J. Roentgenol.*, **22**, 463.

Revised salary scales have been agreed for senior nursing staff in general and fever hospitals and sanatoria. The new scales are part of the general review of nurses' salaries which has been proceeding for some time, and they have retrospective effect from February 1, 1949. The new scales cover all senior staff in these hospitals except tutorial grades, which are now being considered by the Nurses and Midwives Whitley Council. The scales for senior staff in mental and maternity hospitals are also under consideration.

REVIEW OF ONE YEAR'S WORK IN WATFORD PREGNANCY DIAGNOSTIC CENTRE

BY

H. SCHWABACHER, M.R.C.S.

(From the N.W.M.R.H.B., Group 9 Laboratory, Watford)

The Watford Pregnancy Diagnosis Laboratory at Shrodells Hospital, Willow Lane, Watford, was set up in 1949, and was equipped to undertake the Hogben test for pregnancy. This particular test was chosen because it is more reliable, more economical, and more easily adapted for routine work than any other method.

The main requirement for reliable results by the Hogben method is that the test animals (*Xenopus laevis*) are in good condition before being used. The routine followed at Watford is almost identical to that published by Landgrebe and Hobson (1949). When the animals are thought to be suitable they are first tested by the administration of 70 i.u. of chorionic gonadotropin. Only those which respond are used for pregnancy diagnosis. For this purpose a dry stable extract of chorionic gonadotropin was made by a modification of the Katzman and Doisy method (1931).

Preparation of Extract of Chorionic Gonadotropin

All urines yielding a positive Hogben reaction are pooled and filtered the day after receipt. To every litre of urine (A) (acidified *p*H 4.5) 50 ml. of saturated benzoic acid in acetone is added by volumetric pipette with a stirring movement. This mixture is allowed to stand in the refrigerator overnight before the supernatant fluid is decanted into another beaker (B). The dry deposit is collected on a Buchner funnel, scraped from the filter paper, and stored under acetone in the refrigerator. Fluid in beaker B is again processed as the urine (A). The dried deposits are pooled—30 litres of urine yielding from 1.5 to 6 g. of powder.

The powder is extracted with three consecutive amounts of 100 ml. of water. To this slightly acid extract (C) are added 3 volumes of 95% alcohol and 1 volume of ether (diethyl ether); it is then left in the refrigerator for 18 hours. After decanting most of the alcohol and ether the remaining extract (C) is filtered on a small Buchner funnel, washed three times with acetone, dried quickly in warm air, placed in ampoules, sealed off, and stored in the refrigerator.

Before attempting the biological standardization, one can estimate the probable amount of chorionic gonadotropin per mg., assuming that the original pooled urine contained 20 i.u. per ml. (It is usual to extract about 80% of the active material.)

This powder is standardized by comparison with the international standard powder, using *Xenopus laevis* as test animal (Landgrebe, 1948), and its potency expressed in international units per mg. The potency varies from 100 to 400 i.u. per mg.

Number of Tests Undertaken in 1949.—Once the stock of *Xenopus laevis* reached 200 tested animals, urines from Hertfordshire were accepted. Specimens from London and the South of England were taken as the number of tested animals increased. In February, 41 specimens were received, while the peak number handled was 522 in October; 3,724 tests were performed throughout the year.

Technique of Test

The chorionic gonadotropin was extracted from the urine according to Scott's method (1940). Half of the eluted gonadotropin—that is, 2.5 ml.—was injected into one toad; the other half was kept at 2° C. overnight and injected into a second toad if the first had failed to ovulate after 18 hours.

Over a series of 103 specimens it had been noticed that, when two toads were injected with the extract on the same day, only in three cases did one toad ovulate without the other responding. Hence it was decided to inject the second toad only if the first had yielded a negative result after 18 hours. On the evidence obtained from the Pregnancy Diagnostic Centre, Edinburgh, about 50% of our tests would be positive, and we were thus able to increase the possible number of tests undertaken with the same number of test animals by 25%. Table I demonstrates that on 55 occasions out of a total of 1,220 tests the *first injected* toad yielded a false result when "read" at 18 hours, in that it had failed to ovulate until 24 to 48 hours, or failed to ovulate at all, whereas the *second toad,* inoculated with the same extract a day later, yielded a positive result.

TABLE I.—*Demonstrating the Need to Inject a Second Animal When the First Animal Failed to React*

No. of Cases	Delayed or Negative Reaction in Toad I		Positive Reaction in Toad II from Identical Extract
	No Reaction After 48 Hours	Positive Reaction within 18 to 48 Hours	Positive Reaction within 18 Hours
55 (4·5% out of 1,220 tested)	35 (63·6%) 2·86%	20 (36·4%) 1·64%	55 (100%) 4·5%

The recording of delayed positive or false negative results is being continued, as it is thought we may have here a means of evaluating the sensitivity of the animals in our colony.

Distribution of Toad Population in the Tanks.—Negative reactors (A) are placed in tanks (A1) and positive reactors (B) in tanks (B1) until there are 50 animals in each tank. These animals are rested for one month. Toads from tank A1 are used for the fresh tests, and are rested in tank A2 or tank B2. All A3 toads (reacting negatively to three injections) are tested by injection of 70 i.u. of extract. We have had to reject 2.7% of our toads. Thus the subnormally reacting toads are continually being excluded from use. "Positive" toads in B tanks are used regularly for the second injection of a negative Hogben reaction.

An Analysis of the Tests Undertaken

We have recently attempted to encourage the doctors to fill in the data asked for on our request forms by refusing to submit the result of the Hogben test until they return the amended form. We now receive a wealth of information.

In Table II are shown the reasons for which the urines were sent to our laboratory for test.

TABLE II.—*Reasons for Submitting Urine for the 3,724 Hogben Tests Performed*

Clinical Condition	
Abortion	12·6%
Hydatidiform mole	5·7%
Abnormal implantation	1·9%
Tuberculosis (pulmonary)	1·5%
Assumed to be normal pregnancies	39·6%
Menopause	9·5%
Fibroid or tumour	3·2%
Unmarried mother	3·9%
Testicular carcinoma	0·33%
Hormonal amenorrhoea (i.e., obesity, anaemia, etc.)	6·4%
Heart lesions	0·07%
No information given	15·3%
	100·00%

Confirmation of Laboratory Findings

Printed cards, asking whether the Hogben reaction agreed with clinical findings, are posted two months after the Hogben test is carried out. This enables the practitioner to report to us with certainty.

False positive Hogben reactions do not occur. The animal cannot ovulate unless it is injected with the active substance. When, at our request, the doctors were asked to investigate the laboratory's two false positive reports, it was elicited that the patients had concealed their abortion (Table III, D).

TABLE III.—*Interesting Cases*

Group	Evidence			
	Histological Report	Ref.	Hogben Test	Doctors' Confirmation
A. Testicular	Teratoma	557	−	
	Seminoma	562	−	
	Malignant	2,560	+	
B. Pregnancy with menstruation	Confinement May	2,159	+1/10	Pregnant
	Menstruation August to October	2,728	+1/10	
C. Pregnancy with *delayed* Hogben reaction	L.M.P. 10 weeks	1,099,	−,	*X*-ray foetal parts present
	,, 12 ,,	1,291	−	
	,, 20 ,,			
	L.M.P. 8 weeks	796	−	
	,, 10	1,163	−	
	,, 11 5/7 weeks	1,360	+	
	L.M.P. 5 weeks	Edinburgh	−	
	,, 9 ,,	,,	−	
	,, 11 ,,	2,151	+	
D. Pregnancy		891	+	Neg. reinvestigated; patient had aborted
		1,386	+	Neg. reinvestigated; patient had aborted

False negative Hogben reactions may occur when the chorionic gonadotropin in the urine is deficient because the urine has been sent too early, or the urine is not a concentrated specimen—that is, of too low a specific gravity—or if the patient is a poor secretor or excretor, or destruction of the chorionic gonadotropin by an unknown factor has occurred.

Owing to the small number of tests undertaken and to the insufficient confirmatory returns in 1949, figures for the evaluation of the accuracy of the work at Watford will be pooled with this year's results and published in the report for 1950.

Some interesting cases are recorded in Table III. There has been only one case of testicular carcinoma: this we were able to confirm (Group A). Group B represents one patient in whom we were able to allay the fear of malignancy and predict a second conception within three months of delivery of a first baby. The three cases in Group C in which the Hogben test became positive two months after probable conception are examples of failure to send early morning specimens of urine of high specific gravity.

Case of Hydatidiform Mole

This case is recorded (Table IV) by permission of Professor F. J. Browne.

According to dates, this patient was 8 to 10 weeks pregnant when first seen, yet the uterus showed a four-months pregnancy. The uterus failed to increase in size during the four weeks of the investigation.

TABLE IV.—*Hogben Tests in a Case of Hydatidiform Mole*

Pre-operative		Ref. No.	Date	Hogben Result in Dilutions	Friedman Test with C.S.F.
1		3308	28/11/49 30/11/49	+ 1 in 400	—
2		4002	1/12/49	+ 1 in 500	
3		4003	7/12/49	+ < 1 in 400	
4		3710	29/12/49	+ 1 in 10	
5		3736	2/1/50	+ 1 in 10	
Operation			3/1/50 4/1/50		+
Post-operative	**Hrs. After Operation**				
1	16	4006	5/1/50	+	
2	18	4007	,,	+	
3	42	4008	6/1/50	+	
4	45	4010	,,	+	
5	56	4011	,,	+	
6	62	4012	7/1/50	+	
7	66	4409	,,	+	
8	72	4013	,,	+	
9	76	4014	,,	+	
10	80	4015	,,	+	
11	90	4016	8/1/50	+	
12	93	4017	,,	+	
13	97	4039	,,	+	
14	100	4042	,,	+	
15	104	4040	,,	+	
16	108	4148	,,	+	
17	109	4149	9/1/50	+	
18	114	4150	,,	+	
19	123	4151	,,	—	
20	138	4041	10/1/50	—	
21	26 days	4258	30/1/50	—	

One millilitre of cerebrospinal fluid was negative to a Friedman test on November 30. A larger volume, 8 ml., injected on January 3, 1950, produced a strongly positive Friedman reaction. It is emphasized that it is *unnecessary to use cerebrospinal fluid* for confirmation of hydatidiform mole. A few years ago, to end the habitual procedure of spinal puncture, the Usher Institute, Edinburgh, refused to accept specimens of cerebrospinal fluid.

Pre-operative urine on December 1 yielded a positive Hogben reaction in a dilution of 1 in 500. Tests repeated 28 and 32 days later reacted only in a dilution of 1 in 10. In view of the lessening of chorionic gonadotropin, the absence of evidence of foetal parts by x-ray examination, and the fundus of fourth-month pregnancy it was decided to empty the uterus. This was accomplished by the vaginal route on January 4, 1950.

Twenty specimens of urine were collected in the course of six days, in the hope of detecting the point at which chorionic gonadotropin was no longer being excreted. The test remained positive up to the fifth post-operative day. During this time no specimen caused a reaction in a dilution of 1 in 10. From the sixth post-operative day the test became negative.

Summary

A description is given of the preparation and standardization of chorionic gonadotropin from urine.

The method of using and resting the Watford colony of tested *Xenopus laevis* is recorded.

Some interesting cases are reviewed.

I wish to express gratitude to Dr. F. W. Landgrebe, of the Usher Institute, Edinburgh, for all the helpful interest he has taken in the Watford Pregnancy Diagnostic Centre.

REFERENCES

Katzman, P. A., and Doisy, E. A. (1931). *J. biol. Chem.*, **98**, 739.
Landgrebe, F. W. (1948). *Proc. roy. Soc. Edinb. B*, **63**, 213.
—— and Hobson, B. M. (1949). *British Medical Journal*, **2**, 17.
Scott, L. D. (1940). *Brit. J. exp. Path.*, **21**, 320.

The Minister of Health recently received a deputation from the Socialist Medical Association, when tuberculosis and its treatment under the National Health Service were discussed. The deputation put forward a number of proposals. The Minister in reply drew attention to the progress already achieved and indicated the lines along which he hoped there would be further advance.

USE OF THE MALE BRITISH TOAD AS A PREGNANCY TEST ANIMAL

BY

J. F. D. FRAZER, B.M., B.Ch.

AND

F. X. WOHLZOGEN, M.D.Vienna

(From the Department of Physiology, St. Mary's Hospital Medical School, London)

In the last four years various workers have successfully used male toads of numerous species in the Galli Mainini pregnancy test (Galli Mainini, 1947, 1948; Houssay, 1947). It was decided to investigate the possibility of using the British species (*Bufo bufo*) as a pregnancy test animal.

Method

Two male toads of over 15 g. weight each have 1 ml. of filtered first morning urine injected into the dorsal lymph sac. The toad's cloacal urine is taken at the time of injection. and the absence of spermatozoa is checked. Further samples are taken three to six hours later, and the presence of spermatozoa in any of these is regarded as a positive result (see Fig.). If no sperms can be detected in either toad's cloacal urine six hours after injection the result is negative.

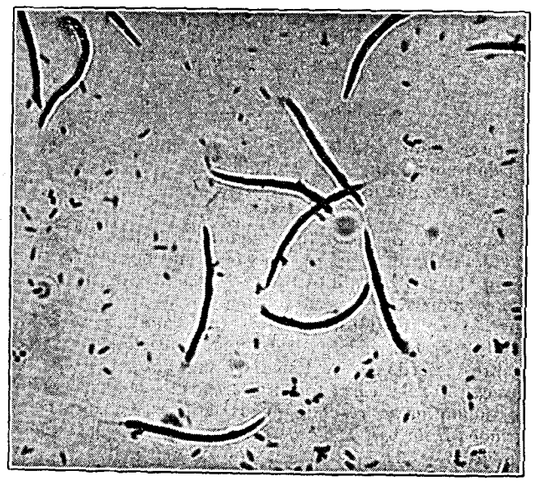


FIG. 1.—Toad spermatozoa (*Bufo bufo*) (× 1,000). The thick black lines are the heads of the sperms, the tails being much finer. The usual debris found in these smears is also present. (Stained Giemsa.)

The toad's urine is collected by means of a fine glass pipette of 1 mm. diameter inserted into the cloaca and moved gently backwards and forwards. This can be examined, unstained, under a low-power microscope (⅔ in.—16 mm.).

Toads can be reused after one week, but no toad should be used for more than four tests, as the reaction is then less prompt, is less pronounced, and sometimes fails altogether.

Results

Eight consecutive tests on 80 pairs of toads gave 53 positive and 27 negative results. Of the 53 positives, 51 were confirmed clinically as pregnancy, one as hydatidiform mole, and one as a chorionepithelioma of the testis. Of the 27 negatives, 26 were subsequently proved clinically not to be pregnant. The one false negative was an early pregnancy of less than six weeks which a few days later became a threatened abortion.

Discussion

A suitable quantity for injection was 1 ml. of first morning urine, this being the most concentrated specimen of the day. Positives could then be obtained when afternoon specimens gave negative results. Some of Klopper and Frank's (1949) false negatives may be due to this, despite the injection of 2 ml. a toad. Cerquiglini's (1948) injection of 10 ml. a toad is far too much for toads around 20 g. in weight.

The weight of the toads should be over 15 g. This was shown by analysis of the first 25 positive tests (see Table). Of the toads heavier than 15 g. 97% were positive after six hours, while only 75% of the lighter toads were then positive.

TABLE.—*Difference in Response Between Light and Heavy Toads*

Time in Hours	No. of Toads First Giving Positive Result	
	Over 15 g.	15 g. or Less
After 2	24	5
,, 4	7	6
,, 6	2	1
,, 24	1	2
Not in 24	0	2

Pairs of toads are used for every test, and the result is regarded as positive even if only one responds. Thus in our series of 53 positive tests (that is, 106 toads), three toads gave a negative result. With single toads the accuracy would then have been 97%, but the use of pairs brings it to over 99.9%.

In considering the stage of pregnancy after which the toad test becomes positive one has to realize that this, as well as the Aschheim–Zondek, Friedman, and Hogben tests, is essentially a test for gonadotrophins; so the result will depend on the concentration of gonadotrophins excreted in the urine. In normal pregnancy the urinary gonadotrophin level shows a marked rise about the fourth to sixth weeks; before this time it is generally too low for there to be sufficient gonadotrophin in the injection mass to produce a positive result in the various biological pregnancy tests.

As the thresholds of different test animals—mice, rabbits, *Xenopus*, *Bufo*—are not the same, and as in various tests different amounts of urine are injected, it is obvious that not all of the pregnancy tests will become positive at the same time. It has been tentatively put forward (Frazer and Wohlzogen, 1949), and since confirmed (Frazer and Wohlzogen, 1950), that in the British toad the threshold (ED 50) is about 8 i.u. for standard chorionic gonadotrophin. Despite the results of Bach and Szmuk (1949) on frogs, this threshold in *B. bufo* has not varied significantly at different times of the year in toads kept in a warmed animal-house. Use of the same standard gonadotrophin has shown a threshold for the Friedman test of 15 i.u. approximately; for the Aschheim–Zondek 10 i.u. approximately, and for the *Xenopus* 70 i.u. approximately (Frazer and Wohlzogen, unpublished). With the usual amounts of urine injected in these tests—namely, Friedman 15 ml., Aschheim–Zondek 2 ml., *Xenopus* 7 ml., and *B. bufo* 1 ml.—this means roughly that the gonadotrophin levels above which positive results are obtained with unconcentrated urine will be: Friedman, 1 i.u./ml.; Aschheim–Zondek, 5 i.u./ml.; *B. bufo*, 8 i.u./ml.; and *Xenopus*, 10 i.u./ml.

From this it becomes apparent that the Friedman test will give a positive result earlier in pregnancy than the others. The toad test, however, can be brought up to the same level of sensitivity as the Friedman test by concentrating the urinary gonadotrophins eight times by the method of Scott (1940).

Conclusion

The series of positive results with unconcentrated morning urine were obtained from cases ranging from the fourth week (eight cases) to the seventh month of pregnancy. Over this period there would seem to be no bar to the use of the toad test; but when negative results are obtained in what may be the third to sixth weeks of pregnancy it would be advisable, for 100% accuracy, either to concentrate the urine eightfold or tenfold and repeat the test, or to perform a Friedman test. If neither is feasible the test should be repeated after a fortnight. Which alternative is adopted may depend upon the laboratory facilities available.

Summary

The use of the male British toad (*Bufo bufo*) for pregnancy tests is described. In a series of 80 consecutive cases no false positive and only one false negative result was obtained.

The results are discussed, and suggestions are made for the assessment of the results of pregnancy tests in what may be the first six weeks of pregnancy.

REFERENCES

Bach, I., and Szmuk, I. (1949). *Lancet*, **2**, 218.
Cerquiglini, S. (1948). *Boll. Soc. ital. Biol. sper.*, **24**, 225.
Frazer, J. F. D., and Wohlzogen, F. X. (1949). *Lancet*, **2**, 134.
—— —— (1950). Awaiting publication.
Galli Mainini, C. (1947). *Sem. méd., B. Aires*, **1**, 337.
—— (1948). *Acta endocrinol. gynaec., hisp.-lusit.*, **1**, 151.
Houssay, B. A. (1947). *Rev. Soc. argent. Biol.*, **23**, 114.
Klopper, A., and Frank, H. (1949). *Lancet*, **2**, 9.
Scott, L. D. (1940). *Brit. J. exp. Path.*, **21**, 320.

Medical Memoranda

Inversion of the Uterus

Inversion of the uterus is a very rare condition. The incidence is variously estimated at figures varying between 1 in 16,000 and 1 in 200,000 deliveries. The most searching article on the subject is that written by P. Das (1940). He studied the literature from the earliest times and found records of 391 cases, of which 297 were puerperal. I have found references to a further 122 cases in the journals available to me, while many more are to be found in the *Index Medicus*.

Case Report

The patient, aged 34, was in her fourth pregnancy. Her last menstruation was on October 10, 1946, and her expected date of confinement was July 28, 1947. Her three previous pregnancies had gone to term and her labours had been rapid —the longest three hours. All the children are alive and in good health. Throughout pregnancy she was very well and had no abnormalities of any kind.

Two weeks before her expected date she felt crampy pains which she attributed to indigestion. These persisted for about 24 hours, when they became stronger and were followed by a "show," after which delivery was accomplished in about 50 minutes. The perineum was intact. The third stage was completed in 20 minutes, with a total blood loss of about 10 oz. (284 ml.).

One hour after delivery the uterus was firmly contracted, and as there had been no loss of blood I left the house. The nurse was called away to another case about an hour later. When she left, the uterus was still firm and no bleeding had occurred. About 30 minutes after her departure the patient felt the need to micturate, and having no bedpan raised herself on to the chamber pot. During the act she "felt something come down" in the vagina, and, finding a mass at the vulva, lay down and sent for me.

On arrival about 10 minutes later the inverted fundus was visible at the vulva, the tubal ostia showing clearly. Only slight oozing was occurring from the placental site. Her pulse was 92. The vulva and fundus were liberally swabbed with "dettol" (20%). Vaginal examination confirmed that the uterus was inverted. The loose cuff of the dilated cervix was palpable. The uterus was reinverted by gentle pressure with a sterile pad. Morphine, ¼ gr. (16 mg.), and ergometrine, 0.5 mg., were given and a course of sulphathiazole was ordered. Her pulse rate was now 80.

Throughout the puerperium her temperature did not rise above 98° F. (36.7° C.) nor the pulse rate above 88. The patient was allowed up on the twelfth day and has been free of symptoms since. She carries out her household duties every day.

J. M. B. DONALDSON, M.B., B.A.O., D.Obst.R.C.O.G.

REFERENCE

Das, P. (1940). *J. Obstet. Gynaec. Brit. Emp.*, **47**, 525.

Acquired Sensitivity to Thiopentone

The following case illustrates how individual requirements for thiopentone can vary from time to time.

CASE REPORT

A woman aged 64 was to be operated on for acute intestinal obstruction. Her general condition was poor, she was ill-nourished, and had been vomiting for 24 hours, though cyanosis and jaundice were not present and she did not look anaemic. Her blood pressure was 180/100 mm. Hg, and pulse 100. Atropine sulphate, 1/100 gr. (0.65 mg.), and morphine sulphate, 1/6 gr. (11 mg.), were given one hour before operation and she was induced with 12 mg. of curare and 0.3 mg. of thiopentone. Slight respiratory depression for about 10 minutes followed this, but no apnoea. Anaesthesia was maintained with cyclopropane and oxygen, and 3 mg. of curare was given after half an hour. A volvulus of the pelvic colon was found and resected, leaving a left inguinal colostomy. The operation lasted 65 minutes, and at the end the patient had completely recovered her cough reflex.

Failure of the colostomy to close necessitated another operation six weeks later. Her general condition had by now greatly improved. Premedication was given as before. After an initial dose of 0.2 g. of thiopentone she became apnoeic, and artificial respiration with oxygen, using a Coxeter-Mushin absorber, was undertaken. The surgeon at this stage commented on the satisfactory relaxation. The absorber was cut out of the circuit periodically lest the washing out of alveolar CO_2 had been serving to maintain the apnoea. After 20 minutes she was intubated orally and the pharynx packed without any sign of resistance from the patient. Later 3 ml. of nikethamide and 1.5 ml. of picrotoxin were given intravenously with no response.

After 50 minutes' apnoea spontaneous respiration began, and at the end of the operation, which lasted one hour, she was breathing normally. Consciousness was regained an hour later, and apart from mild bronchitis she made an uneventful recovery.

COMMENT

The altered response of this patient to thiopentone points to some change having occurred in her detoxicating powers.

Thiopentone detoxication is imperfectly understood (Hewer, 1948), but the drug is believed to be broken down quickly in the tissues generally (Adams, 1944). The role of the liver in this process is very debatable, and, while some hold that it plays a major part (Shideman and Kelly, 1947a, 1947b; Shideman, 1948, 1949; Walker and Wynn-Parry, 1949), Richards and Appel (1941), Lundy (1942), and Scheifley (1946) do not believe that liver damage prolongs thiopentone anaesthesia. Liver and kidney function tests done on the day after the second operation revealed gross dysfunction, and there were persistently high quantities of urobilin in the urine.

The patient was also grossly deficient in vitamin C. While this deficiency prolongs pentobarbitone ("nembutal") narcosis, of which thiopentone is the sulphur analogue, Adriani (1946) denies that it plays any part in the detoxication of thiopentone.

Fears that thiopentone administration might have a deleterious effect on patients undergoing sulphonamide therapy were abandoned after the experience gained in the last war (Adams, 1944). Nevertheless, it may be mentioned that in my case 21 g. of sulphadiazine had been administered two weeks previous to the second operation, and that a course of succinylsulphathiazole was started 24 hours before it. The precise bearing of this on the course of events is a matter for speculation.

Shortly before her discharge from hospital the patient informed us of her intention to resume the "injections for the blood," which she had been having thrice weekly prior to admission. Blood examination at that time showed: red cells, 1,430,000; white cells, 2,000; Hb, 40%; the stained film being typical of pernicious anaemia. Her first operation being a night emergency, no pre-operative blood examination was feasible, and her satisfactory post-operative course gave no indication for haematological investigation.

On incubating thiopentone with blood at body temperature, Richards (1947a, 1947b) found a decrease in potency which did not occur when plasma was substituted for whole blood. This suggests that some enzyme in the red cells is capable of detoxicating thiopentone. In my case the deficiency in the red cells due to anaemia at the time of the second anaesthetic would mean loss of this enzyme and could account, at least in part, for the altered response to the drug.

Liver deficiency could have been secondary to the gross degree of anaemia that developed during the six weeks' abstinence from liver extract, and could have been a manifestation of anoxia. Thus the "acquired sensitivity" to thiopentone can be attributed to a combination of gross anaemia and liver damage.

I am indebted to Mr. A. M. Abrahams and Dr. J. B. Hargreaves for permission to publish this case, and I would be interested to hear of any similar cases.

JOHN W. DUNDEE, M.B., D.A.,
Anaesthetic Registrar, Walton Hospital, Liverpool, 9.

REFERENCES

Adams, R. C. (1944). *Intravenous Anaesthesia*. Harper, New York.
Adriani, J. (1946). *Chemistry of Anaesthesia*, p. 404. Blackwell Scientific Publications, Oxford.
Hewer, C. L. (1948). *Recent Advances in Anaesthesia and Analgesia*, 6th ed., p. 39. Churchill, London.
Lundy, J. S. (1942). *Clinical Anaesthesia*, p. 40. Saunders, Philadelphia and London.
Richards, R. K. (1947a). *Fed. Proc.*, **6**, 118.
—— (1947b). *Anesthesiology*, **8**, 90.
—— and Appel, M. (1941). *Curr. Res. Anaesth.*, **20**, 64.
Scheifley, C. H. (1946). *Anesthesiology*, **7**, 263.
Shideman, F. E. (1948). *Fed. Proc.*, **7**, 225.
—— (1949). Ibid., **8**, 306.
—— and Kelly, A. R. (1947a). Ibid., **6**, 334.
—— —— (1947b). *J. Pharmacol.*, **91**, 93.
Walker, J. M., and Wynn-Parry, C. B. (1949). *Brit. J. Pharmacol.*, **4**, 93.

Reviews

TUMOUR FORMATION

Studies on Tumour Formation. By the late G. W. deP. Nicholson, M.A., M.B., B.Ch. (Pp. 637; 183 figures. 63s.) London: Butterworth. 1950.

Between 1921 and 1938 the late Professor G. W. Nicholson wrote a series of articles on tumour formation for the *Guy's Hospital Reports*. These are collected together and published in chronological sequence in this volume, which, as Professor R. A. Willis says in the foreword, "is a fitting memorial to a great man who was too little known in his lifetime."

It is regrettable that Nicholson's published work was not more widely read in his lifetime. This was to a large extent due to his strong aversion to the public exposition of his views and his disinclination to oversimplify his writings. His literary style was entirely his own, and this volume carries so deep and accurate an impression of his personality that, in order to give the prospective reader some idea of the scope and quality of the work, it is necessary to say something of the author himself.

Nicholson was first and foremost a general biologist with a passionate interest in microscopic structure and the broad problems of growth and development. With this background he was led, in the genial atmosphere of the Guy's Medical School, to the study of tumour formation, and to this problem he unselfishly devoted his life and energies. Others have followed or are following this trail, but Nicholson's writings and teaching had a unique quality which was to a large extent the outcome of his early training in the humanities. He brought to the study of biology the fruits of an arduous Continental schooling in the classics and a long period of rigid training in formal logic and Germanic philosophy. As he reached maturity and his experience of the structure and behaviour of tumours ripened, his deductions were the outcome of intellectual integrity, an uncommon degree of independence and impartiality of thought, and fierce intolerance of dogma which provoked him in his published work to outspoken and almost pungent criticism.

Although the last chapter of this volume was published twelve years ago, Nicholson's deductions with regard to the fundamental nature of tumour formation have not been outdated by modern discoveries. Close analysis of his evidence led him to believe that in structure, function, and manner of growth tumours "do not differ essentially from other tissues and obey the laws of growth that govern their behaviour." With regard to causation, he concluded that two basic factors were concerned—an external stimulus (factor of realization), and an intrinsic cellular reaction, which he concluded must be "essentially natural, biological, and entirely physiological." He was not greatly concerned with the external stimulus, the carcinogen, or, as he called it, the "cause of cancer in the medical sense." He believed that we understand as much about this aspect of causation as we do about infection. He was almost entirely preoccupied with the living reacting cell, and the growing modern tendency to investigate the biochemistry of the growing cell supports his belief.

Of the twenty chapters in the book six deal with specific but debatable subjects in tumour pathology, such as the hypernephromata, the mixed tumours, the teratomata, and the heterotopic tumours. In each case, although the basic significance of observed structure is fully examined, the tumour in question is used to illustrate general principles or to stress the futility of some theory or hypothesis which professes to "explain" its origin. The hypotheses of Cohnheim, Grawitz, and Wilms are dealt with in turn, gently at first, then with a gradually rising crescendo of less and less restrained criticism.

The remaining chapters are on the application of biological principles to the general pathology of tumour formation, and of these Chapter XI (Causation: Reaction and Environment), Chapter XIII (Somatic Development and Tumour Formation), and Chapter XX (Induction and Determination) should be read by every serious student of the subject.

To read this book demands patience and concentration. As the author's arguments are unfolded the reader is likely to meet with some rude shocks to one or other of his cherished beliefs. He may sometimes be annoyed, but he will far more often be amused. He will certainly be made to think, and it is very probable that he will never again say that "tumours are autonomous."

GEOFFREY HADFIELD.

TEXTBOOK OF RADIOTHERAPY

A Short Textbook of Radiotherapy for Technicians and Students. With a supplementary Chapter for the Dermatologist. By J. Walter, M.A., B.M., M.R.C.P., D.M.R.E., and H. Miller, M.A., Ph.D., F.Inst.P. Foreword by J. L. A. Grant, *M.C.*, F.R.C.S.Ed., F.F.R., D.M.R.E. (Pp. 444; 199 illustrations. £1 8s.) London: J. and A. Churchill. 1950.

When a book covers the intricacies of modern physics, deals with cancer from a medical point of view, and is on a subject, radiotherapy, which many doctors shy away from, it is clearly a delicate task to be lucid for girls of School Certificate standard who will have to use the book for technical examinations. This book is written for radiographers and student radiographers, and whether the authors have succeeded entirely in their aim cannot be easily decided by anyone familiar with the technical terms. For instance, will the average radiographer be confused by two different applications of the word "normal" occurring on the same page? Only the reader for whom it is designed can answer these questions properly. In the opinion of the reviewer the authors have succeeded admirably in their aim and, moreover, produced a book which will serve for medical students as an introduction to a subject which is something of a mystery to them. Physics, radium, radon, and high-voltage radiation, together with super-voltage apparatus and radioactive isotopes, are some of the non-biological ingredients, while accounts of theories of cancer development, spread of cancer, biological action of radiation, and effects of *x*-ray treatment are some of the biological ingredients. The fruit of the cake consists of accounts of various diseases coming within the scope of radiotherapy and of the methods employed in dealing with them, together with a section on protection from radiation. The whole is liberally decorated with diagrams and photographs which are clear in their application, and the last two-thirds is spiced with quotations and footnotes which show the derivation of some medical words.

Inevitably the readers for whom it is intended are destined to suffer from some mental indigestion, but the authors have done well in making the cake appetising and attractive, considering all the ingredients necessitated by the examinations which radiographers must take in therapy. Any radiotherapist could criticize some points, but all will agree that it fills well a need for which no other book is available.

FRANK ELLIS.

A GREAT WORKER IN PUBLIC HEALTH

Selected Papers of Haven Emerson, A.M., M.D., D.S.M. Published on the occasion of his 75th birthday, October 19, 1949, by the W. K. Kellogg Foundation, Battle Creek, Michigan. (Pp. 507. $3.)

On October 19, 1949, Haven Emerson, one of America's greatest practitioners of public health, celebrated his 75th birthday. The occasion was marked by the most sincere expressions of appreciation from his many friends and colleagues and by the publication of thirty-five well-selected papers from more than one hundred and fifty written by him during his long life.

He is not the first great worker in the field of public health to have forsaken a most promising career as a physician for the less obvious attractions of preventive medicine and to have distinguished himself subsequently in epidemiology and medical administration. His rarity lies not only in his clear and able scientific work but in his constant awareness of its deeper social significance.

This book can be recommended to readers in Britain on three accounts. First, such papers as that on "The Prevention of Heart Disease" and "The Place of Mental Hygiene in the Public Health Movement" are as worthy of study now as when they were written. Secondly, many papers are concerned with the relation to each other of voluntary and official bodies and their proper place in the promotion of community health. These are the considered opinions of a man of great intelligence and experience, and should be closely examined at this critical time in the development of our health services. Thirdly, those interested in the growth to maturity of the human personality will find fascination in the study of these papers, taken as they are chronologically, and representative of the main stages in the life of an outstanding man.

J. M. MACKINTOSH.

ASPECTS OF UROLOGY

Essential Urology. By Fletcher H. Colby, M.D. (Pp. 580; 342 figures. £3 1s. 6d.) London: Baillière, Tindall and Cox. 1950.

The title of this work is apt to mislead. To most people the essentials of any specialty are those broad principles which should guide the medical man in his practice of it and should form a sound basis for diagnosis and treatment. But in this work the emphasis is on the embryology, anatomy, physiology, and pathology of the genito-urinary organs. The author considers that methods of treatment change so rapidly and are so soon out of date that it is difficult to include them in a book meant primarily for students. But, although he does not claim that this book is a comprehensive work on genito-urinary surgery, and discusses treatment only secondarily, he throws light on many of the practical problems with which the genito-urinary surgeon is concerned. For example, the book includes an excellent table which allows the reader to see at a glance the respective advantages and disadvantages of the various methods of carrying out prostatectomy. It also gives statistical data by which the mortality rate, and therefore the risks attached to these operations, can be assessed. The book can therefore be looked upon as being an excellent means of supplementing other reading on this subject. It can claim to deal with essentials in so far as anatomy, physiology, and pathology are the foundation subjects on which all surgery rests. Like almost all medical works coming from the U.S.A., this book is very well illustrated.

KENNETH WALKER.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Human Sex Anatomy. By R. L. Dickinson, M.D., F.A.C.S. 2nd ed. (Pp. 145. 76s. 6d.) London: Baillière, Tindall and Cox. 1949.

Domestic Science and Dietetics. Choice of Careers: New Series No. 13. (Pp. 40. 9d.) London: H.M.S.O. 1950.

Manual of British Water Supply Practice. Compiled by the Institution of Water Engineers. Edited by A. T. Hobbs, M.I.C.E., and J. E. Hobbs. (Pp. 910. 50s.) Cambridge: Heffer. 1950.

Vision: Its Development in Infant and Child. By A. Gesell, M.D., and others. (Pp. 329. 42s.) London: Hamish Hamilton. 1949.

Transactions of the American Goiter Association, 1949. (Pp. 460. 77s. 6d.) Oxford: Blackwell Scientific Publications. N.D.

Cytologic Diagnosis of Lung Cancer. By S. M. Farber, M.D., and others. (Pp. 80. 45s.) Oxford: Blackwell Scientific Publications. 1950.

Lip Reading. By J. H. Burchett. (Pp. 192. 6s. 6d.) London: National Institute for the Deaf. 1950.

Communicable Diseases. Edited by R. L. Pullen, A.B., M.D., F.A.C.P. (Pp. 1,035. 140s.) London: Henry Kimpton. 1950.

A Manual of Bandaging, Strapping, and Splinting. By A. Thorndike, jun., M.D. 2nd ed. (Pp. 148. 14s.) London: Henry Kimpton. 1950.

Feeding Mothers and Babies. By N. Heaton and G. Daynes, M.R.C.S., L.R.C.P., D.C.H. (Pp. 214. 7s. 6d.) London: Faber. 1950.

Psychic Pitfalls. By S. Desmond. 2nd ed. (Pp. 271. 15s.) London: Rider. 1950.

Food Poisoning. By E. B. Dewberry, M.B.E. (Pp. 318. 17s. 6d.) London: Leonard Hill. 1950.

Manual of Massage and Movements. By E. M. Prosser, T.M.M.G. 3rd ed. (Pp. 388. 15s.) London: Faber. 1950.

Cerebral Angiography. By P. A. Lima. (Pp. 221. 45s.) London: Geoffrey Cumberlege. 1950.

Practical Post-Mortem Technique. By E. G. Poynter, R.M.P., S.E.A.N. Edited by L. L. Griffiths, M.A., M.D., B.Ch., B.A.O., D.P.H. (Pp. 118. 9s.) London: Henry Kimpton. 1950.

General Clinical Counseling in Educational Institutions. By M. E. Hahn and M. S. MacLean. (Pp. 375. 30s.) New York, Toronto, London: McGraw-Hill Book Company. 1950.

Some Relations between Vision and Audition. By J. D. Harris, Ph.D. (Pp. 56. 11s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

The Cerebral Circulation in Health and Disease. By C. F. Schmidt, A.B., M.D. (Pp. 78. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Simmonds's Disease. By R. F. Farquharson, M.B., F.R.C.P.C. (Pp. 93. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

The Use of Chemical Tests for Alcohol in Traffic Law Enforcement. By G. C. Forrester, Ph.D. (Pp. 91. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Atlas of Human Anatomy, Descriptive and Regional. By M. W. Woerdeman, M.D., F.R.N.A.Sc. Vol. 2. (Pp. 642. 63s.) London: Butterworth. Amsterdam: Wetenschappelijke Uitgeverijnv. 1950.

Gedenkboek der Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst. (Pp. 308. No price.) Amsterdam: De Bussy. 1949.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY AUGUST 5 1950

THE CAUSES OF DELINQUENCY

In the opening pages of this issue we publish the memorandum submitted to the Royal Commission on Capital Punishment by Sir David Henderson, who from his great experience suggests certain lines of treatment for "sick society." Sir David, like many others, thinks that the state of uncertainty and insecurity in which people live is an important cause of the prevalent emotional instability. Certainly the post-war increase in juvenile delinquency, to which we have already referred once before this year,[1] has disturbed public opinion and has led to a number of investigations, published and unpublished, into its possible causes. Of these the most elaborate and most recent is that carried out by Mr. D. H. Stott with the assistance of the Carnegie United Kingdom Trust.[2] His plan was to take up residence at an approved school as an apparent member of the staff and to make an intensive study of 100 youths during the time that each remained at the school. The age of his subjects varied from 15 to 18 years, and their ability from that of a high-grade defective to that of an average grammar-school pupil. The majority were persistent offenders and had made at least "three previous court appearances." Stott's method was to collect all available information about the previous history of each youth and about the conditions prevailing in his home, and then to amass detailed records, for the most part in non-technical language, by means of interviews, unobtrusive observation, and reports from his colleagues on the staff. His results are presented in the shape of informal case-histories; and a bird's-eye view is given in one huge frequency table, showing how often each important feature was noted in each individual. The raw material, including as it does numerous verbatim records, constitutes an unusually valuable mine of data for the patient reader, but it might perhaps have gained a little in intelligibility had the details been arranged or classified in accordance with some regular scheme. Stott discards "psychiatric categories" and dispenses with psychological tests, except for a preliminary application of the matrix test of intelligence. He defends his procedure by contending that "a delinquent act is not a fortuitous episode, but the outcome of many emotional cross-currents, which can only be demonstrated by a full and continuous description of each case." The conclusion which he finally reaches is that "delinquent breakdown is an escape from an emotional situation which (for the particular individual with the various conditionings of his background) becomes, temporarily at least, unbearable." This intolerable emotional situation arises almost always within the lad's own home and "centres round his relationships with his parents."

Within this general picture Stott found it possible to distinguish five main motives for juvenile crime. The most frequent, present in more than half his cases, is that which he calls "avoidance-excitement"—"the lad throws himself into a round of escapades to keep at bay an anxiety too poignant to be faced." The second, almost equally common, is "spite or retaliation," usually directed against the parents. In nearly half the cases he discerned a third "co-operating motive"—an attempt, often quite deliberate, to secure removal from home. In a smaller number of cases the delinquent behaviour began as a somewhat perverse method of attracting the notice of unaffectionate parents and "testing their loyalty." The last motive, found in about one case in five, was that of "compensating for inferiority." His classification, it may be noted, is based on types of reaction rather than on types of person, and the author's insistence on this is one of the most welcome features of this report. As so many investigators have emphasized, delinquency, like other forms of maladjustment, is to be explained not in terms of any simple cause, such as heredity, innate constitution, or economic or social handicaps, but rather as the result of a prolonged dynamic interaction between an individual personality on the one hand and environmental circumstances on the other. This insistence on the complexity of the causes of delinquency comes out clearly in his discussion of the influence of the cinema. Stott notes that film-going, as the most readily available channel for what he terms "avoidance-excitement," provided the favourite form of entertainment for nearly all the youths he had under observation. It is from the cinema that they have obtained the chief means of "emotional education." Sometimes its influence has proved beneficial, since it can "perform the function of catharsis, and at the same time keep them out of mischief." The worst that can be said of "the gangster and the gay-life film" is that it sets a low standard of social behaviour and may occasionally "determine the form of the delinquent breakdown." It is interesting to note that much the same conclusion has been reached by the recent inquiries among delinquent youths carried out by the Departmental Committee on Children and the Cinema.[3]

If any one cause is to be singled out as all-important, Stott believes it is the conditions in the home. "The problem of delinquency is in great measure the problem of the unsatisfactory family." However, before his

[1] Leading article in the *British Medical Journal*, 1950, 1, 590.
[2] *Delinquency and Human Nature*, Carnegie United Kingdom Trust, 1950.
[3] *Report of the Departmental Committee on Children and the Cinema*, 1950, London: H.M.S.O.

wider generalizations are accepted, two limitations in his survey must be borne in mind. First, the youths who provided the material for his study can scarcely be regarded as forming a random or typical sample of juvenile offenders. Those committed to an approved school are a specially selected group. "The vast majority of the boys," Stott writes, "had been removed from their homes as a measure of despair." It is therefore not surprising to find that in almost every one of his cases a dominant part was played by the unsatisfactory home conditions and lack of adequate parental care and discipline. Secondly, it is not known how frequently the same kind of conditions prevail among law-abiding youths drawn from the same social classes. In planning his investigation Stott decided to dispense with what he calls "the standard modern technique" of comparing a typical sample of the delinquent population with a parallel sample of non-delinquents. This omission he defends by insisting on "the probable inconclusiveness of the control-group technique": of itself, he says, it cannot directly reveal the line of causation. That may be true; but the inclusion of a control group can certainly help to verify inferences about the probable nature of causes deduced on other grounds. Every psychological observer can cite instances in which non-delinquent youngsters have been brought up in homes where the emotional situation has become intolerable. Many react not by delinquency but by neurotic breakdown. As Sir David Henderson states in his memorandum, "the conflict which produces criminal acts in the case of delinquents is very much the same type as that which produces psychoneuroses." It seems very probable, therefore, that some additional condition may be present, either in the boy or in his social circumstances, which leads to a breakdown in some cases and not in others, and which, in a certain proportion of the former, causes that breakdown to assume the form of criminal outbreaks.

Stott considers that many of his cases, judged by present-day psychiatric standards, would probably be diagnosed by medical investigators as "psychopathic personalities." Sir David Henderson considers that the individuals in this group are a most serious problem, but Stott believes that the label "psychopathic personality" is apt to be misleading. He cites instances in which the diagnoses offered by psychiatrists contradicted each other or in which their prognoses were not borne out by the after history of his cases, and he deprecates the tendency of current psychiatric teaching to encourage the "psychologically minded parent" to suppose that the inevitable naughtiness of his child may be symptomatic of some incipient "mental abnormality." He believes that all this results from the fact that "some schools of psychology have yielded to the temptation of generalizing wholesale from the pathological to the normal." We ought, he argues, to begin with the study of the normal mind before we turn to the delinquent. The prevalence of crime is sufficient evidence of the unsatisfactory condition of the psychology of crime, and this, in his opinion, is due not so much to any intrinsic difficulty of the subject but to "that disease of modern psychology—the classic separation between theory and practice." On the one hand, there is the psychiatrist daily engaged in clinical work, working with "concepts of a crude pre-scientific character"; on the other, the academic psychologist, "well versed in general principles and the methodology of research," but engaged on little else but intelligence testing. The cure is for theorist and practitioner to come together, each profiting by the experience of the other. Stott concludes his report with suggestions for future research. In the past the most substantial contributions to the study of delinquency have been made by those psychologists who were in a position to combine the statistical method with the case-study method. His own inquiries have admirably demonstrated the value of the case-study method. But, as he himself points out, "the total number of cases so studied remains insufficient to demonstrate any convincing association," and what is now most urgently needed is a broader co-operative inquiry, using both the theoretical and the practical approach, and extensive enough to permit "a statistical validation of the hypotheses already advanced."

PUBLIC HEALTH DISPUTE

The negotiations on revised salary scales, which have been conducted through Whitley machinery for the last four months, have broken down, and the matter has been referred to arbitration. Discussions began on March 16, public health medical officers being represented by the staff side of Committee C of the Medical Whitley Functional Council under the chairmanship of Dr. Metcalfe Brown. The management side comprises representatives of the associations of local authorities, and an observer from the Ministry of Health and from the Department of Health for Scotland.

The new salary scales were first formulated over eighteen months ago.[1] Under them the range of maximum salaries for medical officers of health varies from £2,400 a year where the population does not exceed 100,000 to £3,600 where the population exceeds 750,000. Senior medical officers who are in charge of services or departments such as school-health and mental-health services would receive maximum salaries, also related to size of population, ranging from £2,160 to £2,520. These salary scales were formulated in terms of the 1939 value of money and include a betterment factor of 20%, which has not been finally agreed.

[1] *British Medical Journal Supplement*, 1949, 1, 45.

The management side of the Whitley Council has countered these claims with proposals of its own. The arithmetical difference between the claims of the two sides is not known, but agreement has not been obtained. On July 24 the staff side therefore intimated their desire to refer the matter to arbitration, and the management side concurred. The dispute will be reported to the Ministry of Labour for reference to the industrial court under the Industrial Courts Act of 1919. A satisfactory feature of the conflict is that resort to arbitration has been agreed by the two sides and has not been demanded by one alone, as it could be under the National Arbitration Tribunal (Defence) Regulations of 1940. The terms in which the dispute will be taken to the industrial court have not yet been agreed between the two parties, but presumably the court's decision will be binding on both.

The necessity for more attractive salary scales for medical officers in the public health service has become increasingly obvious since the Health Service started. Medical men and women now take up public health work with a reluctance that is bound to be detrimental to the efficiency and development of the country's preventive medical services. Again, the Health Service has provided opportunities for remuneration which, though unsatisfactory to many, yet seem attractive to the absurdly underpaid workers in the public health services. The "wage freeze" still remains the Government's policy, but clearly it cannot be allowed to jeopardize the safety of the country's health. Whatever view the industrial court may take—and comment would be out of place, for the matter is now *sub judice*—the Government cannot allow the present drift away from public health work to continue.

THE MEDICAL ACT, 1950

The Medical Act, 1950, received the Royal Assent on July 28. The main purpose of the Bill, which was first considered in the House of Lords on April 18, was to give effect to the Government's acceptance of certain recommendations put forward by Sir William Goodenough's Committee in 1944. The General Medical Council in the first instance drafted a non-controversial Bill which provided for the "intern year" and for a number of amendments to its own disciplinary procedure. The two most important changes proposed were the establishment of a disciplinary committee and the granting of the right of appeal. It was generally felt that the opportunity might be taken to introduce further changes, so the British Medical Association, the Medical Defence Union, and the other defence societies prepared in 1947 recommendations for submission to the G.M.C. A number of conferences followed, and the draft Bill was passed to the Ministry of Health. There were prolonged and useful discussions between representatives of the Ministry, the Association, and the defence societies. The draft Bill as finally revised then had to wait some months before there was a prospect of legislation. When it did reach the House of Lords a number of constructive amendments were adopted. Lord Addison introduced the Bill, and valuable contributions were made by his noble colleagues to the debates on the Second Reading, in Committee, and on the report stage.[1] In the House of Commons[2] the Minister of Health was open to argument, and the medical members there effected other amendments and obtained a number of important assurances. The Bill was entirely a non-party measure, and both medical Lords and medical Members of Parliament showed their anxiety to improve the standards of medical education and to fortify the General Medical Council in its disciplinary functions.

In its first six clauses the Act provides for the "Good-enough year." After securing a registrable qualification a student will be obliged, from a day to be appointed, to spend a period to be prescribed in a resident appointment at an approved hospital or institution.

It will probably be a year, or even two years, before an "appointed day" can be set with the assurance that there will be places available for every medical student who qualifies. The period to be prescribed, probably 12 months as it was in the original Bill, is now to be decided by the G.M.C., subject to the approval of the Privy Council. Once these points have been settled the newly qualified man or woman must first of all seek and obtain an appointment. He or she has then to submit to the Registrar of the G.M.C. evidence of appointment, evidence of qualification—and five guineas—to secure "provisional registration." Full registration will follow on presenting to the Registrar a certificate of satisfactory service duly completed—and six guineas. Until the newly qualified are fully registered they will not be at liberty to practise other than in an "approved appointment." Subject to certain safeguards, approved appointments may at some future date include appointments at suitable health centres. These appointments are intended to be an extension of the period of medical education, though they will carry a rate of remuneration of £350 a year for the first six months and £400 a year for the second six months. The scope of the work that can be undertaken by a provisionally registered practitioner will depend on rules to be laid down by the Privy Council. It is anticipated that anyone provisionally registered will be authorized to sign death certificates and to prescribe dangerous drugs. Reciprocal arrangements with the Republic of Ireland have been negotiated, and it seems that similar arrangements may be made with, for example, New South Wales, the Union of South Africa, and other countries.

[1] *British Medical Journal*, April 29, 1950, p. 1011; May 13, p. 1146; May 27, p. 1275.
[2] Ibid., July 8, 1950, p. 112; July 22, p. 223; July 29, p. 302.
[3] Ibid., 1949, 1, 1144.

New powers have now been given to the G.M.C. to inspect the medical tuition afforded to students at medical schools. This, too, is in accordance with the recommendations of the Goodenough Committee. Hitherto the Council has only had power to "listen in" at examinations. The visitors appointed for this purpose are expected to work harmoniously with the visitors who conduct an inspection of hospitals from time to time on behalf of the University authorities. In this way the G.M.C. will exercise a closer supervision over the work and instruction of medical students.

In 1945 the Representative Body adopted a motion by Hendon that it was necessary to examine and report on the composition and procedure of the G.M.C. The new Act does increase the number of directly elected representatives. The present Council consists of 39 members, including seven elected by the rank and file of the profession. The remainder are the nominees of the Privy Council, the Universities, the Royal Colleges (now including the Royal College of Obstetricians and Gynaecologists), and the Licensing Corporations. The new Council is to have 11 elected members—an increase of four—out of a total of 47. It is now obligatory to appoint three lay members. Lay members will not receive any fees but will be granted the usual travelling and other expenses. This gets over the difficulty of lay members who are M.P.s holding offices of profit under the Crown.

The disciplinary machinery of the G.M.C. has often been criticized by the legal profession and by doctors. The medical defence societies have long had prepared a whole series of recommendations for the improvement of this machinery. Not all their proposals have been accepted, but some of the more important ones are incorporated in the Act, and others are likely to find their way into the new Rules of Procedure. In future, complaints will in the main be the subject of a statutory declaration. The Ministry of Health still reserves its right in certain special circumstances to inform the G.M.C. of the facts disclosed at an inquiry under the National Health Service Acts. The Minister, however, has given an undertaking that when a doctor is acquitted by the Tribunal no documents on the case will be sent to the G.M.C. Witnesses can be subpoenaed in future, and to them, as to others giving evidence, the oath may be administered. Doctors, and others, will be entitled to be legally or otherwise represented if they so choose. The new Disciplinary Committee is to consist of 18 members and the President, though for most cases only nine members will sit. Six of the 18 and two of the nine acting in this capacity are to be directly elected members; five will form a quorum. Only a simple majority is required for any decision (which might mean a majority of three to two), and a respondent, when a charge is not proved, is now entitled to a verdict of "Not Guilty." The Disciplinary Committee is to sit with a legal assessor, and if he gives any ruling the parties to the case are entitled to be made aware of that ruling. Any member of the Council (except the President) who takes part in a preliminary review of a case by the Penal Cases Committee is precluded from serving on the Disciplinary Committee when that same case is under inquiry. Most important of all, there will in future be an appeal from a decision of the G.M.C. to erase the name of a practitioner from the *Register*. This appeal will be to the Judicial Committee of the Privy Council and must be entered within 28 days. The G.M.C. may appear as a respondent, and the appeal can rest on points of law or on points of fact.

There is a minor though important provision raising from £20 to £500 the fine that may be imposed, under Section 40 of the Medical Act, 1858, on a person who wilfully and falsely holds himself out to be a registered medical practitioner. In this regard it may be said that the clarification of the law suggested by the Lord Chief Justice in the Lufting case[3] has not been effected. In general, however, though not all that has been sought has been conceded, the Medical Act, 1950, makes a number of substantial and welcome changes. In future the G.M.C. will be possessed of wider powers, improved machinery, and a better status, all serving to ensure the continued and enhanced confidence of the profession and the public alike.

VARICOSE ULCERATION

A condition such as varicose ulceration, the incidence of which in Great Britain has been estimated to be in the region of five per thousand of the population,[1] certainly merits the most serious and conscientious attention of general practitioners and surgeons alike. Knowledge of the aetiology of this condition and sound understanding of the proper methods of treatment have been slowly and painfully acquired, and gradual progress has been made. The underlying mechanism of varicose ulceration is certainly more complex than was formerly believed, and sometimes exponents of one or other theory and practice have been guilty of over-simplification of this problem. It is true to say that few things are either as good or as bad as they at first seem, and this is a valid comment on many of the methods of operative treatment of this condition which have gradually come into vogue.

Few with experience of this problem will now dispute that most cases of so-called varicose ulceration are due to a previous deep venous thrombosis. For this reason it should be obvious that the prevention and early treatment of cases of deep thrombosis are of the greatest importance, and in this direction surgeons have made much progress, though it would be rash to suggest that the thrombosis problem is near to solution. It is at least possible that a few of the most recently introduced measures, and especially the sometimes indiscriminate use of deep-vein ligation in cases of acute thrombosis, may lead to later leg troubles, but it would take ten years or more to justify such a prediction.

During the last few years the increasing use of phlebographic investigation of the veins of the legs, and the less extensive practice of venous-pressure studies, have modified some earlier conceptions of valvular damage in the deep vessels. There is now ample evidence of the serious structural damage which a deep thrombosis may inflict, and the regurgitant venous flow which results from valvular incompetence in the deep veins has been clearly demonstrated. Homans[2] first suggested the use of femoral- and iliac-vein interruption in these cases, and several other surgeons have undertaken careful studies of femoral-vein ligation.[3-7] It has been difficult to assess the true value of these procedures, for no properly controlled trial has been described which will enable an independent and more sceptical observer to judge the importance of the many accessory influences to which such cases have been subjected. Mahorner,[8] writing from great experience, has expressed strong doubts about some of the reported results of vein ligation.

Failure to relieve the ulceration and related symptoms by superficial femoral-vein ligation can in certain cases be ascribed to the presence of other incompetent main channels and to tributaries which continue to "feed" the ligated vessel at a lower level. In a paper which he read at the recent Annual Meeting of the B.M.A. at Liverpool and which is published in this issue, Dr. Gunnar Bauer discusses this problem and makes the reasonable suggestion that the main vessels should be divided in the popliteal region, where by-passing can less readily occur. Though this seems a logical step, it might be wise to add that there is perhaps some danger of being a little too logical and of regarding this as simply a mechanical and hydrostatic problem. With earlier experiences of femoral-vein ligation before us it would be altogether premature to try to assess the value of this new operation so soon. In one respect at least popliteal-vein ligation offers special advantage, for it seems to provide immediate relief from the distressing bursting pain of which many patients complain. This type of pain is, however, often relieved by the support given by an efficient bandage, and it would be wise to try the effect of a well-applied bandage before deciding to tie the popliteal vein. Dr. Bauer mentions a test of femoral-vein incompetence which can be performed on the operating table, but it should be remembered that in the resting patient the pressure in a dependent vein, whether normal or abnormal, will represent the hydrostatic pressure exerted by a column of blood extending up to heart level. The measurement of pressure in the popliteal vein on the operating table is therefore of doubtful significance. On the other hand, White and Warren[9] have shown the value of the walking venous-pressure test, and Walker[10] has confirmed their observations on patients with the syndrome of lower-leg stasis. Dr. Bauer, who has done much to advance knowledge of early thrombotic processes, rightly regards the operation of popliteal-vein ligation as merely one weapon to be used in concert with other methods; it does not supersede the well-tried and more conservative forms of treatment.

Popliteal-vein ligation should be submitted to a fully controlled investigation in this country, and surgeons who are too busy to study their results, or unable to provide their patients with adequate supporting bandages and detailed aftercare, should not in the meantime be tempted to use it indiscriminately. The proper application of supporting bandages is a technique which not many have mastered, but one which brings the patient great benefit. At the discussion which took place after Dr. Bauer had presented his paper Mr. Dickson Wright referred to the need for a missionary zeal in dealing with cases of varicose ulceration. This advice, from one who has for many years emphasized the benefits of a more conservative regime than is sometimes practised to-day, should be heeded.

[1] Oldham, J. B., at the meeting of the Section of Surgery, Annual Meeting of the B.M.A., Liverpool, 1950. Reported in the *British Medical Journal*, 1950, **2**, 269.
[2] *New Engl. J. Med.*, 1941, **224**, 179.
[3] Buxton, R. W., Farris, J. M., Moyer, C. A., and Coller, F. A., *Surgery*, 1944, **15**, 749.
[4] Buxton, R. W., and Coller, F. A., ibid., 1945, **18**, 663.
[5] Glasser, S. T., *Surg. Gynec. Obstet.*, 1949, **89**, 541.
[6] Linton, R. R., and Hardy, I. B., *Surg. Clin. N. Amer.*, 1947, **27**, 1171.
[7] ——— ——— *Surgery*, 1948, **24**, 452.
[8] *Surg. Gynec. Obstet.*, 1949, **88**, 115.
[9] *Surgery*, 1949, **26**, 987.
[10] At the meeting of the Section of Surgery, Annual Meeting of the B.M.A., Liverpool, 1950.

CARDIAC ARREST DURING ANAESTHESIA

The experienced anaesthetist nowadays hardly ever meets with a case of cardiac arrest during anaesthesia. Though this emergency is rare, its treatment is now clear: immediate cardiac massage offers the only hope of re-starting the heart. But the patient will survive only if the heart is re-started before anoxia has caused irreversible damage to the brain. If there is damage but the patient survives, various nervous lesions may be left. Even in cases of apparent recovery mental changes may be a late result.

Courville[1] has already pointed this out in an important book. He recorded in it reports of a number of cases all of which showed the effects of cerebral damage as a consequence of anoxia. They ranged from death to the mildest mental changes, some appearing long after the incident. Another case of the latter type, so often missed, has recently been put on record by Turner.[2] The patient, a healthy young man of 29, was to have a submucous resection of the nasal septum. Cyclopropane was administered, and then, perhaps unwisely, 2 ml. of 1-in-1,000 adrenaline solution was injected into the submucous tissues. The heart promptly stopped but was re-started after a subcostal incision had been made and massage carried out. Not until the third day did consciousness return, and not until the tenth day did the patient become correctly orientated. A year later he showed signs suggestive of a mild frontal-lobe syndrome with distinct personality changes. After two years had elapsed he appeared to have made a good recovery, but amnesia for twelve hours before and four days after the incident remained. Anaesthetists should study this case and others like it described in Courville's book. Fortunately those methods of using nitrous oxide whereby the patient is "blacked out" are now outmoded, and recently described methods[3 4] of using this gas indicate the importance of suitable and sufficient supplementary drugs.

If the patient's heart stops during anaesthesia speed in performing cardiac massage is essential for success. The emergency demands heroic treatment, and tardiness due to diffidence or ignorance in these circumstances may cost the patient, at worst, his life or, at best, his senses.

[1] *Untoward Effects of Nitrous Oxide Anaesthesia.* Mount View, California. 1939.
[2] *J. Neurol. Neurosurg. Psychiat.*, 1950, **13**, 153.
[3] Mushin, W. W., and Rendell-Baker, L., *British Medical Journal*, 1949, **2**, 472.
[4] Neff, W., Mayer, E. C., and Thompson, R., ibid., 1950, **1**, 1400.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE FAILING HEART

BY

K. SHIRLEY SMITH, M.D., F.R.C.P.

Physician, and Physician in Charge of Cardiac Department, Charing Cross Hospital

While dyspnoea is constantly present in heart failure, the symptoms and signs as a whole vary according to the cause of the failure. Thus heart failure in mitral stenosis is very different clinically from that in hypertensive disease. The recognition of these divergences and of their importance dates from the improved methods of determining circulation time and cardiac output during the past 20 years; moreover, the better understanding of the circulatory derangements in the various syndromes of failure has led to a more discriminating therapy. Although digitalis still holds an honoured place as a specific cardiac remedy, it is by no means in every case the most important, or even an advisable, medicament. For these reasons it will be best here to consider first the recognition of heart failure in general and in its various forms; the basic principles of prevention and treatment will then be reviewed. Each important syndrome of failure in relation to its cause will be considered and its treatment and management described. The various forms of acute failure, such as occur in cardiac infarction, diphtheria, and pulmonary embolism, will not be dealt with.

Recognition of Early Heart Failure

Breathlessness on exertion is the most constant indication of diminishing cardiac reserve, although this symptom obviously has many other possible organic causes, notably diseases of the lungs. But it may also derive from disorders of function such as the effort syndrome. When difficulty is encountered in distinguishing an organic from a functional dyspnoea the following points in symptomatology will help: breathlessness due to disease of the heart will be proportionate to the amount of exertion and may be accompanied by cyanosis; it will be constant from day to day and the patient will often claim that he feels quite well when the symptom is not being produced. Shortness of breath due to functional causes (e.g., in effort syndrome and sighing breathing, or suspirious) varies greatly from day to day and even from hour to hour, bearing no precise relation to the degree of effort; and, apart from this symptom, the patient has other complaints, often numerous, such as dizziness, "nerves," and insomnia.

The failing heart usually implies a diminishing cardiac output, and thus a reduced blood supply to muscles and vital organs. Physical weakness and disinclination for activity result. Sleep may become disturbed from no obvious cause, and the patient may have found benefit from using extra pillows. Cough is not uncommon, particularly on lying down at night. This symptom and paroxysmal nocturnal dyspnoea will be referred to later in the section on left ventricular failure. Instrumental or other special methods of investigation find little application in the diagnosis of cardiac failure, but radiographs will reveal engorgement of the branches of the pulmonary artery when the left ventricle is failing and at a time when there may be no other manifestation except paroxysmal dyspnoea. Some enlargement of the heart will be found in almost every case in which dyspnoea is of cardiac origin.

While in adults the first signs of congestive failure are rales at the bases of the lungs and oedema at the feet, in children the most important indication is the respiratory rate. This has been pointed out by Taussig, who states that when the rate exceeds 30 a minute the liver begins to enlarge. She draws the inference that rales at the bases in children cannot be taken as being due to failure unless a rapid respiration rate and hepatic engorgement coexist.

Treatment of Early Heart Failure

When the cardiac reserve is waning but before congestion has developed, adjustments in the regime and mode of life are of greater importance than medicines. The first requirement is to lessen the work of the heart. The obvious means of doing this is by curtailing the patient's daily activities and increasing his hours of rest, both at night and in the daytime. A laborious occupation must be discontinued and lighter work sought. If insomnia impairs the night's rest a sedative at bedtime, such as phenobarbitone 1 gr. (65 mg.) or sodium amytal 2 gr. (130 mg.) should be given. At this stage digitalis therapy is not required. The work of the digestive system may be lessened by avoidance of heavy meals. A search for contributory causes of overburdening of the heart should be made, and, if found, remedied. Thus coughing should be checked by a codeine linctus. Obesity, which is a common and sometimes heavy burden for the damaged heart, should be corrected by adjustments of diet—chiefly the restriction of starchy foods and the avoidance of fat, fried foods, and sugary foods.

Infections, and particularly those of the respiratory tract, are often immediate causes of heart failure. As shown below, this is especially the case when chronic pulmonary disease overburdens the right heart; but it is also true in other forms of heart disease, and many a patient with advanced hypertension or mitral stenosis holds his own until an attack of bronchitis or influenza ushers in heart failure with increasing breathlessness, which may be paroxysmal. This serious consequence is attributable to toxaemia, the strain of coughing, and the heightened metabolism in feverish illnesses. For these reasons persons with heart disease should do their best to avoid contact with colds or influenza, and if such infections are contracted they should be treated with especial care: anything more than a slight cold will necessitate confinement to the house or perhaps to bed. The infection itself will need prompt treatment according to its nature, and, particularly, measures should be taken for the relief of cough.

Anaemia is a frequent additional burden on the heart, because in this condition there is a great increase in the output and therefore in the work of the organ. If anaemia exists, prompt steps should be taken to determine its nature by blood examination and the appropriate remedy—iron or liver extract—administered. The repair of anaemia may so greatly lessen the work of the heart that failure is averted.

Use of Digitalis

If, in spite of the adjustments of regime and the lightening of the work of the heart, congestive failure develops,

the use of digitalis becomes necessary. Digitalis is then of value irrespective of the cause of the failure, of the rhythm of the heart, the level of the blood pressure, and the presence or otherwise of mitral or aortic lesions. This drug, however, cannot be effectively administered unless the facts concerning excretion and action are known. The body can eliminate about 20 minims (1.2 ml.) of the tincture or 2 gr. (130 mg.) of the leaf preparation in 24 hours; only when the daily dosage exceeds these amounts does digitalis begin to accumulate in the body. When a certain concentration is reached in the body the dyspnoea of heart failure is relieved, diuresis sets in, and the discomforts due to oedema of the legs and engorgement of the liver disappear. Digitalization is the process of securing this beneficial result while avoiding toxic symptoms due to overdosage; these are headache, nausea, vomiting, and slowing of the heart with pairing of the beats.

The quantity of digitalis necessary to bring about digitalization in a patient of 10 st. (63.5 kg.) weight is about 20 ml. of the tincture or 30 gr. (2 g.) of digitalis folia. For lighter patients less will be needed in proportion, and for heavier patients more. The digitalizing total may be given in divided doses over a period of 24 hours (rapid digitalization); thus an initial dose of 90 minims (5.4 ml.) of the tincture could be followed by 60 minims (3.6 ml.) after six hours, and 30 minims (1.8 ml.) six hours later, and thereafter 20 minims (1.2 ml.) thrice daily, this amount being increased or diminished. Sometimes in very rapid fibrillation with a heart rate of 150 a minute or more, or when a speedy result is essential, "digoxin" may be used in doses of 1.5 mg. orally or 1 mg. intravenously. These doses will produce full effects in six and two hours respectively, but they must never be given if the patient has been taking digitalis during the previous 10 days.

In general, these very rapid methods of digitalization are not necessary, and satisfactory effects upon congestive failure are produced in several days by the use of an initial dose of 6 gr. (0.4 g.) of the leaf followed by 3 gr. (0.2 g.) at six-hourly intervals, until the symptoms of dyspnoea and congestion are alleviated or toxic symptoms are produced, when the administration should be stopped for 12 hours and continued subsequently at a dose of, say, 2 gr. twice or thrice daily. Thereafter a maintenance dose of digitalis must be determined; this may range from 2 gr. of the leaf thrice daily to 1 gr. daily.

Treatment of Left Ventricular Failure

This is a very common form of heart failure, because the chief causes—namely, hypertensive disease and aortic valve disease—occur so frequently. The patient becomes aware of breathlessness on exertion, perhaps slight, and then experiences a paroxysm of dyspnoea which usually wakens him from sleep. The distress may be short-lived, so that sleep is soon resumed, or it may become a protracted struggle to breathe, lasting for an hour or more. For this disorder morphine is a sovereign remedy and should be given subcutaneously in doses of ¼ to ¼ gr. (16–22 mg.), repeated in half an hour if necessary. The patient should be propped up well with a back rest or pillows in bed or in an arm-chair. The latter is especially helpful in severe cases, as the dependent posture of the legs slows venous return and helps to lower the pressure in the right auricle; in the overloaded heart this results in an augmented cardiac output, so that pulmonary congestion is relieved. If, in spite of the use of morphine, dyspnoea persists or pulmonary oedema or Cheyne-Stokes breathing appears, an intravenous injection of theophylline ethylenediamine ("cardophylin") should be given—0.48 g. in 10 ml. of distilled water, administered slowly. Some patients with failure of this kind who have high blood pressure and distended veins with normal rhythm respond more dramatically to venesection than to any other procedure. This may be carried out either by slitting the antecubital vein direct through the skin with a sharp scalpel or by introducing a wide-bore Record needle or French's needle into the vein. In either case, after 15 to 20 oz. (420–570 ml.) of blood has been withdrawn, a pad and firm bandage are applied and the arm allowed to lie in a horizontal position.

In some patients with left ventricular failure there is, in addition to the usual features, conspicuous bronchospasm aggravating the respiratory distress. The safest means of treating this will be by the oral or, if necessary, intravenous administration of one or other of the theophylline derivatives, such as cardophylin or "monotheamin." Ephedrine and adrenaline are, in general, contraindicated in heart failure owing to their liabilty to increase the work of the heart; however, if the measures mentioned above fail to relieve bronchial spasm a subcutaneous injection of adrenaline hydrochloride, not exceeding 4 minims (0.25 ml.) in a 1 in 1,000 solution, might be tried.

When pulmonary oedema develops and is not quickly relieved by the methods described above, oxygen administration should be started without delay. The method of choice is the transparent oxygen tent which forms a canopy over the head of the bed. There must be no open fire in the room if this method is used, owing to risk of explosion.

Episodes of paroxysmal dyspnoea are due to failure of the left ventricle to discharge fully its contents, so that blood begins to accumulate in the left auricle and the pulmonary circulation. The attack should be a signal for a thorough review of the patient's mode of life, the state of the heart, and the general condition. Rest in bed is ordered for a week or two, the patient being placed on a light diet with no added salt; the intake of fluids during the latter part of the day is avoided so far as is possible. If oedema exists three or four injections of 2 ml. mercurial diuretic are given intramuscularly or intravenously at four-day intervals. Even if there is no oedema one or two such injections may help to relieve paroxysmal dyspnoea. Apart from the longer-term measures, one of the best preventives for nocturnal dyspnoea is a draught containing chloral hydrate 10 gr. (0.65 g.), with nepenthe 20 minims (1.2 ml.), given at night. In chronic left ventricular failure, digitalization, preferably by one of the slower methods described above, is often of value, and may bring good results when other therapy has failed. Large doses in hypertensive disease may induce auricular fibrillation.

Heart Failure in Chronic Rheumatic Heart Disease

Heart failure in mitral stenosis is compatible with a longer tenure of life than failure in any other chronic heart disease. I have records of a patient whom I have seen in failure at intervals during eight years, and it is not uncommon for failure to recur at intervals for four or five years. Failure in these patients is ushered in often by bronchitis or other respiratory tract infection, or sometimes by physical strain; fibrillation may make its appearance at this time or it may have existed previously. It is particularly in failure associated with fibrillation of rheumatic origin that digitalis effects its most brilliant results, and the rapid digitalization method, with massive or intravenous dosage, finds its chief application when such failure has developed suddenly with a very high heart rate.

Digitalization will be employed in conjunction with mercurial diuretics. Venesection is not advisable in these

patients. On account of the vascular engorgement and the oedema of the lungs, oxygen administration will often be of value in the initial stages of treatment of severe failure. Pulmonary infarction (generally due to embolism) is perhaps commoner in this variety of failure than in any other; pleural pain, sudden dyspnoea, or jaundice otherwise unexplained should arouse suspicion of this complication, which should be treated with morphine injection and oxygen therapy.

The Failing Heart in Chronic Pulmonary Disease

This form of failure, usually following long-standing bronchitis and emphysema, is one in which the cardiac output is substantially more than normal. Recognition of this fact is fundamental in treatment, because the raised output is a compensation for the reduced oxygenating power of the lungs. Any treatment, such as venesection, that depletes blood volume will be detrimental. For the reason that it may lessen cardiac output by lowering venous pressure, full digitalization may be prejudicial to these patients.

Failure in patients with chronic pulmonary disease most commonly develops in the winter months, and the first cold or foggy spell of the autumn reduces many of these patients to a serious condition in a few days. Such breakdown is due principally to recrudescence of infection in the respiratory tract. The lung symptoms become worse, with severe dyspnoea, wheezing, and cough; cyanosis deepens, while the cervical veins and liver become engorged; headache and mental confusion develop. This is one of the few forms of heart failure in which pyrexia may coexist, but fever is not always present. Normal rhythm may be maintained or fibrillation may supervene.

Treatment is based upon the existence of cyanosis and infection: oxygen therapy should be instituted at an early stage and maintained for days or a week or two, and at the same time penicillin treatment (200,000 units I.M. every six hours, or "prolopen" 1 ml. daily) should be started, whether or not obvious infection or fever exists. Sulphadimidine may be employed in addition. The necessity for immediate effective treatment in these cases makes it impracticable to await sputum examinations and tests of penicillin sensitivity of suspected causal organisms. The measures described will often retrieve situations that are well judged to be desperate.

Digitalis may be employed at a later stage, but only in moderate dosage, such as tab. digitalis folia 2 gr. twice or thrice daily. Morphine, if it is used, should be given in small doses and in conjunction with atropine. A few injections of mercurial diuretic should be given if oedema is more than slight. While salt should be restricted, too great a reduction of fluid intake should not be made, three pints (1.7 l.) in the 24 hours being a suitable quantity.

Some Less Common Forms of Failure

In thyrotoxic heart disease, heart failure develops only after many years, and generally only when no adequate treatment has been given for the thyroid disorder. Indeed, by the time heart failure sets in evidence of active thyrotoxicosis may be lacking; the ruins of the cardiac structure and its chaotic function are the relics of a fire that is smouldering or extinct. Such patients have hearts that are enlarged and fibrillating rapidly; they often have hypertension; the evidences of failure point to both ventricles, so that there is often pulmonary oedema and hydrothorax, while the liver and the cervical veins are engorged. The usual regime of bed-rest and fluid and salt restriction is necessary, coupled with digitalization, which should be by fairly rapid oral methods. If swift control is gained by these methods it is an indication that little or no thyroid influence remains. Sometimes digitalis alone fails to control the heart rate, and success following the simultaneous administration of Lugol's iodine points to persisting thyrotoxicosis. In this case the treatment of failure must be followed by the treatment of the thyrotoxicosis either by operation or by methyl or propyl thiouracil.

Failure develops often in later middle life among patients who have severe thoracic deformity. In these cases cervical venous engorgement may be masked and hepatic engorgement may be difficult to assess. Increasing dyspnoea and oedema of the legs, with signs of pulmonary oedema, are the important indications. Treatment will be based on the general lines already described in conjunction with digitalization that is not too rapid. The evidences of right ventricular failure ultimately predominate and call for oxygen therapy, and the antibiotics if respiratory tract infection is suspected.

Treatment of Advanced Chronic Failure with Anasarca

This condition may be the final stage of failure due to any cause. The duration of life must in any case be short, and the aim of treatment is to secure comfort by dispersing the accumulation of fluid. In the first place salt intake must be reduced to less than 0.5 g. daily, milk being restricted and salt-free bread and margarine being used. Fluids are cut down to 25–30 oz. (0.7–0.8 l.) in the 24 hours. Any accumulation of fluid in the pleural cavities must be removed. If the legs have become greatly swollen with fluid and mercurial diuretics are diminishing in effect, then drainage of the legs by Southey's tubes is called for. It is often found that removal of fluid collections by these various means allows some restoration of cardiac function. Thus kidney function is improved and the mercurial diuretics regain their efficacy. Slowly the longer-term measures of salt restriction take effect and the patient may ultimately be quite rid of the oedema. He thus may become able to leave his bed by day and sleep undisturbed at night. Measures of this kind may be effective also in the even more intractable cases where there is recurrent ascites due to chronic congestive changes in the liver. Fluid accumulation may by these means be confined to the abdomen and the intervals between paracenteses be considerably lengthened. Mercurial diuretics function well when given intraperitoneally, and 1.5 ml. in 10 ml. normal saline introduced at the conclusion of tapping will sometimes produce a better result than intramuscular injection in disorders of this kind.

Dr. I. C. Fang, of the World Health Organization, has recently gone to Bangkok, where he will temporarily direct W.H.O. health activities in the Western Pacific. A regional organization, grouping all countries in that area, is to be established early next year. It is expected that the regional committee of W.H.O. member States in the Western Pacific will hold its first meeting in February or March to recommend the permanent location of the regional office, designate a director, and outline health campaigns needed in the various countries. Several international health programmes are now under way in the Western Pacific region: they include W.H.O. nursing, sanitation, hospital, and tuberculosis services in China, and joint W.H.O./Unicef programmes for mother and child health in Sarawak, Brunei, North Borneo, Hong Kong, and South Korea, as well as B.C.G. vaccination campaigns against tuberculosis in Singapore, Malaya, Formosa, and the Philippines. It is expected that the temporary W.H.O. office will be in Hong Kong until a permanent site is approved by the United Nations.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

MEETING IN LONDON

The 16th International Congress of Ophthalmology, attended by over 1,000 members representing 64 nations, was opened by the Duke of Gloucester on July 17 at Friends House, Euston Road, London. His Royal Highness delivered a message of good will to the assembly from their Majesties the King and Queen, who had graciously consented to be patrons of the Congress.

Professor J. W. NORDENSON (Stockholm), the president of the International Council of Ophthalmology, stressed the importance of these gatherings, which enabled experiences to be pooled and misunderstandings smoothed away. He also paid generous tribute to the services rendered by Great Britain, not only in the organization of previous international congresses, but in scientific and clinical discovery as well.

Inaugural addresses were delivered by Dr. EDWARD HARTMANN (Europe), Dr. JOHN H. DUNNINGTON (North America), Professor R. ARGAÑARAZ (South America), Sir JAMSHEDJI DUGGAN (Asia), Dr. ABDEL FATTAH EL TOBGY (Africa), and Dr. J. RINGLAND ANDERSON (Australasia). Professor Nordenson then presented the Gonin Medal to Dr. H. ARRUGA (Barcelona) for his outstanding services to ophthalmology. Since the opening of the Congress Dr. Arruga has also been created a count, and he and Sir Stewart Duke-Elder have both received Honorary Fellowships of the Royal College of Surgeons of Edinburgh.

Presidential Address

The chairman of the Congress, Sir STEWART DUKE-ELDER, in his opening address said that modern ophthalmic surgery was now two centuries old and dated from the achievement of that great Frenchman Jacob Daviel, oculist to Louis XV, who introduced his operation for cataract in 1747 and communicated his method to the Academy in Paris in 1752. This year also marked the centenary of ophthalmology as an independent specialty within the larger kingdom of Medicine, owing to the genius of Herman von Helmholtz, who first demonstrated his ophthalmoscope to the Physical Society of Berlin on December 6, 1850. The new world opened by Helmholtz was explored with enthusiastic zeal: it must indeed have been exciting living at a time when within a few years so many things no one had even dreamed of were disclosed, when, almost every few months, a new disease was discovered and described. There was the work of Bowman and others on the minute anatomy of the eye, of Donders on refraction and the prescribing of spectacles, and of a host of others on new techniques in surgery—all within the first decade after the ophthalmoscope was introduced.

In the hundred years which had followed, they had been reaping the fruitful harvest of this prodigal sowing, consolidating and expanding, but adding little that was fundamentally new and revolutionary. Improvements and intricacies of techniques had been added one to the other: von Graefe's iridectomy for glaucoma had evolved into a dozen drainage operations, and Daviel's extraction of cataract was to-day transformed. The only great revolutionary concept that had been added to the techniques of surgery was the treatment of detachment of the retina by Jules Gonin, whose memory they were proud to honour.

They had surely reached the stage when the ophthalmoscope and the microscope had revealed most of their secrets; for revolutionary new advances they required revolutionary new techniques. Virchow's theory of cellular pathology wherein the cell was taken as a unit had moulded pathological thought for 100 years. But to-day they could go further: they could leave the world of cells and enter the world of atoms and molecules. From the structural point of view the electron-microscope was opening out a new and more intimate universe within the cell. From the functional point of view they could follow metabolic processes through all their intricacies by means of radioactive elements.

The first great revolutionary victory had already been won. It was now possible to overcome a great number of infective organisms—not by their mass slaughter by antiseptics but by interfering with their intimate metabolism by penicillin and other antibiotics. Ophthalmology was leaving its first century of adolescence and entering its second century—its adult life.

Bowman Memorial Service

On Sunday, July 16, the day before the Congress began, a short religious service, at which the Venerable the Archdeacon of Hampstead officiated, was held in St. James's Church, Piccadilly. Professor J. W. NORDENSON paid tribute to the memory of Sir William Bowman, founder of the Ophthalmological Society of the United Kingdom, and afterwards laid a wreath at the Bowman memorial tablet. Sir STEWART DUKE-ELDER thanked Professor Nordenson for his gesture of sympathetic understanding, and referred to the warmth of Sir William Bowman's personality, as well as to his achievements in the realm of ophthalmology.

Scientific Activities

"The role of the sympathetic nervous system in the genesis of vascular hypertension and its effect upon the eye" and "The clinical and social aspects of heredity in ophthalmology" were subjects to each of which one whole morning was devoted.

At the other six scientific sessions three halls had to be used concurrently for the presentation of 131 papers on other subjects, including detachment of the retina, choroido-retinal degeneration, the pathology of the aqueous humour, corneal grafting, radiotherapy, glaucoma, the technique of cataract extraction, electroretinography, and aniseikonia.

Retrolental Fibroplasia

Special interest was aroused by a paper on retrolental fibroplasia by A. B. REESE and F. BLODI (U.S.A.), who showed slides demonstrating the presence of angioplastic tissue in the retina of affected babies during the active stage, which lasted for about ten weeks. Haemangiomata of the skin were found in about 18% of the cases. Apart from the fact that nearly all the babies affected by retrolental fibroplasia were premature, the aetiology of this disease remained unsolved. The ocular manifestations were only one aspect of a systemic malady; associated changes had been found in many other organs and tissues. Slight exophthalmia had occurred initially in some of the more severe cases. In a fully developed case the anterior chamber was shallow; the iris was atrophic and partially adherent to a lens progressively opaque. Until the cataracts had become dense, irregular masses of connective tissue were visible in the vitreous chamber.

Dr. Reese's statistics underlined the increased incidence of retrolental fibroplasia in the United States since 1943, so that to-day it would appear that a premature baby with a birth-weight of less than 4 lb. had a 1 in 14 chance of being afflicted with the disease. This risk was doubled when the birth-weight was less than 3 lb.

Professor A. FRANCESCHETTI (Geneva) and his assistant, Dr. J. D. BLUM, both testified to the rarity of retrolental fibroplasia in Switzerland, and Professor Franceschetti wondered whether wrong classification might partly account for the discrepancy. He suggested that the term "hyaloretinal dysplasia" might well be adopted to embrace this and kindred diseases. Dr. REESE maintained, however, that in the compilation of his figures he had been careful not to include cases of persistent posterior vascular sheath, congenital falciform fold, and other conditions likely to simulate certain phases of retrolental fibroplasia.

[Evidently the incidence of retrolental fibroplasia varies in different countries, but this disease is not as rare in Great Britain as it appears to be in Switzerland. At the Hospital for Sick Children, Great Ormond Street, and at other hospitals, the reporter has seen at least 25 cases within the last year. Inquiry among several British colleagues, although not yet

documented by statistics, shows that the incidence of retrolental fibroplasia has risen to a disquieting level, so that the task of prevention is becoming urgent.]

Ocular Effects of Hypertension

Professor F. H. ADLER (Philadelphia), who opened the discussion on "The role of the sympathetic nervous system in the genesis of vascular hypertension and its effect upon the eye," emphasized that stenosis of the arterioles was a cardinal fact in hypertension, but he went on to insist that the main problem was to explain the reason for this vasoconstriction. Did it arise from direct intervention of the nerve supply to these vessels, or was it an effect of some chemical substance? If the latter supposition was true, did the humoral agent exert immediate action upon the vessel walls, or did it influence the vascular calibre through the medium of the medullary vasomotor centre?

According to Professor Adler, the role of the sympathetic nervous system was secondary, and the known facts indicated that a humoral substance acting upon the vessel walls must be the explanation in a typical case of arterial hypertension. He asked, Why, then, did sympathectomy ever produce good results? Elimination of "pressure peaks" was the reason. When the average level of arterial pressure was higher than normal, vasoconstrictor impulses were apt to produce a disproportionate increase in peripheral resistance. Thus arose the threat of a vascular crisis, which might produce retinal damage or fatally interfere with the brain. The cardiovascular system could sometimes adapt itself to pressure levels far beyond normal limits, but sudden increments were less likely to be tolerated. At any rate the nervous control of vessels within the eyeball was not abolished by operations upon the sympathetic system. Therefore the benefit undoubtedly conferred by such treatment upon some cases of hypertensive retinopathy must be attributed not to any action upon the blood vessels of the retina but rather to a flattening of the peripheral resistance peaks elsewhere in the body.

Continuing the discussion, Dr. S. SCHIFF-WERTHEIMER (Paris) also recognized the basic role of peripheral resistance, but drew attention to the multiplicity of the factors concerned in the regulation of blood pressure. They had to bear in mind not only such obvious influences as the cardiac thrust, the blood volume, the recoil of the great vessels, and the resistance of the distal arterioles, but also nervous regulation, both central and peripheral, together with the incalculable effects of the endocrine system. Dr. Schiff-Wertheimer said that she believed there was a reversible and an irreversible phase of hypertension, although admittedly there was no abrupt line of cleavage between the two. Ophthalmoscopy might supply a clue to differential diagnosis, but prognostication founded mainly upon this mode of examination often proved fallacious. She agreed with Professor Adler's contention that sympathectomy did not augment the calibre of the retinal arteries, but claimed that the operation usually mitigated retinal damage in so far as it might be due to abnormal capillary permeability.

Mr. HEDLEY ATKINS (London) pointed out that the patients with hypertension were as numerous as those affected by cancer, and that the vascular changes found were the results and not the causes of raised pressure. He regarded the retinal changes found in malignant hypertension as images or heralds of pathological processes in the kidneys. Patients with this severe form of the disease were as a rule comparatively young. Shortness of breath, intellectual decline, and irascibility were characteristic manifestations, and many patients complained mainly of headache, which was particularly severe after a sleep. Drugs might relieve such headaches, but lasting relief was unlikely without operation.

The difficulties attending comparison of various surgeons' results were stressed by Mr. Atkins. So much depended upon individual selection of cases, although most authorities agreed that the prospect of benefit faded when they operated upon patients more than 55 years old. He surveyed the main surgical methods, but himself favoured the Smithwick procedure, which was less mutilating than some of the rival operations. Charts illustrating the favourable effect of this operation upon certain cases were shown.

Dr. A. J. BEDELL (U.S.A.) pointed out that most hypertensives displayed no changes in the fundus. This generalization was based upon the study of more than 2,500 fundus photographs. Nor was it correct to assume, as did many observers, that an increased reflex along the retinal arteries was pathognomonic of raised pressure. Another consideration to be borne in mind was the capacity of the retina to absorb haemorrhages and exudates, whether the patient was being treated or not. Naturally they would be replaced by other exudates and haemorrhages in many instances, but that tendency might be modified by rest in bed. In other words, recumbency rather than any particular operation might well deserve the credit in certain alleged surgical cures.

Dr. I. S. TASSMAN (U.S.A.) emphasized the importance of emotion, especially anxiety, apprehension, or anger, as factors modifying the blood pressure. Various material factors, proved by experiment to have an effect upon the pressure, were in their turn subject to the influence of emotion, under the everchanging conditions of life outside the laboratory. Such influence would often be mediated through the thalamus. Dr. P. BAILLIART (Paris) maintained that the actual calibre of the vessels was less important than the permeability and degree of fragility manifested by their walls.

Heredity in Ophthalmology

Professor LAURENCE H. SNYDER (U.S.A.), who opened the discussion on heredity, insisted upon the need for thoroughly investigating the family history before making decisions about genetic disease. Nor should the observer's attention be confined to families exhibiting a high incidence of the particular abnormality. Sporadic cases often illuminated the problem of inheritance so long as they remembered that sporadic instances might be fortuitous. This speaker also mentioned the problem of genetic carriers. He dwelt upon the fact that genetic influences could be profoundly modified by environment, and vice versa. Thus the distinction between inherited and non-inherited congenital defects was far less rigid than was formerly supposed. Another interesting aspect of the subject considered by Professor Snyder was the part played by enzymes in the fulfilment of pathological changes hinging upon a faulty gene.

Miss IDA MANN (London and Perth, Australia) also spoke of the intimate relationship obtaining between hereditary and environmental factors, and she suggested the subdivision of congenital ocular defects into four groups: (1) dependent upon the parents' genetic constitution, (2) due to gene mutation, and therefore transmissible but not inherited, (3) due to some genetic factor activated by an environmental influence, and (4) entirely attributable to environment. Miss Mann proceeded to describe some of her own experimental work on the transmission of ocular and other defects in mice and rats. She emphasized the importance of such work as a means of interpreting lesions found in human subjects. Recent statistics showed an enormous increase in the proportion of cases of blindness due to congenital defects of the eye. Many of these abnormalities could be prevented by making parents aware of the facts, and especially the fact of "anticipation," in Nettleship's sense of that word.

Professor A. FRANCESCHETTI's remarks were founded upon work done with his colleagues D. Klein, S. Forni, and J. Babel at Geneva. He discussed a number of inherited fundus diseases, particularly those which attacked the macula. The relationship of cutaneous dystrophy and choroido-retinal degeneration was also considered.

Demonstrations

Clinical demonstrations interspersed with sightseeing tours during the week preceding the Congress were organized by Dr. G. I. SCOTT (Edinburgh) and by groups of English ophthalmologists. During the Congress week members were free to visit the Institute of Ophthalmology in Judd Street, where the departments of pathology, medical illustration, physiology, and chemistry were on view. Special physiological and pathological demonstrations were arranged there during each afternoon. Operative sessions, orthoptic work, and demonstrations in radiotherapy, physiotherapy, and colour television were also placed on the programme, and the Association of Dispensing Opticians staged a show of artificial-eye fitting, including the "mobileye," a prosthesis used in conjunction with the Hamblin-Cutler implant. Contact lens manufacture and fitting were also demonstrated.

Films and Exhibitions

Only a few years ago the ophthalmological film was a rarity, but this branch of activity has now leapt far ahead. Over 60 items had been selected for display, so that six sessions in the auditorium of the Wellcome Research Institution were required for this exceedingly popular part of the programme.

A whole week might profitably have been spent upon the superb clinico-pathological display set out in the Wellcome Research Institution, but there were, in addition to that, other treasures, including historical books, early operating instruments, and spectacles. A number of beautiful histological specimens were on view, the principles of illumination were exhibited, and an excellent museum of social and industrial ophthalmology had been assembled in the London School of Hygiene and Tropical Medicine. The display of work done by blind people showed the variety of occupations that can be successfully followed without the aid of vision.

A skilfully planned array of ophthalmological and surgical instruments, books, and drugs was on view at the St. Pancras Town Hall.

Ancillary Societies

At a scientific session of the International Association for the Prevention of Blindness, under the presidency of Dr. P. BAILLIART (Paris), reports upon "nomenclature and classification of the causes of blindness" were submitted by several delegates. The International Organization against Trachoma held a discussion on the initial signs of trachoma, which was opened by the president, Mr. A. F. MACCALLAN (London). Eight other papers were read.

Social and Other Events

The Old Library in B.M.A. House, Tavistock Square, was used as the registration office for the Congress, and an information bureau was set up in the Hastings Hall. On July 17 a reception and dance were held at Grosvenor House. His Majesty's Government arranged a reception at the Tate Gallery on July 18, when visitors were welcomed by the Right Honourable Aneurin Bevan, M.P., Minister of Health. On July 19 receptions were given by the Royal College of Surgeons, the British Medical Association, and the Royal Society of Medicine. Sir CECIL WAKELEY, P.R.C.S., conferred the Honorary Fellowship of the College upon Dr. PAUL BAILLIART (Paris) and Dr. DERRICK T. VAIL (Chicago, Illinois) during the reception at the Royal College of Surgeons. On the eve of the Congress the president and council of the Royal College of Surgeons had entertained the International Council of Ophthalmology to dinner in the council room of the College.

The chief guests at the official banquet of the Congress, held at Grosvenor House on July 20, were His Excellency Lewis W. Douglas, the American Ambassador, and Mrs. Douglas. Mr. M. H. WHITING, president of the Ophthalmological Society of the United Kingdom, presented the Nettleship Medal to Dr. A. J. BALLANTYNE (Glasgow) at Apothecaries' Hall, where some of the senior visitors were entertained to dinner by the officers of the Ophthalmological Society, the Ophthalmic Section of the Royal Society of Medicine, and the Faculty of Ophthalmologists.

Closing Ceremony

At the closing ceremony Professor NORDENSON generously praised the ophthalmologists of Great Britain for the success of the Congress and the warmth of the welcome extended to visitors from other countries. He suggested that it would be inadvisable at this stage to decide where the 1954 Congress should be held. The venue should be left for later decision by the International Council. Closing speeches were made by Professor L. GUGLIANETTI (Europe), Dr. G. STUART RAMSAY (North America), Professor M. E. ALVARO (South America), Dr. N. F. AYBERK (Asia), Dr. R. C. J. MEYER (Africa), and Dr. W. J. HOPE-ROBERTSON (Australasia).

Sir STEWART DUKE-ELDER, the chairman of the present Congress, emphasized the value of friendships formed and strengthened at these gatherings of colleagues from all over the world. He also expressed his warm gratitude to Professor Nordenson, whom he has succeeded as president of the International Council; to Professor H. Ehlers (Copenhagen), whose position as honorary secretary of the International Council now passes to Dr. E. Hartmann (Paris); to Mr. F. W. Law, secretary-general of the present Congress; to all the many helpers and promoters of Congress activities; and to the guests, with their wives and associates.

DEVELOPMENT OF RENAL PHYSIOLOGY

MEETING OF THE RENAL ASSOCIATION

The Renal Association held a special meeting at the house of the Ciba Foundation, London, on July 15 to hear an address on the development of renal physiology by Dr. HOMER SMITH. The president of the association, Dr. A. A. OSMAN, was in the chair.

Dr. Homer Smith said it was a special pleasure to him that the first time he addressed a scientific meeting in England he should be speaking to the Renal Association and that it should be in London, the home of Cushny and Starling. Dr. Smith remarked that Cushny had come into renal physiology "via the gastro-intestinal tract" through his work on magnesium sulphate, which led him to renal catharsis. Cushny remained in London until 1916, when he went to Edinburgh, where he occupied the chair of pharmacology until his death in 1927. He was very much influenced by Starling, who, Dr. Smith remarked, had left a tradition of ultra-filtration which he applied to the capillary bed throughout the body. Starling had bequeathed problems which were far from being resolved to-day and which were as important as the simple concepts that he had left in physiology: no one had had a greater influence since Harvey, except Claude Bernard.

Cushny's Theory

In Edinburgh Cushny studied the literature on the kidney, mainly German and French, and he found a "wrangle of two great views"—those of ultra-filtration and tubular absorption and of tubular excretion. Out of the mélange of conflicting ideas Cushny wrote his *Modern Theory of Renal Secretion*. The experimental era in renal physiology had not yet arrived, and Cushny had approached the matter mainly from the analytic standpoint. He called it the "modern theory," because he said it was not the work of one man but of many. Dr. Smith remarked that on the subject of tubular excretion Cushny might be accused of a historical prejudice. He used the expression: "Renal physiology is the one last relic of vitalism. . . ." Having taken his stand against tubular excretion, Cushny proceeded on the basis of ultra-filtration and tubular reabsorption, and he was faced with the complicated nature of the reabsorbate. There were so many substances that if they were each reabsorbed separately it would again look like exercise of "free will" by the cells—which Cushny would not accept. He therefore stated that both filtration and reabsorption were due to blind physical force and that an "ideal fluid" was reabsorbed without discrimination to maintain the blood in that constancy of composition which Bernard had emphasized.

Cushny was the first to apply modern physico-chemical thinking to the kidney. In 1917 Richards went to France. After the war he met Cushny in Sir Henry Dale's laboratory, and after he returned to the United States he began with Schmidt his classical experiments on the amphibian kidney.

The Glomerular Fluid

Dr. Smith discussed the analysis of the glomerular and tubular fluid obtained by Chambers's microdissection pipette by Richards, Walker, Bordley, R. C. Bradley, Bott, and Westfall. It was found that the capsular fluid was an ultrafiltrate, that glucose was reabsorbed in the proximal tubule and not the distal, and that the distal tubule was concerned with chloride reabsorption, ammonia excretion, *p*H, and hypotonic urine formation.

There was lacking, however, a standard of reference to indicate the degree of water reabsorption. In 1926 Marshall and Grafflin began their studies of the aglomerular fish kidney, and showed that its blood supply was venous in nature—a counterpart of the renal portal system—that there was no glomerulus and the structure resembled the proximal tubule in man.

Inulin Clearance

By now a standard of reference was available in inulin, a polysaccharide with a large molecular weight (5,200). Dr. Smith mentioned that, although the human kidney was not comparable in certain respects with that of the dog, he thought the laboratory experience with inulin was such that it must be trusted as a clinical standard. Inulin gave an identifiable clearance rate, and from the time of its introduction proper experiments began on tubular reabsorption and excretion. Shannon's study on glucose was the first to show a maximal rate in tubular transport. This maximum rate (T*m*) was subsequently determined for a number of other substances—vitamin C, various amino-acids, sulphates, phosphates, creatine, uric acid. Clinically this knowledge was useful, but most interesting was the implication of the possibility of complete clearance.

Dr. Smith remarked that Cushny would not have believed that the normal renal filtration rate per day was 180 litres: this contained 1,200 g. of sodium chloride (or nearly 3 lb.), excretion being regulated to within ± 1 g. a day—an indication of the importance of the kidney in relation to body fluids—400 g. of sodium bicarbonate and 190 of glucose.

Section of the vasomotor nerves had no effect on the renal blood flow. Discussing the question of how the blood flow in the kidney is regulated, Dr. Smith remarked on the constancy of this blood flow and of the filtration rate, and suggested that the next chapter in the history of renal physiology would be headed "Glomerular–tubular balance."

Sodium Excretion

Dr. Smith then discussed sodium excretion in relation to glomerular–tubular balance. He recalled that some years ago it had been postulated that water reabsorption was carried out in two phases, obligatory and facultative, the obligatory absorption taking place in the proximal tubule and the facultative in the distal. In maximum water diuresis about 15% of the filtered water was available for excretion. In extreme osmotic diuresis 60% of water was excreted, although sodium chloride continued to be reabsorbed. It appeared that reabsorption of sodium was independent of the reabsorption of water and that it was an active process. First the sodium chloride was absorbed and then the water diffused back to maintain the osmotic pressure of the urine at approximately that of plasma.

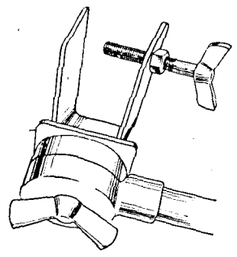
Dr. Smith said that the thin segment consisted of very flat epithelium; many investigators thought that its function was to act as an "osmotic dialyzer." In the distal system the reabsorption of sodium chloride at least appeared to be limited by a critical constant comparable with the constants for glucose and other substances in the proximal system.

In general Merrill's theory of the genesis of oedema in chronic congestive heart failure was supported by recent studies. But it must be recognized that the tubular reabsorption of sodium was importantly influenced by adrenal cortical hormones and other factors. Finally the speaker stressed that modern methods of renal measurement were not suitable for general clinical use. The most valuable clinical method of assessment remained the urea clearance.

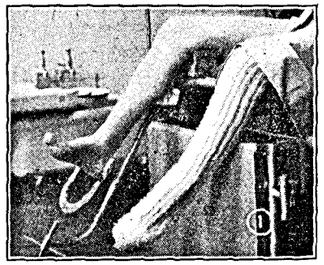
Preparations and Appliances

TREATMENT OF FRACTURES OF TIBIA AND FIBULA

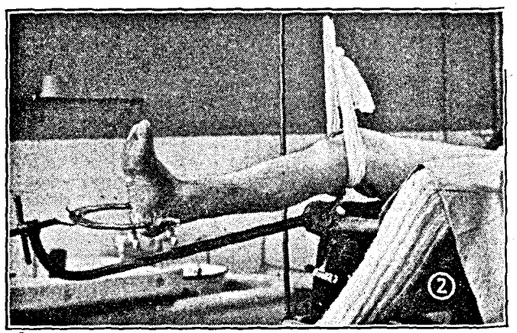
Dr. P. R. SONDHI, Worcester Royal Infirmary, writes: In the treatment of these fractures, with current methods of traction apparatus, it has always been a handicap to apply a plaster-of-Paris cast in two stages. This usually involves handling of the leg by porters and nursing staff while the plaster is being completed. Owing to this uncertain and variable traction, angulation or even shortening can occur.



If a swivel apparatus (see Diagram) is attached to the table end of the Watson-Jones apparatus, traction can be applied with the knee held at any angle. Traction can be done with the knee at right-angles (Fig. 1) and the whole apparatus swung round to the position of slight flexion at the knee, when post reduction radiographs can be taken (Fig. 2). The knee is supported during this manœuvre by a sling and the hip is raised from the table by a sandbag. Counter-traction is applied by raising the foot of the table. The whole leg and the fractures are thus held in a fixed position in which the cast can be applied in one stage.



Another suggested use for this apparatus is that the traction can be applied to the



fracture with the knee in slight flexion in cases where it is not desirable or practicable to have the knee in 90 degrees flexion, such as in fracture with ankylosis of the knee. It can also be of use in compound fractures, as the leg is held in a fixed position for towelling and surgical toilet.

The Ministry of Health has sent a circular to superintendents of certified institutions saying that the Railway Executive will allow reduced fares for visitors to patients at hospitals that accommodate mainly long-stay cases. Particulars of the scheme can be obtained from the secretary of the Passenger Committee, Railway Executive, 203, Eversholt Street, London, N.W.1.

ONE HUNDRED AND EIGHTEENTH ANNUAL MEETING

of the

British Medical Association

HELD AT LIVERPOOL AND SOUTHPORT
JULY, 1950

THE SECTIONS

SUMMARY OF PROCEEDINGS

SECTION OF MEDICINE

Thursday, July 20

Pharmacology of Antihistamine Compounds

With Professor ROBERT PLATT (Manchester), a vice-president, in the chair, Professor J. H. BURN (Oxford) opened the discussion on the pharmacological action of antihistamine compounds. He pointed out that many of the substances used medicinally as analgesics and as spasmolytics had common properties, among which was included the ability to act like quinidine on the heart.

During the last war work had been carried out to find substances to replace quinidine. These substances had been tested to assess their ability to reduce the maximum rate at which rabbit's auricle could follow electrical stimulants. It had been found that various local analgesics, including procaine, amethocaine, and cocaine, had an action similar to quinidine, and it had then been discovered that spasmolytics such as atropine, papaverine, and "trasentin" also had such action, as did the analgesic pethidine. "Anthisan" had been found to be twice as active as quinidine. It also had the properties of the other substances; as an analgesic it was not as good as pethidine, though it was more active than aspirin. "Benadryl" had the same effect.

Once these properties had been established it would be expected that the action of these various drugs would merge into one another. From this knowledge, certain practical consequences were to be anticipated. Benadryl, like atropine, might cause drying of the mouth, and like pethidine mental confusion; indeed, all the antihistamine drugs had such side-effects. They had properties like those of hyoscine, which could control sea sickness. In a single-dose experiment on aviators at Randolph Field it had been shown that benadryl and "dramamine" prevented air sickness, though hyoscine was slightly better, failures with benadryl being 30.7%, dramamine 28.7%, and hyoscine 19%.

It was known that atropine might abort a common cold by drying up secretion; so would the antihistamine drugs. One would therefore expect that, just as quinidine would help to restore normal rhythm in the case of auricular fibrillation, so would the antihistamine drugs, and there was no doubt that benadryl gave great benefit in cases of myotonia. One would also expect that, just as procaine had been used successfully to relieve bronchial spasm, pethidine must be even more effective. The basis of these common properties was that these substances had a depressing effect on acetylcholine, histamine, and adrenaline—the substances that controlled activity locally in many tissues.

Professor D. M. DUNLOP (Edinburgh) recorded the clinical results which he had found in treating patients with antihistamine drugs. The drugs were excreted in the urine unchanged, and therefore the administration had to be continued indefinitely, since histamine was continually produced in the body. Most of the cases he had treated were given doses of anthisan varying from 100 mg. to 250 mg. three times a day. He had treated 350 cases, and in 138 (55%) there had been side-effects—mild and passing off within 48 hours in 65, more severe in 60, and severe enough to stop the drug in 13. These symptoms consisted of sleepiness in 58, more persistent sleepiness in 51, nausea in 14, dizziness in 11, dryness of the mouth in 10, feeling of tension in 10, vomiting in 5, diarrhoea in 3, headache in 3, and collapse from hypotension in 1.

He found the best use of the drugs in the treatment of urticaria and angioneurotic oedema, over 80% of the cases being controlled by the drugs, provided the dosage was adequate and properly spaced. They prevented irritation but had no effect on established lesions, though they prevented new ones from occurring. They were effective in uses of urticaria resulting from sensitization to penicillin and streptomycin. While they removed the skin irritation in serum sensitization, they had no effect on the fever and arthralgia of that condition.

In hay-fever anthisan gave relief in 55% of 36 cases, and significant relief in a further 31%. It was certainly far more satisfactory than long desensitization with a specific protein. The results in perennial vasomotor rhinitis were less impressive, but definite. Complete relief was obtained in 54% of 35 cases, with significant relief in a further 34%. He had found antihistamines disappointing in asthma.

In 47 patients with carcinoma of the breast having the same dose of deep *x*-ray therapy who had developed radiation sickness, he had found that 17 patients treated with anthisan did worse than 15 having no treatment and 15 with dummy tablets. He had found benefit from anthisan in cases of liver sensitivity, insulin sensitivity, pruritus, intermittent hydrarthrosis, and paralysis agitans, but no benefit in periarteritis nodosa, dermatomyositis, migraine, allergic purpura, and acute nephritis.

It had no effect on the gastric secretion of hydrochloric acid. It appears, therefore, that antihistamine drugs found their main clinical application in those states characterized by superficial vascular phenomena. The newer antihistamines, though of greater potency and more satisfactory because of increased duration of action or a lowered incidence of side-effects, had so far made no material addition to the list of disorders amenable to this form of treatment. There seemed to be no benefit to be obtained in the deep visceral allergies.

Dr. LESLIE GAY (Johns Hopkins University, Baltimore) recorded the results of his observations with beta-dimethylaminoethyl benzohydryl ether 8-chlorotheophyllinate (dramamine). The investigation was promoted by the observation that in a pregnant woman with urticaria, who had suffered all her life from car sickness, it was possible to control the car sickness at will. A placebo failed repeatedly, but dramamine gave complete relief if she took 50 mg. a few minutes before she boarded a car. Other victims of car sickness, without exception, had been completely freed of discomfort, provided the drug was taken just before exposure to the motion of the vehicle.

Sixty patients who had developed sea sickness on crossing the Atlantic had had the condition controlled by dramamine. Investigation was therefore carried out on a crossing of the Atlantic by troopship in bad weather. There were 1,366 soldiers on board, and the drug was given in a dosage of 50–100 mg. every six hours orally or rectally. It had been effective both prophylactically and therapeutically, and no untoward side-effects had been observed by the investigators. In 319 soldiers treated therapeutically there had been failure in only 8, and in 124 treated prophylactically failure in only 2, compared with the failure in 38 out of 59 treated therapeutically with a placebo, and 35 out of 123 given a placebo prophylactically. It was the only drug which would relieve the condition once the symptoms had developed.

It had been shown in another investigation that among 210 sufferers from sea sickness 204 had been completely relieved; out of 52 with air sickness 51 had been relieved; and out of 59 with car sickness 54 had been relieved: making a total of complete relief in 309 out of 321 patients. There had been partial relief in 6 and failure in 6, while reactions had occurred in 37.

An investigation had then been carried out to determine the effect of dramamine on marksmanship. Ninety-six marines

had been divided into two groups by random selection as to firing ability and as to positive history of motion sickness. Dramamine had had no effect on marksmanship.

Further investigations had been carried out by commercial air lines in the United States. One line in one month had had 270 cases of air sickness among 3,528 passengers. The symptom of sweating occurred in 155 cases and had been relieved by dramamine in 125; nausea had been relieved in 163 out of 207 patients, and vomiting in 66 out of 111. The principal side-effect appeared to be drowsiness, which had occurred in 3.7% of the patients!

Intercarotid injection of di-isopropyl fluorophosphate (D.F.P.), a drug which destroyed cholinesterase and permitted accumulation of acetylcholine, caused "adversive syndrome" in rabbits. Within a minute of injection there was marked constriction of the pupil on the operated side. The head was turned away from that side and the animal was compelled to circle on four legs in the direction opposite to the injected side. The injection of 5 mg./kg. of dramamine intravenously immediately corrected this turning effect. It had also been found that dramamine prevented the epileptic seizures which occurred in rabbits after injection of D.F.P.

He suggested that the effectiveness of dramamine was due to the vasodilator effect of this drug. Nearly all other antihistamines had a vasoconstrictor effect. The vasodilator action was probably produced by the 8-chlorotheophyllin part of the molecule. Dramamine was also found to be effective in the nausea of pregnancy, following vestibular operations, and in radiation sickness.

Professor PLATT said he thought the evidence in favour of the antihistamines in acute nephritis was most unconvincing, and pointed out that the course of this disease was very variable.

Professor BURN, while admitting that dramamine was effective against sea sickness, said that there had not been a controlled experiment to show that it was more effective than hyoscine. Dr. GAY pointed out that this was hardly practicable, since hyoscine was too toxic to give continually over a period of 14 days. He asked why, if such a dramatic response as had been obtained with dramamine was possible with hyoscine—a drug which had been known for a large number of years—it had not been already reported.

Vitamin B_{12}

Dr. J. F. WILKINSON (Manchester) reviewed the present state of knowledge about vitamin B_{12}. It was found in liver, kidney, milk, and the grasses, and contained about 4% of cobalt. Used in adequate dosage of 60 μg. initially, followed by 40 μg. weekly until the blood count returned to normal, and then 20 μg. fortnightly or monthly, it usually caused a good initial response as judged by the reticulocyte count and the subsequent return of the blood to normal. In all cases the bone marrow showed a rapid change in the course of two days from megaloblastic hyperplasia to the normoblastic condition seen in a properly treated case of pernicious anaemia. Since 1948 he had treated 170 patients with pernicious anaemia or subacute combined degeneration of the cord for periods of more than six months. Of these 136 remained well, with normal counts. But the following were exceptions: 28 (16%) had subsequently shown falls in the red blood cells after 3–4 months' treatment on a dosage of 20–40 μg. at weekly intervals in 7, and at fortnightly intervals in 21. Two had given poor response on 40 μg. weekly and had been put back on to liver extracts. Three others had responded very slowly—one taking seven weeks to reach 4,000,000 red cells per c.mm. at 80 μg. weekly; another seven months to remain at over 4,000,000 on 20 μg., and the third three months to reach 4,300,000 before falling again, although he had responded to larger doses. Increasing the dosage in some of these cases had improved the counts.

Vitamin B_{12}, like liver extracts, seemed to reverse in the early stages the neurological symptoms and signs produced by folic acid therapy. Nutritional megaloblastic anaemias seen in the Southern States of America and in Cuba and India appeared to respond well to vitamin B_{12}; but macrocytic anaemias of pregnancy, idiopathic steatorrhoea, and sprue, which did not respond to liver extracts, were usually also refractory to vitamin B_{12}.

He thought that vitamin B_{12} was as efficient as, if not better than, highly potent liver extracts in the treatment of pernicious anaemia and subacute combined degeneration of the cord. But there was more than one factor concerned in the true story of the mechanism of the megaloblastic anaemias; vitamin B_{12} was certainly not *the* factor and not the only one.

Dr. D. RIDING (Runcorn) suggested that in man the normal requirements of vitamin B_{12} were met by bacterial synthesis in the colon. The only foods in which it was found were meat, liver, herring, and egg yolk. Therefore only meat and fish eaters, and possibly young suckling mammals, derived vitamin B_{12} from food. The vegetable-eating populations of many parts of the world must derive their requirements from some other source.

To reproduce in laboratory culture media the conditions maintained in the caecum was obviously impossible. It was likely that in the great symbiotic conglomeration of faecal organisms there must be very many types capable of synthesizing vitamin B_{12}.

Normal gastric juice contained a non-dialysable heat-labile substance which combined with vitamin B_{12} to form a complex which was non-dialysable and not dissociated by dialysis. Vitamin B_{12} in this combination was not available to micro-organisms but was released by heat, whereupon it was again microbiologically active. It was probable that this "inhibitor" was the intrinsic factor of Castle or an important component thereof. In all specimens of human gastric juice which had been examined where free HCl was present, this intrinsic factor had been found in large quantities. The only instances where there was no inhibitor were cases of known pernicious anaemia. It was interesting that some animals did not possess this intrinsic factor. The dog and the pig had it, whereas the horse, calf, and sheep did not.

Vitamin B_{12} given orally to cases of pernicious anaemia in relapse produced a response, so it was possible for man to utilize this vitamin orally without the intervention of intrinsic factor. Could it be that in the carnivora and omnivora, depending as they did on ingested meat for a partial supply of vitamin B_{12}, intrinsic factor acted as a protective mechanism? The combination of vitamin B_{12} with intrinsic factor to form a complex not available to micro-organisms might also prevent destruction of the red substance by the alkaline digestive juices of the upper intestine.

SECTIONS OF SURGERY AND OF PATHOLOGY AND BACTERIOLOGY

Thursday, July 20

Renal Failure

With the president of the Section of Surgery, Professor CHARLES WELLS (Liverpool), in the chair, the combined meeting was opened by Mr. RALPH SHACKMAN (London), who explained that the views he would express were not necessarily those of Professor Ian Aird, for whom he was deputizing. He first mentioned the various types of renal failure, and said that he did not intend to deal with the post-renal obstructive variety. After reviewing certain pertinent points in the anatomy and physiology of the kidney, he described the functions of the various parts of the nephron and the factors influencing them, pointing out that renal failure might be due either to failure of glomerular filtration or to tubular dysfunction. The effects of systemic hypotension were not altogether predictable; glomerular filtration could be maintained under conditions of unusually low blood pressure by various adjustments in the intrarenal vascular mechanism. Changes in the calibre of the efferent arterioles might affect not only the glomerular filtration but also the function of the tubules. Tubular dysfunction was associated with water intoxication, retention of tissue metabolites, and potassium poisoning; the mechanism of this type of failure was probably more complex than it appeared to be. In the early stages of tubular dysfunction the patient could be regarded as virtually having had a bilateral nephrectomy; in the later stages the polyuria, loss of potassium ions, and *p*H imbalance could cause very severe symptoms. The possible role of the pituitary, adrenal, and parathyroid glands could not as yet be properly assessed. Among the several clinical conditions in which renal failure occurred, Mr. Shackman mentioned oliguria following surgical operations, renal failure associated with gastro-intestinal bleeding, and renal failure after biliary surgery. The first type was incompletely understood; the second type, while chiefly due to absorption of breakdown products from the bowel, was also due to other factors; and the last type, following biliary surgery, might be due to the effects of an unknown toxin and/or peripheral circulatory failure. He concluded with a few words on treatment and said that, although the Borst method was not well tolerated by patients after operations, he believed that Bull, Joekes, and Lowe had made a considerable contribution to our understanding of the proper management of renal failure.

Histological Changes

Professor J. H. DIBLE (London) said that he proposed to confine his remarks to intrarenal causes of renal failure and to concentrate on the histological changes in the kidney. He emphasized the difficulty of obtaining pathological material in the first stages and of assessing the early changes; the results of animal experimental work were not strictly analogous. Though there was no profound significance in the finding, he had found it useful to differentiate between cases of tubular necrosis without pigmentation and those with this change. He thought that there was little or no evidence of glomerular damage and that the condition was chiefly due to tubular failure, the earliest evidence of which was the presence of hyaline material in the medullary and second convoluted tubules. At an even earlier stage there was congestion of the kidney; after 30 hours the hyaline casts appeared, and, in those cases showing pigmentation, pigment appeared after 40 hours. Tubular "blockage" was not evident at this early stage. Between the fourth and sixth days inflammatory changes appeared, and regeneration of the collecting tubules was also obvious. Inflammatory changes and tubulo-venous lesions were, however, secondary events, but they were possibly more marked in the pigmented cases. Later still there was oedema and fibrosis of the medulla, with widely dilated tubules containing flattened epithelium. Professor Dible said that it remained to be decided whether the renal lesions were primary or secondary in nature, but anuria was present before the development of the lesions. The powers of recovery of the kidney, though remarkable, were slow; even with the best treatment some patients did not recover. This was an unsolved problem worthy of the closest consideration. He concluded on a provocative note by offering alternative explanations of the changes so that others would criticize them, and he mentioned cortical ischaemia, obstruction to glomerular filtration, the absorption of toxic substances from the filtrate, a mechanism due to changes in the marginal zone, and, finally, an obstructive lesion lower in the nephron.

Dr. E. M. DARMADY (Portsmouth) said that though oliguria and anuria might have many causes there was great similarity in the histological changes. Some 60 different precipitating factors had been listed, and he himself divided them into seven groups, though some conditions could be placed in more than one group. Of the theories put forward to explain the condition he felt that tubular blockage should be ruled out for three reasons: casts were often minimal or absent; the glomeruli were not dilated; and there was no dilatation of the tubules above or below the casts. He had studied the dissected tubules by the method of Oliver and had been struck by the fact that the casts did not seem to have damaged the related lining of the tubules; he therefore discarded the idea that the casts were nephrotoxic. Dr. Darmady showed a series of slides demonstrating tubular "bursts" with resultant leakage of protein; the nephron seemed to be damaged at many points throughout its course. He thought the shunt theory was not entirely tenable, as was shown by the oxygen extraction studies of Bull. Further, the condition had been produced experimentally by neurogenic stimuli which, it had been shown, were incapable of sustaining the shunt. The pituitary-adrenal mechanism deserved fuller attention, and the general adaptation syndrome of Selye might provide some explanation of the changes seen.

Acute Tubular Necrosis

Dr. G. M. BULL (London) said that with Drs. A. M. Joekes and K. G. Lowe he had investigated 50 patients suffering from acute tubular necrosis of differing cause. These causes ranged from the purely toxic to the purely ischaemic. He and his colleagues had shown that the clinical course was largely predictable and could be divided into four phases: onset, anuric or oliguric, early diuretic, and late diuretic. They had not investigated the first phase, but the work of van Slyke and others made it clear that the reduction of renal blood flow was the most important factor at this stage and its correction called for blood, plasma, or saline tranfusion. In toxic cases, on the other hand, there was probably no significant initial reduction in blood flow; preventive measures and the use of specific antidotes were indicated. In the second phase blood flow might be under 5% of normal; studies by means of renal vein catheterization showed that this was mechanically induced, was not due to a shunt, and was not relieved by splanchnic block. Glomerular filtration was virtually absent at this stage, and there was no renal excretion of water or of sodium, chloride, and potassium ions, or of the end-products of nitrogen metabolism. For these reasons water intake should be 1 litre a day; no minerals should be given, and the diet should be protein-free and of high calorie content. In the anuric phase potassium intoxication was second only to water as a cause of death. On this type of diet the blood urea rose at about a third of the rate that occurred on a protein-free low-calorie diet, and potassium release from the tissues was inhibited. The early diuretic phase was characterized by returning blood flow and increasing glomerular filtration rate and urine flow, with continued poor tubule function. The urine passed was only a slightly modified glomerular filtrate. Water loss could be measured and corrected. The sodium and chloride loss could be predicted because the urine concentration of these substances was approximately half that in the plasma, but the potassium loss was not easily predicted. In practice it was found that once the urine volume exceeded 1 litre a day a diet consisting largely of fruit would maintain adequate potassium levels. The keynote of this stage was adequate mineral replacement. On the average this phase persisted for as long as the anuric or oliguric phase preceding it; for this reason mineral replacement should be continued for this time. Concluding with a few words on dialysis, Dr. Bull said that he had experience of this method. It was theoretically sound, but in practice extremely difficult, requiring a large and experienced team. He believed that with conservative management the mortality of uncomplicated acute tubular necrosis need not exceed 5–10%.

Steps in Treatment

Mr. RONALD W. REID (Colchester) acknowledged the great help given by Dr. Bull and his co-workers. The two main functions of the kidney were, first, the excretion of water and waste products and, secondly, the maintenance of the *milieu intérieure*. Both functions must be clearly remembered in planning treatment lest this should tend to restore one function and to embarrass the other. The first step was, where possible, to remove the cause, and in many general surgical cases this meant the relief of obstruction in the urinary tract; the second step was to correct anaemia, restore blood volume and blood pressure, and so ensure a normal circulation. He agreed with the early limitation of fluid. In the later stages he preferred to use Ringer's solution for fluid replacement, but he thought the use of sodium sulphate a dangerous procedure. Oedema in the kidney could have a serious effect. In two recent cases he had, among other measures, undertaken renal decapsulation. In both of these cases much fluid, containing urea, had drained from the flank wounds; in one case there had been as much as 1,200 ml. He confirmed the great difficulties and dangers of peritoneal dialysis, but by the use of a plasma substitute in the peritoneal wash there was less danger of over-hydrating or dehydrating the patient.

In the subsequent discussion Mr. L. R. BROSTER (London) said that his particular problem had been in adreno-cortical cases. Laboratory control was difficult. Dr. Bull had shown a number of beautiful charts, but he felt that few surgeons

would be able to avail themselves of such expert facilities. Professor CHARLES WELLS referred to the work going on in the Liverpool area, where they had been chiefly concerned in trying to avoid these troubles. He spoke of the use of an adrenaline drip in certain operation cases, and said he would like to know the answers to several problems. What was the mechanism of this condition? When did it occur? How much time had one in which to remedy the early stage of onset? From the remarks made by Dr. Bull and others he presumed that they should not make use of spinal analgesia and splanchnic block in the treatment of the early case. Professor H. L. SHEEHAN (Liverpool) said he had been greatly impressed by Dr. Bull's work and he thought that in it lay their only real hope in treatment. He disagreed with Dr. Darmady's views about cast obstruction; he also had noted damage in relation to the casts (perhaps only five or six cells of the tubule). He believed that there was no connexion between the initial cortical ischaemia and the later changes in the tubules. Mr. R. MARCUS (Liverpool) spoke of the immediate effects on renal function of relieving urinary obstruction, and he demonstrated this by reference to some intravenous pyelograms, one of which had been taken on the operating table just after an enlarged prostate gland had been removed.

Dr. GEORGE DISCOMBE (London) said that they had to consider first the patient with urinary obstruction; secondly, the surgical patient with impaired kidneys who was faced with a severe operation; and, lastly, the patient with established uraemia due to one of the many causes already mentioned. His chief concern had been the last two groups, and in the second group he would emphasize the great importance of keeping the haemoglobin level high and of assuring a correct acid-base balance. At the Central Middlesex Hospital they had seen a number of post-abortive cases and they had had the benefit of Dr. Bull's advice and experience. He had no doubt of the value of the method described by Dr. Bull, for the cases recovered much more readily than his previous experience would have led him to expect. Good results were the rule rather than the exception. Dr. W. N. LEAK (Winsford) recalled that he had been told by a missionary doctor in Formosa some 30 years ago that it was their practice to decapsulate the kidneys in cases of acute nephritis. It had seemed to him that Professor Dible's slides had demonstrated the picture of a pressure necrosis.

Professor WELLS, from the chair, then called on the opening speakers to reply. Dr. BULL said that some speakers had expressed concern about laboratory facilities, but the method of treatment he had described could be carried out with the minimum of laboratory control, or even with no laboratory control at all. In reply to a question about how he had demonstrated changes in the renal blood flow he referred to a method of catheterizing the right renal vein and the various tests they had done. The available evidence suggested that there was no shunt in the stage they had investigated, for the blood in the renal vein was more venous, rather than more arterial as might have been expected. Dr. DARMADY, in reply to Professor Wells's question about how much time there was to treat the early stage, thought that there was probably about eight hours in which to do this. He pointed out that casts tended to occur in one nephron and not in others, while tubular "bursts" might occur anywhere. Casts also tended to occur lower down in the tubules because of greater concentration there. Professor DIBLE said that there were really two main types of tubular necrosis: those cases due to exogenous causes and those due to endogenous ones. He thought that one could not reconcile the cortical changes with a pressure lesion, and this was confirmed by the apparently normal condition of the glomeruli. He agreed with Professor Sheehan that the casts were by no means static and developed with the passage of time. The most remarkable thing of all was that the damage done in such a short space of time persisted and, in some cases, might never recover at all. Mr. SHACKMAN, in conclusion, said that the common factor to both glomeruli and tubules was the blood supply going to the whole nephron, and it was here that they must look for the cause of the condition. Discussing the question of pressure necrosis, he quoted a case in which he had had evidence that the intrarenal pressure was not high. He agreed that prevention was of paramount importance.

SECTION OF CHILD HEALTH

Thursday, July 20

Breast-feeding

The president, Professor NORMAN B. CAPON (Liverpool), took the chair and conveyed the apologies of Mr. E. C. Fahmy (Edinburgh) for unavoidable absence. Dr. F. CHARLOTTE NAISH (York) outlined the history of breast-feeding over the centuries. She drew attention to the varying influence of fashion. Continuity of supervision was the key to successful breast-feeding, and the study of breast-feeding problems was the duty of the general practitioner. Utilizing their opportunities for controlled experiments, the paediatricians had done much to emphasize the importance of breast-feeding. The general practitioner was in a position to see other issues: the emotional integration of the mother that resulted from success with feeding; the success of breast-feeding resulting from increased care of the emotional stability of expectant and nursing mothers; and the resultant improved health of the children.

There could be no questioning the value of antenatal care. Breasts should be examined as a routine at the time of first and subsequent examinations. No comment should be made at the time of the first antenatal examination, as it was not possible to foretell the degree of success which would attend breast-feeding. Fashion determined views on when the newborn baby should be first put to the breast.

For treatment of congestion of the breast Dr. Naish advocated reducing both the time between feeds and the time spent at each feed. Finger-tip massage to the periphery of the breast was valuable where congestion was severe. It was possible that the massage stimulated the "draught" just as the butting of the lactating sheep's udder by lambs might stimulate the "letting down." In Dr. Naish's experience the reduction in secretion which frequently took place in the third week was a feature common to mothers not getting adequate supervision. To obviate it post-natal visits should be made by the family doctor until the end of the fifth week. Where a decline in the volume of milk occurred, immediate resort should be made to complementary feeding, which was best explained to mothers as a form of "topping up," possibly required only temporarily.

The need was for the organization of all looking after the mother with the object of favouring continuity of supervision, and full co-operation between the health services, the obstetrician, and paediatrician, and, of first importance, the family doctor, whose key position must receive full recognition. The family doctor could carry out infant welfare within the ambit of his general practice.

Mr. K. C. RICHARDSON (London) then discussed the structural basis of milk discharge. He pointed out the need to distinguish between milk secretion and milk discharge. In the cow at the time of milking the milk pressure rose—the so-called "let-down." Where this did not occur, less than half the expected yield was obtained, only the cisterns and large ducts being emptied. The rise in milk pressure was due to activity of contractile tissue in the mammae initiated by a neurohormonal mechanism. Experimental evidence justified the belief that nervous reflexes from stimulation of the nipple and breast were transmitted to the posterior pituitary and led to discharge of oxytocin. A contraction resulted independent of smooth muscle surrounding the major ducts. Animal experiments had shown that oxytocin and other substances such as acetylcholine acted specifically on the contractile tissue in the absence of a motor-nerve supply and under conditions of constant blood pressure. Many accounts referred to the contractile tissue as smooth muscle intermingled with the mammary glandular units. There were, however, contractile myo-epithelial cells between the secretory epithelium and the basement membrane. Mr. Richardson showed interesting slides of goat and human material which, by means of a new method of silver impregnation applied to thick sections, clearly demonstrated the presence of myo-epithelial cells. The orientation of the cells was consistent with the assumption that they squeezed the distended alveoli and shortened the ducts so that they were held open.

He said it was not known whether myo-epithelium was innervated and so possessed a neural as well as a hormonal response. The sensory innervation of the breast and udder had not been sufficiently studied. The effect on the neuro-hormonal mechanism of milk discharge by stimuli from the skin surface and from the cerebral cortex was established, but knowledge was lacking whether filling of the breast influenced the mechanism.

Breast Tension

Dr. H. K. WALLER (Tunbridge Wells) said that security of lactation depended on regular emptying of the breast from the time secretion began. Failures resulted from insufficient regard to the condition of the breasts. He discouraged too hasty conclusions about the relation of failure of milk secretion to such factors as nervous upset and a return to domestic responsibilities. The relation between failure to secrete and excessive milk retention required prior consideration. It was known that involution tended to follow gross overloading of the breasts, and it was possible that distension might give rise to injury and irreversible interference with the function of the secretory cells. Among causes of incomplete emptying of the breasts were a yield in excess of the infant's requirements, lack of strength or of inclination to feed on the part of the baby, and nipples so adherent to deeper structures that effective suckling was impossible.

Discussing reflex stimulation, he suggested that the fact that milk might leak periodically between feeds was possible evidence that milk secretion was stimulated in part by milk tension reaching a certain level. He deprecated the use of rules intended for general application; submitted a plea for more objective study; asked for more help from the anatomist and the physiologist; and asked that obstetricians should realize that breast-feeding cannot be firmly established in the first two weeks of life.

The president, Professor CAPON, said that, while the part psychology played in normal breast-feeding must be respected, study must remain objective. Dr. D. CRADDOCK (Clare) considered that in general practice manual expression need not start before the 36th week of pregnancy, and that some practitioners had not the time to continue supervision for five weeks after the baby was born. Dr. K. M. HIRST (London), referring to a remark by Dr. Naish on co-operation, said it was the duty of the health visitor to visit as soon as possible after the attendance of the doctor or midwife had ceased, and thereafter as frequently as circumstances permitted. Dr. P. D. MOSS (Liverpool) gave self-demand feeding as a means of overcoming the tendency for hospital sisters temporarily to possess infants to the partial exclusion of the mothers. Dr. MARGARET M. FISHER (Luanshya, Northern Rhodesia), speaking as a mother, suggested that hospital routine allowed the mother little rest and that the baby should not be continuously at her bedside. Midwives and mothers-in-law were described by Dr. G. CATHERINE EVANS (Herne Bay) as inclined to have a discouraging influence on breast-feeding. This view, so far as midwives were concerned, was not shared by Dr. ALAN BARKER (Whitstable), who regretted the tendency for early discharge from hospital.

Professor W. S. CRAIG (Leeds) urged that antenatal care should have as one object the discouragement of weaning decided on without professional advice. The expectant mother should have impressed upon her that the doctor, health visitor, and midwife were there to maintain continuity of supervision and to advise if feeding difficulties arose at any time in infancy.

Speaking as an obstetrician Mr. A. H. HOLMES (St. Asaph) attributed many difficulties in breast-feeding to the attitude of the general practitioner, and expressed doubts about the value of stilboestrol in cases of breast congestion. Dr. J. D. HAY (Liverpool) spoke of experience of self-demand feeding at a maternity hospital. Four months' experience had been encouraging. The procedure was practicable and was appreciated by the mothers. Supervision of feeding was less close, but the nursing staff was less overworked.

Replying to points raised in discussion, Dr. NAISH shared doubts expressed about the use of stilboestrol. She urged that management of breast-feeding should not be determined by strict adherence to theories of rigid regimentation or of self-demand. Dr. WALLER described the use of stilboestrol as valuable and justifiable if carefully studied and if the nursing staff was carefully trained.

SECTION OF DERMATOLOGY

Thursday, July 20

Chemotherapy of Venereal Diseases

With the president, Dr. R. STOPFORD-TAYLOR (Liverpool), in the chair, Dr. ROBERT LEES (Manchester) opened a discussion on chemotherapy of venereal diseases, its uses and abuses. He said that the use of penicillin and sulphonamides was advocated in the treatment of gonorrhoea, but reliable tests to establish diagnosis and cure were essential. Streptomycin was preferable if coincident syphilis was suspected. Empirical treatment and neglect of ancillary treatment were common abuses, and overdosage with penicillin might conceal syphilis. He did not approve of penicillin by mouth as a prophylactic against venereal disease.

In cases of early syphilis penicillin alone might be curative, but the amount of drug and the duration of administration required were unknown. A common practice was to combine the use of penicillin, bismuth, and arsphenamines. A treatment schedule suggested had two phases: (*a*) a very intensive attack, lasting two to three weeks, with penicillin, bismuth, and arsphenamine; and (*b*) a prolonged phase—e.g., for six months—with arsenicals and bismuth. The place of penicillin in the treatment of late syphilis was still undetermined. It was valuable in syphilis of the central nervous system and might be useful in the treatment of cardiovascular lesions. For the latter, caution and the proper preparation of the patient by slow-acting drugs were advocated. Congenital syphilis could be prevented completely by antenatal treatment, which should consist of penicillin and bismuth, but not arsenicals. Special technique was needed for lesions such as interstitial keratitis.

Some abuses in the treatment of syphilis were: (1) overdosage, especially of cases of congenital syphilis and of latent cases with "fixed" positive serum reactions; (2) undertreatment of early syphilis, often without established diagnosis; (3) local applications of penicillin; and (4) treatment of healthy persons wrongly suspected of having syphilis.

Dr. SYDNEY M. LAIRD (Ipswich) said that chemotherapy represented a fundamental advance over the symptomatic treatments of earlier centuries. The principles of treatment were essentially the same irrespective of the particular chemotherapeutic drug. Three important factors were the virulence of the organism, the natural defensive powers of the patient, and the efficacy of the drug. The last depended on the sensitivity of the pathogenic organism and the tissue level of the drug which could be established at the site of infection. The combined use of chemotherapeutic agents might sometimes be advantageous. Accurate bacteriological diagnosis before treatment and adequate follow-up were essential.

In gonorrhoea one injection of penicillin was usually adequate for the uncomplicated case. In complicated cases longer chemotherapy and local treatment were required. Penicillin had established its place in the treatment of all stages of syphilis and with few exceptions should replace the arsphenamines. Bismuth compounds should be combined with it in all stages. In late syphilis treatment with bismuth should precede penicillin to reduce the risk of Herxheimer reaction and therapeutic paradox.

Dr. DOUGLAS J. CAMPBELL (Sheffield) thought that there was more rapid clearance and a higher rate of cure with the early pattern of treatment of gonorrhoea in the male with 100,000 units of penicillin than with the modern dosage of 300,000 units of procaine penicillin with 2% aluminium stearate. To avoid masking syphilis in cases of gonorrhoea dosage of penicillin should be either low or very high. The toxic effects of arsenic were overemphasized. Streptomycin, which was effective in non-venereal urethritis, was not as good as penicillin in the treatment of gonorrhoea. He had found the antihistamine drugs of some use in the treatment of interstitial keratitis.

Interference with Immunity

Dr. ARTHUR S. WIGFIELD (Worcester) emphasized that the relatively short six-weeks combined course of treatment with N.A.B., bismuth, and penicillin as prescribed in Liverpool carried less than a 2% failure rate. With this yardstick it was not necessary to treat hundreds of cases of early syphilis with newer and more intensive methods. Three failures should be sufficient to condemn a course. Intensive initial treatment interfered with immunity to syphilis. Clinical relapses following penicillin therapy alone occurred within the first nine months of the disease. He considered that the masking of syphilis by penicillin was less of a danger than was generally believed.

Dr. D. I. WILLIAMS (London) spoke on the value of B.A.L. in the treatment of arsenical and other metallic poisonings and especially of exfoliative dermatitis. The drug should be administered early; the necessary dosage was not yet settled. It should not be employed where there was any liver damage. There was a high incidence of sensitization to the drug. It was difficult to assess the published results, but they were certainly encouraging. He felt that B.A.L. should be given to all cases of arsenical intoxication except the mildest.

Dr. P. B. MUMFORD (Manchester) thought arsenical dermatitis was now rarely seen. The procaine employed with penicillin might cause sensitization reactions. Dr. A. O. FERGUSSON ROSS (Liverpool) referred to the early work with penicillin in the treatment of cases of secondary syphilis in Liverpool. He stressed the importance of care in the use of penicillin in late syphilis. Without preliminary medication it was dangerous in cardiovascular syphilis.

Colonel CLIFFORD MORGAN (U.S. Army) gave figures indicating the reduction in the incidence of venereal disease in the army in Europe. There was danger from concealed cases. Use was being made of the Career Guidance Council. Dr. J. T. INGRAM (Leeds) thought the development of some immunity in the patient was important. Penicillin was withheld until the middle of the period of treatment. Dr. A. MURRAY STUART (Portsmouth) thought that wives of men infected with gonorrhoea should be treated without waiting for confirmation of the diagnosis. He had found calcium thiosulphate of value in treating the toxic effects of arsenic. Dr. DONALD R. HUGGINS (Port of Spain, Trinidad) said that an effective short course of treatment for syphilis was essential to deal with the problem in the West Indies. Dr. J. P. G. ROGERSON (Shrewsbury) drew attention to the difficulties of the problem in small country communities. Patients could attend for treatment only once a week, because of distances and for economic reasons. He saw very little arsenical dermatitis.

The openers replied briefly to the points raised.

SECTIONS OF DISEASES OF THE CHEST AND TUBERCULOSIS AND OF PREVENTIVE MEDICINE

Thursday, July 20

Care of the Tuberculous Patient in the Home

With the president of the Section of Preventive Medicine, Professor W. M. FRAZER (Liverpool), in the chair, Professor F. R. G. HEAF (Cardiff) opened a discussion on the care of the tuberculous in the home. He drew attention to the lack of institutional facilities for the treatment of tuberculosis; the result of this was that 137,000 patients had to be treated in their own homes. The curative aspects of domiciliary treatment could be divided into two parts—pre-sanatorium and post-sanatorium. The success of pre-sanatorium treatment depended on the home conditions: when these were poor domiciliary treatment should not be attempted. Such patients should have priority for admission to a sanatorium. There must be co-operation between the chest physician and the general practitioner, and together they should teach the patient the importance of rest. The three essentials for successful domiciliary treatment were freedom from financial anxiety, facilities for rest, and a co-operative patient. Sympathetic help from the local health authority was also important. It had to be recognized that domiciliary treatment cost money, though it was cheaper than sanatorium treatment. A good ambulance service was necessary, and also a home-help service and facilities for occupational therapy. Active domiciliary treatment threw a great burden on the chest clinic, and the physician would need additional staff. Hospital beds for the treatment of complications were a necessity. Existing schemes proved that active domiciliary treatment could be successful. Collapse therapy should be used with care, and streptomycin should not be employed indiscriminately, because of the danger of spread of resistant organisms. An exception might be made in cases of tuberculous laryngitis with dysphagia and tuberculous tracheobronchitis. All general practitioners should consult the chest physician before giving streptomycin to their patients. During the pre-sanatorium period preventive measures should be instituted, and the education of the family was essential. Contacts should be examined and Mantoux-negative children vaccinated with B.C.G.

In the post-sanatorium period it was necessary to help the patient adapt himself to the change of environment from the sanatorium to the home. Prevention of the spread of infection and rehabilitation were the main objectives. The experience of village settlements, where serious tuberculosis in children is rare, showed that spread could be prevented.

Financial assistance and the finding of suitable occupations, including sheltered employment, were essential. Some of the money which would have been spent on these patients in hospital might be used to provide domiciliary treatment. But the spending of this money was the concern of the hospital board, and the local health authority was often disinclined to accept the financial burden which proper aftercare arrangements entailed. The reunion of the tuberculosis services was as essential to the anti-tuberculosis campaign as the provision of more nurses. Treatment must not be divided from prevention and aftercare, and hospital boards and local health authorities should find some means of co-operation, such as by the formation of local joint tuberculosis panels. Better still, the Act should be amended to provide a unified tuberculosis authority.

The Work of the Chest Clinic

Dr. R. GRENVILLE-MATHERS (Harrow, late of Wallasey) said that the chest clinic was now the major centre for the treatment of the tuberculous. Only selected cases suitable for active treatment should be admitted to the sanatorium, but there was a need for places where precautionary measures could be taught to other patients and where the deteriorating chronic patient could be looked after. Proper selection of patients would solve the sanatorium bed problem. There were dangers in instituting collapse therapy at home. In Wallasey the aim had been to put the available sanatorium beds to their maximum use. Patients were admitted for collapse therapy and discharged as soon as this was established, to continue their treatment at home. The co-operation of the general practitioners was secured, and by these means domiciliary treatment was successful if the home conditions were good. Mothers and housewives were unsuitable for home treatment. Home helps were required, but many patients were unable to afford the charge made by the local authority, and this penalized the patient who was having home treatment. The patient with a persistently positive sputum presented a major problem. Village settlements had pointed the way by showing that such a patient was not a danger if suitable conditions were provided. In the North Wirral area sputum-positive patients were given immediate priority for rehousing, and they were carefully trained in hygienic precautions and found suitable employment. A resettlement clinic which was attended by an officer from the Ministry of Labour had the task of selecting a suitable job for the patient, consideration being given both to his or her point of view of health and to the prevention of spread of the disease. Sixty-five per cent. of the children notified to this clinic had no known contact, showing that it was the unknown case of tuberculosis which was the danger.

Integration of the Tuberculosis Services

Dr. W. D. GRAY (Liverpool) said that the clinic physician was responsible for the care at home of all tuberculous persons, before and after sanatorium treatment. He must know the home, and the family must be treated as a whole and contacts examined and re-examined. Co-operation with the general practitioners was essential, but tuberculosis was not a well-taught subject in medical schools and some doctors did not realize the importance of rest. Many patients did very well when they were able to rest at home, but, especially in industrial areas, accommodation for urgent cases and patients from poor homes was needed. Housewives were unable to rest at home, and the majority of families could not afford the local authority's charges for home help. Housing policy must be used in a preventive way. In the North Liverpool area, with a population of 300,000, there were 1,895 adult patients: 140 were awaiting admission to hospital, and of these 82 were able to rest in bed in a separate room (this included married couples who shared a room), 5 were able to rest in a room shared with others, 35 were unable to rest, and 28 were unwilling to rest. In the same area 51 patients were deteriorating at home, 302 were ambulant but unfit for work, 58 were fit but unemployed, and 920 were working. Diagnosis and treatment and prevention and aftercare should not be separated. Beds should be allocated on an agreed plan between sanatorium and clinic, taking into consideration social as well as medical needs. Sympathetic attention should be given to each individual case—every patient could be helped, although not all could be treated.

In the subsequent discussion Dr. L. M. JOHNSTON (Wallasey) mentioned the dangers of tobacco-smoking. Dr. E. G. SITA-LUMSDEN (Southend-on-Sea) advocated postural retention for patients having home treatment and the greater use of open-air shelters. Dr. J. K. B. WADDINGTON (Liverpool) mentioned the gulf between the general practitioner and the specialist service. The chest clinic should maintain contact with the practitioner and preach the gospel to him. Dr. J. GREENWOOD WILSON (Cardiff) stressed the need for amending legislation to provide free home helps for the tuberculous. He said that some local authorities had lost the use of occupational therapy workshops in hospitals taken over by the hospital boards and that some patients abused housing priority. Dr. O. F. FRAZER (Liverpool) said that streptomycin should not be given to the patient who was likely to have surgical treatment, and he warned against its indiscriminate use in the home. P.A.S. was comparatively harmless. Dr. WATSON (Chester) thought that the great importance of preventive work in tuberculosis should be reflected in the grading of physicians engaged in such work. Dr. J. L. LIVINGSTONE (London) suggested that the matrons of teaching hospitals should be instructed, possibly by a booklet, in the very small risk attached to nursing tuberculosis. Nevertheless the conditions of nursing in some hospital wards for advanced cases still needed improvement. Dr. C. H. C. TOUSSAINT (London) mentioned the importance of the work of the welfare officer, who could help the patient undergoing domiciliary treatment to have an easy mind. In the home postural treatment and absolute rest were the most successful measures. He supported Dr. Johnston in a dislike of tobacco.

SECTION OF GERIATRICS

Thursday, July 20

Activity in Advancing Years

With Dr. C. O. STALLYBRASS, the president, in the chair, the theme of activity in advancing years was introduced by Dr. MARJORY W. WARREN (London), who contrasted the results of continued inactivity of body and mind with those of activity. She emphasized both physical and psychological aspects, mentioning stiffness of joints, contractures, and flexion deformities of limbs and neck, as well as the mental atrophy which is so often found. Much incontinence could be attributed to actual laziness and bad habits. The diagnosis of senility or simple old age should be avoided at all costs, since it could hide a multitude of physical and mental lesions. At the end of her talk Dr. Warren showed a film illustrating her methods of rehabilitation in cases of hemiplegia and of double amputation through the thighs.

Mr. J. P. HERON (Liverpool) spoke on the orthopaedic aspect of activity for the aged. He urged the need to conserve and increase all bodily function as much as possible. The less limbs were immobilized by plaster the better. As for the use of skin traction in fracture treatment, it gave poor results. He emphasized the need for planned treatment from the first time of seeing the patient. Consultation with the anaesthetist before operation was often more helpful than the opinion of the physician. Curare could be of great value in producing muscle relaxation for surgery. It was of great importance to start mobilization of the patient as well as of the affected limb soon after operation. Manipulation was best performed under a general anaesthetic, not too much being attempted at one session. Mr. Heron ended his talk with a brief survey of common orthopaedic complaints met with in elderly patients, together with practical points concerning their management.

Dr. TREVOR H. HOWELL (London) spoke on the need to analyse the various kinds of pain which might be found in elderly patients suffering from different types of arthritis. He distinguished between synovial pain, capsular pain, and pain secondary to muscle spasm. The first would usually respond to tetraethylammonium bromide or methonium compounds, and was described as general, diffuse, and throbbing, with exacerbations. The second was sharp, stabbing, and localized in character. It could be relieved for a time by accurate injection with a local analgesic. The third, also sharp and stabbing, was associated with muscle spasm which could be relaxed by 0.5 mg. of neostigmine intramuscularly.

Dr. S. R. HIRSCH (Brussels) gave an account of the newer conceptions of arteriosclerosis. He pointed out how the clinical and pathological aspects differed and how the experimental approach had not yet met the needs of the clinician. After summarizing the aetiological factors, Dr. Hirsch mentioned the vasomotor and haemodynamic results of ischaemia, congestion, and tension, which might be clinically silent although pathologically established. He ended with a plea for the establishment of an investigation into the early signs and symptoms, so that prevention might be attempted for a disease which had no effective form of treatment. "This is the scourge of contemporary humanity," was his conclusion.

Dr. ROBERT M. EVANS (Liverpool) spoke on the subject of pulmonary fibrosis as a cause of diminished activity among the elderly. Chronic bronchitis, old tuberculosis, or bronchiectasis in this age group all had this factor in common. The main symptom was dyspnoea, to which wheezing, cough, and the onset of congestive heart failure were added. In the aged, hypertrophy of the right ventricle was prevented by coronary insufficiency. Hence prevention was essential as early as possible. Removal from known aetiological factors, depression of cough, and removal of irritants to the pharynx were all needed. It was necessary to cut short all attacks of bronchitis by antibiotics and antispasmodics before more damage to the lung took place. Too much rest in bed should be avoided or lung bases would get clogged with sticky mucus.

Dr. LOUIS CARP (New York) gave a most interesting address on operative mortality in geriatric surgery. He emphasized the need for the surgeon to be a good doctor as well as technically expert. After describing the work of the Goldwater Memorial Hospital in New York, he showed how the operative mortality in various clinics ranged from 7% to 17% according to the amount of emergency work undertaken. In his unit half the cases needed emergency surgery, and these cases had a 39% mortality during the past five years. Surgery of election showed this rate diminished very considerably. Bronchopneumonia, pulmonary oedema, and peritonitis were the chief fatal complications, with pyelonephritis as a main contributory cause. Dr. Carp emphasized the need for planned procedure and careful preparation before operation. Nitrogen imbalance, fluid lack, and anaemia in particular required special study. After a survey of the common surgical conditions which prevailed and the technical measures needed, he stressed the importance of early ambulation and the limitation of sedation. Finally, there was the need for a proper psychological approach to the patient, which could result in co-operation instead of fear, nervousness, and resistance.

SECTION OF MEDICAL GENETICS

Thursday, July 20

Genetics and Medical Practice

After taking the chair, the president, Dr. C. P. BLACKER, said that this first meeting devoted to medical genetics in the history of B.M.A. Annual Conferences owed its inception to Professor Arnold Sorsby. Owing to other commitments Professor Sorsby was unfortunately unable to attend, but he had sent a letter of good wishes.

Professor L. S. PENROSE (London), opening the discussion on the contribution of genetics to medical practice, said he thought the contribution of genetics was real though of limited usefulness. There were, however, two fields in which it was of especial value. One was serology and the other pathological chemistry. He looked forward to the time when the treatment of metabolic disorders would be helped by the application of genetic knowledge. He did not consider that there was much hope of reducing the number of bad genes in the population, but said that guidance on having children could be useful in individual cases. The most important task for the immediate future was the study of relatively common, and therefore important, conditions in whose causation a hereditary contribution was important. He stressed the need for ascertaining the morbidity rates by sex, age, etc., as the all-important prerequisite.

This was illustrated by studies on peptic ulcer and mammary cancer, in which the necessary basic figures for the population were first obtained. It could then be seen that the rate among brothers of sufferers from the first condition and among female relatives of sufferers from the second were about doubled as compared with rates in the general population.

Tests for Paternity

Dr. R. R. RACE (London) then discussed practical aspects of blood-group genetics. He mentioned the genetic simplicity of the subject and said that there were now eight independent systems of blood groups. The gene and the antigen might be almost the same thing, and the ultimate contribution to pure genetic theory might be great. He outlined the story of haemolytic disease and deplored the fact that girls were still, at least recently, being given transfusions or injections of whole blood in the attempt to protect against measles, without rhesus testing. The chance of a single incompatible transfusion or injection immunizing the patient permanently was 50%, and those so immunized stood a high chance of losing their first and subsequent babies if, as would be usual, they married an Rh-positive man.

On the subject of exclusion of paternity, he said that this country was very backward in its appreciation of the new knowledge. In Denmark the number officially tested was now 20,000. It was a great pity that Lord Merthyr's admirable Bill became a war casualty. It was now possible to exclude 62% of wrongful paternities, and in his experience half the paternities attributed were wrong. As 7,200 affiliation orders were made in a year and 2,000 men went to prison for non-payment, he thought that preventable injustice was being inflicted on a large scale. The majority of suspected mixings of babies at maternity hospitals could be cleared up by serological methods.

Genetic Clinic

Dr. J. A. FRASER ROBERTS (London) described a genetic clinic organized in connexion with the Institute of Child Health of the University of London, and held once a month at the Hospital for Sick Children, Great Ormond Street. Patients were referred by the physicians and surgeons to the hospital. While the proportion of the population needing genetic advice might be small, the numbers in any large city would be considerable.

Cases should be referred by the family doctor or a specialist, and all necessary investigations should already have been carried out. One man could give reasonable advice over the whole field except for genetic advice on mental disease (not mental deficiency), which should be provided by a psychiatrist who was also a geneticist. The chances should be explained, but the decision left to the persons concerned. In his experience it was possible to give advice adequate for the patient's needs in the great majority of instances. Much of the work consisted in reassuring those who had little to fear.

The discussion was summed up by Professor F. A. E. CREW, F.R.S. (Edinburgh), who on the basis of his long experience in genetics contrasted the work of the plant and animal breeder with that among human beings. He stressed the fact that at a genetic clinic the real patient was the unborn child. The doctor could not escape having the power to influence conduct, and this must be increasingly based on exact knowledge. He devoted his concluding remarks to the serious genetic implications of the use of radiation in industry and medicine. These beneficent activities could not only hurt individuals but were potent in regard to the well-being of future generations. Here was a new field of mutational prophylaxis which was to be based on genetic knowledge.

In the discussion that followed, Dr. WILLIAM N. PICKLES (Aysgarth) said that the general practitioner who had been long in one district saw clearly the baneful trend of hereditary disease—not of rare diseases such as had been mentioned that morning, but of common conditions such as hypertension and glycosuria. He described a remarkable family which contained 62 members of whom 23 had had rheumatic fever or unmistakable signs of mitral disease. It was for the G.P. to provide facts of this sort and for others more skilled to give advice on them. He pleaded for a greater interest in genetics by G.P.s and a close liaison between them and the geneticist.

Dr. MURIEL BARTON HALL (Liverpool) mentioned the difficulty in routine clinical practice of making use in the genetic field of relevant material which presented itself.

Dr. N. S. BARNETT (Liverpool) asked whether it was possible, if the "undesirable" type—for example, the achondroplastic dwarf—were allowed to breed and rebreed, that by mutation a type might emerge superior to the previously accepted standard of "fitness." Dr. FRASER ROBERTS said that there was little chance of this.

The president, Dr. BLACKER, and Professor CREW remarked on the general agreement among those present in their approach to these problems. This new Section had been inaugurated with some diffidence, but could look forward to a useful future.

SECTION OF NEUROLOGY

Thursday, July 20

The Diagnosis and Treatment of Pain in the Upper Limb

With the president, Sir HUGH CAIRNS, in the chair, Dr. M. J. MCARDLE (London) opened the session by referring to the considerable advances in knowledge of this subject during the last ten years. The diagnosis of "brachial neuritis" was rarely made to-day. In 1938 frequent reference was made to the scalenus syndrome as a cause of pain in the arm, but recently this had received less attention. The lesson had been drawn from our knowledge of lumbar disk lesions as a cause of sciatica, and greater interest was now taken in cervical disk lesions producing cervical root irritation. Practically all cases of pain in the arm were included under the following headings: disk root lesions, costoclavicular syndrome, acroparaesthesia, and fibrositis. Cervical root pain was of a constant character, being a nagging severe pain not intensified by abduction of the arm. There was tenderness of the muscles supplied by the affected root. Objective signs of a root lesion would be found on careful examination: objective sensory signs were minimal and motor changes were diagnostically the most useful.

Prolapsed cervical disks were usually those between the fifth and sixth or sixth and seventh vertebrae. Lateral flexion of the neck towards the side of the lesion might exaggerate the pain. Dr. McArdle referred to the small "neurocentral" joints whose importance had recently been emphasized by Dr. James Bull, and said that osteophyte formation from these joints, when arthritic, could compress and irritate a cervical root in its foramen. A prolapsed disk and an osteophyte were not very easy to differentiate as a cause of root pain. A sudden onset of symptoms favoured a disk lesion, and slow changes

osteoarthritis. *X*-ray examination might reveal the osteophyte formation. The differentiation was not very important, as treatment was the same. Diffuse osteoarthritis of the cervical spine did not commonly produce root irritability. Pressure at the cervico-brachial junction was the most controversial aspect of the subject. If there were no vasomotor changes it was not very easy to diagnose. "Proximal thenar atrophy" was sometimes caused by such pressure. Unaccustomed physical strain, such as the carrying of heavy weights, might produce temporary symptoms. Recent investigations had shown that costoclavicular compression (compression of the subclavian artery and the brachial plexus between the clavicle and the first rib) was impossible if there was no gross structural abnormality.

Acroparaesthesia was most often seen in women between the ages of 40 and 50 years and commonly woke them at night by intense burning sensations in the hands and arms, sometimes paroxysmal in character, and there was usually an unpleasant aching pain as well. Manual work during the day appeared to be a provocative factor. The syndrome ran a chronic fluctuating course from a few months to thirty years. It was very unusual in men. Dr. McArdle considered that the paraesthesia was due to nerve compression of some kind occurring at varying sites. Sometimes it was a median nerve compression in the carpal tunnel. He had had a dozen suspected cases of this in which surgical decompression of the median nerves had given uniformly good results. In other cases the ulnar nerve might be involved, and yet others were of very obscure aetiology. Our views in five to ten years' time would be very different from those of to-day.

Cervical Disk Lesions

Dr. M. KREMER (London) considered that in most cases symptoms due to a cervical disk lesion were insidious in onset. Sometimes a history of an antecedent stiff neck was obtained, but this was not common—not as common as the history of lumbago preceding sciatica. The root pain from a cervical disk lesion generally began at the root of the neck and spread laterally either anteriorly or posteriorly to the axillary fold, then down either the anterior or posterior aspect of the arm to the elbow. The pain usually paused for a time at the elbow. Very rarely the pain extended further below the wrist and into the fingers. The affected muscles became very tender. In left-sided cases coronary pain was sometimes simulated. Muscular spasm occurred in some cases. The head might be tilted towards the shoulder on the affected side. As a result of spasm and immobilization the condition of "frozen shoulder" might develop. By the time pain had reached the wrist paraesthesia had usually developed in the fingers. Sensory changes resulted in difficulties in picking up small objects. A visible flabbiness or atonia was often seen in affected muscles and there might be reflex losses. Some objective signs would invariably be found after a few weeks in all these cases of root lesion. The pain was of a very severe character. It was worse at night. Sleep might become impossible. Additional pain was caused by putting strains on muscles in spasm. Movements of the neck are commonly restricted. Patients would often seem to "turn in one piece." Even in the early stages of root lesions some pathognostic signs were generally to be found. For example, pressure vertically downwards on the head might produce root pain. In contrast, traction under the chin might give great relief; this was a most useful sign.

Dr. Kremer emphasized the importance of conservatism in treatment. More than 90% of cases became well spontaneously in six to ten weeks. The keynote of treatment was rest in bed. The three-quarters sitting position, properly supported, was best, though lying flat suited some patients better. Sandbags might be necessary to keep the head still, and the affected limb must be fully supported. Analgesic drugs should be freely given to relieve pain where necessary. The object was to secure complete rest in bed by obtaining relief of all pain by appropriate drugs. Manipulation under general anaesthesia was dangerous. The use of a neck-sling, with extension, was valuable for the relief of pain in some cases. If necessary a plastic or leather collar for the neck could be fitted, or, alternatively, a temporary collar could be made by the patient himself from a sheet of 1-in. orthopaedic rubber. Only a very small percentage of cases required operative treatment. Dr. Kremer referred to neuralgic amyotrophy as another cause of pain in the arm in young adults. Severe pain at the root of the neck and around the shoulder was present for 10 to 20 days. Then weakening and wasting of the affected muscles became noticeable. Later the pain disappeared, and recovery, partial or complete, slowly took place.

Radiological Features

Dr. J. W. D. BULL (London) described the radiological anatomy of the cervical spine, with particular reference to the structures bordering on the exit foramina of the vertebrae. He pointed out the importance of the small neurocentral joints which lay on the lateral aspects of the bodies of the third to seventh cervical vertebrae only; they also formed the anterior border of the exit foramina. He showed how in cases of cervical disk degeneration these joints often showed signs of arthritis and osteophyte formation encroaching on the exit foramen. He felt that this feature was one of the factors in the production of brachial neuralgia. He stressed the puzzling absence of symptoms in some cases with marked radiological abnormalities and referred to our ignorance of many other factors concerned in causing root pains in the arm. He expressed the view—and other speakers agreed—that myelography was unnecessary in the diagnosis of cervical disk lesions.

Mr. W. R. HENDERSON (Leeds) said that an important point in the diagnosis of cervical disk lesions was that only one root was affected. He agreed that the treatment was mainly conservative and operation rarely needed. He spoke of the dangers of manipulation. Such treatment might occasionally result in sudden improvement but sometimes made the symptoms worse. Operative treatment was essential if there was compression of the spinal cord. Spinal tumour was an occasional cause of pain in the arm. Such tumours were generally extradural, benign, and removable if diagnosed early enough. Root pains from such tumours usually occurred over the shoulder and down the arm. There might, however, be very little root pain, and this added to the risk of misdiagnosis. There was a danger of overlooking the presence of removable tumours by considering prolapse of cervical disk as the cause in all cases of cervical root pain.

Mr. D. LLOYD GRIFFITHS (Manchester) spoke from the standpoint of the orthopaedic surgeon and stressed that the commonest cause of pain down the arm was something wrong with the shoulder. Among his cases, only one in five of pain in the arm was due to a cervical disk. The disk syndrome was easily recognizable, as was the shoulder syndrome. There were some cases, however, that could be very difficult to diagnose. The pains from a shoulder lesion were from soft tissues, the capsule, and surrounding tendons. In such cases not only might "frozen shoulder" develop but also "frozen hand," and after the pain had disappeared movements remained restricted. Many cases of rheumatoid arthritis in middle age began with pain in the neck and down the arm. In normal people the costoclavicular syndrome was of no importance, but it became very important when a large cervical rib was present. Unlike the lumbar region, in the cervical region osteoarthritis in the spine was common in cases of cervical disk lesions. Mr. Griffiths disagreed with Dr. Kremer and considered that a plaster-of-Paris jacket to fix the neck was more important than rest in bed. It could relieve pain dramatically. Lastly, referred pain—such as that of cardiac disease—should not be forgotten.

Mr. D. M. MORRISSEY (Birmingham) spoke of the costoclavicular or thoracic inlet syndrome. He considered that the loss of supraclavicular hollowing was a sign of a falling clavicle. This was particularly important in cases of cervical rib, which might become very prominent. He agreed with other speakers that alteration in the pulse volume was of little significance. Except in rare cases conservative treatment gave the best results. Nearly all patients recovered spontaneously. Operation might be required if a cervical rib gave rise to severe symptoms.

The Care of Paraplegics

In the afternoon the Section visited the spinal injury unit at the Southport Promenade Hospital. Mr. A. SUTCLIFFE KERR (Liverpool), in a preliminary address, stated that it was now not enough to keep all paraplegics alive. They must be rehabilitated

sufficiently to be able to go home. The treatment of their cases could be put in three categories: care of the renal tract, of the skin, and of the patient's mental outlook. A keen nursing staff was necessary. In the early stages paraplegics had to be turned every two hours to reduce the risk of bedsores. They might have to be nursed on their faces for long periods. Rehabilitation consisted largely in developing the muscles of the upper trunk and arms: these could largely replace those of the legs in relearning to walk. In the treatment of bedsores already present Mr. Kerr advised bland, not sticky, dressings, the excision of sloughs, and the use of full-thickness pedicle skin grafts where necessary. Stiff joints were a handicap, and joints should be kept healthy by physiotherapy. Mr. Kerr stressed that every patient with a lesion at the tenth dorsal segment or below should be able to walk. Spastic paraplegics were less easy to rehabilitate. It was important to have a resettlement unit in connexion with a spinal injury centre. Mr. J. COSBIE ROSS (Liverpool) and others spoke on the urological problems in paraplegics; in the relief of chronic retention of urine bladder-neck resection had important possibilities. Apparatus of an original character for training patients to walk was demonstrated.

SECTION OF RADIOLOGY

Thursday, July 20

Some Aspects of Bronchiectasis

With Dr. P. H. WHITAKER (Liverpool), a vice-president, in the chair, Dr. J. C. H. MACKENZIE (Leicester), opened the discussion on bronchiectasis, which, he said, was defined as a condition with dilatation of the bronchi. With the introduction of iodized oil as a contrast medium it had become possible to confirm the diagnosis during life.

In the medical literature there were no statistics of the incidence of this disease in a community. The figures from the Leicester Isolation Hospital and Chest Unit showed that the greatest incidence occurred up to the age of 15 years, and that the incidence in females was greater, particularly up to the age of 10. There was good co-operation between the Leicester chest unit and the Leicester City school medical service, and the figures for bronchiectasis among the school population in the city could be considered reliable. These cases of bronchiectasis were proved by bronchograms. The incidence was 2.9 per 1,000 school-children. The speaker suggested that the incidence would vary between communities, depending on social factors, the efficiency with which T.B.-positive cases were isolated from children, and the efficiency of chemotherapeutics and antibiotics.

The aetiological factors were mechanical forces—from traction and from distension from secretory pressure—and infection. Lander and Davidson had shown that traction forces within a collapsed segment produced dilatation of the bronchi, and they suggested that bronchiectasis was reversible. Lander in 1946 further suggested that in an incomplete bronchial stenosis the collapse was peripherally situated and the bronchus dilated, but that in complete obstruction dilatation might occur from secretory pressure. Infections which produced dilatation of the bronchi could be acute, subacute, or chronic. Acute destruction of the lung tissue occurred in Friedländer's pneumonia—non-specific suppurative pneumonitis and viral diseases associated with secondary infection. The subacute destructive changes occurred in tuberculosis when the upper lobes were particularly involved. The bulk of cases of bronchiectasis were chronic and invariably began with atelectasis of the lower lobes, either from an inflammatory cause or from glandular pressure, particularly tuberculous hilar adenitis. Bronchiectasis, however, did not necessarily follow atelectasis.

Pathological Changes

Dr. F. WHITWELL (Liverpool) said that his material had been collected from surgically resected lungs for bronchiectasis. He divided his cases into three main groups. First, the disease occurred in young people, usually following previous respiratory infections—particularly whooping-cough and measles. Here there were thickened, inflamed bronchi surrounded by zones of chronic interstitial pneumonia. No epithelial ulceration had been observed. These changes produced a compression of the bronchi and bronchioles from outside. The absence of alveolar filling and mucous plugs suggested that collapse was unimportant in the causation of bronchiectasis, and that the changes of importance were a peripheral bronchial obstruction.

In the second category was the saccular type of bronchiectasis, occurring in older people, usually without any previous respiratory infection. Sections showed an obvious saccule, which had a fibrous wall and was lined by metaplasic squamous epithelium. This was surrounded by normal alveoli, while the draining bronchus showed superficial bronchial inflammation with polypoid changes. These produced partial obstruction but no destruction of the bronchial wall. The third group of cases showed evidence of collapse with generalized bronchiectasis. The cause was enlarged hilar masses, usually tuberculous glands.

Lung Function

Dr. F. J. PRIME (Liverpool) described studies of lung function in a series of cases of bronchiectasis of varying severity in adults. The cases fell into two groups. In one function was but little affected: vital capacity, total lung capacity, and residual air were normal, but some degree of dysfunction was apparent in a reduced breathing reserve and minimal suboxygenation of the arterial blood. In the second group all measurements were grossly abnormal. Severe emphysema, shown by a high ratio of residual air to total lung capacity, was present in all, together with gross defects of intrapulmonary mixing of inspired with lung air. All the findings were such as would be expected from spreading fibrosis, with the production of focal or generalized emphysema.

In the general discussion the chairman, Dr. P. H. WHITAKER, said that in cases of bronchiectasis most of the damage was done in childhood, and early recognition of the disease was essential. Professor A. S. JOHNSTONE (Leeds) referred to the irregularity and kinking that might occur in the bronchi and bronchioles in an otherwise normal bronchogram, and suggested that these might be due to early bronchiectatic changes. Dr. R. J. KEATING (Wirral) noted that all cases of bronchiectasis did not fit into the groups that had been described, and suggested that a possible vascular disturbance might be associated. Dr. K. D. F. MORLE (Liverpool) referred to cases of reversible bronchiectasis which he had noted in healthy adults. These would appear to follow a segmental pneumonitis: bronchographic studies disclosed that return to normal occurred in from 10 days to 6 months. Mr. L. G. CRUIKSHANK (Leicester), Dr. J. E. WALLACE (Bognor Regis), Dr. R. FAWCITT (Ulverston), Dr. W. S. HOLDEN (Liverpool), Dr. G. B. LOCKE (Manchester), Dr. J. A. ROSS (Liverpool), and Dr. J. S. FULTON (Liverpool) also joined in the discussion. Replies were given by the opening speakers.

SECTIONS OF OTO-RHINO-LARYNGOLOGY AND RADIOLOGY

Thursday, July 20

Carcinoma of the Larynx

With the president of the Section of Oto-rhino-laryngology, Mr. I. SIMSON HALL (Edinburgh), in the chair, Dr. M. LEDERMAN (London) opened the discussion. Laryngeal cancer, he said, could be subdivided into supraglottic, glottic, and subglottic forms. The old classification into intrinsic and extrinsic groups should be abandoned. Of the radiotherapeutic methods of treatment available, external radiation by teleradium or high-voltage *x*-ray therapy was to be preferred, particularly the former if available. Radiation might be used for curative or palliative purposes or as a pre- or post-operative measure. The palliative value of radiotherapy was considerable. Pre- and post-operative radiation should be used with discretion.

Supraglottic tumours should be treated by radiotherapy, and subglottic tumours should be treated surgically. Radiotherapy should be used for all cases of glottic tumours suitable for laryngo-fissure, partial laryngectomy, or laryngectomy in which the cord was still mobile. Surgery should be reserved for cases unsuitable for curative radiotherapy—that is, the more advanced, recurrent, or complicated cases. If the primary lesion was to be treated by radiation and nodes were present, these should be treated in the same way. If the primary lesion was healed and operable nodes appeared, block dissection should be performed. Inoperable nodes should receive palliative radiotherapy. "Prophylactic" irradiation of the neck was indicated for all supraglottic tumours. The results of teleradium treatment at the Royal Cancer Hospital, London, were as follows: 5-year survivals—operable cases, 16 out of 23 (70%); all cases, 18 out of 56 (32%). 3-year survivals—operable cases, 30 out of 46 (65%); all cases, 35 out of 96 (35%).

The discussion was continued by Mr. C. P. WILSON (London), who said that the factors to be considered in deciding upon the best method of treatment in intrinsic carcinoma of the larynx were the site of origin and extent of the growth, the mobility of the cord, the histological features, and the type of patient. The methods of treatment available were radiotherapeutic, limited surgical removal, radical surgical removal, and palliative treatment only. Early growths—with a rigid regard for the definition of an early growth—gave equally good results whether treated by radiotherapy or limited surgical removal by the laryngo-fissure route. Choice would depend upon the facilities available, the histological features, and the circumstances of the patient. More extensive unilateral growths were best treated by radiotherapy. Growths of the commissure should be treated by radiotherapy rather than by limited surgical removal. Growths with fixation of the cords were better treated by radical surgery than by radiotherapy. Advanced growths should be treated by radical surgery in comparatively fit patients and by palliative measures in the old and infirm. Subglottic and supraglottic growths were both less favourable than glottic growths for treatment either by surgery or by radiotherapy; if comparatively early, radiotherapy might be the better, but if there was fixation of the cord, or if the growth was of an extensive nature, radical surgery offered a more favourable prognosis. If the growth was of a well-differentiated keratinizing type there should be a bias in favour of surgery, but if the growth was of a non-keratinizing undifferentiated type the bias should be in favour of radiotherapy.

Recurrence after previous limited surgery or radiotherapy should be treated by radical surgery or palliative means alone. A second course of radiotherapy should be given only rarely. If glands were present the results were likely to be poor whatever treatment was adopted. If they were of differentiated type and were amenable to radical surgical removal this should be done, otherwise only radiotherapy or palliative treatment should be given.

Radiological Examination of the Larynx

Dr. J. J. STEVENSON (London) said that a thorough radiological examination of the larynx was not one which was carried out in many hospitals in this country. While it was a time-consuming investigation requiring a special technique, the information gathered from it did supplement that obtained by clinical methods. It was often helpful in determining the site of origin of a tumour, thus influencing the method of treatment and the prognosis. The extent, and particularly the lower borders, of laryngeal tumours were very difficult to assess by any other means. Indirect laryngoscopy sometimes failed to show subglottic extension of laryngeal growths which could be easily demonstrated by radiography. This method was also of help in assessing the nature of the tumour—as in the case of involvement of the epiglottis. To discover whether the growth was ulcerating, infiltrating, or proliferating was useful in planning the management of the case. The propagation of the tumour could be appreciated in most cases of spread into the pre-epiglottic space or into the pharynx. Finally, in cases subjected to radiotherapy it provided an objective record of the patients' response to treatment.

Dr. Stevenson said that his practice in all cases of carcinoma of the larynx was to take soft-tissue lateral radiographs and antero-posterior tomographs. Two lateral views were taken, one during normal respiration and one during phonation: as well as showing the topography, these helped to show the mobility of the laryngeal structures.

Mr. TERENCE CAWTHORNE (London) said that he regarded it as very satisfactory that surgeons and radiologists were in such close agreement about the treatment of this condition. He also referred to Dr. Constance Wood's work for the Medical Research Council and her successful results in the treatment of carcinoma of the larynx. Lieutenant-Colonel D. MACD. FRASER (Liverpool) asked how big a disability a total laryngectomy was to a labouring man who had to use considerable energy. Dr. S. C. SEN (New Delhi) asked whether the Coutard method of protracted treatment, as against high-intensity treatment, was still in favour amongst radiotherapists.

Combination of Surgery and Radiotherapy

The chairman, Mr. I. SIMSON HALL (Edinburgh), said that no surgical operation on the larynx was performed in his clinic between 1932 and 1942. The five-year recovery rate was 20%, *x*-ray therapy alone being used. This convinced him of the necessity for combining surgery with radiotherapy. Dr. J. S. FULTON (Liverpool), president of the Section of Radiology, said that he thought that the subject had been most adequately covered by the opening speakers. He was very much against the use of the single-dose method of radiation in the treatment of any form of cancer. He recommended continuous radiation for seven to ten days. He considered that radiation was not a successful method after surgery. In his opinion the discomfort caused to the patient by radiotherapy was much exaggerated.

Mr. WILSON, in replying, stressed that there was no conflict between laryngologists and radiotherapists. He thought that radiation was quite useless in the treatment of hyperkeratosis. He disagreed with Dr. Lederman that supraglottic tumours were not removable surgically. The modern operation of laryngectomy allowed even a labourer to do almost anything except swim. Dr. LEDERMAN also spoke in reply. He said that Coutard's method of low dosage had been almost universally abandoned.

SECTION OF TROPICAL MEDICINE

Thursday, July 20

Intestinal Parasites of Man in Great Britain

With Professor R. M. GORDON (Liverpool) in the chair, Professor J. J. C. BUCKLEY (London) spoke on helminthic infections of man in Great Britain. He said that on account of the climate and geographical position Britain's human helminthological fauna was restricted to relatively few of the 120-odd species known to occur in man. Those which did occur could be divided into those for which man was the normal host and those which were normally parasites of domesticated animals—e.g., dog and sheep—and which occurred in man only accidentally. Most of the "accidental" parasites came from the dog because it was a privileged household pet. They belonged mostly to the tapeworm family, and it should be recognized that tapeworms in dogs were dangerous and should be removed. *Dipylidium caninum* (which could be recognized by its segments) might be regarded as a trivial danger, but *Taenia multiceps* and *T. serialis* were more serious. The most dangerous of all was *Echinococcus granulosus*, which was easily overlooked in dogs, being very small, and which produced hydatid cysts if the eggs were swallowed. Fortunately human infections were now rare.

The "normal" parasites of man included four nematodes. Of these *Ascaris lumbricoides* and *Trichuris trichiura* were rarely important in Britain. *Enterobius vermicularis* (although in one sense it passed a "hand-to-mouth" existence) was very common. Recently it had been shown that the infection could be continued in the same host by a method named "retrofection," wherein eggs (scattered in the perianal region by the migrating female threadworm) hatched into larvae, which crawled back through the anus into the original host and attained maturity in the caecum. *Trichinella spiralis* had attracted attention during the war because of several outbreaks in widely separated localities in England and Wales. A pre-war survey had shown subclinical infection in only 2 out of 200 human diaphragms examined at necropsy, but a

survey made later in the war revealed trichiniasis in 10.8%. Women were infected more often than men.

The human tapeworms in Great Britain included *Taenia solium* and *T. saginata*, the latter appearing in beef as *Cysticercus bovis*. Routine meat inspection at abattoirs had shown a marked increase in the frequency of *C. bovis* in meat. A similar increase had been recorded from Denmark, and there it was accompanied by a rising incidence of the tapeworm in man. The general experience in Denmark had shown that meat inspection does not prevent transmission of the infection to human beings, since the cysts are often few and are easily overlooked. The other human tapeworm, *T. saginata*, which was derived from pigs, was fortunately now rare, partly because of efficient meat inspection, and partly because of the improved methods of keeping and feeding pigs.

Dr. C. A. HOARE (London) spoke on amoebiasis in Great Britain. His paper was published in full in last week's *Journal* (July 29, p. 238).

Treatment of Intestinal Helminths

Dr. R. F. VERE-HODGE (Tisbury, Wilts) spoke on the treatment of intestinal helminths. Before treatment a careful examination should be made to exclude debilitated subjects, the dose should not be repeated within ten days to avoid accumulation of the drug, and in children it was best to err on the side of underdosage. The commonest infestation was by threadworms. Treatment by gentian violet was usually effective, but relapse or reinfection often occurred. Younger children must be treated with quassia enemata on alternate days, probably for a month. In Britain ascaris never occurred in such overwhelming numbers as in China, where one patient might harbour as many as 2,000 worms. Santonin, being non-toxic, was the best drug to give, provided that oils, fats, and alkalis were avoided. A second treatment, 4–7 days later might be necessary. The treatment of taenia was often difficult and uncertain. He recommended fluid diet and purgation for two days, then a dose of 90 min. (5.3 ml.) of liquid extract of male fern, followed half an hour later by magnesium sulphate. Carbon tetrachloride was also effective, but might be toxic. Hexylresorcinol was non-toxic but not very effective. For hookworm he recommended tetrachlorethylene plus oil of chenopodium. Strongyloides was usually resistant to treatment, but methylene blue had given promising results in a small series of cases.

Mr. R. B. GRIFFITHS (Liverpool) spoke on the incidence of *Cysticercus bovis* in Great Britain. Apparently this had recently become more common, and in 1949 routine inspection at the abattoirs had shown that 1.6 to 4.2% of the cattle slaughtered might contain it. It must be recognized that inspection at the abattoir could not detect all cases of infection, and the housewife must constitute a second line of defence by insisting on the thorough cooking of all meat. Apparently women were more liable to infections derived from meat than men were. The problem was of appreciable financial as well as medical importance, and a careful inquiry into the means of improving preventive measures to protect cattle from this infection would be well worth while.

Infestation in Children

Dr. R. C. MACKEITH (London) described the case of an infant with an ocular infection by *Enterobius vermicularis*. He also described a survey of the faeces of 142 children in London which showed 4 infected with *E. vermicularis* (perianal smears detected many other cases), 1 with *Trichuris trichiura*, 9 with *Giardia lamblia*, 1 with *Chilomastix mesnili*, 12 with *Entamoeba coli*, 3 with *Endolimax nana*, and 10 with *Blastocystis hominis*. Many of these infections occurred in the same patients. Other speakers in the discussion included Dr. L. E. NAPIER (London), Colonel W. H. HARGREAVES (London), Brigadier J. S. K. BOYD (London), Mr. P. L. LEROUX (London), and Dr. A. R. D. ADAMS (Liverpool). It was agreed that the higher rate of infections from meat among women was probably due to the contamination of the hands, though in some cases during the war trichiniasis had been contracted by eating raw sausages. In most cases *G. lamblia* was non-pathogenic, but many of the speakers considered that it might cause a peculiar chronic diarrhoea in certain patients.

SECTION OF ORTHOPAEDICS

Thursday, July 20

Treatment of the Short Leg

With the president, Dr. BRYAN L. MCFARLAND (Liverpool), in the chair, Mr. GORONWY E. THOMAS (Liverpool) opened a discussion on treatment of the short leg. Having described the common methods of alleviation by alteration to footwear and noting the possibility of disguising a very short limb within an extension prosthesis, Mr. Thomas reviewed methods of surgical correction either by lengthening the affected limb or by shortening the normal one. During the growth period of the *long* limb, operations could be performed for arresting growth by interfering with the epiphysial line by either permanent ablation (epiphysiodesis) or temporary interference by *stapling*; after the period of growth, shortening osteotomies, generally femoral, could be performed. The optimum period for the former was between the years of 8 and 11, and for osteotomy after the age of 12. He drew attention to the risks of operation, particularly of the ablation type, during the growth period, for late deformity had been reported in from 10% to 20% of cases. Discussing operations for the *short* leg, he said that sympathectomy to improve its vascularity and therefore its growth was unreliable and the improvement insignificant. When growth had ceased, lengthening of the short leg by osteotomy and distraction of either the femur or of the tibia and fibula was a procedure of complexity, and there were not unimportant possibilities of complications. The whole problem was difficult of decision, for, while leg shortening of the normal limb was less complicated and demanded a shorter period in hospital, it had the material disadvantage of general reduction in stature.

Mr. F. G. ALLAN (Birmingham), speaking about leg lengthening, discussed the problem on the basis of 101 cases. The tibia and fibula had been lengthened in 54 and the femur in 47, the largest number in the former group being for poliomyelitis and in the latter for shortening due to tuberculosis of the hip. The surgical technique and the complex apparatus used were described. Mr. Allan emphasized the necessity for a three-point hold above and below the step-cut osteotomies of the tibia and fibula, each comprising two *transfixion pins* and plaster-of-Paris. In the femur the maintenance of alignment was more difficult. The principles of the method were absolute fixation of the fragments, and completely controlled distraction, which was carried out very slowly. The possible complications included traction lesions in nerves, fracture of one or other of the step-cut osteotomies, mal-union, delayed union, weakness of lengthened muscles, osteomyelitis, traumatic arthritis, late fracture, pressure or stretch necrosis of skin, and circulatory disturbances.

Mr. A. L. EYRE-BROOK (Bristol), discussing surgical shortening, said that epiphysial arrest was more readily within the scope of the average surgeon and had few risks. Post-operative deformity had been a cause of criticism of the procedure, but he felt that this was minimized by greater thoroughness in the process of ablation of the epiphysial line. Besides the insertion of grafts across each side of the epiphyses, above and below the knee, it was necessary to excise a large section of the epiphysial cartilage between the grafts. Surgical shortening was the preferable approach to all patients in the older age group with the exception of a small number who were unwilling or who could ill afford to sacrifice any height. It was a safe procedure, quick in its results. It was best done in the femur, and as much as 4 in. (10 cm.) of shortening could thus be obtained with full return of knee movements and muscular control within three to five months.

In the subsequent discussion, Mr. H. OSMOND-CLARKE (London) noted the possibilities which were being explored in Sweden to improve the vascularity of the short limb, and therefore growth, by the production of an arteriovenous fistula with ligation of the main vein on the proximal side. He also stated that insufficient attention was being paid to the psychological problems of the patient in whom shortening a normal limb was contemplated. While in the adult this could be decided by the individual more readily, surgeons were assuming a very serious responsibility in committing a child to a future of psychological stress associated with shortened stature.

Mr. D. WAINWRIGHT (Newcastle, Staffs) described an elongating Thomas splint on which the limb was supported during bone lengthening of the femur, for which he advocated an oblique osteotomy from the region of the lesser trochanter downwards and outwards. Mr. H. J. SEDDON (London) and Mr. B. L. MCFARLAND, the president, both stressed the importance of segregating such cases in the hands of a few people prepared to master the complex technique involved.

Acute Osteomyelitis

Professor WALTER MERCER (Edinburgh) noted the beneficial effect which the use of modern chemotherapeutic drugs had had on acute osteomyelitis. There were still the problems of early diagnosis, the best use of penicillin, and the indications for surgery. The responsibility of general practitioners was very great in the early recognition of osteomyelitis, for the cure of the disease depended on the start of antibiotic treatment within five days of onset. After that, abscess formation occurred in spite of penicillin, and after ten days all cases required some intervention. The significant symptom was pain and the conspicuous sign was bone tenderness. Radiographs at this stage were valueless.

In treatment, the penicillin blood level must never fall below 0.1 unit per ml. It was necessary to give a large initial dose of 200,000 units followed by 50,000 units three-hourly in order to ensure that organisms shut away in the dense bony tissues were dealt with. He was also satisfied with giving daily injections of 300,000 units of procaine penicillin and 100,000 units of sodium penicillin with aluminium stearate in arachis oil. He did not approve of the fantastic high dosage sometimes given. It had been suggested that the bactericidal effect might be reduced thus. Penicillin-resistant organisms, of which there were between 5% and 10%, detected after 48–72 hours' treatment might require "aureomycin," with a dose of 10–60 mg. per kilogram body weight orally per day.

This treatment still necessitated immobilization of the limb, general supportive measures, and, if abscesses developed, their prompt evacuation. In such cases after ten days operation was almost always necessary—drilling of the bone and primary closure, penicillin being instilled into the wound.

Mr. DENIS BROWNE (London) agreed that early operation should be avoided, and advocated the aspiration of abscess. Mr. F. C. DWYER (Liverpool) felt that it was better if in doubt to open the medullary cavity rather than wait for destruction.

Hidden Dislocations

Mr. H. OSMOND-CLARKE (London) discussed a group of injuries the diagnosis of which might readily be missed unless care was exercised to temper the evidence of radiography by proper use of clinical acumen. Most frank dislocations were easy to recognize, but there were some which might escape notice until the time for successful treatment by simple means had passed. Among such lesions were persistent dislocation of slight degree and lesions of the deep joints. Some dislocations reduced spontaneously but left important soft-tissue damage—particularly, for example, in the ankle after a rupture of the external lateral ligaments and resulting inversion subluxation; in the knee with rupture of the collateral ligaments; and in the neck, where subluxation might be shown only when the neck was in forward flexion. Such cases were often being diagnosed for a long period after injury as hysterical. If they were recognized early, adequate immobilization would produce a stable joint. If clinical signs suggested these more serious lesions, a negative *x*-ray examination should be checked repeatedly. The question was asked whether simple plaster immobilization was adequate for the treatment of a complete ligament rupture at the knee. Mr. Osmond-Clarke agreed that, based upon one reported group of 60 cases of internal lateral ligament rupture, these should always be explored surgically.

Supracondylar Fracture of the Humerus

Mr. F. W. HOLDSWORTH (Sheffield), discussing supracondylar fracture of the humerus, mainly in children, remarked on the anxiety which had affected most surgeons because of the possibility of late deformity and loss of movement. He noted the difficulties of accurate reduction. They had tended to lead surgeons in America to perform open operation, and in Britain to carry out repeated manipulations. Discussing particularly transverse fractures, he noted that the most difficult to reduce was that through the condyles, in which reduction was often a matter of obtaining a knife-edge balance. Stability was almost impossible without some rotatory deformity. Some of the worst results were achieved by open operation and fixation.

The speaker had recently reviewed a considerable group of old cases, and his conclusion was that these fractures gave good results regularly by a single manipulation, with maximal correction, the use of collar-and-cuff fixation, and then gradual mobilization. Some degree of displacement after manipulation need not cause any great anxiety for the ultimate result. No advantage was obtained by the use of posterior plaster supports. A year must pass before assessment was possible. But he had found that the anterior spike from the upper fragment, which was due to the stabilizing rotatory displacement, was of no importance, for it was lost by remoulding later, and this process also tended to bring the lower articular surface of the humerus into normal alignment. In adults, T-shaped fractures also did not need absolute anatomical reduction.

Ischaemic contractures were always due to arterial damage at the time of injury, and required exploration of the artery. Fractures with displacement of the capitellum required operative replacement of the fragment and simple immobilization with the elbow in extension and pronation without internal fixation. Fractures of the internal condyle required no special treatment unless incarcerated within the joint.

Trochanteric Fractures of the Femur

Mr. NORMAN W. ROBERTS (Liverpool) discussed the results of 50 cases of trochanteric fracture of the femur, of which 35 had received operative reduction and fixation with a two-piece nail plate. There was no operative mortality. The method gave at least as good results as conservative treatment by immobilization and traction in bed, and at the same time gave these results with a shorter period in hospital and an easier convalescence. He did not operate on all such cases, for there were some which were entirely stable and did well by conservative means. The average age of his patients was 62, but he had operated on a certain number of young people. A particular indication was in pregnant women, where early activity was essential. There were certain types of subtrochanteric fracture where the nail plate provided a very satisfactory alternative to the less desirable Küntscher nail. He emphasized the need to impact the fracture in all cases when applying the device.

Clinical Demonstration

A clinical meeting was held at the Royal Infirmary, Liverpool, on Friday, July 21, at which the president, Mr. B. L. MCFARLAND, presented a case of arthroplasty of the knee for ankylosis. He mentioned the technical difficulties which distortion of bony outline caused. Cases were shown in which patellectomy had been done for recurrent dislocation, and in which plastic reconstruction of the quadriceps had realigned the pull on the tibia (the point of the procedure being that such patellae were always degenerate). He also demonstrated the first case of congenital pseudarthrosis of the tibia on which he had operated, 17 years ago, by his "by-pass" method of bone grafting. The growth of the tibia and remoulding from the original deformity to a straight bone were remarkable.

Mr. F. C. DWYER (Liverpool) presented cases of transplantation of the ulnar nerve, including two cases of leprosy in which fibrotic shortening of the nerve had occurred. He also demonstrated a case of Madelung's deformity due to traumatic arrest of growth.

Mr. P. B. MORONEY (Liverpool) presented an example of "railings" fracture. These injuries, he pointed out, occurred in children who fell from railings and twisted their lower legs into severe adduction at the ankle, the lower epiphysial plate being split by the "anvil" action of the astragalus, producing premature fusion and severe late varus deformity. Correction by osteotomy was performed.

Mr. R. P. OSBORNE (Liverpool) showed cases of leg lengthening.

SECTION OF SURGERY

Friday, July 21

Burns

With the president, Professor CHARLES WELLS (Liverpool), in the chair, the meeting was opened by Mr. ROWLAND P. OSBORNE (Liverpool), who said that, as he had been working in co-operation with Mr. J. P. Reidy at Stoke Mandeville, it was his purpose to deal with the treatment up to the skin-grafting stage and to leave Mr. Reidy to continue from that point. Mr. Osborne began by emphasizing the very great importance of preventive measures and the need for special precautions in the case of children and epileptics. The use of fireguards and the proper placing of electric fires could do much to prevent the distressing incidence of burns. Turning to the question of burns centres, Mr. Osborne said he did not think it would be an economic or practicable proposition to establish many big centres, but he believed that by the simple modification of existing ward accommodation much could be done to provide proper dressing-rooms without sacrifice of too much space.

Mr. Osborne first discussed the problems of local treatment. In the initial process of cleansing the burnt area nothing should be applied which would damage the remaining epithelial elements. The first-aid dressing should consist in the application of the cleanest material available, and clothing should not be cut away. When the patient had reached hospital it was often best to delay the local treatment for some time in those cases requiring urgent and extensive resuscitation. It was their practice to undertake the first dressing in the theatre with full aseptic ritual and under general anaesthesia. The area was gently cleansed with a 1% "cetavlon" solution, and they then generally preferred the use of a Bunyan-Stannard envelope for limb burns, or, alternatively, the use of penicillin cream containing 400 units per gramme. In the latter instance the application of some pressure to the dressing was of importance, but it was not always easy to do this properly, and elevation of the limb was a simpler way of checking oedema. The speaker did not favour the use of plaster-of-Paris other than as a means of lightly splinting the limbs in children. Where dressings were used they should be applied with the greatest care and so fixed that they could remain securely in place for a long time; generally they were not disturbed for 10–14 days, and the only indications for changing them before this were: (1) because the dressing had shifted; (2) because exudate had soaked through and provided a passage for infection, or (3) because of fever, pain, or severe constitutional disturbance. Many superficial burns would be healed or nearly healed after 14 days, and in areas of full-thickness burn sloughs should then be removed and early grafting undertaken. Mr. Osborne referred to the importance of having a clean and flat granulating area to graft on, but he emphasized that it was sometimes justifiable and imperative to apply "postage-stamp" grafts to an infected area, and in any case they always used these "postage stamps" rather than sheets of skin. Concluding his discussion of local treatment, he referred to the use of saline baths, a method which was applicable only where expense was no object and a big team was available, and he stressed the need for careful bacteriological examinations and sensitivity tests, so that bacteriostatic and antibiotic agents could be intelligently used. He also mentioned the early excision of localized deep burns. In referring to the problems of general care, the speaker said that time would not permit more than a brief survey of circulatory restoration, the avoidance and control of anaemia, and the difficulties of correcting those profound metabolic disturbances which occurred in severe cases. Attention to the latter two factors, in particular, was an essential prerequisite to control of infection.

Skin Grafting

The discussion was continued by Mr. J. P. REIDY (London and Stoke Mandeville), who considered the patient from the stage when his burn was ready for the application of skin. Early skin cover of areas of deep loss reduced toxaemia, promoted healing, and restored function. Autogenous grafting of "postage stamps" cut from a thin sheet of skin was the most certain and economical method. Pinch grafts certainly had no place in treatment, for they were less likely to take and could leave a most unsightly donor area which was of no further use for provision of skin. Mr. Reidy said that, although homogenous grafts were able to survive only for a short time, homogenous grafting was of the greatest value as a temporary measure in many cases in which more than 40% of the body area had been burned. He then referred to the "high priority areas"—eyelids, hands, and flexures—all of which should be grafted at the earliest possible moment. In the case of the hand it was absolutely essential to maintain it in a position of function while healing occurred. Donor areas should be chosen with great care, and every effort should be made to use the maximum amount of each donor site in the most economical manner possible. Mr. Reidy concluded his remarks on early grafting by brief reference to the causes of failure and the occasional value of refrigerated grafts. On the subject of later repair he referred to the use of Wolfe grafts and flaps and to the problems of keloid scarring, illustrating his points by reference to a number of photographs.

Treatment by Exposure

Mr. A. B. WALLACE (Edinburgh) described the problems of controlled fluid replacement and his own method of treatment by exposure. He referred to the significance of pallor, thirst, and restlessness as evidence of incipient oligaemic shock, and explained the principles and methods of fluid replacement. In his own unit they had prepared tables which gave detailed guidance in this therapy at different ages and in burns of different extent, and these formulae gave considerable help to the junior medical and nursing staff in the care of the case. Mr. Wallace said that he was a great believer in keeping the burnt surface dry, and, having found that burns treated by pressure were much more readily healed when they remained dry, he was emboldened to try the treatment of cases by exposure to the air of the ward. After a careful ritual cleansing essentially similar to that mentioned by Mr. Osborne (although often conducted under premedication only), the burnt area was liberally insufflated with penicillin-lactose powder. This insufflation was continued four-hourly in the ward until the area was crusted over; this usually took 48 to 72 hours. He had used this method initially in children, and he emphasized the freedom from pain, marked lack of constitutional disturbance, low fever, and good progress. Although these surfaces were exposed to the full bacterial contamination of a general ward he had not had a case of infection with a β-haemolytic streptococcus, proteus, or *Ps. pyocyanea* in two years, and this was despite the fact that Petri dishes exposed in the ward were liberally contaminated by these organisms. Mr. Wallace illustrated the application of this method in various cases and concluded by showing a coloured film on exposure treatment of a superficial burn of the perineum and buttocks.

Dr. HERBERT M. BATTINGER (Gary, Indiana) said that as he was in such considerable measure of agreement with the two opening speakers he did not propose to burden the meeting with his full paper. He then selected the more important points for elaboration and said that he was a firm believer in the proper use of pressure dressings and elevation of the affected part. It was his practice to give one part of blood to every two parts of plasma in the early treatment, and he rarely gave much intravenous fluid after the first 36 hours. Dressings were left for 12 to 14 days, and he then performed a delayed excision of the sloughs and grafting, or else applied pressure dressings for a few more days if it was a superficial burn which had not yet healed. He believed in using sheets of skin and had not tried "postage-stamp" grafts. He referred to the use of high-calorie and high-protein diets, the administration of vitamins, and the need for keeping the haemoglobin at not less than 85%. Commenting on the exposure method of treatment, he said that this was new to him, and, although he was quite impressed, he felt that the superficial burns shown in Mr. Wallace's film might have healed equally well under any application, even cabbage leaves.

In the general discussion Mr. JOHN A. SHEPHERD (Liverpool) mentioned the dangers of morphine in some of these cases, the importance of avoiding all sticky dressings, and the treatment of shock. In the latter connexion he believed that there was a great danger in using such tables of fluid replacement as Mr. Wallace had mentioned. He also thought that laboratory investigation with haematocrit readings was often difficult, and he preferred to rely on clinical judgment in giving his intravenous fluids. Mr. R. S. MURLEY (London) said that, as one who had been privileged to see Mr. Wallace's patients in the Edinburgh Children's Hospital, he would like to underline various points in this method. Many who had neither seen nor tried it were far too ready to condemn this very simple and eminently satisfactory method. He could confirm the remarkable general well-being of these patients and the absence of infection. Although some had said that this was a method which was likely to be difficult to apply in adult cases or in deep burns, he did not believe that this was so. In wartime, or in the treatment of large numbers of cases, the method would certainly be of the greatest value. Mr. Murley said that he could not agree with Mr. Shepherd's remarks about judging fluid therapy on clinical grounds: it was necessary to have some basic plan of campaign if one was to avoid doing great harm to some of these patients.

Treatment of Severe Burns

Miss ISABELLA FORSHALL (Liverpool) said that she was disappointed that none of the opening speakers had shown a picture of a really severe burn, and she would have liked to hear more about the burnt hand. She wondered whether the results with exposure were really much better than they had formerly obtained with tannic acid and other similar agents. It had seemed to her that relatively inefficiently cut skin grafts of varying thickness took better than carefully cut ones. Mr. R. B. WELBOURN (Liverpool) said that Mr. Osborne did not seem to regard infection as a major problem. He would like to know if the opener agreed with the practice of grafting on an infected surface to save time. He thought that somebody should emphasize the dangers of serum jaundice, for the previous speakers had all spoken of using plasma and had not mentioned the possibility of this serious complication. Surely plasma substitutes were advisable. Finally, he was not clear whether Mr. Wallace applied dressings after grafting.

The chairman, before calling on the first two speakers to reply, asked Mr. Wallace to answer some of these questions. Mr. WALLACE regretted that he had shown no severe cases, for he had a number of photographs of such cases with him and had been unable to show them in the short time available. He went on to describe some of the methods, such as the use of a special bed, by which he had treated very extensive burns by the exposure method. He completely disagreed with Miss Forshall about tannic acid and gentian violet, both of which damaged the burnt area, while the latter was a protoplasmic poison which delayed healing. In reply to Mr. Welbourn, he stated that he treated his cases after grafting in an orthodox manner. Mr. REIDY, in reply, said that he strongly disagreed with Mr. Shepherd's remarks about basing fluid therapy on clinical impression, though he agreed with his comments on the dangers of morphine. It was naturally justifiable to graft on an infected area provided that infection had been properly reduced beforehand. Miss Forshall had said that grafts of varying thickness might take better, but he did not know how she had formed this impression, since thin grafts of even thickness certainly took much better. He always cut his grafts with a Humby knife and had given up use of the dermatome for this purpose. He had not said more about burnt hands because he had purposely limited his remarks to the underlying principles of maintaining function, since in other respects there were few fundamental differences in treatment. Like Mr. Wallace, he could only mention tannic acid in order to condemn it.

Mr. OSBORNE pointed out that it had been hoped to get Sir Archibald McIndoe to open this discussion, and he regretted that the meeting had not had the privilege of hearing him. Mr. Osborne thought a basic plan of fluid therapy was quite essential. Haematocrit readings were not really so difficult, especially if one used capillary blood, as was the practice at Birmingham. A previous speaker had said that anaemia could be entirely prevented, but this was certainly not true, since it was, unfortunately, an inevitable development in severe burns and could be corrected only by frequent transfusions of fresh blood. In burns of the hand the important points were early movement, early removal of sloughs, and early grafting. He thought that the patient's own work was altogether preferable to remedial occupational therapy. Contrary to Mr. Welbourn's remarks, he did regard infection as a major problem: it was exceedingly difficult to render a surface sterile and almost impossible to keep it so, but luckily one could graft successfully without eradicating all infection. He concluded by showing pictures of some massive burns and briefly mentioned a useful method of applying alternate strips of autogenous and homogenous skin grafts in such cases. The latter method had been developed by Mr. L. M. Rouillard at St. Albans.

The chairman, Professor WELLS, then thanked the opening speakers for their contribution to what had been a very interesting and valuable discussion, and he especially thanked Dr. Herbert Battinger for having come so far for this meeting and for having been so courteous and considerate in cutting his paper down to an absolute minimum.

SECTION OF CHILD HEALTH

Friday, July 21

Epidemiology in Relation to Child Health

After thanking officers of the Section for their assistance, the president, Professor NORMAN B. CAPON (Liverpool), invited Dr. WILFRID SHELDON (London) to take the chair. Professor S. G. GRAHAM (Glasgow) opened the discussion with a paper on infection in the maternity hospital. He pointed out that the behaviour of infection in the newly born differed from that in older children and adults. The incidence of infection in the newly born was difficult to assess, but there was reason to believe it was highest in teaching hospitals, where premature deaths were more frequent. Necropsies revealed that approximately only 50% of infections were detected during life by experienced clinicians. Endogenous infection might explain the greater liability of the small premature infant to develop infection. Approximately 25% of the neonatal mortality was associated with infection. Professor Graham stated that the increase in institutional midwifery coupled with the failure of hospital construction to keep pace with demands made for greater risk of infection. The risks were less, and the possibility of epidemics did not exist in domiciliary practice. The greatest hazard in hospital arose from the herding of infants in ill-equipped and poorly ventilated rooms.

Neonatal Infections

Neonatal infections in a nursery were all potentially dangerous. In general, conjunctivitis, pemphigus, and thrush did not contribute materially to the neonatal death rate. Some sticky eyes were sterile, but *Staphylococcus albus* was frequently found and was probably pathogenic. Thrush was almost endemic in many nurseries, and had increased in frequency, though there had been no corresponding increase in monilia infection among mothers. Among major infections the aetiology of epidemic diarrhoea remained uncertain. Incrimination of special types of *Bact. coli* awaited final proof or disproof. Treatment of serious infections was on the whole unsatisfactory. Despite conflicting reports concerning their value, there was a place for the sulphonamides and penicillin, and there was justification for believing that there was a future for "aureomycin" and "chloromycetin." There was need to differentiate the so-called pneumonia arising from the aspiration of irritant amniotic fluids and the infective pneumonia of bacterial origin. A rigid regime designed to prevent the spread of infection constituted the essence of treatment. The prevention of prematurity required further study, and attention must be focused on social factors which contributed to the major problem of infection in the newly born.

Tuberculosis in the Home

Introducing Dr. W. N. PICKLES (Aysgarth), the chairman congratulated him on the honorary degree of D.Sc. recently conferred on him by the University of Leeds. Dr. Pickles's paper dealt with infection in the private house. In vivid terms he described instances known to him personally of tuberculous infection contracted by infants and children from relatives and elders in the household. He made a moving appeal for full appreciation by doctor and public that tuberculosis was our most important infectious disease. He reinforced his argument by contrasting the great care exercised in isolating scarlet fever, and by illustrating from records compiled during a long experience of general practice the providentially small death rate arising from the exanthemata and other diseases of an infectious nature.

Dr. Pickles gave it as his conviction that infectious diseases other than tuberculosis were introduced to the home by the school-child, and the method of transmission was usually by droplet infection. During the war evacuation was instrumental in bringing infection into rural reception areas, but not on the scale anticipated by many. Measles and chicken-pox were easily traced to their source in country districts, and Dr. Pickles suggested that in contradistinction to whooping-cough they need not occasion too much concern. Poliomyelitis he described as a seemingly insoluble problem of the future. Tuberculosis was the infectious disease of first importance; it should, with a view to control, have reserved for it their main resources and hospital beds.

Infection in the Hospital Ward

Dr. R. McL. TODD (Liverpool) discussed infection in the hospital ward. In his introduction he referred to reports on the subject published by the Medical Research Council (1944) and the British Paediatric Association (Watkins, 1949). Cross-infection was commonest in wards admitting infants of less than 12 months of age. Spread was by contact, droplet infection, or infected dust. Ideally every child admitted to a children's hospital should be isolated until proved non-infectious.

Dr. Todd outlined the procedures followed and the results obtained in 1949 in controlling infection at Alder Hey Hospital, which admitted infants and children up to the age of 15 years suffering from medical and surgical conditions, acute and long-term. Some wards were open: others were of the cubicle type. The average number of beds occupied was 586. In the open wards there were outbreaks of dysentery (61), measles (11), and chicken-pox (7). Medical wards in which Sonne dysentery developed were closed for all admissions until three negative rectal swabs had been obtained from all patients. When measles occurred all patients were given serum (if available), and until the end of the quarantine period only patients with a history of measles were admitted. In the cubicle wards some babies admitted for other symptoms developed diarrhoea and vomiting. The isolation of α and β coli proved a valuable indication of cross-infection. Instances were described of infection following intravenous infusions.

Summarizing, Dr. Todd gave the following as factors affecting the incidence of hospital infection and cross-infection: ward architecture; the standard and adequacy of nursing service throughout the 24 hours; methods of food preparation; aseptic technique; standards of toilet and hygiene; and ward cleaning procedures. There was reason to believe that vacuum cleaners used where floors were not oiled were as effective in reducing the spread of infection as the method of oiling floors and using sweeping brushes.

Infections in Nurseries

Dr. K. M. HIRST (London) continued the discussion with a contribution on infections in nurseries. She referred to the two principal groups of infections—respiratory catarrh and intestinal infection. The incidence of respiratory catarrh among children attending day nurseries was higher than that among children of comparable age not attending nurseries. Symptoms occurred at all ages but especially in children between the ages of 2 and 3 years. Spread of respiratory infection in nurseries could not be wholly prevented if the children were to lead a normal life. Little was known concerning the long-term significance of those minor respiratory conditions which might in any event be contracted during school life but which in nurseries developed earlier. There was a need for a follow-up of nursery children, and in particular of those children who had not stayed the course and had attended for only a short period.

Discussing intestinal infections, Dr. Hirst advocated the exclusion of young babies from nurseries because of the potential danger of enteritis. Food-poisoning was relatively uncommon. Many nurseries suffered from such disadvantages as lack of sink provision, a poor hot-water supply, inadequate draining and drying facilities, and domestic workers who required constant close supervision. For the washing of dishes and cutlery satisfactory results were obtained with the use of detergents followed by immersion in really hot water. The use of hypochlorites required care in the matter of "dosage." Sonne dysentery was the source of greatest trouble and was liable to involve the staff. Trial of chemoprophylaxis was justifiable where medical examination could be maintained and where laboratory services were available. The susceptibility of young members of staff entailed the close supervision of their general state of health. The risk of infection was such that it should be taken into consideration when nursery policy was being formulated.

A paper on infections in schools was given by Dr. J. C. RYLE (Shrewsbury). The conditions he described consisted of a group of specific infections, and a larger group of non-specific infections, including influenza and tonsillitis. Virus influenza had an average attack rate of 4% per term. Streptococcal infections had an attack rate of 6.4% and a high carrier rate. Influenza and streptococcal infections accounted for 40% of non-specific infections in school. Common colds accounted for 50%. The remaining 10% was generally diagnosed as P.U.O. and was composed of several entities which included abortive forms of virus diseases (glandular fever, poliomyelitis, and probably infective hepatitis), which played a small but important part.

Routine Preventive Measures

General discussion of the papers was opened by Dr. W. E. CROSBIE (Liverpool), who stressed two aspects of cross-infection in hospital—routine procedures to prevent spread of unrecognized infection and steps to control spread of manifest infection. Essentials of routine were adequate ventilation, avoidance of overcrowding, and medical examination on admission, with special attention to cases off the waiting-list. Manifest infection called for removal of the patient, search for carriers, and ascertainment (with immunization where applicable) of susceptibles. An appointment system reduced spread of infection. Administrative and medical staff should recognize the key importance of nursing staff. Dr. J. D. HAY (Liverpool) supported earlier views concerning the limited value of hypochlorites as sterilizing agents. Dr. G. SLOT (London) urged that sight be not lost of the social background to the subjects under discussion. Many children had no bed to themselves. He referred to the sense of false security arising from faulty mask technique in hospital. Considering visitation of patients, Professor CAPON asked for common-sense consideration of a child's human needs. Professor WILFRID GAISFORD (Manchester) gave the retention of babies with their mothers in lying-in wards as a method of reducing infection. He favoured the immunization at an early age of all infants against pertussis, and advocated sulphonamide therapy in appropriate daily doses in the winter as a form of prophylaxis against respiratory infection in infancy.

Dr. WILFRID SHELDON (London) spoke of his conviction that the incidence of infection was not increased where visitors to hospitals were allowed. He deprecated the unnecessary retention in hospital of healthy children, and urged that patients and relatives be educated into an understanding of higher hygienic standards. Accepting that a case might exist for day nurseries at the present time, Dr. Sheldon submitted that they should not be continued a day longer than absolutely necessary.

SECTION OF GERIATRICS

Friday, July 21

Hospital and General Practitioner

With Dr. MARJORY W. WARREN, a vice-president, in the chair, Dr. C. T. ANDREWS (Truro) opened the discussion on linkage between the hospital service and the general practitioner in the care of the aged sick. The problem of co-ordination was difficult, he said, because of the increase in the aged section of the population, the inadequate hospital accommodation, strain on the general practitioner, and various social problems. He showed that 41% of all hospital patients in Cornwall on a certain day were over 60 years old. Many old folk should be treated in their own homes rather than in hospital beds, which were over twice as costly to maintain as in 1939. Co-ordination between general practitioners and hospital was needed at three levels. First, in the geriatric unit and its long-stay annexe; secondly, at the cottage hospital, where doctors could care for their own aged patients with consultant advice; and, finally, by domiciliary consultations with the geriatric team, assisted by the district nurse and the home help. It was essential to bring together all the different social and medical agencies interested in the welfare of the old person. This could best be done at first on a voluntary basis.

Dr. VISCHER (Basle) described the post-mortem findings on 1,836 aged subjects from his hospital. Omitting cancer from his survey, he found that 99% of the cases had some degree of arteriosclerosis. This affected the aorta in 94%, the coronary arteries in 86%, and the circle of Willis in 71%. The main renal vessels were involved in fewer than half the subjects. Over a quarter showed myocardial fibrosis, and 9% died with coronary thrombosis. There was softening of the brain in 29% as a contributory factor. Emphysema grew more frequent with advancing years, but hypertrophy of the right ventricle in such cases was less marked as age increased. Gastric ulcers were more frequent than duodenal ones, but not related to age. Enlargement of the prostate, however, was commoner in older people than in those aged about 60. Pulmonary tuberculosis was not rare in the aged. The incidence of bronchopneumonia far outweighed that of any other pulmonary disease and was a frequent cause of death.

Dr. I. HARRIS (Bootle) spoke as a general practitioner. Formerly, he said, it had been quite easy to get an elderly patient into hospital. Now it was very difficult, as the gap left by removal of the relieving officer had never been filled. General practitioners had no contact with hospital management committees, and there seemed to be nobody whose duty it was to be responsible for hospital admissions. He advocated the creation of a senior geriatric medical officer at regional level. There should be more domiciliary consultations and mobile physiotherapy and mobile pathology services. The general practitioners were too busy to devote enough time to treating elderly patients and keeping them out of hospital. Pressure by relatives, need for laundry facilities, and so on tended to increase the calls for hospital admission of many aged persons who were sick.

Dr. A. FRANKLIN (Garston) contrasted the differences between urban and rural practice as regards the elderly patient. Difficulty over hospital admissions had begun in crowded town districts when the National Health Service had started. There were more idle, lonely, and unwanted old folk in the cities, while agricultural workers continued at their wonted work and play long after 65. More co-ordination of hospital services, consultants, district nurses, and welfare services was essential on the domiciliary front, and physiotherapy should be easily available. Only by early hospital treatment could the burden on the relatives of an old person be lessened.

Dr. E. L. ROBERTS (Formby) said there was a financial inducement for relatives to get aged people into hospital, and this also added to their reluctance to have them back again. More hostels were badly needed to ease the younger generation's plight of being tied to their houses. Otherwise hospital beds would be blocked by old people unable to return home.

Dr. K. B. GIBSON (Liverpool) thought that the general practitioner was now isolated from the hospitals, so that the profession was divided into two parts. Geriatrics must lead against this situation and bring doctors from hospitals out to meet the general practitioners in clinics and domiciliary visits. They should also take them into hospitals to help as clinical assistants and part-time medical officers to the great benefit of both parties. There was room for general practitioners here, since geriatric units did not recruit medical staff easily.

More Hostels Needed

At Fleetwood Road Hospital, Southport, in the afternoon, Dr. W. E. FITZ-GERALD, the medical officer of health, advocated a service for the elderly like that now existing for children. Remarking on the preponderance of women in the older section of the population, he mentioned the need for more ground-floor accommodation. Hostels were badly needed, preferably with a sick-bay provided. In Southport the district nurses spent half their time attending to old people, and admission to hospital was not easy. Hence efforts must begin in the home of the patient. After mentioning the local activities to help the aged sick, Dr. Fitz-Gerald urged the special allocation of hospital beds to meet the problem which had arisen.

Dr. P. Y. LYLE (Southport) likened the geriatric specialist to the general of an army. His headquarters were the geriatric unit; his weapons were the new methods of treatment and rehabilitation; his army was composed of general practitioners, nurses, home helps, welfare workers, and the relatives of the patient. Only by good staff work and deploying his forces to the best advantage could he successfully attack the troubles of old age.

After the welfare officer (Mr. Sinnert), a health visitor (Mrs. Brown), and a voluntary social worker (Mrs. Spilsbury) had described the work which they were doing in the town and its evident success, Dr. JEANIE F. WISHART spoke. She outlined the hospital arrangements for the local aged sick and the measures taken to select cases for admission to various units. Acute cases were taken at once to general hospitals to avoid delay in waiting for a bed. It was often difficult to get relatives to receive rehabilitated cases home again, and beds were blocked for lack of hostel accommodation suitable for frail ambulant patients.

SECTION OF NEUROLOGY

Friday, July 21

The Treatment of Parkinsonism

With Dr. S. P. MEADOWS, a vice-president, in the chair, Dr. HUGH GARLAND (Leeds) opened the session by saying that the Parkinsonian syndrome was first described by Parkinson in 1817, in the first account of paralysis agitans. This disease, a degenerative disorder, appeared most often in the presenium. Recent work had shown the importance of the genetic factor. Other causes for Parkinsonism were encephalitis lethargica, cerebral arteriosclerosis, neurosyphilis, and, occasionally, head injury, carbon-monoxide poisoning, and manganese poisoning. The syndrome had been reported as having appeared suddenly after an emotional shock. Dr. Garland outlined the many drugs used in the treatment of the syndrome, over the years, with little evidence of efficacy. He thought that "artane" was now the most popular. He considered the attitude of doctor and family to the patient to be of great importance. Deep *x*-ray therapy was useful in correcting sialorrhoea. Oculogyric crises, so troublesome in chronic Parkinsonism, appear sometimes to be influenced by environment, and Dr. Garland had obtained temporary good results by electric convulsion therapy.

Dr. G. E. SMYTH (Manchester) said that palliative drug treatment did not have a prolonged effect. He considered physiotherapy of the greatest importance in treatment, drug treatment coming second. He had found artane produced troublesome mental confusion in some cases.

Dr. DENIS LEIGH (London) stressed the need for objective tests and standards in assessing results of treatment. He described electromyographic and other experimental methods he had used for this purpose. He found it necessary, however, to come back to an assessment of the patient's subjective symptoms and changes. He considered artane the most effective of

the modern drugs. Dr. Leigh then spoke at length of the psychological strains and stresses of the patient with Parkinsonism in relation to his environment.

Doubts about Surgical Treatment

Sir GEOFFREY JEFFERSON (Manchester) discussed the recent attempts to relieve the tremor of Parkinsonism by surgery. He was doubtful of its value. The desiderata for operation were as follows: (1) the disease must be predominantly or wholly unilateral; (2) not, or very slowly, progressive; (3) the chief disturbance must be tremor; (4) the tremor must be so severe as to be disabling; and (5) patients must not be over 55 years.

These conditions, said Sir Geoffrey Jefferson, removed 95% of cases. The three operations at present used were, first, division of pyramidal tract on the affected side at C_2 level; secondly, ablation of cortical area 6; and, thirdly, division of the anterior limb of the internal capsule by a transventricular approach. Sir Geoffrey Jefferson found the high published mortality rate of the operations inexplicable. There was much evidence of a considerable risk of focal epilepsy after removing area 6. The published figures showed that after division of the pyramidal tract in 25% of cases there was a complete hemiplegia still present one year later. In one series of 55 cases of cordotomy there was reported worth-while relief in 15 cases. Sir Geoffrey Jefferson quoted Klemme's figures for the operation of removal of area 6. Out of 100 cases 17 died—too high a figure in the speaker's opinion—and relief of tremor was reported in 45. Myers had reported good results with his difficult operation of division of the internal capsule. Sir Geoffrey Jefferson deprecated the inaccurate publicity recently given to the treatment of Parkinsonism by surgery; he emphasized that there could be no surgical "cure" for this disease.

Sir HENRY COHEN (Liverpool) was surprised at the statements that sustained drug treatment was of no value in Parkinsonism. He had many patients benefiting from large doses of stramonium regularly administered. He emphasized the activity of the infection in many chronic post-encephalitic cases and felt that future antibiotic treatment might bring an advance.

SECTION OF OTO-RHINO-LARYNGOLOGY

Friday, July 21

Deafness in Children

With the president, Mr. I. SIMSON HALL (Edinburgh), in the chair, Mr. R. R. SIMPSON (Hull) opened the discussion on deafness in children. He said he proposed to deal only with deafness as it occurred in school-children. This was a problem which otologists should be able to solve, though, of course, they could not eliminate hereditary congenital deaf-mutism nor prevent the onset of otosclerosis in the older school-child. There remained the large problem of deafness in children due to Eustachian tube obstruction and to chronic otitis media.

It was not always easy for parents to realize that a child was deaf, and it was often the school-teacher who first suggested that the child's hearing should be examined. In this connexion the speaker regretted the change of status and importance under the new Health Service of the school clinic, for in his opinion a follow-up of suspected cases of deafness could not now be so effectively done as it was under the former school medical service. Before the war he and Dr. Ritchie Rodger, working in the school clinics in Hull, believed that they had largely eliminated chronic otitis media among the school population. The method adopted in Hull was worth recording. All the school children in the city were inspected by the school doctors, and if any ear disorder was discovered the child was referred to one of four well-equipped clinics for examination by an ear specialist. After this examination treatment was ordered or operation advised. The "follow-up" system was excellent, and no case was allowed to become chronic. Otorrhoea was quickly spotted in the schools and the child referred to one of the ear clinics. The condition quickly cleared up under treatment or after a mastoid operation. In this way the child's hearing was saved. After this scheme had worked for a year the number of cases of chronic otorrhoea among school-children was reduced by 66%.

Mr. Simpson said there were three causes of deafness due to Eustachian tube obstruction in children—adenoids, sinusitis, and nasal allergy. Here again the school medical service did invaluable service in the early recognition of these cases. In his opinion adenoids had not been satisfactorily removed in a case of deafness unless the fossa of Rosenmüller was palpated by the gloved finger. In deafness due to sinusitis he adopted a conservative outlook. Mr. Simpson said he was surprised at the relatively few children who were certifiable as "partially deaf." He had fitted such children with a Medresco hearing-aid, and they remained at an ordinary school. The children under 14 used their aids only in school, but those over 14 were allowed to have their aids at home; this was to try to ensure that reasonable care was taken of the aids.

Value of Hearing-aids

Mr. J. H. OTTY (Bradford) gave details of his experience in the fitting of children of school age with the Medresco hearing-aid. Some 50 children had been fitted with the aids. Their ages ranged from 5 to 14 years of age. There was universal agreement among parents and teachers about the very real benefit that followed from the use of an aid. All the children showed pleasure in using it. There was a brightening of the expression in many of the partially deaf, who heard without strain for the first time. Again, there was almost universal improvement in the individual voice production. The teachers' impressions were that the children were more ready to take an active part in class lessons, and their attention was more easily sustained for longer periods. It was important that the partially deaf children should be sought out early so that they might be fitted with aids. In many cases, by so doing, they should be able to continue in normal schools. Practically all cases were fitted with individually moulded inserts for the receivers, and there had been little difficulty with their retention. The children readily learnt to adjust the volume control of the instrument and were very sensitive to defects in the instrument or batteries.

Dr. T. S. LITTLER (London) said that the steps to be taken to ensure the maximum articulation efficiency in the use of a hearing-aid would be as follows: (1) The output of the hearing-aid should be arranged so that it was never likely to exceed the maximum comfortable intensity under the conditions of use. (2) The listening positions should be arranged so that there was a minimum amount of reverberant sound and noise—i.e., by the closest proximity to the teacher and by the disposition of acoustic absorbents to reduce the effect of multi-reflective sound paths. The floors of rooms should in addition be covered by soft surfaces to reduce shuffling and impact noises. (3) The acoustic amplification of the hearing-aids should be as free from peaky responses as possible, otherwise the tolerance range was likely to be seriously affected in cases of severe nerve deafness, and the range of steady speech was likely to exceed the normal 30 decibels.

It was most desirable that a child should have a course of instruction in the manipulation of the hearing-aid, so as to use it with the maximum efficiency. Since the alleviation of deafness by the use of a hearing-aid could never restore articulation to normal it was extremely important that the child should receive a good training in lip-reading; many speech sounds which were difficult to distinguish by hearing were among those which were easy to recognize by lip-reading. So far as the constructional side was concerned, the single unit, or monopack, hearing-aid was probably the most satisfactory for children. The disadvantages of extra running costs due to battery consumption were more than outweighed by the simplicity, extra comfort, and minimization of lead breakages. Wherever possible a moulded insert should be provided, and there should be periodical checks with the supply of a new insert whenever there was any indication of an acoustic leak, with the accompaniment of inferior response or likelihood of howling. It would appear that as the use of hearing-aids in normal schools became more widespread the importance of binaural listening, refinement of response, and other improvements would receive more attention. There should therefore

be a possibility that ultimately any intelligent partially deaf child should be able to take his place alongside his hearing fellows.

Importance of Early Ascertainment

In the ensuing discussion Mr. T. E. CAWTHORNE (London) said it had been noted that some 6% of school-children were hard of hearing in one or both ears, and it was probable that about ½% were permanently hard of hearing in both ears. It was of the utmost importance that any impairment of hearing should be discovered at the earliest possible moment—often no easy matter—so that appropriate remedial or educational measures could be quickly instituted. It was always sad to see a child whose mental development, education, and speech had all been retarded because of unsuspected deafness. It was gratifying to know that the Medresco aid had proved so helpful in children. Sometimes in very deaf children the use of an aid, though it might not help in comprehending speech, resulted in an improvement in the speaking voice. In this connexion it was of fundamental importance to ensure that a deaf child always understood the meaning of any word it was asked to try to repeat. Mr. J. E. G. MCGIBBON (Liverpool) said he had found deep *x* rays of some value in the prevention of recurrent attacks of otitis. He preferred *x* rays to radium from experience in the R.A.F. Mr. R. F. J. MARTIN (Liverpool) stressed the importance of Eustachian obstruction by adenoids as a major cause of deafness in children. The operative removal must be adequate, particularly from the fossae of Rosenmüller. No mention had been made of secretory deafness. He aspirated the viscous fluid from the tympanum in such cases by means of a short-bevel lumbar-puncture needle mounted on a special type of haemorrhoid syringe.

Mr. T. A. CLARKE (Canterbury) was disappointed to learn from Mr. Otty how small a percentage of children in deaf schools were fitted successfully with hearing-aids. In his experience a much larger percentage were helped. He was disappointed also to hear the opinion expressed that mental defect was common in addition to the hearing defect; this was contrary to the teaching long given by otologists. He thought that the necessarily slow tempo of education in special schools accounted for the difficulty in transferring such children, helped by hearing-aids, to ordinary schools. The Ministry of Health should make clear to the public that the supply of hearing-aids was inadequate, and that educational and employment requirements must be met first. The Association could do a very great service to the deaf—children and adults—by encouraging the training and employment of more lip-reading instructors. Colonel J. P. J. JENKINS (Pontypool) said that as a general practitioner he had found that the mothers would not bring their children regularly for treatment. They were not prepared to wait for hours in overcrowded surgeries for treatment lasting only a few minutes. Therefore facilities should be provided for treatment in centres equipped with a trained staff. Mr. G. A. MOULDEN (Birkenhead) was surprised at the omission to mention catarrhal otitis media with effusion as a cause of deafness in children. Hoople had recently made a plea for better teaching about this condition, stressing the difficulty of diagnosis by inspection alone. He (Mr. Moulden) would like to stress the value of tympanic aspiration; if the condition was left untreated or did not resolve spontaneously deafness developed.

Mr. J. C. MCFARLAND (Liverpool) had had disappointing results from irradiation. He found that otologists were asked to make very few domiciliary visits: it was surely important that cases of acute otitis media should be seen early, so that myringotomy should, if necessary, be done before chemotherapy was begun. Mr. I. SIMSON HALL asked if it was possible to decide by an audiogram whether a child should go to a special or an ordinary school. In Edinburgh every possible acute case was admitted to hospital. At least 91% were cured by conservative treatment inside 12 weeks, and of the residue 89% were then cured by simple operative measures.

Mr. SIMPSON, in reply, said that the answer to Colonel Jenkins's problem was efficient school treatment centres, and he thought the Ministry should re-establish them. In his estimate 1% of children referred for deafness in Hull were partially, and 0.1% totally, deaf. He agreed that for the partially deaf training in the use of an aid and return to a normal school produced much better speech in the child. He agreed with Mr. Clarke's figure of 25% fitted with aids, and said that even toddlers had been successfully fitted. Mr. OTTY, in reply, said he wished to stress the importance of lip-reading instruction. He thought that the old school medical service should be re-established by the hospitals. He had found the incidence of recurrent otitis to be reduced by irradiation. Dr. LITTLER, in reply, said that a hearing-aid should be fitted at as early an age as possible, provided no distress was caused. This could best be assured by keeping output at a low level. Two devices were being experimented with, known as "peak limiting" and "automatic volume control." These aimed at restricting speech reception to the tolerance range. The child should sit as near the teacher as possible, but screening devices should be avoided, as they tended to put the child in a special "compartment."

Correspondence

Infection by Syringes

SIR,—I was very glad to see the paper by Drs. R. J. Evans and E. T. C. Spooner (July 22, p. 185), pointing out the danger inherent in one of the common methods of mass inoculation. In your annotation on the subject (p. 204) you suggest two possible improvements, neither of which seems very good.

May I bring to your notice another method which is simple and effective? This is not a new method, for it has been used for half a century. Instead of changing the syringe and/or the needle for each inoculation, the same syringe and the same needle can be used throughout the series of inoculations. The syringe is sterilized immediately before each inoculation by four or five successive fillings and emptyings with liquid paraffin at 130° C. If a fine needle is being used through which the oil will not rapidly pass it is better to remove the needle and then sterilize the barrel of the syringe with the hot oil. The needle is then replaced and can be held in the hot oil for 15 to 30 seconds, or the hot oil can be drawn through and expelled several times.

If great speed of inoculation is desired two syringes can be used, and an assistant sterilizes one while the other is being used. Another advantage of this method is that the needles are always oily, so that they do not rust and remain sharp for a long time.

As I have said, the method is not new. It was devised by Sir Almroth Wright in the early days of this century and was used by him and his pupils (of whom I have the honour to be one) ever since as the standard method employed in the Inoculation Department of St. Mary's Hospital. In that one institution close on one million inoculations have been given with syringes sterilized by hot oil, and there have been no disasters. The method is described in Wright's book[1] on the technique of the teat and capillary glass tube, and more recently the merits of the method have been pointed out by K. B. Rogers.[2]

I have myself used this method of sterilizing syringes for inoculation since I entered Wright's laboratory in 1906, and I still use it. I cannot remember in that 44 years septic complications in any of the thousands of patients I have inoculated.

If it is desired to use a syringe containing many doses of the vaccine or toxoid I would suggest that this can still, with the aid of a hot-oil bath, be done safely and simply. Instead of removing the needle and thereby infecting the syringe, the needle is merely dipped into hot oil for about 10 seconds. The oil could for this purpose be at a higher temperature than could safely be used to sterilize Record syringes, and temperatures of 150° or 160° C. could be employed. The water in the needle would boil, and any pathogenic organism likely to have infected

the needle would be destroyed. At the same time the needle is oily, so that it goes through the skin more easily and remains sharp for a long time.—I am, etc.,

London, W.1. ALEXANDER FLEMING.

REFERENCES

1 Wright, Sir A. E., and Colebrook, L., *Technique of the Teat and Capillary Glass Tube*, 1921, London.
2 *Lancet*, 1946, 2, 87.

SIR,—I have read with great interest the article on this subject by Drs. R. J. Evans and E. T. C. Spooner (July 22, p. 185). By a curious coincidence I have recently referred to the same problem in an article in the *Medical Officer* (July 15, p. 29), the point there being prevention of the possible transference of the virus of poliomyelitis from one individual to another. Without then having the benefit of the experiences described by the above workers, I suggested the following: (1) Only the amount of material required for one injection should be drawn up into the syringe. (2) Obviously a sterile needle is used for each case. (3) After discharging the contents, the plunger should be kept pressed firmly home until the needle is withdrawn from the arm.

I was not apparently far wrong, with the exception of the possibility of fluid being sucked up the bore of the needle in the act of removal from the syringe, owing to the vacuum created when disconnecting the boss.

Here, then, is a further suggestion. Slightly more fluid is drawn up into the syringe than is required for the injection. The correct amount having been inoculated (when convenient subcutaneously, to avoid built-up pressure from muscular contraction) the syringe and needle are withdrawn and the remainder of the fluid is expelled through the needle before removal of the latter from the syringe for changing. I think that the syringe should have a plunger which fits perfectly, like the good old "agla" once supplied by Burroughs Wellcome and Co., and it should be slightly stiff in operation. Further, pressure of the thumb or palm of the hand should be maintained evenly on the plunger during removal of the needle from the arm. Most of the pitfalls should be covered by this procedure.

Short of sterilizing numerous syringes, which is difficult in mass immunization, this is the most watertight technique that I can envisage. I would be glad to hear what Drs. Evans and Spooner think of this as the best compromise.—I am, etc.,

London, S.E.5. GUY BOUSFIELD.

SIR,—I have read with considerable interest the paper by Drs. R. J. Evans and E. T. C. Spooner on this subject (July 22, p. 185), and noted that, though using a bacteriological method, they confirmed my findings which were published in the *British Medical Journal* in 1946.[1]

I continued my investigations and published the results in the *Journal of the Royal Army Medical Corps* in 1946.[2] This further work made it clear that the pumping action on removing a needle from a syringe was of considerable importance, particularly with the large "Army" fitting. I found that with a Record fitting contamination with red cells occurred in 14% of instances after an intramuscular injection, whereas with an "Army" fitting it occurred in 47% of instances. As Evans and Spooner, using a very sensitive bacteriological method, have found contamination of the syringe in 81% of injections with a Record fitting, presumably if the experiments were repeated using their method contamination with an "Army" fitting would be almost 100%.

Syringe contamination would certainly seem to be an important factor in the transmission of infective hepatitis and possibly other diseases during mass inoculation in the Forces. It would be a pity to discard the "Army" fitting on this account alone, as the larger joint is much more convenient than the Record fitting—the needle does not tend to slip from the syringe, and one can use a large aspirating needle on the syringe with a good deal more security. In my opinion the "Army" fitting would be mechanically more satisfactory than the Record fitting for general use.

I suggested a simple method by which contamination of the syringe could be avoided during an intramuscular injection. In brief, this consists in interposing a removable tap between the needle and the syringe; when the injection is given the tap is turned off, the needle withdrawn from the tissues, and the tap and the needle removed for sterilizing. A further tap and needle can then be applied to the syringe for the next injection. This method has the great advantage that the needle and tap can be rinsed and dropped in a boiling sterilizer, to be sterilized in the minimum of time, unlike syringes, which are liable to breakage by unskilled personnel. I carried out a series of 99 intramuscular injections using this technique, and on microscopical examination for red cells I was unable to detect contamination of the syringe in a single instance. It would be interesting if this work could be repeated using Evans and Spooner's bacteriological technique; if the safety of the method is confirmed I think it might well be adopted during mass inoculations. The taps could be mass produced at a comparatively small cost: only about half a dozen would be required for each operator.

Incidentally, the author of your annotation on syringe sterility in the same issue of the *Journal* (p. 204) scarcely does me justice when he states:

"Hughes concluded that the pressure produced, especially by a rapid injection into contracted muscle, may force a little fluid back into the nozzle of the syringe. No suggestion is offered in his paper that any other mechanism may be concerned."

I would draw his attention to the final paragraph of my paper, published in the *Journal* in 1946, which is as follows:

"The limited number of investigations carried out suggests that contamination occurs as follows. A small amount of fluid is forced back into the needle after the injection, or traces of blood are left on the tip of the needle when it is withdrawn; this blood tends to spread slowly along the needle, and on removing the latter from the syringe the needle contents are aspirated, leaving a contaminated drop of fluid on the tip of the syringe. This drop contaminates the next injection, despite the changing of the needle."

If he still doubts whether I mentioned the importance of aspiration of fluid from the needle when it is removed from the syringe, I would refer him to my paper in the *Journal of the Royal Army Medical Corps*.[2]—I am, etc.,

Liverpool. ROBERT HUGHES.

REFERENCES

1 *British Medical Journal*, 1946, 2, 685.
2 *J. R. Army med. Cps*, 1946, 87, 156.

Haemorrhage from Peptic Ulcer

SIR,—The discrepancy between mortality figures in haematemesis and melaena given in the *Journal* of July 15 by Drs. C. D. Needham and J. A. McConachie (p. 133) from the Aberdeen Royal Infirmary and by Drs. A. G. Ogilvie and I. O. B. Spencer (p. 138) from the Royal Victoria Infirmary, Newcastle-upon-Tyne, is so great that a further comment on them may not be out of place. There will probably be general agreement with the statement of Needham and McConachie that their mortality rate of 13.9% for 476 cases corresponds to results obtained for a similar period in most general hospitals. The achievement of Avery Jones[1] (7.8% mortality in 615 cases) shows clearly how large is the room for improvement, but I submit that the very low mortality claim by Ogilvie and Spencer (2.4% in 170 cases) may be misleading.

To begin with, the total number with which these authors deal is relatively small—they work out at two patients per month, while general physicians in hospitals of comparable size where no restriction is placed on admission of such cases will often handle many times that number. This low turn-over suggests that only a small proportion of cases of haematemesis and melaena occurring in the populous area of Newcastle-upon-Tyne found their way into the Royal Victoria Infirmary, probably because of needs for teaching students. The figures given by Ogilvie and Spencer bear out the idea that such a selection was indeed made, because they show that only 16% of their patients were over 60 years of age, most of these between 60 and 70, whereas the records of Needham and McConachie, Avery Jones[1] from the Central Middlesex Hospital, and Baker[2] from the Selly Oak Hospital, Birmingham, dealt with about 30% of patients over 60, a heavy proportion of whom were over 70.

Without knowing what happened to the other patients with bleeding peptic ulcers in Newcastle-upon-Tyne, it is difficult to accept Ogilvie and Spencer's mortality figures at their face value.

On the larger issue, haemorrhage from peptic ulcers ceased some time ago to be solely the preoccupation of physicians, and now even the most conservative recognize that surgery has a place in the treatment of that emergency. Few will be found to subscribe to the idea that all, or even the majority of, cases of such haemorrhage should be operated on as a matter of course, and the balance of present-day opinion inclines to the view that there is a definite, though not very large, percentage of cases in whom operation would be a life-saving measure.

Most clinicians now feel that an emergency operation should be offered to some of the patients in whom severe haemorrhage recurs after admission to hospital. Obviously a number of such patients will not be fit for operation for a variety of reasons, while others may refuse surgical aid, and the crux of the matter is to balance in the remainder the probability of death without and with operation. The problem would be easy if only there were a way of divining whether bleeding comes from an opening in a sizeable artery, often eroded tangentially in the floor of a chronic ulcer, because it is then that an imminent threat to life exists. Few will disagree that in such instances an operation, preferably a partial gastrectomy, should be performed.

In the various series of cases of haematemesis and melaena recorded I have yet to find a reference to the type of patient who is admitted—sometimes shocked, sometimes in a fair condition—who in spite of recognized treatment continues to lose ground in a rather insidious way. The blood count of such patients goes on dropping to a level far below that for which haemodilution would account; frequently they do not vomit or pass melaena stools, and one must assume that in them continued seepage of blood into the bowel is taking place. I am sure others will recognize in that description a large group of cases whose place is between those who go all one way and give rise to little anxiety and, at the other extreme, those in whom a sharp recurrent haemorrhage gives clear warning of impending disaster. The patients in this middle group often benefit from blood transfusion, and with experienced management they will rarely need an operation.

This letter is not the place for giving an account of the routine treatment of haemorrhage from peptic ulcers adopted in the hospital at which I work—this has been done already by Baker in his report—but one of the points I insist on in my patients is the avoidance of any aperients or enemata in the first week after admission, or even longer if melaena continues. I have found from prolonged observation that, as in typhoid, constipated patients with haematemesis or melaena rarely die. I feel that injudicious stimulation of the bowel in a precariously balanced patient may start bleeding again. It is true that an occasional subject has to pay for my view with faecal impaction, but, while this may give rise to considerable discomfort, it can be relatively easily relieved and does not endanger life.

Finally, those charged with the care of patients suffering from haematemesis and melaena will agree with the views expressed in your leading article (p. 153) that there is a real need for further clinical studies of this serious and all too commonplace problem.—I am, etc.,

Birmingham. A. M. NUSSEY.

REFERENCES

1 *Guy's Hosp. Rep.*, 1947, 96, 1.
2 *British Medical Journal*, 1947, 2, 441, 477.

Abortion

SIR,—We should like to offer the following comments on the review of 2,665 cases of abortion by Mr. Albert Davis (July 15, p. 123). He suggests that the frequent finding of organisms such as *Staphylococcus albus* and diphtheroids is indicative of active infection.

In the former London County Council puerperal sepsis unit at the North-western Hospital, Hampstead, a strict bacteriological survey of all cases of post-abortal sepsis was carried out between 1937 and 1946, and the infecting organisms were classified as follows:

Infecting organism	Cases	Percentage
Haemolytic streptococcus	134*	13.9
Staphylococcus pyogenes	110	11.4
Bact. coli	239	24.8
Other aerobes	119	12.3
Cl. welchii	190	19.7
Anaerobic streptococci	125	12.9
Bact. pseudonecrophorum		
Negative cultures	48	5
Total cases	965	100

* 60 strains (45%) belonged to group A.

While a series of 50 consecutive cases of abortion are not strictly comparable with cases of definite sepsis, nevertheless we did not consider that the presence of organisms such as *Bact. coli, Cl. welchii*, anaerobic streptococci, or coagulase-negative staphylococci was always associated with clinical signs of infection, although putrefying products of conception may certainly encourage their proliferation.

The greatest difficulty in the bacteriological assessment of these cases is the determination of the pathogenicity and invasiveness of the various organisms found on cervical culture. The wide variation in the toxigenicity of *Cl. welchii* strains has been emphasized in a previous study.[1] Experience has shown also that the finding of coagulase-positive staphylococci on cervical culture carries with it a considerable chance of pyaemia, whereas coagulase-negative organisms can be disregarded.—We are, etc.,

A. MELVIN RAMSAY.
London, N.W.3. J. VAHRMAN.

REFERENCE

1 Ramsay, A. M., *J. Obstet. Gynaec. Brit. Emp.*, 1949, 56, 247.

SIR,—In his interesting report on abortion Mr. Albert Davis (July 15, p. 123) describes a method of causing the uterus to empty itself while the cervical canal is distended by a Hegar's dilator. Ten units of oxytocin are injected into the uterus. Since I have seen severe and prolonged circulatory collapse following the administration of ten or even five units of "pitocin," I am prompted to ask if the risk of this alarming complication is justified in order to achieve a more or less bloodless evacuation of the uterus.—I am, etc.,

Birmingham. HUGH C. MCLAREN.

D-tubocurarine Salts and Derivatives

SIR,—The letter from Drs. G. A. Mogey and J. W. Trevan (July 22, p. 216) rightly calls attention to the need for exercising caution in using derivatives of D-tubocurarine. The variation in the relative potencies of D-tubocurarine and its dimethyl ether from species to species is, as the writers point out, not surprising, nor indeed are the variations observed with different methods of testing and modes of administration; for it would be very unusual if a phenol and its methyl ether were absorbed and metabolized in precisely the same way.

The experiments carried out by Dr. H. O. J. Collier and Mr. R. A. Hall (June 3, p. 1293) were designed to show whether dimethyl tubocurarine differed in any important respect from D-tubocurarine. The results obtained with different species of animals were important because they indicated that the relative potencies of the two substances varied from species to species, suggesting that there might also be a difference in the relative potencies of the two substances in humans. Such a difference was in fact found, and was favourable to dimethyl tubocurarine, which, according to Drs. H. B. Wilson, H. E. Gordon, and A. W. Raffan (June 3, p. 1296) and Pelikan, Sadove, and Unna,[1] is two to two and a half times as potent as D-tubocurarine in humans. The pharmacological investigation showed furthermore that for equipotent doses in the cat less histamine was released by dimethyl tubocurarine than by D-tubocurarine and that there was less paralysis of the autonomic ganglia. Further, in the rabbit and the rat there was less paralysis of respiration by dimethyl tubocurarine than by

equipotent doses of D-tubocurarine. Far from being a more dangerous drug than D-tubocurarine, dimethyl tubocurarine clearly has several desirable properties not shared by D-tubocurarine.

The conclusion to be drawn from the results quoted by Drs. Mogey and Trevan is presumably that, whatever the methods used by research workers in evaluating a new drug, the potency and toxicity of any particular sample of that drug must be determined relative to that of a standard specimen of the substance, ideally a chemically pure specimen. This is of course the procedure followed with D-tubocurarine, every batch of which must be approved by the Ministry of Health following a direct comparison with a standard preparation of D-tubocurarine chloride kept in the National Institute for Medical Research. The reason is that D-tubocurarine is a "therapeutic substance the purity or potency of which cannot be adequately tested by chemical means'" and thus falls within the scope of the Therapeutic Substances Act, 1925, to which it was made subject by the Therapeutic Substances (Amendment) Regulations, 1948. Drs. Mogey and Trevan have indicated how difficult it is to prepare a chemically pure specimen of such a complex substance as D-tubocurarine, which may exist in a large number of different enantiomorphic forms. These considerations apply equally to dimethyl tubocurarine, although in preparing it from tubocurarine by methylation the number of enantiomorphs present would tend to be reduced and would certainly not be increased. In any event, no reputable manufacturer would attempt to prepare dimethyl tubocurarine iodide for clinical use by methylation of crude mother liquors.

Drs. Mogey and Trevan draw attention to the variations obtained by different workers in values for the ratio:

$$\frac{\text{potency of dimethyl tubocurarine salt}}{\text{potency of D-tubocurarine salt}}$$

Reference to Table I in the paper of Collier and Hall indicates that only two seriously aberrant values are found among the total of 19. One of these, the value of 5 in man, was obtained by Marsh, Sleeth, and Tucker[2] in a single volunteer, and it would be reasonable to discount it. The other, a figure of 8, obtained in the rat by Marsh and his colleagues, would appear to be anomalous. The rat appears to be the only animal in which such an anomaly has occurred. It so happens that in these laboratories the rat has been regularly used for assaying the potency of dimethyl tubocurarine since 1948. Results with consecutive samples have been very uniform in this animal, and nothing resembling the results of Marsh and his colleagues has come to light.

The fears expressed by Drs. Mogey and Trevan that different batches of dimethyl tubocurarine iodide may vary widely in potency and toxicity should be dispelled by the information that dimethyl tubocurarine iodide, like D-tubocurarine chloride, now falls within the scope of the Therapeutic Substances Act, 1925. The provisions applicable to this substance are contained in part III of the ninth schedule in the Regulations of 1948, and the licensing authority has tested and approved all the material recently made available to clinicians. Moreover, the potency of recent batches has been compared with that of a standard preparation of the dimethyl ether kept at the National Institute for Medical Research, so that the misgivings expressed by your correspondents have been anticipated and no clinician need feel that he is running unnecessary risk in using dimethyl tubocurarine in preference to D-tubocurarine.—I am, etc.,

Ware, Herts. NORMAN EVERS,
Director of Research, Allen and Hanburys, Ltd.

REFERENCES
1 *J. Pharmacol.*, 1950, **98**, 25.
2 Ibid., 1948, **93**, 109.

Vascular Changes in Diabetes

SIR,—Dr. Elliott P. Joslin (May 13, p. 1095) demonstrates the formidable incidence of peripheral vascular disease in young diabetics, and Dr. Cecilia Shiskin (June 24, p. 1490) and Dr. R. D. Lawrence (July 8, p. 107) consider the possibility (I like to think probability) of a common factor causing both diabetes and vascular damage; this awaits further research, but there is another aspect on which I should like to invite opinion. Vascular disease is believed to be a degenerative process which affects diabetics and non-diabetics; in the former there is a heavier incidence and earlier onset. May this be due to malnutrition of the peripheral tissues, including the vascular system? Perhaps this factor makes gangrene of the toes so much more common in diabetics than in non-diabetics with arteriosclerosis. The diabetes is usually mild and stable in these cases, the blood sugar being easily kept within orthodox limits with small doses of insulin, yet gangrene, superficial or deep, develops in one toe after another. Dr. Lawrence points out that no diabetic has a normal sugar metabolism. Certainly the injection of insulin, which is absorbed into the blood stream regardless of the prevailing glucose level, is a clumsy substitute for the delicate mechanism by which it is secreted normally in response to a rise in the blood sugar. It seems possible that injected insulin needs a greater "head" of sugar in the blood than that found in the normal person in order to carry out the anabolic process of promoting the storage and utilization of glucose.

The fear that a persistent high blood sugar is harmful has overshadowed our thought and practice; I suggest that it is not the high blood sugar *per se* which brings disaster to the untreated diabetic, but rather starvation in its widest sense. Two observations illustrate my point. First the dramatic improvement in the general health, strength, and weight of a diabetic as soon as he begins insulin and long before the blood sugar levels become normal; and secondly an observation on the nutrition of the muscles. The diabetic before he begins insulin experiences an aching and weakness of the great muscles of the thighs—e.g., on going upstairs. The diabetic on insulin develops exactly the same weakness and aching if, for example, in the course of a long walk hypoglycaemia develops. In both cases the sugar metabolism is at fault and the muscles are deprived of fuel.

Dr. Joslin's observation that on the whole the better controlled patients resist longer the onset of vascular complications is not incompatible with this suggestion, since the badly controlled probably have insufficient insulin for their metabolic needs; but the fortunate few, who escape vascular complications after more than 20 years, are by no means those who adhere to a strict regime, weighing their food and testing their urine, but often lead a full free life, taking exercise, food, anxiety, and hard work as it comes.

The practical application is to endorse and underline the doctrine that a persistently low blood sugar is more dangerous to diabetics than a persistently high one. Should we set the optimum in routine blood sugar estimations, four hours after meals, at a higher level than that of a normal person—perhaps at above the renal threshold of 180 mg. per 100 ml. ?—I am, etc.,

Hove, 3. G. M. WAUCHOPE.

Rectal Thiopentone in Children

SIR,—On reading Dr. John Lorber's article on this subject (July 1, p. 21), I was struck by his omission to lay sufficient stress on the potential hazards of this method. The technique described is so simple that physicians using it for diagnostic procedures may be tempted to employ this method where no trained anaesthetist is available or present. Such a course should under no circumstances be contemplated, as considerable respiratory depression may ensue from the dosage the author recommends, and as there is no evidence that the drug given by the rectal route will be less liable to predispose to laryngospasm than when given intravenously.

In that connexion I also notice that Dr. Lorber fails to mention a laryngoscope and endotracheal tubes as accessories which should be available whenever thiopentone is being given by whatever route. Indeed, it appears likely that the patient who had "severe spasm of coughing and temporary cyanosis" may have suffered from a mild attack of laryngospasm, which fortunately resolved spontaneously. Atropine is by no means infallible in preventing such an occurrence, although it will markedly lessen the vagal hypersensitivity induced by thiopentone.

This and the other case of aspiration of vomitus constitute 3% of the whole series, and any one of these two cases may have had serious consequences. Thus one cannot fail to wonder whether the risk involved is not too high a price to pay in order to obtain sedation for diagnostic procedures.—I am, etc.,

University of Illinois, Chicago, U.S.A. GORDON M. WYANT.

Intermittent Dosage with Streptomycin

SIR,—I have read with interest the article "Intermittent Dosage in the Treatment of Pulmonary Tuberculosis with Streptomycin" (May 27, p. 1224) and also the leading article entitled "Streptomycin Resistance of Tubercle Bacilli" (p. 1245).

Reports of this kind ably presented by the Medical Research Council are eagerly awaited and usually put into effect in this country. In view of this I would like to draw attention to a principal finding in the above article—"It is concluded that one gramme of streptomycin a day in a single injection, without intermission of treatment, is the most satisfactory way of giving the drug in pulmonary tuberculosis." The continued existence of a streptomycin-resistant organism depends on possibly two factors—an inherent and an acquired or environmental factor, which latter is dependent on a low peak concentration of streptomycin. The four dosage groups employed in this case in an attempt to avoid or delay the emergence of predominantly streptomycin-resistant tubercle bacilli in the treatment of the disease have been all of relatively bacteriostatic, not bactericidal, regimes. The use of a higher single dosage of streptomycin given twice weekly and its bactericidal effect on the life cycles of the tubercle bacilli and their mutants have not, in this case, been considered.

The coexistent use with streptomycin of a synergistic drug such as P.A.S. to prevent the formation of streptomycin-resistant mutants is plausible, but it seems that a fundamental factor is being ignored when the dosage of streptomycin given does not prevent, indeed is conducive to, the formation of a streptomycin-resistant from a previously streptomycin-sensitive tuberculous organism, irrespective of its inherent property.—I am, etc.,

Adelaide, South Australia. R. MUNRO FORD.

Domiciliary Treatment of Tuberculosis

SIR,—Under the subheading "Doctors' Ignorance," in the account of the meeting of the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the B.M.A. in Liverpool, Dr. W. D. Gray is reported in the *Liverpool Echo* (July 20) as having expressed the following opinion: "There is a deplorable ignorance among general practitioners about the first principles of treatment in tuberculosis."

We feel that Dr. Gray should seek the hospitality of your columns to substantiate or withdraw this serious charge, which, to our knowledge, has already caused considerable concern among patients.—We are, etc.,

R. FITZGERALD, P. T. GARRY,
M. J. O'DONNELL, T. A. JERMY,
T. A. G. HUDSON, JAMES BINNIE,
C. A. L. KELLY, E. V. O'RIORDAN,
T. J. COAKLEY, J. V. COGHLAN.

∴ A letter from Dr. W. D. Gray is published below.—ED., *B.M.J.*

SIR,—In my address to the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the B.M.A. in Liverpool I complained of the ignorance about principles of treatment of tuberculosis shown by some general practitioners. This I attributed to faulty education in our medical schools, where many students are trained without ever entering a sanatorium or chest clinic for instruction. My charge was that some general practitioners do not seem to realize that it is more important for the tuberculous case to rest in bed while awaiting admission to sanatorium than it is for him to seek fresh air by walking in the park. I complained that some doctors told the patients to go out, when I had told them to stay in bed. I also referred to some general practitioners prescribing streptomycin and P.A.S. indiscriminately, without consulting the tuberculosis officer or chest physician. This was also mentioned by Professor F. R. G. Heaf.

The press excerpt from my address did not report that I said: "There are many general practitioners with whom it is a pleasure to work, however, and they make the care of the tuberculous at home much easier for the clinic physician. Close co-operation is essential for success." I fully realize the difficulties of the busy general practitioner in any industrial city, and my aim in mentioning these points was solely to stress the need of closer co-operation between specialist and general practitioner in the home treatment of the tuberculous.—I am, etc.,

Liverpool. WILLIAM D. GRAY.

Stevens–Johnson Syndrome

SIR,—In view of the recent paper by Dr. Bernard A. Thomas on this subject (June 17, p. 1393), the following case may be of interest.

A married woman aged 31 years came to the surgery on May 20 complaining of the sixth attack of a condition which appeared as blistering of the lower lip and hands and intense itching of the eyes and vulva. She stated that she had been exceptionally healthy until February, 1949, when she had her first attack, which was sudden in onset. The attacks invariably started with an eruption on her lip, which symptom was the last to disappear after the attack had subsided. The blisters on her hands appeared two or three days after the lip eruption. This was the first time in which the eyes or genitals were affected.

Her temperature was normal. There was slight injection of the conjunctiva, one fairly large bulla on the lower lip, and several smaller blisters on the inside of the lower lip. The dorsum of the hands was covered with small clear blisters. The palms and palmar aspect of the fingers were covered with closely set erythema iris macules, which did not subsequently progress to bulla formation. There were a few scattered macules on either forearm which did not form bullae. Desquamation took place in from 10 to 14 days. The blood Wassermann reaction was negative. There was mild secondary anaemia. The urine was normal. Fluid from the blisters yielded no organisms. No history of allergy or susceptibility to sulphonamides or other drugs could be elicited.

This appears to be a mild case of erythema exudativum multiforme (Hebra). A point about it seems to be that the attacks are increasing in severity gradually, since this is the first time in which the conjunctivae were involved even mildly. The normal temperature is also unusual.—I am, etc.,

Tullow, Co. Carlow. J. B. MAHER.

R.A.M.C. Roll of Honour

SIR,—May I crave the hospitality of your columns to inform your readers that the Roll of Honour of all ranks of the R.A.M.C. who gave their lives during the Second World War (September 3, 1939–May 8, 1946) is now complete, and copies have been sent to all the next-of-kin with whom we have been able to get into touch. I shall be glad to send a copy to any who, owing to a change of address or other cause, may not have received the original notice. Application should be made to me at R.A.M.C. War Memorial Fund, 34, Victoria Street, S.W.1.

The Roll is included in an illustrated booklet describing our Book of Remembrance, the Memorial Window, and other Corps Memorials in Westminster Abbey and its precincts, and will be sent to any of your readers who are kind enough to send a donation to our fund, which is devoted to helping all ranks of the R.A.M.C. who took part in the war, and their families.—I am, etc.,

London, S.W.1. R. E. BARNSLEY,
Major-General.

Obituary

IVOR I. PRICE, M.B., F.R.C.S.

Mr. I. I. Price, senior consultant surgeon to the Whittington Hospital, London, died on July 24, 1950, at the age of 46.

Ivor Isaac Price was educated at Daventry Foundation School and entered King's College Hospital Medical School in 1920. He had a most distinguished student career and won many awards, among them the Alfred Hughes Memorial Prize and the Senior Scholarship. He took the conjoint diploma in 1925 and graduated M.B., B.S. in 1926. After holding resident appointments at King's College Hospital and Queen Mary's Hospital for the East End he was appointed medical superintendent at the Seamen's Hospital, Tilbury. He became a Fellow of the Royal College of Surgeons in 1928, and in 1929 he entered the London municipal hospital service, where his outstanding surgical skill and judgment brought him rapid advancement. He served in several surgical posts in L.C.C. hospitals, and in 1938 was appointed senior resident surgeon and deputy medical superintendent at St. Mary Islington Hospital. Here he soon built up a reputation as an able general surgeon, widely respected by the general practitioners of the district and by the large numbers of patients who had reason to be grateful for his skill and kindness. His experience covered almost every field of surgery, and he published papers on several subjects in this *Journal* and elsewhere, but he developed a special interest in gastro-enterology.

In the L.C.C. hospital service he was one of the pioneers of gastroscopy, at which he became highly skilled. As an operator he was quick, yet gentle and meticulous, and he had special success with patients whom many would regard as poor operative risks. He was a scrupulously conscientious surgeon, avid for work, and was seen at his best in his handling of the patient with post-operative complications. Those who worked with him will always be grateful for the way in which he rallied to their support when problems arose, and he was especially beloved by the nursing staff. He was an accomplished clinical teacher, and many candidates for the F.R.C.S. examination will remember the bedside classes which he so ably conducted for the Fellowship of Postgraduate Medicine.

In 1947 Mr. Price was appointed surgeon specialist by the London County Council. Unhappily it was about this time that he suffered the first symptoms of heart disease, and in the following year he had two attacks of coronary thrombosis. He returned to duty early in 1949 and took up his operative work again. With the reorganization of his hospital under the National Health Service and its amalgamation with the two adjacent hospitals to form the Whittington Hospital, he became surgical director of the newly established gastro-enterological unit. Despite recurrent anginal attacks he was courageously taking an increasingly heavy share of the arduous surgical work of this unit, when he suffered his third and fatal attack of coronary thrombosis. Though his determination to return to active surgical work probably shortened his life, all who knew him will realize how characteristic was his decision to carry on to the end. He leaves a widow and one young son.—A. L. J.

Sir JOHN HUTSON died at his home in Pine Hills, Barbados, British West Indies, on March 29 at the age of 91. The son of the late Archdeacon Hutson, he was one of three brothers, each of whom held distinguished positions in the Colonial Empire. His eldest brother, Sir A. Hutson, was a Colonial Governor, while his other brother was Bishop of Antigua and Archbishop of the West Indies. John Hutson was educated at Lodge School, Codrington College, and Edinburgh University, where he graduated M.B., C.M. in 1883. He took the Cambridge D.P.H. in 1905. Returning to Barbados, he joined the staff of the General Hospital there, and he served as public health inspector and poor law inspector for a time. Subsequently he was appointed chief medical officer when that office was created. He was appointed a member of the Legislative Council in 1920, and served on the Education Board and on the Executive Committee. He represented Barbados at the coronation of King George VI, and until he resigned the presidency of the Legislative Council he was chairman of the local branch of the Empire Parliamentary Association. Sir John Hutson, who was knighted in 1943, had been a member of the British Medical Association for over sixty years, and he represented the Branch at the annual meetings at Portsmouth in 1923 and at Eastbourne in 1931. He was president of the Barbados Branch in 1929–30 and then from 1932 to 1938. He was one of the Branch's keenest and most hard-working members, and the sympathy of all his colleagues and friends will be extended to Lady Hutson, who survives him.—A. P. M.

Medico-Legal

TRESPASS AND ASSAULT

A recent report in these columns entitled "Trespass by a House-surgeon" (July 15, p. 171) has prompted the council of the Medical Defence Union to remind practitioners again of the need to obtain proper consent in writing from patients or their relatives when any operative treatment is recommended.

This case has emphasized another point. It is also essential to make it clear that, when a patient is admitted to hospital for operative treatment, the operation proposed will not necessarily be performed by any particular surgeon, who may have seen the patient previously, or under whose name he is admitted.

So that practitioners will be provided with adequate legal authority and protection to avoid the risk of their subsequent appearance in the Courts on a charge of trespass or assault, the council of the M.D.U. has had prepared a number of model forms. These forms of consent, reproduced below, are considered appropriate by the solicitors to the M.D.U.

Consent by Patient

I ..... of .....
hereby consent to undergo the operation of .....
the effect and nature of which have been explained to me.

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anaesthetic for the purpose of the same.

I understand an assurance has not been given that the operation will be performed by a particular surgeon.

Dated this ..... day of .....

(Signed)

Consent by Relatives

I ..... of .....
the ..... of the above named .....hereby also consent to such operation.

Dated this ..... day of .....

(Signed)

(The formula of consent by the spouse or near relative, although not strictly necessary in law, may save trouble afterwards.)

Consent for Minor

I ..... of .....
hereby consent to the submission of my child .....
to the operation of ..... the effect and nature of which have been explained to me.

I also *consent* to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anaesthetic for the purpose of the same.

I understand that an assurance has not been given that the operation will be performed by a particular surgeon.

Dated this ..... day of .....

(Signed)

Consent for E.C.T.

I ..... of .....
hereby consent to the administration of convulsive therapy, the effect and nature of which have been explained to me. Notwithstanding the fact that there are certain risks of injury inherent in the treatment, I request you to administer the same to me and I accept any risk attaching to such administration.

I understand that an assurance has not been given that the treatment will be administered by a particular practitioner.

Dated this ..... day of .....

(Signed)

Medical Notes in Parliament

ROYAL ASSENT TO THE MEDICAL BILL

The Medical Bill became an Act of Parliament on July 28. The amendments made in its passage through the House of Commons were agreed to by the House of Lords on July 26, and on the 28th, the day Parliament rose for the summer recess, the Royal Assent was signified to it and a number of other Acts by commission.

Tuberculosis in Scotland

MRS. JEAN MANN asked the Secretary of State for Scotland on July 25 what consideration he had given to the report of the Scottish Committee on Tuberculosis Service in Scotland; and if he would make a statement on the recommendation of crisis expansion of tuberculosis service.

Miss HERBISON, the Under-Secretary, replied that with his officers the Secretary of State had been studying carefully this report, but had found in it no recommendation for the expansion of facilities which had not already been considered, while most of the recommendations had been tried with varying degrees of success. In the last two years more than 300 additional beds had been brought into use for respiratory tuberculosis, many of them in infectious-diseases and general hospitals: This process he proposed to continue, especially in general hospitals where nursing staffs were strongest.

Mrs. MANN said that not all the recommendations published in the *British Medical Journal* [of July 8] had been tried—notably the ones that beds in infectious-diseases hospitals should be used, and that patients should have treatment in their own homes.

Miss HERBISON said that was quite wrong. Already, as she had pointed out, there were 300 beds, most of them coming from infectious-diseases hospitals; and certain steps in the direction of domiciliary treatment had been taken in the auxiliary services.

Sir DAVID ROBERTSON said there were only 10 beds for tuberculosis patients in the county of Caithness, and a large number of sufferers were walking about in great danger for whom accommodation could be found.

Mr. ELLIOT asked if recent figures showed a rise or fall in the trend of notifications, and if the number of deaths—which was recently notable—continued, or was it slacking off.

Miss HERBISON said the number of notifications for the whole of Scotland had gone down slightly. In the number of deaths in the 16 principal towns in Scotland there had been about a 20% decrease during the last year.

Dr. CHARLES HILL pointed out that there were 1,000 beds available in Switzerland for the treatment of tuberculosis, and suggested the restoration of the scheme by which public money was made available to enable persons to obtain treatment in Switzerland.

Mr. JOHN HYND said the question whether Swiss treatment was suitable for all these cases should be seriously considered before the taxpayer was involved in any considerable expenditure.

Mr. ELLIOT said it was a case of relieving the overloaded bed system in this country.

Miss HERBISON said that she could give no information on the subject of Swiss sanatoria.

Replying to Mr. CARMICHAEL, Miss HERBISON stated that Glasgow's waiting-list of tuberculosis patients at June 30 this year showed an improvement of 205 compared with last year.

Treatment in Switzerland

Miss WARD asked the Minister of Health on July 27 whether, in view of a recent decision to accommodate tuberculous patients in general hospitals, he would introduce legislation to enable him to subsidize tuberculous patients recommended by local authorities for treatment in Switzerland. Lord MALCOLM DOUGLAS-HAMILTON also asked the Minister whether, in view of the increase in pulmonary tuberculosis in Great Britain, he would take steps to provide funds to enable tuberculosis patients in the lower income groups to undergo sanatorium treatment in Switzerland, as was at present done by Holland, and as was formerly done by our own local authorities prior to 1939.

Mr. BEVAN said that he could not undertake in present circumstances to add to the cost of the Health Service as proposed; but he had recommended to hospital authorities action for making the best use of their own resources.

Empty Beds

Mr. MARPLES asked how many beds which were suitable for tuberculous patients were empty; and how many could be used if there were staff available.

Mr. BEVAN said that hospital returns at December 31 last showed that approximately 5,000 such beds had been unoccupied on that date, of which about 4,000 stood closed for lack of staff.

Chest Physicians' Contracts

Mr. KABERRY asked the Minister of Health on July 27 why the Leeds Regional Hospital Board continued to delay the presentation of contracts to chest physicians within that region; why the board could not now define the point of entry to the salary scale proposed by the board for each chest physician within that region, and pay forthwith all arrears of salary from July 5, 1948.

Mr. BEVAN said that action by the board must await settlement of the general question of the basis of employment of these officers, which was under discussion with the local authority associations and the medical profession.

Sanitary-Inspector Students

Mr. KING asked the Minister of Health on July 27 if he was aware that ex-Service students recruited into and educated for sanitary inspectorship under his department's health training scheme were finding it difficult to obtain employment in their profession; and what steps he proposed to see that they were absorbed into the profession.

Mr. BEVAN said he was aware that some students had not found immediate employment. Appointments of sanitary inspectors were made by local authorities. He was accordingly in no position to ensure the employment as such of any person. Employing authorities must advertise vacancies, and he was sure they might be relied on to give due consideration to applications from ex-Service men.

Mental Officers' Retirement

Mr. RANKIN asked the Secretary of State for Scotland on July 25 if he would state the reasons for the decision of the Western Regional Board to enforce the retirement of all officers in their asylums and mental institutions who had reached the age of 60 years.

Miss HERBISON, the Under-Secretary, replied that she was informed by the Western Regional Hospital Board that they had taken no such decision, and that in fact many mental health officers over the age of 60 were employed in the region.

Doctors' Prescription

Mr. DRIBERG asked the Minister of Health on July 27 if he would investigate the circumstances in which a general practitioner, of whose identity he had been informed, had been notified that he should not have prescribed charcoal biscuits for a patient and that the cost of this medicament was to be deducted from his remuneration; and if he would make a statement.

Mr. BEVAN said the regulations provided a proper procedure for determining whether doubtful substances were drugs in the circumstances of a particular case and for the recovery from the general practitioner of the cost of any substances prescribed which were not drugs. Charcoal biscuits were normally regarded as food, and as such should not be prescribed at the cost of the National Health Service.

Mr. GEOFFREY COOPER asked the Minister of Health on July 28 whether, having regard to the views of the Cohen Committee on Prescribing that preparations advertised direct to the public should not be prescribed under the National Health Service, he would assist doctors by providing them with a list of equivalent preparations; and if he would forbid the use of such advertised proprietary medicines under the Service.

Mr. BEVAN said a list of official counterparts of proprietary preparations was given in the *National Formulary*. Doctors had already been asked not to order proprietary preparations where the alternative standard drug could be ordered without detriment to the patient's condition.

Bone Induction Hearing-aids

Mr. LESLIE HALE asked the Minister of Health on July 27 on what date it was proposed that a bone induction hearing-aid would be available for distribution under the provisions of the National Health Service.

Mr. BEVAN said that trials of a modified aid were now being arranged, but it was too early to say when supplies would be available generally.

Suture Needles

Lady TWEEDSMUIR asked the Minister of Health on July 27 whether, in view of the acute shortage of surgical suture needles in Aberdeen, Edinburgh, and Glasgow, he would assist manufacturers to increase supplies as a matter of urgency.

Mr. BLENKINSOP, the Parliamentary Secretary, said the Minister had been taking steps to assist the manufacturers to increase supplies.

Surgical Appliance Contracts

Mr. OSBORNE asked the Minister of Pensions on July 25 if he would permit pensioners to purchase surgical boots from any supplier provided they were prepared to pay the extra cost of better-quality boots; and if he would make a statement on the conference about this subject recently held at Blackpool with representatives of the Surgical Instrument Makers' Association.

Mr. MARQUAND said the surgical boots supplied by his Department were made from best-quality materials requiring a high standard of workmanship. He was satisfied that the requirements of war pensioners were fully safeguarded by the terms of the manufacturers' contracts and by technical inspection. His Department had made contracts for the supply of surgical boots and appliances with 713 firms throughout the country at prices which were considered by them reasonable and fair. A minority of contractors had refused the terms offered by his Department, but he hoped that they would reopen negotiations. He was not prepared to enter into contracts at excessive prices.

Lieutenant-Colonel KINGSMILL asked the Minister of Pensions how many contracts to date for the year 1951 had been placed for surgical boots and appliances with the co-operative societies; and how many through the Surgical Instrument Manufacturers' Association.

Mr. MARQUAND said that for the year 1950–1 contracts had so far been placed with 36 co-operative societies. He had not a complete list of members of the Surgical Instrument Manufacturers' Association, but, of 94 members who were known to be suppliers of surgical boots and appliances, contracts had been placed with 55 and negotiations were proceeding with 18 others.

Smallpox

Mr. VIANT asked the Minister of Health on July 24 what was the definition of a smallpox-infected country; and whether any part of Great Britain was smallpox-infected at the present time.

Mr. BEVAN said the International Sanitary Conventions did not define a smallpox-infected country. No part of Great Britain was infected at the present time.

Lingfield Epileptic Colony

Brigadier MACKESON asked the Minister of Health on July 27 if he would make a statement on the death of Winton Hogben at Lingfield Epileptic Colony, and if he had taken steps to ensure that supervision had been improved.

Mr. BEVAN replied that he had no jurisdiction over this voluntary institution, but he understood that the medical superintendent felt there had been inadequate supervision of this patient and had strengthened the rules governing supervision of patients in bathrooms.

R.A.M.C. Pay and Conditions

Major NIALL MACPHERSON asked the Secretary of State for War on July 27 what was the present deficiency of regular commissioned specialists in all branches of medicine and surgery on the basis of existing establishment of the Royal Army Medical Corps; to what extent the deficiency was being made up by civilian specialists; and what steps he was taking to overcome the shortage of regular specialists at an early date; and also what was the present deficiency of permanent and short-service regular qualified doctors in the Royal Army Medical Corps on the basis of present establishment; and what was the total deficiency after taking into account National Service doctors; and what steps he was taking to overcome the shortage.

Mr. STRACHEY said that the deficiency of regular, including regular short-service, doctors was 381. This figure included 13 specialists. Taking into account National Service doctors the total deficiency was 265, which included 115 specialists. With a view to overcoming these shortages an examination of the rates of pay of doctors and specialists was being carried out. Sixty-six civilian medical practitioners and 10 civilian specialists had been employed, and 49 medical officers, including 12 specialists, had been given type "B" commissions for one or two years or had been granted special deferments. Conditions for short-service commissions for women doctors would shortly be promulgated, and proposals were now under discussion for reopening short-service commissions for specialists which were calculated to attract highly qualified doctors from civil life.

Major MACPHERSON asked if the Secretary of State for War would now bring the emoluments of qualified doctors and specialists serving on regular commissions in the R.A.M.C into line with those applying under the National Health Service.

Mr. STRACHEY said the rates of pay of medical officers and specialists in the R.A.M.C. were now being examined. Account would be taken of the average earnings of doctors under the National Health Service.

Major MACPHERSON further asked what was the present scale of pay and allowances offered to specialists attached to the R.A.M.C. in a civilian capacity, for home and overseas service respectively.

Mr. STRACHEY replied that civilian specialists serving at home were paid £1,300 or £1,600 a year according to experience and qualifications. Abroad they were paid £1,800 or £2,200 a year and received an outfit allowance and a local allowance varying from £25 to £425 a year according to the station and whether they were married or single. These allowances were common to all Civil Servants of comparable grades. Free sing

accommodation and, in certain stations, free messing were also provided.

Employment of German Doctors

Mr. SORENSEN asked the Secretary of State for the Colonies on July 26 why medical practitioners with German qualifications were allowed to practise in Tanganyika and the Cameroons but not in the Gold Coast, Nigeria, and other Colonies; and, in view of the great need of doctors in all the Colonies not being likely to be met for a long time, whether he would take action to secure the fuller services of German medical practitioners, dentists, and similar professional men.

Mr. GRIFFITHS said there were no special rules about German qualifications as such. In most Colonial territories doctors from outside who wished to practise were required by law to have qualifications recognized by the General Medical Council in the United Kingdom. The law in the former mandated territories, however, gave the local authorities discretion to register practitioners with other qualifications. The recruitment of foreigners for the Government medical services in the Colonies was obviously not free from difficulty, but in fact a number of foreign doctors and dentists had been appointed during the last two or three years. Most of them had obtained British registration.

Pneumoconiosis

Mr. PATON asked the Minister of National Insurance on July 25 if she proposed to amend the relevant regulations to bring within the scope of the Industrial Injuries Act all foundry workers who suffered from a pneumoconiotic condition as a result of being engaged in any process in or around a foundry.

Dr. EDITH SUMMERSKILL said pneumoconiosis was already prescribed in respect of a number of foundry processes where medical evidence indicated there was a risk of contracting the disease, and she was not considering an extension of the scope of the regulations.

Mr. PATON said there was a great deal of evidence of the spread of pneumoconiosis and silicosis in processes other than those prescribed by the regulations. Would it not be simpler and more just if, instead of having to prescribe processes, the basis for eligibility were to be made the existence of the disease in a foundry worker.

Dr. SUMMERSKILL said she was prepared to examine that.

Mr. AWBERY asked what procedure was adopted before a disease was regarded as an industrial disease and was liable to be brought under the Industrial Injuries Act.

Dr. SUMMERSKILL said they had to have convincing medical evidence before it could be attributed to the process.

Whiter Bread

Mr. WEBB, Minister of Food, announced in reply to questions by Wing Commander BULLUS and Dr. STROSS on July 24 that it had been decided to reduce to 80% the extraction rate of flour used for the national loaf. This would be made up of home-milled national flour with a rate of 81%, and a proportion of imported flour with a lower rate. This change, which would take effect on Sunday, August 27, would enable the public to get a whiter and more generally acceptable loaf while still meeting the standards recommended by the Post-War Loaf Conference. It would also add to the quality and quantity of supplies of animal feeding-stuffs.

Dr. STROSS said the 85% extraction rate, together with the high consumption of liquid milk, was responsible in the main for the continuously improving conditions in the health of the nation, and asked the Minister to state now that he did not contemplate any further degradation of that standard.

Mr. WEBB said this was their decision. They had decided that it was possible to reduce the extraction rate at this point because of the high nutritional value of the extra amounts of other kinds of food which they were now able to supply.

Dr. STROSS asked the Minister what was the iron content of wheaten flour at the rates of extraction 85%, 80%, and 72%.

Mr. WEBB said that depended on the grists (the mixtures of wheat). But typical figures for 85%, 80%, and 72% extraction rates were 2.1, 1.65, and 1.25 mg. per 100 g. of flour.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on July 25 a formal welcome was addressed to the International Congress of Anatomists being held at Oxford. The honorary degree of D.C.L. was conferred on Viscount Addison, P.C., M.D., F.R.C.S., Lord Privy Seal, and the honorary degree of D.Sc. on Professor G. W. Corner, director of the Carnegie Institute of Embryology, Professor M. W. Woerdeman, Professor of Anatomy at Amsterdam, and Mr. L. S. B. Leakey, Curator of the Coryndon Museum, Nairobi.

In a Congregation held on July 15 the following degrees were conferred:

D.M.—*W. D. Brinton.

B.M.—D. J. Goldsmid, C. N. Watson, J. D. Cairns, G. C. R. Morris, J. Taylor, J. G. Armstrong, J. M. L. Gilks, G. E. D. Morrhall, W. W. Slack, W. A. Openshaw, J. R. W. Gleave, R. F. Brown, M. J. Evans, J. L. Galbraith, Mrs. Margaret E. H. Warwick, Margery P. S. Woolf, *M. J. Rosenthall, *Jean M. Shanks, *Anne S. Fowkes.

*In absence.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the Royal College of Physicians of London held on July 27, with the President, Dr. W. Russell Brain, in the chair, the following Fellows were elected officers for the ensuing year: *Censors*, J. F. Smith, A. H. Douthwaite, F. J. Nattrass, K. E. Harris; *Treasurer*, W. G. Barnard; *Registrar*, Sir Harold Boldero; *Harveian Librarian*, E. C. Dodds, F.R.S.; *Assistant Registrar*, M. I. A. Hunter.

Sir Archibald Gray was appointed Harveian Orator and Dr. D. H. Brinton Bradshaw Lecturer, both for 1951. The following Lecturers were also appointed: Lumleian (1951), Sir Adolphe Abrahams; Goulstonian (1951), Dr. H. J. Anderson; Oliver-Sharpey (1951), Professor K. J. Franklin; Milroy (1951), Dr. J. C. Broom; Croonian (1952), Dr. E. B. Strauss; FitzPatrick (1951), Dr. W. Brockbank; Mitchell (1951), Dr. W. E. Lloyd.

The President, Dr. Russell Brain, was elected the College representative on the General Medical Council and on the governing body of the British Postgraduate Medical Federation.

The Bisset Hawkins Medal was awarded to Sir Wilson Jameson in recognition of his services in promoting public health during the past ten years while he was Chief Medical Officer of the Ministry of Health.

The Gilbert Blane Gold Medal for 1950 was awarded to Surgeon Commander E. B. Martin, R.N., and the Murchison Scholarship to Dr. J. C. Mitchell.

The appointments of Dr. W. D. W. Brooks as a member of the Prophit Committee, Dr. Alice Stewart as a member of the Rheumatic Fever Committee, and Dr. Mildred Creak as a member of the Psychological Medicine Committee were confirmed.

The following having satisfied the Censors' Board were elected Members of the College: E. M. Backett, M.B., J. C. Batten, M.B., J. S. K. Boyd, M.D., E. G. Brownell, M.D., A. W. Capon, M.B., T. Chelvarajah, L.M.S., P. R. Clay, B.M., Betty L. Coles, M.B., D. H. Collins, M.D., A. E. Doyle, M.B., R. L. Eakin, M.B., W. J. D. Eberlie, M.B., R. Fife, M.B., T. R. L. Finnegan, M.B., W. Fox, M.B., E. N. Gauld, M.B., S. B. Hall, M.D., A. C. Hayton, M.B., J. B. Holroyd, M.B., G. Howells, M.B., M. C. Joseph, M.B., W. A. E. Karunaratne, M.D., S. E. Large, M.B., Major, R.A.M.C., G. L. McDonald, M.B., C. McIver, M.B., H. W. Matthews, M.B., Lieutenant, R.A.M.C., W. R. May, M.B., S. S. Meighan, jun., M.B., J. S. Menzies, M.D., A. W. N. Oatway, M.B., Margaret M. O'Hare, M.B., L. I. Phillips, M.B., Muriel E. Port, M.B., G. S. Ratnavale, M.B., B. Stone, M.B., T. J. Thomson, M.B., W. J. Walkden, M.B., A. P. Waterson, M.B., J. A. Waycott, M.B., R. G. Welch, M.B., E. Williams, M.B.

Licences to practise were conferred upon 107 candidates (including 15 women) who have passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board and who have complied with the necessary by-laws: K. R. Aberdour, D. Abse, Lilian E. Ackermann, Sheleagh E. Aldersmith, R. J. Ancill, M. J. Argyrides, B. H. Bass, W. H. G. Batham, Barbara E. Batty, H. H. G. Bell, J. C. Betts, Hyla M. Birks, F. R. Brearley, J. M. Brown, B. H. Burne, G. E. H. Callebaut, T. H. Christie, D. J. Coleman, H. G. Cooper, H. D. Cullimore, H. J. B. Day, A. R. de C. Deacock, J. C. Dilley, P. Dinmore, W. A. W. Dutton, M. A. Ebrahim, H. B. Eckstein, J. A. Eddington, P. C. Fleming, R. Fleming, J. H. G. Ford, N. S. Galbraith, L. E. Garrett, Angela M. Geere, R. E. Gibson, A. L. A. Gill, S. C. Gomez, J. Gower, B. P. Green, J. L. Griffiths, R. Hart, R. F. Harvey, C. McL. Hewat, R. Hill, R. Hinchcliffe, E. R. Heuhns, Anne Isaac, G. Jessup, P. E. E. Kann, F. M. Kinsman,

S. F. Knipe, S. S. Lazarus, D. Lennie, H. E. Lewis, J. A. F. Lord, J. W. McCloy, R. F. McKnight, Sheina A. Maclean, M. K. Mason, Jennie C. Maurice-Jones, W. C. Mok, R. D. Morbey, Ann E. Morgan, A. H. Mortimer, G. M. Murphy, R. N. Nauth-Misir, T. O. O. Ogunlesi, D. W. Orton, E. M. Orton, Kathleen M. Parker, J. W. Parkin, J. A. Pedler, L. H. Pell, J. E. H. Pendower, Joan K. Perkins, D. A. Plomer, A. J. Redenham, G. D. Rees, Alison M. Richardson, E. H. Roffey, I. M. Rosen, N. L. Rowe, K. E. K. Rowson, Hilary G. Rubin, P. W. Ruggles, P. S. B. Russell, M. R. Salkind, Gwendoline D. Salter, D. I. Segall, H. Silver, P. R. Stevens, E. Stokoe, D. T. I. Stuttaford, G. C. Swain, D. R. *Sweetnam*, Gwendolyn R. Tapp, I. O. Taylor, W. C. T. Thomas, G. W. Thorpe, J. G. Turner, W. J. A. H. Turner, J. M. Walker, H. B. G. Webb, J. A. Williams, K. G. Williams, R. I. J. Williams, D. Wiseman.

Diplomas in Medical Radio-Diagnosis, in Medical Radiotherapy, in Laryngology and Otology, in Psychological Medicine, in Anaesthetics, in Tropical Medicine and Hygiene, and in Child Health were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

Other diplomas were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN PUBLIC HEALTH.—N. J. Caldwell, M. J. Collins, R. E. C. Copithorne, Audrey T. Evans, K. C. Mackenzie, N. Newman, J. O'Callaghan, R. O'Farrell.

DIPLOMA IN OPHTHALMOLOGY.—M. Alimuddin, H. L. Backhouse, R. H. Baird, J. C. Bass, Fiona M. Bennett, W. G. C. Craigen, R. P. Dhanda, D. B. Dunlop, R. Ebenezer, R. F. Elliott, Nora M. English, B. Ibrahim, B. U. Killen, Ella I. Mackinnon, S. Prakash, P. K. Rai Chaudhuri, A. V. *Rajagopal*, J. P. *Robinson*, T. R. Sakhuja, J. H. Scott, K.-Y. Sun.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—P. H. Ball, R. N. Bulsara, R. B. W. A. Cole, P. C. Ghosh, Margaret M. Harley, M. C. Head, Anna J. Kesson, J. M. McKeogh, R. A. Morris, D. J. O'Connor, J. Ll. J. Phillips, D. Plum, T. F. Roche, F. Saif, L. F. Samut, A. G. Shanks, J. R. C. Spicer, H. S. Sweet, D. S. Thomson, Ll. M. Weerekoon.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England held on July 13, Sir Cecil Wakeley was re-elected President for the ensuing year, and Professor Ernest Finch and Mr. P. H. Mitchiner were elected vice-presidents.

Mr. A. Hedley Whyte, Mr. E. W. Riches, Sir Arthur Porritt, and Professor A. M. Claye were admitted as Members of the Council.

Professors and Lecturers for the ensuing year were appointed as follows:

Hunterian Professors.—Mr. A. W. Allen, one lecture on modern trends in colonic surgery; Mr. R. T. Johnson, one lecture on carotid ligation for intracranial aneurysms; review of 100 cases; Professor Milroy A. Paul, one lecture on the blood and lymph pathways in the spermatic cord; Mr. A. *Wilfrid Adams*, one lecture on the range and results of transurethral surgery; Mr. Denis J. Browne, one lecture on congenital deformities of mechanical origin, their pathology and treatment; Mr. Harvey Jackson, one lecture on tumours of the orbit; Mr. F. G. Hollands, one lecture on malignant disease of the urinary bladder; Mr. P. G. L. Essex-Lopresti, one lecture on fractures of the os calcis; Mr. J. C. Goligher, one lecture on the functional results following sphincter-saving excisions of the rectum; Mr. C. A. R. Schulenburg, one lecture on adamantinoma; Mr. B. N. Brooke, one lecture on the surgery of ulcerative colitis; Mr. Arthur Naylor, one lecture on brachial neuritis, with particular reference to lesions of the cervical intervertebral disks; Mr. R. P. Jepson, one lecture on a clinical and physiological study of 200 cases of severe Raynaud's phenomenon.

Arris and Gale Lecturers.—Professor J. M. Yoffey, one lecture in the form of a film of the lymphatic system; Mr. J. B. *Kinmonth*, one lecture on surgical physiology of large arteries, with particular reference to traumatic spasm; Mr. W. J. Dempster, one lecture on some problems involved in homotransplantation of tissues, with particular reference to skin.

Erasmus Wilson Demonstrators.—Mr. C. E. Shattock, two demonstrations; Mr. P. H. Mitchiner, two demonstrations; Mr. L. W. Proger, two demonstrations.

Arnott Demonstrators.—Mr. R. J. Last, two demonstrations; Dr. F. S. Gorrill, two demonstrations; Dr. H. D. Ross, two demonstrations, with a discussion of the pathology of reactive and neoplastic changes in synovial tissues, illustrated by specimens from the museum.

Professor David Slome, Professor of Applied Physiology, was also appointed as Bernhard Baron Research Professor.

The Macloghlin Scholarship for 1950 was awarded to John Julius Fryatt of Lewes County School.

Diplomas of Fellowship were awarded as follows: W. E. Wimberger, N. T. Holden, J. B. David, S. H. Janikoun, R. P. Crick, J. D. Randall, G. H. D. Channing, J. G. Craddock, W. Sewell, R. O. Wheeler, R. S. Henderson, J. G. Stubbs, A. J. Evans, L. R. McLaren, D. T. R. Evans, P. R. *Sondhi*, O. M. Jonathan, A. M. B. Tompkin, R. H. Maudsley, H. O. Williams, J. P. Hopewell, J. D. Trethowan, R. H. Sewell, R. R. Burn, J. E. L. Price, C. G. Attenborough, G. S. Yeoh, D. A. Bailey, J. Upsdell, C. W. Graham-Stewart, L. T. Cotton, K. D. Roberts, L. F. Tinckler, N. C. D. Pizey, A. J. Ruzicka, E. J. Newton, K. K. Ghosh, D. F. de S. Goonawardena, A. Hirtstein, A. B. May, R. V. Singh, M. D. Gelfand, T. M. Hennebry, K. W. B. Rostron, G. S. M. Wilson, A. F. Marshall, E. Hoffmann, B. M. Pujari, O. H. Schneider, S. E. Seneviratne, A. Ashworth, J. L. Bignell, A. T. S. Paul, M. A. Sadek, P. K. Chatterjea, A. M. M. Farag, J. M. Jalundhwala, W. Paterson, H. J. Richards, P. Sivasubramaniam, D. S. Chapman, I. A. Lester, J. F. *McInerney*, P. W. E. Moore, C. A. Simmons, H. F. Smith, J. H. Cloke, B. S. Crawford, G. M. Goodson, G. W. H. James, P. N. S. Jayaswal, T. P. Leadman, N. C. Mackillop, A. W. Middleton, J. H. Shelswell, I. B. Taylor, J. H. Brown, M. D. Cremin, T. G. Crombie, D. P. Greaves, M. H. M. Harrison, S. J. *Hersch*, J. R. Heseltine, A. A. Jefferson, P. Jewsbury, A. U. Khan, R. Merryweather, A. G. Quinlan, F. G. Smiddy, J. W. Sutherland, W. L. Thompson, R. G. Turner, R. M. T. Walker-Brash, T. J. Wilmot, K. C. Wybar, R. E. Aitken, D. M. Bell, A. R. Cockerell, L. A. Eckert, B. Hurst, C. H. Kinder, W. L. F. Utley, R. G. Webb, B. N. Catchpole, W. D. Corfield, D. A. Gibson, J. Hankinson, I. A. McDonald, R. G. C. MacLaren, D. E. Savage, R. H. C. *Robins*, M. S. Strong.

A Diploma of Membership was awarded to Robert Foster McKnight (St. Thomas's Hospital).

Dr. George Edward was appointed Frederick Hewitt Lecturer.

J. C. Nicholson, D. Blatchley, A. G. Shields, and H. R. Sheppard were elected Fellows of the Faculty of Anaesthetists.

Diplomas were granted, jointly with the Royal College of *Physicians* of London, to the following successful candidates:

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—Violet Auld, E. A. Beetles, H. S. Bennett, N. N. Blaxland, D. J. Chapman, H. Clain, D. Cockcroft, W. J. J. Czyzewski, I. O. Faiman, S. Ghose, D. T. Glass, G. L. Hardman, R. T. Hastings-James, V. Hay-Bolton, R. M. Hector, K. E. Hodge, F. H. Howarth, D. C. Light, M. J. Lochrin, J. K. McCabe, R. P. C. MacDonald, E. V. M. Medill, I. R. Moyle, A. H. R. Muir, J. J. O'Connell, S. N. Prasad, L. L. Ralph, J. A. Rankin, D. F. Reynolds, K. A. Rowley, M. G. Scott, D. Sircar, W. H. Smith, R. F. Stubbs, G. J. MacA. Teunon, T. F. Thomas, W. R. R. Thursfield, E. A. Waldron, D. A. H. Walton, H. B. Ll. Williams, A. R. C. Young.

DIPLOMA IN MEDICAL RADIOTHERAPY.—J. Ackerley, F. Batley, F. M. Benton, L. G. Capra, P. K. Dutt, A. J. H. *Henning*, Dorothy M. E. McGuire, I. McHattie, P. K. Mookherjee, Dorothy J. D. Smith, J. E. Stapleton.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—N. Ahmad, M. Amjad Ali, C. R. Black, A. C. Camm, A. R. Curtis, H. A. Fraser, D. S. Gideon, B. S. Hilliar, H. M. Mann, G. S. Ramachandran, V. Rasanayagam, M. Shawaf, M. S. Strong.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—M. W. *Annear*, A. L. Galea, M. M. Glatt, E. L. Ives, S. F. Lindsay, S. J. Rydlewski, A. R. Samuel, J. E. G. Vincenzi, J. H. S. Whyte, G. M. Woddis.

DIPLOMA IN ANAESTHETICS.—R. C. Allison, W. E. Arnold, D. A. N. Barran, J. K. Black, H. R. Blades, S. O. Bramwell, C. P. Brown, D. H. P. Cope, Sheila A. Costello, A. S. Crawford, Celia M. Davies, P. S. Dearden, J. W. Dundee, D. A. Forbes, Marion G. Foster, F. N. Gabali, R. Ghose, C. M. H. *Gunaratne*, W. S. Hart, E. H. Hopkinson, R. A. House, Evelyn M. Lafferty, R. E. Lee, Mair Llewelyn, N. G. Marshall, D. Matheson, C. J. J. Morkane, T. P. Murray, Barabara M. Parker, Cynthia M. Parrott, K. A. S. M. A. Quader, D. E. G. Sayers, W. M. Smeeton, A. E. Smith, D. I. H. Smith, W. J. Tyson, A. B. Ward.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—S. H. Shah.

DIPLOMA IN CHILD HEALTH.—Edith J. R. Parfit, K. Prabhakar.

Regulations were approved for the award of the James Berry Prize endowed by Lady Berry.

The award of the Mackenzie Mackinnon Research Fellowship to Mr. R. S. Murley was reported.

The following hospitals were recognized under paragraph 23 of the Fellowship regulations: Beckett Hospital, Barnsley (resident surgical officer); Clatterbridge General Hospital, Bebington (resident surgical officer, first and second house-surgeons); Royal Victoria Hospital, Dover (senior house-surgeon); City General Hospital, Stoke-on-Trent (surgical registrar, first and second and third house-surgeons, ear, nose, and throat registrar).

The National Association for Mental Health has published the proceedings of the conference on "Mental Health and the Family" held on March 23–24 this year. The proceedings are obtainable for 5s. from the association at Maurice Craig House, 39, Queen Anne Street, London, W.1.

No. 28

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infections	33	1	18	—	1	39	4	15	1	—
Deaths		—	1				—	—		
Diphtheria	50	2	12	3	3	103	27	26	3	5
Deaths	—	—	—	—	—	1	1	—	—	—
Dysentery	222	19	87	—	1	59	10	27	1	—
Deaths		—			—				—	—
Encephalitis, acute	8	1	—	—	—	9	2	1	—	—
Deaths		—	—				—			
Erysipelas			11	4	3			14	5	1
Deaths			—				—			
Infective enteritis or diarrhoea under 2 years	9		4	27 2	—	37	2	4	55 —	3
Deaths										
Measles*	9,295	647	267	321	128	5,571	523	122	228	117
Deaths†		—	1	—	—		—	1	—	
Ophthalmia neonatorum	29	1	6	—	—	29	3	6	—	—
Deaths										
Paratyphoid fever	9	2	—	1 (B)	—	32	2	2 (B)	—	—
Deaths	—		—		—	1	—	—	1	—
Pneumonia, influenzal	315	18	2	—	1	346	13	4	2	5
Deaths (from influenza)‡	—	—	—	1	—	6	2	—	—	1
Pneumonia, primary			96	¶ 6	7			130	23	
Deaths	109	8				115	12		3	5
Poliomyelitis, acute	212	8	49	5	12	77	6	6	1	—
Deaths§	7	—	—			6	—			
Puerperal fever		—	1	2			—	16		
Deaths										
Puerperal pyrexia‖	67	7	10	—	4	103	9	7	1	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,175	63	92	76	47	946	66	130	53	29
Deaths†			—	—				—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—				—	—	—
Typhoid fever	3	1	3	1	—	5	2	—	6	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,117	256	240	62	25	2,183	92	34	73	88
Deaths	6	2	—	1	—	6	—	—	—	—
Deaths (0–1 year)	209	29	31	19	13	239	22	30	13	18
Deaths (excluding stillbirths)	4,098	595	514	155	83	3,910	590	496	172	121
Annual death rate (per 1,000 persons living)			10·3					9·9	10·7	
Live births	7,317	1219	866	348	193	7,690	1225	986	482	248
Annual rate per 1,000 persons living			17·4					19·8	29·9	
Stillbirths	153	21	25			185	26	34		
Rate per 1,000 total births (including stillborn)			28					33		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended July 22 were: paralytic cases 189 (152); non-paralytic 71 (60); total 260 (212). The figures for the previous week are shown in parentheses. London had 20 more cases than last week, Warwick 5 more, Stafford 3 more, Essex 3 more, Worcester 2 more, and Lancaster 2 more. Four counties together contributed 46% (119 cases) of the total notifications for the week under review—namely, Warwick 43, London 28, Lancaster 24, Stafford 24. Most of the increase in notifications for the week ended July 22 were in areas where the disease was already present, and there is no evidence of any considerable spread elsewhere.

Anthrax in Cattle

An outbreak of anthrax in cattle has occurred at Holme Pastures, Sutton-on-Trent, Nottinghamshire. Nine cattle have died, but at the time of going to press the cause of death has not been bacteriologically proved in all cases. The outbreak is regarded as exceptionally severe.

Discussion of Table

In *England and Wales* there were increases in the notifications of measles 340, whooping-cough 183, scarlet fever 144, acute pneumonia 34, while the only decreases were dysentery 56, and diphtheria 13. Large changes in the trend of measles were recorded in only a few counties; the largest rises were Lancashire 329, Yorkshire West Riding, 141, Dorset 66; and the largest falls were Middlesex 118 and Hertfordshire 77. Most of the increase in the incidence of scarlet fever occurred in the southern section of the country; in London and the south-east counties the notifications were 73 more than in the preceding week.

The chief features of the returns for diphtheria were an increase of 5 notifications in Lancashire and a decrease of 7 in Durham. The largest increases of whooping-cough were in Nottinghamshire 55, Lancashire 49, and Sussex 42, while the only large decrease was 71 in Durham. The fall in notifications of dysentery was due to the experience in Lancashire, where 55 fewer cases were recorded than in the preceding week. The largest returns for dysentery were Lancashire 83 (Preston C.B. 26, Oldham C.B. 12, Royton U.D. 8); Yorkshire West Riding 36 (Bradford C.B. 10); London 19; Northumberland 16 (Newcastle-upon-Tyne C.B. 12).

The notifications of poliomyelitis were the same as in the preceding week. The largest centres of infection were Warwickshire 38 (Birmingham C.B. 29, Sutton Coldfield M.B. 4); Lancashire 22 (Liverpool C.B. 9); Staffordshire 21 (Rowley Regis M.B. 4, Sedgley U.D. 5); Northumberland 16 (Newcastle-upon-Tyne C.B. 8); Worcestershire 11 (Halesowen M.B. 4); Yorkshire West Riding 11; Essex 10; Gloucestershire 9 (Cheltenham M.B. 4); London 8; Middlesex 7; Nottinghamshire 6; Leicestershire 5 (Leicester C.B. 5); Durham 5; Carmarthenshire 5.

The only large outbreak of food-poisoning notified during the week was in Durham, Easington R.D., with 249 cases.

In *Scotland* there were decreases in notifications of measles 127, whooping-cough 41, scarlet fever 26, acute primary pneumonia 19, while the only increase of any size was 7 for acute poliomyelitis. The fall in the incidence of scarlet fever occurred in the Western area. Although the number of notifications of dysentery were the same as in the preceding week, an increase of 20 was recorded in the Western area due to outbreaks in Dumfries 16 and Kilmarnock 10. The other important returns for dysentery were Glasgow 33 (a decrease of 9), Edinburgh 10, and Dundee 8. The largest returns for acute poliomyelitis were Glasgow 15, Fife county 7, Lanark county 5, Renfrew county 4.

In *Eire* an increase of 102 occurred in the notifications of measles and a decrease of 23 was recorded for whooping-cough. The largest returns for measles were Dublin C.B. 124; Dublin, Dublin South R.D. 48; Meath, Dunslaughlin R.D. 33.

In *Northern Ireland* there were decreases in measles 37, scarlet fever 23, whooping-cough 19.

Statistical Review, 1948

Part I (Medical) of the Registrar-General's *Statistical Review for 1948* records that the crude death rate during the year was 11.0, the lowest ever recorded in England and Wales, and 0.4 below the previous lowest rate recorded in 1930. The infant mortality was 34 per 1,000 related live births and was the lowest ever recorded, being 7 below the previous low level of 1947. Cancer accounted for 16.9% of all deaths compared with 15.1% in 1947. Deaths from coronary disease and angina pectoris showed a further substantial increase, and, even allowing for the change in the age and sex distribution of the population, mortality from this cause has practically been doubled in the last ten years.

Infant Mortality

Provisional figures for the second quarter of this year show that both stillbirths and infant mortality were lowest on record for a June quarter in England and Wales. Stillbirths were 22.5 per 1,000 total births. Infant mortality was 28 per 1,000 related live births, compared with 30 in the June quarter of 1949, and 50 in the same quarter of 1938.

Week Ending July 22

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,153, whooping-cough 3,881, diphtheria 46, measles 8,754, acute pneumonia 293, acute poliomyelitis 260, dysentery 166, paratyphoid 5, typhoid fever 6.

Medical News

Miners' Welfare Commission

The Minister of Fuel and Power has reappointed the Miners' Welfare Commission in accordance with the Coal Industry Nationalization Act of 1946. Viscount Hyndley is chairman. The only medical member is Dr. S. W. Fisher, H.M. Principal Medical Inspector of Mines. Professor E. L. Collis, formerly Talbot Professor of Preventive Medicine in the University of Wales and H.M. Medical Inspector of Factories, has resigned after serving on the commission for over 30 years.

First Prize for Film

The film "The Treatment of Infections of the Hand" was shown at the film section of the International Medical Congress at Verona and awarded first prize. It demonstrates the methods taught in Professor R. S. Pilcher's department at University College Hospital, and was produced under the auspices of the B.M.A. Glaxo Laboratories, Ltd., sponsored the film, and it was produced by the Realist Film Unit, Ltd. A note on it appeared in the *Supplement* of July 29 (p. 71).

Joseph Goldberger Award for 1950

Dr. Fuller Albright, associate professor of medicine at Harvard Medical School, is to receive the Joseph Goldberger Award in Clinical Nutrition for his work on mineral and human metabolism. The award, which is made annually by the American Medical Association, consists of a gold medal and $1,000.

Food Production

The Royal Society of Arts is to award a prize of £500 and a gold medal for a new and outstanding means of promoting the production or the economic utilization of food in Britain. The society gives as examples of its objective: a scheme for encouraging a return to the land; a system to ensure the marketing of perishable food, such as fish or vegetables, in better condition. The prize is given as part of the society's celebrations for the Festival of Britain. Entries must be received by March 1, and the award will be made on May 1, 1951.

Princess Tsahai Memorial Hospital

The Princess Tsahai Memorial Hospital, which has been built at Addis Ababa, will soon be engaging staff. Applications for the post of principal physician should be addressed to the honorary secretary, Miss E. Sylvia Pankhurst, 3, Charteris Road, Woodford Green, Essex.

COMING EVENTS

First-aid and Home-nursing Course

A plan for civil defence having been put into operation by the authorities, the St. John Ambulance Brigade will hold an Intensive First-aid and Home-nursing Course at St. John House, 15–16, Collingham Gardens, London, S.W.5, on September 2 for two weeks. The first week will be on first aid and the second on home nursing, including an examination in each subject after the week's lectures. Anyone is eligible, without obligation, to join the Brigade, and the successful candidate will receive the St. John Ambulance Association certificate. The course will be under the direction of a Brigade county surgeon, and there will be a resident S.R.N. tutor to instruct in home nursing and practical first aid. For further details apply to the Warden at the address above.

Institute of Ophthalmology

The academic year 1950–1 of the Institute of Ophthalmology (University of London) (Judd Street, London, W.C.) will be inaugurated on Wednesday, October 4, at 4.30 p.m., with an address by Dr. W. Russell Brain, President of the Royal College of Physicians of London. The annual dinner of the institute will be held at Claridges Hotel, Brook Street, London, W., at 7.30 p.m. the same day. Past students of the institute and of Moorfields Westminster and Central Eye Hospital are invited to both these functions. Tickets for the annual dinner are 25s. each and may be obtained on application to the secretary of the institute at the above address.

SOCIETIES AND LECTURES

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

Tuesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, August 8, 3.30 p.m., "*Development of Modern Renal Physiology*," by Professor Homer W. Smith (New York).

APPOINTMENTS

FISHER, R. E. W., M.B., B.Ch., D.P.H., D.I.H., Chief Medical Officer, South Eastern Area Gas Board.

NEILL, G. A. W., M.D., D.P.H., Barrister-at-law, Medical Officer of Health, County Borough of Barnsley.

PULLAN, J. M., M.Chir., F.R.C.S., Part-time Consultant Surgeon, St. Thomas's Hospital, London, S.E.

BIRTHS, MARRIAGES, AND DEATHS

BIRTH

Keeling Roberts.—On July 21, 1950, at The Crescent, Wem, Shropshire, to Margaret (formerly Mayhew) and John Keeling Roberts, M.R.C.S., L.R.C.P., the gift of a son, a brother for Alison—Christopher Stuart.

MARRIAGE

Bailey—Simpson.—On July 26, 1950, at West Kirk, Greenock, John Oswald Bailey, Berrow Court, Edgbaston, Birmingham, to Catherine Gilray Simpson, M.B., Ch.B., D.P.H.

DEATHS

Daniel.—On July 28, 1950, at Gilcroft, Checkendon, Oxfordshire, Peter Lewis Daniel, F.R.C.S., late of 1a, Upper Wimpole Street, London, W.

Hughes.—On July 28, 1950, at Pembury Hospital, Kent, Ernest Cranmer Hughes, O.B.E., M.Ch., F.R.C.S., aged 71.

Jamieson.—On July 23, 1950, at 43, George Square, Edinburgh, John Boyd Jamieson, T.D., M.D., F.R.C.S.Ed.

Kennard.—On July 24, 1950, Douglas Frederick Kennard, *L.R.C.P.Ed.*, of Clacton-on-Sea, late of Spitalfields.

Laidlaw.—On July 27, 1950, at 40, Sherbrooke Avenue, Glasgow, Marion Wylie Laidlaw, M.B., Ch.B., wife of Dr. Stuart I. A. Laidlaw, Medical Officer of Health for Glasgow.

Moir.—On July 25, 1950, at Lloran Lodge, Combs, Chapel-en-le-Frith, Edward Moir, L.S.A., D.A.

Solly.—On July 26, 1950, at a Harrogate nursing-home, Ernest Solly, *M.B.*, F.R.C.S., of Strathlea, Coldbath Road, Harrogate, aged 87.

Ward.—On July 30, 1950, at the Manor House, Shelsley Beauchamp, Bernard Joseph Ward, F.R.C.S.

Any Questions?

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

Chondromalacia of the Patella

Q.—*Is chondromalacia of the patella a toxic, nutritional, or vascular disease? What can be done in treatment to prevent pain and destructive changes in the joint?*

A.—Chondromalacia of the patella is characterized by roughening or fibrillation of the articular cartilage of the patella, the joint being otherwise normal. The condition not infrequently begins in young persons. The cause is unknown. Some authorities have attributed it to injury, but others have denied that injury is a significant factor. Clinically, there is aching in the front of the knee, a tendency to recurrent mild effusions, and crepitus in the patello-femoral compartment on movement. In the early stages the bone is not affected and the radiographic appearances are normal. The course is variable. In mild cases the condition is not necessarily progressive; but there is always a risk of the later development of osteoarthritis.

The problem of treatment is difficult. In mild cases radical measures do not seem justified, and resort is usually had to rest (as in a plaster cylinder) or to physiotherapy in the form of short-wave diathermy and muscle development exercises. But when the early development of progressive and painful degenerative arthritis is suspected excision of the patella is probably the wisest course, even in relatively young subjects. Attempts have been made to restore a smooth patellar articular surface by paring away the fibrillated cartilage, but the operation is unlikely to give permanent relief and cannot be recommended. No form of medication—whether it be systemic or by intra-articular injection—can be expected to be of benefit.

Subacute Combined Degeneration

Q.—*In "Any Questions?" of December 31, 1949 (p. 1539), the treatment for subacute combined degeneration was given as "an intensive initial course of liver injections . . . and then two or three times weekly until the condition is much improved." Is there any indication when the patient is getting too much? On the other hand, should the injections be continued for a year or longer at two or three times a week? The case I have in mind is a man of 78 who has been having liver injections for macrocytic anaemia about once a month for the last eight years. During the last year a certain degree of optic atrophy has developed in one eye, with paraesthesia of the feet and other signs. In the last two months there has been some improvement under more intensive treatment. The blood count, which eight years ago was down to 1,500,000, now and for the last few years remains fairly steady at a little over four million, and the red cells are normal in appearance.*

A.—There is no danger of giving too much liver therapy in the treatment of subacute combined degeneration of the spinal cord; the only exception to this is in the small minority of patients who develop sensitivity to liver extracts. In the case mentioned, neurological symptoms have apparently appeared during treatment of the macrocytic anaemia while the blood count was around four million. Optic atrophy is a recognized but rare complication of pernicious anaemia (*Brain*, 1940, **63**, 225), and may well be so caused in the case described. The development of neurological symptoms indicates that the dosage of liver extract was inadequate or that the liver preparation used was not fully active, and the clinical response which has occurred with more intensive treatment suggests that the former alternative is correct. The intensive treatment should be continued in view of the presence of optic atrophy and could be supplemented with proteolysed liver by mouth in a dose of 1 oz. twice daily. Visual impairment due to optic atrophy complicating pernicious anaemia usually improves with adequate liver treatment. Vitamin B_{12} has now been shown to be effective in the treatment of pernicious anaemia and of subacute combined degeneration, and this substance in a dosage of 40 μg. twice a week by injection could be given as an alternative to liver injections.

Delayed Reaction to Midge-bites

Q.—*Is there any means of desensitizing a patient who suffers severe and prolonged irritation and swelling following midge- and gnat-bites?*

A.—Severe prolonged irritation and swelling following midge- and gnat-bites is presumably the "delayed" type of reaction which comes on about 24 hours after being bitten and which often lasts some days, and not the "immediate" urticarial type of reaction which comes on in about 30 minutes and is usually of comparatively short duration. Work on similar reactions from mosquito-bites suggests that so far as these delayed reactions are concerned specific desensitization should greatly reduce the inconvenience caused (Heilesen, B., *Acta Allergologica*, 1949, **2**, 245 (in English)). An extract from midges and gnats for specific desensitization can be obtained from commercial firms; the dosage and the details of administration vary according to the particular preparation employed. (See also article by Professor R. M. Gordon at p. 316.)

Hyperpiesis and Albuminuria

Q.—*What investigations are called for, what is the treatment, and what is the likely prognosis in a case of hyperpiesis with paroxysmal albuminuria? The patient is a man of 39, and his blood pressure, which is now 210/140 mm. Hg, has risen gradually since he was first examined six months ago. He complains of severe headaches and occasional vomiting, and during these attacks his urine is loaded with albumin. In the worst of his attacks there was a small retinal exudate. Transient improvement follows venesection or rest in bed for a few weeks. What is the cause of the albuminuria in a case of this kind? Is this the sort of case in which sympathectomy should be considered?*

A.—The albuminuria is a reflection of episodes of extreme hypertension, and is a result rather than a cause of the patient's illness. The diagnosis may well be malignant hypertension, although chronic nephritis is possible. Lumbodorsal sympathectomy should certainly be considered. Preliminary investigations should include renal function tests, examination of urine deposits, intravenous or retrograde pyelography, and perhaps a sedation test, in which the effect on the blood pressure of 3 gr. (0.2 g.) of sodium amytal repeated hourly for three doses is determined. If the results of the renal function tests are fairly good, malignant or severe essential hypertension is the probable diagnosis. Paroxysmal hypertension from pheochromocytoma of the adrenal medulla should be excluded by means of the histamine, tetraethylammonium, and benzodioxine tests, details of which need not be given here. If there is serious impairment of renal function, chronic nephritis is probably responsible for the hypertension, in which case little can be done. Acute episodes of extreme hypertension, headache, and vomiting should be treated with rest in bed, sedatives, and a low sodium diet, whatever the aetiology. Venesection is not advised.

Haemospermia

Q.—*What are the possible causes of haemospermia in a patient aged 58? He is married and free from venereal disease; his occupation necessitates absence from home for regular periods of four months, during which time he is absolutely continent. The condition has occurred three times in the last four years. Can anything be done about it, beyond increased exercise and avoidance of "pelvic congestion"?*

A.—Slight enlargement and congestion of the prostate and a mild vesiculitis are probably the most frequent causes of haemospermia in a patient of this age. However, haemospermia often occurs without any cause being discovered for it, and for lack of any other explanation it is attributed to congestion of the genital tract. Provided that genital tuberculosis and any

form of growth have been excluded (and these are comparatively uncommon explanations) the condition is of no importance. Nothing can be done for it beyond trying a period of sexual continence, and in this case the patient has been continent for over four months without result. He should be told, therefore, not to bother about his condition, which will eventually clear up.

Chronic Pancreatitis and Carcinoma

Q.—*(1) What are the possible causes of death in chronic pancreatitis with an indeterminate type of diabetic blood-sugar curve and in the absence of jaundice or ketosis? (2) Is chronic pancreatitis ever the result of chronic malnutrition, and is it ever regarded as a precancerous condition? (3) How many cases of carcinoma of the pancreas with or without chronic pancreatitis have been reported as dying from spontaneous hypoglycaemia? (4) Do you know of any cases of chronic pancreatitis associated with carcinoma of the pancreas with a diabetic type of blood-sugar curve dying from spontaneous hypoglycaemia while the patient was on ordinary diet and not having insulin?*

A.—(1) A chronic pancreatitis causes loss of weight and energy. Patients lose strength fairly quickly and usually die of an intercurrent disease. The details given in this case are insufficient to make a diagnosis of pancreatitis. A hard tumour in the region of the pancreas is always suggestive, and a barium meal should be given to exclude a tumour in the stomach. An enlarged and hard liver may be present, and secondary metastatic deposits should be sought for. An estimation of the total amount of fat excreted in the stools per day should be made when a diet containing 100 g. of fat is eaten for three days. The presence of undigested meat fibres in the stools should be looked for when the patient is eating meat. An estimation of the diastase in the urine may be useful. Since the sugar tolerance is said to be low the possibility of a bronzed diabetes should be considered. A small portion of the skin should be removed and stained for iron.

(2) The cause of chronic pancreatitis is quite unknown, but it is more likely that it has been responsible for the chronic malnutrition than that the latter has caused the chronic pancreatitis. A carcinoma may arise as a result of the chronic inflammatory condition.

(3) Neither chronic pancreatitis nor carcinoma of the acinous portion of the pancreas causes spontaneous hypoglycaemia. But a carcinoma of the islets of Langerhans is a well-known cause of the condition. Secondary deposits of the islet tumour occur in the liver, and in the end lead to death in hypoglycaemia.

(4) No. Patients with a sugar-tolerance curve suggesting a slight diminution of sugar tolerance sometimes have symptoms of hypoglycaemia, but these are usually very mild and death is most unlikely to occur from this cause. These mild symptoms of hypoglycaemia are not necessarily associated with a chronic pancreatitis or with carcinoma of the pancreas.

Climate and Rheumatoid Arthritis

Q.—*Are there any statistics showing the incidence of rheumatoid arthritis according to climate? During twenty years of practice in the Tropics, in Malaya and India, although mild joint affections were extremely common, I doubt if I ever saw in an Asiatic patient a typical case of rheumatoid arthritis.*

A.—There are no statistics showing the incidence of true rheumatoid arthritis in the Tropics, but it is commonly believed to be rare, though infective arthritis, which may be difficult to distinguish from true rheumatoid arthritis, is a common complication of some tropical diseases. Gonorrhoeal arthritis is said to be common in Nigeria, India, and China, and may be difficult to differentiate. Dr. Julia Morgan, who was associate professor of medicine at Shantung in China, mentions a list of tropical diseases associated with arthritis and others in which arthralgia is common, and says that among natives in the Gulf of Guinea "rheumatic arthritis" is said to be the commonest joint disease (Comroe's *Arthritis and Allied Conditions*, 1944, London). Pemberton states that he had several patients from Arizona, which has a hot dry climate and is generally considered to be favourable for chronic arthritics. There is some evidence that humidity may be more important than temperature and that fluctuations in temperature and humidity, such as are common in Britain, may have an even greater effect.

Lemon Juice and Calcium

Q.—*It is commonly believed among Colonial peoples that lemon juice, when used freely, produces a diminution in the calcium content of the body, especially of the bones. Is there any foundation for this belief?*

A.—Theoretically the organic acids in lemon juice—for example, citric acid—might be expected to precipitate calcium in the gut and hinder its absorption. From a practical point of view, however, there is no evidence that fruit juices, even in large amounts, interfere with the absorption of calcium. After all, relatively large amounts of citrate are added to infants' milk to render it more easily digestible, yet it does not produce rickets in these infants. The acid reaction of the small intestine, from which calcium is absorbed, is probably sufficient to prevent the formation of insoluble calcium salts. It has been found that calcium is quite well absorbed, except at critical levels of vitamin-D intake, even when relatively insoluble compounds are administered, such as calcium silicate.

Insulin Ointment

Q.—*What is the best base or bases for insulin ointment?*

A.—Experiments on the administration of insulin in various ointment bases have proved that this method is valueless.

NOTES AND COMMENTS

Tennis and Golfer's Elbow.—Dr. J. H. CYRIAX (*London*) *writes:* Your expert ("Any Questions?" July 15, p. 177) is mistaken in regarding tennis and golfer's elbow as identical. "*Tennis elbow*" is the term widely adopted for chronic strain of the extensor tendon at the lateral humeral epicondyle; it was first named "lawn-tennis elbow" by Major in 1883. By contrast, golfer's elbow occurs at the medial humeral epicondyle as the result of strain of the common flexor tendon. The distinction has a practical importance, for the usual type of tennis elbow is quickly cured by manipulation (Mills, 1928), whereas the only way to secure swift recovery from a golfer's elbow is adequate deep massage (Cyriax, 1947).

REFERENCES

Cyriax, J., *Rheumatism and Soft Tissue Injuries*, 1947. Cassell, London.
Major, H. P., *British Medical Journal*, 1883, **2**, 557.
Mills, G. P., ibid., 1928, **1**, 12.

Corrections

Mr. MALCOLM DONALDSON (London, W.1) writes: Since my recent visit to America I realize that I used the wrong term in speaking of "tumour clinics" in the second paragraph of my article on "Education of the Public Concerning Cancer" (July 1, p. 35). The clinics at which the patients without any symptoms are examined are, as a rule, called "detection clinics," and the term "tumour clinic" is generally used to mean a weekly consultation of the staff to see all new cases of cancer in order to plan treatment.

Mr. H. J. SEDDON writes from the Royal National Orthopaedic Hospital, Stanmore: May I correct a small but significant slip in your report (July 29, p. 293) of the meeting of the Section of Orthopaedics held at Liverpool on July 19? The mobilizing apparatus used for patients confined to bed for long periods, which has the effect of minimizing skeletal decalcification, is described as if I had invented it. This is not so; both at the meeting and in the MS. of my paper I said that we owed this most valuable innovation to my friend and colleague, Mr. E. J. Nangle.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 12 1950

HUMANISM, HISTORY, AND NATURAL SCIENCE IN MEDICINE*

BY

F. M. R. WALSHE, M.D., D.Sc., F.R.C.P., F.R.S.

Physician to University College Hospital; Physician to the National Hospital for Nervous Diseases, Queen Square, London

The Linacre Lectureship, to which the Master and Fellows of St. John's College have done me the honour to call me, is, I believe, the oldest medical lecture foundation in this country. It has a tradition all its own in that it was one of the academic activities that survived the greedy spoliations of this University by Henry the Eighth that Latimer was to deplore in 1550, and again because its founder, Thomas Linacre, has a great place in our history, not only as a physician and the translator of the works of Galen from their original tongue but also as the principal restorer of the knowledge of Greek in this country.

In this work of restoration he was one of that small group of English humanists which included Grocyn, Lily, Colet, and Thomas More, who shed such lustre upon English learning in their time; one of whom, Thomas More, was to catch the imagination of all Christendom in his day as the living embodiment of all that was best in Christian Humanism; an ideal by which he lived and, in the manner of his death, endorsed.

What perspectives of opportunity, therefore, this lecture must conjure up in the heart and mind of anyone possessed of imagination and called upon to take his place in the long sequence of Linacre lecturers.

It would be vain for me to hope to rise to the height of this opportunity. I can but do my best to set out in their relevance to medicine three themes which come naturally to the mind in the contemplation of Linacre's life and circle. They are Humanism, History, and Natural Science.

For my shortcomings in a journey that will take me beyond the confines of medicine, as we ordinarily think of it, I ask your charity. And if I venture upon this task, it is not with the hope of completing it, but out of the conviction that to rebuild a bridge between medicine and the humanities is a pressing need; that this building can be done only from the side of medicine; and that someone must make a start if medicine is not to lapse into a mere congeries of techniques, to fail in coherence on its theoretical side, and to suffer the loss of its traditional values. Linacre was a bridge-builder between the ancient world of Hellas and Tudor England. It is not unfitting, therefore, that the Linacre lecturer of to-day should, in however humble a fashion, seek also to be a bridge-builder.

I shall not be derogating from Linacre's just place in history when I submit that perhaps his chief claim to enduring renown amongst us was his reintroduction of Greek to England. He was already an accomplished Greek scholar when, almost by chance as it might seem, he turned aside in his Italian journey to visit Padua, then a foremost centre of medical learning and of philosophy. There with a remarkable celerity he graduated as a doctor of medicine. Upon his return to England the Universities of Cambridge and Oxford hastened to confer upon him the like degree, with an easy liberality that must excite the puzzled envy of the present generation.

I am not enough of a historian to know precisely what could have been the course of the studies so speedily accomplished, but we learn that he defended his thesis with skill and applause against all comers, that within a few years of his return to his native land he had been appointed physician to that formidable patient King Henry the Eighth, and had embarked upon his famous translations of Galen, about which, were I strictly faithful to the provisions of his foundation, I should now be discoursing to you. One of his last acts was to found these lectures, expressing in his Deed of Gift the wish that they should "redound to the glory of God, the true art of medicine, the relief of the fallen, and the increase of the realm." I take leave to say, even in this bleak age of the spirit in which we live, that no nobler ideal of the vocation of the true physician could be proposed.

In a Harveian Oration before the Royal College of Physicians in 1948 I ventured to submit the claim of medicine to a place as of right within the body of the natural sciences. It is not my purpose to-day to reiterate this claim, but rather to propose to you that in its nature and aim medicine transcends the natural sciences; that medicine has in it an element also that properly belongs to the discipline of historical science, and that, ranging high above these, it has, at its best, qualities of humanism that the natural sciences, at least, can scarcely claim. Humanism, History, and Natural Science therefore are, I submit, the elements which medicine, worthily conceived and practised, integrates, or seeks to integrate, into a harmonious whole.

*The Linacre Lecture delivered to the Master and Fellows of St. John's College, Cambridge, on May 6.

Humanism

In his attractive seventeenth-century phraseology Hobbes reminds us that "the Light of Humane minds is Perspicuous Words, but by exact definitions first snuffed, and purged from ambiguity," and there can be few terms in respect of which this process is more necessary than the one now in question—namely, Humanism. Aristotle provided the first apology for an intellectual and secular humanism in his *Ethics*. Boethius, in his *Consolations of Philosophy*, gave us an early and familiar apology for a truly Christian humanism; and since his day, and particularly during the Italian Renaissance from the time of Petrarch onwards, ideals of humanism, secular and 'Christian, have been many.

In our own time and country Pater and Housman have expounded their views on the subject, and have written of a humanism in which the cultivation of the mind, of an intellectual excellence, is an end in itself.

But it seems to me that the humanism which a Linacre lecturer must put before you must be the Christian ideal and not the purely secular one, though this undeniably has its own intrinsic excellence. With the narrowest of all conceptions of humanism, that which equates it with a classical education, I am certainly not now concerned. Nor do I adopt any of the definitions given in that impressive shorter dictionary which emanates from another seat of learning than this.

Let me say, more positively, to what I do refer by the term "humanism." The Christian world inherited from the ancient world an idea and an ideal of culture which had three aspects: a speculative aspect, the ideal of truth, *veritas*; a moral aspect, the ideal of virtue, *virtus*; and an oratorical and literary aspect, *eloquentia*. And, since we are the agents of thought, speech, and action, this ideal may properly be called humanism.

Here is a humanism that strives for intellectual excellence, on the speculative side for the perfection of the lower reason which is ordered knowledge, *scientia*, and for that of the higher reason which is wisdom, *sapientia*, by which we are enabled to place knowledge in the whole framework of life; while, on the moral side, it includes practical wisdom—that is, prudence. Aristotle in his *Ethics* points out that science deals with things that are of necessity and with universals, while prudence deals with the affairs of men and not with universals only but with particulars. Thus it demands experience.

In the application of science to the practice of medicine the physician needs practical as well as speculative wisdom. He must be governed in his actions by a wise regard for the whole welfare of each patient individually. This regard is the peculiar, the essential, act of the virtue called prudence, which transcends natural science and comes within the category of moral excellence—ethics.

Finally, a complete humanism demands also the literary quality of eloquence: lucidity and conciseness of language and the skilled use of analogy and metaphor, which is what the mediaevals spoke of as rhetoric.

This is the humanism we see so beautifully exemplified in the life of Linacre's youngest and most famous pupil, Sir Thomas More, the patron saint of humanism. To whomsoever may not have read them I recommend the biography of More, and the smaller volume upon More's place in English literature and history, written with such insight by the late Professor R. W. Chambers, himself a rare humanist; works which have done so much to clear away those mists of provincialism and prejudice that have blinded the eyes of so many writers on More.

More's humanism had an eager zest for the things of the mind and a fine sense of proportion—"nothing too much"; a clear sense of the limitations of the State when viewed against the natural rights of the human person, and the courage to resist tyranny in the State; a clear and unfailing vision of what lay beyond finite values; and the grace to look beyond these to the hope of a greater experience in another sphere of existence. Here, then, is the humanism I should like you to associate with your thought of Linacre and of the practice of medicine. It is all implicit in the terms of this lecture foundation, drawn up by him in his last years and already quoted.

This occasion therefore seems to me one singularly appropriate for an exposition of medicine, not primarily as a theoretical and practical activity within the realm of natural science, but as an activity whose full scope and final end transcend natural science. With this confession of faith I turn to my second theme—namely, the relation of medicine to historical science.

Relation of Medicine to Historical Science

Medicine to-day carries the wounds of much ruthless administrative planning, but what she most needs is some intellectual organization from within, and as part of this it is important that we should ourselves undertake some analysis of her relations to the disciplines under which her activities are subsumed.

In a recently published book, *The Concept of Mind*, the Wayneflete Professor of Metaphysical Philosophy in the University of Oxford, Professor Gilbert Ryle, writes that medicine is but "the name of a somewhat arbitrary consortium of more or less loosely connected enquiries and techniques, a consortium that neither has, nor needs, a logically trim statement of programme."

This is surely an erroneous notion of the nature and methods of medicine, lacking both in historical sense and philosophical comprehension. Yet it is significant that such a definition should find serious utterance, and that in Professor Ryle's mind—if indeed I may apply this term to the neural dispositions of an avowedly anti-intellectualist philosopher—medicine is, as it were, comparable to a travelling country dealer's horse and van, wandering the countryside from farmhouse to cottage, with its odd assortment of wares, chosen in a spirit of opportunism, casually thrown together and having no other relationship than that of contiguity.

Yet, however apt the analogy, the light of common sense shows us that even the travelling dealer has a unity of method and purpose, capable of and needing that logical statement of programme that Professor Ryle to medicine, either as a possession or as a requirement it has seemed worth while to cite this pronouncement because it hints at what may, even now, be the medicine by many others, even within its own ranks, have not given serious thought to its history and philosophy. Who can doubt that the mushroom growth of specialisms, especially therapeutic specialisms, in medicine is a its disintegration as a body of ordered knowledge by men alert to lift their minds out of the mass of This state of affairs is justification enough for an to subsume medicine under the notions of history natural science, for now, more than ever, some principles must be impressed upon those who wish thought and practice in the medicine of the future.

In discussing in what sense medicine may within the discipline of historical science

also, that what is known as psychological medicine belongs primarily to this discipline and not to that of natural science. In doing so, I begin to tread upon dangerous ground, knowing full well that many rhetorical land-mines may be expected to go up noisily and dustily in my track as I proceed upon my hazardous way. Nevertheless, someone must clear the ground if it is to be made fertile soil for the growth of clear and coherent notions in psychological medicine.

Those who are acquainted with Collingwood's stimulating work entitled *The Idea of History*, or with Whitehead's *Modes of Thought*, where the same thesis is briefly expounded, will know something of the argument I shall try to develop, but to many within the ranks of medicine this will be unfamiliar and it is to them primarily that I address my thesis.

History in Medicine

We are prone to take it for granted that our activities in medicine are all to be subsumed under the heading of scientific theory and practice on the one hand, and that of purely empirical and traditional arts on the other. However, in the primary and essential process of eliciting what we call the history of an illness, our activities do not come within any of these categories. We are in fact seeking to collect a record of past events that for us are not sense data, but things that have happened not under our eyes; things that, more often than not, we cannot submit to any process of scientific verification. This record we proceed to subject to a process of critical thought. From its items we select, discard, and assemble in the light of our previous experience; and the final product of our activity is the sublimation of a certain kind of evidence from one source and of a critical study of it from another. Also, since the evidence we thus collect includes not only events that have happened to the patient but, in addition, actions that he has performed, there appears a new element not encountered in natural science—namely, human action. Between a simple event and a human action a distinction has to be made. In short, what we call "the history" in clinical medicine is not a mere chronicle of events, subjected to no analysis or interpretation, but it is a true exercise in historical method, as I shall seek to define this. This is not yet to assert that we are historians in the sense commonly understood by historians, but that we are using their method, which is not the method of natural science.

Distinction Between Natural and Historical Science

Let me briefly elaborate the distinction that I wish to make between natural and historical science, but although I begin from Collingwood's conception of history I shall allow myself the liberty of differing somewhat from him as to his application of this conception to psychological factors in medicine.

The prime method of natural science is the observation of events, the flux of which forms a moving spectacle before us, with such verifications and repetitions of this observation as sound factual conclusions may demand. Under the term "observation" I include the method of controlled experiment which Bacon has spoken of as "putting nature to the question." Having observed these events as particulars we then seek to determine the patterns and sequences in which they fall, and from these to make the generalizations that we speak of as laws of nature. The historian, on the other hand, is not concerned with events which he can only infer, nor does he seek to make generalizations, or to propound universals. He is concerned with events that lie in the past, though they may have their consequences in the present, which have not the quality of sense data as these are understood in natural science. His evidence is the written and archaeological record, to which he applies a critical judgment based on his experience, using those processes of selection and assembly that I have spoken of as of the essence of clinical history taking. To his final conclusion there go the same two elements that we have seen in the clinical history. In both historical science, as the historical expert conceives this, and in taking a clinical history there is a subject–object composition.

Now the historian regards his task as concerned not with simple events as such, but with events as determined by, and expressive of, human thought—that is, with human actions—and his quest is to uncover the motive forces which, for him, are the inside of the event. Events are not spectacles which he observes and seeks to classify, but something that he seeks to go behind so that he may uncover the human thoughts and motives, conscious and unconscious, that they express.

Collingwood gives a simple example that may make this distinction clearer to those who are not familiar with it. He says, "When a scientist asks, 'Why did that piece of litmus paper turn pink?' he means, 'On what occasions do pieces of litmus paper turn pink?' When a historian asks, 'Why did Brutus stab Caesar?' he means, 'What did Brutus think which made him decide to stab Caesar?' The cause of the event for him means the thought in the mind of the person by whose agency the event came about: and this is not something other than the event, it is the inside of the event itself."

It is the function of the natural scientist to ask the first kind of question, but that of the historian to ask the second kind; and, having asked it, he does not proceed to formulate general laws or to indulge in predictions, and in this also he differs from the natural scientist.

The True Historical Method

We come now to consider the relevance of all this to medicine. It is clear that the historian does not regard sequences or patterns of simple events as part of the historical process as he conceives this. Therefore, much of what we elicit and interpret in the taking of a "clinical history" is not history in this general sense, though, I submit, the method we have used is in fact the true historical method.

Yet, as every physician knows from his experience, the elements of "event" and of "human action" do enter into the development and behaviour of bodily illness: there is action and reaction between mind and body, and both contribute to the sum which is presented for elucidation. This is true not only of what I shall continue to call the "history" of the illness, it is true also of the clinical picture presented to our direct observation. I submit, therefore, that even in the apparently and exclusively somatic illness we cannot confine ourselves wholly to the methods of natural science but must take account also of the historical method. Further, owing to the common incompleteness of the data of observation presented to us, we have to read them in the context of the clinical history. Thus the methods of natural and of historical science are closely interwoven in our activities.

Every physician, and especially every teacher of medicine, knows that what is called "history taking" is a task calling for experience and critical thinking, and that it cannot be learned with the ease to which the techniques of clinical examination often lend themselves. This is in

*The Linacre Lecture was delivered in the Hall of St. John's College, Cambridge, on June 9, 1950.

accord with what, following Collingwood, we have said of the nature of historical evidence, and of its criticism, selection, and assembly in the writing of history : a complex intellectual exercise in which the evidence is given life and meaning by the historian's own contribution of thought and knowledge. Therefore, we need not be surprised that the young student so often gives us those flat and incoherent chronicles, thickly sown with irrelevances, that are too frequently allowed to pass muster as medical histories.

History and Psychology

It is when we come to consider psychological medicine, and what we may term psychologically determined illness, that the analogy between medicine and history leaps to the eye. Here, I submit, we are truly within the realm of historical science as the historian strictly defines it. Psychology, or the science of human nature, as our eighteenth-century philosophers were wont to call it, has since their time sought assiduously to establish itself as a discipline within the field of the natural sciences, and has claimed to use their methods.

In the case of psychological medicine, or psychopathology, this claim has been eloquently stated by Bernard Hart in his Goulstonian Lectures of 1926. He regards the data of the psychologist in medicine as strictly comparable in character to those of natural science, and goes on to say that a scientific concept "must explain the observed facts, and must be capable of verification by repeated reference to experience and experiment." These postulates he clearly believes to be fulfilled in psychological medicine. Yet surely the aim of psychological medicine is the discerning and unravelling of the mental processes, conscious and unconscious, that lie behind the "observed facts," which are in their origin and nature merely derivative phenomena and of infinite variability and unpredictability. The essential data in psychology, as we find it in medicine, are the mental processes behind the façade of the so-called "observed facts." It is surely a *non sequitur* to invoke the canons of natural science in this situation. The postulates propounded by Hart are not, and cannot be, fulfilled by psychological medicine, and it is meaningless to speak of "verification by repeated reference to experience and experiment" in this connexion. Elsewhere in the lecture he says that "the introduction of purpose removes psychology from the mechanistic sciences, but this does not justify its removal from the whole field of science." Here Hart seems almost trembling on the brink of awareness that psychology does not belong to natural science. However, he goes on to place it with biology. Yet the word "purpose" is not unequivocal, for teleology in biology is not the "purpose" that determines human actions. Such are the pitfalls of linguistics.

It is of course virtually impossible to generalize about psychology as we find it in medicine to-day, because it has no unity of method or of concept, and it continues to be regarded by its exponents as "scientific" in so loose and undefined a way that the adjective has no clear connotation. Nevertheless, countless expositions make it certain that it is natural science which the psychologist has in mind when he uses the term.

Of its possible relation to historical science we find no word in the superabundant writings on psychological medicine. Even that most lucid and philosophic critic of Freudian method, psychology, and philosophy, Maritain, in his attempt to assess and orient them, shows no realization of the possibility that much of the difficulty in determining their status would be resolved if they were measured against the standards and methods of history and not against those of natural science.

Yet how far removed from the methods of natural science are the Freudian psychology and philosophy Maritain indicates in the following verdict : "It is in the techniques of interpretation (that is, of dreams and free association), and especially in the use of symbolism, that Freud and his disciples have been led to the profusion of the arbitrary, of obsessional dogmatism, and of pedantry."

Even in the latest review of the development of psychological medicine by Rickman it is stated that the unravelling of the meaning of dreams is "the main tool of research," and the concepts derived from the use of this tool are spoken of as within the realm of "scientific thought," though what order of science we are not told.

An Illusion

For any who may still cherish the illusion that Freudian psychology has any discoverable relation to natural science in its methods or concepts, a careful reading of Rickman's article, "The Development of Psychological Medicine," should prove an effective remedy.

The fact surely is that the psychologist in medicine is not primarily concerned with events, nor does he use the sense data that are the material of natural science, but his first concern is the application, more or less imperfect, of the historical method to the fragmentary and fugitive records of human thinking and action which he can glimpse in his patient's mental past. It is upon this application that all depends.

The springs of human action which are his quest are not data of observation amenable to experimental control or classification. If they are to be revealed at all it is only by the method of historical thinking in which the inquirer collects his record of evidence, subjects it to critical assessment and selective assembly, and then formulates conclusions that have the duality of origin I have already proposed for the ordinary clinical history.

In this process he aims to understand the mental activities underlying the concrete situation he is studying, and he can do this effectually only by rethinking or reliving these activities in his mind and in the context of his own knowledge. The medical psychologist's problem is a concrete historical one and does not and cannot lead to the formulations of universals, for there is no blue print, no master key, to the springs of human thoughts and actions, applicable to all persons at all times and in all circumstances, and no natural laws for the human mind as natural laws are generally conceived.

We may therefore conclude that the steady endeavour of two centuries to fit psychology within the realm of the natural sciences is based upon a false analogy, to which the very term "human nature" lends colour. This analogy has gravely retarded the growth of a true science of psychology under the aegis of history.

In medicine the easy illusion that they are natural scientists, using the methods of natural science, has not saved medical psychologists from wandering within a labyrinth of conflicting speculations and methods, blown about by every wind of doctrine ; from exotic symbolist systems on the one hand to extremes of anti-intellectualism on the other, and through the latter to a new psychiatry which in effect dementalizes mind and seeks to account for its activities in terms of "nerve nets," "reverberating circuits," and "feedback mechanisms" in the cerebral cortex—that is, to provide physiological accounts of mental activities and in so doing to leave no room for psychology.

Wanderings of Psychological Medicine

This constant wavering of psychological theory in medicine between allegory and machinery, and of psychological practice between the exegesis of dreams and what in a barbarous neologism is called "psycho-surgery," does not allow a resting-place for the psychology of the modern psychiatrist within the confines of any known scientific discipline. It has become a chaos of conflicting allegorical systems, of pseudomysticism, and of "hit or miss" mutilations of the brain that have no ascertained scientific basis.

Surely, in such a situation, the claim to come within the realm of natural science is revealed as no more than the overt expression of unconscious yearnings to acquire some sort of academic prestige within the world of ordered knowledge. These wanderings of psychological medicine in the wilderness, not yet ended, always recall to my mind the title of one of Captain Marryat's stories for boys, *Japhet in Search of a Father*.

Yet, despite this profoundly unsatisfactory situation, there are of course sage medical psychologists who do use the historical method in its strictness, though they may not know it for such. When these men do turn to physical methods of treatment they remain fully aware that these have no scientific basis, but are wholly empirical procedures acting in unknown fashion but having the possibilities of pragmatic justification in particular instances. Nevertheless, it is surely clear that the hope of an advance towards coherence and scientific status for psychological medicine would be immeasurably increased if its exponents thought out the nature of their subject and became aware of the scientific discipline to which it should be affiliated—that of historical science.

If there be a body of psychological knowledge within the bounds of natural science it is that physiological psychology which has sense data to observe and classify in the forms of nervous and muscular activity which are the physical expression of current mental causes. Of such a physiological psychology there is a distinguished school in this university, but its aims, methods, and results in no way resemble those of the so-called medical psychology which shares with it little but the substantive common to their names.

It would be over-sanguine to look for a ready assent from the psychologist in medicine to a proposition so contrary to all he has hitherto believed regarding the nature of his activities and their place in the body of science. Yet it may be that the moment will arrive in which he is found willing to turn to some epistemological contemplation of his special body of knowledge and theory. The need is surely urgent, for there is a place for a scientific psychology in medicine under the aegis of historical science, a discipline as worthy of our esteem as that of natural science. To seek to remove psychological medicine from the one domain to the other is not to derogate from its status and importance.

Yet the historical method has its own ideals of truth ; and the realization of these is not compatible with intellectual submission to fixed symbolic systems in the interpretation of human action. Such lesser loyalties have no place in any scientific discipline, and with their advent there creep in, as attendant evils, myth and pseudomysticism, an obsessional dogmatism, and a sacerdotalism of outlook that have always been the greatest enemies of science.

The medical psychologist must be elective if he is to preserve his intellectual freedom and integrity, and in the interpretation of human records which are the essential data of his study his own knowledge and critical insight must be the dominant instruments.

A Dissent

Before I leave this subject I venture to make one dissent from Collingwood's view of the proper task of psychology. He says : "In realizing its own rationality mind also realizes the presence in itself of elements that are not rational. . . . These irrational elements are the subject matter of psychology. They are the blind forces and activities in us that are part of human life as it consciously experiences itself, but are not parts of the historical process : sensation as distinct from thought, feelings as distinct from conceptions, appetite as distinct from will. Their importance to us consists in the fact that they form the proximate environment in which our reason lives, as our physiological organism is the proximate environment in which they live. They are the basis of our rational life, though no part of it. Our reason discovers them, but in studying them it is not studying itself."

Yet surely reason does not work in an emotional vacuum, and in studying human actions it is impossible to separate, save by the process of abstraction, the emotional from the rational elements in our actions and their motive forces. And if history is the study of the concrete, this abstraction cannot be made save for purposes of discourse and logical analysis. I venture to submit, therefore, that we cannot regard psychology as concerned solely with the irrational in us, or allow that the latter is not involved in the historical process which it is the psychologist's business to study.

Conclusion

I believe, then, that history and natural science are recurrent themes, closely interwoven in medicine, not always recognized by us as such as we pursue our activities, but always present. I believe, too, that we shall think more clearly if we know that this is so.

At least those of us who teach medicine, and bear responsibility for the future of medicine, should have some awareness of the nature of our subject. In his book, *The Idea of the Universe*, Collingwood, whom I have quoted so often, observes that "a man who has never reflected upon the principles of his work has not achieved a grown-up man's attitude towards it ; a scientist who has never philosophized about his science can never be more than a second-hand, imitative journeyman scientist. A man who has never enjoyed a certain type of experience cannot reflect upon it."

These thoughts must be my justification for the excursion I have made this afternoon upon territory which the physician will enter with diffidence and tread with circumspection, yet the physician is the man best placed to reflect upon his experience and to philosophize upon it.

This foundation of Linacre's has seemed to me an admirable opportunity for such reflection, and I venture to think that he might not altogether disapprove the intention which informs my lecture, though he might well have thought less highly of its realization.

In conclusion, although the occasion that calls us together is not the only Foundation we owe to Linacre's concern for the advancement of medicine, it is the only one which has been consistently devoted to humanist and academic themes and ends.

To use the brief recurrent occasions which this lecture affords us amidst the press of material preoccupations in order to dwell upon these values and purposes is not mere escapism. It should be refreshment.

Doubtless the cynic will think and say otherwise, but cynicism is too often only the threadbare cloak for timidity in the face of threats to our traditional values. The idealist, as he looks at the world around him, which he has so little

share in moulding, need not feel ashamed if he continues to cherish and to advocate his ideals.

Only such an ideal of humanism as I have sketched, with its emphasis upon practical wisdom, and such reflections upon the nature of our activities as I have so imperfectly put before you, can save the loss of our traditional values and keep us aware of the nature of what we are thinking and doing. Yet, whatever be true of the latter, there can be no doubting that the practice of medicine flourishes most when doctors think most highly of their functions; when they remember that prudence governs the employment of science, and that in the last resort they are concerned with the ultimate particular thing, the human person, whom science by itself is inadequate to comprehend.

BIBLIOGRAPHY

(Of the works quoted hereunder I owe a special debt to the Aquinas Papers of the Revs. Kenelm Foster, O.P., and D. J. B. Hawkins)

Chambers, R. W. (1935). *Thomas More.* Cape, London.
—— (1937). *The Place of St. Thomas More in English Literature and History.* Longmans, Green, London.
Collingwood, R. J. (1945). *The Idea of Nature.* Cambridge Univ. Press.
—— (1946). *The Idea of History.* Cambridge Univ. Press.
Foster, Kenelm (1949). *St. Thomas, Petrarch and the Renascence.* Aquinas Paper No. 12. Blackfriars, Oxford.
Hart, Bernard (1927). *Psychopathology, its Development and its Place in Medicine.* Cambridge Univ. Press.
Hawkins, D. J. B. (1945). *The Problem of Christian Humanism.* Aquinas Paper No. 1. Blackfriars, Oxford.
Johnson, J. N. (1835). *The Life of Thomas Linacre.* London.
Maritain, J. (1940). "Freudianism and Psychoanalysis," published in *Scholasticism and Politics.* Geoffrey Bles, London.
Rickman, J. (1950). *British Medical Journal,* 1, 30.
Ryle, G. (1949). *The Concept of Mind.* Hutchinson's Univ. Library, London.
Walshe, F. M. R. (1948). *The Structure of Medicine and its Place among the Sciences,* Harveian Oration R.C.P., London. Livingstone, Edinburgh.
Whitehead, A. N. (1938). *Modes of Thought.* Cambridge Univ. Press.

INSULIN-INDUCED SKELETAL ABNORMALITIES IN DEVELOPING CHICKENS*

BY

P. K. DURAISWAMI, M.S., M.Ch.Orth., F.R.C.S.
Research Fellow, Department of Orthopaedic Surgery, University of Liverpool

According to C. S. Stockard (1912) developmental anomalies of various types and degrees cause "the death of about 23% of the human race before or shortly after the time of birth and handicap(s) a certain proportion of the survivors throughout their lives." During the last few decades the discovery of genetic factors leading to malformations has attracted a great deal of attention, while research in the field of environmental teratogenic factors has lagged behind.

There exists a widespread belief among laymen as well as among physicians that single and multiple congenital malformations are always the result of changes in the germplasm—in other words, they are genetically determined and hereditary. I do not, for a moment, minimize the role of genetic factors in the causation of congenital anomalies, but it has been shown in recent years that developmental processes can be altered by environmental disturbances as well as by abnormal genes. It will be of great interest to the geneticist to know that types of congenital malformations which are sometimes genetically determined, such as microphthalmos, cleft palate, and certain skeletal abnormalities, can be produced in the offspring not only by maternal nutritional deficiencies and by roentgen irradiation, but also, at least in some animals, by the deliberate introduction of certain substances during embryonic growth.

New momentum to this line of thought has been given by the valuable epidemiological observations first made by Gregg in Australia in 1941. Since then evidence has accumulated that the contraction of rubella by the mother early in pregnancy is related to the development of congenital anomalies like cataract, heart disease, and deafmutism in the offspring. This has naturally raised the question whether other infectious diseases, particularly those due to a virus, such as mumps, measles, and chickenpox, may cause similar defects. It may easily be that the more severe infectious diseases contracted during pregnancy are prone to result in abortion or miscarriage, whereas comparatively milder ones like rubella can give rise to congenital anomalies in the foetus without jeopardizing its life.

In 1943, while investigating the role of glycogen granules in hypertrophic cartilage cells during endochondral ossification, I made an accidental observation as a result of which I became interested in the insulin-induced skeletal abnormalities in developing chick embryos. In the course of a series of experiments I introduced 5 units of insulin into hens' eggs at various intervals after the beginning of incubation and noticed that some of the chicks showed *x*-ray appearances resembling osteogenesis imperfecta in the human, that some had developed abnormalities of the spinal column like spina bifida, with partial or complete suppression of development of some vertebrae, while others showed deformities in the limbs. I have observed that "synthalin," too, can induce certain skeletal deformities when injected in the same way, and an account of these deformities will be given in a separate paper. Unfortunately my investigations were interrupted during the war, and for one reason or another I could not renew my experimental work until I came to Liverpool in October, 1947.

Material and Method

My experiments have been conducted mostly with eggs from brown leghorn matings. I have used a simple apparatus not only for testing the fertility of an egg before injection but also for transilluminating it while drilling a hole into the shell and injecting into the yolk. In this way I have avoided injuring the embryo and the chorionic blood vessels. A fine dental drill held in a small chuck has been used to make a hole in the egg-shell, which has been sterilized with spirit. A tuberculin syringe fitted with the finest hypodermic needle ¼ in. (1.9 cm.) long has been found most suitable for making the injections. This length of needle enables one to inject into the yolk.

In my experiments I have used crystalline insulin dissolved in distilled water and made up to a strength of 40 units in each millilitre. The doses given varied from 0.05 to 6 units at different intervals after the beginning of incubation. Calculated on the basis of the human dose, 6 units to a developing chick embryo may appear to be distinctly excessive. But Riddle (1923) and others have shown that birds are highly resistant to insulin and can therefore survive a dose of insulin 30 times as strong as that which would kill a rabbit. Whenever the volume of the solution injected has exceeded 0.05 ml. an additional hole has been drilled into the egg-shell in the region of the air sac in order to prevent undue increase of pressure inside the egg. I should perhaps make it perfectly clear, at this stage, that only one injection of insulin is given into the egg, and no more either during the remaining period of incubation or after hatching.

After making the injection the needle is carefully removed without injuring the embryo or the chorionic blood vessels, and the holes are sealed and the egg returned to the incubator. By the same technique control eggs have been injected with the same quantities of physiological saline and incubated in the same incubator. Embryos have been removed at varying intervals before hatching for histological and other investigations. All chicks which survived 14 days after the beginning of incubation and those that hatched out alive either by themselves or with help, as in the case of deformed ones, have been *x*-rayed. All the live chickens, insulin-treated as well as the controls, have been fed on a nutritious diet rich in vitamins and reared under conditions equal in every way. It should be noted here that nearly all the insulin-treated chickens are smaller and more delicate than the controls, so that they have to be reared with special care.

*Based on a paper read at the Liverpool Medical Institution on January 19, 1950.

Observations

I do not propose to enter here into a detailed discussion on the histological, biochemical, and other aspects of the problem, which will be dealt with later, but rather to give a preliminary survey of the more important observations that have so far been made.

Insulin-induced Skeletal Abnormalities

Day of Injection after Starting of Incubation	Part of Body *Primarily* Affected by Insulin
0–2nd day	Vertebral column
3rd day	Claws
4th and 5th days	Limbs; beak
6th day	Hip (congenital dislocation of hip)
3rd to 6th days (high doses of insulin)	Generalized developmental disturbance of bone resembling osteogenesis imperfecta



FIG. 2.—Spina bifida in an embryo treated with insulin 24 hours after incubation and removed from the shell alive on the 20th day of incubation.

Broadly speaking, insulin seems to affect primarily the part or organ which is in the most active stage of development or differentiation at the time of injection, though the growth of the embryo as a whole is retarded to a degree varying with the dose of insulin. The accompanying Table and Fig. 1 give some idea of the type of deformity that has been induced by insulin in relation to the time of injection after the starting of incubation of the egg. If it is remembered that during the development of the limb bud it is the distal part that first shoots out, as it were, from the side of the trunk, then it is easy

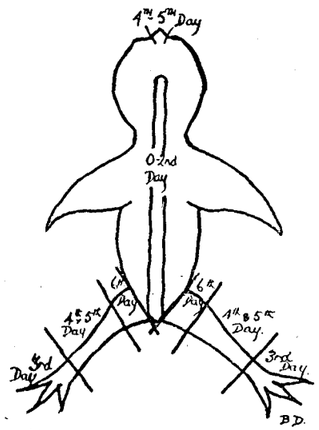


FIG. 1.—Diagram illustrating the type of deformity induced by insulin in relation to the time of injection into the egg after incubation.



FIG. 3.—Divarication of claws. Note the arched upper beak ("parrot beak"). (20-day-old embryo treated with insulin on the third day of incubation.)



FIG. 4.—Adduction deformity of the claws resembling clubfoot in a 20-day-old embryo treated with insulin on the third day of incubation.

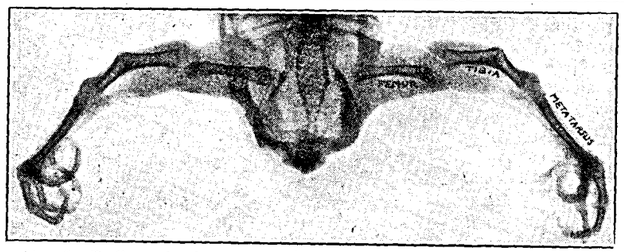


FIG. 5.—Radiograph of a 3-weeks-old chicken with bilateral dislocation of the knee. Note the pathological fractures of both tibiae and the marked buttressing of the concavities of the bowed bones by subperiosteal new bone. (Injection of insulin into the egg on the fourth day.)

to understand the significance of Fig. 1. Within the range of 0.05 to 6 units of insulin that I have injected, both the incidence and the severity of the deformities seem to increase with the dose of the hormone. Figs. 2–11 illustrate the various abnormalities, with appropriate controls for comparison. A generalized developmental disturbance of bone resembling osteogenesis imperfecta has been induced by injecting high doses of insulin between the third and the sixth day of incubation.



FIG. 6.—Deformity of the limbs as seen in arthrogryposis in a 20-day-old embryo treated with insulin on the fifth day. Note the "parrot beak."

Ossification in the Chick

As the process of ossification in the long bones of birds differs in certain essential respects from that of mammals, it is necessary to outline briefly the normal process of ossification in the chick before considering the abnormalities in ossification induced by insulin. Ossification of a long bone in the chick comprises the following four stages :

1. *Formation of Perichondral (Periosteal) Bone.*—The perichondrium deposits a layer of bone on the surface of the cartilage near its centre, thus forming a bony ring, which gradually lengthens into a hollow cylinder by extending towards the ends of the cartilage. This is illustrated in Fig. 12. The perichondral bone is naturally thickest in the centre of the shaft and tapers towards the extremity of the cartilages.

2. *Absorption of Cartilage.*—The matrix softens in the centre of the shaft, and the cartilage is replaced by the fundamental tissue of the marrow. This process extends towards the ends and is faster in the region of the cartilage subjacent to the perichondral bone than in the centre. In this way there remain two terminal cone-shaped cartilages, and the ends of the cones project into the marrow cavity.

3. *Calcification of Cartilage.*—Salts of lime are deposited in the matrix of the cartilage at the ends of the marrow cavity.

4. *Endochondral Ossification.*—Osteoblasts within the marrow cavity deposit bone on the inner surface of the perichondral bone.

It is worthy of note that in birds there is no independent epiphysial centre of ossification in the long bones such as exists in mammals. The ends of the bones remain cartilaginous and provide for growth in length. Growth in diameter of the bones takes place from the periosteum, and is accompanied by enlargement of the marrow cavity owing to simultaneous absorption of bone from within. It is thus obvious that in time all the endochondral bone is removed from the shaft, though some may remain in the spongy ends.



FIG. 7.—Generalized developmental disturbance of bone resembling the "prenatal type" of osteogenesis imperfecta with marked stunting in growth (compare with Fig. 8 on the same scale). Note the deformities of the limbs and beak. (20-day-old embryo treated with a high dose (5 units) of insulin on the fifth day of incubation.)

Effect of Insulin on Ossification

We may now see how insulin interferes with the normal process of ossification by comparing the photographs of

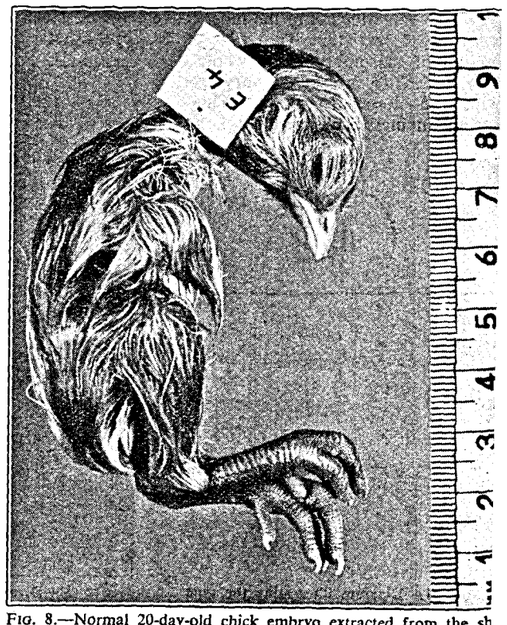


FIG. 8.—Normal 20-day-old chick embryo extracted from the sh before hatching.



FIG. 9.—Radiograph of the skeleton of the same embryo as in Fig. 7 (× 2). Note the deformities of the various bones due to pathological fracture and bending (mollities). Observe the defective ossification and also lack of development of several vertebrae in the distal part of the vertebral column.

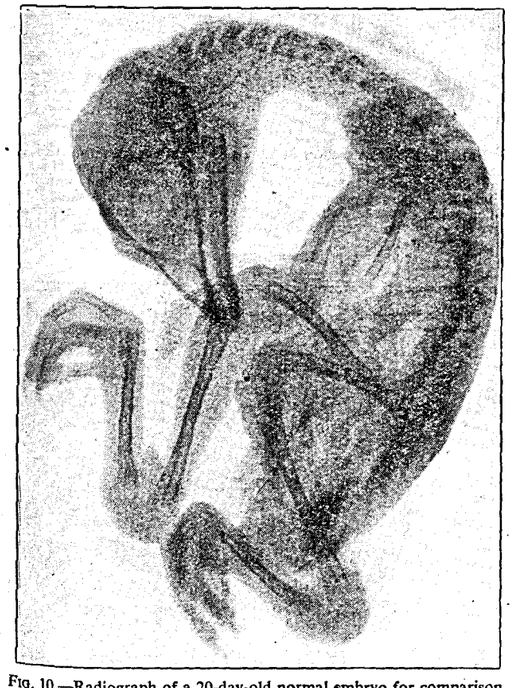


FIG. 10.—Radiograph of a 20-day-old normal embryo for comparison with Fig. 9.

enlarged mid-sagittal sections of the tibiae taken from insulin-treated and normal chick embryos of corresponding ages. The possible mechanism of action of insulin is discussed below.

Fig. 13 shows a mid-sagittal section of the tibia from a 20-day-old insulin-treated embryo, and Fig. 12 represents a mid-sagittal section of the proximal half of the tibia from a 20-day-old control embryo for comparison. The special features to be noted in the case of the insulin-treated one are the deformity, the pathological fracture, the stunted growth, and the lack of subperichondral ossification as compared with the corresponding control. Fig. 7 is a photograph of a 20-day-old excessively stunted chick embryo, showing evidence of a generalized developmental disturbance of bone resembling osteogenesis imperfecta ("prenatal type"), while Fig. 9 is a radiograph of the same embryo showing the various deformed bones and pathological fractures.

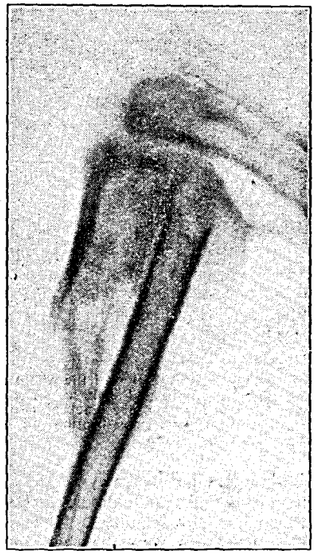


FIG. 11.—Radiograph of pathological fracture of the left tibia in a 5-months-old cockerel with insulin-induced osteogenesis imperfecta (resembling "post-natal type").

The occurrence of a pathological fracture at the distal third of the tibia has been noted with great regularity in such chicks. It may be recalled that this is the favourite site for pseudarthrosis in children. Fig. 11 shows the radiograph of a pathological fracture of the left tibia in a 5-months-old cockerel with insulin-induced osteogenesis imperfecta ("post-natal type").

Deformities of the Beak and other Malformations

A highly arched upper beak was often associated with the limb deformities, and, much less commonly, a short upper beak and crossing of the beaks were observed. Apart from the skeletal abnormalities, I have noticed only

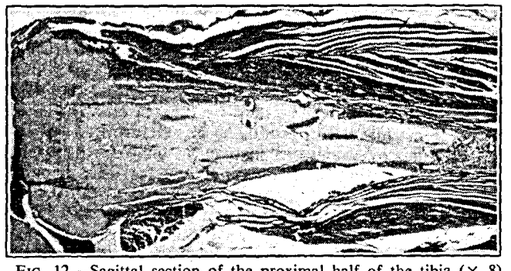


FIG. 12.—Sagittal section of the proximal half of the tibia (× 8) of a normal 20-day-old embryo stained with haematoxylin and eosin. Note that the subperichondral bone is thickest in the centre and tapers towards the extremities. (The perichondrium, together with the subperichondral bone, was partially detached from the proximal cone-shaped cartilage of the tibia during preparation of the section.)

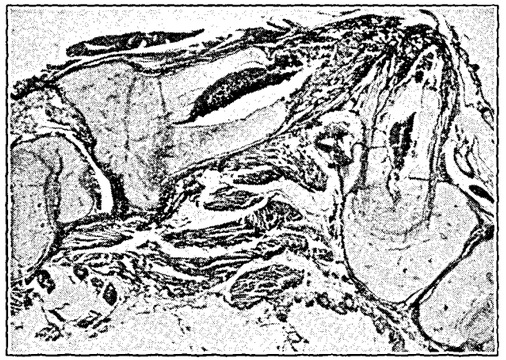


FIG. 13.—Sagittal section of the whole of the tibia (× 7.5) from a 20-day-old insulin-treated embryo. The pathological fracture, the deformity of the tibia, the thickening of the periosteum, and the defective subperiosteal ossification all suggest the condition of osteogenesis imperfecta.

certain anomalies of the eyes such as anophthalmos, microphthalmos, and buphthalmos, the last-named almost always accompanied by blindness. It is interesting to note that all the malformations that have been induced by insulin in my experiments so far have been confined to the skeleton and the eyes. The reasons for this selective action of insulin are given below.

Discussion

The question naturally arises whether these deformities are due to the trauma caused by the injection or to any specific action of insulin. Saline in quantities very much larger than the volumes of insulin solution has been injected into hundreds of control eggs and no deformities have resulted; and injections of parathormone (up to 5 units), calciferol (up to 2,000 i.u.), and radioactive phosphorus (up to 20 microcuries) have been made, also without any resulting deformities. Insulin inactivated by the methyl-alcohol-hydrochloric method of Charles and Scott (1931) has been injected and no deformities have appeared, whereas, when inactivated insulin was reactivated by alkali and then injected the deformities have occurred. I am satisfied, therefore, that the possible trauma of injection is not a factor in causing the abnormalities and that insulin has, in fact, a very specific effect.

There are further reasons for holding this view on the specificity of insulin. Insulin, if injected during the first week of incubation, produces a definite hypoglycaemia which persists till about the twelfth day of incubation (blood sugar estimated by the Hagedorn–Jensen method). Insulin-treated embryos which survive seem to recover normal blood-sugar levels from their own resources between the twelfth and the fourteenth day after the beginning of incubation. This may be the reason why I have so far not succeeded in producing any deformity by injecting even up to 6 units of insulin on or after the twelfth day of incubation. The explanation for this apparent discrepancy may very well lie in the experimental observations made by Idzumi (1924), Murray (1926), and Potvin and Aron (1927), indicating that the embryonic liver in the chick begins to store glycogen in appreciable quantities on or about the eleventh day of incubation, and it is only thereafter that the carbohydrate metabolism is controlled by interaction of the various hormones concerned. Presumably this unchecked insulin hypoglycaemia until about the twelfth day of incubation could result in damage to embryonic cells which, according to Needham (1926), almost exclusively metabolize glucose during the early developmental stage of the embryo. It is generally recognized that insulin enables the tissues to utilize glucose, but, if the

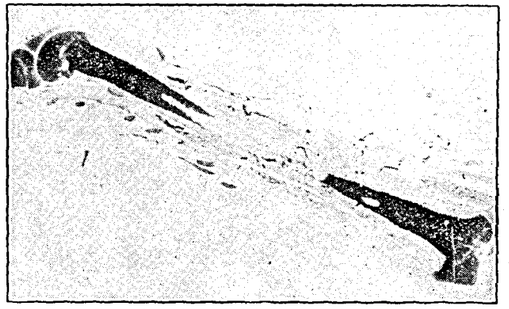


FIG. 14.—Sagittal section of tibia (× 7) of a normal 12-day-old embryo stained with toluidine blue. The cartilaginous core of the tibia has been stained deeply by this selective stain, whereas all the rest of the tissues in the section, including subperichondral bone, appear faintly tinted. The unstained area between the cones of cartilage in the middle of the bone represents the newly forming marrow cavity.

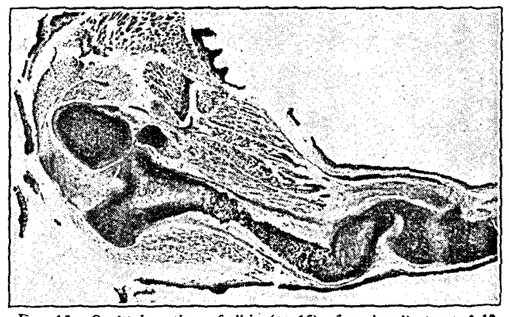


FIG. 15.—Sagittal section of tibia (× 15) of an insulin-treated 12-day-old embryo stained with toluidine blue. Note the marked stunting and deformity of the tibia as compared with the normal in Fig. 14. There is no marrow cavity, the whole sagittal section being filled with cartilage, which has, however, been stained much less intensely by the specific stain owing to poor chondroitin-sulphuric acid content in cartilage cells, many of which show degenerative changes as seen in Figs. 18 and 19.

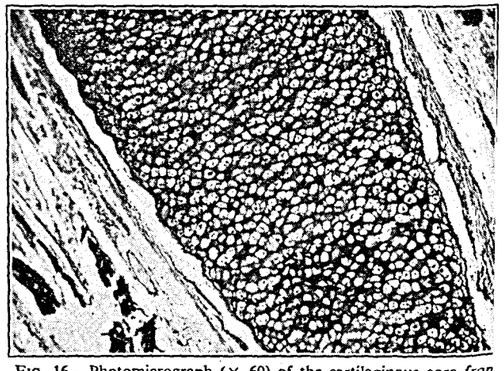


FIG. 16.—Photomicrograph (× 60) of the cartilaginous core from the tibia of a normal 10-day-old embryo stained with toluidine blue Cartilage cells are stained deeply by this special stain and appea normal.



FIG. 17.—Same as Fig. 16 (× 450).



FIG. 18.—Photomicrograph (× 60) of the cartilaginous core from the tibia of an insulin-treated 10-day-old embryo stained with toluidine blue. Note the moth-eaten appearance of the cartilaginous core and the debris of disintegrating nuclei of degenerated cells.



FIG. 19.—Same as Fig. 18 (× 450).

blood sugar is persistently low and glycogen is not stored in the liver during the early stages of development, then it is easy to understand how cellular metabolism will continue to be abnormal as long as the hypoglycaemia lasts.

Needham (1926) has also observed that in the early stages of development in the chick there is a larger proportion of glucose not accounted for by glycogen or free glucose than at any other time. According to him this combined glucose is probably a "mucoprotein glucose," and its importance in the early stages may be correlated with the primitive gelatinous intercellular matrix in which embryonic cells at that time grow and migrate. It is known that cartilage and parts of the eye such as the cornea, vitreous humour, and the sclera, which has a special inner layer of hyaline cartilage in birds, are all rich in substances of the mucoprotein (glycoprotein) type, and it is significant that the insulin-induced abnormalities that I have observed so far have been confined to the skeleton and the eyes.

With a view to the investigation of the effect of insulin treatment on the mucoprotein content of developing cartilage I have employed Lison's histochemical technique for localizing the chondromucoid, which contains chondroitin sulphuric acid, by staining with a basic metachromatic aniline dye such as toluidine blue. Lison (1935) has presented evidence that the metachromatic reaction is specific for chondroitin-sulphuric acid, the affinity of which for the dye is so great that even in very high dilutions (approximately 1 in 250,000) the chondromucoid is stained deeply while the other tissues are faintly tinted by the dye. The contrast between the arresting red-violet of the chondroitin-sulphuric acid and the faint blue colour of the surrounding tissues facilitates a comparative analysis of the distribution and the amount of the chondroitin-sulphuric acid in the cartilaginous skeletons of the insulin-treated and control chick embryos of corresponding ages.

By employing this technique I have observed that there is not only very marked stunting of the cartilaginous skeleton in the insulin-treated chick embryos as compared with the controls, but also the cartilage cells in the former show varying degrees of degeneration and exhibit less affinity for the dye owing to a low chondroitin-sulphuric acid content (Figs. 14–19). It is suggested that such degenerative changes in the cartilaginous skeleton may be followed by deformities, defective ossification, and pathological fractures which may be caused by the vigorous embryonic movements that can be observed from an early period of development, and thus may eventually result in a condition resembling osteogenesis imperfecta.

As mentioned at the beginning of this paper, several nutritional deficiencies have been shown to give rise to congenital malformations. Ivanovsky (1923), in a report on the physical modifications of the population of Russia under famine, remarks: "The number of children either prematurely born or stillborn, monsters, and children with different anomalies considerably increased during the famine." In India and Japan stillbirths, premature deliveries, and congenital malformations have often been reported to be the result of maternal vitamin-B deficiency. Byerly and his co-workers (1935) obtained short-legged embryos from eggs of chickens on a deficiency diet whose effects were reversed by wheat-germ, liver, and whey. Romanoff and Bauernfeind (1942) demonstrated that riboflavin deficiency gave rise to short-legged embryos. Couch and his co-workers (1948) obtained similar abnormalities with eggs from biotin-deficient hens.

It was reported by Warkany and Nelson (1940) that female rats reared and bred on a diet deficient in riboflavin gave birth to offspring a third of which had congenital skeletal abnormalities. The malformations consisted of shortening of the mandible, tibia, fibula, radius, and ulna. Histological examinations revealed that not only osseous but also cartilaginous and pre-cartilaginous structures were deformed in a manner similar to the insulin-induced deformities. It is interesting to note that the tibiae were affected in a high proportion of the deformed offspring as in the case of insulin-induced skeletal deformities. When riboflavin was added to the maternal diet no abnormal young rats were obtained. This new knowledge in the field of nutrition deserves special attention, since it demonstrates the effect of vitamin deficiencies upon the earliest processes of growth and differentiation.

It is well known that the yellow enzyme (containing riboflavin), coenzyme I, and coenzyme II (containing nicotinamide) participate in the breakdown of carbohydrates in the tissues. Spratt (1949) has presented experimental evidence for the existence of the typical phosphorylating system in the early chick embryo. One can therefore anticipate that deficiency of phosphorylating enzymes, produced by lack of vitamin-B complex, may induce malformations in the same way as insulin hypoglycaemia can,

by causing disturbances to cellular carbohydrate metabolism at critical periods during development. Further, I have experimental proof that insulin-induced deformities can be prevented to a remarkable extent by injecting nicotinamide and riboflavin into eggs along with insulin, and details of this work will be given in another paper dealing with the preventive aspect of the problem.

Summary

Though genetic factors play an important part in the causation of congenital anomalies, it has been shown in recent years that certain environmental factors can interfere with the normal developmental processes in the embryo.

An account of the skeletal abnormalities induced by insulin has been given.

It has been suggested that unchecked insulin hypoglycaemia during the early stages of development may adversely affect the development of the cartilaginous skeleton and of the eyes by depriving them of their essential constituent mucoprotein to varying degrees.

This experimental research has been conducted in the Department of Orthopaedic Surgery, University of Liverpool, with the aid of a scholarship granted by the Government of India till October, 1949, and thereafter with a Fellowship awarded by the University of Liverpool, and my grateful acknowledgments are extended to them. I wish to thank Mr. Bryan McFarland, director of orthopaedic studies, and his assistant, Mr. G. V. Osborne, for providing the facilities for carrying out this research; Sir Edward and Lady Mellanby for their helpful criticism; Dr. C. A. St. Hill and Miss M. Lichfield for the histological sections; Mr. W. Lee for the photographs and photomicrographs; Miss B. Duckworth for the drawing; and Burroughs Wellcome Ltd. for a supply of crystalline insulin.

BIBLIOGRAPHY

Balfour, M. I., and Talpade, S. K. (1932). *Indian med. Gaz.*, **67**, 601.
Byerly, T. C., Titus, H. W., Ellis, N. R., and Landauer, W. (1935). *Proc. Soc. exp. Biol., N.Y.*, **32**, 1542.
Charles, A. F., and Scott, D. A. (1931). *J. biol. Chem.*, **92**, 289.
Couch, J. R., Cravens, W. W., Elvehjem, C. A., and Halpin, J. G. (1948). *Anat. Rec.*, **100**, 29.
Fox, M. J., Krumbiegel, E. R., and Teresi, J. L. (1948). *Lancet*, **1**, 746.
Gordon, J. E., Aycock, W. L., and Ingalls, T. H. (1947). *Amer. J. med. Sci.*, **214**, 322.
Harris, R. S., and Thimann, K. V. (1945). *Vitamins and Hormones*, vol. 3. Academic Press Inc., New York.
Hempelmann, L. H. (1940). *Anat. Rec.*, **78**, 197.
Idzumi, S. (1924). *Mitt. med. Fak. Tokyo*, **32**, 197.
Ivanovsky, A. (1923). *Amer. J. phys. Anthropol.*, **6**, 331.
Landauer, W. (1947). *J. exp. Zool.*, **105**, 145.
Lillie, F. R. (1919). *The Development of the Chick*. Henry Holt, New York.
Lison, L. (1935). *C.R. Soc. Biol., Paris*, **118**, 821.
Morton, R. A. (1942). *The Application of Absorption Spectra to the Study of Vitamins, Hormones, and Co-enzymes*. London.
Murray, H. A. (1926). *J. gen. Physiol.*, **9**, 405.
Needham, J. (1926). *Brit. J. exp. Biol.*, **3**, 189; **4**, 114, 145.
—— (1927). Ibid., **5**, 6, 21, 37.
—— (1927). *Quart. J. exp. Physiol.*, **18**, 161.
—— (1931). *Chemical Embryology*. Cambridge University Press.
—— (1942). *Biochemistry and Morphogenesis*. Cambridge University Press.
Potvin, R., and Aron, M. (1927). *C. R. Soc. Biol., Paris*, **96**, 267.
Riddle, O. (1923). *Proc. Soc. exp. Biol., N.Y.*, **20**, 244.
Romanoff, A. L., and Bauernfeind, J. C. (1942). *Anat. Rec.*, **82**, 11.
Spratt, N. T. (1948). *J. exp. Zool.*, **107**, 39.
—— (1949). Ibid., **110**, 273.
Stockard, C. S. (1912). Quoted by Gordon, J. E., Aycock, W. L., and Ingalls, T. H. (1947). *Amer. J. med. Sci.*, **214**, 322.
Swan, C. (1948). *Lancet*, **1**, 744.
Warkany, J., and Nelson, R. C. (1940). *Science*, **92**, 383.
—— —— (1942). *Arch. Path.*, **34**, 375.
—— —— and Schraffenberger, E. (1943). *J. Bone Jt Surg.*, **25**, 261.

The booklet *Notes on the Diagnosis of Occupational Diseases Prescribed under the National Insurance (Industrial Injuries) Act* is now obtainable by medical practitioners from H.M.S.O. or through any bookseller for 1s. 6d. An earlier edition was issued in 1948 to those medical practitioners to whom claimants to industrial insurance benefit on account of prescribed occupational diseases were being referred for initial diagnosis. Notes on pneumoconiosis and byssinosis have now been added to the booklet.

MORTALITY FROM AND RISK OF GASTRIC CARCINOMA AMONG PATIENTS WITH PERNICIOUS ANAEMIA*

BY

JOHANNES MOSBECH, M.B., B.S.

AND

AAGE VIDEBAEK, M.D.

(From the Bispebjerg Hospital, Medical Department B, Copenhagen, and the University Institute of Human Genetics, Copenhagen)

The introduction of concentrated preparations of liver and stomach in the treatment of pernicious anaemia (Minot and Murphy, 1926) has changed completely the prognosis of this complaint. The disease, which previously had followed a capricious but usually rapidly fatal course, could now be kept under control, so that as a rule the patients enjoyed a long period of freedom from symptoms with full working capacity.

It is now possible, with more than 20 years' experience of this treatment, to evaluate the prognosis of the disease under the radically altered conditions. While studying for a different purpose a group of patients suffering from pernicious anaemia we arrived at results which differ in several respects from those previously reported and which we therefore feel justified in publishing.

Present Investigations

The series comprises a fairly large number of patients treated for pernicious anaemia at the Bispebjerg Hospital, Medical Department B, during the period 1928 to 1949. A few foreigners and provincials have been omitted. All the case records were reviewed and the diagnoses confirmed according to the following criteria: a characteristic clinical picture, typical blood findings (megalocytic, hyperchromic anaemia, anisocytosis, leucopenia, increase in reticulocytes following specific therapy), and achlorhydria refractory to histamine.

In cases in which the diagnosis had been made before admission to hospital, data regarding the earliest clinical

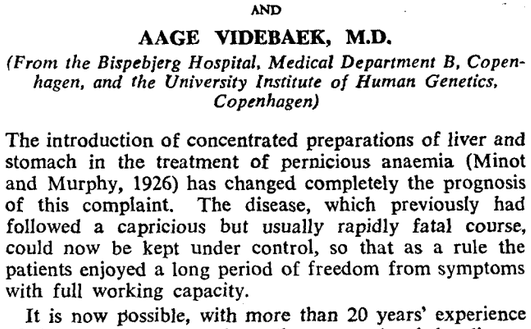


FIG. 1.—Age distribution of 219 females and 82 males suffering from pernicious anaemia. (Age when the disease was diagnosed.)

symptoms and blood findings were sought for confirmation. It was decided to leave out one case of megalocytic anaemia in a pregnant woman and two cases in which specific treatment was suspended at the recommendation of the department, since the blood findings were atypical; one of them has been symptom-free without treatment for 2½ years, but contact with the other has been lost.

Thus curtailed, the series comprises 301 patients—219 females (72.7%) and 82 males (27.3%). Fig. 1 shows the age of the patients when the diagnosis was made (average: females 59.1, males 56.4 years).

Table I groups the series according to the length of the follow-up period, and gives the number of deceased patients within each group.

TABLE I.—*Follow-up Period in 301 Cases of Pernicious Anaemia*

Follow-up Period (Years)	Females		Males	
	Cases	Deaths	Cases	Deaths
1–5	45	32	24	12
6–10 ..	72	26	22	9
11–15 ..	51	16	17	5
16–20 ..	39	7	13	5
21–25 ..	12	2	6	1
Total ..	219	83	82	32

Mortality Among Pernicious Anaemia Patients

The average follow-up period was 10.5 years (10.3 years for males and 10.7 for females), the study being concluded on June 1, 1949. By that time 83 of the 219 females and 32 of the 82 males had died.

On the basis of the mortality among the population of Copenhagen during the period 1935–9, it would be expected that, of 301 individuals of the same age and sex distribution and followed up for the same length of time as the patients with pernicious anaemia, 89 females and 28 males would die. It is evident from Table II that the actual findings are in perfect accordance with the expected deaths, and that in the present series the mortality did not exceed what is normal.

TABLE II.—*Deaths Among 301 Patients with Pernicious Anaemia as Compared with the Number of Deaths Among a Corresponding Group of Normal Persons*

	No. of Deaths Among 301 Patients with Pernicious Anaemia	Expected No. of Deaths
Females	83	89
Males	32	28
Total	115	117

Prognosis

For the purpose of adjudging the actual prognosis in cases of pernicious anaemia the authors chose a follow-up period of 10 years, including in this group only those patients whose disease was diagnosed prior to 1940. This group comprises 222 patients (168 females and 54 males). A total of 51 females and 17 males died during the follow-up period. On the basis of the ordinary mortality it was calculated that, among a population of the same age and sex distribution as the 222 patients, 50 females and 13 males would be expected to die in the course of 10 years.

Figs. 2 and 3 show the survivors among the females and males, respectively, with pernicious anaemia followed up for a minimum of 10 years, and also the survivors among a population of the same age and sex distribution. It is clear from the diagrams that, so far as the females are concerned, the mortality of patients with treated pernicious anaemia is the same as that of the average population. The apparently high mortality among the males (Fig. 3) proves, upon statistical calculation, to be within the error of the mean, due perhaps to chance in this small series of males. In other words, in the present series the life expectancy among the female patients is the same as among normal females; in the case of the males there is a slightly higher, but not significantly excessive, mortality.

In contrast to these findings, Jörgensen (1949), in his series of 148 females and 58 males suffering from pernicious anaemia, found the mortality in the females to be 13% and in the males 107% above the normal. He is of the opinion that this high mortality is due entirely to inadequate treatment. The difference in his mortality rate from that of the present series may be due to the fact that our patients were treated largely with the same preparation ("exopylorin," medicinalco), whereas Jörgensen's patients had undergone various treatments. In addition, a large number of our patients have been examined at intervals for years because of the particular interest devoted to pernicious anaemia in the department.

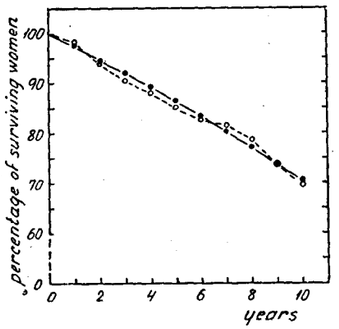


FIG. 2.—Percentage of survivors among 168 females suffering from pernicious anaemia (O- - -O) as compared with the calculated mortality among a corresponding population (●——●).

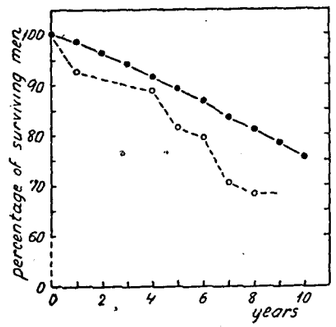


FIG. 3.—Percentage of survivors among 54 males suffering from pernicious anaemia (O- - -O) as compared with the calculated mortality among a corresponding population (●——●).

Causes of Death among Pernicious Anaemia Patients

Up to June 1, 1949, 115 (83 females and 32 males) out of the 301 patients had died. Table III shows the way in which the causes of death were ascertained.

TABLE III.—*Sources of the Cause of Death in 115 Cases of Pernicious Anaemia*

	Cause of Death Confirmed by		
	Case Record and Necropsy	Case Record Without Necropsy	Death Certificate
Females ..	13	36	34
Males	7	12	13
Total ..	20	48	47

Sixty-eight patients (49 females and 19 males) died in hospital. In the case of 13 females and 7 males the cause of death was confirmed by necropsy. Forty-seven patients died in their homes, and the cause of death was derived from the death certificates. In cases in which the latter mentioned carcinoma, further details regarding the diagnosis were obtained from the family doctor or the hospital department concerned.

*This investigation was supported by a grant from the Division of Research Grants and Fellowships of the National Institutes of Health, U.S. Public Health Service.

TABLE IV.—*Causes of Death in 115 Cases of Pernicious Anaemia*

	Females	Males	Total
Pernicious anaemia	2	1	3 (3%)
Carcinoma of stomach	8	6	14
,, ,, liver	1		1
,, ,, colon	1		1
,, ,, uterine cervix	1		1 (18%)
,, ,, thyroid gland	1		1
,, ,, mammary gland	1		1
,, ,, prostate		2	2
Heart disease	23	9	32 (28%)
Pulmonary diseases (apart from cancer)	13	7	20 (17%)
Cerebral disorders (apart from tumours)	19	5	24 (21%)
Pyelonephritis	5		5
Uraemia		1	1 (6%)
Papilloma of urinary bladder		1	1
Intestinal obstruction	2		2
Peritonitis	1		1 (5%)
Cholangitis	1		1
Cirrhosis of liver	2		2
Ovarian cystoma	1		1
Agranulocytosis (due to drugs)	1		1
Total	83	32	115

The causes of death in the 115 cases of pernicious anaemia are listed in Table IV. Pernicious anaemia appears to have been the immediate cause of death in only the three cases given. Two of these patients were senile females who were admitted to hospital in a state of severe anaemia, and both were so debilitated that adequate therapy proved of no avail. The third patient refused treatment, and died in his home from severe anaemia a fortnight after discharge from hospital.

In this connexion it might be interesting to call attention to a study from the Simpson Memorial Institute published by Sturgis (1939). Analysing the causes of death in 150 cases of treated pernicious anaemia dying within the first 10 years after the introduction of liver therapy, he arrived at the result that half the patients died from anaemia (particularly myelopathic manifestations with sphincter disturbances) and the other half from irrelevant causes. In the present series myelopathic symptoms did not constitute the cause of death in any case.

Gastric Carcinoma in Pernicious Anaemia Patients

Thirteen females and eight males died from carcinoma (Table IV). On the basis of the mortality from carcinoma among the population of Copenhagen, 1935–9, it may be calculated that, among 301 individuals of the same age and sex distribution and followed up for the same length of time as the anaemic subjects, 6 males and 15 females would be expected to die from carcinoma (Table V). In

TABLE V.—*Number of Deaths From Carcinoma Among the Series of 301 Cases of Pernicious Anaemia as compared with the Number of Expected Cancer Deaths*

	No. of Patients	Deaths from Cancer	
		Actual	Expected
Females	219	13	15
Males	82	8	6
Total	301	21	21

other words, the mortality from carcinoma among the present series was not excessive.

It is striking that no fewer than 8 out of 83 females (10%) and 6 out of 32 males (19%) died from carcinoma of the stomach. In addition, the series includes a man who underwent operation for gastric carcinoma and who six months later is still surviving in a debilitated state. Details of the 15 cases of gastric carcinoma are given in Table VI.

Of the females, four died in hospital and were examined at necropsy, but microscopical examination was performed

TABLE VI.—*Fifteen Cases of Gastric Carcinoma Occurring Among 301 Patients Suffering From Pernicious Anaemia*

Case	Sex and Age	Duration of Pernicious Anaemia Before Gastric Carcinoma was Diagnosed (Years)	Site of Tumour in Stomach	Microscopical Examination
1	F 60	3	Ulcerated tumour occupying entire pyloric area (necropsy)	Papilliferous carcinoma
2	F 71	1	Large tumour occupying distal half of stomach (*x*-ray)	Not performed
3	F 72	2	Flat tumour, size of child's hand, on posterior wall of stomach, 6-7 cm. from pylorus (necropsy)	,, ,,
4	F 72	1	Firm and nodular tumour, size of goose's egg, occupying entire pyloric antrum (necropsy)	,, ,,
5	F 75	15	Entire pyloric area tapers into fine irregular canal (tumour of pylorus) (*x*-ray)	,, ,,
6	F 58	9	Irregular, large filling defects on middle of lesser curvature, reaching to and involving entire cardia (*x*-ray)	,, ,,
7	F 68	17	From fundus a large irregular filling defect extends 8–10 cm. into body (*x*-ray, operation)	,, ,,
8	F 68	4	Ulcerating carcinoma, size of an orange, on middle of lesser curvature (necropsy)	,, ,,
9	M 48	19	Nodular tumour, size of closed fist, on middle of lesser curvature (operation)	Adenocarcinoma
10	M 66	13	Circular carcinoma, size of closed fist, in area of pyloric antrum (operation)	Adenocarcinoma with solid areas
11	M 68	8	Diffuse infiltration of entire stomach (necropsy)	Solid, scirrhous, diffuse carcinoma
12	M 70	7	Firm tumour, size of half-crown, on middle of greater curvature (necropsy)	Adenocarcinoma
13	M 57	5	*X*-ray: pyloric tumour. Operation revealed cicatricial stenosis. Five years later entire stomach was involved in diffuse scirrhous infiltration (operation and *x*-ray)	Not performed
14	M 61	7	Circular constriction of middle area of body which shows irregular, sharp contours. Fundus and pylorus normal (*x*-ray)	,, ,,
15	M 57	14	Operation revealed an ulcerated tumour, size of palm of hand	Adenocarcinoma

in only one case. Four died in their homes, the diagnoses having been confirmed by characteristic *x*-ray findings, occult bleeding, and the clinical course of the disorder. So far as the males are concerned, histological verification was available from operation or necropsy specimens in five cases. In two cases the diagnoses were substantiated by typical *x*-ray findings. The age stated in the table refers to the age when the diagnosis of carcinoma was made, and, since the patients usually die from carcinoma within the first year (the longest interval in this series being 18 months), the age at diagnosis accords fairly well with the age at death.

All the patients were examined radiologically. Five (one female and four males) underwent operations; necropsy was performed in six instances (four females and two males).

On the average, pernicious anaemia was of eight years' standing (seven years for females and ten years for males) when gastric carcinoma was diagnosed, the average age when the carcinoma was diagnosed being 68 years for the eight females and 61 years for the seven males. This difference in age is not statistically significant, but in all probability it is real, since Jörgensen found a corresponding sex difference in his series.

On the basis of the ordinary mortality from gastric carcinoma among the population, corresponding as regards sex and age to the 301 cases of pernicious anaemia and followed up for the same length of time, it may be calculated that 3.5 females and 1.7 males should have died from

TABLE VII.—*Incidence of Gastric Carcinoma Among 301 Cases of Pernicious Anaemia as Compared with the Expected Incidence in a Corresponding Normal Population*

	No. of Patients	Cases of Gastric Carcinoma	
		Occurring	Expected
Females	219	8 (4%)	3·5 (1·6%)
Males	82	7 (9%)	1·7 (2·1%)
Total	301	15 (5%)	5·2 (1·7%)

gastric carcinoma at the end of the follow-up period. *Table VII* gives the cases of gastric carcinoma occurring in the present series as compared with the expected incidence.

The number of patients dying from gastric carcinoma in the present series has thus far exceeded the expected deaths. The difference is significant for females as well as for males. It strikes one that the increased incidence of gastric carcinoma does not involve a corresponding increase in the incidence of total carcinoma.

Previous workers (Jenner, 1939; Waldenström, 1945; Kaplan and Rigler, 1945, 1947; Bourne, 1948) have called attention to the particular predisposition to gastric carcinoma among patients suffering from pernicious anaemia. This finding was recently confirmed by Jörgensen, who emphasized that the increase in the incidence of gastric carcinoma among patients suffering from pernicious anaemia was more marked among males than among females, an observation which accords with the findings in the present series. It is difficult to explain this male preponderance. The data available in our series afforded no evidence that the male patients developing gastric carcinoma were alcohol addicts.

Attempts have been made to explain the high incidence of gastric carcinoma in association with pernicious anaemia as being the result of the pathological changes found in the stomach in the latter condition. It has been pointed out by Meulengracht (1939) that patients with pernicious anaemia are affected with atrophic gastritis, localized primarily to the fundal area, whereas the mucosa of the distal part of the stomach is comparatively intact. If this gastritis were the precursor of gastric carcinoma, such carcinoma would be expected to develop by preference in the fundal area or at least in the proximal part of the body.

According to Torgersen (1944) gastric carcinoma in pernicious anaemia is in the great majority of cases localized to the fundus and to the proximal part of the body. In contrast, gastric carcinoma in a non-selected material was found to be situated in the pylorus and pyloric antrum in 50 to 60% of the cases. Torgersen's series comprises 106 cases of pernicious anaemia coexisting with gastric carcinoma (90 from the literature and 16 of his own). According to the description, in only two of his own cases was the carcinoma unmistakably in the fundus, whereas in seven it was in the body and in seven in the pylorus.

There seems to be some incongruity between Torgersen's observations in his own cases and the conclusion which he claims to be able to draw from earlier reports. The earlier reports of gastric carcinoma in association with pernicious anaemia have usually been of single cases or of groups comprising only a few patients. Among a somewhat larger series (Table VIII), the one reported by Strandell and Jansson (1937) is worth mentioning. Among 686 cases of pernicious anaemia they found 21 of gastric carcinoma in the following sites: nine in the pylorus, four in the fundus, and eight in the body of the stomach.

TABLE VIII.—*Site of Gastric Carcinoma Occurring in 85 Cases of Pernicious Anaemia*

	Pylorus and Antrum	Body	Fundus	Diffuse
Jenner (1939)	3	2	1	1
Strandell and Jansson (1937)	9	8	4	
Washburn and Rozendaal (1938)	4	2	3	
Torgersen (1944)	7	7	2	
Doehring and Eusterman (1942)	8	4	3	2
Present series	5	6	2	2
Total	36	29	15	5

Among 906 cases of pernicious anaemia Washburn and Rozendaal (1938) found gastric carcinoma in nine—three were in the fundus, two in the body, and four in the pylorus.

Jenner (1939), studying 181 cases of pernicious anaemia, found among them seven cases of gastric carcinoma. In one case the fundal area was definitely the site of the tumour; in two cases the site was probably the body; in three it was natural to interpret the tumour as being in the pylorus; and in the last case the growth was without doubt a scirrhus involving the entire stomach.

Doehring and Eusterman (1942) found 17 instances of gastric carcinoma among 1,014 patients suffering from pernicious anaemia. Eight were situated in the distal third of the stomach, four in the middle third, and three in the proximal third; two cases involved the entire stomach. These authors concluded that the site of gastric carcinoma in patients suffering from pernicious anaemia did not differ from that found normally.

The reported cases of gastric carcinoma in the presence of pernicious anaemia therefore fail to afford evidence that the growths in these patients are situated by preference in the fundal area or in the proximal part of the body.

The present series includes five cases of pyloric carcinoma, six of the body, and two of the fundus; in two instances the entire stomach was involved. Accordingly, this group does not confirm the theory that gastric carcinoma in the presence of pernicious anaemia should be localized by preference to the fundus.

The reason for the particular predisposition to gastric carcinoma among patients suffering from pernicious anaemia remains unelucidated. Possibly the explanation is that both pernicious anaemia and gastric carcinoma result from achlorhydria. If so, it is not unnatural that the two conditions should at times coexist. There is perhaps a question of inherited factors, since achlorhydria, an almost invariable sign of both lesions, occurs with particular frequency in families affected with pernicious anaemia.

A wide study of the familial occurrence of achlorhydria, pernicious anaemia, and gastric carcinoma may help in elucidating the relationship between these lesions. Investigations along these lines are being carried out.

Summary

A total of 219 females and 82 males who received treatment for pernicious anaemia at the Bispebjerg Hospital, Medical Department B, Copenhagen, during the period January, 1928, to June, 1949, have been studied. Of these, 83 females and 32 males have died. The expected number of deaths is 89 females and 28 males.

Two hundred and twenty-two patients have been followed up for more than ten years. Female patients with pernicious anaemia have the same chances of survival as normal females, whereas there is a slightly but not significantly higher mortality among the males.

The causes of death are tabulated. Twenty-one patients died from carcinoma, a figure which corresponds to the expected number of cancer deaths. Among this group, however, no fewer than eight females and six males died from gastric carcinoma. The expected number of deaths from carcinoma in all sites is 15, from gastric carcinoma only 5, so that the excessive mortality from gastric carcinoma is statistically significant.

It is found that patients suffering from pernicious anaemia do not develop their gastric carcinoma in the fundus and upper part of the body of the stomach, where the pathological changes characteristic of pernicious anaemia are localized. Possibly the explanation is that both pernicious anaemia and gastric carcinoma result from achlorhydria.

REFERENCES

Bourne, W. A. (1948). *British Medical Journal*, **1**, 92.
Doehring, P. C., and Eusterman, G. B. (1942). *Arch. Surg.*, **45**, 554.
Jenner, A. W. F. (1939). *Acta med. scand.*, **102**, 529.
Jörgensen, Jörgen (1949). *Den perniciöse anaemis vedligeholdelses-behandling og prognose i Danmark*. Copenhagen.
Kaplan, H. S., and Rigler, L. G. (1945). *Amer. J. med. Sci.*, **209**, 339.
—— —— (1947). *J. Lab. clin. Med.*, **32**, 644.
Meulengracht, E. (1939). *Nord. Med.*, **1**, 11.
Minot, G. R., and Murphy, W. P. (1926). *J. Amer. med. Ass.*, **87**, 470.
Strandell, B., and Jansson, T. (1937). *Nord. med. Tidskr.*, **14**, 1316.
Sturgis, C. C. (1939). *Trans. Ass. Amer. Phys.*, **54**, 46.
Torgersen, J. (1944). *Acta radiol., Stockh.*, **25**, 845.
Waldenström, J. (1945). *Nord. Med.*, **25**, 729.
Washburn, R. N., and Rozendaal, H. M. (1938). *Ann. intern. Med.*, **11**, 2172.

HAEMOLYTIC STREPTOCOCCAL GANGRENE OF BREAST SUCCESSFULLY TREATED WITH STREPTOMYCIN

BY

R. MARCUS, M.D., Ch.M., F.R.C.S.

(From the Department of Surgery, University of Liverpool)

Haemolytic streptococcal gangrene was first accurately described by Meleney (1924). In almost all cases there is an initial lesion which may escape the patient's notice. The limbs are affected more commonly than any other part of the body, as they are exposed to injury. The disease may occur in the scrotum (Marcus, 1949) and rarely on the trunk. Its clinical course is characterized by very rapid development. Within twenty-four hours the affected part becomes markedly swollen and shows all the signs of a rapidly spreading inflammation. In a day or two blisters and bullae begin to form and then the skin becomes frankly gangrenous. The condition is due to the haemolytic streptococcus, which can be obtained by culturing the discharge aerobically or anaerobically. Other organisms, such as *Staphylococcus aureus, Pseudomonas pyocyanea, Bact. coli, Proteus vulgaris, Streptococcus faecalis,* and diphtheroids may occur as secondary invaders.

Meleney (1924) recommends incision as far as the extension of the subcutaneous necrosis, but not further, as incisions in the zone of cellulitis may be harmful. The gangrenous skin should be excised as soon as the line of demarcation has developed and removal can be adopted without causing much bleeding. Amputation is rarely necessary, as the infection is superficial in most cases and can usually be combated by superficial incisions.

Penicillin and the sulphonamides have proved of value in haemolytic streptococcal infections, and in many cases render incisions unnecessary. The following two cases may be of interest, as these drugs failed to prevent the infection spreading, but when used with streptomycin localization occurred within a few hours.

Case 1

A married woman aged 57 was admitted for investigation for Cushing's syndrome. She had a small infected area on the left breast, for which she was given 100,000 units of penicillin daily. The inflammation extended by 1½ in. (3.8 cm.) in 24 hours and discharged copiously. When seen five days later the skin of the breast, except for the nipple and areola, was gangrenous (Fig. 1). The spreading margin extended upwards towards the clavicle, and was painful and vesiculated. Sulphatriad, 1 g. thrice daily, was given for 48 hours.

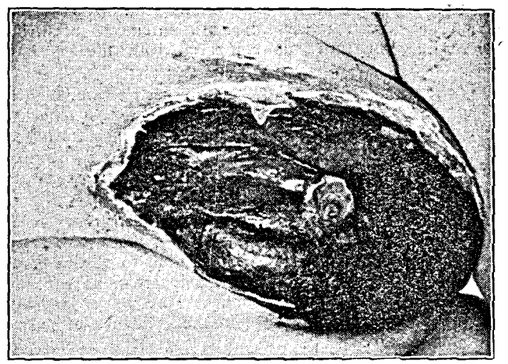


FIG. 1.—Case 1. Before streptomycin. The skin of the breast is gangrenous, and the gangrenous process is extending by 1½ in. daily.

Culture on February 16 showed: haemolytic streptococcus sensitive to 1/16 unit of penicillin per ml. and 8 units of streptomycin per ml.; *Staph. aureus* sensitive to 32 units of penicillin per ml. and 2 units of streptomycin per ml. Streptomycin, 0.5 g. six-hourly, was given—total 6 g.

The general condition improved within 12 hours. The tenderness was lessened, the spreading process was arrested, and the gangrenous skin showed a line of demarcation. *Culture:* haemolytic streptococci sensitive to 1/16 unit of penicillin per ml. and 8 units of streptomycin per ml.; *Staph. aureus* resistant to at least 32 units of penicillin per ml. and sensitive to 4 units of streptomycin per ml.

On February 18 the bacteriological findings and sensitivity to penicillin and streptomycin were unaltered. About three-quarters of the gangrenous skin had separated, and this was easily cut away with scissors, leaving a remarkably clean granulating surface. The remainder of the skin was removed next day without causing much bleeding; the nipple and areola were left intact. A small area below the nipple was affected more deeply than the remainder of the breast and contained a slough about ¾ in. (1.9 cm.) long. Culture from this region grew *Proteus vulgaris.*

On February 23 healing began, and granulations were healthy except for a small area below the nipple. Culture from this region grew *Proteus vulgaris* resistant to at least 32 units of penicillin. On March 23 postage-stamp Thiersch grafts were applied to the granulating surface. By April 1 most of the grafts had taken successfully and healing proceeded rapidly. The raw area had completely epithelized by April 18.

Comment on Case 1

The haemolytic streptococcus isolated was of Lancefield Group A. It was not completely eliminated from the margin of the gangrenous area during the period streptomycin was given. After the gangrenous skin had been removed the organisms were not found in repeated cultures from the margin of the granulating tissue. As the skin was not viable when streptomycin treatment was initiated it is not surprising that the organisms were not eliminated until the affected area was excised.

Case 2

A married woman aged 64 had a radical mastectomy for carcinoma of the breast. The wound had been sutured without tension. Five days after operation she was toxic and had severe pain in the wound. There was a small area of erythema with a vesicular centre in the outer part of the wound. She was given 500,000 units of penicillin intramuscularly daily and 1 g. of sulphadimidine three times a day.

When seen 14 hours later the temperature was 103° F. (39.4° C.), pulse 180. The outer part of the incision showed a gangrenous area, undermining of the skin, and gross oedema. While being examined the margin was seen extending. The discharge from the wound was copious and foul-smelling. Culture from the margin grew anaerobic haemolytic streptococci sensitive to one unit of streptomycin per ml., *Staph. albus (coagulase-negative),* and an organism of *Bacillus subtilis* group. Streptomycin, 0.5 g. six-hourly, was given—total 6 g. Sulphadimidine was discontinued, as this caused vomiting.

Next day her general condition improved considerably; the tenderness was much less and the spreading margin was arrested. The following day the gangrenous skin showed a line of demarcation and was excised (Fig. 2). Cultures grew

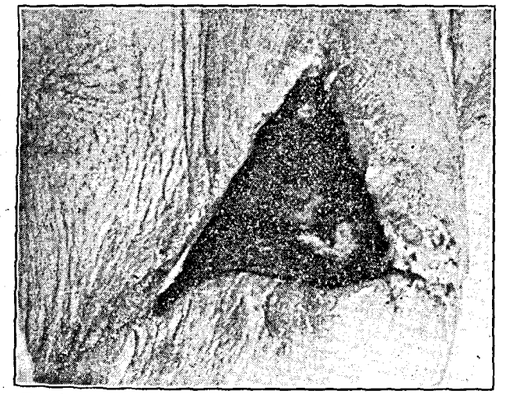


FIG. 2.—Case 2. Two days after receiving streptomycin. The gangrenous skin showed a line of demarcation and was excised. The sutures have been removed and the remainder of the incision has healed. Pain and oedema were markedly decreased.

anaerobic haemolytic streptococci, non-haemolytic streptococci, and an organism of *B. subtilis* group. A week later the wound was dry and healthy. Closure was carried out with interrupted sutures, and a small stab drain was inserted into the dead space below the suture line.

Discussion

Meleney (1933) classified the various types of infectious gangrene of the skin as acute and chronic. The acute forms are represented by gas gangrene and haemolytic streptococcal gangrene; the chronic forms include ecthyma (gangrenous *impetigo*), anaerobic gangrene, fuso-spirochaetal gangrene, and progressive bacterial synergic gangrene. The last-named condition is due to a symbiotic infection by a non-haemolytic *Staph. aureus* (Brewer and Meleney, 1926; Meleney, 1931, 1933, 1935). There are a few reports of successful treatment of post-operative progressive bacterial synergic gangrene with penicillin (Grimshaw and Stent, 1945; Meleney *et al.*, 1945; Clarke, 1947). In successful cases the inflammation, induration, oedema, and pain around the wound resolve and healing occurs rapidly, or after skin-grafting. Failing a satisfactory response excision of the wound is necessary before the condition is finally controlled (Meleney *et al.*, 1945).

Haemolytic streptococcal gangrene has been described as phlegmonous or gangrenous erysipelas, but should not be confused with erysipelas, which is also caused by the haemolytic streptococcus. Lymphangitis and lymphadenitis are rare, though phlebitis is fairly common in the former condition. In erysipelas, organisms may be cultivated at and beyond the spreading margin but not in the centre. The reverse is the case in haemolytic streptococcal gangrene. There may be a wide zone of sterile oedema beyond the limits of necrosis.

The synergic effect of penicillin, streptomycin, and the sulphonamides is of value when one drug alone fails to arrest the gangrenous process. This synergic effect has been noted in other infections (Redewill and Potter, 1948; Wells and Marcus, 1949; Bigger and Daly, 1949). The response to this form of treatment in the above two cases was dramatic. Within a few hours there was demonstrable improvement in the local and general condition of the patients. The spreading process was arrested and separation of the gangrenous skin began before completing streptomycin therapy. In both cases incisions as recommended by Meleney (1924) were not necessary.

The morbidity resulting from anaerobic streptococcal gangrene may be decreased by early recognition of the condition and by giving streptomycin before the gangrenous process is extensive. Incisions and skin-grafting will then be unnecessary. It is questionable whether secondary sutures are as valuble as skin-grafting. The undermining of the skin results in a dead space which cannot be easily obliterated by sutures.

Summary

Two cases of streptococcal gangrene of the breast are described. Penicillin and the sulphonamides by themselves failed to prevent the infection spreading, but when used together with streptomycin this was localized within a few hours.

Grateful thanks are due to Professor C. A. Wells and Mr. H. Hughes, who entrusted me with the care of their patients. I also thank Professor A. W. Downie and Dr. T. Black for the bacteriological investigations and sensitivity tests, and Mr. W. Lee, of the Central Photographic Department, University of Liverpool, for the illustrations. The streptomycin used for Case 1 was supplied by the Medical Research Council.

REFERENCES

Bigger, J. W., and Daly, R. A. (1949). *Lancet*, **1**, 296.
Brewer, G. E., and Meleney, F. L. (1926). *Ann. Surg.*, **84**, 438.
Clarke, S. H. C. (1947). *Lancet*, **1**, 748.
Grimshaw, C., and Stent, L. (1945). Ibid., **1**, 494.
Marcus, R. (1949). *Brit. J. Urol.*, **21**, 320.
Meleney, F. L. (1924). *Arch. Surg., Chicago*, **9**, 317.
—— (1931). *Ann. Surg.*, **94**, 961.
—— (1933). *Surg. Gynec. Obstet.*, **56**, 847.
—— (1935). *Ann. Surg.*, **101**, 997.
—— Friedman, S. T., and Harvey, H. D. (1945). *Surgery*, **18**, 423.
Redewill, F. H., and Potter, J. E. (1948). *Urol. cutan. Rev.*, **52**, 259.
Wells, C. A., and Marcus, R. (1949). *Brit. J. Urol.*, **21**, 68.

Normally claims for sickness benefit must be made within three days of the beginning of an illness, but when a person has never claimed sickness benefit before there will be no penalty so long as the claim is made within 21 days of the beginning of the illness. This is the main effect of provisional regulations made by the Minister of National Insurance, Dr. Edith Summerskill, which came into force on July 19. The regulations also enable delay in making a claim to be automatically excused during a period in hospital up to a maximum of three months. There is no change in the general rule that sickness benefit cannot be paid for more than three days before the claim is received at the local National Insurance office unless good cause for the delay is shown. The new regulations, however, allow late claims to be accepted without inquiry into the reason in special circumstances where difficulty has been experienced by insured persons.

RHEUMATIC HEART DISEASE IN SERVICE PENSIONERS

A REVIEW OF 318 CASES

BY

RONALD HARTLEY, M.R.C.P.

Physician to the Miller General Hospital and to the Dreadnought Hospital for Seamen

During the 1939–45 war cardiologists recorded their experience in the diagnosis of early chronic rheumatic heart disease in recruits. In spite of excellent work by medical boards, backed by specialist opinion, a small proportion of men with this condition were accepted for service. This paper reports the subsequent course of 318 such men re-examined after discharge while drawing disability pensions. In only one of these had the opinion of a cardiologist been taken before entry. The age at diagnosis varied from 18 to 50, and it may be presumed that the disease was already present on entry, for all had well-established valvular disease at the time of diagnosis. The lesions present are shown in Table I. In only five cases had an apical systolic murmur been noted on entry. In view of the fact that many hundreds of men with incidental systolic murmurs were accepted for service on specialist advice it is apparent that clinically the problem of distinguishing incidental from organic systolic murmurs has been largely solved. At the time of invaliding three of these five had mitral stenosis and aortic incompetence and two had mitral stenosis only. Seven other men had hypertension in addition to the valvular lesion.

TABLE I.—*Incidence of Clinical Valvular Disease Found in 318 Men at Time of Diagnosis*

Mitral stenosis	82 (25·7%)
Aortic incompetence	77 (24·2%)
Mitral stenosis and aortic incompetence	127 (39·9%)
Aortic stenosis and incompetence	19 (5·9%)
Mitral stenosis, aortic incompetence, and aortic stenosis	13 (4·0%)

After the 1914–18 war Grant (1933) analysed 736 cases invalided with valvular heart disease, and his figures show aortic lesions in nearly 60%, compared with 74% in this series. Both these figures were high and do not represent the true incidence of aortic valvular involvement, for aortic valvular disease is more readily missed than mitral valvular disease in routine examination, and so those with aortic lesions are more likely to enter the Forces, yet rheumatic aortic lesions are far commoner than is generally realized.

A history of previous rheumatic infection was obtained in only 37% in this series—a low figure; 100 men reported an attack of rheumatic fever, 15 of chorea, and 3 of both diseases.

Medical boards were much influenced by such a history, and many men were referred to cardiologists for this reason alone. This largely explains the low percentage of positive histories in this valvular series.

The features leading to diagnosis are given in Table II.

TABLE II.—*Features Leading to Diagnosis in 318 Men With Chronic Rheumatic Heart Disease*

Rheumatic fever	98 (31%)
Dyspnoea on effort	73 (23%)
No symptoms. Discovered at routine examination	104 (33%)
Haemoptysis	17
Anxiety state	7
Onset of auricular fibrillation	5
Mass radiography	5
Bacterial endocarditis	4
Congestive cardiac failure	1
Paroxysmal tachycardia	1
Embolic phenomena	1
Angina of effort	2

Cases with Recurrence of Rheumatic Fever.—The expected recurrence rate of rheumatic fever at the age of 20–25 is approximately 5% (Wilson, 1940). A Service rate of 31% is very high. Although a few men were under active service conditions when they had their relapse, most admitted that they were in good billets. It was apparently the open-air life and exposure to chill during training that brought about so many relapses. There was an increased liability to relapse in those who had had a previous known attack. In this group 51% relapsed within two years of enlistment, while only 13% served over five years. The valve affected in the 98 patients who developed acute rheumatic fever in the Service was the aortic in 35 (36%), the mitral in 18 (18%), and the combined lesion in 45 (46%). This is surprising, but the figures are hardly adequate for definite conclusions to be drawn. A previous rheumatic history was recorded in 50% of these men. There was no difference in the age at relapse between those with such a history and those without it.

Cases Reporting with Dyspnoea.—Only 27.4% of these men had a previous rheumatic history. The age at which the symptom appeared is that which would be expected from present knowledge of the natural history of the disease. There is no evidence that it was precipitated prematurely by the vigorous Service training. In this group 42% reported dyspnoea within two years of enlistment, while 27% served over five years.

Cases Diagnosed on Routine Examination.—A previous rheumatic history was recorded in 31%. The diagnosis in 16 was made at the demobilization examination. The percentage of men with a cardiac neurosis superimposed upon their disability is high. This is due to a failure on the part of doctors to explain the condition to the patient at the first diagnosis. Too often a man's sole knowledge about a cardiac affection is derived from the more sensational novels and films. Among the 104 men diagnosed on routine examination, all denying dyspnoea prior to diagnosis, over 80% claimed the advent of their symptoms within six months of diagnosis. This is due to two facts: first, the development of cardiac neurosis, and, secondly, the over-restriction of activities. All 104 had done their full Army training—the majority one battle course and a high percentage two or more such courses—yet they had no dyspnoea until they were told to go carefully. Lack of training alone may account for this symptom. A history of collapse or heart failure during exercise was not found among these 104 men or among the 73 reporting with dyspnoea.

Cases with Haemoptysis.—The percentage presenting with an initial haemoptysis was small—17 men (5.3%). In most cases there was prolonged dyspnoea as a result of work in full kit or wearing gas masks before haemorrhage occurred. The great importance of haemoptysis as a symptom of mitral stenosis does not seem to be fully appreciated. Often there was considerable delay while lung investigations were carried out and before the correct diagnosis was made. Five men entered sanatoria; one of these had four postero-anterior *x*-ray plates of the chest taken before the true condition was recognized.

Cases with Bacterial Endocarditis.—The percentage of men with subacute bacterial endocarditis in this series is low and many must have died from the disease before the introduction of penicillin. Those who survived were permanently disabled and none were fit for work.

Discussion

That most of the 318 cases could have been diagnosed before entry is without question. Twelve admitted that they were rejected as volunteers and later were accepted as conscripts. One man was invalided from the Guards and then joined the Royal Air Force. These keen men persevered until they had their own way, and came to no harm while doing excellent service.

Failure to carry out a full clinical cardiac examination such as recommended by Parkinson and Hartley (1946) accounted for most acceptances. In many men auscultation failed to reveal the mitral diastolic or presystolic murmur with the patient in the standing position, when these conditions were obvious with the man lying in the left lateral position after exertion. In the same way many aortic diastolic murmurs could be heard only when the breath was held at the end of full expiration with the patient sitting. But there is often a silent period in the natural history of rheumatic fever when no murmurs may be present, and in the absence of radiological enlargement a positive diagnosis is impossible. The early diastolic murmur of aortic incompetence may be difficult to hear unless there is absolute quiet, and many boards did not work under such ideal conditions. Boards were handicapped by the absence of facilities for routine radioscopy and so depended entirely on the clinical findings.

More attention might have been paid to the apex beat. The apex beat as a physical sign has two components—position and type of impulse. The position is defined as the furthermost point outwards and downwards at which the impulse raises the examining finger. This point is an extremely accurate guide to the left cardiac border, except in those with a broad chest and those with a vertical heart. Normally the position lies within the mid-clavicular line. Among these 318 men both position and character were normal in only 20. In 154 the position was normal but the type of impulse was diagnostic: mitral stenosis gives a sudden impulse, aortic incompetence a forcible one. Over 200 normal young Naval officers were examined as a control, and in none was the type of impulse abnormal, while in only two was the position beyond the mid-clavicular line. These were both broad short men, and the coincidence of the apex beat as defined above with the radiological left border of the heart was confirmed in these officers.

Radiology

The radiological findings of established chronic rheumatic heart disease are well known, and the use of mass radiography in the future will ensure that most men with the disease will not be accepted for military service (Maclean and Rogen, 1949). It will not exclude all. The limitation of mass radiography in heart disease is that the postero-anterior film only is taken, whereas the earliest change in mitral stenosis is enlargement of the left auricle, shown in the right oblique position with barium in the oesophagus.

Parkinson and Hartley (1946) found this to be the only certain *x*-ray change in 74% of 104 symptomless recruits with presystolic murmurs, while in 13% there was no change in the size or shape of the heart. The same observers could find no change in the heart's appearance in 16% of 202 men with symptomless rheumatic aortic incompetence. Full-plate radiographs, usually only postero-anterior, were taken of 264 men in this series at the time of the first diagnosis. Of these, 215 hearts (81.4%) were reported as enlarged, while 44 (16.6%) were reported as normal. The valvular lesions found in these 44 men are shown in Table III. The high percentage of radiographs reported to be normal in this series is discouraging, for if enlargement is not detected on the full-size plate it is unlikely to be recognized on the miniature film. Five more (1.9%) were diagnosed on mass radiography. Three of these had mitral stenosis, one aortic incompetence, and one both.

TABLE III.—*Valvular Lesion in 44 Men Whose Postero-anterior Film Was Reported as Normal at the Time of Clinical Diagnosis*

Mitral stenosis	8
Aortic incompetence	13
Mitral stenosis and aortic incompetence	19
Mitral stenosis, aortic incompetence, and aortic stenosis	2
Aortic incompetence and stenosis	2

It is during the silent period of the disease that radiology is the only method of detection. Wilson (1940) says that, in her patients, while the auscultatory signs of cardiac involvement might disappear or become uncharacteristic during the course of the disease, cardiac enlargement was demonstrable at all times. Hartley (1948) has pointed out that aortic incompetence may cause enlargement before the aortic diastolic murmur is heard, while, as Parkinson (1949) has emphasized, the *x*-ray appearance often suggests further auscultation, with positive results.

It has always been well known that the patient with a chronic rheumatic heart fares badly in the armed Forces. He should not be accepted, as it is impossible to foresee which case will deteriorate and which will not.

The figures in Table I show that men with chronic rheumatic heart disease who are accepted for the Forces fall mainly into three groups from the medical point of view.

In the first group there occurred during service some incident of the rheumatic disease which might be expected to affect permanently the natural history of the disease in that man. Such incidences are the recurrence of rheumatic fever, auricular fibrillation, bacterial endocarditis, heart failure, angina of effort, or embolic phenomena. In all these cases, although such complications might have occurred in civilian life, the prognosis has been made worse. Hence a permanent increase in the disability must be accepted as a medical fact. Of the 318 men 34% are found in this group.

In the second group fall those men whose initial symptoms occurred during service, but in whom there was no specific incident that might be expected to influence the ultimate prognosis. Dyspnoea was the main symptom. Haemoptysis in 17 cannot be said to have done any permanent damage. Paroxysmal tachycardia is a disorder of function only. Nearly 29% fell in this second category. The presenting symptom can in no way be associated medically with military service, for between the ages of 20 and 30 the onset of symptoms is to be expected.

The remaining third of the cases had no symptoms before the diagnosis at routine examination. Over 80% of these developed dyspnoea within six months of this knowledge. It would appear that Service life with daily exercise improved their condition, and allowed them to exert themselves more than they would have been able to do otherwise.

It was the overrestriction of their activities, together with inadequate knowledge of their own condition, that precipitated symptoms.

Summary

Of the 318 men drawing disability pensions for chronic rheumatic heart disease who were re-examined, 74% had an aortic-valve lesion.

Only five men had an apical systolic murmur on entry, and the conclusion is drawn that the many hundreds of men accepted with incidental apical systolic murmurs were correctly assessed and so provide remarkably few of the cases here examined.

Most of the cases (87%) were revealed in three main ways—31% had a recurrence of rheumatic fever, 23% developed dyspnoea, and 33% were discovered on routine examination. These three groups of cases are discussed in detail.

The reasons why medical boards failed to diagnose and exclude these cases from service are discussed, with special reference to the importance of the position and type of the apex beat in diagnosis.

Increased disablement from a purely medical point of view occurred in only 34% of the total. It was caused by recurrent rheumatic fever, bacterial endocarditis, auricular fibrillation, angina of effort, and the occurrence of emboli or cardiac failure.

The importance of radiological examination of the heart and the potential value of mass radiography are discussed.

I wish to thank Sir John Parkinson for his helpful criticism. My thanks are also due to Dr. F. T. Rees, Director-General of Medical Services, Ministry of Pensions, for permission to publish this article, which does not necessarily represent the view of that Ministry.

REFERENCES

Grant, R. T. (1933). *Heart*, **16**, 275.
Hartley, R. (1948). *British Medical Journal*, **2**, 673.
Maclean, A., and Rogen, A. (1949). *Brit. Heart J.*, **11**, 264.
Parkinson, J. (1949). *Lancet*, **1**, 895.
—— and Hartley, R. (1946). *Brit. Heart J.*, **8**, 212.
Wilson, M. G. (1940). *Rheumatic Fever*. Commonwealth Fund, New York.

DECAMETHONIUM IODIDE AS A CURARIZING AGENT IN GENERAL ANAESTHESIA

BY

A. R. ELLERKER, L.M.S.S.A.

Late Anaesthetic Registrar, Selly Oak Hospital

The following series of 208 cases in which decamethonium iodide (C10) was used as a curarizing agent, in conjunction with most general anaesthetic agents, may prove of interest to those who are not convinced of its value as a substitute for D-tubocurarine chloride.

C10 is the decane derivative of bistrimethylammonium iodide. It is a white crystalline water-soluble salt, which forms a stable neutral solution. On intravenous injection both in experimental animals and in human beings it produces a neuromuscular block with little or no effect on the autonomic ganglia. The fact that it is cheap to synthesize and mixes readily with thiopentone sodium, together with its curarizing properties, makes it an even more attractive proposition.

Clinical Series

In all the 208 cases, with the exception of those in which caesarean section was performed, premedication with "omnopon," ½ gr. (22 mg.), or morphine, ¼ gr. (16 mg.), and hyoscine, 1/150 gr. (0.43 mg.), or atropine, 1/100 gr. (0.65 mg.), was carried out between 30 and 60 minutes before operation, and anaesthesia was induced with thiopentone sodium in doses varying from 0.4 to 1 g. For the caesarean sections premedication was carried out with atropine, 1/100 gr., and induction with cyclopropane and oxygen. The ages of the patients ranged from 12 to 79 years. The following are the operations for which the method was used.

Operation	No.
Oesophagoscopy	10
Bronchoscopy	5
Tonsillectomy	18
Mastoidectomy	10
Thyroidectomy	8
Dental operations	20
Facial and neck operations	13
Upper abdominal operations (including gastrectomy, gastro-jejunostomy, perforated peptic ulcers, cholecystectomy)	14
Laparotomy (appendicectomy, colostomy, excision of colon, etc.)	9
Herniorrhaphy	21
Prostatectomy	10
Nephrectomy	4
Anal and rectal operations	12
Thoracic sympathectomy	4
Caesarean section	13
Mastectomy	3
Amputation of leg	3
Laminectomy	10
Orthopaedic, unclassified	11
Unclassified, miscellaneous	10

Administration and Results

C10 may be injected intravenously either as a mixture with thiopentone sodium or by itself. Dosages of from 2 to 5 mg. have been used on different cases, and to produce full muscular relaxation an initial dose of 4 mg. was found to be the best. This produced excellent relaxation of the abdominal musculature for as long as 25 minutes, but also brought about apnoea due to respiratory paralysis for five to ten minutes after the full effect was obtained, which was usually some three to five minutes after the original injection.

Experiments carried out on the conscious patient by Organe, Paton, and Zaimis (1949) indicated that with a dose of 3 mg. of C10 the respiratory musculature was not in any way affected. It has been found here, however, that even with this dose there was apnoea for one to three minutes, while adequate abdominal relaxation was not always obtained. In this respect it differs from D-tubocurarine chloride, which does not always produce respiratory arrest with an equivalent dosage.

Repeated doses have not the cumulative effect that D-tubocurarine chloride has, and a maximum of 15 mg. of C10 has been given without ill effects, recovery taking place as after a single dose.

Continuous or intermittent injections of a thiopentone C10 mixture have been used with success in most of the herniorrhaphies and in a large number of the intraperitoneal operations, but the resulting apnoea makes it desirable to intubate these patients and to keep them well oxygenated.

The experimental work of Young (1949) on near-term guinea-pigs and rabbits suggests that C10 does not pass the placental barrier, and clinical trials by Organe (1949) indicate that this is so. In the 13 caesarean sections in this series, using doses of 2 to 3 mg. injected 10 to 15 minutes before delivery, we have found that the infant was definitely more flaccid and reluctant to breathe than after cyclopropane, oxygen, ether, or gas-oxygen-ether anaesthesia. It would seem, then, that C10 does cross the placenta into the foetal circulation, although more slowly and in smaller quantities than D-tubocurarine chloride. Recovery of muscle tone in these babies is fairly rapid.

Side-effects.—No deleterious side-effects were noted in any of these cases. One death occurred at the end of a partial gastrectomy for uncontrollable haematemesis. This patient was not, however, in the best condition, and some difficulty was experienced in keeping him oxygenated. *Post-mortem* examination revealed bilateral basal pneumonitis, with a large amount of purulent exudate and an advanced degree of myocardial degeneration.

Discussion and Conclusions

The use of C10 in short operations is clearly indicated to avoid the respiratory depression so often seen after the use of D-tubocurarine chloride. In all cases in which intubation is necessary or desirable C10 facilitates the passage of a Magill intratracheal tube without producing complete abdominal relaxation, which is so often unnecessary in E.N.T., orthopaedic, and other classes of operation.

It may be used in conjunction with D-tubocurarine chloride to produce short-term relaxation of the abdominal muscles when the peritoneum is being closed and it is undesirable to give another dose of D-tubocurarine chloride because of its long action and cumulative effect. Full respiratory excursions will then be established before the patient returns to the ward.

Antagonist.—Pentamethonium iodide, or C5, is the antidote to C10. Hewer *et al.* (1949) have reported its effects. It acts by producing a block of the autonomic ganglia, and would seem to be contraindicated in major surgery. It may produce a profound fall in blood pressure, and the patient may collapse in a very alarming manner. No opportunity has arisen and no attempt been made to use this substance here.

My thanks are due to Dr. T. H. Hobbes, the senior anaesthetist, for his help.

REFERENCES

Hewer, A. J. H., *et al.* (1949). *Lancet*, **1**, 817.
Organe, G. (1949). Ibid., **1**, 773.
—— Paton, W. D. M., and Zaimis, E. J. (1949). Ibid., **1**, 21.
Young, M. (1949). Ibid., **1**, 1052.

Medical Memoranda

Volvulus of the Small Intestine

The following case illustrates the difficulty of diagnosis of volvulus of the small intestine. This difficulty is present not only before operation but when the abdomen has been opened. The aetiology of the condition is obscure, and in the case described an adhesion was present round which the gut appeared to have pivoted. This has been described in other cases, but the operator is likely to find no obvious cause whatever.

CASE REPORT

A storekeeper aged 53 was admitted to hospital complaining of acute abdominal pain 1 in. (2.5 cm.) to the left of the umbilicus two days previously. Before this he had always been quite well. There was continuous dull abdominal pain with exacerbations of acute colic. The bowels had been absolutely confined and no flatus passed. Vomiting began a few hours after the onset of pain and had continued.

On admission he had an ashen appearance. His tongue was dry and furred. His temperature and pulse were normal. The abdomen was tympanitic and a little distended but with no real rigidity. No free fluid was discovered and there were no localizing signs of any sort to assist diagnosis. He was vomiting brownish fluid but there was no faecal change in the vomit. Enemas were returned unchanged. Borborygmi were heard over the large intestine. A diagnosis was made of small-bowel obstruction probably due to strangulation by band or internal hernia.

At operation there was a little free fluid and the whole small intestine presented moderately distended and markedly congested but not "plum coloured." In the left hypochondrium a band 3/16 in. (0.5 cm.) in diameter and extending from the splenic flexure downwards and inwards was found to be attached to the middle of the mesentery. This band was part of numerous adhesions tying the whole colon from caecum to sigmoid to the anterior peritoneum. The small intestine was free of adhesions. The large intestine was moderately and normally distended. Round the band was wrapped a loop of small intestine which was more obviously affected than the rest, as it was plum coloured and more distended. The band was divided and the small loop began to recover in appearance. At first it was thought that the cause of the obstruction had been discovered and dealt with, but the poor condition of the whole small intestine raised doubts, and, on feeling round the abdomen, the typical "band" caused by the twisted mesenteric root was felt and the volvulus diagnosed. The small intestine was eventrated, the 180-degrees twist that was present was untwisted, and the abdomen closed. The patient made an uninterrupted recovery.

A. J. HOBSON, F.R.C.S.

Aplastic Anaemia Complicating Miliary Tuberculosis

In the following case complete aplasia of the bone marrow developed. This seems to be an unusual complication and the clinical findings are worth recording.

CASE REPORT

The patient, a man aged 41, was healthy until March, 1949. His initial symptoms were non-specific—namely, lassitude, anorexia, and headaches. In June, 1949, he had a severe epistaxis and bleeding from the gums. He was admitted to hospital on August 4. There was no family history of tuberculosis.

On examination he was obviously very ill. He complained of a sore throat. The fauces were injected but not ulcerated. Pallor was pronounced without any evidence of icterus. The superficial lymphatic glands were not enlarged. His temperature was 101.6° F. (38.7° C.) on admission, and a remittent pyrexia, fluctuating between 100 and 103.2° F. (37.8 and 39.6° C.), persisted until the day before death. The pulse was 120. A loud systolic murmur was audible at the mitral area. The blood pressure was 145/80. No abnormal signs were elicited in the lungs. The spleen was enlarged to ½ in. (1.2 cm.) below the umbilicus, and the liver was enlarged 2 in. (5 cm.) below the costal margin.

The urine was normal. A blood count showed: haemoglobin, 36%; red cells, 1,510,000; C.I., 1.2; white cells, 1,200. No primitive cells were seen in the film. The red cells showed anisocytosis and poikilocytosis. Aerobic blood culture was negative. Examination of the sternal marrow smears revealed no primitive cells of either the myeloid or erythrocyte series. The film was diagnostic of aplasia of the bone marrow.

A radiograph of the chest showed a resolving area of consolidation in the left mid-zone. The remainder of the lung fields was clear. There was no enlargement of the mediastinal lymph nodes and no mottling. The patient died on August 21, 17 days after admission.

Permission for a necropsy could not be obtained, but the spleen was removed. This viscus was grossly enlarged and the histological examination showed multiple areas of necrosis with a slight mononuclear reaction around the margins. With Ziehl-Neelsen's stain lesions were seen to contain acid-fast bacilli. The picture was that of an atypical miliary tuberculosis.

COMMENT

There are several features of unusual interest in this case. Aplasia of the bone marrow was caused by an overwhelming toxaemia with a very low resistance. The absence of chest symptoms and minimal radiological findings are very difficult to explain in a case of generalized miliary tuberculosis. The primary focus was probably extrapulmonary. The gross splenomegaly was due to numerous tubercles and there was no evidence of splenic panhaematopenia. The miliary tuberculosis was not seriously considered in the differential diagnosis. Aleukaemic leukaemia was excluded by the marrow findings.

Septicaemia due to an anaerobic organism was the tentative diagnosis.

My thanks are due to Professor J. H. Biggart for his report on the histological section of the spleen, to Dr. M. G. Nelson for the report on the marrow smears, to Dr. C. R. Murdock for the report on the blood, and to Dr. H. B. McDowell for the report on the radiographs.

ROBERT J. KERNOHAN, M.D., M.R.C.P., M.R.C.P.I., D.P.H.,
Physician, Mid-Ulster and Mid-Antrim Group of Hospitals, Northern Ireland.

Treatment of Typhoid Carrier with Penicillin and Sulphamerazine

The successful treatment of a typhoid carrier, who had resisted combined sulphonamide–penicillin and caronamide, and choramphenicol, was eventually achieved by sulphamerazine and penicillin in dosage similar to that employed in our earlier case (Rumball and Moore, 1949).

CASE REPORT

A boy aged 9 contracted typhoid fever in Egypt in July, 1948, and came under our care six months later as a chronic persistent and profuse faecal carrier. His agglutinations were: typhoid O, 1 in 20; typhoid H, 1 in 250; and typhoid Vi, 1 in 10 standard agglutination and 1 in 20 partial agglutination. *In vitro* sensitivity tests showed: sulphathiazole—insensitive at 25 mg. per 100 ml., sensitive at 50 mg.; penicillin—insensitive at 1 unit per ml., sensitive at 5 units; sulphathiazole and penicillin combined—no demonstrable increase in sensitivity.

Over a period of nine days beginning on February 12, 1949, 19,000,000 units of crystalline penicillin, 75 g. of caronamide, and 39.75 g. of sulphatriad were given. Serum penicillin assay showed a range of 0.08 to 0.3 unit per ml., and sulphonamide concentration from 9.2 to 18 mg. per 100 ml., these levels being obtained immediately before the four-hourly doses of the combined drugs. A scanty growth of *Salmonella typhi* continued throughout treatment, but a profuse growth returned within a few days afterwards, even though the patient's serum on February 18 had inhibited the isolated organism.

Chloramphenicol was considered as a second method of treatment, based on the findings of Smadel *et al.* (1948), Woodward *et al.* (1948), and Murgatroyd (1949) that this drug was active in the acute disease, though at the time no literature was available regarding its effectiveness against the carrier state. The isolated organism was found to be extremely sensitive *in vitro* to chloramphenicol at a dilution of 2.5 mg. per ml. A course of treatment, using 0.25 g. of chloramphenicol four-hourly for seven days, to a total of 10.5 g., was therefore given from April 12 to 18. This dosage, equivalent to 10 mg. per kg. body weight, was based on half the adult dose given in acute cases. Positive stool cultures were obtained consistently during and after this course. A further course, using a threefold increase in dose to a total of 32.25 g., was given from April 25 to May 2, and was also unsuccessful. During the latter course serum sensitivity levels from 0.02 to 0.04 mg. of chloramphenicol per ml. were obtained, and faeces were negative. Apparently inhibition of the organism occurred while there was a high concentration of the drug in the bowel, but with the cessation of treatment the organism reappeared in profusion. In view of the outbreak of typhoid fever in Crowthorne, Berkshire, at the time (April, 1949) the unsuccessful use of the drug in this particular carrier was regarded as an important though disappointing clinical result.

Finally a 10-day course of 29.5 g. of sulphamerazine and 32,200,000 units of penicillin, comparable to that successful in our earlier case, was given in May, during which serum penicillin levels rose to 1 unit per ml., sulphamerazine concentration ranged from 15.8 to 36 mg. per 100 ml., and the patient's serum inhibited the organism in dilutions of 1 in 16. Faeces became negative early in this course of treatment and have remained negative consistently throughout the nine months' follow-up. The Vi titre had also returned to negative. Cure is therefore presumed probable.

COMMENT

It is stressed that cure of a second case with this method warrants no special claim being made of its superior value over other reported successful methods of treatment, but this case again serves to impress the fact that high and sustained blood levels are essential for success. In this case repeated failure with other methods, and success with the third course of treatment, may also be explained on the findings of Fry *et al.* (1948) that intermittent courses of treatment may be more successful than a continuous attack. The advent of chloramphenicol has considerably reduced the clinical complications and hastened recovery in acute cases of typhoid, in which the organism is more accessible to its action, but the treatment of the carrier state is a very different problem. Before abandoning hope in the treatment of carriers it is considered that the combined use of penicillin and sulphamerazine is worth a trial.

Since submitting this article a chronic urinary and faecal carrier of *Salmonella kottbus* has come under our care. Treatment similar to that detailed above was successful. *Salm. kottbus* belongs to the food-poisoning group of organisms. A summary of the case history is appended.

A 21-year-old aircraft hand was notified to us from a military hospital, to which he was admitted in December, 1949, suffering from diarrhoea and vomiting. His stools and urine gave a pure growth of *Salm. kottbus*. He was transferred to our care on January 31, 1950, symptomless and well. The organism was isolated and found to be sensitive to chloramphenicol, and a course of 25 g. was given. Subsequent cultures showed that the urinary infection had been eradicated, but the bowel infection persisted. At the end of February he was given a seven-day course of penicillin, 400,000 units four-hourly, night and day, together with a course of 27 g. of sulphamerazine. On completion of this the faeces were free from *Salm. kottbus*. He has remained under bacteriological surveillance, and during the three months since completing treatment both stools and urine remain free from *Salm. kottbus* infection. This case demonstrates the susceptibility of urinary infection to chloramphenicol and the resistance of bowel infection, which, however, responded to combined sulphamerazine and penicillin.

Our thanks are due to Air Marshal Sir P. C. Livingston, Director-General of Medical Services, for permission to publish these cases, and to Air Vice-Marshal T. C. Morton, consultant in pathology and tropical medicine, for advice and assistance in the bacteriology of the cases.

L. G. MOORE, M.B., B.Ch., B.A.O.,
Squadron Leader, R.A.F.
C. A. RUMBALL, M.R.C.P., D.P.M., D.T.M.&H., K.H.P.,
Group Captain, R.A.F.

REFERENCES

Fry, R. M., Jones, R. E., Moore, B., Parker, M. T., and Thomson, S. (1948). *British Medical Journal*, 2, 295.
Murgatroyd, F. (1949). Ibid., 1, 851.
Rumball, C. A., and Moore, L. G. (1949). Ibid., 1, 615, 943.
Smadel, J. E., Woodward, T. E., Ley, H. L., jun., Philip, C. B., Traub, R., Lewthwaite, R., and Savoor, S. R. (1948). *Science*, 108, 160.
Woodward, T. E., Smadel, J. E., Ley, H. L., jun., Green, R., and Mankikar, D. S. (1948). *Ann. intern. Med.*, 29, 131.

The British Standards Institution has issued a draft British Standard for linen textiles for use by local authorities and hospitals. The draft is being circulated to interested organizations so that they may comment on it before August 15. It is based on proposals made by the Local Authority Standards Advisory Committee in collaboration with the Hospital Equipment Standards Advisory Committee.

Reviews

UROLOGY

Essentials of Urology. By J. C. Ainsworth-Davis, M.A., M.D., B.Ch.(Cantab), F.R.C.S., F.R.C.S.Ed. (Pp. 734; illustrated. £2 10s.) Oxford: Blackwell Scientific Publications.

Urology has established itself now as a specialty, and many new textbooks are being published. Some are written by single authors and others by teams of contributors. One misses in the composite works what may be called the personal touch. While they are excellent books of reference, they do not reveal so clearly, as does a book by a single writer, which of the various alternatives described is likely to be the best method of treatment in a given case. Mr. Ainsworth-Davis does not derive sufficient profit from this advantage enjoyed by the single author. He gives an excellent description of the various alternative operations that may be carried out, but he keeps too far in the background and does not tell us enough of his own personal experience of them. Otherwise his book is to be highly recommended. The text is concise and clear, the accounts of after-treatment are excellent, and the diagrams and plates of an exceptionally high order. The general surgeon and postgraduate student could not have a better account of urology than what this book gives them. It is to be hoped that in a second edition the author will be a little less modest and let us know more of his own experience of the operations he so clearly describes.

KENNETH WALKER.

PRINCIPLES OF INDUSTRIAL HEALTH

Industrial Health. By R. Passmore, M.A., D.M., F.R.S.Ed., and Catherine N. Swanston, M.R.C.S., L.R.C.P., D.P.H., D.I.H. Foreword by Professor F. A. E. Crew, F.R.S. (Pp. 110. 4s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

This book is labelled an introduction for students. It is far more. It is a concise, readable—if elementary—account of the principles of industrial health. The writers have drawn on their practical experience in presenting their material, and doctors and industrial nurses, managers and foremen, could all find valuable information here.

After describing the distribution of the working population in this country and the special occupational problems of young and old, the writers discuss methods of assessing the health of working communities. A good short account of the main factors in the physical environment follows. Despite the steady improvement over many years in physical working conditions, it is pointed out that improvement in psychological and social environment has not kept pace, and that in consequence "many are working at three-quarters pressure only." The writers discuss these psychological and social factors and their effect on working efficiency. Chapters on industrial accidents and occupational diseases are included. They are sound, except for the account of the pneumoconioses, which is somewhat muddled and may confuse the reader. Short chapters follow on legislation and on the responsibility of management for health in industry, and the functions in this field of such industrial experts as the personnel manager, the safety officer, and other technical staff.

More and more are doctors being asked to undertake duties in factories and among working groups. If their time is to be used to the full they require some special training. This little book would provide an excellent accompaniment to any short course, and it would alone provide the general practitioner with a useful introduction to medical work in industry.

R. E. LANE.

DRUGS AND TREATMENT

A Concise Applied Pharmacology and Therapeutics. By F. G. Hobart, Ph.C., and G. Melton, M.D., M.R.C.P. With a foreword by Sir Adolphe Abrahams, O.B.E., M.A., M.D., F.R.C.P. Third edition. (Pp. 234. £1 1s.) London: Leonard Hill Ltd. 1949.

The appearance of the third edition of this book indicates that it has been found useful. Since one of its authors is a pharmacist, the publication contains much information required by the practising physician which is not of interest to the student approaching pharmacology in its early stages. The student is then chiefly concerned with understanding the mechanism of the action of drugs and has not yet come to face the practical difficulties of nomenclature, for example. The practising physician, on the other hand, will value a book which begins with a list of proprietary drugs and their definitions or non-proprietary equivalents. For him it is obviously a valuable and handy book of reference.

J. H. BURN.

MARMALADE AND MATERIALISM

A Doctor Digresses. By Kenneth M. Walker, M.A., M.B., B.Ch., F.R.C.S. (Pp. 207. 10s. 6d.) London: Jonathan Cape. 1950.

"If those of you who have brought their Bibles with them will turn to the Book of Leviticus . . ." Thus Kenneth Walker began his 9 a.m. lecture on gonorrhoea twenty-five years ago, and we amiably concluded that the lecturer had wit, style, and an interest in religion. These qualities have remained with him, and in this book he displays them yet again. The book is in truth a series of essays on such subjects as health, the patient, psychosomatic medicine, Western psychology, and Eastern philosophy—a continuing skein through them being skilfully woven by Marmalade, his cat, and Bonnington, an *alter ego* : Marmalade stands for elegance, for grace, and for non-attachment, while Bonnington holds fast to scientific materialism.

Pandit Nehru said recently that the man without internal conflict is a lunatic, and in our author there is a healthy schism between Kenneth, the artist, and Walker, the surgeon, which is scarcely resolved by "K. W.," the well-known medical philosopher. The philosopher tries hard to be eclectic in his approach to authority, but those who have read his other books will know that his heart is with Whitehead against Russell, with Jung against Freud, with Sherrington against Watson, with free will against determinism, with spirit against corpus, with physicians against specialists—in short, with Marmalade against Bonnington. This book adds little to our knowledge of the author's philosophy; but for the interested layman it provides stimulating and even exciting reading, and there are few medical readers who will not find here a new idea well conceived and finely phrased, or an old concept freshly illuminated. If Mr. Walker had given his book an index, it would have been a kindness to reviewers and at the same time have provided a silent testimony to the remarkable range of his

reading and to the extent of his learning. Now and again, however, he is uncritical in his acceptance of authority, as when he fails to examine the statement that nine out of ten of the persons attending the Peckham Health Centre were in a state of ill-health.

He tells us that this book rose phoenix-like from the ashes of a burnt manuscript, an ambitious work entitled "The Philosophy of Medicine." As he watched the flames destroy the result of a year's labour he consoled himself with the reflection that the philosophic method had no place in medicine, which required only careful observation and experiment. This is Walker writing, for nothing is more apparent in the practice of medicine to-day than that it lacks a coherent philosophy. "K. W." should try again.

D. V. HUBBLE.

FANCY FREE

Adaptation. Edited by John Romano, M.D. (Pp. 113. 16s.) Ithaca, New York: Cornell University Press. London: Geoffrey Cumberlege. 1949.

This volume consists of the papers read at the "Dedicatory Program" of the psychiatric unit at the Rochester School of Medicine and Dentistry. A brief editorial introduction is followed by five variations on themes suggested by the title. They are composed respectively by distinguished professors of zoology, physiology, psychobiology, psychiatry, and anthropology, the theme of "adaptation" being chosen on the grounds that it was a concept "central" to them all.

It is impossible to summarize the contents, since the contributors have let their fancy roam with fluent zest. The action of enzymes, the work of Pavlov and Sherrington, the views of sundry philosophers, the behaviour of wild rats and of neurotic goats, the result of a Gallup Poll (published in the *Ladies' Home Journal*) on the belief in the existence of God, the revelations of Freud, and many other matters—all find a place.

It is as if each professor had been set a question in some nightmare examination, "Write down what you know and interests you in not more than 22 pages"; but none complain, and only one seems to ask rather plaintively what it is all about. And who would not be puzzled, for example, about whether it is remarkable or only to be expected that elephants should have legs thick enough to support their weight? If they hadn't—but that is too easy: the elephant —and what else?—does not arise, or falls flat.

DESMOND CURRAN.

In *Energy and Matter* (Staples Press, 10s. 6d.) Dr. R. L. Worrall endeavours to give in a short space an account in simple language of the development of modern physics. He begins with a rapid review of the rise of physical science from the days of Aristotle to the present time. Such a review must of necessity be limited to the main positions taken up by the great physicists upon whose discoveries progress is dependent, and the author has wisely expressed their views in terms used by the discoverers themselves. Even if this method involves a certain degree of discontinuity, it provides a series of solid foundations the veracity of which can scarcely be questioned. Whether the reader who is not already familiar with the conceptions of modern physics will be able to grasp their meaning is an open question, but at least he will have the opportunity of a rapid review of the problems. The author has evidently read very widely, and it is a remarkable achievement to have compressed so much in so short a space. The absence of mathematical terms and symbols will certainly be appreciated by the readers for whom the book is intended.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Divine Healing: What the Bible Miracles Teach. By P. Raymond, M.B., B.S. (Pp. 55. 2s. 3d.) Dorchester: Longmans. 1950.

Illustrations of Anatomy for Nurses. By E. B. Jamieson, M.D. 3rd ed. (Pp. 86. No price.) Edinburgh: Livingstone. 1950.

Manson's Tropical Diseases. Edited by Sir Philip H. Manson-Bahr, C.M.G., D.S.O., M.A., M.D., D.T.M.&H., F.R.C.P. 13th ed. (Pp. 1,136. 45s.) London: Cassell 1950.

Eye Surgery. By H. B. Stallard, M.B.E., M.A., M.D., F.R.C.S. 2nd ed. (Pp. 667. 52s. 6d.) London: Simpkin Marshall. Bristol: John Wright. 1950.

A Textbook of Venereal Diseases. By R. R. Willcox, M.B., B.S. (Pp. 439. 32s. 6d.) London: William Heinemann. 1950.

Regional Dermatologic Diagnosis. By E. Epstein, M.D. (Pp. 328. 42s.) London: Henry Kimpton. 1950.

A Short Textbook of Surgery. By C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.Ed. 5th ed. (Pp. 676. 30s.) London: Churchill. 1950.

Physiological Mechanisms in Animal Behaviour. Symposia of the Society for Experimental Biology. No. 4. (Pp. 482. 35s.) Cambridge: University Press. 1950.

The Abnormal Pneumoencephalogram. By L. M. Davidoff, M.D., and B. S. Epstein, M.D. (Pp. 506. 105s.) London: Henry Kimpton. 1950.

Living Anatomy. By R. D. Lockhart, M.D., Ch.M. 2nd ed. (Pp. 71. 12s. 6d.) London: Faber and Faber. 1950.

The Effects of Temperature, Humidity, Air Movement, and Solar Radiation on the Behaviour and Physiology of Cattle and Other Farm Animals. By J. D. Findlay, B.Sc., Ph.D. (Pp. 178. No price.) Kirkhill, Ayr: The Hannah Dairy Research Institute. 1950.

The Centennial of the Sheffield Scientific School. By E. O. Lawrence and others. Edited by G. A. Baitsell. (Pp. 206. 20s.) London: Geoffrey Cumberlege. 1950.

The Closed Treatment of Common Fractures. By J. Charnley, B.Sc., M.B., F.R.C.S. (Pp. 190. 35s.) Edinburgh: E. and S. Livingstone. 1950.

Modern Trends in Obstetrics and Gynaecology. Edited by K. Bowes, M.D., M.S., F.R.C.S. (Pp. 778. 60s.) London: Butterworth. 1950.

Supervoltage Roentgentherapy. By F. Buschke, M.D., and others. (Pp. 297. 77s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

Living by Zen. By D. T. Suzuki, D.Litt. (Pp. 187. 15s.) London. Rider. 1950.

Recent Advances in Ocular Prosthesis. By J. H. Prince, F.B.O.A., F.S.M.C., F.R.M.S., F.Z.S. (Pp. 155. 20s.) Edinburgh: Livingstone. 1950.

Emergencies in Medical Practice. Edited by C. A. Birch, M.D., F.R.C.P. 2nd ed. (Pp. 564. 27s 6d.) Edinburgh: Livingstone. 1950.

Irish Medical Directory and Hospital Year Book, 1950. 11th ed. (Pp. 269. 15s. 6d.) Dublin: Parkside Press. 1950.

The Chemistry of Industrial Toxicology. By H. B. Elkins, Ph.D. (Pp. 406. 44s.) New York: John Wiley. London: Chapman and Hall. 1950.

Lipidoses: Diseases of the Cellular Lipid Metabolism. By S. J. Thannhauser, M.D., Ph.D. Edited by H. A. Christian, A.M., M.D., LL.D., Sc.D.Hon., M.A.C.P., Hon.F.R.C.P.Can., D.S.M.(A.M.A.), (Pp. 606. 96s.) New York: Oxford University Press. London: Geoffrey Cumberlege. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY AUGUST 12 1950

NON-PULMONARY TUBERCULOSIS

At a time when the incidence of most of the common infectious diseases in Great Britain is declining rapidly, more and more attention is being directed to the continued high mortality from tuberculosis. Unfortunately our knowledge of several factors in the aetiology of this disease is still deficient, and no reliable records are available even for the morbidity rate. Public health interest is centred mainly in pulmonary tuberculosis, and the importance of the non-pulmonary form in causing sickness, deformity, and prolonged invalidity in those who escape death tends to be overlooked. The publication, therefore, of a report[1] to the Medical Research Council on non-pulmonary tuberculosis is to be welcomed, for the committee of experts responsible for planning the investigation, under the chairmanship of Dr. G. S. Wilson, have produced a very informative document. Apart from the intrinsic value of its contents, the report affords an admirable example of what can be achieved by group research. All the investigations were carried out on material obtained in their day-to-day work by hospital pathologists, public health bacteriologists, and tuberculosis officers working according to an agreed plan. The inquiry took its origin at a conference that was called by the Medical Research Council to discuss whether any light could be thrown on the reasons for the increased mortality from tuberculosis during the first two years of the war.[2] The delegates from England, Wales, and Scotland who attended decided to restrict their investigations to non-pulmonary tuberculosis and to organize their work for each country separately. The general plan was for pathologists in hospitals to collect suitable material taken during life or after death and to send it to bacteriologists, working usually in public health laboratories, for determination of the type—human or bovine—of the infecting organism. As soon as this had been done, the tuberculosis officer or medical superintendent was asked to provide information on the patient's occupation, change of address within the preceding five years, number of persons in the home, exposure to contact with tuberculous patients, and the milk supply before and during the war. The report is in two sections, the first concerns England, the second Wales. The inquiries in these two countries were carried out in 1943, 1944, and the first nine months of 1945. It is presumed that the Scottish report will be published later.

In England tubercle bacilli were cultivated from a total of 994 patients; of these, 733 (73.7%) were shown to be infected with the human and 261 (26.3%) with the bovine type. An attempt made to compare the distribution of the human and bovine types according to the age, sex, occupation, address of the patient, and other factors proved difficult for two reasons. First, no figures were available for the true morbidity of non-pulmonary tuberculosis in different parts of the country, so that all conclusions had to be based on the proportions of the two types in different regions; and, since a high bovine–human ratio in one region compared with a low ratio in another might mean either that there was a greater risk of infection with the bovine or a smaller risk of infection with the human type, it was impossible to estimate the real risk of infection with the bovine type in the two regions. Secondly, though the information obtained by the collecting pathologists on the age and sex of the patients and the site of the disease was practically complete, details provided by the tuberculosis officer or medical superintendent about the patients' environment were less satisfactory. Much of the information asked for could not be obtained, partly for reasons connected with the war; and some of it, derived by postal or delegated questionaries, was manifestly so unreliable that it had to be discarded.

Analysis of the figures according to the site of disease showed that the bovine type of bacillus was responsible for approximately 28% of all cases of meningitis, 57% of cases of cervical glandular tuberculosis, 10% of cases of bone and joint disease, and 22% of cases of genito-urinary disease. In all these groups the proportion of bovine-type infections was higher in children than in adults. This was in accord with previous experience: but in contrast with previous experience it was found that the highest proportion of infections with the bovine type was no longer in the 0–4 age group, but in the 5–9 age group. The reason for this change is supposed to be twofold. Owing to the gradual replacement of raw by heat-treated milk for infant feeding during the past 25 years or so the relative risk of infection with the bovine type in the first year or two of life is less than it used to be. On the other hand, the introduction of the milk-in-schools scheme has resulted in a greater relative risk of infection with the bovine type among school-children, many of whom receive milk now who before would have had none at all. Though it is true that most school milk is either heat-treated or comes from T.T. or attested herds, in the early days of the scheme much ordinary raw milk was supplied, and even

[1] *J. Hyg., Camb.*, 1949, **47**, 337.
[2] *Report of the Committee on Tuberculosis in War-time*, Spec. Rep. Ser. med. Res. Coun., Lond., 1942, No. 246. H.M.S.O., London.

at the present time probably about 10% of schools—though a lower percentage of school-children—are still provided with potentially dangerous milk. Further analyses revealed that adult females who developed non-pulmonary tuberculosis were almost twice as liable as adult males to be infected with the bovine type; that 30% of all cases of infection with the bovine type were in persons over 15 years of age; that 87% of patients infected with the bovine type gave a history of drinking raw milk as against 53% of those infected with the human type; and that the lowest proportions of bovine-type infections occurred in the London, North-East, and South-East regions, and the highest in the North-Midland and North-West regions, where tuberculosis in cattle is known to be particularly prevalent. By applying the proportions for the different ages and the two sexes to the recorded deaths from the different forms of non-pulmonary tuberculosis it is calculated that 1,300 persons died in England during the year 1944 from infection of bovine origin.

The investigation in Wales was carried out on a smaller scale. The proportion of infections with the bovine type was found to be lower than in England. Strains of tubercle bacilli were cultured from 112 patients, of which 17%, as compared with the English figure of 26%, proved to belong to the bovine type. How much of this difference is to be attributed to the higher proportion of attested herds in Wales, to the relatively large number of cases of meningitis examined, and to the possibly greater risk of infection with the human type, it is impossible to say. If the figures for England and Wales are combined it may be said that about 24% of all cases of non-pulmonary tuberculosis were due to infection with the bovine type of tubercle bacillus, and that in 1944 approximately 1,350 persons died from non-pulmonary tuberculosis of bovine origin. Previous estimates of this nature have been criticized because they were based on material drawn from selected areas which were not necessarily representative of the country as a whole. No such criticism can be made of the present report. Material was drawn from all parts of the country, and, though not exactly the same proportion of samples from each form of the disease was examined in each region, the authors have, by standardizing the age and sex distribution and by working out alternative arithmetic means, provided figures more reliable than any previously collected. There can be no doubt from their analysis that a large number of deaths, and presumably a still larger number of cases of non-pulmonary tuberculosis, are occurring each year which might be prevented by adequate heat treatment of the milk supply. The Government now have the power of compulsory pasteurization; it is to be hoped that they will soon use it.

FOETAL PATHOLOGY

The pathology of the foetus is a relatively unexplored subject, though as long ago as 1892 Ballantyne, of Edinburgh,[1] made what now appears a notable beginning to the solution of some of its problems with his book *The Diseases and Deformities of the Foetus*, which he styled "an attempt towards a system of antenatal pathology." The foetus, Ballantyne showed, is by no means exempt from the ordinary diseases of adult life, though its response to any particular stimulus may be very different from the more familiar happenings in the adult. But, in addition, the foetus has its own diseases, though for obvious reasons the pathologist has little opportunity to study these in the post-mortem room. Outstanding among these specifically foetal conditions are the "malformations"—the end-results of abnormal developmental processes. In recent years advances in embryology have greatly aided the study of these conditions. Descriptive embryology has provided the "time-table" of normal embryonic development, thus helping to define the period during which the disturbance responsible for a particular malformation must have occurred. At the same time those working in the field of experimental embryology, using the easily manipulable embryos of amphibia, have demonstrated that many of the spontaneously occurring foetal abnormalities can be caused by simple mechanical interference with the developing embryo. Huxley and de Beer[2] have given an account of experiments of this nature, which of course have not provided evidence about the aetiology of spontaneously occurring developmental abnormalities in the human but have merely illustrated the mechanism which has brought about the final results. Indeed, the importance of environmental causes of human malformations has received little emphasis, and from published surveys[3 4] of the work on this subject it might be concluded that inherent defects—that is, genetic abnormalities—are the cause of nearly all congenital malformations. It is of interest that a minor developmental abnormality—brachydactyly—was the first example of Mendelian inheritance demonstrated to occur in man.

This emphasis on the importance of genetic factors in the causation of developmental abnormalities does not come solely from clinical studies. In 1929 Bagg[5] was able to produce, by subjecting parent mice to *x* rays, a strain of animals with familial malformations, including clubfoot, syndactylism, hypodactylism, and congenital "amputation," all presumably due to induced genetic mutations. However, the association of developmental abnormalities—such as cataract, cardiac septal defects, patent ductus arteriosus, deaf mutism, and microcephaly—with epidemics of German measles, noted in Australia by Gregg[6] in 1941 and later clearly attributed to maternal infection in the early months of pregnancy,[7] demonstrates clearly enough that genetic factors cannot always be invoked as the cause of such abnormalities. Other environmental factors, too, such as deficient diets, have been found experimentally to cause developmental abnormalities, and the relative aetiological importance of heredity and environment therefore still remains to be determined. Experimental work in this field is full of interest and should be rewarding, for from the study of the factors, inherent or environmental, which cause malformations in the human some information may be obtained about why such factors should affect the particular tissues concerned. Hitherto the difficulty has been to find a precise agent with which to influence the developing embryo. But in the chick embryo at least this difficulty has been overcome, and in an interesting paper appearing elsewhere in this issue Mr. P. K. Duraiswami describes how the injection of insulin into the yolks of developing hens' eggs gives rise to a number of developmental abnormalities, including spina bifida, abnormalities of limbs and beak, eye changes, and certain skeletal defects which can be compared to osteogenesis imperfecta.

Limb changes resembling those noted by Duraiswami have been described in the offspring of rats reared on a diet deficient in riboflavin,[8] and it is interesting that he found the administration of nicotinamide and riboflavin largely prevented the abnormal development. From the clinical standpoint it is clear that a number of bone defects are "developmental." While there is good evidence that genetic factors are concerned in the causation of a few of these—such as osteogenesis imperfecta, osteopetrosis, multiple exostoses, and achondroplasia—there are many others whose aetiology is unknown. It is significant, therefore, that bone appears as the outstandingly susceptible tissue in these examples of experimentally induced abnormalities, and that such "physiological" factors as blood sugar, hormones, and vitamins appear to control the normal development of this tissue. Without fuller information it is not possible to judge how closely the condition of the bones in Mr. Duraiswami's experimental animals resembles human oesteogenesis imperfecta, or to suggest how the mechanism of calcification is so grossly disturbed, but it is quite certain that the study of these and other experimentally induced developmental abnormalities of the skeleton is important.

1 *The Diseases and Deformities of the Foetus*. 1892, Edinburgh.
2 *Elements of Experimental Embryology*, 1934, London.
3 Macklin, M., *Amer. J. Obstet. Gynec.*, 1936, **32**, 258.
4 Murphy, D. P., *Congenital Malformations: a study of parental characteristics, with special reference to the reproductive process*, 1940, Philadelphia.
5 *Amer. J. Anat.*, 1929, **43**, 167.
6 *Med. J. Aust.*, 1945, **1**, 313.
7 Swan, C., Tostevin, A. L., and Black, G. H. B., ibid., 1946, **2**, 889.
8 Warkany, J., and Nelson, R. C., *Anat. Rec.*, 1941, **79**, 83.

PERNICIOUS ANAEMIA AND GASTRIC CARCINOMA

In the last five years much evidence has been brought forward to suggest that carcinoma of the stomach is a complication of pernicious anaemia. Bourne[1] examined 15 unselected cases and found symptomless carcinoma in three. Wilkinson[2] reported on the causes of death in the 301 patients who died out of the 1,480 patients with pernicious anaemia which he had treated since 1929. He found that 70 died of cancer and that of these the site of the growth was in the stomach in 28. It is impressive that the proportion of cancers which were located in the stomach was twice as high as that which occurs generally, but it is not possible to determine from the evidence whether the unexpectedly large figure was due to an abnormally high incidence of gastric cancer or to a low incidence of other forms. Drs. Johannes Mosbech and Aage Videbaek, in Copenhagen, now demonstrate in a paper published in this issue that carcinoma of the stomach does in fact develop in patients with pernicious anaemia about three times as often as in other subjects. Their series consists of 301 patients. It is not large, but all the patients have been followed up—the longest for 21 years—and 115 deaths have been observed. Results of treatment were so successful that only three deaths could be directly attributed to pernicious anaemia; and the actual number of deaths attributed to other diseases was slightly less than would be expected in the same number of normal inhabitants of Copenhagen (in a group of appropriate age and sex composition) observed for the same number of years. The only exception to this good prognosis was the increased risk of developing carcinoma of the stomach: 15 cases occurred, significantly higher than the expected 5.

Now that the risk is recognized, the important question is how the knowledge can be used to the advantage of patients with pernicious anaemia. Diagnosis must be early if there is to be any chance of treating gastric cancer successfully, and the advisability of regular and frequent barium-meal examinations must be considered. It is, however, doubtful whether many investigations are justified. Jennings[3] has pointed out that the annual risk of a man in his fifties developing gastric cancer is 1 in 1,000, and, even if the risk in a selected group were twice or three times that figure, routine barium-meal examinations would bring few cases to light. It would, of course, be a different matter if a group could be defined in which the annual risk was as high as 1 or 2%: Jennings has suggested that patients with pernicious anaemia might constitute such a group in the first few years following diagnosis, but Mosbech and Videbaek's data do not support his hypothesis. On the contrary, in their series the risk was practically constant at all stages after diagnosis. Why the two diseases are associated is not known. Pernicious anaemia is constantly, and gastric carcinoma is frequently, associated with atrophy of the gastric mucosa, and it is tempting to ascribe the carcinoma to the atrophy. Torgersen[4] has claimed to find evidence for this, in that the growths associated with pernicious anaemia have mostly been

1 *British Medical Journal*, 1948, **1**, 92.
2 *Lancet*, 1949, **1**, 249, 291, and 336.
3 Ibid., 1949, **1**, 457.
4 *Acta radiol., Stockh.*, 1944, **25**, 845.

located near the fundus of the stomach, in the area mainly affected by the mucosal atrophy of pernicious anaemia. Mosbech and Videbaek found the contrary, and they also reached a different conclusion from a review of the literature. In their experience the commonest site for gastric carcinoma was the pyloric antrum, both in patients with pernicious anaemia and in all others. It would therefore seem that mucosal atrophy is not in itself a sufficient explanation, and that the reason for the association must be sought in the disturbed physiology which underlies the development of pernicious anaemia.

THE PRE-THROMBOTIC STATE

Although thrombosis and embolism occur in relatively few patients after operations these complications may be crippling or fatal, and methods for the prevention and treatment of thrombo-embolic disease have been extensively studied. Many of the treatments suggested, such as the use of anticoagulant drugs and ligation of the femoral veins or inferior vena cava, are potentially dangerous and cannot be applied indiscriminately. The selection of patients for treatment is therefore important, and many workers have attempted to find tests to diagnose a "pre-thrombotic state" and to distinguish those patients in whom intravascular thrombosis may occur. All of these tests presuppose that some alteration in the coagulability of the blood is an important factor in thrombosis. This assumption is reasonable, because changes in the blood which might facilitate coagulation are commonly found in patients after operation.[1-4] In 1940 Bergquist[5] suggested that the whole-blood clotting time was shorter than normal in some cases of thrombosis, but in 1945 he reported that the shortening was not constant and the test was, in his view, of no value.[6] Cummine and Lyons[7] reinvestigated the test in 1948, using the capillary tubing method with capillary blood at room temperature. They found that in patients who developed thrombosis the clotting time fell below a critical level of 4–5 minutes just before the onset of thrombosis. In addition they suggested that the fibrinogen in these patients was altered to a form, "fibrinogen B," which was clotted non-specifically by substances other than thrombin, of which naphthoquinone is one. In a series of 550 surgical patients there were 20 in whom the whole-blood clotting time was shortened and the fibrinogen-B test positive. Of these patients, twelve who received no anticoagulant therapy developed thrombosis and eight who had anticoagulant therapy did not develop thrombosis. These findings are clear cut and convincing, but they have not been supported by subsequent work. In 1949 Dunn, Jackson, and Lyons[8] showed that the fibrinogen-B test was positive in many patients who never developed thrombosis, and other workers have found that the capillary clotting time as used by Cummine and Lyons gives variable and unreliable results.[9 10]

A different approach to the problem was followed by Ochsner and his colleagues,[11] who suggest that a decrease in antithrombin combined with an increase in prothrombin may predispose to thrombosis. This combination of pathological findings was found in 30 out of 200 surgical patients. Of these 30 patients 16 developed thrombosis, whereas only one out of the remaining 170 patients showed any evidence of thrombosis. The authors suggest the use of α-tocopherol in the treatment of incipient thrombosis because this substance causes a rise in blood antithrombin. These results are promising, but it will be necessary to await their confirmation before applying them in practice.

1 Wright, H. P., *J. Path. Bact.*, 1942, **54**, 461.
2 de Takáts, G., *Arch. Surg., Chicago*, 1944, **48**, 105.
3 Waugh, T. R., and Ruddick, D. W., *Canad. med. Ass. J.*, 1944, **50**, 547.
4 Brambel, C. E., *Arch. Surg., Chicago*, 1945, **50**, 137.
5 *Acta chir. scand.*, 1940, **83**, 415.
6 Ibid., *Suppl.*, 1945, **92**, 101.
7 *Brit. J. Surg.*, 1948, **35**, 337.
8 *Med. J. Aust.*, 1949, **2**, 266.
9 Greig, G. W. V., *British Medical Journal*, 1949, **2**, 845.
10 Vorhees, A. B., and Pulaski, E. J., *J. Lab. clin. Med.*, 1949, **34**, 1352.
11 Proceedings of the Thirteenth Congress of the International Society of Surgery, 1949, in the press.

EXPROPRIATION OF PRIZE FUND

The National Health Service Act of 1946 gave the Minister of Health power to take over certain hospital endowment funds, and under these provisions he has appropriated the Sanderson-Wells Nurses Prize fund, which was founded by Mr. T. H. Sanderson-Wells, who was for many years honorary surgeon to the Weymouth and District Hospital and is now living in retirement. The securities which formed the endowment were vested in trustees through a trust deed. The annual value of the prize is said to have been about £30. On July 5, 1948, the Minister of Health appropriated the securities at a capital value of about £714. The trustees were not consulted and did not give their consent. The income balance of about £50 standing in the current account was transferred to the Minister through the Bank of England on January 1, 1949. In reply to a Parliamentary question by Sir Ernest Graham-Little, Mr. Bevan stated[1] in October last year that the Sanderson-Wells Nurses Prize fund did not still exist as a separate unit. Mr. Bevan added that he had asked the West Dorset Management Committee to have regard to the objects of the fund in administering the sums received from time to time from the Central Hospital Endowments Fund. Later asked[2] what sum had been allocated from the Central Fund to this prize fund, Mr. Bevan pointed out that the prize fund no longer existed, "and there can therefore be no question of allocation of funds to it." He repeated that the management committee had been asked to bear in mind the objects of the old prize fund, and for the time being they were awarding an annual prize of £5. He had asked them to review the matter in the light of the considerable sums they had received from the Central Fund. As a result of the exertions of Mr. Sanderson-Wells and others an allotment of £19 was subsequently made by the West Dorset Hospital Endowment Committee.

Apart from the fact that the nurses are considerably worse off financially since the Minister appropriated the fund, it is questionable whether he had the right to take it over at all. In Section 7 (10) of the Act the expression "endowment" is defined as "property held by the governing body of the hospital or by trustees solely for the purposes of that hospital." It seems hardly possible that those who framed the Act intended the words "solely for the purposes of that hospital" to cover an endowment made solely for the purpose of a nurses' prize fund. Again, the annual income of the fund is said to be slightly over £25, yet this sum is apparently not being awarded as a prize. Under Section 7 (7) of the Act an obligation is put on the Minister to secure, "so far as is reasonably practicable, that the objects of the endowment and the observance of any conditions attaching thereto . . . are not prejudiced by the provision of this section." The object of this endowment was to provide an annual prize worth about £25–£30, and it would appear to have been prejudiced by the Minister's action, for the sums paid out have been very much smaller, while the value of the securities has probably not depreciated much, if at all.

The Minister is in a very strong position, for in order to challenge Mr. Bevan's actions Mr. Sanderson-Wells or someone else would need to undertake long and expensive litigation in the courts. The Government puts an intolerable burden on private citizens when it passes Acts which are so loosely worded that their provisions appear to be in contradiction to the actions taken under them by a Minister. It would seem to be desirable that cases such as this should be taken to the courts, as the *Law Journal* has suggested,[3] at the expense of the State.

1 *Hansard*, October 21, 1949.
2 Ibid., November 3, 1949.
3 *Law Journal*, 1949, **99**, 701.

POST-TUBERCULOUS MIDDLE LOBE SYNDROME

An important consequence of tuberculous adenitis may be stenosis of the bronchus of the middle lobe of the right lung. In a review of this relatively common condition Brock[1] has described the occurrence and behaviour of tuberculous lymphadenitis within the lungs and mediastinum. A primary tuberculous focus in the lung is accompanied by enlarged glands at the hilum, which are closely related to the bronchi and may obstruct them or cause ulceration. The middle-lobe bronchus is especially vulnerable, since it and its two branches are long and narrow and are surrounded by glands which drain the middle and the lower lobes. A mass of glands may cause complete bronchial obstruction if it is large or if it occurs in childhood when the bronchi are soft. Such an adenitis may resolve completely, and the effects be only temporary, even if the primary infection occurs in adult life. On the other hand, in the presence of secondary infection bronchiectatic changes will occur and be permanent even when the obstruction subsides. Alternatively, a caseous gland may ulcerate into the bronchus. Its contents, or granulation tissue, may again cause obstruction, or even be coughed up. Caseous tissue often calcifies, and if this happens at a later stage a broncholith or pneumolith will be formed. The contracture caused through healing of the ulcerated bronchus leads to a partial or complete fibrous stricture. Such pathological processes may involve the middle lobe bronchus before it branches or its lateral segment only, and the same changes may take place coincidentally in the cardiac segment of the right lower lobe or the anterior segment of the upper lobe. It is important to recognize these late secondary manifestations as sequelae of tuberculous disease. Each may eventually be complicated by a more or less severe degree of pyogenic infection, and it is usually only when this occurs, which may not be for many years, that the lesion becomes clinically evident. Bronchiectasis is accompanied by pulmonary fibrosis. Fibrosis may also occur beyond a stricture, but distension with mucus or pus is more common, resulting in an abscess or a pyocele. A very severe infection may be associated with the presence of a broncholith. Suppuration may spread to the pleura, other pulmonary lobes, or even more distantly.

This syndrome usually appears in late middle life, the "cancer age," even though the primary lesion occurred in childhood. The sexes are equally susceptible. The symptoms are the result of infection. A pneumonitis may resolve or be followed by an empyema, lung abscess, or by recurrent attacks at the same site. General malaise or unexplained pyrexia may be due to the chronic infection. Cough and sputum suggest bronchiectasis. Haemoptysis is common, and may be repeated and copious, but it is seldom the only symptom. The signs may be very suggestive of bronchial carcinoma. Although a lower-lobe carcinoma may spread to involve the middle-lobe bronchus, and although this bronchus may be compressed by a mediastinal mass of glands, carcinoma of the middle-lobe bronchus itself is very rare. When it does occur it lies peripherally, whereas a post-tuberculous stenosis affects the proximal part of the bronchus: if the exact anatomical location of the lesion is investigated—a lateral radiograph is essential—this diagnostic pitfall will be avoided. Further valuable confirmation of the originally tuberculous cause is afforded by radiological evidence of calcification, either of the primary focus or especially of the gland at the site of the stenosis. Calcification which changes position in successive films indicates a broncholith.

Accurate diagnosis is the first step to treatment. It is clear that radical treatment is often unnecessary, since the disease may remain latent for many years and attacks of inflammation usually subside. In young persons especially surgery is to be avoided, for the tuberculous process may still be active. Operation is necessary if broncholiths or pneumoliths are present, and is indicated if there is a total or subtotal bronchial obstruction; this can best be demonstrated by bronchography. Excision is the treatment for chronic abscess, but not for bronchiectasis unless there is much purulent sputum. During the operation bronchial occlusion is essential. A middle lobectomy is the manœuvre of choice, but technical difficulties sometimes necessitate removal of the lower lobe as well. Brock operated on 18 of the 60 patients in his series.

1 *Thorax*, 1950, **5**, 5.

The half-yearly indexes to Vol. 1 of the *Journal* and the *Supplement* for 1950 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes to be sent regularly to them can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

SULPHONAMIDE THERAPY

BY

D. M. DUNLOP, B.A., M.D., F.R.C.P. F.R.C.P.Ed.

Professor of Therapeutics and Clinical Medicine, Edinburgh University

Indications for Use

The pre-eminent place of sulphonamides in the treatment of many infections has been usurped by penicillin. Their prerogatives indeed are likely to be curtailed still further when the newer antibiotics come into more general use. Nevertheless, they still have a wide application in therapeutics: they are the drugs of choice in meningococcal meningitis, since penicillin passes the blood-brain barrier uncertainly and with difficulty, and in dysenteric and coliform infections, which are unaffected by penicillin; they are almost as effective as penicillin in pneumococcal pneumonia and erysipelas, in which their use is preferable because of their relative cheapness and the convenience of their oral administration; they have been superseded by penicillin in gonococcal and staphylococcal infections and to some extent in streptococcal infections, particularly in septicaemias, except in those cases in which the organism has proved to be penicillin-resistant. When a purulent complication has occurred sulphonamides are ineffective.

The evidence favouring the employment of sulphonamides to prevent the respiratory complications of measles, common colds, and influenza, and for the prophylaxis of the complications of scarlet fever, is in my opinion insufficient to justify their routine use for such purposes. There is considerable statistical evidence that their prophylactic use in daily doses of 0.5 g. for long periods is of value in preventing the recurrences of acute rheumatism, even though sulphonamides are useless in the treatment of the established condition. There seems to be little danger in giving such small doses even for years; nevertheless, further controlled studies must be undertaken before this form of treatment can be recommended in general practice.

Experience gained in the recent war seems to indicate that the use of crystalline sulphonamides and of sulphonamide ointments as topical agents is not very successful in the treatment of infected wounds or in infections of the skin and mucous membranes. Moreover, the prolonged use of sulphonamide creams and ointments often results in severe and intractable forms of sensitization dermatitis. The routine use of sulphonamides as topical agents is therefore to be discouraged, except in the form of eye-drops for the treatment of conjunctivitis, corneal ulcers, and blepharitis, and to prevent infection after injuries to the eye. Even here a mild chronic blepharitis may result from the use of sulphacetamide.

In summary, then, the main indications for sulphonamide therapy to-day are in the treatment of meningococcal, coliform, and dysenteric infections; lobar pneumonia; erysipelas; certain infections of the eye; and in infections due to haemolytic streptococci, gonococci, and staphylococci when these have proved resistant to penicillin.

Absorption, Fate, and Action

When sulphonamides are swallowed they are absorbed to a greater or less extent from the small intestine. Some preparations are completely absorbed, others are hardly absorbed at all. When they are absorbed they become rapidly distributed among all the body fluids, though their concentration in milk is too low to affect a suckling baby. The amino-nitrogen in these compounds is partly acetylated in the body—the degree of acetylation varying according to the preparation used. The acetylated form has no therapeutic effect. A mixture of the free drug and acetyl compound is excreted in high concentration in the urine, but about 30% of the sulphonamide is destroyed in the body.

The concentrations of sulphonamides in the blood (5 to 15 mg. per 100 ml.) which are obtained by therapeutic doses do not kill organisms but inhibit their growth so that they are dealt with by the ordinary defence mechanisms. Their action is due to their inhibiting effect on the metabolism of *p*-aminobenzoic acid, which is required by many species of organism as a growth factor.

Preparations and Choice of Drug

There are numerous official preparations of sulphonamides, many of which are marketed by manufacturers under an astounding variety of names, one of the few undesirable expressions of the inventive genius of the great pharmaceutical firms. The practitioner may well be bewildered by the number of preparations at his disposal and doubtful about which drug to use in any given circumstance and how to use it to the best advantage. Many of the sulphonamides differ only very slightly from one another, and it is more important to know how to use a few properly than to be continually changing to an unfamiliar preparation because of some slight advantage it may be reputed to possess. Actually only three or at most four preparations need be employed; one or possibly two for general infections; one for intestinal infections; and one for application to the eye.

The following are brief notes on the main attributes of the more important sulphonamides.

Sulphanilamide (*B.P.*) is the active principle of the original sulphamidochrysoidin ("prontosil red") introduced by Domagk in 1935. It is rapidly and completely absorbed and quickly excreted. It is relatively soluble so that it does not produce renal complications, though in other respects it is more toxic than the newer sulphonamides and less therapeutically active, having no effect on pneumococcal infections. Its prescription is now seldom indicated.

Sulphapyridine—the famous "M. and B. 693"—has been omitted from the 1948 *British Pharmacopoeia* because of the severe toxic effects it produces, particularly nausea and vomiting. There is nothing it can do that modern sulphonamides cannot do better, and it should never be prescribed nowadays.

Sulphathiazole (*B.P.*) and *Sulphadiazine* (*B.P.*) closely resemble each other. They are both highly active and are rapidly absorbed and excreted, so that they have to be given at short intervals in high dosage to maintain adequate blood concentrations. Both drugs and their acetyl derivatives are relatively insoluble in acid urine. Sulphadiazine is rather less toxic than sulphathiazole, and of the two is probably the preferable drug.

Sulphadimidine ("sulphamezathine") and *Sulphamerazine* (*U.S.P.*) have almost identical qualities. I am prejudiced in favour of the former—possibly on account of its British origins.

Sulphadimidine is more rapidly and completely absorbed than sulphadiazine, so that with equal oral doses sulphadimidine attains a blood concentration approximately twice that of sulphadiazine. It is also more slowly excreted, so that it may be given in smaller amounts and less frequently. The acetylated and free forms of sulphadimidine are more soluble than sulphadiazine in neutral and acid urine, and are thus much less apt to give rise to renal complications, though in other respects the two drugs have approximately the same degree of toxicity. Thus, sulphadimidine is probably the best sulphonamide for routine use, though, as it is possibly a little less active than sulphadiazine, the latter may remain the preferable drug in severe meningococcal meningitis.

Sulphadiazine and sulphadimidine are insufficiently soluble for parenteral administration except in the form of their *sodium salts*. Such solutions are strongly alkaline and should be administered only intravenously. Ampoules containing 1 g. of dry powder are available, and the contents should be dissolved in 10 ml. of normal saline. An excellent alternative is "soluthiazole," which is supplied in rubber-capped bottles ready for use; 5 ml. are equivalent to 1 g. of sulphathiazole. It is a neutral solution and so can be given intramuscularly as well as intravenously—a considerable advantage where babies are concerned. It is seldom necessary to give the drugs parenterally except in very severe infections when it is desirable to obtain rapidly a high concentration of sulphonamide in the blood, or when the patient is comatose and unable to swallow, or when intense vomiting prevents absorption.

Sulphatriad, a combination of sulphathiazole, sulphadiazine, and sulphamerazine, is recommended on the principle that if two or more sulphonamides are administered in combination the therapeutic actions of the different compounds are additive but their solubilities remain independent of each other. Accordingly, it is possible to obtain a high blood concentration without the risk of renal complications. Since we have in sulphadimidine a powerful and relatively soluble sulphonamide it seems superfluous to use sulphatriad, which is also more costly.

Sulphacetamide (*B.P.*) yields a very soluble and almost neutral sodium salt (sulphacetamide sodium *B.P.*) which can be used as eye-drops in concentrations up to 30%.

Sulphaguanidine (*B.P.*), *Succinylsulphathiazole* (*B.P.*), and *Phthalylsulphathiazole*, though soluble in the intestinal contents, are all relatively poorly absorbed, thus permitting them to exert their bacteriostatic action in the intestinal tract. Hence their only use is for intestinal infections, particularly dysenteric infections, and for treatment before and after operations on the colon. All three are non-toxic, but succinylsulphathiazole and phthalylsulphathiazole are absorbed even less than sulphaguanidine and are therefore preferable to it. There is some slight evidence that succinylsulphathiazole is superior to phthalylsulphathiazole in acute dysentery and for the elimination of the carrier state.

From what has been said it would seem that the following four sulphonamides are probably the drugs of choice: sulphadimidine for lobar pneumonia, erysipelas, and coliform infections; sulphadiazine and its sodium salt for meningococcal meningitis; succinylsulphathiazole for intestinal infections; and sodium sulphacetamide for infections of the eye.

Administration and Dosage

Sulphonamides are marketed in tablet form, each of which contains 0.5 g. (7½ gr.). The tablets should be broken into small fragments and swallowed with 2–3 oz. (57–85 ml.) of milk or water. The drugs should be given in full dosage or not at all. The only exception to this rule is in infections of the urinary tract (see below). Full dosage should be maintained till the treatment is stopped. The administration of sulphonamides should seldom be continued for longer than seven days and never for more than ten days. It is always advisable to give an initial "loading dose." Children tolerate the drugs well and require a larger dose than might be expected on a purely weight basis. Over the age of 12 they can be given the full adult dose; between 3 and 12, two-thirds of it; between 1 and 3, one-third; and under 1, one-sixth.

In *lobar pneumonia* and *erysipelas* a "loading dose" of 3 g. of sulphadimidine should be given, followed by 1 g. six-hourly till the temperature has been normal for two or three days.

In *coliform urinary infections*, owing to the fact that sulphonamides are concentrated by the kidneys in their passage from the blood into the urine, it is unnecessary to give the large doses required in other diseases. A "loading dose" of 2 g. of sulphadimidine should be given, followed by 0.5 g. six-hourly.

In *meningococcal infections*, in view of their serious nature, the "loading dose" of sulphonamide should be given intravenously in the form of at least 1 g. of sodium sulphadiazine. The injection should be made slowly. Thereafter 2 g. of sulphadiazine should be given orally followed by 1.5 g. every four hours. Treatment should be terminated only when the cerebrospinal fluid has been sterile for some days and all physical signs are in abeyance. This usually involves the administration of sulphadiazine for seven or eight days. As dehydration is common in cerebrospinal fever, and as there is a real danger of renal complications when sulphadiazine is used under such circumstances, every effort must be made to maintain an adequate fluid intake, if necessary by the use of parenteral fluids. As sulphadiazine is much more soluble in an alkaline medium an attempt must be made to render the urine alkaline by the administration of a mixture containing 20 gr. (1.3 g.) each of potassium citrate and sodium bicarbonate—the frequency of dosage being determined by the reaction of the urine to litmus.

In *acute bacillary dysentery* succinylsulphathiazole can be given in massive doses with complete safety, since little is absorbed into the blood. At least 3 g. should be given four times a day and continued for some days after the stools have become normal. Prolonged treatment, which is perfectly safe with this drug, may be necessary in the eradication of the convalescent and chronic carrier state. The drug has been recommended in idiopathic ulcerative colitis, but in my experience is of little or no value.

In *infections and injuries of the eyes* sulphacetamide sodium is used as eye-drops, though penicillin is more effective in severe infections such as ophthalmia neonatorum. In the treatment of acute conjunctivitis and in the prophylaxis of ocular infections after injuries a few drops of a 10% solution are instilled every two hours. An ointment containing 5% of the drug may be smeared along the roots of the lashes three times a day in the treatment of blepharitis.

Toxic Effects

When modern sulphonamides are properly used toxic effects should be rare, and virtually confined to those few

patients who have become sensitized to the drugs or who have an idiosyncrasy to them.

Some malaise and loss of appetite are not uncommon as the result of sulphonamide therapy, but the distressing vomiting so common after the use of sulphapyridine is seldom produced by the more modern drugs.

A harmless cyanosis due to methaemoglobin was often encountered during treatment with sulphanilamide but is rarely occasioned by the drugs which have been recommended. Very exceptionally, sulphaemoglobinaemia develops, accompanied by cyanosis, shallow respirations, and a rapid pulse of poor quality. I have seen this complication on only one occasion. A slow recovery usually occurs when the drug is withdrawn. Sulphaemoglobinaemia is probably due to absorption of sulphides from the large bowel, and, as this is facilitated by fluid colonic contents, the use of saline purges is inadvisable in conjunction with sulphonamide therapy.

Sensitization phenomena, taking the form of a drug fever with or without a skin rash—usually a widespread rose-red maculo-papular rash which fades on pressure—may occur in a previously sensitized individual after a single dose of sulphonamide or may appear from the fifth day of treatment onwards. In the latter case, when there is only a fever and no rash, it may be difficult to distinguish this toxic manifestation from a recrudescence of the disease. When these sensitization phenomena occur or are suspected it is wise to stop sulphonamide therapy and to change to penicillin or one of the other antibiotics if further treatment is indicated. Sensitization to sulphonamides is common and serious enough to render it highly undesirable to resort to sulphonamide treatment for every minor infection which may occur in practice.

Owing to the low solubility of sulphadiazine and especially of its acetyl derivative the risk of microscopic or gross haematuria and ultimately anuria may be considerable following its use under conditions which reduce the output of urine, such as an inadequate fluid intake, vomiting, diarrhoea, or excessive sweating. These renal complications may be prevented by ensuring a fluid intake of at least five pints (2.8 litres) and preferably six pints (3.4 litres) a day, sufficient to maintain a urinary output of not less than 50 oz. (1.4 litres), and by rendering the urine alkaline. The occurrence of a microscopic haematuria is a warning signal to institute prompt preventive measures. Provided the urinary output is normal the discovery of crystals of the drug in urine which has stood for some time is of no significance. The development of anuria calls for immediate cessation of sulphonamide therapy and for forcing oral and parenteral fluids. If this is not rapidly successful specialist aid should be sought and a trial made of ureteric catheterization. Sulphadimidine practically never gives rise to these renal complications.

Blood dyscrasias are rare after sulphonamide treatment unless it is prolonged beyond ten days, or unless previous sensitization phenomena have been disregarded. They include purpura, haemolytic anaemia, aplastic anaemia, and agranulocytosis. The occurrence of these disorders is an absolute indication to stop treatment.

A few cases of peripheral neuritis have been reported following sulphonamide therapy.

The Nursing Appointments Service of the Ministry of Labour and National Service has been reorganized. One result is that there will be 135 offices of the Ministry instead of 33 where nurses and midwives and would-be nurses and midwives can receive advice about these careers and any help they may want in obtaining posts.

INTERNATIONAL CONGRESS OF RADIOLOGY

MEETING IN LONDON

The Sixth International Congress of Radiology, attended by 2,700 members from 54 countries, was opened by the EARL OF ATHLONE, chancellor of the University of London, on July 24 at the Central Hall, Westminster. Dr. RALSTON PATERSON was invested with the insignia of office as president of the Congress, and gave an address in which he pictured the evolution of radiology from its troglodytic days in beetle-infested basements to its modern status as a mature science helping medicine in diagnosis and treatment. On the evening of the same day British Radiology gave a dinner at the Guildhall to over 600 guests from many countries. The Lord Mayor of London and Vice-Admiral Earl Mountbatten of Burma were the guests of honour, and the latter, in proposing the toast of Radiology, referred to the advanced course in radiological defence and atomic medicine given to civilians and members of the Services at the Royal Naval Medical School at Alverstoke.

The scientific meetings took place in three main groups: (1) General Congress Symposia, four in number; (2) a series of symposia in each of the four main subdivisions of radiology—radiodiagnosis, radiotherapy, radiobiology, and radiophysics; (3) meetings of all four sections, with the addition of electrology, at which more than 300 papers were delivered.

General Congress Symposia

A symposium on supervoltage radiotherapy was held on July 25 at which Dr. R. S. STONE (U.S.A.) evaluated the late effects of the use of radiation in excess of 1,000 kV. There were definite advantages, although the relatively high incidence of deep fibrosis of tissues counselled caution. Dr. O. DAHL (Norway) described the 1,500 kV generator at Bergen, and discussed the factors influencing the choice of voltage and the engineering problems involved. Professor B. W. WINDEYER, the chairman, pointed out that, in the range of one to four million volts, therapy has now emerged from the technically experimental stage and is available for clinical evaluation. Advantages to be derived and problems of organization were discussed.

On the following day Sir STANFORD CADE (London) opened a symposium on radiological achievements (1937–50) with a review of the clinical aspects of radiodiagnosis and radiotherapy, and marked the recent milestones of progress. Dr. EDITH QUIMBY (U.S.A.) pointed out the need for a unified and adequate system of dosimetry for high energy radiations now being developed. She described some instruments designed to meet special problems in this field. Dr. A. LACASSAGNE (France) dealt with the advances in the understanding of the actions of radiation on living tissues, in the physio-chemical mechanism of direct and indirect radiation, and with some aspects of cytoplasmic changes in the cell. Dr. ROSS GOLDING (U.S.A.) reviewed advances in gastro-intestinal radiology, with particular emphasis on the radiology of the small intestine and the use of the Miller–Abbott tube. Gall-bladder radiology had been improved by the introduction of a new opaque medium. Dr. P. FARINAS (Cuba) also discussed opaque media, while Dr. K. LINDBLOM (Sweden) considered the use of water-soluble iodine compounds in the study of trauma to joint-cartilages and other structures. Dr. J. LAWRENCE (U.S.A.) outlined the present status of treatment with radioisotopes of iodine and phosphorus. Dr. RALSTON PATERSON (Manchester) dealt with advances in clinical radiotherapy (1937–50).

Mass radiology of the chest was discussed on July 27. Professor M. DE ABREU (Brazil) traced the development of his work from the earliest attempt at fluorography in 1923 to the final methods presented in 1936. Problems relating to the efficient employment of 180 units operating in Brazil were discussed. He gave some details of the chest diagnostic service which works alongside the mass survey for the further assessment of abnormal shadows. He touched upon the social implications of mass radiology. Dr. A. C. CHRISTIE (U.S.A.), who is ill and whose paper was read by Dr. Orndoff, outlined the development of mass radiology in U.S.A.; it was first applied on a large scale to the examination of the U.S. Army and Navy, when 15 million recruits were seen during five years, 1940–5. Dr. A. NELSON (Sweden) surveyed the progress in technical developments of mass radiography, especially improvements in brilliance of screens, the employment of mirrors instead of lenses, and the use of automatic exposure timers to ensure uniformity of image density. Dr. P. KERLEY (London) compared the present position of mass miniature radiography with that of B.C.G. inoculation. There were not yet figures to prove that mass radiography on a national scale was justified, although the statistics for selected groups showed the method to be of value.

On July 28 radiation hazards were discussed. Professor ROBLEY EVANS (U.S.A.) presented the quantitative aspects of chronic radium and mesothorium poisoning in a series of 24 men exposed for many years to luminous paint. New methods of *in vivo* estimation of these elements have been devised. Studies are still proceeding, but it appears that the figure of 0.1 μg. of radium as a maximum permissible dose may have a much larger safety factor than was once supposed. Dr. A. BRUES and Dr. S. WARREN (U.S.A.) considered various types of radiation hazards and their control. Professor W. V. MAYNEORD (London) described some of the hazards associated with the use of radioactive isotopes and high energy sources of radiation, such as the 30 meV synchrotron in clinical practice, with methods of controlling them.

Radiodiagnosis

At a symposium on angiocardiography papers ranged over technique and clinical applications, a notable contribution being by Dr. C. WEGELIUS and Dr. J. LYND (Finland) describing apparatus for taking serial radiographs at speeds of up to 12 per second synchronously in two planes, with concurrent electrocardiograms. The films illustrated were impressive for their clarity and degree of contrast. Dr. G. JONSSON (Sweden) stressed the value of selective visualization of the abnormal area and described his method of passing a catheter directly into the aorta. Dr. R. N. COOLEY (U.S.A.) and Dr. T. HILLS discussed the technical requirements in the visualization of congenital defects causing cyanosis, and features of practical importance in the selection of patients for surgical treatment were emphasized.

In a discussion on the small intestine Dr. E. A. ZIMMER (Switzerland) described a contrast preparation which tended to excite slight motor activity and thus gave a more rapid transit through the small bowel, so that it could be examined in one hour; the illustration showed a very satisfactory delineation of the mucosal folds in all its parts. In discussing the significance of meteorism Dr. K. ANDERSON (Denmark) gave his reasons for regarding the interchange of gases between bowel and blood stream as proceeding by diffusion. Tests showed that in mechanical ileus gas accumulated proximally to the obstruction and was mainly due to swallowed air. In a closed loop gas formation does not occur. Dr. FRIMANN-DAHL (Norway) dealt with the early diagnosis of strangulation. Strangulation often excites little output of fluid, and few levels are visible on the plain film. An important diagnostic feature is the presence of a tumour-like opacity due to the matted and incarcerated coils. Dr. F. R. BERRIDGE described changes in the small bowel in subjects suffering from calorie deficiency. Delay in transit, with widening of intestinal calibre and loss of mucosal pattern, were noted, with segmentation of the barium column as seen in the sprue syndrome. The small intestine enema by direct intubation was described by Dr. A. LURAO (Italy), and Professor R. PREVOT (Germany) dealt with the diagnosis of inflammatory conditions.

Under the heading of arthrography the value of the injection of water-soluble contrast media into the joint was discussed by Dr. K. LINDBLOM (Sweden) with reference to the menisci of the knee-joint, by Dr. C. H. NELSON as applied to the shoulder-joints, and by Dr. F. NORGAARD (Denmark) in the diagnosis of lesions of the temporo-mandibular joints. Dr. P. HAUCH (Canada) compared the value of injected oxygen as against "diodrast" or vacuolization in the diagnosis of knee-joint derangements. Professor A. LEB (Austria) showed angiograms of the vessels around joints in rheumatoid arthritis, and demonstrated narrowing of the small vessels and stasis in the veins.

Bone changes in the leukaemias of children were discussed by Dr. J. A. SOTO (Uruguay). Dr. L. DREY (Israel) presented a case of Cooley's anaemia having widespread skeletal changes. Drs. LEFEBVRE, J. LERIQUE, and P. BERTRAND (France) presented a large number of examples of leukaemic bone changes, and Dr. U. COCCHI (Switzerland) dealt with the osseous lesion of lymphosarcoma, myelomatosis, and osteomyelosclerosis.

Radiotherapy

Contributions to a symposium on the presentation of results in the treatment of cancer came from Professor J. HEYMAN (Sweden), Dr. H. F. DORN (U.S.A.), Mr. J. W. BOAG, Dr. P. F. DENOIX (France), Dr. J. CLEMMESON (Denmark), and Professor R. MACWHIRTER. There was general agreement that the present lack of uniformity in methods of presenting results reduced the value of the contributions made by the various workers in cancer therapy. Suggestions for standard methods were put forward by Boag and Denoix. Heyman outlined the more important criteria of cure upon which agreement should be reached. Clemmeson and MacWhirter drew attention to W.H.O. as an appropriate body with which a liaison might be reached, and it was proposed on behalf of the British delegation that an International Committee for standardization of method be set up.

On July 25 the use of radioactive isotopes in therapy was discussed.

Radioiodine (I^{131}) is now emerging from the experimental stage in the treatment of thyrotoxicosis in selected cases, and has proved of value in both primary and metastatic thyroid carcinoma. Radiophosphorus (P^{32}) has proved beneficial in the treatment of polycythaemia vera and in the chronic leukaemias. These points were made in contributions by Mr. G. W. BLOMFIELD, Dr. J. G. HAMILTON (U.S.A.), and Dr. L. O. JACOBSON (U.S.A.). Dr. S. M. SEIDLIN (U.S.A.) gave his experience of cases of metastatic thyroid carcinoma treated with I^{131}, while Professor D. W. SMITHERS remarked that many applications of artificial isotopes, in both treatment and diagnosis, were being tried, but that experience had been short in this country as compared with the U.S.A. He had obtained interesting results in plotting the spread of breast cancer; and in many other fields, such as the rate of absorption of Na^{24} from the bladder, work was in progress.

On July 27 Professor G. E. BERVEN (Sweden) outlined the method used at the Radiumhemmet for treating breast cancer, and gave reasons for the use of pre-operative as well as post-operative irradiation. His figures gave 81.5% five-year cures when no glands were found, and 48.6% five-year cures when glands were involved. He pressed for a committee to standardize rules for presenting results along the lines suggested by Heyman. Professor J. MAISIN and Dr. E. PLUYGRES (Belgium) treated operable cases by radium implant, employing 125–135 mg. of radium for five days. Ten-year survival rates in Steinthals type I and II were 35.8%. Professor M. PONZIO (Italy) reviewed the present position of treatment of cancer of the breast as presented by the literature, and felt that medium tension *x*-ray therapy was still superior to other methods of irradiation. He did not think that there had been any remarkable progress within recent years. Dr. U. V. PORTMAN (U.S.A.) presented a method of classifying types of breast cancer based on clinical and pathological assessment of their extent. Dr. M. LENZ (U.S.A.) made comparison between cases receiving surgical treatment with pre- or post-operative irradiation, and those receiving irradiation only, in various types of breast cancer seen between 1930 and 1942.

In a symposium on radiotherapy of cancer of the larynx Dr. F. BACLESSE (France) described his results in the treatment of cancer of the vestibule, of the glottis, and of the subglottis. He outlined the treatment employed at the Fondation Curie. Mr. V. E. NEGUS dealt with the criteria upon which the employment of surgery, surgery and irradiation, or irradiation alone should rest. Professor A. ZUPRINGER (Switzerland)

considered that satisfactory cure rates were possible by *x* rays, but that tissue reaction in relation to the distribution of dosage was of major importance and still not adequately worked out. He had had promising results when giving the dose in two parts separated by a space of 30 days. Dr. F. E. LEBORGNE (Uruguay) was convinced that *x* rays were in most cases the best form of treatment but advocated the irradiation of minimal areas, not attempting to include lymphatic channels in one treatment. Dr. J. NIELSEN (Denmark) gave statistics for treatment of 115 cases of intralaryngeal cancer. All cases were subjected to fractionated therapy. In cord cases, functional results were excellent. Overall there had been a 57% five-year cure rate.

Radiobiology

The emphasis in the earlier part of a meeting on histology was upon the cellular reaction to radiation, Dr. S. WARREN (U.S.A.) dealing with the general aspects of biological response, and Dr. G. GRICOUROFF (France) with the problem presented by cells which resist radiation action and retain both their viability and mobility, and consequently their capacity for producing new growth. Dr. GLUCKSMAN described the action of radiation in promoting differentiation and so inducing a process by which some malignant cells can be rendered non-viable, although they are not "immediately" destroyed. This process can be followed by the examination of serial biopsies of tumours under treatment, and has a prognostic value. Dr. PALMIERI (Italy) showed that even after the death of the "organism as a whole" there is a short period during which cells still "react" to radiation. The last paper, by Dr. WEST (U.S.A.), dealt with the systemic enzyme changes induced by radiation therapy of malignant tumours, and this contribution produced a lively discussion.

This subject led on to the following day's symposium on radiation chemistry, which centred chiefly on the problems connected with the formation of active radicals within the substance of, and in the neighbourhood of, living cells. Contributors were Dr. M. BURTON (U.S.A.), Dr. P. BONET-MAURY (France), Dr. F. S. DAINTON, Dr. W. M. DALE, and Dr. W. MINDON (Switzerland).

The effect of irradiation and of chemical agents in the production of chromosome changes and in the induction of mutations was the principal subject of another symposium. Similarities and differences between the chemical and radiological changes were discussed by Dr. C. E. FORD and Dr. C. AUERBACH, while Dr. G. BONNIER (Sweden) attributed to indirect chemical change, caused by irradiation, the discrepancy between calculated values for mutations at zero dose and those found in controls. Work by Dr. T. C. CARTER on whole-body irradiation of mice served mainly to demonstrate that a high spontaneous mutation rate existed. A paper by Dr. A. H. SPARROW and Dr. L. F. NIMS (U.S.A.), which was read by the latter, dealt with the cytochemical approach to the understanding of irradiation effects, and included a discussion of desoxy-pentose nucleic acid concentration and of oxygen tension.

A final discussion reviewed the mode of action of ionizing radiations and the many ways in which biological changes might be induced in living cells, especially with changes in their chemical environment. This was the main theme of the papers of Dr. A. FORSSBERG (Sweden) and of Dr. LATARJET (France), while Dr. L. H. GRAY dealt with the influence of radiation quality on the biological response, both for the single ionization and for the integrated result of many ionizations. Dr. A. HOLLAENDER (U.S.A.) described changes in biological response induced by the association of infra-red (heat), light, and ultrasonics with *x*-ray irradiation. Striking modifications of radiosensitivity were observed, although singly these agents had no effect. Dr. B. RAJEWSKY (Germany) discussed the limitations of the target theory. Dr. J. READ presented results from his work upon the roots of *Vicia faba*, which showed that increase of oxygen tension within the cell markedly increased the biological response to *x*-ray dosage.

Radiophysics

Dr. D. W. FRY described the linear electron accelerator and emphasized its suitability in the production of *x* rays in the 3–20 meV region. Experience gained has been applied to the production of a suitable design of apparatus for therapeutic use. A paper by Dr. C. A. TOBIAS, Dr. H. O. ANGER, and Dr. J. H. LAWRENCE (U.S.A.) described experiments on mice using the 184-in. cyclotron built by E. O. Lawrence and his associates. At 190 meV deuterons had a range of approximately 15 cm. in soft tissues. Their ionization intensity is maximal at about 0.7 cm. before the end of their track, and this is approximately four times that on entry. Heavy dosage is thus possible at depth without skin overdosage. Experiments suggested that a useful therapeutic field existed for these high-speed particles. Dr. J. G. TRUMP (U.S.A.) outlined recent research with electrostatic accelerators in the energy range up to 4 meV.

At a symposium on radiological units the difficulty presented by the inadequacy of the "r" unit when high energy radiations were being used was the theme of most speakers. Professor W. V. MAYNEORD suggested the retention of the "r" unit for energies up to 5 meV, but advocated a unit based upon energy absorbed per unit mass of material for radiations of higher energy. This was in line with the views expressed by Dr. LAURISTON TAYLOR (U.S.A.) and Dr. M. FRILLEY (France). Professor R. SIEVERT (Sweden) was more doubtful of the value of an energy unit, and raised the possibility of utilizing certain phenomena which occurred in a vacuum chamber as a possible starting point in the search for a suitable unit.

Treatment was the subject in this section on July 27, when Dr. S. BRENNER (Sweden) described the activities of the Institute of Radiophysics in Stockholm. Constant check is kept upon the output of tubes in the Radiumhemmet by taking measurements in about 15% of all treatments. Drs. H. E. JOHNS and E. K. DERBY (Canada) described the physical aspects of treatment with *x* rays generated by the 22 meV betatron. Dr. L. F. LAMMERTON pointed out the difficulty of attempts to apply a standard system of dosage measurement to many conditions of treatment. An instrument of recent design was presented which enabled the depth dose within a field of any size or shape to be rapidly estimated. Dr. W. J. MEREDITH discussed problems of dosage estimation when using radium implants, and referred to the value of radiography in this connexion. Dr. F. W. SPIERS dealt with the discontinuities in dosage caused by the presence of bone and air-containing tissues, and described attempts to calculate dosage modifications. Dosage variations within bone were discussed. The effects of heterogeneous tissue were much less in evidence when higher energy ranges were used. Dr. W. C. WILSON gave an account of the development of the physical aspects of teleradium therapy since 1937, and gave some description of apparatus and techniques employed.

A symposium was also held on the production and physical properties of radioisotopes, when the production and distribution of radioisotopes in Oakridge, U.S.A., Chalk River, Canada, and Harwell, Great Britain, were discussed respectively by Dr. P. AEBERSOLD, Dr. A. J. CIPRIANI, and Dr. H. SELIGMAN. Methods of standardization were presented, and the steps taken to safeguard those handling radioactive material were described. Emphasis in the clinical use of isotopes has shifted somewhat from therapeutic to diagnostic applications. Dr. L. D. MARINELLI (U.S.A.) described investigation of the ionization which took place in air around beta-ray emitting sources.

Exhibitions

The largest technical exhibition of *x*-ray plant and equipment ever to be held in Britain filled both of the Royal Horticultural Halls. Manufacturers from many countries were represented. The Science Museum in South Kensington arranged a historical exhibit, including a copy of Roentgen's original description of his discovery in 1895 and a print taken by him of his wife's hand. In the main meeting-place of the Congress at the Central Hall was an impressive display of radiographs and of photographs of machines and apparatus.

Reports on Protection and Radiological Units

During the closing ceremony on July 28, Sir ERNEST ROCK CARLING, chairman of the International Committee on Radiological Protection, read a summary of the committee's report, in which it was recommended that the tolerance dose for workers continuously employed in radiological departments should be reduced to 0.5 r per week. Dr. LAURISTON TAYLOR, secretary of the International Committee on Radiological Units, in summarizing its report, said that for radiations of higher energies than 5 meV the "r" unit should be replaced by one based upon energy absorbed per unit mass of tissue.

The next Congress will be held in Copenhagen in 1953.

STREPTOMYCIN IN THE TREATMENT OF TUBERCULOUS MENINGITIS

Streptomycin trials have been in progress for some time in 25 hospitals, under the guidance of the Medical Research Council, and the Ministry of Health recently held a conference of interested workers to discuss the records of 369 patients with bacteriologically proved meningitis, with or without generalized miliary tuberculosis, who had been under observation for from 10 to 22 months. The Ministry has now issued the following report of their general conclusions.

General Results

There appears to be a belief prevalent amongst medical practitioners that streptomycin treatment does no more than prolong life or produce "recovery" as a physical and mental wreck. This is not true. It seems a better representation of the facts to say that, provided skilful treatment was given *early in the disease*, some 40% of patients made a complete recovery, except in some instances for minor disabilities which at the time of assessment did not interfere with their leading a normal life. Medical practitioners who have doubts about the efficacy of treatment would probably have better impressions if they were to take the opportunity of visiting some of the special units treating these patients and seeing for themselves. They will be welcomed at these units. Before the introduction of streptomycin treatment, proved cases of tuberculous meningitis were inevitably fatal with no indisputable evidence in support of alleged exceptions. In the series under review about 1 patient in 4 survived. More precisely, a mortality of well-nigh 100% was reduced to 71.4%, and to 50.7% for early cases. Of those who survived 31% had normal cerebrospinal fluid and approximately 89% were clinically fit and well. Approximately 40% of the early cases survived and were clinically fit and well. In all, 104 of the 369 patients survived.

The 104 survivors were followed up at the end of a further year, giving observation periods varying from 22 to 33 months. All were still alive. Eighty-eight were clinically fit and well, 59 (57%) had normal C.S.F. Of the 16 not fit and well 6 were under age 4 and described as "mentally retarded"—a condition on which it is perhaps unwise yet to make a definite pronouncement; 2 were suffering from genito-urinary tuberculosis; 8 had been "unfit" at the assessment a year previously and included 3 with bone or joint tuberculosis, 1 with optic atrophy registered as a blind person, 2 paralysed and incontinent, 2 "emotionally unstable," one of them being also deaf.

At the end of 22 months the overall survival percentage was 27 for meningitis alone and 17 for meningitis complicated by generalized miliary tuberculosis. Amongst those patients who were observed for longer periods there was no fall in those percentages. For early cases of meningitis there were 48% of survivors at 16 months and at 2½ years, but for advanced cases only 12% at 13 months and only 10% at 2½ years. This emphasizes the importance of prompt diagnosis and treatment.

Methods of Treatment

Only exceptionally did a patient suffering from meningitis respond satisfactorily to intramuscular treatment alone; that occurrence was even more rare with miliary tuberculosis plus meningitis. Intrathecal treatment accompanying intramuscular treatment gave appreciably poorer results when it was given on 50% or less of the intramuscular treatment days in a given period than it did if given more intensively. The general trend of results within homogeneous clinical groups seems to be towards better chances of survival with more intensive intrathecal courses. This assumes, however, concurrent intramuscular treatment for at least two-thirds of the days in a given period. There is no unequivocal evidence on the optimum level of intensity of intrathecal treatment above 75% of the days in a given period. The best results were obtained in patients with early meningitis. Early diagnosis and prompt treatment are of the first importance.

In patients suffering from miliary tuberculosis without meningitis, examination of the cerebrospinal fluid at the commencement of, and at intervals during, streptomycin treatment is important. One-third of the cases of miliary tuberculosis so treated developed meningitis during treatment, and about one-fifth died following it. Meningitis can develop as late as the seventh month of a course of treatment for miliary tuberculosis, and some workers have reported even later onsets in cases not in the series reviewed. There was no evidence that "prophylactic" intrathecal treatment prevented the occurrence of meningitis in patients during the course of their treatment for miliary tuberculosis, and what little evidence there was seemed to incline in the direction that it did not.

Assessment of Results

There is a good deal of difficulty in comparing the results obtained by different observers owing to differing conceptions of what constitutes a normal cerebrospinal fluid. Accounts given should state clearly what is the definition adopted in terms of cerebrospinal fluid cells, protein, and sugar. In the series under review the reports given by the hospitals were all compared with a severe standard of normality—namely, per ml. of cerebrospinal fluid; cells not more than 4; protein not more than 40 mg.; sugar not less than 45 mg. During the period of observation there was no instance of relapse in a patient whose cerebrospinal fluid had attained to that standard and who was at the same time clinically fit and well. Further investigation is, however, needed into the possibility of relapse after longer periods, to distinguish relapse from reinfection, and the possibility of tuberculous lesions arising later elsewhere in the body.

Although it was stated in general terms that recovered patients were mentally normal, rather backward, etc., there would be great advantage in recording detailed psychometric assessments, and their value would be enhanced if there were appended any information derived from school medical records or other sources about the mental condition prior to the onset of illness. Vestibular function and deafness should also be investigated and recorded in relation to recovered patients.

Laboratory Findings

Bacteriological proof is of the first importance in assessing results. It does not seem to be fully realized that on occasions this may be obtained only after a large series of negatives over a long period before eventually a positive is obtained. The most extreme example in the series was a patient who had 61 negative reports in the course of about 10 months before a positive was obtained in the 62nd. The attempt to obtain bacteriological proof should not be too readily abandoned. The larger the volume of a sample of cerebrospinal fluid it is possible to send to the bacteriologist for examination the greater is the likelihood of his being able to obtain a positive result.

The importance of precise quantitative estimates of the cerebrospinal fluid sugar content as a guide in assessing progress is becoming increasingly recognized. It is less well recognized that, whilst cerebrospinal fluid examinations are necessary at intervals to assess progress, it is also necessary, if there is to be research into the relative efficacy of different treatment regimes, to make cerebrospinal fluid examinations at certain definite stages. These are: before and after proposed dates of commencing and ending treatment, on discharge, in the earlier follow-up examinations, and from time to time in the later ones.

There will always be a proportion of patients for whom it is not possible to secure consent to a post-mortem examination, but for research to be of real value necropsy of 100% of the patients who die should be the aim.

Future Research

Apart from the investigation of results over the extended observation periods now in progress, it is hoped to organize further more intensive investigation by selected hospitals into aspects of streptomycin therapy which the recent analysis either failed to clarify sufficiently or revealed as matters which needed special study. With the general release of streptomycin to all practitioners and hospitals there has been a considerable decline in the number of patients admitted for treatment to the selected hospitals participating in this investigation. In order that research may be carried out on the relative merits of different modes of employment of streptomycin in patients clinically comparable, adequate numbers are needed. The greater the number of patients available the more speedily can an answer be found leading to yet better results and the preservation of useful human lives. It is most necessary therefore to give the selected hospitals the opportunity for admitting these patients if they have accommodation available.

EPSOM COLLEGE

The ninety-seventh annual general meeting of the governors of Epsom College was held at 49, Bedford Square, London, W.C., on July 7, with Dr. Harold Spitta, the chairman of the council, in the chair. The results of the last election of pensioners and foundation scholars were announced by the chairman. Dr. Spitta reported that the progress of the school had continued to be most satisfactory. Rises in costs had forced the council to raise the fees from Michaelmas, 1950, and to make a charge for stationery and the use of books. The council intended to appeal for funds with which to make lasting improvements to the school in commemoration of the centenary of the college and its Royal Medical Foundation. The following eight members of the council were re-elected for a further period of three years: Miss Janet K. Aitken, Sir Ernest Goodhart, Mr. J. W. Horsford Hodgson, Mr. Frederick G. C. Morris, Sir Cosmo Parkinson, Mr. Cyril J. Parton, Dr. Harold Spitta, and Mr. B. N. Wallis, F.R.S. Colonel Norman C. King, Mr. H. H. Rew, and Mr. H. A. Deeker were reappointed auditors for the ensuing year. A cordial vote of thanks was passed to all honorary local secretaries, the British Medical Association and its Charities Committee, numerous panel committees, and the editors of the *British Medical Journal*, the *Lancet*, and the *Medical World*, through whose generosity and help the funds of the college and its Royal Medical Foundation have benefited during the past year.

The Ministry of Health states that the Prison Commission recently approached the Minister of Health about the psychiatric treatment of offenders serving short sentences. Such treatment may be incomplete when the offender is discharged, and if not continued any benefit from it is likely to be lost. But if arrangements could be made for the treatment to be given by a regional hospital board psychiatrist while the offender is in prison it would probably often be possible to continue it after discharge. The Minister does not object to arrangements being made by regional hospital boards and local prisons for consultants to treat prisoners serving short sentences with a view to continuing the treatment if necessary after discharge from prison. Conversely, prison medical officers who have psychiatric qualifications could assist at regional hospital board clinics. The Minister considers this proposal to be an important social service which should be developed where possible, and hopes that any approach made by local prison authorities will be sympathetically considered.

Correspondence

Residual Insecticides in Assam

SIR,—Dr. D. M. Bertram has recorded the results of an inquiry into the relative efficacy of D.D.T. and benzene hexachloride ("gammexane") in the control of *Anopheles minimus* in Assam (May 20, p. 1200). He reached the conclusion that many anophelines landing on walls treated with D.D.T. were stimulated rather than killed, and though the numbers caught in treated houses were materially reduced the anopheline mosquito population able to bite was not materially changed.

My colleague Dr. Alan Gilroy, also working in Assam on *A. minimus*, has asked me to report the following findings, which do not support Dr. Bertram's conclusion. The technique of treatment and checking was as described by Dr. Bertram. D.D.T. was applied at 45 and 90 mg. per sq. ft. (929 sq. cm.), B.H.C. at 10 mg. of the gamma isomer per sq. ft. Dead mosquitoes were counted on floor sheets, and traps containing mosquitoes which had tried to emerge were removed and kept under cool conditions for 24 hours' observation, others being substituted in the huts. Results at one month are summarized below.

Treatment	Mosquitoes Collected			Mosquitoes in Traps Surviving 24 Hours
	Dead on Floor	In Trap		
		Dead	Alive	
(*a*) All mosquitoes:				
B.H.C.	134	144	777	66
D.D.T. 45 mg. ..	13	44	361	47
D.D.T. 90 mg. ..	3	41	245	7
(*b*) Anophelines only:				
B.H.C.	50	59	104	8
D.D.T. 45 mg. ..	5	33	56	2
D.D.T. 90 mg. ..	0	19	37	2

The anophelines included 135 *A. minimus* and 17 *A. leucosphyrus*, none of which survived 24 hours.

The figures show no material survival following contact with D.D.T. in excess of that following contact with B.H.C. Care was taken to prevent contamination of cages, a possible cause of mortality. If it occurred it is not likely to have exceeded the contamination of the cages from huts treated with B.H.C. in which the survival rate is greater than reported by Dr. Bertram.

In my opinion both of these insecticides may be of great value in Assam, and ultimately it might prove desirable to alternate them. It would be regrettable if either of them were to be condemned without very full trial and independent repetition of work to confirm results, such as is now being made in the case of Muirhead Thomson's work on D.D.T. in the control of *A. gambiae* in Africa.—I am, etc.,

London, W.C.1. G. MACDONALD.

Haemorrhage from Peptic Ulcer

SIR,—Your two articles by Drs. C. D. Needham and J. A. McConachie and by Drs. A. G. Ogilvie and I. O. B. Spencer (July 15, pp. 133 and 138) provide further useful data on the mortality from bleeding peptic ulcer and its response to treatment. But the only indication that Drs. Needham and McConachie give of the treatment employed in their cases is that it was the usual routine conservative regime employed in medical wards. But, Sir, may I urge that there is no usual routine? Opinion has been divided between the extremes of those who feed and those who starve their patients, and those who transfuse on the least provocation and those who transfuse only when the late manifestations of exsanguination supervene. May I ask, therefore, Drs. Needham and McConachie to state whether their patients were starved or fed, and if fed when and on what? May I also ask whether their patients were transfused; if so, on what indications and how much? I ask this, Sir, because I think we still have much to learn about the medical treatment of bleeding ulcer, and we can all learn if we are in full possession of the facts.—I am, etc.,

London, W.2. G. W. PICKERING.

*** The reply of Drs. Needham and McConachie to Professor Pickering's inquiry appears below.—ED., *B.M.J.*

SIR,—We are grateful for this opportunity to reply to Professor G. W. Pickering's letter. We would suggest that for some years past it has not been usual to treat haematemesis by either starvation or full immediate feeding. The "usual routine conservative regime" employed in the Aberdeen Royal Infirmary lay somewhere between those extremes—viz., fluids by mouth from the time of admission (2–5 oz. = 57–142 ml. of half-normal saline or of half-strength milk hourly or two-hourly), going on to thickened feeds the second day, and small amounts of pounded-chicken type of solids on the third day. Minor differences existed between the three medical units concerned, but the most "cautious" and the most "liberal" feeding wards showed the same mortality, which was slightly higher than that in the "intermediate" feeding ward, which, however, seemed to have dealt with a smaller proportion of severe cases. The appended table gives details of the blood transfused.

		Not Transfused	Transfused	
			Number	Average Amount of Blood per Patient Transfused (M.R.C. Bottles)
Fatal ..	Recurrent	3	48	4·9
	Non-recurrent	3	12	
Survived	Recurrent	14	59	4·5
	Non-recurrent	288	49	2·4
Total		308	168	4·08

The indications for giving blood can best be estimated from the numbers transfused and the amount of blood used. There was never any hard-and-fast policy laid down on this point, but blood was not withheld until severe exsanguination was evident.—We are, etc.,

Aberdeen. C. D. NEEDHAM. J. A. MCCONACHIE.

Anaesthesia in Heart Surgery

SIR,—Dr. D. C. Devitt (July 29, p. 295) is of course absolutely correct in stressing the importance of smooth induction of anaesthesia and of adequate oxygenation in patients who are to be the subjects of cardiac surgery. I believe, however, that his objections to the use of thiopentone for this purpose are not necessarily valid.

It may be of interest if I describe briefly the method that I and my colleagues at Guy's Hospital have found useful in anaesthetizing Mr. R. C. Brock's cases of mitral valvulotomy (we were not concerned in Case 6 of the series described in the article published in your issue of June 3). Preliminary medication is with papaveretum ("omnopon") and scopolamine, and the patient sucks an amethocaine tablet for fifteen minutes before coming to the anaesthetic room. The larynx is then anaesthetized with 2% "butyn" or amethocaine, as if for bronchoscopy, and 5% thiopentone is injected very slowly—the slowness being of great importance—until the patient is unconscious and the jaw relaxed. The dose required to produce this effect is not greater than 0.5 g., and is sometimes less than this. The largest possible cuffed endotracheal tube is then passed under direct vision, and anaesthesia continued with ether and oxygen only.

When using this method we have always found induction to be smooth and free from untoward incidents. Provided that the thiopentone is really injected slowly, significant circulatory depression does not seem to occur, and I know of no quicker or more certain way of gaining complete control of the situation.

I agree with Dr. Devitt in his reluctance to use cyclopropane in cases of mitral stenosis, where there is always a considerable element of myocardial insufficiency. I have no such reluctance, however, in the cases of congenital heart disease which I anaesthetize, for in these the heart muscle appears usually to be extraordinarily healthy. The technique of induction in children suffering from these conditions is different from that for adults. Premedication is by pentobarbitone sodium, administered orally, and atropine, and anaesthesia is induced with cyclopropane and ether by means of a facepiece to a sufficient depth for the passage of a tube by direct vision.—I am, etc.,

London, S.E.1. E. H. RINK.

Treatment of Painful Amputation Stumps

SIR,—After reading the article by Drs. W. Ritchie Russell and J. M. K. Spalding (July 8, p. 68) we think it worth while to mention a form of treatment now under trial at Queen Mary's Hospital, Roehampton.

The treatment consists in infiltrating the painful area with a local anaesthetic of prolonged action, in this case "prolongal" benzocaine, which is 2% benzocaine in urethane. This preparation was devised by Dr. Rappaport and was kindly supplied to us by the manufacturers, Messrs. Zori, of Tel Aviv. After injection urethane is absorbed and benzocaine, being insoluble in water, is precipitated in the tissues in the form of tiny crystals. These crystals persist in the tissues for about four to five weeks and are very slowly absorbed. The pain-killing effect, however, in most cases seems to last much longer.

The injection is performed under general anaesthesia, as there is a period of initial pain which we try to avoid, and, furthermore, a psychological effect is also achieved. In most of our cases other forms of treatment have been tried and failed to bring about an improvement.

So far the results have been very encouraging, provided the cases were well selected, and the relief from pain is sometimes quite dramatic. The selection of cases is most important. The pain has to be due to local causes if the treatment is to be successful. No improvement can be expected if the pain is of psychoneurotic origin.

The number of cases treated is still small and the period of observation too short to draw any valid conclusions, but we hope to be able to report further details and results when a larger series of cases has been treated and observed.—We are, etc.,

Queen Mary's (Rochampton) Hospital, London, S.W.15. M. VITALI. J. KOHN.

Treatment by Mechanical Vibration

SIR,—In 1949 I wrote pointing out to you that mechanical vibrations had been used for many years prior to Dr. Ritchie Russell and that they were of value in other painful conditions beside amputation stumps, but that there was a danger to the operator. This last point has been conceded in Dr. Russell's report (July 8, p. 68). It is amusing to find in the book by Dr. James Ross (then assistant physician to the Manchester Royal Infirmary) called *Diseases of the Nervous System*, published by J. and A. Churchill in 1885, a reference to "mechanical vibrations" from which I send a quotation:

"Some years ago Dr. Mortimer Granville was led to try the effects of rapidly tapping the skin over the fifth nerve in a case of fascial neuralgia by means of a Bennet's percussion hammer, using the pleximeter as a shield. The results were so encouraging that he gradually extended the application of mechanical vibrations as a therapeutic remedy to various other nervous diseases. With the view of better regulating the number and strength of the blows which can be delivered in a given time, Dr. Granville had an instrument constructed which he names 'percuteur.' The newest and most efficient is worked by electricity. . . . Dr. Granville believes that by its use he can relieve neuralgia in a considerable number of cases."

—I am, etc.,

Manchester. S. SHUBSACHS.

Crisis in Tuberculosis

SIR,—The recent memorandum on tuberculosis from the Ministry of Health to regional hospital boards and local authorities (July 15, p. 162) will be welcomed by all who strive for the welfare of the consumptive patient. The declaration (though long overdue) that "many more beds must be made available quickly," and that the Minister "deems it necessary to augment the insufficient resources of sanatoria and tuberculosis hospitals by using a proportion of beds in general hospitals for tuberculosis cases," suggests that the tuberculous patient may perhaps eventually receive a fair share of the medical resources of this nation.

Most chest physicians will agree with the recommendation to use beds pre-eminently for recoverable cases, and to expedite the "turn-over" of cases in hospital beds. It is surprising to find that an official document which advocates such formerly heterodox practices as this, as well as the active treatment of tuberculosis cases in their homes, nevertheless clings to the idea of "central oversight of admissions and discharges by headquarters medical staff." Throughout the country to-day waiting-lists are longest where this rigid bureaucratic control is imposed, and the most successful improvisations and bed economy are to be found where each chest physician has his own direct charge of hospital beds, no matter how few.

If indeed beds are to be made available quickly it is of paramount importance that general hospitals shall open their doors not primarily to relieve central waiting-lists but to help the patients in their immediate locality. To allocate direct control of general hospital beds to each local chest physician, both for tuberculosis and non-tuberculous illness, should facilitate the immediate full and proper assessment of each newly diagnosed case. In this way recommendations for admission to major sanatoria would become more selective, and active therapeutics in the home (which must be supported by hospital facilities) would soon become more widely practised. The disrepute of the old "dispensary system" was largely attributable to its lack, in practice, of such proper facilities, though in theory these were often alleged to be available.

The solution of the appalling problem of waiting-lists for sanatoria is not to be found through ponderous central administration but by providing chest physicians with the necessary facilities to do their job properly.—I am, etc.,

Reading. W. H. TATTERSALL.

SIR,—The memorandum of the Ministry of Health on the treatment of tuberculosis, published in the *Journal* (July 15, p. 162), practically endorses most of the timely recommendations of the Scottish Committee in their crisis expansion programme. We all look forward to the provision of the urgently needed beds (plus nurses) in general and in fever hospitals. How many beds there are readily available for the admission of our patients we just don't know, but I feel that these facilities will not be so plentiful, nor will they be placed at our disposal as quickly as they are required. It has been acknowledged by the Scottish Committee as well as by the Minister that something else, and something almost immediately available, has got to be done without further delay. Long before the authorities concerned with, and responsible for, the control of tuberculosis deemed fit to take up the challenge, several enterprising chest physicians followed the lead given by Dr. Toussaint and organized some scheme of active domiciliary treatment.[1-6]

However, a crisis expansion of such an emergency scheme, which at once would make a large number of sanatorium beds quickly available for early and urgent cases, clearly depends on whether the chest physician can carry on collapse treatment at the chest clinic. A considerable proportion of the old dispensaries—though they are now called "chest clinics"—are lacking the equipment and often also the accommodation for *x*-ray examination and collapse treatment. In order to meet the requirements of a modern chest clinic, and to give the chest physician and the young trainee specialist the widest possible chance of diagnostic and therapeutic clinical work outside the chest hospital, I have suggested the introduction of mobile clinics.[7,8] Such a mobile unit, installed in a caravan, could—in a rota service—be operated by one travelling team in conjunction with the existing dispensaries of a suitable area. It is time now, as you put it in your leading article (July 8, p. 92), "that something is done as an emergency operation." The rapid transformation of our obsolete dispensaries—or rather "visiting stations"[9]—into workable chest clinics is one of the most urgent operations if the crisis expansion of the tuberculosis service is to become a reality.—I am, etc.,

Wolsingham, Co. Durham. E. G. W. HOFFSTAEDT.

REFERENCES

1 Toussaint, C. H. C., *Lancet*, 1948, **1**, 422.
2 Maclean, A., and Gemmill, J. S., ibid., 1948, **1**, 173.
3 Tattersall, W. H., ibid., 1949, **2**, 957.
4 Trenchard, H. J., ibid., 1949, **2**, 956.
5 Wynn-Williams, N., Shaw, J. B., and Mashiter, W. E., ibid., 1950, **1**, 221.
6 Pritchard, E. K., ibid., 1948, **1**, 302.
7 Hoffstaedt, E. G. W., *Brit. J. Tuberc.*, 1949, **43**, 36.
8 —— *Lancet*, 1949, **2**, 672, 1104.
9 Ridehalgh, F., and Aspin, F., *Napt Bull.*, 1949, April, p. 34.

Poliomyelitis and Inoculations

SIR,—In view of the recent discussions concerning the relationship between injection and the onset of paralysis in the injected limbs, I should like to give details of a case which was under my care in 1947, during the peak of the poliomyelitis epidemic. At that time I was resident medical officer in charge of medical wards in a general hospital. The patient concerned was a girl of 21 who was sent to me by an outside practitioner with a diagnosis of boils which would not respond to treatment.

On examination the girl had a temperature of 100° F. (37.8° C.) and on her back were four or five subacute boils which were not particularly tender to pressure. Apart from this there were no abnormal physical signs. The patient was kept in bed under observation for two or three days, during which time her temperature rose to 101.5° F. (38.6° C.) in the evenings, and subsided to 99.5° F. (37.5° C.) in the mornings. In view of the fact that the boils did not improve, penicillin therapy was commenced. The patient was given 20,000 units of penicillin intramuscularly every three hours. There was no change in the patient's condition for the next two or three days, and on the fourth day after treatment she complained of pain in both legs. At the time this was thought to be due to the injections. However, on the fifth day the patient discovered that she could not move her legs. On examination a flaccid paralysis was found to be present in both legs. A lumbar puncture was done, (this was typical of poliomyelitis), and the patient was transferred to an isolation hospital. I saw her again three months later and discovered that there was still a severe degree of residual paralysis in both legs.

About this time I read the article in the *British Medical Journal* (March 19, 1949, p. 465) which suggested that the degree of paralysis bore a relationship to the amount of exercise undertaken in the pre-paralytic stage. I observed to myself at the time that in the case of this particular girl, although she had been resting in bed for at least seven or eight days before the onset of paralysis, she had been left with a severe degree of paralysis in both legs after three months.

I thought no more of the case at the time.

During recent weeks on thinking back I realize that in the case of this girl we had been giving intramuscular injections in both thighs and nowhere else, and that in her case it was her two legs that had been affected, and nowhere else. In view of this and similar cases reported I think we should seriously consider whether it is trauma due to the needle passing through the muscular tissues which predisposes the limb to paralysis, this effect being independent of the contents of the syringe.—I am, etc.,

Newport, Mon. J. NEWCOMBE.

Vaccination Certificates

SIR,—It might be well to add to the useful information on vaccination and inoculation certificates in Sir Philip Manson-Bahr's letter (July 22, p. 215) the reminder to doctors advising migrants overseas that, although the official certificate form states, "This certificate is not valid for more than three years from date of issue," several quarantine authorities in the Far East, and possibly elsewhere, strictly limit the validity of certificates against smallpox for their area to 12 months from date of issue. One authority recently limited the validity to 60 days. These "parochial" regulations seem to be altered with very little notice and are apt to cause very considerable trouble on attempting to disembark.—I am, etc.,

London, E.C.2. O. MARRIOTT.

Folic Acid and Pernicious Anaemia

SIR,—We have read with interest the article by Dr. H. Fuld (July 15, p. 147) entitled "Effect of Vitamin B_{12} on Neuropathy in Pernicious Anaemia Treated with Folic Acid," in which the conclusion is drawn that since neurological lesions or symptoms developed during the course of such treatment there existed a causal factor in the folic acid.

It is, of course, highly desirable that clinical findings of this sort should be brought to the attention of the medical public, and equally desirable that whenever there are differing interpretations these should also be expressed, in order that scientific knowledge may progress through the interchange of critical observations until a truly accurate consensus of opinion is reached. With the desire to be helpful in the clarification of the proper role of folic acid in the treatment of anaemias we wish to cite a few comments and findings which were in all probability not available to Dr. Fuld at the time of the writing of his paper.

An editorial which appeared in the *New England Journal of Medicine* (March 23, 1950) takes the stand that while folic acid does not possess the power of protecting the nervous system against the development of disorders as concomitants of certain macrocytic anaemias, as does liver or vitamin B_{12}, and whereas it does not possess therapeutic properties in respect of these neural lesions, it nevertheless does not play a toxic, causal, or harmful role in this direction. If this is true, then there is every reason to avail ourselves of the benefits of this medication, which has proved its usefulness in eliciting reticulocyte and erythrocyte responses. A proper understanding of its action, however, would call for the addition of liver extract or vitamin B_{12} for the protection afforded the nervous system by these agents where such protective or therapeutic action is indicated.

The following are quotations from the editorial cited: "That folic acid does not offer neurologic protection to patients with pernicious anaemia is clear, but that it actually does harm to nervous system tissue directly appears to have been disproved. Folic acid may even be used safely in typical cases of pernicious anaemia, for maintenance, provided that liver extract is also used." The editorial goes on to point out the great usefulness of folic acid in the treatment of atypical, tropical, megaloblastic anaemias, and the megaloblastic macrocytic anaemias of infancy. We quote: "'Achrestic' anaemia and the 'refractory' megaloblastic anaemias described by Davidson seem to respond better to folic acid (referring to the effectiveness of liver extract and vitamin B_{12} in these cases). Thus, this chemical appears to have earned a definite place as a useful drug, although its exact relations, if any, to vitamin B_{12} require further elucidation."

In the same issue of the *New England Journal of Medicine* there appears an article from the Medical Clinic of the Peter Bent Brigham Hospital and the Department of Medicine, Harvard Medical School, by Harvey, Howard, and Murphy, who concur with the opinion of the editorial we have cited. These investigators treated 40 subjects with 20 mg. of folic acid daily for three to twelve months. They say, "None of the subjects demonstrated spinal cord or peripheral nerve damage during the period of treatment. This confirms other recent studies and supports the accumulating evidence that folic acid does not have a toxic effect on the central nervous system of persons without pernicious anaemia. In the February, 1950, issue of *Blood* Drs. Weissberg, McGavack, Vogel, and Kenigsberg of the Metropolitan Hospital Research Unit of the New York Medical College report that folic acid has no harmful effects on the central nervous system. These physicians investigated 26 persons who were normal or who had some form of neural changes not associated with anaemia. Each person was given 20 mg. of folic acid daily. The period of treatment was from six to twelve months, with the average at ten months.

From the observations cited above we would submit, then, the following conclusions: (1) Folic acid is a valuable medicament in the treatment of anaemias, being especially useful in refractory, achrestic, atypical macrocytic types of anaemia exemplified by the megaloblastic anaemia of infancy, tropical anaemias, the so-called "pernicious anaemia of infancy," and sprue; (2) that in many of these anaemias folic acid brings about a normal peripheral blood picture and favourable marrow responses in a way which is superior to the effect of liver extract or vitamin B_{12}; (3) that folic acid does not *per se* play any causal role in neurological damage, nor does it have a toxic action; but (4) that folic acid should not be used with the anticipation of correcting or preventing the neurological lesions associated with pernicious anaemia, but that liver extract or vitamin B_{12} should be used in addition to folic acid where this therapeutic action is needed. We respectfully submit the above observations in the hope that they will receive attention and that they will be useful in the clarification of the proper role to be played by folic acid in the treatment of disease.—I am, etc.,

RUTLEDGE W. HOWARD,
New York. Director of Professional Service, Lederle Laboratories Division, American Cyanamid Company.

Cancer of the Respiratory System

SIR,—There has been a steady and progressive increase in the number of deaths from cancer of the respiratory system in men and women in recent years. The Registrar-General's returns for England and Wales are as follows:

	Males	Females
1937	4,089	1,162
1942	5,596	1,525
1943	6,094	1,581
1947	8,603	2,019

In the annual returns of the Medical Officer of Health for Manchester for the years 1937 to 1946 inclusive, the increases were from 133 to 188 in males and 23 to 45 in females. In 1949 it affected 234 males and 49 females. Leading British insurance companies have been impressed by an increase of bronchial cancer in their death claims. These increases are probably due, to some extent, to more careful and accurate diagnosis of diseases of the lungs, but there are other probable reasons for them.

There has been a great increase in cigarette smoking since the 1914–18 war, and especially by women. The Board of Trade returns show that the total weight of all forms of imported tobacco in millions of pounds rose from 114 in 1910 to 356 in 1919. In succeeding years it varied in amount, especially during the second world war, and in 1946 it was 434 million pounds.

In American opinion the incidence of diagnosed cases of bronchial carcinoma is increasing at a rate which appears to be faster than that of other diagnosed tumours. Tobacco smoking as a cause has received particular attention there because of the great incidence of carcinoma of the lung in males as compared with females. It occurs chiefly in heavy smokers and especially from 40 to 70 years of age. In 330 post-mortem examinations 78% were of men and 21.9% women. The life tables prepared by Pearl in America have a bearing on this point; he gave these, from the age of 30, for 6,813 individuals—non-smokers, moderate, and heavy smokers—and found that only 30.4% of heavy smokers lived to 70.

There is much tar-containing soot in the Manchester atmosphere from domestic and commercial fires, and in recent years this has been added to, as elsewhere, by the black exhaust of Diesel-engine buses and other heavy vehicles. A sample of this was found to contain 3% of a tarry oil which produced epithelioma of the skin on laboratory mice. There was no evidence found at Manchester that inhalation of this exhaust tar can cause cancer of the lungs, as laboratory animals could not be exposed to it for long enough periods for more than bronchial irritation to be obtained.—I am, etc.,

Manchester. E. M. BROCKBANK.

Morphine in Bronchial Asthma

SIR,—Dr. A. G. Ogilvie does not quote me correctly in his letter (July 29, p. 300). I did not write that "the use of morphine in severe asthma is justified because sedation is urgent." I stated that morphine is justified if other means of sedation have failed, and then only if its depressant and—probably histaminic—broncho-constrictor actions are compensated by adrenaline. I do not agree with Dr. Ogilvie that the asthmatic who has had morphine will not respond to adrenaline. Naturally, an effective dose of adrenaline is necessary, and if the patient is tolerant to it (tolerant to *any* dose of it) morphine would be as dangerous as it is without adrenaline. I do not see why Dr. Ogilvie wants to exclude morphine from use in asthma without any exception: that its injudicious use is dangerous is no valid reason. All that is necessary is that the medical practitioner is aware of the danger and of his responsibility.—I am, etc.,

London, W.C.1. H. HERXHEIMER.

Deaths in Breech Deliveries

SIR,—Dr. T. Redman (April 8, p. 814) showed that in breech deliveries the combined foetal and neonatal death rate is irrespective of parity and type of breech. Some statistics from Sorrento Maternity Hospital, Birmingham, may be of interest in this connexion. From 1945–9 inclusive, out of a total of 9,225 deliveries—excluding twins, malformations, and babies weighing less than 5½ lb. (2.5 kg.)—there were only 178 breech deliveries. The results are summarized in the following tables:

TABLE I.—*With Legs Flexed*

	Number	Stillbirth, With Cause	Neonatal Deaths, With Cause	Combined Foetal and Neonatal Mortality Per cent
Primigravidae	13	0	0	0
Multiparae ..	23	3 (1 prolapsed cord 2 intracranial birth injury)	1 (intracranial birth injury)	17

TABLE II.—*With Legs Extended*

	Number	Stillbirth, With Cause	Neonatal Deaths, With Cause	Combined Foetal and Neonatal Mortality Per cent
Primigravidae	88	1 (cord tight round neck; died during 1st stage labour)	4 (1 atelectasis, 1 haemorrhagic diathesis, 2 intracranial birth injury)	6
Multiparae ..	54	2 (intracranial birth injury)	0	4

Owing to the infrequency of breech deliveries, it has become very difficult for midwives and general practitioners to be taught and to keep in practice. In addition, to minimize foetal and neonatal deaths an expert team is required for the delivery, as stressed by L. Cox.[1]

The diagnosis must obviously be made prior to term so as to ensure hospital delivery and also to enable the size of the pelvis to be carefully assessed, if necessary by *x*-ray pelvimetry. To avoid an excessively large baby, labour should be induced at term and, occasionally, shortly before. Frequently, surgical induction will be required, but by using the Drew Smythe catheter a bag of forewaters can be left with advantage. This method was used in 48 of the above cases.

At Sorrento Maternity Hospital better results have been obtained recently, shown by no foetal or neonatal deaths during the first six months of this year, and only one during 1949. This was a foetus with a flexed breech, the third pregnancy of a woman with a flat pelvic brim. The improvement is largely due to the routine use of pudendal block anaesthesia in all primigravidae, as well as an episiotomy when the foetal buttocks distend the perineum. The resultant pelvic floor relaxation facilitates delivery to a marked degree. The anaesthesia results in good co-operation of the patient, so that she is more likely to keep her buttocks well over the edge of the bed when in the lithotomy position, and so ensure that the baby's body can hang and aid flexion of the after-coming head. Any shoulder manipulation can be performed painlessly, without further anaesthesia, and the occiput rotated anteriorly if necessary, the Mauriceau–Smellie–Veit grip being preferred. Should there still be difficulty with the head—if disproportion is prevented this should be rare—forceps can usually be applied without further anaesthesia.

The prime object of this letter is to urge that the time has come for revision of the Central Midwives Board rules regarding breech deliveries. Every breech should be considered as an abnormality, medical aid sought, and hospital delivery ensured. In hospital, a delivery team is necessary. Pudendal block anaesthesia is a great advantage in primigravidae.—I am, etc.,

Birmingham, 13. JEAN L. HALLUM.

REFERENCE

1 Cox, L., *J. Obstet. Gynaec. Brit. Emp.*, 1950, **57**, 197.

Myeloid Leukaemia and Pregnancy

SIR,—As Drs. L. M. Edwards and H. D. Freeth (July 22, p. 199) found that there are few records of pregnancy in myelogenous leukaemia, the following brief case notes may be of interest to them.

A woman, aged 36, was admitted to the Meath Hospital, Dublin, in August, 1947, with gross splenic enlargement, which was found to be due to myelogenous leukaemia. She had deep *x*-ray therapy to the spleen, ending on August 22, 1947. The white blood count began to rise in December, and by the end of February, 1948, she needed further deep *x*-ray treatment, which was completed on March 8. In July she was given a third course of deep *x*-ray therapy. At the end of October she was found to be pregnant, and her white-cell count was 62,200. She was given a further course of *x*-ray treatment in January, 1949, and a normal baby was born on May 1. The baby, now 14 months old, is a normal, well-grown, and healthy child. The mother had to have further *x*-ray treatment in October, 1949, and is still keeping quite reasonably well.

It is interesting to note that pregnancy occurred after three courses of deep *x*-ray therapy and that a course given during pregnancy had apparently no ill-effects on mother or baby.—I am, etc.,

Dublin. BRENDAN O BRIEN.

Diphyllobothrium Infestation

SIR,—The very full article by Drs. J. C. Harland, J. G. Humble, and P. G. Mann (July 22, p. 188) upon diphyllobothrium infestation in Great Britain encourages a brief report of a case met with in 1936.

The patient, a man at that time aged 43, had spent part of the first world war in Northern Europe and admitted later that he and his Army colleagues had often caught and eaten fish somewhat inadequately cooked. He had been diagnosed as having pernicious anaemia in 1923 and treated with liver for many years before he was seen in 1936. In that year he had a macrocytic hyperchromic anaemia: haemoglobin 112%, and r.b.c.s 3.8 million. The differential white cell count showed 4% eosinophils. He complained of a bad taste in his mouth, flatulence, occasional bouts of diarrhoea, and borborygmi. Treatment for his anaemia failed to produce a normal blood picture, and examination of his stools showed scanty ova of diphyllobothrium.

The worm was obtained, head and all, by the use of filix mas. Subsequently his red blood count rose to normal, but his eosinophilia actually increased and continued between 6% and 11% for eighteen months afterwards. The test meal showed that he was achlorhydric. Ova were never found again in this man's faeces and he appeared to be the host of only one worm.

—I am, etc.,

London, W.1. F. HARWOOD STEVENSON.

Obituary

E. CRANMER HUGHES, O.B.E., M.Chir., F.R.C.S.

Mr. E. C. Hughes, consulting surgeon to Guy's Hospital, died at Pembury, Kent, on July 28 aged 71.

Ernest Cranmer Hughes was educated at Marlborough and Clare College, Cambridge, and went to Guy's Hospital in 1901. He qualified in 1904, took the F.R.C.S. in 1906, and M.Chir. of the University of Cambridge in 1907. He was appointed assistant surgeon to Guy's Hospital in 1911, full surgeon in 1932, and consulting surgeon on his retirement in 1938. He served on the Court of Examiners of the College from 1930 to 1940, and also examined in the Universities of Cambridge and Birmingham. In the first world war he was a captain in the R.A.M.C., and was consultant surgeon to Queen Mary's Royal Naval Hospital at Southend-on-Sea. On the outbreak of the recent war he was appointed surgeon to the E.M.S. hospital at Pembury, near Tunbridge Wells, and when the medical school of Guy's was evacuated to Pembury he became once again the chief teacher in surgery of the undergraduates of his old school. Throughout the war, and up till 1947, he operated and taught at Pembury and at the same time conducted a weekly teaching round at Guy's.

As a young man Hughes came under the influence of two very great surgeons: he was house-surgeon to Arbuthnot Lane and assistant surgeon to F. J. Steward, and throughout life he carried on Lane's clean, careful technique and Steward's clinical wisdom. He wrote little, his publications being for the most part lectures on clinical subjects. He will, however, be remembered by all who came in contact with him for his personal charm, his sunny disposition, his complete inability to speak or think unkindly of anyone, and his wonderful gift of bedside teaching and of expounding the simplest things in telling phrases that fixed them permanently in the minds of his students. To many generations of Guy's men, and to those surgeons who worked with him or were examined by him during the years that he served on the Court of Examiners of the Conjoint Board, he was known affectionately as Joey Hughes. He was a wonderful teacher, a wonderful examiner, and a well-loved colleague. He is survived by his widow and a son and a daughter.—H. O.

E. T. JENSEN, M.B.

Dr. E. T. Jensen died suddenly in London on July 31 at the age of 76. He was co-founder of the Institute for the Scientific Treatment of Delinquency and chairman of its council until his death.

Ernest Thomas Jensen studied medicine at Guy's Hospital. He graduated M.B. in 1901. In his early days he held several posts. At one time he was civil surgeon to the Herbert Hospital, Woolwich. He served with the Field Force in the Boer War, and later he went as the medical officer to an expedition into unexplored parts of East Africa. Throughout his professional life he exhibited a catholic interest in many branches of medicine.

We are indebted to Dr. Edward Glover for the following appreciation: Dr. Jensen will be remembered not so much for his strictly medical services as for the part he played in founding and developing the Institute for the Scientific Treatment of Delinquency. The psychological study of criminal conduct is of comparatively recent growth, and even yet lags behind other branches of medico-psychological investigation. As is so often the case, much of the impetus to research came from without, in this case from persons whose primary interest was in social reform rather than in clinical and social psychology. When Dr. Jensen first interested himself in this field, little or no systematic work had been done on the subject. A happy association with Dr. Grace Pailthorpe, who in the early 'twenties had pursued a research on prison populations, led to the formation of an organizing committee under the chairmanship of Dr. Jensen. Soon the services of a number of medical psychologists were enlisted, and the Institute for the Scientific Treatment of Delinquency was formed. An embryo clinic, housed at first at Dr. Jensen's own residence and later given a roof by the West End Hospital for Nervous Diseases, soon acquired a regular organization and home of its own under the name of the Psychopathic Clinic. After 16 years of work, uninterrupted by war, this was taken over in 1948 by the National Health Service and now functions as the Portman Clinic: I.S.T.D.—a special out-patient centre dealing yearly with well over 400 cases of pathological crime. Throughout this period Dr. Jensen supported the organization with unflagging zeal and, once the clinic was taken over, devoted his attention to expanding the existing Institute for the Study and Treatment of Delinquency, which remains a private enterprise engaged in numerous teaching, publishing, and research projects.

Those who had the opportunity of working with Dr. Jensen were quick to recognize his personal qualities, a quiet courtesy and humour, fertility of resource in difficulty, and an almost boyish optimism which could not be shaken by any reverse. The breadth of his cultural interests—he was in private life an art connoisseur of note—could not be mistaken. He was a man of distinguished, almost ascetic, cast with a somewhat frail stooping figure. His memory will long remain with those colleagues who worked with him in what proved to be a pioneering experiment in social medicine and which in fact remains a lasting tribute to his unquenchable spirit.

Dr. Grace W. Pailthorpe writes: Although a lifelong friend, Dr. Jensen and I came together in our medical work in 1931, when I had completed a research for the Medical Research Council on the "Psychology of Criminals." Because my colleagues were impressed with my research findings, I was encouraged to feel that something should immediately be done. This led me to approach Dr. Jensen with the idea of founding a body to deal with delinquency both scientifically and clinically. In May, 1931, he and I founded the Institute for the Scientific Treatment of Delinquency. For the following six years his home at 56, Grosvenor Street housed the institute. As chairman from its inception till his death he gave his time and money freely, and to him as well as to myself came the satisfaction of seeing the work well rewarded by results. In 1937 the I.S.T.D. at last was able to house itself, and moved from Dr. Jensen's home to Portman Street. But unfortunately this change was not to last: during the war the Portman Street house was bombed, and Dr. Jensen again came forward with his assistance until the I.S.T.D. was finally accommodated in its present quarters at 8, Bourdon Place, Mayfair.

During the last war, old as he was, he was in London actively taking part in tending air-raid casualties. His publications were relatively few. His modesty accounted for this, for he would often prepare a paper for publication which his colleagues thought of value but which he could not feel had reached the point of perfection which he demanded of himself. This need for perfection was due to his highly developed aesthetic sense. To the day of his death

his vitality, his joy in his work, and his love of his fellows were among his outstanding features. His death brings sorrow and a void in the hearts of all those who knew him intimately, whether as patient, medical colleague, or friend.

HENRY FAITHFUL SMITH, who died on July 12, was born, in his own words, of South Saxon stock, the younger son of Dr. J. A. Smith, vicar of Swansea and later dean of St. David's. He was educated at Repton and Oxford, and after farming for a few years in Canada began to study medicine at Edinburgh University in 1904, when he was about 10 years older than most of his fellow students. He graduated M.B., Ch.B. in 1909, and after acting as house-physician to the late Sir Byron Bramwell he settled in partnership in a practice at Windermere, his old chief describing the terms as "not a deed of partnership but an agreement between gentlemen." He proceeded M.D. in 1913. In the first world war he served in the R.A.M.C. in Mesopotamia, where he won the reputation of always knowing his own mind and acting with promptitude and decision. He had a most strict sense of duty, and from his duty no power on earth could make him swerve. He could turn his hand to most things. He returned to his Windermere practice and remained there, a doctor much beloved. Dr. Smith's last professional work was done as chairman of the Kendal recruiting medical board during the last war. Then he retired to Gower, the place of his boyhood, and there, after a laryngotomy performed in London, he died. He had unusual physical toughness, and even in his seventies could tramp the fells all day and walk his juniors off their legs. He was a devoted golfer, and almost his only sedentary recreation was bridge. He was no intellectual, but he had an abounding common sense. He was a survival of the God-fearing Victorian Englishman and a gentleman in the tradition of Charles Kingsley, and he will be missed.—J. W.

Medico-Legal

A DOCTOR EXONERATED

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

A man who was demobilized from the Army in 1945 suffered from chronic rheumatism, for which his doctor treated him. The diagnosis was confirmed by various specialists. In January, 1948, he returned home from work feeling very ill, and late in the evening he collapsed. His wife telephoned to the doctor and asked him to come to the home, but the doctor did not do so, and prescribed sedatives. In the early morning she asked a policeman to call the doctor again, and at 4 a.m. he came and arranged for the patient to go into hospital, where he was operated upon for a perforated gastric ulcer. He died the following morning. His wife sued the doctor, Dr. John D. Hempseed, of Sheffield, at Yorkshire Assizes for negligence.[1] In defence the doctor gave evidence that at no time had the patient ever complained of stomach pain, but rather of pains of the shoulders, legs, arms, and lumbar region. He had understood the wife to say over the telephone that the husband was suffering from the "usual" pains; she had not mentioned the stomach. Her counsel then said that he was no longer prepared to submit that the doctor should have diagnosed a gastric ulcer, but maintained that he had been unskilful in not attending the patient when he was first summoned.

Mr. Justice Hilbery said in giving judgment that he was satisfied that there had never been any complaint of abdominal pain or sign of abdominal disturbance. It would, he added, be a shocking thing if in the circumstances the court were to hold that a medical man was guilty of negligence because he did not rush round immediately. He entered judgment for the doctor with costs.

[1] *Yorkshire Post*, April 21, 22.

Universities and Colleges

UNIVERSITY OF DURHAM

The following candidates have been approved at the examinations indicated:

M.D.—C. B. Henderson, C. Josephs, G. S. Michelson, W. Walker, J. E. Wilson, W. K. Yeates.

FINAL M.B., B.S.—J. Anderson (with second-class honours), A. King (with second-class honours), Jean Armstrong, J. S. Bearcroft, Dorothy G. Blackett-Ord, Mary A. Brennan, I. S. Brown, H. Byrne, R. Carr, Joan M. Cashman, A. Chesshire, D. B. Clough, Irene Colbert, Greta I. Drummond, Ola E. P. During, M. Graham, R. P. Graham, Mary E. S. Gray, K. Hardy, R. J. Harris, Anne H. Harrison, W. R. Heeler, J. G. Hindmarsh, K. W. Holt, G. Hurst, P. Hutchinson, Audrey Jennings, B. O. Kawala, Joyce L. Kemp, June M. Kirk, J. C. Knox, G. B. Lawrence, Hilda M. McCormick, J. A. McCraith, M. J. Morgan, Elizabeth Nicholson, J. D. Rickinson, C. Robertson, D. Russell, C. Shadforth, Monnica C. Stewart, K. A. Stone, N. Thompson, T. A. Trotter, D. M. Turnbull, K. E. Wardill, Joyce M. Watson, F. J. Wilkinson, B. Zimet.

D.P.H.—A. Forster, W. B. A. Smyth.

UNIVERSITY OF LONDON

Sir Archibald Gray has been appointed by His Majesty in Council as a member of the University Court from October 1 for the remainder of Sir Henry Dale's term of office—i.e., 1948-53.

Sir Alexander Fleming, F.R.S., will represent the University at the fifth International Congress of Microbiology to be held at Rio de Janeiro from August 17 to 24.

The following have been appointed, or nominated for appointment or reappointment, as representatives of the University on the governing bodies indicated in parentheses: Professor Dorothy Russell (Institute of Ophthalmology); Professor W. J. Hamilton (second representative, Royal Veterinary College); Major-General P. H. Mitchiner (Territorial and Auxiliary Forces Association of the County of London); Dr. A. Topping (University College Hospital).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Middlesex Hospital Medical School:* Dr. A. C. Thackray (Pathology); Dr. F. C. Golding (Radiology); Mr. Rainsford Mowlem and Mr. T. Holmes Sellors (Surgery). *Westminster Medical School:* Dr. I. W. Magill and Dr. G. S. W. Organe (Anaesthetics); Dr. J. G. Humble and Dr. B. W. Lacey (Bacteriology); Dr. I. McA. Anderson (Children's Diseases); Dr. G. D. Lumb and Dr. A. D. Morgan (Pathology). *Royal Free Hospital School of Medicine:* Dr. Nuala F. T. Crowley (Bacteriology). *King's College:* Dr. J. P. Quilliam (Pharmacology). *Institute of Psychiatry:* Dr. K. Cameron (Mental Diseases). *Institute of Obstetrics and Gynaecology:* Dr. V. B. Green-Armytage (Obstetrics and Gynaecology). *Guy's Hospital Medical School:* Mr. R. O. Holland, M.R.C.S., L.R.C.P., L.D.S. (Dental Surgery). *St. Thomas's Hospital Medical School:* Dr. J. F. Ryan (Anaesthetics).

The South Middlesex Fever Hospital, Isleworth, has been added to the list of institutions at which students may take the course in fevers for the M.B., B.S. degrees.

The following candidates have been approved at the examinations indicated:

M.D.—*Branch I (Medicine):* Daphne S. A. Anderson, P. G. Arblaster, G. Beven, E. P. Bharucha, D. P. Bowler, P. D. Bryant, G. B. Carruthers, Betty L. Coles, J. B. Cook, J. N. C. Cooke, Rosemary Davies, D. M. Douglas, H.-J. B. Galbraith, R. F. Griffith-Evans, A. G. S. Grimble, D. B. Gunasekara, H. C. Hamilton, E. P. W. Helps, H. D. G. Hetherington, F. C. N. Holden, Mary C. Holt, O. A. N. Husain, S. L. O. Jackson, J. W. M. K. W. S. Jayewardene, I. D. MacDonald, W. Mackenzie, J. G. Millichap, J. C. Mitchell, Madeleine B. Morris, *W. O'Brien, Ethel A. Perrott, *F. I. Rackow, G. S. Ratnavale, R. B. Sloane, Margaret H. Stanfield, Kathleen Staynes, *J. S. Stead (*University Medal*), B. E. R. Symonds, G. I. Tewfik, J. L. G. Thomson, D. Q. Trounce, R. B. N. Wilsdon, B. B. Zeitlyn. *Branch II (Pathology):* J. D. Abbott, D. N. Baron, A. R. Blowers, B. S. Cardell, M. C. H. Dodgson, R. J. Evans, H. P. Ferreira, A. K. Mant, A. F. Mohun, D. S. Ridley, H. Sterndale, Elizabeth Topley. *Branch III (Psychological Medicine):* J. P. Crawford, M. Hamilton. *Branch IV (Midwifery and Diseases of Women):* H. D. Freeth, F. Kohiyar, F. C. R. Picton, G. J. Sophian. *Branch V (Hygiene):* L. R. L. Edwards, H. T. Phillips, Alison D. McDonald, G. H. Stuart, W. C. Turner. *Branch VI (Tropical Medicine):* S. Fernando.

*Mark of distinction.

No. 29

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	38	2	22	1	—	17	1	12	—	—
Deaths		—	1				—	—		
Diphtheria	46	4	13	2	3	104	22	16	2	7
Deaths	1	—	—	—	—	1	1	—	—	—
Dysentery	166	8	109	—	2	68	8	33	2	2
Deaths					—				—	—
Encephalitis, acute	14	4	—		—	2	—	—	—	—
Deaths		1		—			—			
Erysipelas			21	4	—			17	4	3
Deaths										
Infective enteritis or diarrhoea under 2 years				23					71	
Deaths	20		2	1	4	22	2	8	1	1
Measles*	8,754	601	197	229	75	5,376	490	149	204	102
Deaths†		—	—	—				—	1	—
Ophthalmia neonatorum	37	2	13	1	—	54	—	12	—	—
Deaths										
Paratyphoid fever	5	—	—	7(B)	—	50	—	1(A)	—	1
								2(B)		
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	293	17	5	—	3	330	24	2	1	1
Deaths (from influenza)‡	6	1	1	—	—	6	—	—	—	—
Pneumonia, primary	114	24	110	¶	3	126	9	123	27	4
Deaths				4					2	
Poliomyelitis, acute	260	28	58	5	18	117	13	3	1	2
Deaths§	13	3	—			9	1			
Puerperal fever			6					6		
Deaths		—					—			—
Puerperal pyrexia‖	94	7	9	—	2	105	11	3	—	1
Deaths							—			
Relapsing fever	—	—		—		—	—			—
Deaths										
Scarlet fever	1,153	67	98	53	50	1,043	66	105	74	32
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—					—	—
Typhoid fever	6	—	1	1	—	6	—	1	4	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,881	303	205	86	23	2,184	84	33	100	76
Deaths	2	—	—	—	1	9	—	3	—	—
Deaths (0–1 year)	207	27	38	16	15	275	43	29	17	9
Deaths (excluding stillbirths)	4,092	611	550	146	108	4,228	678	496	146	91
Annual death rate (per 1,000 persons living)			11·0					9·9	9·0	
Live births	6,758	1142	913	443	235	7,608	1223	866	411	209
Annual rate per 1,000 persons living			18·3					17·4	25·5	
Stillbirths	181	29	22			182	20	19		
Rate per 1,000 total births (including stillborn)			24					21		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications in the week ended July 29 were: paralytic, 197 (189); non-paralytic, 108 (71); total, 305 (260). The figures for the previous week are shown in parentheses. It is perhaps satisfactory that the main increase—37—occurred in the non-paralytic types and only 8 in the paralytic, and that the proportion of the former for the week under review increased to 35.4% of the total notifications.

The four counties London, Warwick, Lancaster, and Stafford contributed one-quarter of the total notifications for England and Wales, compared with 46% in the previous week.

The more important increases in the week under review were as follows:

	Paralytic	Non-paralytic
Warwick	12	1
Essex	(1 less)	7
Gloucester	(3 less)	8
Leicester	6	5
Middlesex	8	3
Isle of Wight	4	3
Total	26 net	27

Total 53 (reduced to 45 for England and Wales by excess of decreases over increases elsewhere).

Attention has been focused in the past week on a relatively serious outbreak in the village of Digby, near Sleaford, Lincs. In this village, with its population of some 400 people, there have been 15 confirmed cases since July 10, and on August 8 there were 4 suspects under observation. The main weight of the attack fell on a new housing estate of 32 houses and 130 inhabitants, in which 11 confirmed cases occurred, including 2 deaths. The situation was improving by August 8 in that there had been no cases on the estate since August 5, although two or three of these suspect cases had developed after August 5 elsewhere in the Digby village area.

A small defect in the drainage system suggested the possibility of contamination of the water supply on the estate, but further investigations appear to have eliminated this possibility, and the evidence points to the spread of the disease in the community by ordinary contact infection from the first case, the onset of which was on July 10. Detailed epidemiological inquiries are being carried out, but the results are not yet available.

Anthrax in Cattle

In the outbreak of anthrax in cattle at Holme Pastures, Sutton-on-Trent, Nottinghamshire, 13 cattle had died by August 5. By the previous week-end 9 had died. Bacteriological proof has been obtained in 5 cases. About 150 cattle are exposed to risk in the area, and measures to prevent spread of infection have been carried out.

Discussion of Table

In *England and Wales* there were decreases in the notifications of measles 541, whooping-cough 236, dysentery 56, scarlet fever 22; while the only increase of any size was 48 for acute poliomyelitis. The incidence of scarlet fever remained practically constant in every area of the country, the only exception being a decrease of 41 in Lancashire. The largest local changes in the incidence of measles were decreases in Lancashire 164 and Yorkshire West Riding 123. Notifications of diphtheria fell by 10 in Lancashire.

In contrast to the general trend the incidence of whooping-cough in London and the surrounding counties increased during the week, the largest increases being in London 47, Surrey 45, and Middlesex 32; the largest decreases were in Lancashire 83, Gloucestershire 51, and Norfolk 51. The largest returns of dysentery were Lancashire 61 (Preston C.B. 15, Oldham C.B. 14, Littleborough U.D. 8); Yorkshire West Riding 28 (Bradford C.B. 8); Derbyshire 12 (Belper U.D. 11).

The rise in cases of acute poliomyelitis continues, 1,195 cases having been notified during the past eight weeks, compared with 496 in 1949, 228 in 1948, and 599 in 1947 for the corresponding period. The largest increase during the week occurred in London, where the cases rose from 8 to 28. Twelve of the 28 boroughs reported a case, and the largest returns were

Lambeth 5 and Woolwich 5. In Northumberland the cases fell from 16 to 8. Other large returns were Warwickshire 43 (Birmingham C.B. 28, Sutton Coldfield M.B. 5); Lancashire 24 (Manchester C.B. 8, Liverpool C.B. 6); Staffordshire 24; these cases were notified from 11 administrative areas. Worcestershire 13 (Dudley C.B. 5); Essex 13 (West Ham C.B. 5); Yorkshire West Riding 12, involving 9 administrative areas; Gloucestershire 11 (Bristol C.B. 7).

In *Scotland* increased notifications were reported for dysentery 22, acute primary pneumonia 14; decreases were reported for measles 70, whooping-cough 35, and acute poliomyelitis 9. A small rise in the incidence of dysentery occurred in every area, the largest returns being Glasgow 58 (an increase of 26) and Edinburgh 12. Notifications of acute poliomyelitis in Glasgow rose from 15 to 25, and the next largest returns were Fife county 7 and Angus county 4.

In *Eire* there were decreases for measles 92 and scarlet fever 23, while the only rise was whooping-cough 24. A decrease of 28 for measles and an increase of 11 for whooping-cough were recorded in Dublin C.B.

In *Northern Ireland* notifications of measles decreased by 53. This was due to a fall of 44 in the number of cases in Down county and 19 in Belfast C.B., where 12 of the 18 cases of acute poliomyelitis were also notified.

Week Ending July 29

Notifications of infectious diseases in England and Wales during the week included scarlet fever 1,012, whooping-cough 3,714, diphtheria 42, measles 8,291, acute pneumonia 277, acute poliomyelitis 305, dysentery 166, paratyphoid fever 7, typhoid fever 10.

Medical News

Royal College of Surgeons

The Honorary Medal of the Royal College of Surgeons of England has been awarded to Lord Webb-Johnson, in recognition of his many generous acts and continued labours in the interest of the college throughout the eight years of his presidency.

Travelling Fellowship Offered

The American Association for Thoracic Surgery has created a travelling fellowship (value approximately $1,000) for the study of thoracic surgery or its related sciences in the U.S.A. or Canada. The fellowship will be an annual appointment, and the American Association has generously invited the Society of Thoracic Surgeons of Great Britain and Ireland to nominate the first holder. Anyone interested in this fellowship is advised to communicate with the honorary secretary of the Society of Thoracic Surgeons, Mr. O. S. Tubbs, 15, Upper Wimpole Street, London, W.1.

Raymond F. Longacre Award

The Raymond F. Longacre Award for 1949 has been presented to Sir Charles Symonds by the Aero Medical Association of America. The award is given annually by the association to the person who has contributed most to the advancement of neuropsychiatric aspects of aviation medicine, including the development of aptitude tests for flying. The first award was presented to Dr. Ross A. McFarland in 1947 and the award for 1948 was made to Dr. Detlev W. Bronk. The presentation was made in London by Group Captain Corbett, of the Royal Canadian Air Force.

Delinquency

The Institute for the Study and Treatment of Delinquency has begun publication of a new quarterly, the *British Journal of Delinquency*, the main purpose of which is to enable students of criminology to keep in touch with recent developments in the various branches of science concerned with the investigation, treatment, and prevention of delinquency. While clinical contributions will receive special consideration, it is intended also to publish articles on medical psychology, psychiatry, psycho-analysis, organic medicine, educational psychology, sociology, economics, anthropology, psycho-biology, and statistics. The journal is published by Baillière, Tindall and Cox, and the annual subscription is £1 7s. 6d.

Japanese Journal of Biochemistry

The *Journal of Biochemistry*, organ of the Japanese Biochemical Society, has restarted publication. Founded in 1922, the journal was discontinued in 1944. In the past it has published many important papers by Japanese biochemists. It will appear quarterly from the Institute of Biochemistry, Tokyo University.

COMING EVENTS

World Federation for Mental Health

The third annual meeting of the World Federation for Mental Health will be held at the Cité Universitaire in Paris from August 30 to September 7. The discussions have been designed to lead up to the work of the next International Congress on Mental Health, which will take place next year. They are concerned with mental health in education, in industry, and among transplanted and homeless persons. A further subject of discussion will be that of leadership and authority in local communities. It is understood that the Government of Mexico has invited the International Congress to hold its meeting there in December, 1951.

Conference on Venous Disorders

A conference on venous disorders will be held at Aix-en-Provence on September 15–17 under the presidency of Professor René Leriche. Particulars may be obtained from the Secrétariat, Journées Internationales de Phlébologie, 4, Cours Mirabeau, Aix-en-Provence, France.

American Public Health Association

The 78th annual meeting of the American Public Health Association, and meetings of 32 related organizations in the field of public health and preventive medicine, will be held in Kiel Auditorium, St. Louis, Missouri, on October 30–November 3. The programme will be published in the September issue of the *American Journal of Public Health*. Additional information may be obtained from Dr. Reginald M. Atwater, executive secretary, American Public Health Association, 1790, Broadway, New York 19, N.Y., U.S.A.

SOCIETIES AND LECTURES

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

Tuesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, August 15, 4.30 p.m., "*The Anatomy of the Bile Ducts*," by Professor John Kirk.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barber.—On July 25, 1950, at Johnstone House, Belfast, to Nan, wife of Dr. J. M. Barber, a son.

Holiman.—On July 31, 1950, at University College Hospital, London, W.C., to Catharine (formerly Large), wife of Dr. Arthur Holiman, a daughter—Catharine Margaret.

Ritch.—On July 27 1950, to Dr. Elsie (formerly Morison), wife of Dr. Donald R. S. Ritch, "Dunholme," Stamfordham, Newcastle-upon-Tyne, a son.

Scadding.—On July 27, 1950, to Mabel, wife of Dr. J. G. Scadding, F.R.C.P., a daughter.

Starey.—On July 30, 1950, at Churchill Hospital, Oxford, to Phyllis (formerly Horton), wife of Dr. C. J. H. Starey, of Stokenchurch, Bucks, a son.

Taylor.—On July 29, 1950, in East London, South Africa, to Andrée, wife of Dr. W. Norman Taylor, of Fort Hare, Cape Province, a son.

Thomson.—On July 31, 1950, in Ashleigh Nursing Home, Newcastle-upon-Tyne, to Elizabeth (formerly McCarn) and Dr. Donald Thomson, Glenroy, Stanhope, Co. Durham, a daughter.

White.—On July 25, 1950, at Mayday Hospital, Croydon, to Margaret White, M.B., D.Obst.R.C.O.G. (formerly Stather Hunt), and Thomas White, M.B., M.R.C.O.G., a daughter.

MARRIAGE

Eyles—Cassells.—On July 12, 1950, in Norfolk, Reginald Eric Eyles, L.D.S. R.C.S., to Nulece Cassells, M.B., Ch.B.

DEATHS

Audland.—On July 31, 1950, at Witherslack Nursing Home, Westmorland, William Edward Audland, M.B.E., M.R.C.S., L.R.C.P., aged 90.

Bankes.—On August 1, 1950, at The Royal Masonic Hospital, Ravenscourt Park, London, W., John Herbert Bankes, M.R.C.S., L.R.C.P., aged 71.

Any Questions?

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

Prematurity and Intracranial Injury

Q.—*I was told during my training that in order to prevent cerebral haemorrhage in premature infants it was necessary to avoid delay in delivering the shoulders. To do this, as soon as the head is born one hand is put inside, the shoulders rotated, delivered immediately, and the baby extracted. The reason given for this was that while the baby's head remains in utero and inside the vagina an even pressure is exerted on the skull. When the head is born there is an alteration in the pressure due to the sudden release of the head, and if the shoulders are not delivered immediately blood is forced down into the baby's brain and the force is sufficient to tear a blood vessel and cause a cerebral haemorrhage. I have never seen this theory in print. Is there any evidence to support it or not?*

A.—Babies born prematurely are undoubtedly more liable to intracranial injury and haemorrhage, and it is generally believed that their tendency to suffer intranatal asphyxia is a predisposing factor, although this acting alone is not likely to cause more than petechial cerebral haemorrhages. The release from compression which accompanies delivery of the head may play a part in some cases, possibly because it allows a resurgence of blood to the brain and meninges, but mainly because it results in a sudden change in the shape of the skull and an alteration in the strains to which the intracranial ligaments are exposed. The release phenomenon occurs no matter whether the shoulders follow the head quickly or slowly, and the writer has never previously heard it suggested that during the interval between the birth of the head and of the shoulders the intracranial vessels can become so engorged as to rupture spontaneously. Certainly this has never been proved and it can only be regarded as a theoretical possibility which is open to dispute. The congestion of the superficial tissues which is sometimes seen pending delivery of the shoulders does not necessarily mean that there is a similar change in the intracranial vessels. Moreover, in the premature baby the girth of the shoulders and trunk is very much less than that of the head, so that they not only tend to slip out easily and quickly but in the meantime are subjected to minimum pressure from the lower birth canal already stretched by the head. The tendency for the head to become congested is therefore less than in the case of the mature infant. One of the facts established beyond reasonable doubt is that the premature baby is ill-fitted to withstand manipulation during labour, and it would appear that manual rotation of the shoulders and extraction or expression of the trunk is potentially more dangerous than allowing the very short delay necessary for the delivery to be completed spontaneously.

In most cases intracranial injury leading to haemorrhage occurs before the delivery of the head, and in premature babies may be caused merely by the resistance of the vagina and perineum. It is now fairly well established that episiotomy appreciably reduces this risk. It may be added that, if there is anything in the argument put forward, episiotomy also ensures rapid and easy delivery of the shoulders without recourse to manipulations.

Coroners

Q.—*What system governs appointments to the office of coroner? By whom are such appointments made? Are they advertised, or is it customary to appoint the deputy already in office? How are coroners nominated, and what are the limits of income available from their office? Is any preference shown to an applicant with a legal qualification over one who is medically qualified? Are any such appointments given only to applicants possessing both medical and legal qualifications?*

A.—A county coroner is appointed by the county council, a borough coroner by the borough council (Coroners (Amendment) Act, 1926, s. 2). If the district of a county coroner is wholly within a county borough the appointment is made by the council of that borough (Coroners Act, 1887, s. 33; Municipal Corporations Act, 1882, s. 34 (4)). An appointing authority is not obliged by law to advertise a vacant coronership, but it is customary to advertise the more important appointments in the legal and medical journals and in the "Public Appointments" columns of the leading daily newspapers. It sometimes happens—but by no means invariably—that a deputy-coroner already in office is appointed to the vacant coronership. In such a case his experience and general suitability rather than the fact that he happened to be the deputy would be the deciding factor. Experience as a deputy, however, carries great weight—this is especially the case where the more important appointments are concerned.

It must be remembered that there are about 270 coroners in England and Wales, and that their coronerships vary very greatly in size and importance. At one end of the scale are the small country appointments where the remuneration amounts to not much more than a honorarium, and at the other extreme are the busy posts requiring the services of men who give their whole time to the duties of the office. Of recent years there has been a tendency for paying authorities to make a distinction between a coroner's basic salary and the amounts it allows him for the expenses incurred in carrying out his work. These allowances for expenses in some instances reach high figures. Thus the two whole-time coroners for the County of Middlesex are paid a salary of £1,500 and receive £1.000 for their expenses. In London the basic salary for a whole-time coroner is £1,600 and he receives £350 for defraying his costs. It must be understood that these sums are paid to the coroner for his personal expenses and have nothing to do with the reimbursements he receives for money paid out in connexion with his administrative or judicial duties. Between these two extremes coroners' salaries vary very widely and the variation does not always bear a constant relation to the amount of work done or the time involved in doing it. The pay of a deputy, or assistant deputy, is a matter of arrangement between himself and the coroner.

Since out of approximately 270 coroners the great majority are lawyers it would be reasonable to infer that a legal qualification is held to be more important than a medical qualification so far as fitness for the office is concerned. In London, and a few of the more important centres, the electing authority endeavours to limit the candidature to persons who possess both legal and medical qualifications. No coroner has been appointed in the county of London for the past thirty years who has not had the dual qualification. There are 13 whole-time coroners in England and Wales, of whom 10 are qualified in both law and medicine. These 13 coroners between them dispose of about one-third of all the cases reported in England and Wales during the year. Of the remaining 257 coroners, 16 have a medical (but no legal) qualification; and 241 are barristers or solicitors with no medical qualification.

Ps. pyocyanea Infection of Middle Ear

Q.—*A man had a chronic discharge from the middle ear. The organism cultured was Ps. pyocyanea. Is there any antibiotic which is active against this organism? Would C.T.A.B. applications be likely to help? What local treatment is indicated?*

A.—*Ps. pyocyanea* is remarkably resistant to both antiseptics and chemotherapeutic agents. Among the former none can be recommended for use in such a case as this. C.T.A.B. (cetavlon) has less action on this organism than on any other commonly concerned in sepsis. Penicillin is useless, and the newer antibiotics aureomycin and chloramphenicol are also generally powerless in the concentrations which can be attained at the site of infection. Streptomycin is the exception; the susceptibility of *Ps. pyocyanea* to this antibiotic varies, but it is usually such that the concentrations attainable by local application are effective. A solution of 5 mg. per ml. should be instilled into the ear several times a day: the drug may also be given intramuscularly, particularly during any surgical treatment which may be indicated. Authors reporting favourably on local streptomycin treatment for otitis media, some of whose

patients were infected with this organism, are Pulaski and Matthews (*Arch. Otolaryng.*, 1947, **45**, 503) and Harris and Finland (*North Carolina Med. J.*, 1947, **8**, 276).

Local treatment would consist in keeping the meatus as clean as possible, and in ensuring that the discharge was allowed a free exit from the middle ear. The first object is attained either by syringing with warm water, followed by dry mopping, or by dry mopping alone, twice daily; the second by removal of granulations with chromic acid, of polypi by a snare, and of debris by syringe or scoop.

Indications for P.A.S. in Pulmonary Tuberculosis

Q.—*What are the indications for the use of para-aminosalicylic acid? I have a patient, aged 22, with advanced pulmonary tuberculosis. She has persistently refused sanatorium treatment, still refuses it, and is beginning to go downhill now. Is it worth while prescribing P.A.S.?*

A.—The indications for this drug in the treatment of pulmonary tuberculosis may be briefly stated as (*a*) recent disease, and (*b*) in combination with streptomycin to prevent or delay the loss of sensitivity of the tubercle bacillus to the antibiotic. P.A.S. is effective only in those lesions in which there is an absence of fibrosis; it is therefore suitable in cases where there is evidence of recent spread of the disease. In chronic fibroid phthisis it has the temporary effect of creating a feeling of well-being, and some improvement radiologically may occur from the clearing up of recent foci of activity, but a state is soon reached beyond which no further improvement can be expected. In combination with antibiotics it is useful in the prevention of drug-fastness. There is also evidence that with the combined administration of streptomycin and P.A.S. patients improve more rapidly than when treated with streptomycin alone.

The treatment of the patient in question with P.A.S. depends very greatly on the character and chronicity of her lesion. However, it is probable that benefit would be derived from P.A.S. but the permanency of any good effects will depend on the clinical state of the patient.

Sensitization to Calf Lymph

Q.—*On February 17 I vaccinated a European baby of 20 months not previously vaccinated against smallpox. No immediate change was observed in the temperature, pulse rate, or respiration, though the same batch of calf lymph was found to be potent when used on control cases. Eight days later a series of papules appeared on the vaccinated leg; within 24 hours they changed first to vesicles and finally to pustules. During the next five weeks the same type of eruption was observed on the other leg and both arms. Very few were seen on the face and trunk. The child at no time ran a temperature and, apart from a slight inclination to scratch individual lesions, showed no signs of constitutional disturbance. This child, now in Nyasaland, will continue to reside in tropical areas in which smallpox is endemic, and it is important that a correct diagnosis should be established. If this was a case of generalized vaccinia, then I must issue a certificate to that effect to ensure that she is not vaccinated again. What is the likely diagnosis, and is revaccination advisable or not?*

A.—Although the information is not explicitly given it is assumed that the papules, vesicles, and pustules which appeared at the site of attempted vaccination were typical and were followed by the usual foveated scars and represented a successful vaccination. It is then necessary to go over the complications of vaccination so far as the skin is concerned in an endeavour to ascertain as accurately as possible the nature of the condition. (i) *Contact vaccination.*—This can be ruled out. Such transference could occur only in the susceptible phase, so that all the lesions (primary vaccination and those transferred) should progress more or less together and not more than a week apart. (ii) *Generalized vaccinia.*—No mention is made of an eczematous condition of the skin, so Kaposi's dermatosis may be excluded. Ordinary dissemination is possible as an explanation, but seems unlikely in view of the absence of constitutional upset. (iii) *Sensitization to calf lymph.*—Rashes —erythematous, papular, urticarial, and vesicular—may be encountered after vaccination and are akin to the "serum rashes" seen after the administration of antitoxins. These usually fade within seven to ten days of their appearance, but a longer duration is possible. Five weeks, however, does seem a rather excessive period. (iv) *Impetigo.*—It is assumed that a vesicular form of impetigo can be excluded.

It seems therefore most likely that a sensitization rash is the best explanation. The following observations are relevant. First, in the absence of an atopic eczema there is no reason to believe that subsequent vaccination would necessarily again be followed by dissemination of virus. Secondly, if sensitization is the cause one would expect further manifestations of sensitization to appear, and these should be looked for. If it was considered practicable a patch or scratch test with heated calf lymph (to destroy the virus) might be tried. Certainly it would be worth while carrying out this simple procedure before any subsequent vaccination.

Penicillin in Chronic Sinusitis

Q.—*Has any work been done on the treatment of chronic sinus infections by antibiotics, particularly those infections which cannot be treated by irrigation?*

A.—A great deal of work has been done on this problem, especially with penicillin. Boyd, in an article in the *Laryngoscope* (July, 1947), gives an excellent summary of the literature, and describes his own results in a small series of cases. He concludes that penicillin undoubtedly has a useful place in treatment. But here, as in all chronic infections of this type, the difficulty is to bring the antibiotic into contact with the organisms in adequate concentrations. For this reason the results of treatment are usually disappointing, even when the antibiotic is administered locally and parenterally over long periods.

NOTES AND COMMENTS

Cracked and Painful Fingertips.—Dr. H. Maitland Moir (Midlothian) writes: Your pessimistic answer (July 15, p. 178) is surely unwarranted. "Circulatory, metabolic, or hormonal dysfunction, xeroderma, psoriasis, lichen simplex, constitutional background factors"—I have none of these, though I do have occasional "hacks," as we call them in Scotland. They are quickly curable and instantly relievable. I pass on Dr. Grant Peterkin's advice to me, which I have proved to be excellent. Dry the hack, open it up, and insert a piece of cobbler's wax about the size of a large pinhead. Hold the finger near the fire or radiator: the wax quickly softens, and is then pressed firmly into the hack. A small piece of adhesive tape may be used to cover up the black spot. A pennyworth of wax is enough to cure all the hacks in Europe.

Corrections

In a leading article entitled "Public Health Dispute" (August 5, p. 336), the Conditions of Employment and National Arbitration Order, 1940, of the Defence (General) Regulations, 1939, was incorrectly described as the National Arbitration Tribunal (Defence) Regulations, 1940.

We regret that Professor R. D. Passey's name was wrongly spelt in the article entitled "Diphyllobothrium Infestation and Anaemia in Great Britain" (July 22, p. 188), and also in the list of references (p. 192).

All communications with regard to editorial business should be addressed to The Editor, British Medical Journal, B.M.A. House, Tavistock Square, London, W.C.1. Telephone: Euston 2111. Telegrams: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). Telephone: Euston 2111. Telegrams: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. Telephone: Euston 2111. Telegrams: *Medisecra, Westcent, London.*

B.M.A. Scottish Office: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 19 1950

CLINICAL TRIALS OF ANTIHISTAMINIC DRUGS IN THE PREVENTION AND TREATMENT OF THE COMMON COLD

REPORT BY A SPECIAL COMMITTEE OF THE MEDICAL RESEARCH COUNCIL*

The investigations of Brewster (1947, 1949), Gordon (1948), Murray (1949), Arminio and Sweet (1949), Phillips and Fishbein (1949, 1950), and Tebrock (1950) suggested that antihistaminic drugs had beneficial effects in the prophylaxis and treatment of the common cold. On the other hand, these observations could not be confirmed by Paton, Fulton, and Andrewes (1949), Hoagland, Deitz, Myers, and Cosand (1950), Feller, Badger, Hodges, Jordan, Rammelkamp, and Dingle (1950), and Cowan and Diehl (1950). A critical review by the Council on Pharmacy and Chemistry of the American Medical Association (1950) cast serious doubt on the validity of the conclusions and the interpretation of the results of some of the earlier investigations, referred to above, which had seemingly shown favourable effects.

In view of the great practical importance of the favourable findings, if confirmed, the Medical Research Council undertook, at the request of the Ministry of Health, to investigate in this country the value of the treatment. A special committee was appointed early in 1950, and the results of the tests arranged by the committee are reported here.

The trials have been of two kinds: (1) small-scale tests of two powerful antihistaminic drugs—promethazine hydrochloride ("phenergan," May & Baker, Ltd.) and chlorocyclizine hydrochloride ("histantin," Burroughs Wellcome & Co.)—in the prevention of inoculated colds in volunteers at the Common Cold Research Unit, Harvard Hospital, Salisbury; and (2) large-scale trials of the much weaker antihistaminic thonzylamine (also known in America as "neohetramine" or "anahist") for the treatment of colds occurring naturally among volunteers drawn from the general adult population—workers in the Civil Service, industrial establishments, universities, and the like (see Appendix).

I. THE PROPHYLACTIC EXPERIMENT AT SALISBURY†

The object of this experiment was to see whether antihistaminics given before, and for a few days after, nasal instillation of common-cold washings to human volunteers would prevent the development of a cold. Histantin and phenergan were selected as the drugs for test, as the antihistaminic activity of both was known to be high. The volunteers were isolated in pairs throughout the trial—in the same way as has previously been described by Andrewes (1949). Half the subjects received the drug under test, the other half received dummies indistinguishable from it and containing ¼ gr. (16 mg.) of phenobarbitone. It was felt that the latter would, in the dosage employed, have a mild sedative effect and so be acceptable as a control medication against which the efficacy of the antihistamine could be measured. Tablets were given at approximately 10 a.m. and 7 p.m., swallowing being supervised by the matron. Two members of a pair were given the same substance. Whether they were to be given the drug or the dummy was decided randomly, and neither the patient nor the clinical observer knew which any particular patient had received.

Trial 1: Histantin (January 18–28, 1950)

A 50-mg. tablet of histantin (or of the dummy) was given twice daily, beginning 48 hours before the cold inoculation and continuing until 72 hours after it. The virus inoculum was a 1 in 3 dilution of an unfiltered washing from patient G., who had developed a cold after receiving passage material from one of the Common Cold Research Unit's "pedigree" strains, Harrow. The results are shown in Table I. The incidence of colds is seen to be the same in the treated and control groups; there was no clinical difference from the usual course of experimental colds. One spontaneous cold developed in a subject who had been taking histantin for 24 hours; a similar case occurred in the control group.

Table I.—*Results of Trial 1*

Drug Administered	Cold	No Cold
Histantin	4*	4
Control tablet	4*	4
Total	8	8

* Includes one spontaneous cold developing during quarantine period before inoculation.

Trial 2: Phenergan (February 1–11, 1950)

A 20-mg. dose of phenergan (or of the dummy) was given twice daily, beginning 60 hours before virus inoculation and continuing for 72 hours after. Two test viruses were used —unfiltered G diluted 1 in 3, as in Trial 1, and a filtrate

*The membership of the committee was as follows: Dr. F. H. K. Green (chairman), Dr. C. H. Andrewes, Professor W. A. Bain, Professor A. Bradford Hill, Dr. W. C. Cockburn, Dr. P. D'Arcy Hart, Dr. J. Faulkner, Dr. N. L. Lloyd, Group Captain T. C. MacDonald, Dr. L. G. Norman, Dr. J. P. Sparkes, Dr. T. Sommerville, and Dr. J. A. Harrington (who was appointed secretary and co-ordinated the trials).

†Members of the staff concerned with this investigation were C. H. Andrewes, T. Sommerville, K. R. Dumbell, and J. S. Porterfield.

TABLE II.—*Results of Trial 2**

Drug Administered	Cold Washing	Cold	No Cold
Phenergan	G	5	0
	Pool 82	2	2
Control	G	3	4
	Pool 82	1	3

* In the phenergan experiment two volunteers of opposite sex were unpaired; these were treated as singletons, one getting the drug and one not. In addition one volunteer and her partner inoculated with the G virus have been excluded since she developed influenza in the course of the experiment.

of pool 82 (also virus of Harrow passage series). Table II shows the results. As in Trial 1 there is no evidence of prevention with the antihistaminic drug.

Side-effects

Subjects were not warned that some side-effects of the drugs might be apparent, but may well have read of this possibility in the lay press. In the first trial, of the eight persons taking the drug only one complained of "fuzziness in the head" half an hour after her fourth dose of histantin; it lasted ten minutes. In the second trial four patients complained of drowsiness; two were in the phenergan and two in the control group. In assessing the significance of this low incidence of side-effects it must be remembered that the volunteers in this trial were leading a very leisurely existence and were under no kind of strain.

Discussion

Some claims to a beneficial effect of antihistaminics in curing colds have emphasized the need for beginning treatment within a few hours of onset. It is thus particularly noteworthy that the results at Salisbury with experimental colds showed no effect even when the drugs were given for two to three days *before* infection. Clinical observation of the volunteers revealed no difference in the nature and duration of experimental colds in those who received antihistaminic treatment and those who did not. The results with the two antihistaminics tested were clear cut, and there seemed to be no good reason for repeating the experiment with other drugs of a similar kind.

II. LARGE-SCALE THERAPEUTIC FIELD TRIAL

Plan of Investigation

To assess the value of antihistaminic drugs in the treatment of the common cold it was necessary to compare the experience of treated individuals with that of a similar group not treated; for this purpose it was decided to plan the inquiry on similar lines to those adopted by a committee of the Council in investigating the value of patulin for the same purpose during the war (*Lancet*, 1944, 2, 373).

Choice of an Antihistaminic for Test.—The antihistaminic drugs vary considerably in their properties, potency, and toxicity, but it clearly was impracticable to carry out field tests of more than one product if sufficiently large groups for statistical analysis were to be obtained within a reasonable period. The available evidence indicated that thonzylamine would be the most appropriate choice in the first instance, as it was generally accepted as having a low toxicity (Friedlaender and Friedlaender, 1948; Criep and Aaron, 1948; Schwartz, 1949) and had been claimed as very effective against the common cold by Arminio and Sweet (1949) and Tebrock (1950).

Organization of Trials at Individual Centres.—The supervision and conduct of the investigation at the individual centres were carried out by medical officers who had been visited by the secretary of the committee and instructed in the standard procedure proposed; at some centres the conduct of the test was delegated to a trained industrial nurse working under the supervision of a medical officer. The existence of the trial was brought to the notice of potential volunteers by means of posters, notices, etc., the details of publicizing the scheme being left to the medical officer in charge. Volunteers were told of the experimental nature of the inquiry and the desirability of attending for treatment as soon as possible after the onset of symptoms of a cold.

Selection of Cases.—Admission to the trial was limited to volunteers over the age of 15 years in whom there was good evidence of the presence of the common cold. As it was important to obtain uniformity in different areas, the following definition of a common cold was given as a guide to the observers: "A catarrhal inflammation of the upper respiratory passages usually without pyrexia but with a watery or mucous discharge from the nose and associated with sneezing, fullness in the head and nose, and sometimes with cough, headache, sore throat, hoarseness, and running eyes." Reliance was placed mainly on the subjective diagnosis, and cases were accepted on the basis of the patient's description of his symptoms; clinical examination, other than the recording of temperatures, was carried out only to exclude other conditions. All volunteers whose conditions fell into any of the following categories were excluded: chronic catarrh or sinusitis; acute tonsillitis; suspected influenza; any person whose temperature was found to exceed 100° F. (37.8° C.); those who, on inquiry, seemed likely to have taken an antihistaminic drug for any purpose within the previous week; those with a *present attack* of hay-fever or allergic rhinitis. Persons with a *previous history* of allergic states were included, but a note to this effect was made in the appropriate column of the record sheet.

Design of Trial

To ensure that no bias could enter into the assessment of results it was essential that neither the patient nor the investigator should be aware whether antihistaminic tablets or control tablets had been given in a particular case. For this purpose, those who were to be treated and those who were to be "controls" were prearranged in random order by the use of random sampling numbers, with the one restriction that each batch of 50 volunteers should include 25 treated (T) and 25 controls (C) (a restriction not known at the centres).

These lists were numbered consecutively, so that, for example, a series might run as follows: 1T, 2T, 3C, 4T, 5C, 6C, and so on, randomly. Such lists were constructed, in the Council's Statistical Research Unit, for each centre. Record sheets and cartons containing the appropriate tablets were then marked (in the Statistical Research Unit) with the serial number—namely, 1, 2, 3, 4, 5, 6, etc., but with no reference to (T) or (C)—and sent to the local centres; thus at the local centre one carton and one record sheet, *the serial numbers of which corresponded*, were used for each patient. They were used in strict order of serial number; thus if the last patient on one day was recorded on record sheet "15" and received tablets from carton "15," the first patient on the next day was recorded on record sheet "16" and received tablets from carton "16." The key to the identity of the serial numbers was kept centrally and secret until the end of the investigation.

This somewhat novel method was adopted in place of the more usual one of merely labelling one product X and the other Y and giving them in random order, in view of the side-effects to be expected with the antihistaminic drug. If decisive side-effects were observed with even one patient then the nature of X (and Y) would ever after be known (or suspected). With the method chosen the identity of one carton might well be suspected in the patient with

side-effects, but no evidence would thereby be given regarding the treatment of any other patient.

Course of Treatment

At the first attendance the medical officer, having satisfied himself that the patient was suffering from a common cold and was not within one of the excluded categories previously defined, completed Part A of the record sheet (reproduced here) and then proceeded to dispense the tablets.

Each patient, it was laid down, should receive one tablet *three times a day for three days*—that is, a total of nine tablets. The individual and numbered carton for each patient held three envelopes, each containing three tablets: one envelope was issued each day—that is, on reporting, on the next day, and on the day following that. Antihistaminic tablets contained 50 mg. of thonzylamine; control tablets contained 5 mg. of quinine sulphate in a lactose base. All tablets were sugar-coated, and those which contained the antihistaminic were indistinguishable in appearance from those which did not. Volunteers were told to swallow the tablets whole, to remove the possibility of detection by taste if they were bitten or chewed. Each patient was given an instruction leaflet (explaining the details of the treatment and follow-up) and a note to hand to his family doctor if the latter was consulted during the period of the test.

Follow-up and Assessment of Progress

Patients were instructed to report progress at the end of 24 hours, 48 hours, and after a week. At these attendances the volunteers were requested to state quite frankly whether they thought the treatment given had been effective; assessments of progress were recorded by ringing the words "cured," "improved," "unchanged," "worse," or "recurred" as appropriate. The definitions of these categories had been laid down as follows:

"*Cured.*"—Only those persons who, after questioning, are found to be *completely* free from symptoms and who, on examination, are found to be without objective signs.

"*Improved.*"—Persons who, on questioning and examination, are found to be improved but not cured since the previous examination.

"*Unchanged.*"—Persons in whom, on questioning, the symptoms and signs are found to be unchanged since the previous examination. (*All cases in which there was doubt regarding progress were included in this category.*)

"*Worse.*"—Persons in whom, on questioning and examination, the symptoms and signs are found to have increased since the previous examination.

"*Recurred.*"—Patients, previously classified as "cured," and who report with another cold within 14 days of recovery from the previous one.

Assessment of Side-effects.—Direct questions about side-effects were avoided during treatment lest the investigator

Trial Centre

RECORD SHEET
Trials of Antihistaminic Drugs in the Treatment of the Common Cold
(MEDICAL RESEARCH COUNCIL)

Serial Number

Surname (BLOCK CAPS) Initials: | Mr. Mrs. Miss | Age (years) | Clock No. | Department | Occupation

A — FIRST EXAMINATION (*To be filled in by a doctor: please put a ring round the appropriate items*)

Has patient been previously treated in these trials? Yes No

Is there any previous history of: Hay-fever Allergic Rhinitis Asthma
Other Allergic Manifestations (*State nature*):

Date of first examination | Time

Duration in days of Head Cold before first examination: ½ 1 2 3 4 5 6 7 or more days

Blocked Nose Fullness in Head Sneezing Sore Throat Hoarseness Cough Headache Feeling Ill

Nasal Discharge: Watery Mucoid Purulent

Temperature (if taken).....

Are you satisfied that this is a case of Common Cold? Yes No Uncertain

B (Enter progress at 24 hours, 48 hours, and after a week) — PROGRESS RECORD — (*Please put a ring round appropriate items*)

Date	Time	Number of Tablets Since Previous Recordings	Progress	Temperature (if taken)	Doctor's Comments
			Cured Improved Unchanged Worse		
			Cured Improved Unchanged Worse Recurred		
			Cured Improved Unchanged Worse Recurred		
			Cured Improved Unchanged Worse Recurred		
			Cured Improved Unchanged Worse Recurred		

[SEE OVER

Reverse Side of Record Sheet

SIDE-EFFECTS
(*Please do not ask* DIRECT QUESTIONS *about specific side-effects as this may give misleading results*)

1. Has the treatment agreed with the patient? Yes No
2. If "No," what symptoms does the patient attribute to the tablets? (*State nature and severity as "mild," "moderate," or "severe"; and date of occurrence*)

Off work* from..... to..... Reason:
* (*Delete if not off work during trial*)

ANY FURTHER COMMENTS

might surmise from the answers whether the patients were on the antihistaminic or the control treatment. Where, however, side-effects were spontaneously complained of, details were noted, including the nature, date of onset, and severity. In all cases the patient was asked at his *last* attendance, and after the assessment of progress, whether the tablets had affected him adversely in any way; if the answer was in the affirmative the symptoms attributed by the patient to the tablets were noted.

Results

These therapeutic trials were set up at 19 widely distributed centres with a total population of approximately 58,000. They were carried out in each area between the middle of March and the middle of May, 1950, though not invariably over the whole of that period.

In total, 1,550 volunteers at the various centres were treated in the investigation—775 with the drug and an equal number with the control tablets. However, 394 record sheets had subsequently to be rejected from the analysis for such reasons as failure to complete the treatment or to report progress on the required days. These rejects came about equally from the treated and control groups (196 and 198 respectively), and thus show no differential bias. Deducting the rejects, 1,156 record sheets were available for analysis—579 for patients who received antihistaminic treatment and 577 for patients who had the alternative treatment. Since analysis of the results from each centre revealed no significant difference between them, only the combined results from all centres need be given here. It may also be noted that a special analysis was made according to the number of records that had to be rejected. The centres were grouped in three categories: under 10% of records rejected, 10–19% rejected, 20% or more rejected. No differences in results were revealed, showing again that the lapses did not bias the inquiry.

TABLE III.—*Duration of Cold Before Treatment was Begun*

Duration of Symptoms Before Treatment (in Days)	Persons Given Antihistaminic Treatment		Persons Given Alternative Treatment	
	No.	%	No.	%
½	64	11·1	60	10·4
½–1	137	23·7	113	19·6
1	180	31·1	213	36·9
2	96	16·6	84	14·6
3	49	8·5	42	7·3
4	22	3·8	25	4·3
5	7	1·2	10	1·7
6	8	1·4	1	0·2
7+	16	2·8	29	5·0
Total	579	100·2	577	100·0

TABLE IV.—*Frequency of Presenting Symptoms at First Visit*

* Symptoms	Persons Given Antihistaminic Treatment		Persons Given Alternative Treatment	
	No.	%	No.	%
Watery nasal discharge ..	359	62·0	337	58·4
Mucoid nasal discharge ..	114	19·7	118	20·5
Purulent nasal discharge ..	49	8·5	42	7·3
Blocked nose	321	55·4	307	53·2
Fullness in the head ..	385	66·5	390	67·6
Sneezing	413	71·3	408	70·7
Sore throat	217	37·5	231	40·0
Hoarseness	183	31·6	177	30·7
Cough	242	41·8	226	39·2
Headache	196	33·9	207	35·9
Feeling ill	44	7·6	46	8·0

The comparable nature in regard to initial symptoms of the volunteers who received antihistaminic treatment and those who did not is shown in Tables III and IV. It will be seen that the method of random allocation used resulted in two groups which were closely alike in relevant respects.

The results at the end of the first day, second day, and one week for different durations of colds before treatment are given in Table V. None of the differences is individually statistically significant for each duration of cold before treatment, and indeed the similarity in response of the two groups seems more remarkable than any dissimilarity. For instance, of those who came for treatment within the first day of their onset of symptoms, 13.4 and 13.9% of the treated and controls, respectively, reported a cure on the second day; 48.8 and 46.8% were cured at the end of the week. It may, however, be noted that the treated group had consistently a slightly higher proportion of cured and improved on the first day of treatment than had the controls.

By combining all results, irrespective of duration of cold before treatment, 48.0% of the treated and 42.1% of the control group were found to be improved (including nine treated and five control cases who were cured) at the end of the first day's treatment. The difference, 5.9±2.9, is just significant in a technical sense, but even if it be real it is so small that it clearly has no practical importance. Also, this small difference, it will be seen, vanished on the second day, when, taking all the group together, the proportions of cured and improved were respectively 8.8% and 53.0% in the treated and 8.5% and 51.3% in the control group. Possibly the apparent small difference at the end of the first day's treatment can be accounted for by a slight sedative effect in some few subjects who received thonzylamine or by the unwitting inclusion of some individuals who were suffering from hay-fever or an allergic rhinitis and not from the common cold.

It has been mentioned that volunteers with a present attack of hay-fever or allergic rhinitis were, so far as possible, excluded, but persons with a previous history of allergic conditions were included provided they were believed to be suffering from a cold. From Table VI it will be seen that a previous history of hay-fever, allergic

TABLE V.—*Percentage Cured or Improved at the End of the First Day, Second Day, and One Week for Different Durations of Cold Before Treatment*

Day of Observation	Duration of Cold Before Treatment											
	Under 1 Day			1 Day			2 Days			3 Days or More		
	T (201 Obs.)	C (173 Obs.)	Difference	T (180 Obs.)	C (213 Obs.)	Difference	T (96 Obs.)	C (84 Obs.)	Difference	T (102 Obs.)	C (107 Obs.)	Difference
First day—improved*	47·8	45·1	2·7±5·2	47·2	38·5	8·7±5·0	50·0	40·5	9·5±7·4	48·0	45·8	2·2±6·9
Second day: Cured ..	13·4	13·9	−0·5±3·6	7·8	6·6	1·2±2·6	3·1	4·8	−1·7±2·9	6·9	6·5	+0·4±3·5
Second day: Cured or improved	68·2	64·7	3·5±4·9	58·3	55·4	2·9±5·0	59·4	57·1	2·3±7·4	57·8	62·6	−4·8±6·8
One week: Cured ..	48·8	46·8	2·0±5·2	42·2	37·1	5·1±5·0	31·3	33·3	−2·0±7·0	29·4	36·4	−7·0±6·5
One week: Cured or improved	80·6	74·6	6·0±4·3	77·8	77·5	0·3±4·5	70·8	79·8	−9·0±6·5	70·6	78·5	−7·9±6·0

T = Antihistaminic treatment. C = Alternative treatment. Obs. = Number of patients observed.
* Including the few patients (9 T and 5 C) who said they were cured on the first day.

TABLE VI.—*Distribution of Results at the End of the First Day, Second Day, and One Week for Persons with a Previous History of Allergic Conditions*

	1st Day		2nd Day		Week	
	T	C	T	C	T	C
Previous history of hay-fever						
Cured	2	—	4	3	6	13
Improved	13	13	13	14	12	12
Unchanged	10	16	8	14	8	6
Worse	3	5	3	3	1	1
Recurred	—	—	—	—	1	2
	28	34	28	34	28	34
Previous history of allergic rhinitis						
Cured	1	—	3	3	3	7
Improved	12	7	10	12	12	8
Unchanged	9	10	10	6	7	4
Worse	3	6	2	2	2	1
Recurred	—	—	—	—	1	3
	25	23	25	23	25	23
*Previous history of other allergic manifestations**						
Cured	—	—	4	5	15	13
Improved	25	17	22	17	20	12
Unchanged	17	10	12	9	8	5
Worse	2	7	6	3	1	3
Recurred	—	—	—	—	—	1
	44	34	44	34	44	34

T = Antihistaminic treatment. C = Alternative treatment.
* Including asthma, urticaria, and other conditions believed to have an allergic basis.

rhinitis, and other allergic manifestations had no striking influence on the results obtained with the treatment, but the numbers in each of the treated and control groups are small. By combining all these allergic manifestations the figures shown in Table VII are obtained.

TABLE VII.—*Percentages Cured or Improved*

	1st Day	2nd Day	One Week
Treated	54·6	57·7	70·1
Controls	40·7	59·3	71·4
Difference	13·9±7·3	−1·6±7·2	−1·3±6·6

There is a suggestion that the antihistaminic drug gave some relief to these subjects during the first day of treatment, but later results do not differ at all.

Side-effects.—Side-effects attributed to the treatment were reported by 121 (20.9%) subjects receiving the test drug, while the comparable figure for those receiving the alternative treatment was 111 (19.2%); details are given in Table VIII. It is most unlikely that the large number

TABLE VIII.—*Side-effects Attributed to Treatment*

Main Symptoms	Persons Given Antihistaminic Treatment	Persons Given Alternative Treatment
Drowsiness, lassitude, listlessness ..	26	35
Dizziness, giddiness, vertigo	21	13
Headache	21	16
Headache and other nervous symptoms ..	11	6
Depression with or without other nervous symptoms	2	5
Insomnia	3	1
Gastro-intestinal	13	12
Combined gastro-intestinal and nervous symptoms	8	7
Miscellaneous	16	16
Total	121	111

of side-effects attributed to the alternative treatment can have been due to the small doses of quinine given in the control tablets. It seems much more probable that many of the symptoms described as side-effects were, in fact, symptoms of the cold itself. On the other hand, when, as here, efforts were made to avoid direct questions about specific side-effects, prior knowledge of the possibility of reactions may have led to a spurious increase in their incidence through psychogenic factors.

CONCLUSIONS

In a small but carefully controlled experiment two antihistaminic drugs—promethazine hydrochloride and chlorocyclizine hydrochloride—showed no evidence of having any value in the prevention of experimentally induced colds.

A large-scale clinical trial of thonzylamine in widely separated areas in Great Britain and Northern Ireland, carried out between the middle of March and the middle of May, 1950, showed that, in the dosage employed, this antihistaminic drug had little if any value in the treatment of the common cold.

The committee is greatly indebted to Dr. W. J. Martin, of the Medical Research Council's Statistical Research Unit, for carrying out the statistical analysis of the results, and to the managements, medical staffs, and volunteers in the industrial and Civil Service establishments, universities, and elsewhere for their co-operation and assistance in carrying out the trials. Thanks are also due to Dr. W. E. Chiesman, Treasury Medical Adviser, for much help, and to the Director-General of Medical Services, Royal Air Force, for permitting the inclusion of R.A.F. personnel in the trial. The antihistaminic drugs and control tablets for the experiment at Salisbury were kindly supplied by May & Baker Ltd., and Burroughs Wellcome & Co., and the supplies of thonzylamine used in the therapeutic field trials were specially made for the purpose by May & Baker Ltd., who also kindly provided the control tablets.

APPENDIX

Trials were carried out at the following establishments:

Trial Centres	Medical Officer in charge
Treasury, London	Dr. V. C. Medvei
G.P.O., London	Dr. E. M. Anderson; Dr. O. May
Ministry of National Insurance, Newcastle-upon-Tyne ..	Dr. S. E. McConnell
University of Leeds, School of Medicine	Dr. J. L. Broadbent
London School of Hygiene and Tropical Medicine	Dr. J. P. W. Hughes
Belfast Corporation	Dr. J. C. Stutt
Lever Brothers and Unilever Limited	Dr. D. S. F. Robertson
Anglo-American Oil Company Limited	Dr. G. J. Murray.
Richard Hodgson and Sons Limited	Dr. E. H. Thierry
Monsanto Chemicals Limited ..	Dr. H. R. Newman
Marks and Spencer Limited ..	Dr. Marjory Oldershaw
Harrods Limited	Dr. Margaret Dobbie-Bateman
Stanton Ironworks Company Limited	Dr. D. K. Cowan
I.C.I. Ltd. Metals Division, Birmingham	Dr. N. G. Marr
London Transport Executive ..	Dr. L. G. Norman
R.A.F. Centres (3)	Group Captain T. C. MacDonald
Central Public Health Laboratory	Dr. J. A. Harrington

REFERENCES

Andrewes, C. H. (1949). *Lancet*, **1**, 71.
Arminio, J. J., and Sweet, C. C. (1949). *Industr. Med.*, **18**, 509.
Brewster, J. M. (1947). *Nav. med. Bull., Wash.*, **47**, 810.
—— (1949). *Industr. Med.*, **18**, 217.
Council on Pharmacy and Chemistry, American Medical Association (1950). *J. Amer. med. Ass.*, **142**, 566.
Cowan, D. W., and Diehl, H. S. (1950). * Ibid., **143**, 421.
Criep, L. H., and Aaron, T. H. (1948). *J. Allergy*, **19**, 215.
Feller, A. E., Badger, G. F., Hodges, R. G., Jordan, W. S., jun., Rammelkamp, C. H., jun., and Dingle, J. H. (1950). *New Engl. J. Med.*, **242**, 737.
Friedlaender, S., and Friedlaender, A. S. (1948). *J. Lab. clin. Med.*, **33**, 865.
Gordon, J. S. (1948). *Laryngoscope*, **58**, 1265.
Hoagland, R. J., Deitz, E. N., Myers, P. W., and Cosand, H. C. (1950). *J. Amer. med. Ass.*, **143**, 157.
Murray, H. G. (1949). *Industr. Med.*, **18**, 215.
Paton, W. D. M., Fulton, F., and Andrewes, C. H. (1949). *Lancet*, **1**, 935.
Phillips, W. F. P., and Fishbein, W. I. (1949). *Industr. Med.*, **18**, 526.
—— —— (1950). Ibid., **19**, 201.
Schwartz, E. (1949). *Ann. Allergy*, **7**, 770.
Tebrock, H. E. (1950). *Industr. Med.*, **19**, 39.

TRIAL OF ANTISTIN IN THE COMMON COLD

BY

GERARD LORRIMAN, M.B.E., M.D., M.R.C.P.
Medical Adviser to Ciba Laboratories, Ltd., Horsham

AND

W. J. MARTIN, D.Sc., Ph.D.
(From the Medical Research Council's Statistical Research Unit, London School of Hygiene and Tropical Medicine)

Following American reports of the suppression of symptoms of the common cold by the prompt administration of antihistaminics, it was felt necessary to make a large-scale trial in the United Kingdom, adopting such controls as were practicable, in an endeavour to remove doubt concerning the efficacy or otherwise of the suggested treatment. "Antistin" (2-phenyl-benzyl-aminomethyl-imidazoline hydrochloride), synthesized by Miescher, Urech, and Klaren, of Ciba, was selected as suitable for such a trial because it is an antihistaminic of which favourable reports have been published in the treatment of allergic conditions such as urticaria, angioneurotic oedema, and hay-fever, and it has a comparatively low incidence of side-effects (Meier and Bucher, 1946; Britton, 1947; Overton, 1948).

The plan of the trial was based on that of the Medical Research Council's trial of patulin in the treatment of the common cold. Their report (1944) emphasized the following points in connexion with such a trial:

1. Since there is no reason to believe that the common cold is always or even usually due to the same agent either in sporadic cases or in different epidemics, it is necessary to include a large number of patients at several widely separated places, over a period long enough to exclude the possibility that a single prevalent epidemic is being studied.

2. Since the duration of colds is not constant but varies not only between different epidemics but also between different patients in the same epidemic, there must be a satisfactory series of control cases. This can be done only by ensuring that alternate cases at each centre receive a spurious treatment which to the recipient is indistinguishable from the genuine treatment.

3. The objective signs associated with the common cold are too variable to suffice as criteria of its presence or progress. A cold manifests itself mainly by subjective symptoms, and consequently diagnosis rests mainly upon the statements of the untrained patient.

Method

The trial was carried out in eight factories and one public school. These centres, comprising a total population of over 50,000, were widely scattered throughout the country. Antistin tablets (0.1 g.) and dummy tablets of identical appearance and practically identical taste were used, the latter having the following composition: lactose, 0.085 g.; quinine sulphate, 0.005 g.; starch, 0.031 g.; talc, 0.015 g.; and gelatin, 0.004 g. (The *British Pharmacopoeia* gives the effective dose of quinine sulphate as 0.3 to 0.6 g.)

It was arranged that none of the medical staff at any of the trial centres should be informed which tablets were active and which dummy. In order further to reduce the likelihood of identification, four letters were used instead of two (Q and S being dummy, and R and T antistin). The tablets were packed in cellophane containers, each container of nine tablets bearing one of the above four letters and instructions for taking the tablets.

It was originally intended that each patient should be seen by a doctor, but in three of the smaller trial centres there was none, and in some of the remainder it was impossible for the doctor to see all patients himself. Therefore many of the case record cards were completed by nurses or medical orderlies. Since the record was in the main simply the patient's own account of his symptoms there seemed to be no serious objection to this procedure.

So far as possible the investigation was confined to patients reporting within 24 hours of the onset of a cold. At the first examination, after recording the patient's name, occupation, etc., on a case record card, the relevant items among the following were ringed:

Duration of cold before first examination: 6, 12, 24 hours.
Nasal: Sneezing Discharge (clear, purulent) Obstruction.
Throat: Soreness Irritation Hoarseness Cough.
Head: Fullness Stuffiness Headache Lacrimation.
General: Malaise Pains Feverish.

At one centre, where all cases were seen by the doctor, the presence or absence of the following physical signs was regularly recorded: pharyngitis, laryngitis, tonsillitis, and sinusitis. The above scheme is by no means free from criticism, but it appeared to serve its purpose.

Successive patients received containers of tablets marked Q, R, S, and T, and the appropriate letter was noted on the case record card. Instructions were given to take two tablets at once, and thereafter one tablet every four hours except during the night. The patient was asked to report again after 24 hours, 48 hours, and one week, and at each interview the patient's own opinion whether the cold was cured, improved, or unaffected was recorded. The number of tablets taken was also noted. Not altogether surprisingly, the request to report three times during treatment met with only very partial success. The trial ran from November, 1949, until April, 1950.

Results

Therapeutic trials were carried out in nine centres, and the records of 1,744 patients were received from these centres. The numbers were 866 in the treated group and 877 in the control group, while for one person the group was not recorded. Of the treated group 379 and of the control group 366 reported after 24 hours, 48 hours, and seven days. Records for the remaining patients who reported once or more were completed for the first day after treatment for 318 in the treated group and 344 in the control group, for the second day after treatment for 245 treated and 249 controls, but only 23 treated and 21 controls reported on the seventh day.

The method of alternative allocation to the treated and control groups gave two groups which were comparable with regard to initial symptoms. Table I shows that the distributions of symptoms at the first examination were very similar for the two groups.

TABLE I.—*Symptoms at First Examination*

	Treated		Controls	
	No.	%	No.	%
Nasal:				
Sneezing	528	61·0	553	63·1
Clear discharge	478	55·2	469	53·5
Purulent discharge	83	9·6	87	9·9
Obstruction	184	21·2	201	22·9
Throat:				
Soreness	283	32·7	233	26·6
Irritation	198	22·9	198	22·6
Hoarseness	155	17·9	139	15·8
Cough	329	38·0	293	33·4
Head:				
Fullness	152	17·6	158	18·0
Stuffiness	358	41·3	370	42·2
Headache	299	34·5	287	32·7
Lacrimation	98	11·3	104	11·9
General:				
Malaise	146	16·9	105	12·0
Pains	79	9·1	91	10·4
Feverish	85	9·8	87	9·9
Physical signs*:				
Pharyngitis	106	12·2	119	13·6
Laryngitis	13	1·5	9	1·0
Tonsillitis	19	2·2	15	1·7
Sinusitis	38	4·4	30	3·4

* Recorded in one factory only.

The results for the patients who reported on each of the three days are shown in Table II. On each day the proportion recovering was slightly smaller in the treated than in the control series, but none of the differences is statistically significant.

TABLE II.—*Results for Patients who Reported on Each of Days 1, 2, and 7*

	Day 1		Day 2		Day 7	
	Treated	Controls	Treated	Controls	Treated	Controls
Cured	6	9	56	68	168	163
Improved	208	215	213	203	121	120
No effect	165	142	110	95	90	83
Total	379	366	379	366	379	366
% cured:						
Treated	1·6		14·8		44·3	
Controls	2·5		18·6		44·5	
Difference	−0·9		−3·8±2·7		−0·2±3·6	
% cured and improved:						
Treated	56·5		71·0		76·3	
Controls	61·2		74·0		77·3	
Difference	−4·7±3·6		−3·0±3·3		−1·0±3·1	

The experience of the patients with incomplete records is shown in Table III. In this group the controls also showed a statistically insignificant advantage over the treated.

TABLE III.—*Results for Patients with Incomplete Records*

	Day 1		Day 2	
	Treated	Controls	Treated	Controls
Cured	8	9	31	39
Improved	169	191	127	142
No effect	141	144	87	68
Total	318	344	245	249
% cured:				
Treated	2·5		12·7	
Controls	2·6		15·7	
Difference	−0·1		−3·0±3·1	
% cured and improved:				
Treated	55·7		64·5	
Controls	58·1		72·7	
Difference	−2·4±3·9		−8·2±4·2	

No direct or indirect questions were asked concerning possible side-effects. The number of patients who had conditions which they attributed to the treatment was too small for detailed analysis, for only 14 in the treated group and 13 in the control group complained that the tablets had any adverse effects. Most of the symptoms described could in fact have been symptoms of the cold.

Conclusion

A large-scale trial of antistin failed to show that this drug had any effect on the course of the common cold.

We are greatly indebted to the managements and medical staffs of the centres where the trials were carried out, and we should like to thank the following people in particular for their co-operation and assistance: Dr. G. G. Crisp; Mr. L. Ellis, of Messrs. James Townsend and Son, Ltd., Exeter; Dr. T. England, of Messrs. Currans, Ltd., Cardiff; Dr. J. V. Manning, of Messrs. Pilkington Brothers, Ltd., St. Helens; Mr. J. E. Olsen, of the Ministry of Supply, Military Engineering Experimental Establishment, Christchurch; Dr. M. W. Robinson, of Metropolitan Vickers Electrical Co., Ltd., Manchester; Dr. Philip Ross, of the Morgan Crucible Co., Ltd., London, S.W.11; Miss Kathleen Stott, of Messrs. Beatson, Clark and Co., Ltd., Rotherham; and Dr. J. Magill Young, of the Brush Electrical Co., Ltd., Loughborough.

REFERENCES

Britton, C. J. C. (1947). *Lancet*, **2**, 870.
Medical Research Council (1944). Ibid., **2**, 373.
Meier, R., and Bucher, K. (1946). *Schweiz. med. Wschr.*, **76**, 294.
Overton, J. (1948). *British Medical Journal*, **1**, 874.

EARLY CLINICAL MANIFESTATIONS OF DISSEMINATED SCLEROSIS

BY

DOUGLAS K. ADAMS, M.D., F.R.C.P.

JOHN M. SUTHERLAND, M.D.
(From the Western Infirmary, Glasgow)

AND

W. 'BELL FLETCHER, F.S.S.
(From the Nuffield Bureau of Health and Sickness Records, Glasgow)

The object of this investigation was to determine which clinical features of disseminated sclerosis are of most diagnostic value, with special reference to the paramount importance of early recognition. The report is based on an analysis of 389 cases of disseminated sclerosis, 79 of which were investigated in a medical ward in the Western Infirmary, Glasgow.

Although not directly concerned in this report with the aetiology of disseminated sclerosis, we would suggest, as does McAlpine (1946), that the evidence in favour of the infective nature of the disease is increasing. Such a contention is strengthened by the recent work of Steiner (1941) and of Margulis and his associates (1946). Campbell and his colleagues (1947) and Campbell (1947) re-emphasize the possible relationship between disseminated sclerosis and agricultural exposure, previously referred to by Morawitz (1904), Steiner (1918), Dreyfus (1921), Adams (1923, 1927), and Wilson (1927).

The diagnosis of disseminated sclerosis at an early stage is important from the point of view of treatment. If therapeutic measures are to be of benefit they must be employed before irreparable damage has been inflicted on the central nervous system. This will be equally true if and when the causal agent is known and specific treatment is available for its eradication. As stressed by one of us in 1923, the ideal hope for the future lies in prevention of infection of the individual by detecting the mode of transmission. Ferraro (1944) has suggested that, once the initial aetiological basis is established, additional factors, such as the development of antigens from the white or grey matter, may play a part in the progress of the disease or in its exacerbations. Bailey and Gardner (1940) have shown that antigenic substances can be derived from myelin sheaths. If such an allergic reaction should indeed occur the importance of early diagnosis and treatment is obvious. The most satisfactory standard of diagnosis will entail recognition of the disease at a monosymptomatic stage.

This standard cannot be achieved, however, until disseminated sclerosis is made known to the general public. It is surprising how infrequently the patient communicates the first symptom to a doctor. Unless the lay public are taught to appreciate the potential significance of such symptoms as temporary weakness in a limb, transient dimness of vision, and diplopia the latter part of Buzzard's (1897) criticism, "the full-grown disease is frequently not recognized, the infant disease practically never," must remain justified.

Early diagnosis depends on proper appreciation of the disease process. We would like to stress the concept that in its early stages disseminated sclerosis is a functional nervous disorder. It was emphasized by Head (1920) that "all disease of the nervous system manifests itself

in loss of function." "Functional" is not the antithesis of "organic," and is not a euphemism for "hysterical." Experience has shown that certain signs depend, commonly, on the destruction of particular parts of the nervous system. It must be appreciated, however, that these are, *per se*, signs of deranged function. In the early stages of disseminated sclerosis they may not be proof of irreversible changes in the central nervous system. Since it is perhaps only at this stage that complete cure can be hoped for, the disastrous policy of waiting for multiple signs and symptoms to become apparent is at once obvious. This paper is mainly concerned with emphasizing those symptoms and signs which appeared first in our series, with a view to the earliest possible recognition of the disease.

Diathesis of the Patient

An important aspect of the clinical recognition of disseminated sclerosis is an appreciation of the type of individual most often attacked by the disease. In the past there has been a tendency to study disseminated sclerosis from the point of view of the "seed" to the exclusion of the "soil." The causal agent of what is almost certainly an infective process may be extensively distributed in nature. The occurrence of the disease in a clinically recognizable form would then be conditioned by personal susceptibility, predisposing factors, or exposure to an overwhelming infection. Such a hypothesis presupposes the existence of subclinical forms of disseminated sclerosis. This possibility has been referred to by Schaltenbrand, and quoted by McAlpine (1946). As in neurosyphilis, there can be little doubt that disseminated sclerosis may exist in an asymptomatic form.

In one case in our experience a paretic curve to colloidal gold was noted in a pensioner suffering from hysteria and showing no clinical evidence suggestive of an organic basis. Four years later loss of the abdominal reflexes was noted. Six years after the colloidal-gold observation had been recorded the patient was admitted to hospital suffering from unmistakable disseminated sclerosis.

With regard to personal susceptibility, disseminated sclerosis occurs most commonly in the sympatheticotonic type of individual. This view has been expressed by Adams, Blacklock, Dunlop, and Scott (1924) and by Adams and Sutherland (1948). As pointed out by Purves-Stewart (1945) in another connexion, sympatheticotonia may be localized. McAlpine (1946) suggests that sympathetic stimulation, by causing a vascular disturbance in the central nervous system, may in some instances be responsible for the appearance of clinical signs. It is not unreasonable to suppose that the effects of such stimulation will be most marked in sympatheticotonic individuals. The occurrence of the disease in patients with a frankly vagotonic diathesis is rare in our experience.

In this series the occurrence of the disease in more than one member of a family has been exceptional. This was also the experience of Risien Russell (1910), Bramwell (1917), Adams (1923), and Wilson (1940). On the other hand, Curtius (1933) found more than one case of disseminated sclerosis in 6 out of 56 families investigated. McAlpine (1946) found a familial incidence in 5% of 143 cases, and Brain (1947) considers that some 5–10% of cases of disseminated sclerosis have a near relative similarly affected. In one case in our series, from a mixed farm in Ayrshire, the patient's father and uncle had died from disseminated sclerosis, whilst his cousin living on an adjacent farm was probably similarly affected. This series of four cases shows common familial and occupational factors.

Predisposing Factors

In 127 cases (32.6%) one or other of four factors preceded the first symptoms of disseminated sclerosis by a short period of time. In no instance did this exceed six months. By so doing, they might reasonably be regarded as predisposing to the illness. These factors were febrile illness (14.4%), trauma (10.5%), pregnancy (4.5%), and emotional upset (2.8%). The association of one of them together with a symptom such as weakness in a limb or diplopia should suggest the possibility of disseminated sclerosis.

Infection

A relationship between disseminated sclerosis and infection has been noted by many workers. Head (1920) observed that disseminated sclerosis not unusually begins with short attacks of what is called "influenza." Bramwell (1917) found this relationship in 28 of his 200 cases (14%). Wilson (1940) and McAlpine (1946) suggest 5% as the possible figure. As a transitory febrile illness may be readily forgotten by the patient, the value of statistical evidence on this point is difficult to assess. Brain (1947) grants that such an illness may be reasonably regarded as a predisposing factor, but considers the cause of the pyrexial reaction to be unknown. Collier and Adie (1933) emphasized the possibility that in some cases this reaction may be a febrile phase of disseminated sclerosis itself.

By analogy with syphilis it was thought that a febrile onset might be associated with a long latency of infection subsequent to the initial manifestation. Thus, Mattauschek and Pilcz (1913) and Browning and Mackenzie (1924) have observed that the course of syphilitic infection may be modified by an intercurrent infection. This possibility was investigated by relating the mode of onset to the duration of the period before the patient presented for treatment. The results obtained suggest that a febrile onset does not materially influence the subsequent course of the disease with regard to latency of infection or progression of the disease process. Of the 56 cases which gave a history of febrile onset, 13 (23.2%) presented for treatment within one year of the first recognizable manifestation of the disease, and 35 (62.5%) within five years. In the 293 cases in which no history of febrile illness was obtained the corresponding figures were 56 (19.1%) and 173 (59%).

Trauma

In 41 (10.5%) of the 389 cases there was a history of either accidental or surgical trauma occurring shortly before the first manifestation of disseminated sclerosis. In a further considerable number of cases a history of trauma preceding an exacerbation was obtained.

This relationship is noted, amongst others, by Marie (1895) and by Adams, Blacklock, Dunlop, and Scott (1924). It appears to exist in 5–10% of cases of disseminated sclerosis (Brain, 1930, 1947). Thus Bramwell (1917) noted the influence of trauma in 17 (8.5%) of 200 cases, von Hoesslin (1934) in 59 (11.4%) of 516 cases, and McAlpine (1946) in 8 (5.6%) of 142 cases.

The mode of action of peripheral trauma as a predisposing factor is not known and the various theories will not be discussed. It is worthy of mention, however, that Browning and Mackenzie (1924), observing that the existence of latent periods in disease is not peculiar to syphilis, consider that trauma may give rise to disturbed relations between the patient and organisms which have already been present for some time without causing an active lesion. In disseminated sclerosis it is possible that trauma may act by adversely influencing the antigen-antibody balance

mechanism in the central nervous system. Klauder (1947), investigating the relationship of trauma and herpes zoster, has afforded some evidence that trauma may light up a latent virus infection.

Pregnancy

The first symptoms of disseminated sclerosis occurred after childbirth in 19 (8.8%) of the 216 female cases. Many authors have referred to the deleterious effect pregnancy and parturition have on this illness. Mention of this is made by Gowers (1893). Risien Russell (1910) observed that pregnancy or parturition may be responsible for relapses or more rapid progress of the disease, and stated that the first symptoms of the malady are not infrequently observed in these instances.

The National Multiple Sclerosis Society (1947) considers that the onset of the disease or a relapse is precipitated in about 40% of female patients who become pregnant. Walshe (1947) refers to the possible ill effects of pregnancy on disseminated sclerosis, but considers that it is not uniformly deleterious, while Wilson (1940) emphasizes the difficulty of establishing a causal nexus between the two. We would suggest that pregnancy in disseminated sclerosis should be regarded as avoidable trauma, and that the occurrence after parturition of a symptom referable to dysfunction of the central nervous system calls for the closest clinical examination.

Emotional Upset

An emotional upset such as grief, worry, or fright preceded the onset of disseminated sclerosis by a short period in 11 cases (2.8%). This relationship has been referred to by Risien Russell (1911), Bramwell (1917), McAlpine (1946), the National Multiple Sclerosis Society (1947), and Adams and Sutherland (1948). Emotional upset may act by "accentuating or evoking phenomena previously existing" (Risien Russell, 1910) or by "reducing resistance" (Wilson, 1940). Emotional reaction may produce stimulation of the sympathetic nervous system, resulting in localized vascular phenomena. It is important to note that in this series patients were not questioned specifically about the occurrence of an emotional upset. The 11 cases concerned volunteered the information, and a note to this effect was made in the case record.

Age and Sex Incidence

Only the age incidence can be regarded as being of diagnostic significance. As will be seen from Table I, 271

Table I.—*Age Incidence at Onset of Disease in 389 Cases of Disseminated Sclerosis*

Age at Onset in Years	Private Series		Hospital Series		All Cases	
	No.	%	No.	%	No.	%
Under 20	22	7·1	5	6·3	27	6·9
20–24	48	15·5	10	12·6	58	14·9
25–29	56	18·0	19	24·1	75	19·3
30–34	61	19·7	19	24·1	80	20·6
35–39	46	14·8	12	15·2	58	14·9
40–44	33	10·7	11	13·9	44	11·3
45–49	14	4·6	1	1·3	15	3·9
50	11	3·5	2	2·5	13	3·3
Not stated	19	6·1	—	—	19	4·9
Total	310	100	79	100	389	100

(69.7%) cases were in the third and fourth decades of life. It is relatively infrequent for the first symptom of disseminated sclerosis to occur in a patient under 20 or over 45 years of age.

In this country female cases slightly predominate. Our figures of 216 (55.5%) female cases and 173 (44.5%) male cases are in accordance with results previously reported by Bramwell (1917), Adie (1937), Wilson (1940), and Brain (1947). Neither the age nor the sex of the patient was found to influence materially the initial symptomatology, with the exception that retrobulbar neuritis predominated in the younger age groups and motor weakness in the older. Thus in the 20–29 years age group of 133 patients, 28 (21%) suffered from transient loss or dimness of vision as a first symptom. In comparison, the 40–49 age group of 59 cases had four cases (6.8%) so affected. Similarly, paresis of one or more limbs was the initial manifestation of the disease in 61 (45.9%) cases in the 20–29 years age group, and in 37 cases (62.7%) of the 40–49 years age group.

Symptomatology

As emphasized by Adie (1932), the onset of disseminated sclerosis is sudden, if by "onset" the appearance of the earliest symptom is referred to. The first symptom is generally attributable to a single lesion in the white matter of the central nervous system. In most cases the initial symptom, after persisting for a variable time, disappears. This is followed by a more or less complete remission, during which time the patient feels in normal health.

An appreciation of those symptoms which suggest the onset of disseminated sclerosis is of fundamental importance. The earliest manifestations in 389 cases are recorded in Table II. It is apparent that the common early symptoms

Table II.—*Initial Symptoms in 389 Cases of Disseminated Sclerosis*

Symptoms	No.	%
Weakness in one lower limb	90	23·1
Weakness in both lower limbs	73	18·8
Temporary dimness or loss of vision in one eye	54	13·9
Diplopia	50	12·9
Paraesthesiae	34	8·7
Weakness in one upper limb	19	4·9
Weakness in one lower and one upper limb	16	4·1
Vertigo	15	3·8
Upset of micturition	11	2·8
General debility; exhaustion; weakness	4	1·0
Mental confusion; inability to concentrate	3	0·8
Pain in leg(s)	3	0·8
Pain in back	3	0·8
Weakness in all four limbs	2	0·5
Epileptiform attacks	2	0·5
Dysarthria	2	0·5
Unilateral facial paralysis	2	0·5
Loss of sensation over side of face; weakness of mastication	2	0·5
Staggering gait	2	0·5
Vomiting	1	0·3
Nervousness	1	0·3

are weakness in one or more limbs (51.4%), visual upset (26.8%), paraesthesiae (8.7%), vertigo (3.8%), and upset of micturition (2.8%). One or other of these symptoms was the earliest manifestation of disseminated sclerosis in 93.5% of cases. The figures obtained differ in no significant manner from those previously recorded by Wilson (1940), who reviewed the initial symptomatology in 539 cases from four series.

We should like to make further reference to the occurrence of acute retrobulbar neuritis in disseminated sclerosis. Owing to the long remission which may follow transient dimness or loss of vision in one eye, the accuracy of statistical evidence on the subsequent development of disseminated sclerosis after retrobulbar neuritis is difficult to assess. Gunn (1904) found that of 233 cases of primary retrobulbar neuritis 51 (21.9%) were due to disseminated sclerosis. Marburg (1920) reported that 14 (58.3%) out of 24 cases of retrobulbar neuritis subsequently developed disseminated sclerosis. Weill (1923) investigated 22 cases of retrobulbar neuritis; 12 were found to be suffering from disseminated sclerosis, and a further five subsequently developed the disease.

Adie (1932) examined 70 cases of retrobulbar neuritis within one or two weeks of onset. He found 31.3% of

these cases to be suffering from disseminated sclerosis, and in a further 41.8% the diagnosis was probably disseminated sclerosis. Thus in only some 26.8% was there no other suspicious symptom and no definite sign of organic nervous disease. Adie (1929) emphasized that "there is only one known, proved, common cause of this condition, and that is disseminated sclerosis." This fact was previously stressed by Adams (1927). We would suggest that as the primary chancre or secondary rash of syphilis need not portend neurosyphilis, so retrobulbar neuritis need not progress to widespread involvement of the central nervous system. It is nevertheless probable that almost every case of otherwise idiopathic retrobulbar neuritis is due to the causal agent of disseminated sclerosis.

Emphasis has rightly been placed on those initial symptoms which occur most commonly, and, by so doing, to some extent suggest the diagnosis. We would stress, however, that in some 5% of cases the first symptom may not in itself be suggestive of the onset of disseminated sclerosis. Thus we have encountered, as the first manifestation of the disease, mental confusion, pain in the back, pain in legs (each three cases, 0.8%), epileptiform attacks, facial paralysis, loss of sensation over side of face, dysarthria, and staggering gait (each two cases, 0.5%).

Potential Relationship Between Occupation and Initial Symptoms.—This aspect was investigated, but with the exception of brain workers difficulty was experienced in classifying the occupation of the 389 patients into clear-cut divisions. It is interesting, however, that the clearly defined group of brain workers showed the highest incidence of retrobulbar neuritis. It is known that in tabes dorsalis occupational overstrain of the eyes predisposes to optic atrophy.

Potential Relationship Between Initial Symptoms and Latency of the Disease.—Adie (1932) observed that very long remissions "up to 20 years or more" are not uncommon where retrobulbar neuritis is the first symptom. He considers, however, that similar remissions are not common after other modes of onset. This question was investigated by relating initial manifestations to the duration of the period before the patient reported for treatment. In some instances this period will refer to the rate of progress of the disease rather than to absolute latency of infection. Despite this, it seemed to constitute a reasonable basis for investigation.

A latent period of 15 years or more followed the initial symptoms in 31 cases (7.9%). The only initial symptoms to be followed by a latent period of such duration were dimness or loss of vision in one eye in 8 cases (14.8%), paresis in 19 (9.5%), and diplopia in 1 (2%). It would therefore be reasonable to suppose that, since these symptoms may be followed by such a long latent period in some instances, they may be the sole manifestation of disseminated sclerosis in a lifetime. As Adie (1929) suggested in connexion with retrobulbar neuritis, "If a remission should last for 24 years, why not 54?" It should therefore be stressed that a prolonged remission following the initial symptom does not in any way invalidate the diagnosis of disseminated sclerosis. A further manifestation may occur at any time, or the remission may last for a lifetime.

Later Symptomatology.—Table III lists the main symptoms in 389 cases on presenting for treatment. Most of these patients were suffering from multiple symptoms; in a few instances the disease was fully established. A noticeable feature is the frequency with which upset of micturition occurs in the later stages of the disease. As an initial symptom bladder control was defective in only 11 cases (2.8%). In comparison, on presenting for treatment 173 patients (44.5%) complained of some defect of micturition. In view of the nature of this paper further discussion on late symptomatology is unnecessary.

TABLE III.—*Main Symptoms in 389 Cases of Disseminated Sclerosis on Presenting for Treatment*

Symptoms	No.	Patients Affected %
Paresis of limb(s)	368	94·6
Upsets of micturition	173	44·5
Paraesthesiae	135	34·7
Diplopia	84	21·6
Dimness or loss of vision	57	14·7
Vertigo	32	8·2
Facial paralysis	12	3·1
Pain in legs	11	2·8
Pain in back	10	2·6
General debility	10	2·6
Headache	8	2·1
Disorder of speech	6	1·5
Loss of sensation over one side of face	4	1·0
Vomiting	3	0·8
Deafness	3	0·8
Epileptiform attacks	2	0·5
Difficulty in swallowing	2	0·5
Mental confusion	1	0·3

Examination of the Patient

It would be reasonable to suppose that, in the early phases of disseminated sclerosis, signs which by custom we speak of as being "organic" are minimal. As previously emphasized, however, these signs are in reality evidence of disturbed function and not of structural change. Thus even in the earliest stages of disseminated sclerosis signs occur which are of fundamental importance in differentiating the disease from hysteria. This difficulty in distinguishing early disseminated sclerosis from hysteria was stressed by Buzzard (1897) in the following words: "In its infancy . . . the name given to disseminated sclerosis is hysteria." Further, it must be remembered that in all the phases of disseminated sclerosis hysterical manifestations complicate the clinical picture. Brain (1930) has observed that hysterical symptoms occur more often with disseminated sclerosis than with other organic diseases of the nervous system.

The physical findings which will be referred to are largely based on the result of examination of cases in the hospital series. The majority of these patients were in the oligosymptomatic stage of disseminated sclerosis. We are of the opinion that these signs occur and are of equal significance in the earlier phase of the disease.

1. Mental State of the Patient

The frequent hysterical overlay in cases of disseminated sclerosis has already been mentioned. Cottrell and Wilson (1926) stressed as being of diagnostic importance the triad of change in prevailing emotional disposition, change in emotional expression and control, and change in sense of physical well-being. Since available records were inadequate, no statistical analysis of this aspect was undertaken. Our impressions, however, are in accordance with the conclusions of these authors.

2. Neurovascular Phenomena

Vasomotor symptoms are common in patients with disseminated sclerosis. Thus cold hands and feet, acroparaesthesiae, and chilblains are often encountered. Erythromelalgia occurred in one case. Purves-Stewart (1945) observes that this condition may be one of the earliest signs of organic spinal cord disease such as disseminated sclerosis.

We have been impressed by the fact that weakness in a limb is often associated with a lowered skin temperature in that limb. It is possible that cutaneous angioneurosis may be an expression of "the soil" which predisposed to the development of disseminated sclerosis. Vasomotor instability of the extremities in disseminated sclerosis has also been referred to by Langworthy (1948).

3. The Eyes

We have found that three ocular signs have an important diagnostic value in disseminated sclerosis. This triad consists of imbalance of the ocular muscles, mydriasis, and hippus.

The ocular imbalance does not amount to strabismus, which in our experience is infrequent; it rather suggests a somewhat dissociated action of the extrinsic muscles of the eyes.

The pupils are generally larger than the average. In only five cases (6.3%) of the hospital series were the pupils myotic. Associated with this is the fact that the pupils are unduly mobile. The reaction to light is generally brisk. In only two cases (2.5%) was the light reflex absent. Similarly, the reaction of the pupil to near vision was found to be brisk in 74 cases (93.7%). The occasional occurrence of paralysis of accommodation has been referred to by Kinnier Wilson (1940), and was observed in three cases (3.8%) of the hospital series. In no instance were the requirements of the Argyll Robertson pupil fulfilled.

In a considerable number of cases the phenomenon of hippus was observed. Lagrange and Marquezy (1924) have referred to the occurrence of hippus in disseminated sclerosis, but it is felt that its presence is not accorded enough importance in textbooks or in teaching.

Gowers emphasized the difficulty in distinguishing between cases of disseminated sclerosis and neurosyphilis. We would suggest that the association of ocular imbalance, mydriasis, and hippus in disseminated sclerosis is of considerable importance in the differential diagnosis of these two conditions. With regard to other ocular manifestations, the pupils are not infrequently unequal and sometimes irregular. Nystagmus occurred alone or in combination with other components of Charcot's triad in 38 (47.9%) of the 79 hospital cases. The "characteristic" ophthalmoscopic picture is that of pathological pallor of the temporal half of the optic-nerve head. Such was found in only 13 (16.5%) of the hospital series. This figure is very low compared with that of "over 50%" suggested by Brain (1947). It closely approximates, however, to the incidence of symptoms referable to retrobulbar neuritis which occurred in 13.9% of the total series as a first symptom. Further, it is our experience, as it was of Adie (1932), that retrobulbar neuritis occurs relatively infrequently after the disease is established. In our series pathological temporal pallor of the optic disk was not present in a high proportion of cases; the absence of this feature should in no way cast doubt on this diagnosis.

4. Knee-jerks

Of the various tendon reflexes, particular diagnostic importance attaches to the knee-jerks. These were regarded as normal in only 7 (8.9%) of the 79 hospital cases. The knee-jerks were unequal in 36 patients (45.5%). In no patient in this series were these reflexes abolished.

5. Abdominal Skin Reflexes

In the diagnosis of disseminated sclerosis the importance of the abdominal skin reflexes is evident from the fact that they were abnormal in 77 patients (97.4%) in the hospital series. They were present normally in only two instances. In 69 cases (87.3%) there was bilateral loss of the reflex; in three (3.8%) unilateral loss was reported, and in five (6.3%) the abdominal reflexes were regarded as being readily exhausted.

The importance of the absent abdominal reflex was noted by Risien Russell (1910). Strümpell is quoted by him as finding them absent in 67% of 24 cases of disseminated sclerosis, compared with 13.5% in 185 persons with normal nervous systems. In Probst's series, quoted by Russell, the abdominal reflex was absent in 73% of cases. "The almost constant absence" of this reflex was emphasized by Adams (1921). Kinnier Wilson (1940) considered that suspicion of disseminated sclerosis should be attached to a case in which the abdominal reflex can be tired. Similarly, Purves-Stewart (1945) stresses the significance of absence or diminution of the reflex on one or both sides. Further, we would suggest that disseminated sclerosis should be suspected in a young patient whose abdominal reflexes do not share in the overactivity of the knee-jerks, should this latter abnormality be present.

Böhmig (1922), analysing 155 cases, considered that the addition of any single nervous physical sign to the combination of spastic phenomena in the lower limbs and the loss of the abdominal reflexes justifies the diagnosis of disseminated sclerosis, syphilis being excluded. This view is undoubtedly correct. It is emphasized, however, that spastic phenomena in the legs are not essential to the diagnosis. In a young adult the presence of a sign or symptom referable to a lesion in the white matter, associated with any of the abnormalities of the abdominal skin reflex mentioned above, should arouse suspicion of disseminated sclerosis. Wartenberg (1944) considers that the abdominal muscle reflex was of value in detecting a pyramidal-tract lesion "much earlier, better, and more surely" than the loss of the abdominal skin reflex. Such a view may be acceptable if significance be restricted to the loss of the skin reflex. If, however, the importance of the other abnormalities of the skin reflex be appreciated, it is felt that in disseminated sclerosis, at any rate, this reflex is at least of equal value in the early recognition of disturbed pyramidal-tract function.

The abdominal skin reflex was abnormal in several instances in which the plantar response was either equivocal or flexor. On the other hand, in no instance was an extensor plantar response associated with normal abdominal skin reflexes. An extensor plantar response (Babinski phenomenon) occurred in 66 cases (83.5%), in 8 (10.1%) it was equivocal, and in 5 (6.3%) it was flexor. In several instances Chaddock's sign has furnished evidence of pyramidal-tract dysfunction at a stage in which the plantar response was flexor or equivocal.

6. Adductor Spasm

We have found hypertonus of the adductor muscles of the legs to be the earliest manifestation of spastic phenomena in the lower limbs. As such, by constituting one of Böhmig's criteria, it is of value in the diagnosis of disseminated sclerosis.

7. Sensory Phenomena

The presence of signs referable to dysfunction of the posterior columns occurred in 37 cases (46.8%) of the hospital series. In this connexion, impairment of vibration sensibility was found to be the earliest manifestation of dorsal cord involvement. Loss of spinothalamic-tract function was unusual, and was found in only three patients (3.8%).

Summary

The symptoms and signs of 389 cases of disseminated sclerosis are discussed.

Weakness in one or more limbs was the first symptom in more than half the cases examined, while visual upset was the earliest manifestation in a further 26% of the patients.

The onset of the disease was found generally to occur in the age group 20–45 years, and when disseminated sclerosis is suspected in patients outside these limits other aetiological factors should be carefully considered.

For the development of disseminated sclerosis personal susceptibility is of importance, and in our experience the incidence of the disease is greatest in those with a sympatheticotonic diathesis.

Reference is made to those clinical signs which are of importance in distinguishing disseminated sclerosis from the manifestations of hysteria. In this connexion significance should be attached to the association of overactive knee-jerks and sluggish or readily exhausted abdominal skin reflexes. Other signs of diagnostic value are the mental state of the patient, the presence of neurovascular phenomena, and the triad of ocular imbalance, mydriasis, and hippus.

Stress is laid on the need for recognition of the disease before permanent damage has been inflicted on the central nervous system. Whatever advances in treatment the future may hold, the degree of recovery will depend on the stage at which a diagnosis is first established.

References

Adams, D. K. (1921). *Lancet*, **1**, 420.
—— (1923). *Glasg. med. J.*, **100**, 290.
—— (1927). *British Medical Journal*, **2**, 13.
—— Blacklock, J. W. S., Dunlop, E. M., and Scott, W. H. (1924). *Quart. J. Med.*, **17**, 129.
—— and Sutherland, J. M. (1948). *Surgo (Glasg. Univ. med. J.)*, **14**, 111.
Adie, W. J. (1929). *Proc. R. Soc. Med.*, **22**, 1257.
—— (1932). *British Medical Journal*, **2**, 997.
Bailey, G. H., and Gardner, R. E. (1940). *J. exp. Med.*, **72**, 499.
Böhtmig, W. (1922). *Dtsch. Z. Nervenheilk.*, **75**, 24.
Brain, W. R. (1930). *Quart. J. Med.*, **23**, 343.
—— (1947). *Diseases of the Nervous System*, 3rd ed., p. 500. Oxford Univ. Press, London.
Bramwell, B. (1917). *Edinb. med. J.*, **18**, 96.
Browning, C. H., and Mackenzie, I. (1924). *Recent Methods in the Diagnosis and Treatment of Syphilis*, 2nd ed. Constable, London.
Buzzard, T. (1897). *Lancet*, **1**, 1.
Campbell, A. M. G. (1947). *Quart. J. Med.*, **16**, 312.
—— Daniel, P., Porter, R. J., Russell, W. R., Smith, H. V., and Innes, J. R. M. (1947). *Brain*, **70**, 50.
Collier, J., and Adie, W. J. (1933). In *A Textbook of the Practice of Medicine* edited by F. W. Price, 4th ed., p. 1603. Oxford Med. Pub., London.
Cottrell, S. S., and Wilson, S. A. K. (1926). *J. Neurol. Psychiat.*, **7**, 1.
Curtius, F. (1933). *Multiple Sklerose und Erbanlage*. Thieme, Leipzig.
Dreyfus, H. (1921). *Z. ges. Neurol. Psychiat.*, **73**, 479.
Ferraro, A. (1944). *Arch. Neurol. Psychiat., Chicago*, **52**, 443.
Gowers, W. R. (1893). *Manual of Diseases of the Nervous System*, 2nd ed., **2**, 544. Churchill, London.
Gunn, R. M. (1904). *Lancet*, **2**, 412.
Head, H. (1920). *British Medical Journal*, **2**, 691.
Klauder, J. V. (1947). *J. Amer. med. Ass.*, **134**, 245.
Lagrange, H., and Marquezy, R. (1924). *Rev. Neurol.*, **1**, 712.
Langworthy, O. R. (1948). *Arch. Neurol. Psychiat., Chicago*, **59**, 13.
MacAlpine, D. (1946). *Brain*, **69**, 233.
Marburg, O. (1920). *Z. Augenheilk.*, **44**, 126.
Margulis, M. S., Soloviev, V. D., and Shubladze, A. K. (1946). *J. Neurol. Neurosurg. Psychiat.*, **9**, 63.
Marie, P. (1895). *Lectures on Diseases of the Spinal Cord*. New Sydenham Soc., London.
Mattauschek, E., and Pilcz, A. (1913). *Z. ges. Neurol. Psychiat.*, **15**, 608.
Morawitz, P. (1904). *Dtsch. Arch. klin. Med.*, **82**, 151.
National Multiple Sclerosis Society (1947). *Multiple Sclerosis, Diagnosis and Treatment*. New York.
Purves-Stewart, Sir J. (1945). *The Diagnosis of Nervous Diseases*, 9th ed. Arnold, London.
Russell, J. S. R. (1910). In Allbutt and Rolleston's *System of Medicine*, **7**, 809. Macmillan, London.
Steiner, G. (1918). *Neurol. Zlb. Referat.*, **37**, 535.
—— (1941). *Detroit med. News*, **32**, 7.
von Hoesslin, R. (1934). *Uber multiple Sklerose*. Lehmann, Munich.
Walshe, F. M. R. (1947). *Diseases of the Nervous System*, 5th ed., p. 180. Livingstone, Edinburgh.
Wartenberg, R. (1944). *Arch. Neurol. Psychiat., Chicago*, **52**, 341.
Weill, G. (1923). *Ann. Oculist., Paris*, **160**, 793.
Wilson, I. G. H. (1927). *British Medical Journal*, **2**, 1220.
Wilson, S. A. K. (1940). *Neurology*, **1**, 148. Arnold, London.

AFTER-HISTORY OF SUCCESSFULLY TREATED CASES OF SUBACUTE BACTERIAL ENDOCARDITIS

BY

HENRY MATTHEW, M.B., Ch.B., F.R.C.P.Ed.
Senior Registrar, Royal Infirmary, Edinburgh

The outstanding achievement of penicillin in overcoming infection in subacute bacterial endocarditis and in procuring a 65% cure (Christie, 1948) has presented new problems in prognosis. The immediate prognosis has received much attention, and an evaluation of the facts on which it may be based has often been presented (Jones *et al.*, 1947; Christie, 1946, 1948, 1949). The long-term influence of the infective process on the heart has naturally not received equal attention owing to the relatively short time since successful treatment of the infection was initiated. As penicillin has now been available for the treatment of subacute bacterial endocarditis since 1944 in America and since 1945 in this country, sufficient cases have been followed over a period of years for a tentative expression of remote prognosis to be offered.

Prognosis in rheumatic heart disease itself is always difficult owing to the tendency to additional damage due to relapse or reinfection, *ouvert* or subclinical. When it is appreciated, as Matthew and Gilchrist (1949) and MacIlwaine (1947) have shown, that the bacterial infection is frequently engrafted on a heart the seat of concomitant active rheumatic carditis, the difficulties of the assessment of the prognosis in subacute bacterial endocarditis will be seen to be further increased. Therefore prognostication of the after-effects of a bacterial infection engrafted on such a background cannot be easy, nor is it likely to be accurate. Deterioration will be difficult to ascribe either to the natural trend of the original rheumatic infection (DeGraff and Lingg, 1935) or the occurrence of rheumatic relapse, or to the after-effects of successful penicillin therapy for the superimposed bacterial infection. Despite such difficulties, it is important to know the fate of survivors from a disease which up to six years ago carried a 96% mortality (Lichtman, 1943).

Of a total of over 40 patients treated for subacute bacterial endocarditis, 20 have been cured for 27 months or longer. These 20 unselected patients provide the information on which assessment of remote prognosis is based. These patients have been closely followed up for periods varying from 2¼ to 5¼ years. Since discharge from hospital no survivor has relapsed or become reinfected, although at least one has had a further attack of rheumatic fever. The absence of relapse or reinfection is noteworthy, as Christie (1949) has indicated that the incidence of delayed relapse is of the order of 2% per annum.

A severe infection of the endocardium and myocardium, often of six months' duration before being arrested, is likely to lead to further cardiac damage. Apportioning of the degree of damage by the bacterial infection, in a heart already the seat of rheumatic or congenital pathology, is difficult for the reasons already advanced. Deterioration, if noted, cannot invariably be ascribed to the healing of the bacterial infection, as the relentless progress of the underlying rheumatic lesion will, especially in the elderly patient, contribute to a greater or less extent.

The cardiac efficiency of successfully treated cases can best be assessed by a study of three factors: (1) a comparison of the patient's capacity for effort before infection and after recovery; (2) changes in the heart size as noted radiologically; (3) the detection of physical signs indicative of new valvular lesions or an increase in the severity of established lesions.

Exercise Tolerance

Table I shows the comparison of cardiac grade (New York Heart Association, 1939) before and 2¼ to 5¼ years after treatment. The preponderance of cases with good

Table I.—*The Cardiac Grade Before and After Treatment*

Cardiac Grade	Before Infection	After Infection	Died
1	11*	11†	—
2a	7	7*	1
2b	2†	0	—
3	0	1	—

* One deterioration. † One improvement (congenital heart).

exercise tolerance before acquiring infection is in accordance with the findings of Libman and Friedberg (1948) that subacute bacterial endocarditis rarely occurs in the presence of advanced rheumatic heart disease. The information in Table I is revealing. Of 11 cases in Grade 1 (symptom-free before treatment) only one has shown deterioration in capacity for exertion, and that only to a slight extent. In seven patients classified as Grade 2a before the bacterial infection was acquired no deterioration was observed with the passage of the years.

One patient with congenital pulmonary stenosis was convinced that his exercise tolerance had improved considerably subsequent to the infection. In one patient, aged 34, classified as Grade 2b, further deterioration has become manifest by advancement into Grade 3 (congestive heart failure).

There has thus been a remarkable maintenance of capacity for effort in the survivors. All but two patients have resumed their former occupations or are now undertaking employment as strenuous as that prior to the onset of the infection. Of the two patients not working, one developed a right-sided hemiplegia during treatment and, although employable, has not yet been suitably placed; the other, in Grade 3, is naturally unfit for work. The occupations of the survivors range from busy housewife to general labourer, farm-worker, electrician and shop-assistant.

Four female patients have married since their illness, two have borne children without difficulty, and one is healthy at the sixth month of pregnancy at the time of review.

The degree to which subjective evidence of increased myocardial damage is absent is remarkable. Investigation of the second factor of assessment—x-ray examination for alteration in heart size—tends to substantiate the subjective evidence of lack of permanent damage from the infective process.

Heart Size

X-ray records were available of the size of the heart in two instances shortly before the onset of infection. In the remaining cases the heart size was assessed in the postero-anterior and both oblique views, if possible during the first week in hospital. This latter time of examination naturally varied with the duration of infection before admission. The variation, however, does not appear to confuse the deductions that can be made.

All patients had radiographs taken at the time of their follow-up, and the heart size was compared with that before or early in the infection (Table II).

The grades of heart size employed are: normal; slight enlargement, for a heart having one or more chambers just outside the limits of normal; one "plus" for a heart definitely enlarged in one or more chambers; and two "plusses" for a grossly enlarged heart. In only four instances did the heart enlarge during or after subsidence of the infection. No heart which was normal in size before treatment subsequently enlarged; increase, if it did occur, took place in a heart already enlarged to some degree.

Table II.—*Change in Size of Heart Found at Follow-up. In Only Four Instances has the Heart Enlarged*

Heart Size	Before or Early in Infection	At Follow-up			
		Normal	Slight	+	++
Normal	5	5			
Slight enlargement ..	10		8	1	1
+	5			3	2

Investigation of the four cases with evidence of change in heart size shows that the enlargement has not been slowly progressive over the years since cure. It occurred to its greatest extent during the weeks of penicillin treatment, and thereafter the size has remained almost stationary. It may be noted in passing that in no instances did the heart enlarge during treatment, only to regress during convalescence—a finding contrary to that of Jones *et al.* (1947), who report three cases showing enlargement which subsequently lessened, although only to a very slight extent. It is therefore assumed that, should the heart enlarge during treatment, it is likely to remain enlarged. That cardiac enlargement during the process of eradication of infection is the result of the bacterial infection cannot be certain. A concomitant rheumatic infection might as readily produce such a change in size.

Further investigation of the four cases with an increase in size shows no constant feature such as age, rhythm, valvular lesions, length of time prior to treatment, past or present rheumatic history, or electrocardiographic evidence of myocardial damage sustained during the bacterial infection, any of which might be responsible for the increase in size. Nor does the increase in heart size correlate with any deterioration in exercise tolerance except in one of the four cases—the patient formerly in Grade 2b and now in Grade 3 has considerable enlargement of the left ventricle and auricle. Jones *et al.* (1947) found that cardiac enlargement occurring at the time of, or subsequent to, treatment was usually associated with decreasing capacity for effort. There is therefore no doubt that heart size on termination of treatment is an important observation in assessment of remote prognosis. Although deterioration may not be evident, it is to be expected that the larger heart will fail earlier.

Fresh Valvular Damage

The finding of fresh evidence of valvular lesions in a heart the seat of rheumatic pathology cannot be ascribed solely to the bacterial infection and the healing process. However, Rosenblatt and Loewe (1945) and, Bloomfield *et al.* (1945) have demonstrated cases in which the mutilation of the valves immediately after penicillin therapy has been such as to constitute a grave mechanical handicap and to contribute materially to heart failure. In a series of fatal cases (Matthew and Gilchrist, 1949) no such destruction was evident at necropsy in 13 instances, except that in one case an aortic cusp had perforated as the result of the infection.

A comparison of the auscultatory findings at the outset of treatment and at the time of follow-up is presented in

TABLE III.—*Valvular Lesion Before and After Treatment. The Term "Mitral" is Employed to Cover Mitral Stenosis and Mitral Damage*

Valvular Lesion	Before Treatment	After Treatment
Mitral	9	8
Aortic incompetence and mitral ..	7	8
Aortic stenosis	1	Died
Congenital	3	3

Table III. In only one instance is there now evidence of additional valvular damage, aortic incompetence having appeared where previously mitral stenosis was the sole lesion. In three other patients the heart murmurs have permanently altered in character. This finding suggests that in these four instances it is probable that the healing of the infective process had some effect on the structure of the valve cusps.

Arrhythmias

Once again it must be emphasized that an alteration in rhythm cannot be attributed with any degree of certainty to the effects of the bacterial infection. However, three patients now suffer from occasional attacks of palpitation which have been shown by electrocardiogram to be due to paroxysmal auricular fibrillation. One additional patient has developed frequent ventricular extrasystoles. These arrhythmias do not disturb the patients unduly, but in one instance the cardiac grade has deteriorated to Grade 2a.

One Death

One patient died 29 months after treatment. He was 49 years old and was the only case of pure aortic stenosis in the series. He gave no rheumatic history, nor was there an aortic diastolic murmur or evidence of rheumatic heart disease, thus suggesting that he comes into the category of pure aortic stenosis (Kiloh, 1950). Death occurred from congestive heart failure of rapid onset and increasing in severity over the course of two months. There was no suspicion of reinfection or relapse of the bacterial infection, nor was there subjective evidence of active rheumatism. Details of his last illness when correlated with a history of effort pain for two years prior to acquiring the bacterial infection indicated death from congestive heart failure subsequent to ischaemic myocardial damage. As death occurred in the patient's home in the north of Scotland a post-mortem examination was not made.

Discussion

The significant prognostic features affecting the immediate outcome of a case of subacute bacterial endocarditis have been clearly enunciated (Jones *et al.*, 1947; Christie, 1948; Bramwell, 1948; Matthew and Gilchrist, 1949). Sufficient time has now elapsed since the availability of penicillin to suggest features of significance pertinent to the remote prognosis of this disease. The period since treatment does not permit of dogmatic statement, but points are now evident which, observed at the time of cure of the initial infection and subsequently, allow a tentative opinion to be expressed.

This disease, carrying in 1943 a 96% mortality rate (Lichtman, 1943), has had the immediate mortality rate reduced to around 30% (Wagner, 1948). Penicillin can unstintingly be credited with this remarkable improvement. As 25% of cases sustain myocardial damage of some magnitude during the infection (Seabury, 1947), it might be assumed that antibiotic therapy, in overcoming the infection, would leave the patient a cardiac cripple. That this does not pertain is amply demonstrated by a study of this series of 20 cases followed for 27 to 63 months. Apart from one death, deterioration in capacity for effort has been restricted to two instances; ten patients remain in cardiac Grade 1 before and after infection and six maintain a grading of 2a despite the infection.

Other investigators have had less encouraging results in the subsequent progress of their cases and have endeavoured to explain on various grounds the deterioration and, on occasion, death of their patients long after eradication of the infection. Kaplan *et al.* (1949), in a study of 18 cases followed up from 25 to 61 months after the infection was cured, found that in 12 instances the infection had behaved as an intercurrent process, the healing in no way aggravating the pre-existing heart disease. Of the remaining six cases, three had a greatly reduced exercise tolerance and three died of congestive heart failure. The severity of the underlying rheumatic infection might have brought about such developments; however, no information is given regarding the age, cardiac grade, or rhythm which might assist in determining this point. One factor common to these six cases and not noted in any survivor is that all had a high pulse pressure on termination of treatment or shortly afterwards. In five this was due to a severe degree of aortic incompetence and in the sixth to a patent ductus arteriosus.

Kaplan postulates that the healing of the infected valve under the influence of penicillin may induce a severer degree of aortic incompetence than would occur in the natural process of the rheumatic endocarditis. Rosenblatt and Loewe (1945) were early aware of this possibility. Kaplan emphasizes that the degree of aortic leak must be sufficient to cause a "dynamic" burden on the heart mechanism. In the series under consideration the one patient who died suffered from aortic stenosis and had no aortic regurgitation. He did, however, suffer from myocardial ischaemia.

Seven cases in this series had aortic regurgitation (Table III). In three the diastolic pressure shortly after the completion of penicillin therapy was below 60 mm. Hg and has since remained below that level. This could be considered as imposing a "dynamic" burden on the myocardium. None of these seven cases shows any deterioration in exercise tolerance. One patient, who had only an organic mitral systolic murmur at the end of treatment, now also has aortic regurgitation with a blood pressure of 134/60. Her cardiac grade has deteriorated from Grade 1 to Grade 2a. She also suffers from paroxysmal auricular fibrillation. Rapoport and Ellis (1948) report 11 cases studied two years after successful penicillin treatment. No deterioration occurred in the four cases of their series showing aortic valve involvement. The degree of valvular damage is not, however, stated. In fact, all 11 of their cases were "at least as well and as active, and some could do more," as compared with their condition before the bacterial infection.

Bramwell (1948) is inclined to vest the healing process under the influence of penicillin, at least in the instance of the mitral valve, with diagrammatically opposite powers to those of erosion and destruction. On the evidence of one patient who originally had aortic incompetence at the time of infection and who two years later developed mitral stenosis, and on the fact that in two other patients the electrocardiograph showed an increased tendency to right axis deviation, it was postulated that, in the process of healing, a stenotic lesion may develop or increase in severity at the mitral valve. The three cases mentioned were the only instances in which deterioration in exercise tolerance occurred in the 18 patients reported on two years after eradication of infection.

In my series no patient developed a stenotic valvular lesion, nor did stenosis once present tend to increase, although the patient dying of aortic stenosis may have been in this category. The alteration in the pitch of the mitral systolic murmur observed in three patients is not necessarily indicative of incipient stenosis. The development of right axis deviation can be attributed to the natural progress of rheumatic heart disease without evoking the healing process of the bacterial infection even as a contributory factor. Based on the slender evidence of one case in this series and another in which the infection has not been eradicated long enough, the effect of the healing process, at least on the pulmonary valve, seems to be the opposite of a stenosing tendency.

A boy aged 14 suffering from congenital pulmonary stenosis with superimposed subacute bacterial endocarditis was unable to trot the length of a football pitch before infection. Now, four years after infection, he can partake energetically in a game of football without undue breathlessness. This improvement cannot be the result of the natural evolution of pure pulmonary stenosis, the tendency in such cases being relentless deterioration (Allanby and Campbell, 1949). It would appear that the infection had freed the stenosis after the nature of a Brock (1948) operation. The other patient with infection eradicated from a stenosed pulmonary valve or infundibulum possesses a capacity for effort greater than she has enjoyed for years. Neither patient has a pulmonary diastolic murmur, only a systolic thrill and murmur at the base of the heart with conclusive *x*-ray and electrocardiographic evidence of the diagnosis. This evidence that healing of the infected process possesses destructive rather than fibrotic powers in the instance of the pulmonary valve has been noted by Pollack *et al.* (1948). As has already been shown, at least in this series, a similar development has fortunately not occurred in healing aortic valves.

Conclusions

In the vast majority of cases of subacute bacterial endocarditis it would appear that, provided the infection is overcome and congestive heart failure avoided at the time of treatment and shortly afterwards, the disease can be regarded as an incident which leaves little or no evidence of additional permanent damage in a heart the seat of congenital or rheumatic disease. In the few cases in which deterioration occurs, it may be anticipated if attention be paid to the following facts: the cardiac grade of the patient when the infection is acquired; the detection of a severe degree of aortic regurgitation after elimination of infection; and the heart size, radiologically, during and immediately after eradication of infection.

Summary

Twenty cases of healed subacute bacterial endocarditis have been followed for periods of between 27 and 63 months. No case relapsed or became reinfected after successful treatment of the bacterial infection. One death occurred.

The effect of the bacterial infection in two cases of congenital pulmonary stenosis is described.

The exercise tolerance, radiological heart-size, and auscultatory features at the time of treatment and after the lapse of years are compared and the significant points identified.

The patients providing the information for this paper were all under the care of Dr. A. Rae Gilchrist, to whom I am grateful for help and criticism.

REFERENCES

Allanby, K. D., and Campbell, M. (1949). *Guy's Hosp. Rep.*, **98**, 18.
Bloomfield, A. L., Armstrong, C. D., and Kirby, W. M. M. (1945). *J. clin. Invest.*, **24**, 251.
Bramwell, C. (1948). *Lancet*, **2**, 481.
Brock, R. C. (1948). *British Medical Journal*, **1**, 1121.
Christie, R. V. (1946). *British Medical Journal*, **1**, 381.
—— (1948). Ibid., **1**, 1.
—— (1949). Ibid., **2**, 950.
DeGraff, A. C., and Lingg, C. (1935). *Amer. Heart J.*, **10**, 459.
Jones, A. M., Herring, R., Langley, F. A., and Oleesky, S. (1947). *Brit. Heart J.*, **9**, 38.
Kaplan, S. R., Rosenman, R. H., Katz, L. N., and Brams, W. A. (1949). *J. Amer. med. Ass.*, **141**, 114.
Kiloh, G. A. (1950). *Brit. Heart J.*, **12**, 33.
Libman, E., and Friedberg, C. K. (1948). *Subacute Bacterial Endocarditis*, 2nd ed. Oxford Univ. Press.
Lichtman, S. S. (1943). *Ann. intern. Med.*, **19**, 787.
MacIlwaine, Y. (1947). *J. Path. Bact.*, **59**, 557.
Matthew, H., and Gilchrist, A. R. (1949). *Edinb. med. J.*, **56**, Trans. Med.-Chir. Soc., **128**, 25.
New York Heart Association (1939). *Nomenclature and Criteria for Diagnosis of Diseases of the Heart*, 4th ed. N.Y. Tuberculosis and Health Association.
Pollack, A. A., Taylor, B. E., Odel, H. M., and Burchell, H. B. (1948). *Proc. Mayo Clin.*, **23**, 516.
Rapoport, B., and Ellis, L. B. (1948). *New Engl. J. Med.*, **239**, 951.
Rosenblatt, P., and Loewe, L. (1945). *Arch. intern. Med.*, **76**, 1.
Seabury, J. H. (1947). Ibid., **79**, 1.
Wagner, B. M. (1948). *Amer. J. med. Sci.*, **215**, 84.

CONGENITAL MALARIA

REPORT OF THREE CASES

BY

B. S. JONES, M.D., F.R.C.S.Ed.

Surgical Specialist, Colonial Medical Service

A considerable divergence of opinion persists regarding the frequency with which congenital malaria may occur. That it is occasionally encountered there can remain no doubt. Jones and Brown (1924) reported two authentic cases in London, while cases have also been recorded by Beekel (1910), who describes 12 instances of undoubted placental transmission, by Tanner and Hewlett (1935), and by Van Nitsen (1932), who demonstrated malarial schizonts in the spleens of six infants, either born dead or dying soon after birth. Chen *et al.* (1944) have summarized 39 cases of congenital malaria from the world literature, while Wickramasuriya (1935) believes that transplacental foetal infection occurs more often than is normally conceded and records six proved cases of *Plasmodium falciparum* infection.

Most British and American authors, however, while recognizing the possibility of congenitally transmitted malaria, regard its occurrence as a rarity. Thus English (1946), who was in charge of a large maternity hospital in Singapore for 20 years, encountered only one case of congenital malaria amongst the 5,551 deliveries during 1938—a European infant aged 6 days.

During and since the recent war many European women have elected to produce their babies in Nigerian hospitals, and the possibility of congenital malaria has become a significant consideration. Since congenital transmission is still generally regarded as a remote contingency, a pyrexial illness in the first few days of life is more likely to raise suspicions of neonatal infection, while a convulsive seizure will more probably suggest an intracranial birth injury. Even less likely is the possibility of congenital malaria to be entertained in the cases of such women who return to the United Kingdom to have their babies. Therefore three cases personally encountered are recorded.

Most non-African labours in Lagos are conducted at the Creek Hospital, the patients being mainly Europeans, Syrians, or Lebanese of varying duration of residence in the country, though almost all may be assumed to have been subject to subtertian malaria at one time or another.

The occurrence of three confirmed cases of congenital malaria during February, 1949, suggested the possibility that certain of the neonatal deaths in earlier years might have been similarly caused. An investigation of the records, however, showed that of the four deaths occurring within the first 12 days of life in the course of the 143 deliveries conducted during 1947 and 1948 only one could possibly be attributed to congenital malaria. From January 1 to June 30, 1949, the period under consideration, there were 37 accouchements.

Case 1

An Englishwoman aged 29 had been resident in East Africa for some years, and was subject to periodic malarial attacks. She had arrived in Nigeria about one year previously, had taken suppressive quinine somewhat irregularly, but since arrival had had no overt attack of malaria. Her husband was English. She had two children, aged 6 and 4 years, her first labour having been prolonged and followed by subinvolution, the second being easy and normal. Throughout the present pregnancy she had been well, with the exception of one attack of cystitis. Her expected date was February 1, and she was admitted at 4.30 a.m. on February 11 with good pains, os dilated two fingerbreadths, a persistent occipito-posterior presentation, and premature rupture of the membranes. At 7.30 a.m. she was easily delivered of a healthy female infant. The maternal blood on admission showed no malaria parasites.

The infant remained quite well till February 13, when it was observed to be fretful and to be vomiting after feeds. At 2 p.m. that day the rectal temperature was 102.6° F. (39.2° C.); the mouth was healthy, the cord was clean, and the chest, cardiovascular system, and abdomen showed no abnormality, but the vulva appeared slightly inflamed, with a scanty thin purulent discharge. A blood smear was taken, and 5,000 units of penicillin intramuscularly three-hourly and 0.125 g. of sulphathiazole six-hourly were prescribed.

At 10 a.m. next day the blood smear was reported to contain scanty subtertian rings, and 2 gr. (0.13 g.) of quinine was given intramuscularly, and 1 gr. (65 mg.) of quinine orally three times a day was prescribed. At 4.30 p.m. the infant was very ill, with a poor slaty colour. At 6.30 p.m. there was a slight improvement; the spleen was found to be palpable and a further 2 gr. of quinine was given intramuscularly. At 9 p.m there were continuous convulsions and the condition was very poor. The infant, whose temperature was now 105° F. (40.6° C.), was sponged with tepid water, and 3 min. (0.18 ml.) of syrup of chloral was given, this being repeated at 9.30 p.m. At 11 p.m. convulsions had ceased, but diffuse moist rales were heard in the lungs: atropine, 1/600 gr. (0.11 mg.), was given and oxygen administered by oral catheter.

At 12.30 a.m. on February 15 the infant was asleep; the respirations were, however, irregular, and there appeared to be a one-in-three heart-block. At 8.30 a.m. she was quiet, the pulse and respirations were regular, but the temperature, which had been sustained, was 104.4° F. (40.2° C.), and 2 gr. of quinine was given intramuscularly. At 9 a.m. there was renewed respiratory and circulatory depression with cyanosis and occasional twitching of the upper limbs, and death occurred half an hour later. Necropsy was not performed.

Case 2

The mother, aged 37, and her husband were Europeans of French nationality. She had been resident in Nigeria for many years, and had had numerous bouts of malaria, though none recently, but took suppressive proguanil, 100 mg. daily. She had three children, the youngest aged 2½ years, and had had no miscarriages. All previous labours had occurred two or three weeks before the expected date, and all had been easy and rapid. She had been well throughout the present pregnancy and the expected date was March 4. Pains started at 5 a.m. on February 20. She was admitted at 6.30 a.m., and an easy rapid vertex delivery was completed by 7 a.m. The maternal blood showed no malaria parasites.

The infant, a healthy female, was bottle-fed from birth. The cord-blood smear, taken at birth, contained scanty subtertian rings, and ¼ gr. (32 mg.) of quinine orally three times a day was prescribed from birth.

At 2 p.m. on February 23 the baby appeared unwell and was vomiting. The rectal temperature was 101° F. (38.3° C.). At 11.15 p.m. 2 gr. of quinine was given intramuscularly. At midnight the vomiting was more severe; it was accompanied by hiccup, a slaty cyanosis, and some twitching of the arms and eyes.

At 1.15 a.m. the next day 3 min. of syrup of chloral was given. At 8.30 a.m. the condition had somewhat improved. The cord was separated cleanly, the chest and cardiovascular system showed no abnormality, but the liver edge was palpable and there was slight icterus. Quinine, 1½ gr. (0.1 g.), was given intramuscularly. At 3.45 p.m. the temperature was 102.8° F. (39.3° C.), the jaundice was deeper, the liver was enlarged to one fingerbreadth below the costal margin, and there were diffuse bilateral moist rales. Penicillin, 5,000 units intramuscularly three-hourly, was prescribed, but death occurred at 5 p.m. Permission for a full necropsy was not obtained, but a post-mortem hepatic puncture smear showed scanty malaria parasites.

Case 3

A Scotswoman aged 29, the wife of an African, had been resident in Nigeria for one year only and took daily suppressive quinine. She had two children, aged 3 years and 1 year 8 months, both labours having been easy, and had had no miscarriage. She had been well throughout the present pregnancy apart from an attack of malaria three weeks before delivery, when she was treated with 0.1 g. of mepacrine orally thrice daily for one week. Her expected date was March 4. She was admitted at 11.15 p.m. on February 25, and an easy vertex labour was completed one hour later. Her blood on admission showed no parasites, but from February 27 to March 1 she had slight pyrexia (99 to 99.8° F.—37.2 to 37.7° C.) accompanied by headache, which responded to a further course of oral mepacrine.

The infant was a healthy half-caste male, and the cord blood at birth contained scanty subtertian rings. On the day of birth, February 26, 3 gr. (0.2 g.) of quinine was given intramuscularly, and ¼ gr. thrice daily by mouth and proguanil, 25 mg. twice daily, were prescribed. Next day a further 3 gr. of quinine was given intramuscularly. On the 28th there was slight pyrexia, but the infant seemed to be well and was taking his feeds. The chest, abdomen, and cardiovascular system were normal, and the blood showed no malaria parasites. There was slight swelling of the left buttock, probably post-injection. Another 3 gr. of quinine was given intramuscularly. At 4.30 p.m. the baby was unwell, with slaty colour and vomiting, and 2 gr. of quinine was given intramuscularly. On March 1 there was rapid deterioration, with coffee-ground vomits, and death occurred at 5.30 a.m. Necropsy was not carried out.

Subsequent to Case 1 every expectant mother was prescribed, in addition to her customary daily suppressive, 400 mg. of proguanil daily, beginning 10 days before the expected date and continuing until admission in labour; a cord-blood smear was also taken at every birth and examined for malaria parasites. Of the 37 deliveries, the first six were not cord-tested: the 31 which occurred after Case 1 were all cord-tested at birth, and only Cases 2 and 3 showed positive smears. Placental smears were not examined as a routine, as it was felt that the universal daily suppressive habit would certainly invalidate the results.

Since my departure from the Creek Hospital there have been a further 23 deliveries during July and August, 1949, all infants being cord-tested at birth. Of these only one showed parasites in the cord blood: a febrile illness developed within a few days of birth, but responded to treatment. A second infant, despite a negative cord blood, developed high pyrexia 26 hours after birth, and was tentatively diagnosed on clinical grounds and therapeutic response as a case of malaria.

Discussion and Conclusions

Since the initial case of congenital malaria, three cord bloods in the course of the next 54 deliveries showed subtertian rings, and all three infants subsequently developed symptoms compatible with a diagnosis of malaria. Of the 51 infants whose cord blood smears were negative, only one developed suggestive symptoms. It is concluded that among non-indigenous European women of relatively low immunity, infected with the Lagos strain of *P. falciparum*, congenital transmission of malaria is by no means rare.

As regards predisposing causes, only one of the three mothers admitted to any recent malarial attack, so that placental transmission may occur in the absence of any overt maternal malarial bout during pregnancy. In all three cases the placenta was macroscopically healthy and intact, an observation which does not support Manson-Bahr's (1940) hypothesis that transmission to the foetus can occur only through a placental breach or defect.

There seem to be few effective precautionary or preventive measures. Thus regular suppressive procedures throughout pregnancy, here almost universal, did not seem to give reliable protection; nor, indeed, did a therapeutic course of proguanil, and in one case mepacrine, before delivery. It is, however, strongly urged that in the case of West Coast wives, whether delivered there or in the United Kingdom, the cord blood should be examined at birth as a routine.

Among the salient clinical features in these three cases was the fact that all three mothers were multiparous and past their first youth, being aged 29–37 years. Two had been long resident in the Tropics and previously subject to malaria, though admitting of no recent attack; while the third, a more recent arrival, had suffered an attack of clinical malaria three weeks before delivery. All labours were easy and rapid.

The intervals between birth, when the infants appeared healthy, and the onset of symptoms were 54, 77, and 60 hours, suggesting the possibility of a short-lived passive protection due to maternal antibodies. The earliest manifestations were pyrexia, vomiting of feeds, and a poor colour—a slaty pallor. Convulsions supervened later, and finally pulmonary oedema. One case exhibited hepatomegaly and jaundice, and one splenomegaly.

Quinine, intramuscularly and orally, in one instance combined with oral proguanil, proved quite ineffective. Subsequent experience of two cases of cerebral malaria in European infants under 6 weeks old suggests that intramuscular mepacrine is the treatment of choice and may be dramatically effective. In each case an intramuscular injection of 0.1 g. of mepacrine precipitated an alarming convulsive seizure within 15 to 20 minutes, followed by complete recovery. To avoid this very real danger the dosage should be sufficiently small and divided—0.03 g. daily being suggested as adequate—and preferably begun immediately on discovery of a positive cord blood.

The notable contrast between hyperimmune indigenous populations, among whom placental infection is exceedingly common but congenital malaria very exceptional, and non-indigenous individuals of low immunity, among whom placental infection is very rare but congenital malaria relatively less so, cannot be passed without comment. In Sierra Leone, Blacklock and Gordon (1925) found placental infection in 38% of indigenous deliveries, but consistently failed to demonstrate parasites in foetal cord or peripheral blood, though Walton (1947), in Freetown, found 0.32% of 2,154 newborn infants to be congenitally infected. Bruce-Chwatt (1949—personal communication), in Lagos, reports a 26% placental infection rate in 450 African women but no single case of congenital malaria. Peel and Van Hoof (1948), from the Congo, record that of 400 African mothers 60% showed malarial infection; infection of the placenta was found in 53.9%, and yet no case of congenital malaria was encountered among the 393 newborn infants. In marked contrast, Clark (1915), in Panama, while finding a significant proportion of infected placentas in the West Indian negroes, found none among the European women.

It is suggested that with the increasing degree of immunity to malaria the frequency of infection of the placenta rises, while coincidentally the efficiency of the placenta as a barrier to foetal transmission increases and the incidence of congenital malaria falls.

It is a pleasure to acknowledge my thanks to Dr. G. B. Walker, Director of Medical Services for Nigeria, for permission to publish this paper; to Dr. L. J. Bruce-Chwatt, Government malariologist, for much helpful information and advice; and to Dr. I. G. MacGregor, senior specialist, for information concerning cord-blood results subsequent to my departure from the Creek Hospital.

References

Beekel, F. (1910). *Cleveland Med. J.*, **9**, 879.
Blacklock, D. B., and Gordon, R. M. (1925). *Ann. trop. Med. Parasit.*, **19**, 327.
Chen, K. T., *et al.* (1944). *Chin. med. J.*, **62**, 199.
Clark, H. C. (1915). *J. exp. Med.*, **22**, 427.
English, J. S. (1946). *British Medical Journal*, **1**, 701.
Jones, J. L., and Brown, H. C. (1924). *Lancet*, **2**, 1058.
Manson-Bahr, P. H. (1940). Manson's *Tropical Diseases*, 11th ed., p. 61.
Peel, E., and Van Hoof, L. (1948). *Ann. Soc. belge Méd. trop.*, **28**, 413.
Tanner, N. C., and Hewlett, R. F. L. (1935). *Lancet*, **2**, 369.
Van Nitsen, R. (1932). *Ann. Soc. belge Méd. trop.*, **12**, 249.
Walton, G. A. (1947). *Ann. trop. Med. Parasit.*, **41**, 396.
Wickramasuriya, G. A. W. (1935). *J. Obstet. Gynaec. Brit. Emp.*, **42**, 816.

FATAL CASE OF POISONING DUE TO INHALATION OF METHYL BROMIDE

BY

A. C. MacDONALD, M.A., M.B., Ch.B.

I. C. MONRO, M.D., D.P.H.

AND

G. I. SCOTT, F.R.C.S.Ed.

Methyl bromide has been widely used of recent years in fire extinguishers for ships and aircraft, and in refrigeration plants. The dangers of exposure to this compound should therefore be better known than they are. For that reason we are reporting a fatal case with which we were concerned, and which arose from the scrapping of fire-extinguishers from aircraft engines.

Case Report

A man aged 21 was admitted to the Joint County (Fever) Hospital, Elgin, on December 2, 1947, at approximately 5 p.m. with a provisional diagnosis of meningitis. The history then available was that he had felt unwell at his work in the afternoon, had come home, had complained of headache, and quite suddenly at about 3.45 p.m. had had a convulsion, rapidly followed by others and by loss of consciousness. Subsequently it was learnt that the patient had been engaged on emptying and "cleaning" aircraft fire-extinguishers. The method employed was to perforate the lower end of the copper "bottle"—shaped like a vacuum flask—with a fireman's hatchet, and to let the vapour and fluid escape. Thereafter

the brass top was sawn off the bottle. Normally all this was done in the open air, but on the day in question there was severe frost, and the empty bottles were stacked in a shed and later cleaned there under cover. In the course of the morning's work, probably about noon, he had splashed a quantity of liquid methyl bromide over his clothes, a little of it reaching his face.

On examination the patient was having recurring convulsive seizures at the rate of about 10 a minute. These affected the jaw, back, both arms, and both legs, and were in the nature of clonic spasms. He was unconscious. An alcoholic odour in the breath was most pronounced. Attempts were made to control the spasms. Thiopentone was given, and, by adjusting the dose, control was effected for a few minutes at a time. During the first interval of freedom from spasm a further rapid examination was made, but there were no additional positive findings except that moist sounds were heard on auscultation of the chest. Samples of blood, urine, C.S.F., and stomach content were secured. The urine was blood-stained. A further dose of thiopentone at a later hour had the same effect. Between 10.30 and 11 p.m., after the intramuscular administration of paraldehyde had proved fruitless, 2 ml. of this drug was given intravenously, with 1/50 gr. (1.3 mg.) of atropine. This combination immediately controlled the seizures. In the course of the next few hours the general condition steadily deteriorated. Nikethamide was injected intravenously to combat respiratory depression, but large amounts counteracted the sedative action of the paraldehyde, leading to recurrence of the clonic spasms. The patient died at 5.15 a.m. on December 3.

At the necropsy on December 5 the stomach showed submucous haemorrhages at the distal end. The duodenum also showed submucous haemorrhages. The remainder of the bowel was normal. The liver, pancreas, and spleen showed no obvious changes. The chest cavity was normal in size; the pericardium was healthy; there was no evidence of valvular disease of the heart, and the heart muscle appeared healthy. The kidneys were very congested. The capsule stripped off easily; there was no evidence of inflammation of any duration, and the appearance of the cortex was in keeping with the condition of haematuria which developed on the night of the onset of illness. The brain showed no evidence of meningitis; the ventricles were normal; the surface of the brain was considerably congested and there were numerous small haemorrhages.

The appearances of the organs accorded with the absorption of an acute irritant poison which had caused submucous haemorrhages of the stomach and duodenum and had acted as a convulsant, causing congestion and haemorrhage of the cerebral cortex and acute congestion of the kidneys in the process of elimination.

Biochemical Findings.—Urine: a slight degree of albuminuria was found on direct examination; there were no other abnormal constituents. Blood: 30 mg. of NaBr per 100 ml. C.S.F.: No NaBr. Stomach contents: 30 mg. of NaBr per 100 ml. These findings suggest that a derivative of bromine was not the cause of death.

Discussion

Methyl bromide (CH_3Br) is a gas at normal temperatures, the boiling-point of the liquid being 4.5° C. (40.1° F.). It is a heavy gas, its weight being aproximately six and a half times that of air. Like chloroform, ethyl chloride, and carbon tetrachloride it is not inflammable. Its use as an agent for extinguishing fires depends on its weight, which leads to a blanketing effect and the exclusion of oxygen, or on its non-inflammability, which is utilized in aircraft engines, where it is played on the carburettor, thus lowering the flash-point of the petrol.

Poisoning by its agency was first noted in 1901, and up to 1940 a total of 42 cases had been reported in the literature. Of these, 12 were fatal, 23 recovered, and in the remaining 7 information was incomplete. From 1939 to 1944 an additional 22 cases were reported in the Royal Navy, with fatalities (Clarke *et al.*, 1945). Cases may have occurred among Air Force personnel, but under conditions of national emergency they would not be disclosed. Inquiry of R.A.F. medical personnel in the neighbourhood suggested that little was known of methyl bromide as a toxic agent.

Its mode of action depends largely on the concentration. If this is of the order of 10,000 parts per million the gas acts as a lung irritant. The victim seeks to escape, and if he does so the duration of exposure is unlikely to be sufficient to produce the chain of events described below. If he fails to escape, the signs, including post-mortem signs, are those of lung irritation, with haemorrhage and oedema of the lung and pleural effusion. Oxygen may be effective in treating this class of case.

If the concentration is in the neighbourhood of 1,000 parts per million the sequence described by Leschke (1934) is typical. After inhalation of the poison there are slight non-characteristic symptoms, such as headache, giddiness, fatigue, vomiting, and double vision. There is then a free interval of hours or even days, followed by the sudden onset of twitching, lockjaw, cramps, double vision, delirium, and raving madness. Leschke thinks that these symptoms are due to some intermediate metatoxic process, and not to the methyl bromide as such. In support of this view is the fact that methyl bromide has never been recovered from man or experimental animals. When death occurs in this class of case there has usually been some degree of pulmonary oedema and pleural effusion. Necrosis of the renal cortex is also a fairly constant sign. In only one other instance have we ascertained that haemorrhages into the cerebral cortex have occurred. This was one of a group of boys from an approved school who were living in a disused naval launch.

No curative treatment is known when convulsions have begun; indeed, in only one instance have we found a report of recovery after the onset of convulsions. Exposure to minimal concentrations of the order of 200–400 p.p.m. results in loss of appetite, nausea, headache, and muscular pains, the symptoms rapidly disappearing on cessation of exposure. Prolonged application of methyl bromide to the skin may lead to burning. It is clear, however, that this does not always happen, as workmen have used it to remove grease from their hands without ill effect. There is, in fact, a strong suggestion of idiosyncrasy.

One feature common to all the reported cases we have studied is its occurrence in an enclosed space, such as a ship, covered railway wagon, or workshop. In our case the actual opening was carried out in the open air, but the "cleaning" was done in a shed, and on a cold day. In our opinion this combination of circumstances led to imperfect emptying of the fire-extinguishers in the open air, with a consequent rise in the methyl bromide content of the shed to dangerous levels.

We wish to acknowledge our indebtedness to Dr. W. Fyffe Dorward, police surgeon, Dundee, for particulars of the cases from the approved school; to Dr. F. S. Fiddes, of the Department of Forensic Medicine, University of Edinburgh; to Dr. Hendry, of the Clinical Laboratory, Royal Infirmary, Edinburgh, for reports on the body fluids and other information; and to Professor S. Alstead, of Glasgow University, for help in the treatment of the case and advice in the preparation of this paper.

REFERENCES

Clarke, C. A., Roworth, C. G., and Holling, H. E. (1945). *Brit. J. industr. Med.*, 2, 17.
Leschke, E. (1934). *Clinical Toxicology*, p. 179. Churchill, London.

THE INTERNAL SPERMATIC FASCIA

WITH REFERENCE TO REPAIR OF INDIRECT INGUINAL HERNIA

BY

C. BRUN, F.R.C.S.

Chief Surgical Assistant, Salford Royal Hospital

The object of this communication is to stress the importance of a thorough exposure of the defect at the internal inguinal ring during the course of operation for repair of indirect inguinal hernia in adults. This step, which is usually dismissed all too briefly in descriptions of the operation, is an essential prerequisite to the performance of an accurate repair. A defect is always present in these cases but requires careful dissection to be clearly displayed, and it is obvious that unless this is done the repair can be only approximate and the risks of recurrence are thereby increased.

Hughes and Fathi (1948), in a short but clear and precise paper, have drawn attention to the same subject, but the manœuvre they advocate (see below) is not, in my experience, quite so easy as it sounds.

The operation referred to above is the one described, with slight modifications, by Ogilvie (1937), Edwards (1943), Lytle (1945), and others. On anatomical and pathological grounds it seems clearly to be the operation of choice. Its essential feature is the direct repair of the stretched internal ring after excision of the sac, without altering in any way the normal anatomy and mechanism of the inguinal canal.

But the difficulty is that the stretched ring is not immediately apparent; its margins are very indefinite and the transversalis fascia itself is not at all easy to identify. It is hoped to show that this difficulty can be overcome by the simple procedure to be described. At least I have found it extremely helpful in the course of some 200 operations.

Anatomy

It is necessary first to refer briefly to the anatomy of the internal inguinal ring. The ring is simply an opening in the transversalis fascia for the passage of the spermatic cord from the abdominal cavity into the inguinal canal. Lytle (1945) has shown that it is strengthened by an obliquely placed U-shaped fibrous sling over which the cord bends; but this is not really relevant to the present argument except to show that the normal ring has three well-defined margins—namely, superior, medial, and inferior—while the fourth one—that is, lateral or more precisely supero-lateral to the cord—is indefinite.

From the margins of the ring a tube of fascia—the internal spermatic fascia—is prolonged on to the cord, to which it closely adheres. In fact the cord does not pierce the transversalis fascia at all, but merely evaginates it at the internal ring (Fig. 1). The continuity of the internal spermatic fascia with the transversalis fascia makes it extremely difficult to decide what are the limits of the ring when viewed from the external aspect—that is, as seen at operation. Gray's *Anatomy* (1946) actually states: "This opening [the internal inguinal ring] is not visible externally since the transversalis fascia is prolonged on these structures [spermatic cord or round ligament] as the internal spermatic fascia." This observation can be easily verified on any normal subject in the post-mortem room and at every operation for inguinal hernia.

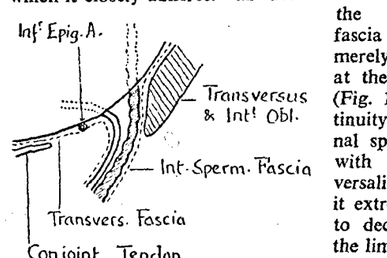


FIG. 1.—Diagrammatic horizontal section through the internal inguinal ring.

The Operation

When an indirect sac is present it is found to lie lateral and superficial to the cord, and always within the internal spermatic fascia. After the cord has been lifted out of its bed the fascial tube must be deliberately incised, and the sac may then be picked up with forceps and freed up to its neck by blunt dissection. It is excised as usual and the stump allowed to retract.

If the cord is now lifted up with slight traction and the conjoint tendon retracted outwards, the appearance will be more or less as shown diagrammatically in Fig. 2. The internal spermatic fascia will be seen to spread out funnel-wise as it approaches the internal ring, which at this stage is not visible. A rent is apparent in the fascia through which the sac was dissected, and is often reduced to a mere slit as the cord is lifted up. The stump of the sac will have disappeared within this rent. It is remarkable how this fascial tube, in spite of the rough treatment which it often receives during the dissection of the sac, becomes more or less accurately re-formed after the excision of the sac and maintains its attachments to the margins of the ring. Furthermore, the extent of the defect at the ring can be neither seen nor felt unless the finger is actually slipped through the rent just mentioned.

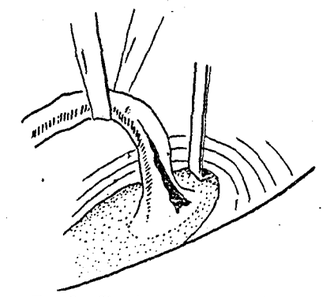


FIG. 2.—Showing appearance after the cord is lifted up with slight traction and the conjoint tendon is retracted outwards. The cremaster is omitted for the sake of clarity.

To expose the defect clearly and to display the margins of the ring, it is now necessary to divide the internal spermatic fascia all round the cord. It should be deliberately picked up with forceps and cut with scissors while gentle traction is exerted on the cord.

Slight difficulty may sometimes be experienced on the medial side of the cord, which is here tethered to the margin of the ring. The small cremasteric vessels are blamed for this by Hughes and Fathi. They stress the importance of these vessels, and state: "After the cremasteric vessels covered by their fascia have been exposed they are divided between silk ligatures. With the division of this 'ligament' the cord can be displaced laterally." However, I have never been able to expose them to my satisfaction, nor am I convinced that it is necessary to do so, because once the fascia has been divided the cord can be retracted laterally, and probably carries the vessels with it.

The stretched internal ring is now clearly displayed (Fig. 3), and usually admits the index finger easily. The cord is retracted laterally and the margins of the defect are approximated by interrupted sutures or a continuous suture medial to the cord. The newly reconstructed ring can in

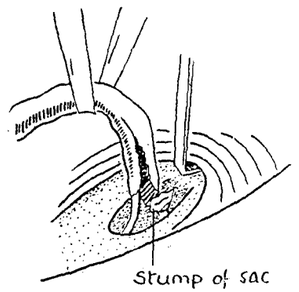


FIG. 3.—Showing the stretched internal ring.

fact be made as small as desired and should fit snugly round the cord.

In some cases the ring has been so stretched that its lower fascial margin is practically non-existent. In such cases the sutures may be anchored to Poupart's ligament inferiorly as described by Edwards, but even then it is usually possible with care to pick up with the needle a strand of tissue that will hold the stitches quite well just above Poupart's ligament and deep to the lower leaf of the cremaster.

Summary

The anatomy of the internal inguinal ring is reviewed.

The importance of a complete exposure of the stretched ring in operations for indirect inguinal hernia is stressed, and a simple method for ensuring this is described.

REFERENCES

Edwards, H. (1943). *Brit. J. Surg.*, **31**, 172.
Gray's Anatomy (1946). 29th ed. Longmans, Green, London.
Hughes, E. S. R., and Fathi, J. T. (1948). *British Medical Journal*, **2**, 135.
Lytle, W. J. (1945). *Brit. J. Surg.*, **32**, 441.
Ogilvie, Sir Heneage (1937). In Maingot's *Post-Graduate Surgery*, **3**. Medical Publications, Ltd., London.

Medical Memoranda

Parathion Poisoning

The increasing use of organic phosphorus insecticides has created a new occupational hazard to agricultural workers. Hunter (1950) has drawn attention to this group of compounds, which includes "parathion" (*para*-nitrophenyl-diethyl-thiophosphate), and has described casualties which have occurred elsewhere, although he noted that no cases of poisoning had been reported in Great Britain. Detailed information concerning organic phosphorus insecticides has been recorded by Goldblatt (1950), together with a description of the signs and symptoms of their toxic effects and the specific antidotal action of atropine. The case of parathion poisoning here recorded should serve to emphasize the nature of the risk, the importance of its prompt recognition, and the value of treatment with atropine.

CASE REPORT

A man aged 46 had been engaged for three weeks in preparing an insecticide spray for hops, using a commercial preparation containing 20% of parathion. The preparation was clearly labelled as to its poisonous nature, and workers were instructed to wear protective clothing.

On June 20, 1950, while preparing a lorry tankful of spray solution (24 oz. (680 g.) of the 20% preparation to 500 gallons (2,270 litres) of water), a drop of the 20% preparation splashed on to his forearm, covering an area about the size of a sixpenny piece. He washed it off with water within 30 seconds; this was at 4 p.m. Within a few minutes a raised weal appeared, but no further local injury. During the evening he remained well, took food, and smoked some cigarettes.

At 9.45 p.m. he experienced a sudden severe pain at the back of his head, spreading forward to the forehead. A few minutes later he vomited violently and developed persistent abdominal pain. This was soon followed by a feeling of weakness in the legs, after which he remembered nothing until the next morning in hospital.

He was admitted to Worcester Royal Infirmary at 11.25 p.m. Atropine, 1/60 gr. (1.1 mg.), had already been administered as a first aid, so that the pupils were dilated but reacting. The patient was very drowsy, sweating profusely, and appeared to have violent headache and abdominal pain; his pulse rate was 60 and of good volume; his blood pressure was 110/90; speech was slightly slurred; there was occasional muscular twitching in the upper and lower limbs; respirations were shallow but not distressed.

Dr. V. Keane (then house-physician) continued treatment with atropine sulphate, 1/75 gr. (0.87 mg.) intravenously; then 1/100 gr. (0.65 mg.) hourly for three doses; then two-hourly for two doses; then hypodermically hourly for three doses. In the morning the patient was rational and in the afternoon clinical examination showed him to be normal. He was discharged well on the fifth day after admission.

COMMENT

The patient's history, condition, and recovery on treatment with atropine are indicative of parathion poisoning. His statement indicates that he was aware of only trivial contact with the toxic material, but as parathion is a cumulative poison it seems likely that he had already absorbed and retained a harmful amount before the final intoxication, which was then further aggravated by smoking and by taking food.

The toxic action of parathion and related organic phosphorus insecticides is due to their inhibiting effect on the activity of choline esterase. Atropine is the specific antidote, but the order of dosage required may be much more than the usual therapeutic quantities. In this case a total of 11/100 gr. (7.1 mg.) of atropine sulphate was administered.

H. L. MILLES, M.A., M.R.C.P.,
Physician.
H. B. SALT, M.Sc., A.R.I.C.,
Royal Infirmary, Worcester. *Biochemist.*

REFERENCES

Goldblatt, M. W. (1950). *Pharm. J.*, **164**, 229.
Hunter, D. (1950). *British Medical Journal*, **1**, 506.

Auricular Fibrillation After Electric Convulsion Therapy

Transient cardiac irregularities are a recognized complication of the various forms of shock therapy employed in the treatment of the psychoses. The following case is of interest because of the prolonged duration of the arrhythmia.

CASE REPORT

A man aged 54 was admitted to hospital in October, 1949, suffering from an agitated depressive state of approximately 12 months' duration. His main complaints were insomnia, inability to concentrate, depression, delusions of guilt and unworthiness, and a feeling which recurred often, and for no reason that he knew, of being urged to strike out at those around him. His blood pressure varied between 230/130 and 150/100, for which fluctuation emotional factors seemed to be largely responsible. No cardiac irregularity or enlargement, tachycardia, or other abnormal physical signs were present clinically.

Electric convulsion therapy was given on alternate days, and was terminated after eight shocks, there being considerable improvement in his mental condition. However, after the last convulsion he complained of palpitation, and on examination

the pulse was irregular, the rate being 110 and the blood pressure 150/90. Electrocardiography confirmed the presence of auricular fibrillation and also showed a minor degree of left axis deviation. This condition persisted for four weeks, with little apparent discomfort to the patient, and then reverted to normal rhythm after quinidine sulphate, 5 gr. (0.32 g.) four-hourly, had been given for four days.

One week later feelings of depression and mental tension had returned. The blood-pressure readings varied between the extremes noted above. Radiological examination of the chest failed to show any definite cardiac enlargement. The electrocardiogram was normal apart from slight left axis deviation. The blood urea was 24 mg. per 100 ml. and the renal clearance (van Slyke) was within normal limits.

In consequence of the mental deterioration, two further convulsions were given at an interval of a week, being preceded on the first occasion by 7½ gr. (0.5 g.) of sodium amytal intravenously, which resulted in a fall of blood pressure from 230/130 to 150/100. For two minutes immediately following the clonic phase in this fit the pulse became irregular, a condition due apparently to premature beats, though electrocardiography was not available to confirm this. The blood pressure, after a transient rise to 180/100, remained within 2 or 3 mm. of 130/85 for 30 minutes afterwards. Oxygen was administered orally throughout.

In the second instance curarization was employed, 22 mg. of D-tubocurarine chloride preceded by 7½ gr. of sodium amytal being given intravenously. A similar fall in blood pressure was noted, but no irregularity. An electrocardiogram taken one minute after the clonic phase showed the left axis deviation and also nodal rhythm for two beats. Other changes were of the type described by Kauntze and Parsons Smith (1948), among others, and consisted of an increase in the height of P_2 and T_2 and depression of the S-T segment in Lead II.

Further convulsive treatment has not been given owing to the improved mental state of the patient.

We wish to thank Dr. E. U. H. Pentreath, medical superintendent of the Pastures Hospital, Derby, for permission to report this case.

P. M. O'FLANAGAN, L.R.C.P.&S.I., D.P.M.
R. B. TAYLOR, M.R.C.S., L.R.C.P., D.P.M.

REFERENCE

Kauntze, R., and Smith, G. Parsons (1948). *Brit. Heart J.*, **10**, 57.

Survival of a 16-oz. Baby

Only a few cases are on record of the survival of babies weighing less than 2 lb. (0.9 kg.) at birth. In a survey of the available literature I have been able to trace only six such cases.

De Lee and Greenhill (1943) recorded the delivery of a viable child 182 days after conception, and Ronaldson (1943) one after 189 days. Hoffman, Greenhill, and Lundeen (1938) reported the survival of a baby weighing 26 oz. (0.74 kg.) at birth. Bush (1947) reported the survival of a female infant born at the 27th week and weighing 24 oz. (0.68 kg.) at birth. Browne (1942) quotes the combined weights of the Dionne quintuplets, who were all girls, as 13 lb. 6 oz. (6 kg.), thus giving the average weight of each child as just under 2 lb. 11 oz. (1.2 kg.).

CASE REPORT

A healthy woman aged 31 had her last regular period on June 20, 1948, and there was a slight loss towards the end of July, 1948. She attended the antenatal clinic of the Civil Hospital when four months pregnant. She was well built and nothing abnormal was detected. She was instructed to return to the clinic in a month's time, but failed to do so.

On January 29, 1949, she returned and complained of swelling of the feet and hands which had been present for three weeks. There was no anaemia, albumin was not detected in the urine, and the blood pressure was 130/80 mm. Hg. Palpation of the uterus revealed the presence of three small nodular fibroids, and the fundus was higher than one would expect for the stage of the pregnancy. The woman was admitted to the maternity ward of the Civil Hospital for rest and treatment. She was then 26 weeks pregnant by her date. The day after admission she began to have labour pains, and a female child presenting by the vertex was delivered normally at 7 p.m. on January 30. The third stage was normal and the placenta showed no abnormality. The puerperium was uneventful, and the patient was discharged home on the eleventh day after delivery.

THE CHILD

At birth the infant was very feeble and did not cry. The air passages were cleared with the mucus catheter, and after injecting 1 ml. of nikethamide into the vein of the umbilical cord respirations became well established. The child weighed 1 lb. (0.45 kg.).

As an incubator was not available on the island, the child was wrapped up in cotton-wool and placed in an ordinary cot lined with blankets. The cot was kept warm with hot-water bottles. During the first four days she was fed by pipette with 2 dr. (7 ml.) of glucose water hourly and she took her feeds well. On the third day her weight was still 1 lb. On the fifth to the tenth days she was fed every hour with 2 dr. of expressed breast milk, diluted with its own volume of glucose water. The supply of breast milk then ceased. On the 16th day she weighed 1 lb. 10 oz. (0.74 kg.) and began to give feeble cries.

Since the infant would not tolerate breast milk from other sources, she was given artificial milk. From the 15th to the 38th days the baby was fed two-hourly with 2 dr. of condensed milk diluted with an equal volume of water. She then weighed 2 lb. 12 oz. (1.25 kg.). She was put on dried milk, and has been kept on it since.

The child has progressed satisfactorily, and her weight five and a half months after birth was 6 lb. 12 oz. (3.06 kg.). She was then receiving 4 oz. (114 ml.) of reconstituted dried milk three-hourly, and only six feeds are given in 24 hours.

In addition to her feeds, from birth she was given thyroid. sic., 1/10 gr. (6.5 mg.) daily for 45 days, and dienoestrol, 0.5 mg. daily for 69 days.

The measurements of the infant when only a few days old were:

Distance from crown to heel	13 in. (33 cm.)
Circumference of head	11 in. (27.9 cm.)
Circumference of shoulders	7½ in. (19 cm.)
Distance from umbilicus to pubes	¾ in. (1.9 cm.)
Distance from xiphisternum to umbilicus	1¾ in. (4.4 cm.)

X-ray examination of the foot on the 18th day after birth showed the presence of the ossification centres of the calcaneus and astragalus. The centres for the lower epiphysis of the femur and the upper epiphysis of the tibia had not appeared at that time. The femur was *x*-rayed again two months later (on the 81st day after birth) and the centre for the lower epiphysis was present.

I have not found any record of the survival of a child weighing less than 16 oz. at birth.

I wish to thank Dr. A. Rankine, Director of Medical Services, Mauritius, for permission to report this case, and Dr. Y. Cantin, medical superintendent, Civil Hospital, Mauritius, for his advice. Credit is due to Miss G. Davies, matron, Civil Hospital, for her tireless care and supervision and to the nurses of the Civil Hospital for their co-operation in the management of the infant. I would like to thank Mr. L. N. A. Planel, of Glaxo Laboratories Ltd., for supplying the milk powder and the vitamins.

H. FAKIM, M.R.C.S.,
Resident Medical Officer,
Civil Hospital, Mauritius.

REFERENCES

Browne, F. J. (1942). *Antenatal and Postnatal Care*, p. 146, Churchhill, London.
Bush, J. P. (1947). *Lancet*, **1**, 909.
De Lee, J. B., and Greenhill, J. P. (1943). *The Principles and Practice of Obstetrics*, pp. 41 and 96. Saunders, Philadelphia and London.
Hoffman, S. J., Greenhill, J. P., and Lundeen, E. C. (1938). Quoted by De Lee and Greenhill (1943).
Ronaldson (1943). Quoted by De Lee and Greenhill (1943).

Reviews

RARITIES

Further Rare Diseases and Debatable Subjects. Edited by F. Parkes Weber. (Pp. 236; illustrated. £1 5s.) London and New York: Staples Press.

This is a companion volume to the one by Dr. Parkes Weber published in 1946, which was welcomed as "a mine of interesting information which may well cause us to think." A further 39 rare diseases or syndromes are described here, and the book closes with a short article on zest in old age.

This is a stimulating volume, valuable to the collector of medical curiosities. Dr. Parkes Weber is well known not only for his abstruse medical knowledge but for his interest in diagnostic problems. The conditions described include such unfamiliar subjects as Sjögren's disease and illuminating accounts are given of more familiar occurrences, such as death while bathing. Those interested in the disturbances of lipoid metabolism will welcome the article on xanthomatosis and arterial atheroma. If "rarity enhances pleasures," many will delight to read this book.

G. E. BEAUMONT.

PSYCHOLOGICAL POLEMICS

Freud or Jung. By Edward Glover. (Pp. 207. 15s.) London: George Allen and Unwin. 1950.

The bewildered doctor who has heard a good deal about Freud and Jung, but has never been able to follow the technical jargon in which their teachings are expressed, may very likely approach this book with the hope that here at last is something which will clear up his ideas and give him new aids in understanding his patients. He will be disappointed, for he will have to be almost as profound a scholar as Dr. Glover himself to understand from this exposition what it is all about. Jung, he will learn, for instance, says that there is only one form of mental energy, which may in its widest sense correspond with *élan vital.* Freud says there are two forms, involved respectively in sexual appetites and instincts towards death and destruction. According to Dr. Glover the first view is false and the second correct, but it would puzzle the reader to understand the argument why.

In his sustained polemic Dr. Glover exposes the nebulosity, vagueness, and self-contradictoriness of the Jungian system, in which psychological, philosophical, and metaphysical elements are all combined. The reader will also be made aware that the Freudian system is much more concrete, closely knit, and logical. It is for that very reason that the Freudian feels that Jung is a threat. Individual Jungian conceptions can be disproved or shown to be meaningless, and other parts of his contribution to psychology may yet stand. If it were once accepted, however, that mental energy is unitary, the whole Freudian house of cards would be in danger of falling to the ground.

One of the faults of Dr. Glover's discussion is that he can find no defect in Freudian doctrine, no good whatever in that of Jung. In his final chapter he issues a serious warning to the eclectic—to the psychiatrist, doctor, or layman who wishes to choose for himself the "best" out of any or all schools. The Freudian system, it is laid down, must be accepted in whole or not at all. This is not the way in which science has progressed, nor is it necessary in the present case. It is perfectly possible to build new theories from fragments taken from Freud and Jung, and any such theory will prove itself less by its internal consistency than by its capacity for making predictions which prove true when subjected to the test of experience. "Who is not with me is against me" is the worst of mottoes for the scientist.

ELIOT SLATER.

TECHNIQUE OF HINGE GRAFTING

The Hinge Graft or Ginglymus Implant. By Arnold K. Henry, M.B.Dubl., M.Ch.(Hon.)Cairo, F.R.C.S.I. (Pp. 64; illustrated. 15s.) Edinburgh: E. and S. Livingstone. 1950.

This small book is about a method of stabilizing certain joints without having resort to arthrodesis. The technique consists essentially in placing a thin narrow strip of cortical bone, with its attached periosteum, longitudinally across each side of the joint to be stabilized. Rigid immobilization is avoided, and progressive movements in the desired plane are encouraged. The bony elements of the grafts break at or near the axis of movement, and a hinged osseofibrous "ligament" is formed along each side of the joint. It is claimed that these ensure lateral stability while permitting free flexion-extension movement. The method has been applied to the treatment of such conditions as instability or deformity of the foot after poliomyelitis, genu recurvatum, and flat-foot. Other possible applications are suggested. No attempt is made to draw definite conclusions from the small number of cases recorded: the author's object has been simply to present the idea and to leave the reader to judge for himself whether or not it is worth pursuing.

Clearly the book's appeal will be mainly to the orthopaedic surgeon. Remembering Professor Henry's masterly work, *Extensile Exposure Applied to Limb Surgery,* most readers will inevitably approach this new book with high expectations. Many will be disappointed. Some, indeed, may wonder whether the hinge graft is really worthy of a book to itself, or whether the author's purpose would not have been served as well by a succinct account of the technique published in an orthopaedic journal. The quality of some of the radiographs falls short of the standard that one has come to expect from this publishing house.

J. C. ADAMS.

FORENSIC MEDICINE

Medical Jurisprudence and Toxicology. By John Glaister, J.P., D.Sc., M.D., F.R.S.Ed. Ninth edition. (Pp. 755; 234 illustrations, 88 in colour. £1 15s.) Edinburgh: E. and S. Livingstone. 1950.

With indefatigable industry the author has kept the ninth edition of this well-known standard textbook thoroughly up to date. It has grown steadily to become a comprehensive source of reference rather than a medical students' handbook, for no student could be asked to measure the subject by this exhaustive standard. The text will nevertheless provide the graduate, specialist, or criminal bar with a sound and authoritative text which incorporates a remarkable amount of detail and reflects current writing over a vast field.

Glaister's painstaking revision includes much new statutory law—the National Health Service and National Insurance (Industrial Injuries) Acts, reviews of Pharmacy and Poisons Law, reference to the liability of hospitals and nursing-homes, to the legality of necropsy, and to artificial insemination. New writing on fingerprints, the coroner, Rh subtypes, blast and blunt head injury, D.D.T., beryllium, and radioactive substances, among innumerable new case histories and references to current literature, reflects Glaister's determination to keep abreast of forensic advances.

There is a danger that this desire for comprehensiveness will lead to a dichotomy of this valuable textbook—into sections on forensic medicine and toxicology—and this would be a serious disadvantage to the study of what is, after all, one subject. Something must be done to limit its growth: *R. v. Ruxton* could be usefully shortened from its 10 pages; many less pointed illustrative cases might be eliminated and arguments long disposed of be relinquished. The less common subjects such as thallium, copper, borax and cadmium, phosphorus, and fluorine might yield space to the more common. Arsenic can no longer lay claim to 14 pages when carbon monoxide achieves only six (and CO_2, D.N.O.C., or the methyl compounds only a paragraph). This is not a criticism of substance but a plea for a general contraction of what is a most valuable single volume lest it grow unmanageably bulky. "Glaister" remains a fine textbook, maintaining the deep-rooted Scottish traditions in the subject.

KEITH SIMPSON.

PROBLEMS OF PUBLIC HEALTH

Ecology of Health. The New York Academy of Medicine Institute on Public Health, 1947. Edited by E. H. L. Corwin, Ph.D. (Pp. 196. £1.) New York: The Commonwealth Fund. London: Geoffrey Cumberlege.

In 1947 the New York Academy of Medicine held, as part of its Centennial Celebration, an Institute on Public Health, and a number of papers dealing with a large variety of problems were presented. These, together with the discussions of the papers and with some other contributions, have been incorporated in this book to present a survey of modern knowledge and practice in such fields as genetics, maternal nutrition, animal and insect transmission of disease, climate and geography, preventive psychiatry, and public health services. Thus the volume covers a number of fundamental aspects of human oecology, and is concerned with the status of social medicine to-day and with the implications for much-needed research in the future.

The sections into which the material is divided vary considerably both in their comprehensiveness and in their attitudes to public health. In the first section is given a very full and interesting discussion on mutation, and many useful suggestions are made not only on the relation of mutation to mortality but on the effect on morbidity and on the application of genetic theory to public health. The chapter on animal and insect reservoirs of disease will interest workers in the field of public health as much as zoologists and bacteriologists; and the section on maternal nutrition gives a very thorough account of the importance of work being done.

There are necessarily many gaps in this book, not only in respect of the branches of public health which are omitted but in many of the sections given. Much could have been said on the relation of climate and geography to disease, and many useful lines of research could have been indicated. The chapter which discusses the preparation of professional workers is extremely brief, as are also other chapters towards the end of the book.

The accounts given of State and local health services will be of particular interest to many readers in Britain in view of the recent changes in health services in this country. In general, this volume contains such a variety of material and covers so much ground that there will be few readers who will not find in it matters of interest to them.

LILLI STEIN.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Biological Oxidation of Aromatic Rings. Biochemical Society Symposia No. 5. Edited by R. T. Williams. (Pp. 96. 8s.) Cambridge: University Press. 1950.

The British Encyclopaedia of Medical Practice. Edited by Lord Horder, G.C.V.O., M.D., F.R.C.P. Vol. 1. 2nd ed. (Pp. 786. 60s.) London: Butterworth. 1950.

Britannica Book of the Year, 1950. (Pp. 718. 50s.) London: Encyclopaedia Britannica. 1950.

The Law and Ethics of Dental Practice. By R. W. Durand, M.R.C.S., L.R.C.P., and D. Morgan, L.D.S. (Pp. 98. 7s. 6d.) London: Hodder and Stoughton. 1950.

The Atlases of Ophthalmoscopy, 1850-1950. By C. W. Rucker, M.D., and T. E. Keys, M.A. (Pp. 31. No price.)

The Scourge of Rheumatism. Report of a conference held by the British Rheumatic Association in September, 1949. Introduction by Lord Horder, G.C.V.O., M.D. (Pp. 85. 5s.) London: William Heinemann. 1950.

Principles of Ophthalmology. By T. Henderson, M.D. (Pp. 230. 20s.) London: William Heinemann. 1950.

Fainting: Physiological and Psychological Considerations. By G. L. Engel, M.D. (Pp. 141. 20s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Personality in Peptic Ulcer. By A. J. Sullivan, M.D., and T. E. McKell, M.D. (Pp. 100. 21s. 6d.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

The Management of the Patient with Severe Bronchial Asthma. By M. S. Segal, M.D. (Pp. 158. 27s. 6d.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Races: A Study of the Problems of Race Formation in Man. By C. S. Coon, Ph.D., and others. (Pp. 153. 21s. 6d.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Fortschritte der Geburtshilfe und Gynäkologie, 1. By W. Neuweiler and others. (Pp. 88. Swiss francs 9.) New York and Basle: S. Karger. 1950.

Le Développement de l'Enfant. By A. Gesell. (Pp. 55. No price.) Paris: Presses Universitaires de France. 1950.

Pars pro Toto. Breviarium Medicum Internationale. By A. Peyser. (Pp. 196. No price.) Stockholm: Almquist and Wiksell. 1950.

Chronic Carbon Monoxide Poisoning. A Study in Occupational Medicine. By A. Grut. (Pp. 229. Danish crowns 12.) Copenhagen: Ejnar Munksgaard. 1949.

Beitrage zur Anwendung der Isotopentechnik in Biologie, Klinik und Therapie. Edited by the Commission on Isotopes of the Swiss Academy of Medical Sciences. (Pp. 213. Swiss francs 15.) Basle: Benno Schwabe. 1950.

Säuglingsernährung. By A. Reuss. (Pp. 133. 13s.) Vienna: Springer. 1950.

Vorlesungen über Topographische Anatomie. By O. Grosser. (Pp. 254. 46s.) Vienna: Springer. 1950.

Unfallchirurgie im Röntgenbilde. By W. Ehalt. (Pp. 619. Schillings 180, M. 60, Swiss francs 60.) Vienna: Wilhelm Maudrich. 1950.

Lehrbuch der Gerichtlichen Medizin. By A. Ponsold and others. (Pp. 568. M. 49 or $11.65.) Stuttgart: Georg Thieme. 1950.

Bakteriologie und Serologie. By L. Hallmann. (Pp. 644. M. 29.70 or $7.) Stuttgart: Georg Thieme. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY AUGUST 19 1950

ANTIHISTAMINIC DRUGS AND THE COMMON COLD

The common cold has again come unscathed through an ineffective therapeutic attack. The hopes that were initially raised by reports of the value of antihistaminic drugs in the prevention and treatment of colds have received no further support. On the contrary, two reports in this issue of the *Journal* provide convincing evidence that these drugs have little or no effect on the course of a cold. It is not the first time that claims for new cures have proved to be groundless, but in this instance emotions have been aroused unnecessarily and tragedies have occurred which should have been avoided. The first report that antihistaminic drugs appeared to cut short the course of the common cold was that of Brewster[1] in 1947. Since then favourable results have been reported by Brewster in another series,[2] Gordon,[3] Murray,[4] and, notably, Arminio and Sweet.[5] All this work was done in the U.S.A., where, as in England, it was received with a certain amount of scepticism by the profession. Several drug manufacturers, on the other hand, accepted it, and the American public was urged to buy drugs in advertisements which featured such statements as "Sensational new discovery kills colds in hours." The public interest was so great that the Council on Pharmacy and Chemistry of the A.M.A. thought it advisable to review the evidence and issue a report.[6] Two of the papers reviewed were based on clinical impressions without the use of untreated controls, and in Brewster's investigations—which contributed more than half of the total patients studied—the statistics were open to important criticisms. For example, in one much-quoted experiment 20% of the treated cases were given drugs within the first two hours of the onset of symptoms, while only 9% of the controls were observed in this period. The council concluded that further experiment was required, preferably of the sort in which volunteers were inoculated with virus, and that "until a scientifically acceptable study is performed, the true effectiveness of the antihistaminic drugs in the control of the common cold cannot be evaluated." This conclusion created a mild sensation, and the council and the *Journal of the American Medical Association*—which had commented editorially on the council's findings—were berated for expressing their beliefs. It was, in fact, hinted that the medical profession was trying to belittle a cure which patients could buy across the counter without having to consult their physicians.

In the case against the treatment of colds with antihistaminic drugs evidence has since been provided by Cowan and Diehl,[8] who, in a carefully controlled study of students at Minnesota University, obtained the same results in the treatment of colds with a placebo containing citric acid as with phenindamine tartrate, tripelennamine hydrochloride, or ascorbic acid. It is just as well that studies should also have been undertaken in this country, though there has been less public interest in this medical nine-day wonder. To-day we publish the report of a committee of the Medical Research Council on two complementary types of experiment, a small-scale laboratory investigation and a large-scale field trial. In the former, conducted at the Common Cold Research Unit, Salisbury, volunteers were inoculated intranasally with cold virus. Half of the subjects, selected at random, were given chlorocyclizine hydrochloride ("histantin") or promethazine hydrochloride ("phenergan") before and after the inoculations and the other half were given dummy tablets containing a small dose of phenobarbitone. Neither the patients nor the clinical observer knew what any particular patient had received. The results were clear cut; full doses of powerful antihistaminic drugs neither prevented colds nor had an effect on the nature of the cold when once it was established. However, the number of volunteers who took part in this trial was small, and the result of the field trial was, in its way, more impressive. For although the diagnoses could not be determined with absolute confidence, and were in fact with certain limitations dependent on the subjective feelings of the patients, there was the compensatory advantage that the drug was given an opportunity of showing whether it had any effect on any group of what may have been a heterogeneous mixture of diseases. The drug used in this experiment was thonzylamine, and it was given in the same dosage as was reported on so favourably by Arminio and Sweet. Medical officers at nineteen centres took part in the investigation, and 1,550 volunteers with colds were treated. They reported to the medical officer concerned or to his assistant as soon as possible after the first symptoms began, when they were given an envelope containing three tablets with instructions how to take them. They saw the doctor again on the two following days, when they were given further supplies

[1] *Nav. med. Bull. Wash.*, 1947, **47**, 810.
[2] *Illinois med. J.*, 1949, **96**, 302.
[3] *Laryngoscope, St. Louis*, 1948, **58**, 1265.
[4] Murray, H. G., *Industr. Med.*, 1949, **18**, 215.
[5] Ibid., 1949, **18**, 509.
[6] *J. Amer. med. Ass.*, 1950, **142**, 566.
[7] Ibid., 1950, **142**, 570.
[8] Ibid., 1950, **143**, 421.

of tablets, and finally one week after their first visit. Half the patients received antihistaminic drugs and half received dummy tablets containing a trace of quinine, but neither the patients nor the medical workers knew what sort of tablets any particular patient received.

To ensure that neither patients nor doctors can identify drugs in trials of this kind it has usually been considered sufficient to give the two sets of tablets a code sign and to choose alternate patients for each type of treatment. This method, however, has the disadvantage that if one of the types of tablets comes to be recognized the investigation ceases to be blind and the possibility of bias arises. In the M.R.C. trial, the reported side-effects of the antihistaminic drugs might conceivably have given a clue to the nature of the tablets, and another method was therefore adopted. The tablets were made up centrally into sets and each set was numbered at random. Since the key was kept centrally until the investigation was finished it was impossible for anyone to know what any individual had received while his progress was being assessed, and even if a correct guess could be made in one instance no light was thrown on any of the others. The results showed that thonzylamine "had little if any value in the treatment of the common cold." The only element of doubt was introduced by the observation of just significant differences (in the technical sense) between the treated and control groups at the end of the first day's treatment, a difference which, however, had disappeared by the end of the second day. This may be interpreted as indicating that a small number of patients with allergic rhinitis (rather than with true colds) were inadvertently included in the series and that these patients had responded to treatment. In any case the difference is so slight that, even if real, it is of little practical importance.

Also published in this issue is a paper by Drs. G. Lorriman and W. J. Martin describing another carefully planned and well-controlled clinical experiment. The drug used was "antistin," and the results were essentially the same as those obtained by the M.R.C. committee: the only difference was that no trace of an effect was obtained on any day of treatment. It is remarkable that side-effects were as common with the placebo as with the drug, despite the full doses given—a feature which was also noted by the M.R.C. workers. Cowan and Diehl's comment on human suggestibility is apposite:

> "We have received many enthusiastic reports . . . from the subjects of the cold study. However, some of the most glowing testimonials came from members of the control group. The first request we received this fall concerning information on the availability of our cold pills came from a student who had been in the study series. . . . He made a special trip from the northern part of the State to get the drug, whereupon it became necessary for us to look up his record. He had been in the placebo group."

In this country we have been fortunate that there has been a spirit of co-operation which has prevented over-enthusiasm on the part of the manufacturers—and here it should be emphasized that there are no doubts whatsoever about the value of the antihistaminic drugs in their right place. There have, however, been individual tragedies. The pressure of public opinion, which is sensitive to news from afar, resulted in the open sale of antihistaminic drugs and their storage In many domestic cupboards. In some instances children have found the tablets, sampled them, and died. Such events are always tragic, but are the more so when the drug would not have been of any use for the condition for which it was bought.

EMOTIONS AND THE COLON

It is common knowledge that disorders in alimentary function which often resemble those resulting from organic disease can be caused by emotional stress. Recent work sheds light on the mechanisms concerned. In experiments on 39 healthy volunteers Almy and his colleagues[1] investigated the functional state of the sigmoid colon by proctoscopic examination or by pressure-recording with inlying balloons. The stimuli applied were cold pain, produced by immersion of the hand for five minutes in ice-cold water; head compression with a headscrew; insulin-induced hypoglycaemia; or discussion of real or imagined disturbing events in the subject's life. In about half of the subjects such stimuli caused stronger contractions of the colon, with hyperaemia and increased mucus secretion. In all who reacted thus there were associated emotional reactions and bodily changes such as sweating, pallor, and a rise in blood pressure. Of those whose sigmoid colon remained functionally unchanged, only two showed general signs of stress, and usually there was close correspondence between the degree of colonic change and the intensity of the general reaction. With all four experimental stimuli the colonic response appeared to be related, not simply to the stimulus itself, but to the subject's attitude towards it—the response occurring only when the subject believed his personal security to be threatened.

In a further investigation[2] the same technique was used in studying patients with spastic constipation which became worse during periods of emotional strain. Comparable results were obtained, but the authors found that the colon responded most vigorously when the patients were upset by discussion of emotional problems and difficult life situations. Strong wave-like colonic contractions were often recorded, but these were

[1] *Gastroenterology*, 1949, **12**, 425.
[2] Ibid., 1949, **12**, 437.
[3] *Amer. J. digest. Dis.*, 1941, **8**, 197.
[4] *Gastroenterology*, 1949, **13**, 547.
[5] *Amer. J. med. Sci.*, 1949, **217**, 241.
[6] *J. Amer. med. Ass.*, 1950, **142**, 1044.

non-propulsive because they occurred simultaneously in more than one place, an observation in accord with the finding of Adler and his colleagues[3] that the majority of colonic waves are non-propulsive for this reason. Thus the response of the colon to emotional strain in both normal individuals and those with spastic constipation is the same, though symptoms occur only in the latter, probably because of the greater intensity and duration of their reactions. Occasionally the source of strain may lie in some disturbing emotional situation, but more commonly tension arises because of the patient's neurotic traits which make him see danger where none exists. Sufferers from colonic spasm are generally sensitive and immature, adapting with difficulty to environmental stress, exacerbations of symptoms often being related to feelings of anxiety, resentment, or guilt. Thus the seat of the trouble lies not in the bowel but in the patient's conflict with his environment. His is a normal bowel reaction to abnormal stress. In a detailed study of the personalities of twenty patients with ulcerative colitis Mahoney and his colleagues[4] found that they presented an abundance of neurotic traits. Such terms as "autonomic imbalance" and "neuromuscular dysfunction" are therefore misleading, and treatment should be along psychiatric lines.

Lysozyme, a mucolytic and bacteriolytic enzyme, is normally present in human tears, nasal mucus, and gastro-intestinal secretions. When fed to dogs it causes acute ulceration of the upper intestinal tract. Grace and his colleagues[5] have recently shown that anxiety, apprehension, anger, hostility, and resentment are associated with variations in faecal lysozyme, particularly when these emotions are repressed. Moderate transient increase occurred in normal individuals in such moods. In sufferers from ulcerative colitis, however, marked and sustained rise in lysozyme production followed emotional upheaval, and the symptoms became worse as the faecal-lysozyme concentration increased. When the disease was in remission lysozyme concentration was low. Normal amounts of the enzyme were found in patients with carcinoma of the colon and mucous colitis. In a patient with a permanent colostomy small circumscribed areas of oedema and inflammation were observed after human tears containing lysozyme had been applied with cotton-wool pledgets for 24 hours. The authors therefore suggest that because of its mucolytic action excessive lysozyme may play an important part in causing colonic ulceration, and, further, that lysozyme production fluctuates with the emotional state of the individual. Grace, Wolf, and Wolff[6] have confirmed and amplified these findings in a particularly well-planned study of four subjects with colostomy. They found that unexpressed anger and resentment were associated with colonic hyperfunction, which was shown by hyperaemia, engorgement, hypermotility, and increased secretion of both mucus and lysozyme. In this state, which resembled that caused by the administration of methacholine chloride, the fragility of the colonic mucosa was much greater than normal. Sustained feelings of anger and resentment leading to continued colonic hyperfunction resulted in submucosal petechial haemorrhage and ulceration. This demonstration of the resemblance between gastric and colonic function under emotional stress helps to a better understanding of the importance of the psyche in the genesis and aggravation of ulcerative colitis, and it confirms Maudsley's dictum that "the sorrow which has no vent in tears may make other organs weep."

HEALED BACTERIAL ENDOCARDITIS

It is now five years since penicillin has been available in this country for the treatment of subacute bacterial endocarditis, and it is therefore possible to consider what the outlook for successfully treated patients is likely to be. In a paper published elsewhere in this issue Dr. H. Matthew makes such an assessment on the basis of cases treated in Edinburgh. It has hitherto been believed that, despite eradication of the infection, a patient's expectation of life may be short owing to the severe damage caused to the affected valves: as a result of inevitable fibrosis and contracture a valve may conceivably be more incompetent when the disease is over than it was when the infective process was active. The two cases of aortic valve disease described by Rosenblatt and Loewe[1] in a paper quoted by Matthew were striking examples of this change: cusps were reduced to mere stumps, the valve being consequently almost functionless. For this reason the final prognosis has been regarded as most favourable in patients with endocarditis not involving a valve, particularly in those whose underlying abnormality is a patent interventricular septum.

Matthew's follow-up study of the Edinburgh series will serve as a corrective to any undue pessimism in this matter. There were 20 patients out of a total of 40 treated who survived for periods varying from 2¼ to 5¼ years. Only one of these patients has died, the cause of death being heart failure and the lesion aortic stenosis. Of the remainder, none has relapsed or become reinfected. A study of their exercise tolerance shows impairment in only two, and an increase in the size of the heart has been observed in only four: all but two are engaged in the same occupation as before their illness or another no less strenuous. Two, whose lesion was pulmonary stenosis, have actually benefited, their capacity for exercise being greater than before the onset of the disease. It appears that the practical effect of the infection has been to reduce the degree of stenosis. In short, the majority of these patients are as well as they were before their disease developed. If an opportunity eventually occurs of examining their heart valves doubtless the sort of fibrosis and calcification will

[1] *Arch. intern. Med.*, 1945, **76**, 1.

be present which is occasionally seen in patients who are not known to have had bacterial endocarditis—a finding which is the chief support of a belief that spontaneous cure of this disease can sometimes occur.

These are very encouraging findings, but it is important to understand that they are based on a study of patients who had already survived for 2¼ years. The fate of 20 other patients in the Edinburgh series who did not survive for this length of time is not discussed in this paper. In fact congestive heart failure, due mainly to gross valvular damage, is most liable to develop actually during the course of treatment or, as Matthew says, "shortly afterwards." It is of some interest to know how long a period is covered by this term. Contracture following reparative changes should be well advanced within two to three months, and it would therefore be expected that heart failure consequent on it should show itself within that time if a gross degree of valvular incompetence were the result. In Rosenblatt and Loewe's two patients, already referred to, death occurred five and six months after treatment had begun. Evidently some such period as this should elapse before it can safely be concluded that the final prognosis is favourable.

CONGENITAL MALARIA

Malaria in the foetus infected by its mother before or during parturition has long been recognized. Plasmodia have often been detected in the peripheral blood of infants at birth, or at any time up to the shortest recorded "incubation" period for the species of parasite concerned. In other cases parasites have been demonstrated in the brain, liver, spleen, or heart's blood of the foetus. As long ago as 1866[1] deposits of malarial pigment were found in an infant at a necropsy performed three hours after birth. More than 100 papers have been published on this subject, but the only extensive series of observations are on the native populations of hyperendemic areas, where the predominant malarial parasite is *P. falciparum*, and where, though there is a high incidence of heavy placental infections, congenital malaria is for the most part extremely rare. Thus Clark[2] in Panama recorded one case in 400 births, Blacklock and Gordon[3] in Sierra Leone none in 173, Garnham[4] in Kenya none in 404, Walton[5] in Sierra Leone 7 in 2,154, and Peel and Van Hoof[6] none in 403.

These findings have created an impression that congenital malaria is everywhere a very rare event, but records for foreign (non-immune) residents in malarious areas show that in them the disease may be less uncommon than has generally been supposed. Dr. B. S. Jones puts forward evidence to support this view in a paper published elsewhere in this issue: three cases of congenital malaria were found among 37 infants born to European women in February, 1949, at a hospital in Lagos. Most of the published reports are of isolated cases, and there are no data available from which the incidence of malaria among non-immune individuals can be accurately calculated. The three cases recorded from Lagos were all due to infection with *P. falciparum*, but a number of infections with *P. vivax* and a few with *P. malariae* have been described.

The mechanism of transmission of congenital malaria is still not fully understood, but it has been generally assumed that the parasites pass from the maternal to the foetal circulation as the result either of mechanical damage to the placenta or of pathological changes in it induced by malarial infection. The reason why congenital malaria is so very rare among natives of hyperendemic areas though relatively common in non-immune subjects has been the subject of much speculation. Schwetz[7] suggested that the greater frequency in non-immune individuals is due to the greater friability and permeability of the placenta caused by febrile malaria. In the cases recorded by Jones, however, only one of the three mothers admitted to any recent malarial attack. Peel and Van Hoof suggested that the enormous numbers of phagocytes observed in the placentae of natives might be an obstacle to the transplacental passage of the parasite. This is in harmony with the view put forward by Jones that with increasing immunity the efficiency of the placenta as a barrier to foetal transmission increases, and the incidence of congenital malaria therefore falls.

[1] Thomas, L., *Arch. Heilk.*, 1866, **7**, 307.
[2] *J. exp. Med.*, 1915, **22**, 427.
[3] *Ann. trop. Med. Parasit.*, 1925, **19**, 327.
[4] *Trans. R. Soc. trop. Med. Hyg.*, 1938, **32**, 13.
[5] *Ann. trop. Med. Parasit.*, 1947, **41**, 434.
[6] *Ann. Soc. belge Méd. trop.*, 1948, **28**, 413.
[7] *Bull. Soc. Path. exot.*, 1939, **32**, 44.

EARLY DIAGNOSIS OF DISSEMINATED SCLEROSIS

The diagnosis of disseminated sclerosis is relatively easy when multiple lesions are found in the central nervous system and when the history indicates that they appeared at varying intervals of time. But in the early stages, and particularly when only one symptom is complained of, the diagnosis may be very difficult, and at times can be only presumptive. The diagnosis remains essentially a clinical one, based on the findings at examination and, more particularly, on the study of the way in which the disorder has progressed. A carefully compiled case history is essential. No pathological or radiological test is of value except in so far as these may help in excluding other types of neurological disease. In a few cases the finding of a completely normal cerebrospinal fluid except for a first-zone or "paretic" Lange gold curve may provide some confirmation of the clinical diagnosis if the Wassermann reactions in the blood and C.S.F. are negative. In a paper published elsewhere in this issue Drs. D. K. Adams and J. M. Sutherland and Mr. W. B. Fletcher have analysed the presenting symptoms in 389 cases of disseminated sclerosis, and they agree with previous authors that the most common early symptoms are weakness of one or more limbs, visual disturbances, paraesthesiae, vertigo, and disorders of micturition. The incidence of retrobulbar neuritis as an initial symptom was 13.9%, which is lower than the 20% recorded by Müller[1] in his remarkable recent study of 810 patients in Sweden. They suggest that the disease occurs most frequently in sympatheticotonic individuals and

[1] *Acta med. scand., Suppl.* 222, 1949, **133**.
[2] *Brit. J. Ophthal.*, 1944, **28**, 40.

that vasomotor disturbances, such as coldness of the hands and feet, and chilblains, are common in the early stages. Frequent early signs which they found in the eyes were imbalance of the ocular muscles, enlarged pupils, and hippus. The first of these, as demonstrated by the two eyes moving at different rates when the patient looks to one side, is a valuable sign of disturbed function of the posterior longitudinal bundle, and when ataxic nystagmus is also present the sign is almost diagnostic of disseminated sclerosis, as Harris[2] has noted. Mydriasis and hippus are quite commonly found in apparently normal people, while the latter is often noted in patients with Sydenham's chorea: it would therefore seem to be unwise to give prominence to these findings in the diagnosis of disseminated sclerosis. Temporal pallor of the optic disks was recorded in only 16.5% of the 79 cases investigated in hospital—a figure corresponding fairly well with the incidence of retrobulbar neuritis in the whole series—and many neurologists will agree that too much is made of this physical sign in some textbooks, especially since it is difficult to assess slight degrees of temporal pallor. Adams and his colleagues rightly emphasize the importance of impairment or absence of the superficial abdominal reflexes when the abdominal musculature is good, even when the plantar responses are flexor. In disseminated sclerosis these reflexes disappear in the early stages of a pyramidal lesion, while in some other neurological disorders, in particular amyotrophic lateral sclerosis, the abdominal reflexes may remain unaffected even when there is spasticity of the legs with ankle clonus and extensor plantar responses.

It is obviously desirable to diagnose disseminated sclerosis in the earliest stage of the disease, when the lesions are potentially reversible. But at the present time, when there is no specific treatment and indeed no therapy which can for certain modify the pathological process or the natural history of the disease in any way, there is a definite danger in attaching the diagnostic label of disseminated sclerosis to a patient on inadequate clinical grounds. Too frequently, when this diagnosis has been made, little further thought is given to the possibility of the diagnosis being wrong, and patients with more readily treated conditions, such as subacute combined degeneration of the cord, myasthenia gravis, and spinal cord tumours, are left untreated.

DOCTORS' HANDBOOK

The new edition of the B.M.A. *Medical Practitioners' Handbook*[1] is an invaluable compendium for the medical practitioner, whatever branch of medicine he practises. Though it is described as not a complete work of reference, it will answer most questions about medical practice, and indicate the sources to consult for the rest. The last edition was published 15 years ago, and many new special sections have been added to cover the changes that have taken place in recent years. The simple, though still fundamental, guidance given in the Hippocratic Oath appears in its opening pages, and the great complexity of medical practice to-day is reflected in the subsequent advice given on such topics as ethical conduct, the administration of the Health Service, business agreements between practitioners, and the legal obligations of doctors to the State. Since hardly any of this information is taught to medical students, newly qualified doctors will find the *Handbook* an indispensable companion to their medical textbooks—and incidentally be thankful that they were not examined on its contents in their Finals, so intricate has the legal and administrative side of medical practice become. The more experienced doctor will find many useful addresses, and the solutions to problems that perhaps crop up only once in a lifetime, while for the postgraduate student details are given of special courses and diplomas. The *Handbook* is well bound and printed, and will stand up to the hard use it is sure to receive.

[1] *The Medical Practitioners' Handbook* British Medical Association, 1950.

ON COUGHING UP CALCIUM

Erosion of calcified glands into the bronchi is known to be one of the rarer causes of haemoptysis, but it is surprising to read that Schmidt[1] and his colleagues consider that broncholithiasis has been of great interest to the medical profession for centuries. To justify this statement they have collected from the Mayo Clinic 41 cases in which calcified material was either coughed up or discovered during endoscopic or surgical procedures. Most of the patients were over the age of 40, and the presenting symptoms were usually cough and haemoptysis. Haemoptysis, the first symptom in nine patients, was severe enough in six to require treatment by blood transfusion. Other distressing symptoms were severe retrosternal pain, thought to be caused by bronchial colic, and intractable asthma. The most characteristic radiological finding was a focus of calcification in association with an area of segmental pulmonary collapse, penetrating radiographs often being necessary to demonstrate the calcium. In other cases there were merely single or scattered areas of calcification.

The term broncholithiasis is perhaps unfortunate, since stones are not formed within the lumen of the bronchus. Bronchial stones are always produced by the ulceration of peribronchial calcified material through the bronchial walls. Schmidt and his colleagues confirm the popular belief that much the commonest source of such material is calcified tuberculous lymph nodes; they give, as rarer causes, coccidioidomycosis and histoplasmosis, neither of which is of great importance in this country. The authors also suggest that the calcified bronchial cartilages so often seen in old age may sometimes separate off into the bronchi, but they do not make it clear that such a process was found in any of their cases.

The importance of stones in the respiratory passages is that the resulting symptoms and signs are apt to be confused with those of other pulmonary disorders, especially bronchial carcinoma. Indeed, the differentiation may at times be exceedingly difficult, since radiography is not conclusive, and bronchoscopy often reveals fleshy granulomatous tissue round the calcified mass. Thoracotomy and exploration may be necessary when doubt exists, though needless operation might be prevented by careful questioning. Almost half of Schmidt's patients gave a history of coughing up stones; one patient claimed to have performed this unusual feat no fewer than 103 times.

[1] *J. thorac. Surg.*, 1950, **19**, 226.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CHEMOTHERAPY—I. ADMINISTRATION OF PENICILLIN

BY

LAWRENCE P. GARROD, M.D., F.R.C.P.

Bacteriologist, St. Bartholomew's Hospital; Professor of Bacteriology, University of London

In describing the therapeutic use of penicillin it is convenient to deal first with its administration and secondly with indications for it: these will be the subject of a succeeding article.

Therapeutic Action

Two theoretical aspects must be considered briefly: one of these is the nature of the action of penicillin. This is exerted exclusively on the bacteria causing the infection, and varies in nature and degree with the concentration to which they are exposed. Low concentrations do little more than inhibit bacterial growth, but one only 5 or 10 times greater than this is actively, though not very rapidly, bactericidal: 99% or more of a fully exposed bacterial population may be killed within a few hours. If the concentration is increased beyond this point no further acceleration of bacterial death occurs, and with certain organisms the rate may even be substantially decreased. Penicillin is unique in this behaviour. It has an optimum concentration for antibacterial effect beyond which an increase will certainly be useless and may be positively detrimental, whereas with other bactericidal substances increased concentration accelerates effect indefinitely. The optimum concentration for a sensitive organism is quite low—for a staphylococcus about 0.1 unit per ml., and for a haemolytic streptococcus even less. It might appear from this that the object of treatment should be to maintain this concentration in the tissues until the infection is eliminated. In the first place this is impossible except by the use of a continuous drip. It further overlooks the fact that penicillin has to diffuse into infected areas, where the concentration is likely to be lower than that attained in the blood. The view is widely held that the intermittent production of relatively very high blood levels is useful in promoting this diffusion into undrained abscesses, areas of necrosis, cardiac vegetations, etc.

How long should this action be maintained, and should it be continuous or intermittent? There are grounds for believing that the necessary duration of treatment depends on two principal factors. One is the sensitivity of the organism: the gonococcus, the most sensitive of all, can usually be eliminated in a few hours. The other is the total number of bacteria to be disposed of, which is tantamount to saying the stage or extent of the infection. At a very early stage the dose required may be only a small fraction of that necessary later. The relative merits of continuous and intermittent effect have been much debated and are still unsettled. Penicillin acts only on multiplying bacteria, and since any given dose leaves a number of semi-dormant bacterial cells alive (Bigger's "persisters") it is argued that these should be allowed to begin multiplying before another is given. It would obviously be dangerous to carry this policy too far. It is known that bacteria exposed to but not killed by penicillin resume growth in a period averaging three to four hours, and it seems reasonable not to allow the concentration in the blood between doses to fall below an effective level for much longer than this. Recent extensive therapeutic tests in animals support this view.

Absorption and Excretion

The ordinary salts of penicillin (the sodium salt being that commonly used) are freely soluble and highly diffusible. Injected in watery solution into the tissues, penicillin is quickly absorbed, reaching maximum concentration in the blood within less than 15 minutes if the dose is not very large. This rise to a high level is followed by a fall at first almost as steep, due to rapid renal elimination. Penicillin leaves the body as fast as it reaches the kidneys, and the enormous quantities which have to be given are due to the fact that on the average each molecule spends only a few minutes in the circulation between absorption from the injection site and excretion by the kidney. Comparatively few ever reach and still fewer remain at the site of a local infection. That the doses given are enormous will be conceded when it is remembered that in a patient of average weight with total anuria the dose required to produce an adequate concentration in the blood for treating a fully sensitive infection would be only 350 units. It is advisable to bear in mind that patients with impaired renal function require smaller doses at longer intervals.

The rate of fall in the blood level, although steep at first, progressively diminishes. During the latter part of this phase traces are probably still being absorbed from the site of injection, and some which has passed into the tissues is returning to the circulation via the lymph. The relation of duration of effect to dose, and means of obtaining more prolonged effect, are discussed later.

Treatment by Intramuscular Injection

Penicillin may be given either by continuous infusion—now an uncommon practice, and feasible only in a hospital—or by spaced single injections. It is usual to make these intramuscularly, but this route was originally adopted because the crude penicillin of early days was more painful given subcutaneously. This objection to the subcutaneous route no longer holds, and it has some slight advantage in being followed by rather slower absorption. The site of injection is theoretically indifferent, and practically so in a well-nourished patient requiring few injections. In an emaciated patient having a long course, rotation of the main sites is essential. In either, skill and a really sharp needle affect his reaction considerably.

It was originally the practice to give small doses at intervals of three or at the most four hours in order to maintain the effect. With the free availability of penicillin the practice has grown up of giving large doses at long intervals, and this has been carried to greater lengths in this country than in any other. It is important to know how far this is justified, and in considering this it must be remembered that duration of effect is by no means directly proportional to the dose given. The larger this is, the greater the rate of elimination, and doubling the dose actually prolongs effect by only about one-third. The following are the approximate times during which a detectable and thus—for a sensitive infection—therapeutically useful concentration persists in the blood.

After	25,000	units	2½ hours
,,	50,000	,,	3 ,,
,,	100,000	,,	4 ,,
,,	250,000	,,	5 ,,
,,	500,000	,,	7½ ,,

These figures are only approximate, because the rate of elimination varies inexplicably in different apparently normal subjects. They conflict in the higher range with other published figures, but the last of them is based on recent observations by a colleague and myself made by an accurate technique in a series of 31 individuals, and we have no hesitation in asserting that for a dose of 500,000 units to produce a detectable blood level after the eighth hour is exceptional.

It has already been mentioned that bacteria are known to take some hours to recover from exposure to penicillin and to resume growth, the length of this period varying with species, length of exposure, and concentration. Allowing for this factor, the following intervals are appropriate between different doses for patients in whom it is necessary that the drug should exert a full and uninterrupted effect.

Dose			Interval
25,000	units		3 hours
50,000	,,		4 ,,
100,000	,,		6 ,,
250,000	,,		8 ,,
500,000	,,		12 ,,

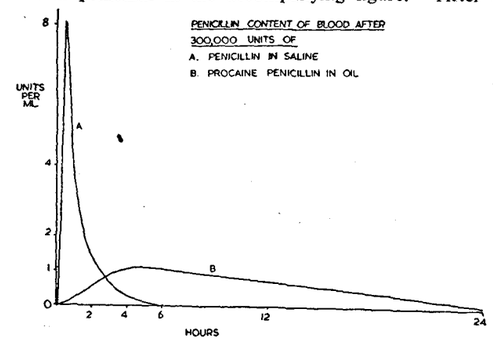
In less serious cases; and when frequent administration is impracticable, these intervals may be lengthened, probably with some retardation of the therapeutic effect, but it seems inadvisable in any circumstances to give penicillin in this form only once daily: the interval for bacterial recovery is then too long. It is true that penicillin persists in exudates after it has disappeared from the blood, and this may add a few hours to the period of efficacy of each dose, but it is not known how far this persistence depends on the nature of the lesion and the rate of exudation into it, and there are some conditions, notably bacterial endocarditis, in which this factor is not operative at all.

Slowly Absorbed Preparations

The effect of a single dose can be prolonged either by delaying absorption or by blocking excretion. Various substances have been used which interfere with the renal excretion of penicillin. Of these the most useful is caronamide, since it can be given by the mouth. The dose required is large, and apt to cause nausea and other disturbances. This method should be used only under hospital conditions for sustaining very high blood levels in unusually resistant infections.

Delayed absorption was first secured by suspending calcium penicillin in an oil base also containing beeswax. Beeswax is essential for the full delaying effect, and it is this ingredient which causes local reactions, sometimes going on to suppuration. These preparations are now almost entirely superseded by oily suspensions (containing no beeswax) or powders, suspended in water before injection, containing procaine penicillin. This compound of the two substances has a low solubility to which its slow absorption is mainly due, and an antibacterial action equivalent to that of penicillin itself. The rate of absorption—and, it may be added, the facility with which the material will pass through a small needle—depend on the size and shape of the procaine penicillin crystals: it is possible, although not all manufacturers have yet succeeded in doing this, to produce crystals large enough (50 μ in diameter) to dissolve slowly, but so compact as not to cause needle blockage.

The rate of absorption of a good preparation of this kind is contrasted with that of an ordinary solution of sodium penicillin in the accompanying figure. After a



dose of 250,000 units or thereabouts the blood level rises to a maximum of about 1 unit per ml. in four hours, then diminishing very slowly so that an effective or at least detectable amount is still present after 24 hours. If the preparation also contains aluminium stearate, a water-repellent substance which delays absorption further, this shallow curve is even more flattened, and penicillin may be detected in the blood after two days or even considerably longer if a large dose (one million units or more) is given. Some of these preparations also contain sodium penicillin, which will also give a high initial level lasting only a short time.

The object of these preparations is to secure a continuous effect from a single daily dose, from doses given at intervals of two or more days, or even to cure an infection by a single dose which need not be repeated. They provide much the simplest means of treating patients efficiently in their own homes, where only infrequent injections are feasible. They may be used in a patient under nursing care either because a continuous fairly low blood level is thought desirable, or simply in order to obviate frequent injections. What they will not do is to produce a high blood level. If the infection is a relatively resistant one, or if for any other reason it is thought desirable to achieve a blood level of much over 1 unit per ml., then large doses of sodium penicillin should be given.

Oral Administration

Penicillin is destroyed by acid in the stomach and by bacterial enzymic action in the lower bowel. There is also some loss, not wholly explained, in the upper part of the intestine, since, even in patients with total achlorhydria or given penicillin through a duodenal tube, only a fraction of the dose is absorbed. It is therefore necessary to give from 5 to 10 times the intramuscular dose in order to achieve the same effect; even so the effect is not altogether dependable, since the proportion absorbed varies inexplicably in different subjects, and even in the same subject at different times. Absorption is better when the stomach is empty: oral penicillin should therefore be given before meals. Antacids and various capsules designed to overcome the acid gastric barrier have not been found helpful. Absorption is rather more constant in infants, and penicillin may be added to feeds. Here there is the double advantage of avoiding injections in patients to whom they are most disturbing, and of reasonable economy, since the dose required is comparatively small on a body-weight basis.

It is difficult to say what place this form of treatment should have, but even its more enthusiastic advocates are reluctant to employ it in serious cases owing to the uncertainty of its effects.

Local Administration

There are many ways in which penicillin may usefully be applied to the actual site of infection. Besides being a chemotherapeutic agent, it has all the properties of the ideal antiseptic, killing or preventing the growth of susceptible bacteria without doing the slightest harm to tissue. Local application may be indicated for its simplicity and economy, because the area concerned can be reached in no other way, or in order to attain a high concentration there which will persist for some time. The following are the more important examples.

Intrathecal Injection.—Only traces of penicillin reach the cerebrospinal fluid from the blood unless enormous doses are given intramuscularly. Meningitis should therefore be treated by intrathecal injection as well as intramuscular. Pure ("white") sodium penicillin should be used, and the solution should be prepared freshly with the strictest aseptic precautions and with no preservative such as phenol. A dose of 10,000 units will maintain an adequate level for 24 hours. Unless there is a block, remarkably uniform diffusion occurs throughout the central nervous system from an injection given by the lumbar route.

Serous Sacs, Joints, and Abscesses.—Penicillin solution may with advantage be injected into an empyema cavity, a joint affected by suppurative arthritis, or abscess cavities elsewhere, the dose depending on the size of the cavity: as much as 100,000 units may be indicated for a large empyema. Absorption from such an area is slow, and penetration into it from the blood equally or more so; this is therefore not only a convenient but the only way of keeping up a high concentration in such a collection of fluid for a whole day or more. If the dose is large, slow absorption will also maintain a systemic effect, to some extent taking the place of intramuscular injections. This is not the place (nor am I the person) to discuss the surgical treatment of these conditions further than to say that penicillin does not necessarily remove the need for it.

Carbuncle can be treated very successfully by injecting penicillin into and around it. Even though the solution also contains procaine, this is a painful proceeding, but may be well worth while to accelerate resolution.

Wounds.—One way of preventing infection in a recent wound is to dust it with a powder containing penicillin. The usual diluent is a sulphonamide (preferably sulphathiazole), and the procedure has been objected to on account of the risk of causing sensitization. Established sepsis in superficial wounds and burns, if due to a demonstrably sensitive organism, may be treated similarly, or by the spraying of a solution or the application of a cream. These last two methods are applicable, under the same condition, to the treatment of infections of the skin. Among other superficial infections, conjunctivitis may be treated by drops frequently applied or by lamellae.

Upper Air Passages.—Infections of the main nasal cavity (it being remembered that the sinuses are generally inaccessible to such measures) can be treated either with a spray or, probably better, by the frequent use of a snuff containing 5,000 units of calcium penicillin per gramme of sulphathiazole. This has been particularly successful in clearing up nasal carrier conditions; and, owing to the backward flow of mucus in the nose, it has also an effect on the nasopharynx and even the throat.

Local treatment of the throat and mouth is best carried out with gelatin pastilles, one of which should be kept in the buccal sulcus throughout the day. Solution is slow, and replacement necessary at intervals of not less than an hour. The official trochiscus penicillinae of the *B.P.*, a tablet with a lactose base, is less satisfactory. The choice of this product was dictated by the greater stability of penicillin in a dry form, but gelatin pastilles are now obtainable which retain the greater part of their activity for months; alternatively, they can easily be made fresh by a pharmacist. Penicillin chewing-gums are also suitable for this type of use if the patient will persist with them.

Infections of the bronchi and lungs may be treated by inhalation, a small volume of concentrated solution containing, say, 100,000 units being administered by a Collison or other inhaler several times a day. There is some absorption by this route: thus a large enough dose will also exert a systemic effect. The inhalation of a fine powder of penicillin, recently advocated in the U.S.A., has not apparently been adopted in this country, and seems likely to be more disagreeable to the patient than a liquid spray.

PHARMACY AND POISONS ACT, 1933

The Poisons List Order, 1950 (S.I. 1950, No. 1213) and the Poisons Rules, 1950 (S.I. 1950, No. 1214), which were made by the Secretary of State on July 21, come into operation on September 1. These Statutory Instruments make the following changes in the Poisons List and the Poisons Rules, 1949, hereafter called the Principal Rules.

Part I of the Poisons List and the First Schedule to the Principal Rules.—The following substances are added: Alphaprodine; its salts. The following antihistamine substances and their salts: antazoline, diphenhydramine, 3-di-*n*-butylaminomethyl-4:5:6-trihydroxyphthalide, phenindamine, substances being tetra-substituted N derivatives of ethylenediamine or propylenediamine. Betaprodine; its salts. Di-isopropyl fluorophosphonate. Hydroxypethidine; its salts. Isoamidone; its salts. Ketobemidone; its salts. Methadol; its salts. Methadyl acetate; its salts. Polymethylenebistrimethylammonium salts. The following items are amended: Amidone (DL-2-dimethylamino-4:4-diphenylheptane-5-one); its salts. The chemical description is omitted and the entry now reads: "Amidone; its salts." The item "6-morpholino-4:4-diphenylheptane-3-one; its salts," which describes the poison now known as phenadoxone is omitted, and after the item "Pethidine; its salts;" there is inserted "Phenadoxone; its salts."

The Third Schedule to the Principal Rules.—Antihistamine substances and their salts are added to Group II of this Schedule and are thereby exempted from the requirements of the Pharmacy and Poisons Act and the Principal Rules when in the form of "preparations intended for external application only."

The Fourth Schedule to the Principal Rules.—Antihistamine substances and their salts, other than the preparations exempted by inclusion in Group II of the Third Schedule, and polymethylenebistrimethylammonium salts are added to this Schedule. The item "6-morpholino-4:4-diphenylheptane-3-one; its salts" is deleted from this Schedule. This poison (under the name phenadoxone) is now subject to control under the Dangerous Drugs law.

The Seventh Schedule to the Principal Rules.—At the end of this Schedule the following paragraph is added: To be labelled with the words "Caution. This preparation should be administered only under medical supervision. The vapour is dangerous": Medicines made up ready for the internal or external treatment of human ailments and containing di-isopropyl fluorophosphonate.

Rules 7 and 12 of the Principal Rules.—These Rules are amended to provide that when a poison is supplied in ampoules the "signed order" or prescription may state either the total amount to be supplied (as at present) or the total amount intended for administration or injection.

Rule 16 and the Thirteenth Schedule to the Principal Rules.—In paragraph (*e*) of the proviso to this Rule and in the Schedule the description "executive officer" is replaced by the description "county agricultural officer or assistant county agricultural officer."

Copies of the Poisons List Order and of the Poisons Rules may be obtained from H.M. Stationery Office or through any bookseller.

INFANT-FEEDING IN NORTH-EAST AFRICA*

BY

LESLIE HOUSDEN, O.B.E., M.D.

Nearly all infants are breast-fed, especially in the southern half of the Sudan. In the northern half western influence and customs have already begun to give native mothers western views. A woman will occasionally come to hospital with her baby already off the breast, saying that her milk was no good. In Somaliland the fathers sometimes demand that their babies shall be given undiluted cows' milk, believing that it makes them "more lively." These fathers also have a way of sending their wives into the interior to look after the stock, leaving the young infants to the care of the grandmothers.

Deprived of breast milk in the early months of life—as through the death of the mother—infants rarely survive. Alternative food is difficult to find, especially in the milkless tsetse-fly country, and is usually unsuitable both in quantity and kind. Overfeeding and malnutrition go hand in hand. Sometimes the young infant is fed on porridge made from sweet potatoes or groundnuts, with additions of mango juice during the mango season, which may last from April until

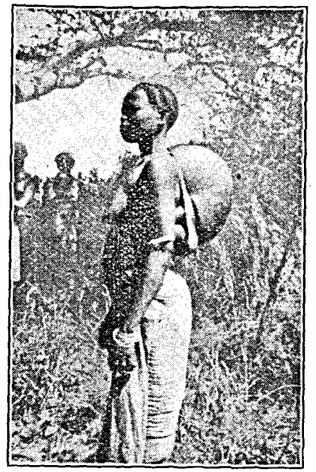


[Photograph by Dr. John Bloss

FIG. 1.—Mother comforting her child.

July. In countries where cows' or camels' milk is obtainable, it is usually very dirty, and gastro-enteritis is a common cause of death. Tea, ghee (clarified butter), rice, and chewed fat are other forms of infant food.

*Notes based on experience in the Anglo-Egyptian Sudan and British Somaliland.



[Author's photograph

FIG. 2.—Baby shielded by half-gourd on mother's back.

Breast-fed Too Long

The chief fault of native nursing is that it is continued too long. Two years is a very usual time, and often the child is breast-fed up to the age of 3 or 4. Early progress is usually good, especially if the mother is herself reasonably well nourished, but after the age of 8 or 9 months the baby ceases to do well and later still loses ground. Often the mother is undernourished and ill, especially in Somaliland, where the standard of nutrition is low and infants of 18 months have been found in an emaciated condition, starving on 6 or 8 oz. of breast milk a day.

There are several reasons for this prolonged nursing. First there is the difficulty of alternative feeding in lands where milk is scarce or unknown and where adult food is unsuitable for infants and often insufficient for the adults themselves. Then there is the physical contact with their mothers in which infants spend so much of the first two years of their lives. They live attached to their mothers. They use neither cot nor cradle. By day they are carried slung to the mother's back or side, at night they lie against her as she sleeps. Whenever a baby cries he is fed. One of the objections to the use of a cradle is that the mother thinks her baby should not leave her. A third reason is that in some tribes husbands do not engage in sexual intercourse with a wife who is nursing a baby. Prolonged breast-feeding therefore acts as a method of birth control.

It is not the prolonged breast-feeding that harms the native infant but breast starvation. After a grossly inadequate intake of breast milk over many months the infant is marasmic and anaemic and ready to succumb to the diarrhoea set up by unsuitable foods at weaning. If additional foods were given the breast milk would be a boon. In some tribes additional foods are given. Zande mothers, for instance, sometimes give scraped banana, with or without water, from the seventh day. They also chew sugarcane and spit it into the baby's mouth. From one month, dura (millet) porridge and chewed sweet potato and cassava may be given. Other Zande mothers, however, give nothing until they add porridge at the ninth month. During these nine months the mothers themselves take nothing but gruel and simsin (a vegetable oil). Among the Shilluks a mother may not drink milk for the first six months of pregnancy lest the cow from which the milk came goes dry.

Hazardous Gardening

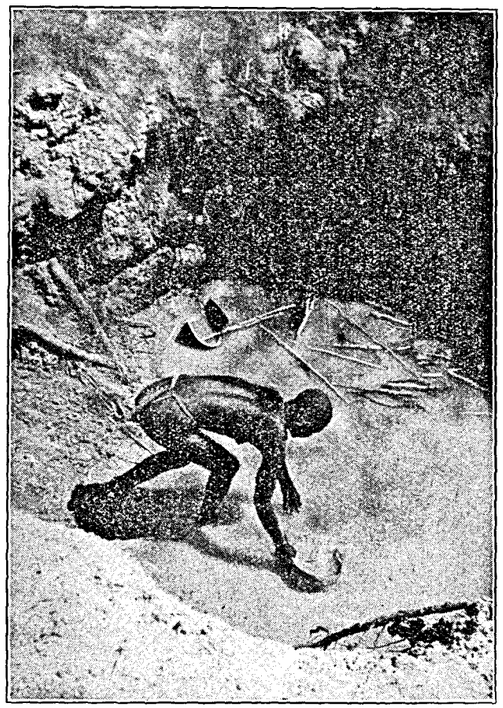
Complementary foods, such as oranges and lemons, sweet potato, banana, millet, and local fruits such as pawpaw, are either obtainable or could be produced if fathers had the will and energy to grow them, but even when they are available the mothers are often unwilling to give them. They say that their babies will not eat them, and continue

to underfeed them on the breast. In some parts there is a further difficulty in persuading the fathers to provide the needed foods, the popular belief being that if anyone produces a garden better than all the others he will die the same year.

Native babies spend the greater part of their first two years in close contact with their mothers' bodies. When the baby cries or when the mother has nothing else to do, her infant is fed. There are no regular feed-times; the breast is available at all times of the day and night. This close maternal contact is maintained as long as the mother has the baby's welfare uppermost in her mind. During the rains, when she may join the rest of the tribe in cultivating the land, she will leave her baby all day with no food at all, to be carried about on the back of an elder brother or sister, crying for food until she returns. The elder brother or sister provides the physical contact usually supplied by the mother but cannot produce the food.

The only other time when the breast is unavailable to the baby is when the mother is drunk. This is a common occurrence in some areas.

The age of weaning varies according to the tribe, the time of year (i.e., the state of cultivation), and chance, but the most usual food at all times is porridge made from



[Photograph by Dr. John Bloss

FIG. 3.—Woman drawing water by means of half-gourd from waterhole.

dura (millet). This requires hours of grinding by hand between two stones if a fine flour is to be produced, but mothers are often unwilling to spend so long over its preparation. They use it for their infants in an incomplete and gritty form. It causes diarrhoea, which is lethal to marasmic and anaemic infants.

Infant Death Rate

In North-east Africa there are few vital statistics—and they are unreliable. There are, however, well-founded impressions. One of these is that in some parts the death rate of infants during the first two years of life is between 50% and 60%. Some natives forget very quickly that they had any children who died, but some figures of value can be produced. In February, 1949, fourteen chiefs of the Torit area had had 186 children, of whom 87 were still living. This was an infant- or child-mortality rate of 53.2%. One Somali interpreter had had by his eight wives 42 children, of whom 18, that is 43%, had died "from some kind of sickness." The eight wives of another interpreter had presented him with 35 children, of whom 22 had died, a mortality rate of 63%. A Somali medical assistant had lost seven out of nine children with "diarrhoea and abdominal pain." Very little is thought of these high death rates. As a Sudanese medical assistant said, "When ill-nourished, anaemic babies get any intercurrent disease, they die. No one ever thinks of natural death."

Infant Welfare

In many parts of the world where black-skinned people dwell there are too many people; in some there are too few. Torit in Equatoria (Anglo-Egyptian Sudan) is one of these, and on May 7 the Save the Children Fund sent a team of one doctor and two nurses to spend the next few years in teaching the local tribes how to keep their babies alive. Although in principle the saving of these infants will be simple, in practice there will be difficulties.

The logic of infant welfare will appeal only to those who have logical minds. It is good to make certain simple preparations for the reception of a baby, but many native mothers believe that if any preparations at all are made for an unborn baby it will surely die. A father should grow food for his children, but, besides his likely death the same year if his garden excels those of his neighbours, he must guard his crops day and night as they reach maturity or they will be stolen. Western ideas of dealing with native problems must be modified by the native outlook. The study and research of the Save the Children Fund team should produce information of interest and value.

A circular from the Ministry of Health states that hospital boards sometimes acquire property with moneys from their endowment fund with the intention of selling or renting the property to the Minister when it is required for hospital purposes, but the Minister warns boards that he cannot acquire a property for which a price has been paid in excess of that appropriate to a compulsory purchase. Nor can he purchase any property for which such an excess price has been paid, even though the board offers to resell to him at the compulsory-purchase price, the loss being taken by the endowment fund, and he cannot rent, lease, or accept a gift of such a property. The Minister is bound to carry out the intentions of Parliament as expressed in Part V of the Town and Country Planning Act, 1947, and he could not take part in a transaction which would undermine the provisions of that Act. This should be remembered whenever a board is buying from the endowment fund property which might be suitable for hospital purposes; and if the board is likely one day to wish to sell, lease, rent, or give such property to the Minister it should consider whether it is advisable to pay a price in excess of the district valuer's valuation of the property. Boards do not at present know what the district valuer's price would be, as his services are available only where purchase by a Government Department is in view. The Minister has therefore arranged that any board may ask him to request the chief valuer to make the services of the district valuer available to the board.

Reports of Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

Scientific Meeting at Leeds

The 44th Scientific Meeting was held at Leeds on July 20, 21, and 22 under the presidency of Dr. NORAH SCHUSTER. The inaugural session was devoted to a consideration of allergic diseases of blood vessels. Dr. G. DISCOMBE (London) reviewed 16 proved and 6 suspected cases of polyarteritis nodosa. Laboratory investigations did not always help in the diagnosis, for biopsy was sometimes negative. Lesions might heal, and, if in the kidney, could produce an essential hypertension the changes of which might almost completely obliterate those of polyarteritis nodosa. Eosinophilia, although common and usually demonstrable by direct counts during the active phase, was not an essential part of the syndrome. Dr. W. PAGEL (London) discussed some unusual aspects of histology and the question of aetiology. Subendothelial swelling due to permeation of fluid seemed to be followed by exudation of fibrinogen with subsequent necrosis, mostly eccentric, of the vessel wall, a breach in which became plugged with fibrin. Fibrin was deposited, too, both inside and outside the necrotic wall. He preferred to reserve the term "fibrinoid" for changes which failed to show the staining affinities of fibrin, and which sometimes occurred in positions which did not always favour the assumption that one was dealing with fibrin which had lost its staining affinities. In his opinion the differences between polyarteritis nodosa and the "pararheumatic" diseases, including lupus erythematosus disseminatus, dermatomyositis, and temporal arteritis, were more in the natural history of the disease and the preferential site and distribution of the basic change rather than in the basic histology, which appeared to be identical. In polyarteritis nodosa extramural foci involved the collagen fibres and were indistinguishable from the acute infiltrative changes in rheumatic fever, lupus erythematosus disseminatus, and dermatomyositis. In some instances healed polyarteritis nodosa appeared to be the basis of an eosinophil-celled alveolitis (Loeffler's syndrome) associated with exfoliative dermatitis and asthma (in one case terminated by cerebral haemorrhage). Intradermal injection of heat-killed streptococci in healthy persons and in rheumatic and other patients who had volunteered had established the significance of bacterial antigens in the reproduction of the changes characteristic of polyarteritis nodosa. Both the histological and experimental evidence supported the view that polyarteritis nodosa and the related diseases were an expression of the hyperergic response to any aetiological factor, including bacterial (notably streptococcal) antigen.

Dr. I. RANNIE (Newcastle-upon-Tyne) described the value of biopsy. A positive result was obtained in 8 out of 12 cases, the four unsuccessful biopsies being explained by either the unsuitability or the insufficiency of the material submitted. In 5 of the 8 positive instances biopsy was carried out for confirmation of diagnosis; 4 were taken from the muscle, and 1 from a skin nodule. The diagnosis of polyarteritis nodosa was established as a chance biopsy finding in the remaining 3 cases, the organs submitted being respectively appendix, liver, and cervix uteri and ovaries. Muscle was the material of choice; a tender area should be chosen for excision, and a negative report should not be issued until serial sections had been studied.

Professor T. CRAWFORD (London), discussing the experimental production of polyarteritis nodosa, said that there were two main types of procedure which had led to the production of lesions in animals closely resembling those of polyarteritis in man. The first, introduced by German pathologists about 1930 and used extensively by Rich and Gregory in the U.S.A., consisted in the administration of foreign protein to a suitable animal such as the rabbit. The second, described in this country by Wilson and Byron, depended upon the production of hypertension by some procedure such as the clipping of a renal artery in rats. The interpretation of these experiments which the speaker favoured was that the first procedure led to a tissue antigen-antibody reaction characterized by necrosis and fibrin deposition in the vessel walls and a cellular reaction around the injured area; whereas with the second procedure sudden elevation of blood pressure caused damage to the less well supported arteries, and this again led to necrosis and fibrin deposition in the vessel wall, with a secondary cellular response as in the former lesion. When considered in conjunction with knowledge gained from clinical sources, the first of these experimental procedures seemed to constitute a closer parallel to the conditions of the human disease than did the latter. Study of these lesions might well lead to better understanding of the human disease and of the effects of various agents upon it.

The sessions which followed provided a varied programme. Short papers were read by Dr. G. B. S. ROBERTS (Glasgow), Dr. I. FRIEDMANN (London), Dr. T. B. MAGATH (Rochester, Minnesota), Drs. R. AIDIN and G. H. TOVEY (*Bristol*), Dr. R. W. FAIRBROTHER (Manchester), and Air Vice-marshal T. C. St.C. MORTON (Wendover).

Dr. SCHUSTER, whose presidential address was entitled "Nec silet mors," told of the increasing demands which advances in medicine and surgery made on pathologists who undertook necropsies; to-day they must needs pay attention to parts of anatomy which 25 years ago they could safely ignore. As a profession doctors were always willing to learn, but it was comforting to know that at the age of 80 Leonardo da Vinci was to be seen passing through the streets of Milan on his way to the medical school to refresh his memory on points of anatomy. A full medical and occupational history was essential for the pathologist at the time of the necropsy, otherwise there might be great wastage of material.

Non-pulmonary Tuberculosis

Dr. G. S. WILSON (London) gave an account of the survey that was carried out in England and Wales during 1943–5 into the distribution and frequency of non-pulmonary tuberculosis caused by the bovine type of bacillus. The survey was an excellent example of what could be achieved by co-operation between different laboratories making use of ordinary routine material, and Dr. Wilson took the opportunity of thanking the 149 pathologists who had gone to the trouble of collecting specimens for examination by the bacteriologists. In England strains from 994 patients had been examined; of these, 26.3% belonged to the bovine type. The percentage distribution according to site of disease was: meninges 27.1; cervical glands 46.5; bones and joints 10.8; genito-urinary system 12.8; miscellaneous 10.6. The proportion of bovine-type strains was highest in the second quinquennium of life, and higher among females than males. It was calculated that in England and Wales during 1944 about 24% of all cases of non-pulmonary tuberculosis were of bovine origin and that 1,300 to 1,400 persons died of milk-borne tuberculosis. In conclusion Dr. Wilson drew attention to the high proportion of mistaken diagnoses in cervical adenitis, and suggested that further work was required to distinguish the tuberculous from other forms of the disease. Dr. G. STEWART SMITH (*Exeter*) spoke on the problem of non-pulmonary tuberculosis as seen in an urban and rural community in the south-west.

Dr. A. J. RHODES (Toronto) gave an account of the epidemiology of the Coxsackie virus and of a recent epidemic in Dufferin county in which both the viruses of poliomyelitis and of the Coxsackie infection appeared to take part. Dr. F. O. MACCALLUM (Colindale) described briefly the results of recent investigations made on material sent in to the Virus Reference Laboratory, and the problems of diagnosis which faced us to-day. Other papers on a variety of subjects were read by Dr. J. B. FOOTE (London), Dr. P. G. WALKER and Mr. R. D. WILKINS (London), Professor C. H. GRAY (London), Drs. E. M. DARMADY, J. HARKNESS, and A. RICHARDSON JONES (Portsmouth), Dr. C. J. YOUNG (Bradford), Dr. OSCAR B. HUNTER, *jun.* (Washington, D.C.), Dr. C. MERSKEY (Oxford), and Dr. J. V. DACIE (London). Speakers at the dinner of the association, which was held on July 21, included Professor MATTHEW STEWART and Dr. ROBERT A. MOORE, professor of pathology at the Washington University, St. Louis, Missouri, and secretary of the American Board of Pathology.

Correspondence

Haemorrhage from Peptic Ulcer

SIR,—Your readers must be tired of the bandying about of statistics on the results of the treatment of haemorrhage from peptic ulcer, but I should like to raise the question whether these haemorrhages need really occur. If every peptic ulcer, once definitely established as chronic, was operated upon "in the cold" there would be few or no bleedings or perforations, the total mortality from the disease would probably be less, and patients would be saved those years of semi-invalidism which the so-called medical treatment of peptic ulcer involves. Such at least is my belief.—I am, etc.,

Streatley, Berks. ROBERT HUTCHISON.

SIR,—In neither of the two articles on haematemesis in the *Journal* (July 15, p. 138) is any mention made of aspirin as a cause of acute peptic ulcer and haemorrhage. There is no doubt that aspirin tablets swallowed whole can have this effect and that cases are now occurring. Arthur Hurst may have over-estimated its frequency, but since his death this factor seems to have been forgotten. Unless the possibility of aspirin tablets having been taken in this manner is specially inquired for, it is most unlikely that it will be mentioned by the patient. It should be borne in mind by those studying the aetiology of peptic ulcer and compiling statistics on haematemesis.—I am, etc.,

London, W.1. HENRY TIDY.

Reflections on Criminal Conduct

SIR,—Sir David K. Henderson's paper "Reflections on Criminal Conduct and Its Treatment" (August 5, p. 311) is a miracle of clarity and good sense such as one might have expected from its source. I am sure that sooner or later his conclusions will become universally adopted. For example, his view that a man medically insane should be regarded as legally insane is a case in point. One certifies a man because he is dangerous to himself or others, yet if he kills someone when confined in a mental hospital he is liable for trial! Was there ever such an illogical position? To my mind a person suspected of insanity who is accused of a crime should be examined before the trial and certified if he is insane. The certificate should be checked by the Board of Control, and if necessary by further independent specialists. If the prisoner is insane he should be regarded as unfit to plead, and sent to a mental hospital. This would prevent the recurring argument over the M'Naghten rules, which, as Sir David points out, are anomalous and antiquated. Juries in my experience are absolutely unable to give a reliable opinion on a prisoner's sanity. I have given evidence in the case of a man whose mental age was eight years, who had confirmed epilepsy, and who did a senseless crime in either an epileptic rage or in a state of automatism. The jury found him guilty. I wrote to the Home Secretary and pointed out that under the Lunacy Acts he must have the prisoner re-examined on the information submitted. He did so, and the man was found impossible to hang humanely because he had a wooden leg! Recently in the face of three doctors' evidence, which included the prison doctor, that he was schizophrenic, a man called Rivett was twice found guilty of murder, his appeal was disallowed, and Lord Justice Goddard praised the jury system—presumably for disregarding medical evidence.

The treatment of sexual offences in court is most extraordinary. I have seen men discharged with a caution by a magistrate for exactly the same offence as received a heavy sentence from a judge. Psychotherapy, which is often very successful in these cases, is allowed grudgingly, if at all. Yet I have treated five cases of exhibitionism during the past two years and not one offended during that time; and everyone who treats sexual cases knows that many respond well to proper therapy.

It is to be hoped that Sir David's valuable paper will be perused by the legal profession, particularly magistrates and judges who have the ultimate disposal of prisoners, so that they have some idea at least of the trend of medical thought since the formulation of the M'Naghten rules 107 years ago.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

SIR,—I yield to no one in my admiration for Sir David K. Henderson's article, but venture on the strength of almost fifty years in practice—for twenty of which I held a prison appointment—to make the following remarks. The clash between lawyer and doctor in these cases is due to each looking at it from his own narrow or specialized viewpoint. All agree that society must be protected: the lawyer says "by incarceration in prison and/or death"; the psychiatrist says "by incarceration in hospital and/or castration"; but these measures are only justifiable, surely, if decreed by a society that is itself blameless. My experience in the years I served in prison as a medical officer was that the more intelligent the prisoner the more emphatic he was that his only extra sin was that of being found out. He confessed readily to hard luck and even to stupidity in allowing himself to be caught, but he remained convinced that in a competitive society where one man's weakness was the other man's opportunity—jungle law, in fact—he was no worse than the judge, jury, lawyer, and doctor who had sent him to jail. In all honesty, Mr. Editor, was he far wrong?

I regret that I cannot agree that the psychiatrist and/or his unit, which Sir David advocates, would yield any result sufficient to justify its inevitable expense. I may have been unfortunate in my experience, but I have seldom or never known of any case being cured by these agencies. I find that attendants and attended, if long enough together, gradually approximate to each other mentally till in time they find a common level. How can it be otherwise?—I am, etc.,

Glasgow, E.1. JAMES COOK.

SIR,—The masterly memorandum by Sir David K. Henderson and your leading article on the causes of delinquency are of great general interest. But to study the problem should we really insist, as might be thought from your article, on classification by types of reaction rather than by types of person? If we consider the equation which expresses type of reaction as the product of environmental stress on a particular type of person, surely it is equally necessary to make adequate records of the other two variables—namely, the person and his burdens.

I would have welcomed some reference in your article to William H. Sheldon's recent book[1] giving detailed biographies of 200 delinquent youths side by side with their somatotype photographs. Sheldon claims that the confusion in psychiatric nomenclature can be reduced by reference to morphology, and the subject made thereby intelligible. His system of somatotyping is governed by objective standards. Types of reaction are found to be closely linked in precise and numerical terms with type of physique. Moreover, he points out that where psychiatrists have repeatedly disagreed about the diagnosis of a particular case the patient's physique lies half-way between the two body types associated with the conflicting diagnoses of types of reaction. These claims are big, but well enough substantiated in his book to warrant at least investigation by other workers.

Stott argues that we ought to begin with the study of the normal before we turn to the delinquent, and it is this which leads me, as general physician in charge of an undergraduate health service, to take the cue. After somatotyping more than 300 undergraduates and completing a short scale-index of temperament, together with a record of the signs of neurosis, it is clear to me that the main substance of Sheldon's work showing the closeness of association between physical type and temperament and the prevalence of signs of neurosis is sound. I should recommend that the use of somatotyping or similar photogrammetric methods be included in any comprehensive scheme for future research into the causes of delinquency. It might, for example, help in time to resolve the perennial argument about the efficacy or suitability of corporal punishment,

and do this by distinguishing those for whom it is unsuited from those whose physique and temperament will stand up to corporal punishment or will even benefit from it. Although somatotyping will provide information about only one aspect of this very complex problem, yet I must emphasize that in studying the delinquent, just as in studying the normal, a positive and objective record of what the subject is himself is likely to be as essential as recording the stress of his environment or the type of his reaction.—I am, etc.,

Oxford. R. W. PARNELL.

REFERENCE

1 *Varieties of Delinquent Youth*, 1949, Harper, New York.

Typing of Bact. coli

SIR,—Your annotation (July 22, p. 205) draws attention to the present confusion in nomenclature of the two serological types of *Bact. coli* found during recent years in association with infantile diarrhoea and vomiting. These types are commonly known as *Bact. coli* alpha (or as *Bact. coli neapolitanum, Bact. coli* D 433, etc.) and *Bact. coli* beta. Your annotator suggests that Kauffmann's notation could be adopted with advantage, and, on the basis of the identification of the somatic (O) antigen, gives the two types the more definitive names of *Bact. coli* O group 111 and *Bact. coli* O group 55 respectively. He does not discuss, however, the criteria upon which these designations should depend. Clarity on this point would seem essential if accurate and comparable results are to be obtained.

To some bacteriologists absorption tests would appear necessary, at this stage of our knowledge, for the confirmation-of the O group. These procedures, however, are not practicable in the identification of the large numbers of strains sometimes obtained in clinical and epidemiological studies. Direct tube agglutination titrations present certain difficulties with regard to absolute and relative end-points (see Wramby, 1948), and may involve a consideration of partial antigenic components and overlapping reactions. Further, it may be recalled, certain "paracolon-like non-lactose-fermenters" have been agglutinated to titre by a *Bact. coli neapolitanum* serum (Bray, 1945). In any case, tube titration tests, in addition to biochemical tests, would prove too time-consuming for many laboratories.

Slide agglutination with impure K sera (prepared with living organisms and therefore of a complex nature) is the method usually employed to-day for the detection of *Bact. coli* alpha and beta colonies on primary culture plates. One fears that, unless the distinction is understood, "detection" may come to be regarded as the equivalent of "identification." The further risk then exists that strains detected by slide agglutination may be assigned, without further investigation, to a *Bact. coli* O group. Drs. A. M. M. Payne and G. T. Cook (July 22, p. 192) record that the first isolations of *Bact. coli* D 433 from 15 infants in a residential home were subjected to biochemical test and were agglutinated to titre by *Bact. coli* D 433 K and O sera; in subsequent isolations from the same infants, however, "the identification of *Bact. coli* D 433 was made by slide agglutination only." In all, 25 (or 62%) of the 40 strains recorded by them as *Bact. coli* D 433 would appear to have been subjected to this test alone. The nature of the serum used for the slide agglutination test is not stated, but it was presumably a K serum. It is not clear how many of these strains have been classed in your annotation as *Bact. coli* O group 111.

The same authors state that a study of the literature reveals that strains of *Bact. coli* α-type isolated by several groups of workers during recent years are, in fact, antigenically identical, and that they are the same as that described in their own paper. Establishment of antigenic identity among these organisms requires consideration of the O, B (see Smith, 1949), and H (see below) antigens, and, so far as I am aware, complete antigenic determinations have not as yet been made in this country. In order that present and future workers may follow clearly the developments of work in this field, I would suggest that, when "serological identity" is reported, accompanying reference should be made to the nature of the antigens determined and the methods used for their determination.

At the present time I am making an investigation of the H antigen(s) of a number of *Bact. coli* alpha strains isolated in the course of a clinical and bacteriological study undertaken in collaboration with Dr. A. T. Roden. Thirty-one of the 144 infants admitted to one gastro-enteritis ward in 1949 yielded *Bact. coli* alpha strains from rectal swabs taken in the admission room. The 31 infants were all suffering from diarrhoea and vomiting. The 31 strains all produced, within 24 hours, acid and gas in glucose, lactose, maltose, and mannite, and, within a few days, acid and gas, or acid only, in sucrose, salicin, and dulcite; all were indol +, M.R. +, V.P. −, citrate −, and urease −; and all were agglutinated to titre by *Bact. coli* alpha O and K sera. All 31 strains were motile, most of them highly so, when subcultured in Craigie tubes of soft nutrient digest agar. An H serum, prepared with a formolized suspension of one highly motile strain, gave "large-flake" agglutination and had a titre of 1/12,800 with the homologous strain and with certain of the other strains but not with all of them. It has not been possible to draw conclusions from these results, since as yet the observations are few and the techniques far from refined.

Four other infants, in the same series and also suffering from diarrhoea and vomiting, yielded atypical *Bact. coli* alpha strains from rectal swabs taken in the admission room. These four strains failed to conform to the characteristic biochemical pattern of the typical strains in two, three, four, and five particulars respectively. They were all agglutinated to titre by *Bact. coli* alpha O and K sera. Three of them were actively motile in peptone water, but did not show significant agglutination with the *Bact. coli* alpha H serum. In contrast to the typical *Bact. coli* alpha strains which were "*O-inagglutinable*" (i.e., not agglutinated in the living state by homologous O serum), the four atypical strains were, in varying degree "O-agglutinable" (i.e., agglutinated in the living state by homologous O serum). Attempts are being made to produce a *Bact. coli* B serum by the employment of one of these "O-agglutinable" strains for absorption.

Among the *Bact. coli* beta strains isolated during the course of the investigation the three following patterns of fermentative activity have been observed: (*a*) rapid acid and gas in sucrose; slow acid and gas, or acid only, in maltose; (*b*) rapid acid and gas in maltose; slow acid and gas, or acid only, in sucrose; (*c*) acid only in seven commonly used "sugars."

The variants and sub-types of *Bact. coli* alpha and beta would seem to merit further attention, since it is possible that in time they might be found to have some clinical or epidemiological significance. The number of atypical strains may prove to be not inconsiderable. Based on comparatively few tests, 11% of the *Bact. coli* alpha strains, isolated from infants on admission to one gastro-enteritis ward during one year, were found to show variation from the type strains and from one another.

There are two lines of approach to the existing and coming problems in the investigation of *Bact. coli* types associated with infantile diarrhoea and vomiting. The first is the advancement of knowledge by fundamental research regarding their antigenic components, their biochemical reactions and other properties, their variants, and their sub-types. The second is the development of simplified techniques designed to meet the needs of the many bacteriologists who are showing an interest in the work and who are anxious to bring the typing of *Bact. coli* strains within the scope of their laboratories. It is particularly in connexion with antibiotics trials and cross-infection studies that this need is being felt. Between the simple but insufficient slide agglutination test and the time-consuming full agglutination and biochemical tests it may be possible to devise a standardized typing technique applicable to everyday use. An inclusion of the determination of the somatic antigen would be of value, because then the O group, as your annotator suggests, could be made the main antigenic component, to which other factors could be added as knowledge grows.—I am, etc.,

Tottenham, N.15. JOYCE WRIGHT.

REFERENCES

1 Bray, J., *J. Path. Bact.*, 1945, **57**, 239.
2 Kauffmann, F., *J. Immunol.*, 1947, **57**, 71.
3 Smith, J., *J. Hyg., Camb.*, 1949, **47**, 221.
4 Wramby, G., *Acta path. microbiol. scand.*, 1948, Suppl. lxxvi.

Value of Tuberculin-jelly Tests

SIR,—Dr. W. Pointon Dick's article on this subject (*Journal*, July 15, p. 141) has escaped my previous notice owing to absence on holiday. I would like to take this opportunity of confirming his findings, first as to the value of an abrasive technique before applying the jelly, and secondly of the superiority of an old tuberculin (O.T.) jelly over one whose active constituent is purified protein derivative (P.P.D.).

Since I originally published the method of skin abrasion (*sand-papering*) in 1946, I have carried out many series of jelly tests on known Mantoux-positive reactors, and have found fairly consistently that the technique of skin abrasion increases the number of positive reactions about 20% over the technique in which abrasion is not used, and yields results comparable to the 1:1,000 Mantoux using O.T.

As regards Dr. Dick's second point, I too have found that a jelly made up of O.T. gives superior results to one containing P.P.D., even using the latter in double strength (i.e., 4 mg./g.), and would recommend that all tuberculin jellies used for skin testing should have old tuberculin as their active constituent.—I am, etc.,

Appley Bridge, near Wigan. E. H. W. DEANE.

Infection by Syringe

SIR,—Some fourteen years ago I was initiated by Dr. Bousfield into the technique of diphtheria immunization and Schick-testing, and since then have been regularly employed in immunizing and testing children from 9 months to 15 years. His letter (August 5, p. 365) was therefore of special interest, for, quite independently, I have during the last few weeks been employing just the technique he suggests—i.e., taking up into the syringe a small overdose and pumping out the excess before refilling the syringe. There is, however, yet another safeguard which for years past has invariably been employed in this area—namely, rapidly passing the needle two or three times through the flame of a spirit-lamp before taking up fresh antigen. We have had no mishaps so far over the years, and the mild local reactions that occasionally follow injection are promptly controlled with a cold saline compress.—I am, etc.,

Haywards Heath. H. L. DUKE.

Obstetrical Anaesthesia

SIR,—While welcoming Dr. J. G. Warnock's support (July 22, p. 218) for my contention (July 1, p. 47) that in domiciliary midwifery the left lateral position is far safer than the lithotomy position for forceps delivery, I would at the same time very readily respond to his invitation to suggest a simple technique which could, I think with advantage, replace chloroform in midwifery, though the method I practise is not original, and may be even disappointing in its simplicity.

First, however, perhaps I may be allowed a few words of comment on his letter. His successful record, on which he is to be congratulated, of freedom from the calamity of primary cardiac failure in his whole series does not mean of course that light chloroform anaesthesia is free from that risk in operative procedures, even in obstetrics. I well remember seeing a sudden death from primary cardiac failure while chloroform was being administered by an expert during a simple stretching of the sphincter ani.

It is not so long ago since a case was recorded in this *Journal* of a woman of 25 whose heart stopped just as the child had been delivered by forceps under chloroform anaesthesia. In this instance the doctor performed cardiac massage by Nicolson's method in circumstances which allowed only the use of an unsterilized scalpel and unwashed hands, and the patient recovered. The case was recorded, very naturally, as a triumph for cardiac massage, though it might well have been published as a warning in respect of the chloroform which unquestionably was the cause of the disaster.

The technique which I use is simply the substitution of ether for chloroform, either by the open method or in a Clover's apparatus, and I have had no mishaps during the whole of thirty years of general practice involving a good deal of midwifery. I do not believe that an open fire in the room need deter one from using ether, but, of course, its potentialities must always be borne in mind and certain common-sense precautions must be observed. These include: (1) adequate ventilation; (2) the site of anaesthesia must be remote from the fire, and this may involve moving the bed; (3) the fire should be rendered "dead"—actual flames are the real danger; (4) in rare instances it may be necessary to have the fire removed in a bucket—if, for example, the room is very small; (5) a gas fire should be turned out during the anaesthetic. I make no apology for detailing these precautions, as they are of crucial importance.

In low-forceps delivery the degree of anaesthesia can be diminished once forceps have been applied, for light ether anaesthesia has no inherent dangers, whereas deep ether anaesthesia, if prolonged, and still more deep and prolonged chloroform anaesthesia carry the risk of post-partum inertia and haemorrhage.

In support of ether I should like to quote Dr. John Elam, whose contribution to anaesthesia as a general-practitioner anaesthetist is unique. He writes:

"Ether is unquestionably the safest and best anaesthetic for the general practitioner to administer for a forceps delivery, the repair of the perineum, or the removal of an adherent placenta. Ether can be safely left in the hands of a midwife once the induction has been accomplished."[1]

With this I am in entire agreement, though I would add to his last paragraph the words "provided the patient is lying in the left lateral position."

The objection that is sometimes raised that ether is unpleasant to take is met by the fact that all anaesthetics are well tolerated during labour, and in actual practice one finds that when, during delay in the second stage, the indications for forceps are fulfilled the patient cares little what anaesthetic is used so long as it is efficient in relieving the pain.—I am, etc.,

London, N.W.7. A. H. MORLEY.

REFERENCE

1 *Post.-Grad. med. J.*, 1946, **22**, 269.

Mongolism in One of Twins

SIR,—The following report may be of interest in adding another case of mongolism in one of twins to the scanty literature on this subject.

I attended the mother on May 19, 1938, when she had her first pregnancy. A healthy male child was born, and this child has developed normally. On March 17, 1943, I was in attendance for her second confinement, when she was delivered of twins. She was then 38½ years of age. There have been no miscarriages. The pregnancy was uniovular, with separate amniotic sacs, and the sex was female in each. There was no obstetric difficulty and the delivery was at full time. The mongolism in the one twin is of a very severe degree, and although now 7 years old her weight is only 19 lb. (8.6 kg.). She is unable to walk, stand, or crawl, and sits all day in a leaning-forward position. She is still bottle-fed, and as yet there is no evidence of any permanent teeth. The circulation in the hands and feet is very poor, but there is no congenital heart defect. The other twin has developed normally and is of a good average intelligence, likes arithmetic, reading, and music, but does not show outstanding ability in any particular subject.

—I am, etc.,

Middleton-in-Teesdale, Co. Durham. ROBERT DAWSON.

Crisis in Tuberculosis

SIR,—We treat live patients, not dead ones. To calculate bed requirements on the basis of mortality rates (see *Journal*, July 29, p. 295) is to presume a constant ratio between those developing tuberculosis and those dying from it. In fact, the evidence suggests that this ratio grows steadily larger; on the one hand more cases are diagnosed, and on the other a smaller proportion end fatally and those that do take longer to do so. Probably there are wide regional variations.

Sanatorium waiting-lists offer only a minimal figure. The waiting period is now so long that at many chest clinics the names of patients are just not put on these lists. Domiciliary

treatment is employed as an alternative, often with very good results, but often with the production of further cases by infection in the home, the statistical effects of which will no doubt become apparent in due course. Meanwhile sanatorium physicians, trying to help the general situation by accelerating their turnover, discharge their patients earlier than they would wish, with results less good than we might hope.

Our true aim therefore should be to provide institutional treatment for all cases of active tuberculosis and for cases where activity is suspected for periods long enough reasonably to ensure stability of the lesion. I suggest that, whereas two and a half beds per annual death may serve as an immediate objective, the proper figure may lie, as Bogen (*American Review of Tuberculosis*, 1949, **59**, 707) indicates, somewhere between 5 and 10.—I am, etc.,

Slough, Bucks. BRIAN THOMPSON.

Multiple Primary Carcinoma

SIR,—In view of the recent correspondence (July 29, p. 297) on double synchronous carcinomata we would like to record the following case.

A married woman of 34 was seen in the out-patient department complaining of bilateral mastitic swellings of six months' duration and intermittent abdominal distension. On examination the patient was emaciated and anaemic (Hb 30%). There was a firm swelling 3 in. by 2 in. (5 cm. by 7.6 cm.) occupying nearly the whole of the right breast, not attached to skin or the pectoral fascia. A swelling 1 in. by 1 in. (2.54 cm.) presenting the same physical signs was present in the left breast. There were glands palpable in the right axilla.

The abdomen was distended and a fluid thrill was elicited. Paracentesis withdrew eight pints (4.5 litres) of straw-coloured fluid, and following this a mobile rounded swelling was palpable in the left iliac fossa. She died ten days after admission.

The necropsy revealed a colloid carcinoma of the stomach. The ovaries were replaced by two mobile swellings which proved to be Krukenberg tumours on microscopical section. The right breast on section showed a spheroidal-cell carcinoma, with colloid degeneration in parts of the specimen.

On going into the family history, further interest was added to the case when it was found that the patient's paternal grandfather died of carcinoma of the stomach at the age of 52; her mother died of carcinoma of the stomach at the age of 54; and her father died of a perforated gastric ulcer (pathology unknown) at the age of 51.

This case shows two primary neoplasms and secondaries, with a strong family history of carcinoma of the stomach. The early onset of malignancy in the patient is noteworthy.

We wish to thank Mr. F. P. Forrest for permission to publish this case, and Dr. W. McNaughtan for the pathological reports.

—We are, etc.,

Poole, Dorset. AUSTIN BROWN.
ALEXANDER Z. ELKES.

Genius and Crank

SIR,—Dr. Eliot Slater (July 29, p. 255) overrates the influence which Fliess exerted on Freud. Fliess, whom I knew intimately, never claimed that his own teachings had made a mark on psycho-analysis. Freud's interest in sex was primarily psychologically determined. Breuer and Charcot were his mentors, not Fliess, who was a physiologist trained under Du Bois-Reymond, though he did not share his belief in "Ignorabimus" and was interested in sex from the genetic point of view. Apart from the insight that a homosexual trend is a general tendency in all neurotics, concluded from the Fliessian concept of the *permanent bisexuality* of all living organisms, there is little evidence of Fliess's influence to be found in Freud's writings. This is all the more remarkable as his interest in, and regard for, Fliess, as Dr. Slater rightly states, was very great indeed. When in 1912 I had published a case of hysteria in which the intervals between states of anxiety as well as between appearance and disappearance of conversion symptoms showed the pattern of Fliess's 28-day and 23-day rhythm, and concluded that a periodically recurrent physiological factor precipitates neurotic states, or may even be responsible for psychological mechanisms to be put into action, Freud wrote to me that he would welcome the introduction of this line of investigation into psycho-analytical work. But this was all, and among his disciples no one showed interest in Fliess except Stekel, who, however, no longer belonged to the Freudian school.

It is true that Fliess made it difficult for anyone who did not share Dr. Slater's view that he was a "crank of the first water" to support him. Some of his concepts are and always were untenable. Nevertheless, if one had to prove that he was cranky, one would have to do it on the lines of Dr. Russell Brain's memorable article on "Authors and Psychopaths," and could certainly not mention in evidence teachings which are based on sound observation—e.g., the "bizarre hypothesis of two types of rhythm." This is not a hypothesis. These types exist, as anyone can see who studies one of his books or, for that matter, one of my publications on the subject. The hypothesis which Fliess has built round his observations may be right or wrong or bizarre. But there can be little doubt that they reveal genius. And this fact alone, and not the "emphasis on sexuality," explains Freud's interest in, and high regard for, Fliess. If this were not so, Freud's infatuation (what else could it have been?) would have to be interpreted in psycho-analytical terms.—I am, etc.,

London, N.W.11. B. C. SAALER.

Do Weed-killers Poison Food?

SIR,—Dr. Alan Maberly does a service in his letter published in your issue of July 29 (p. 299) in questioning the assumption that the differential weed-killers and latest insecticides when absorbed into the sap of plants leave no trace in the fruit or seed. The members of these two classes of agricultural and horticultural aids have rendered possible the growth of heavier crops on land already in use and have made it possible to cultivate hitherto unused tracts of tropical countries. However, disturbances in the local oecology are inevitable following their use, and some of these may be undesirable—e.g., the killing of bees, leading to less efficient pollination. (Another trend of modern times is the mechanization of agriculture, leading to the present scarceness of farmyard manure and the consequent increase in the use of artificial manures.) The effect on human teeth of minute amounts of fluorine in water is now well recognized. The use of nitrogen trichloride in the treatment of flour ("agene" process) is to be replaced by the use of chlorine dioxide on the recommendation of the Medical Research Council, not because any effects in humans have been traced to its use but because dogs fed on such treated flour have developed canine hysteria. Is it not possible that such poisonous substances as dinitro-ortho-cresol mentioned by Dr. Maberly may be equally undesirable? O.M.P.A. (octamethyl pyrophosphoramide), which acts by inhibiting cholinesterase and thus affects parasympathetic activity, circulates in the sap of a plant for weeks.

I suggest that the effect on food of such potent substances used in agriculture and horticulture could with advantage be studied and reported on by some such body as the Medical Research Council. Such authoritative pronouncements would aid those entrusted with, or advising on, the formulation of a national food policy.—I am, etc.,

Rochester. J. H. WHITTLES.

A Clarification

SIR,—It has been pointed out to me that there is a misleading remark contained in the table of my article "*Bact. coli* D 433 in Cases of Diarrhoea in Adults" (July 22, p. 195). The remark in question is in connexion with Case 3, where the words "(nor with other cases of this series)" appear in the column headed "Contact with Children." This was intended to make clear that this was the only patient who developed diarrhoea *in hospital*, and so far as could be ascertained this patient could not have been infected by the others of the series. The cases of the series occurred in two separate hospitals in widely separated wards, but it is proposed to make this the subject of a future epidemiological study.—I am, etc.,

Glasgow, N. JOHN S. STEVENSON.

A School for Doctors' Children

SIR,—On p. 89 of the *Supplement* to the *British Medical Journal* of August 12 Dr. J. B. Wrathall Rowe pleads for the erection—inferentially at a cost of £120,000 or thereabouts—of a school for medical war orphans and "other children of doctors, particularly doctors serving overseas." On p. 414 of the same issue the 97th annual meeting of the governors of Epsom College is reported, including a statement that the council intends to make an appeal for funds required to make lasting improvements to the buildings. Is it possible that Dr. Rowe has not heard of Epsom College, and of its Foundation which pays for free board and education at Epsom of medical orphan boys and defrays scholarships elsewhere for girl orphans? Does he know that education is provided there strictly at cost price for the sons of all doctors, and that the buildings have an insured value of £250,000? Does he know of the numerous leaving exhibitions for boys intending to enter the medical profession? In a word, would not his ideals—with which I have a lot of sympathy—be best realized by expanding the resources of Epsom College as the most practical method of achieving what he has at heart? The B.M.A. has already a permanent representation on the council of the College, at present by Mr. N. E. Waterfield, F.R.C.S.—I am, etc.,

Tunbridge Wells. HENRY ROBINSON,
Deputy Hon. Treasurer,
Royal Medical Foundation of Epsom College.

Nervous Yet Unafraid

SIR,—Vast as is the English vocabulary it would, I think, be improved by the invention of a word which would do away with an unfortunate anomaly. The word nervous on the one hand is used for the great miscellany of neurotic illness and on the other for the timid and fearful. But they have nothing in common. The neurotic may be and in fact often is fearless, almost contemptuous of personal danger, and yet the word lumps him together with the craven-hearted. The new word should be quite new, with no associations with the many unsatisfactory synonyms which have tried vainly to deal with the dilemma. A meaningless word with no ethical significance for the neurotic type of nervousness I suggest is *crobly*, adjective or adverb, and *crobliness*, where a substantive is needed. No such word exists in the *O.E.D.*—I am, etc.,

London, S.W.1. E. GALLOP.

POINTS FROM LETTERS

Psoriasis

Dr. C. F. PATTERSON (St. Neots, Hunts) writes: I have found that the strain of responsibility and the "adrenal flood" of anger are the principal precipitating factors, and this is why retirement to bed is of value, but there is really more frictional trauma in bed, particularly to the forearms, than anywhere else. As for Father William, cited by Dr. R. M. B. McKenna in his Refresher Course article (July 22, p. 207), the patient does not need to stand on his head to obtain a scalp like a contour map. He can do this quite simply and absentmindedly by scratching or picking at his head while reading his book in bed (or in an armchair), and the more so if his book is exciting or his newspaper alarming. Repeated baths are not advisable, as they clear the skin of its natural oils—including all its vitamin D. No, for the G.P. the answer remains as follows: to limit the patient to one bath a week, followed by a rub with ung. picis carb. co., and to give him a single dose of 150,000 units of vitamin D (i.e., three tablets of calciferol. fort. *N.F.*) in the *summer*, and to advise him not to live in large smoky towns or misty valley bottoms, and either to take regular phenobarbitone or to avoid anger and responsibility. Bed, or phenobarbitone, or both, should help more in the case of fear and anger than cortisone (when it comes), but how the sympathetic nervous system enters into the problem of psoriasis, as it undoubtedly does, still remains a mystery. At present, I suppose, we are forced back to Selye's target organ theory, but have no real idea as yet how this works.

Smallpox in the Unvaccinated

Dr. H. TUDOR EDMUNDS (Slough, Bucks) writes: I should like to reply to Dr. J. S. Gemmill's letter (July 8, p. 107) and to point out that, while it is impossible to prevent atypical cases of smallpox that may occur in the unvaccinated, it is possible to prevent those cases which are brought about by vaccination. . . .

Obituary

BERNARD J. WARD, F.R.C.S.

Mr. Bernard Ward, formerly the senior surgeon of the Queen Elizabeth Hospital, Birmingham, died at his home in Shelsley Beauchamp on July 30. He was 71 years of age, and his health had been failing for some time.

Bernard Joseph Ward was the son of the late Dr. Joseph Ward, who practised for many years in Birmingham. He received his medical education at Birmingham medical school and the London Hospital. Qualifying in 1902, he obtained his F.R.C.S. in 1905. He held resident posts at the Queen's Hospital, Birmingham, and in London at St. Peter's Hospital for Stone. He became assistant surgeon to the Queen's Hospital in 1907, and an honorary surgeon in 1917. In the first world war he served as a captain in the R.A.M.C. He was later appointed consultant surgeon to the Children's Hospital and to the Birmingham City Police. He served the medical school as lecturer and examiner in surgery. He achieved his greatest reputation in urology and in this field became one of the foremost surgeons in the country. He held office as president of the Section of Urology of the Royal Society of Medicine and was vice-president of the British Association of Urological Surgeons. This last office is commemorated by the Ward Medal, which he presented as an award to mark outstanding work in the field of urology. His own great skill in this field earned for him the confidence of the profession and of the public alike. He was a member of the British Medical Association for forty years. He leaves a widow, a daughter, and two sons: to them his many friends offer their sincere sympathy.

L. T. C. writes: For twenty-five years I had the honour to be Bernard Ward's anaesthetist. In that time and in those circumstances I had the unique opportunity of knowing the man, his strength, his weakness, his virtues, and his faults, and now at the end I can say with a full heart, "He was a great man, a powerful friend, and an outstanding surgeon." In this last capacity he was widely known, and such was the quality of his work that we who worked with him were glad to satisfy his demands—and for his patients he demanded the maximum. I recall that as a very young man about to anaesthetize one of our colleagues I sought his opinion, hoping to give "that little more." His reply I have never forgotten. "That little more, my lad! If that is possible, why do you deny it to my other patients? Doctor A is your patient—that is all you need to remember." The quality of a man may be judged by the stories and legends connected with him. In our teaching school, "Beeje," as we called him, figured in so many and, happily, so humorously. The whole man was known to the comparatively few, and that happy few gave him their complete devotion. How many of his furtive kindnesses to patients and friends do I recall—kindnesses which he would deny with the blustering innocence of a schoolboy caught in the larder. At heart "Beeje" was a countryman; horse, hound, and the trout stream for him spelt happiness. He was a man of impressive physique, essentially a man's man. It is pleasant to recall that on his retirement as senior surgeon his old house-surgeons practising in Birmingham gave him a complimentary dinner.

P. L. DANIEL, F.R.C.S.

Mr. P. L. Daniel, consulting surgeon to Charing Cross Hospital, died suddenly on July 28 at Checkendon, aged 79.

Peter Lewis Daniel was born in Carmarthen in 1871. He studied medicine at Charing Cross Hospital and was associated with that hospital for the whole of his professional life, except for a short period of work in Vienna. He qualified in 1898, and took the F.R.C.S. a year later. The list of the posts he held at Charing Cross is a large one, for in his time specialization was not carried to the lengths it is to-day. In addition to several surgical appointments he was also at one time or another house-physician, assistant demonstrator of anatomy, assistant in the electrical department, pathologist, and curator of the museum. He was also on the staff of the Gordon Hospital for Diseases of the Rectum, of the Metropolitan Hospital, Willesden, and of several smaller hospitals near London. He was medical referee to the Cremation Society. He retired from the staff of Charing Cross Hospital in 1931, but he continued to work at the Gordon Hospital until 1948. During the war he was able to help his old hospital, returning as a surgeon to the evacuated hospital at Ashridge.

Daniel was a man of great good sense and a very sound surgeon. He specialized in rectal and abdominal disorders, but quite early in his career he interested himself in the effects of oral sepsis and was the author of a book, published in 1910, entitled *Arthritis: A Study of the Inflammatory Diseases of Joints*. Old Charing Cross students will remember him as a man of fine character and an excellent practical teacher. He is survived by his wife and son, Dr. P. M. Daniel.

Dr. DOROTHEA JANE MANN died at her home in Nottingham on June 29. The elder daughter of the late Rev. Alexander Mann, she was a student at the University of Edinburgh, where she graduated M.B., Ch.B. in 1921, proceeding M.D. in 1926. She held the posts of assistant medical officer to the V.D. clinic and of medical officer in charge of the mental deficiency department at Nottingham.

G. G. D. writes: Some thirty years ago, when we left Nottingham, our house was taken by a young woman who had just graduated in medicine. She told me she was going to set up in practice for herself. We thought it a brave thing to do and wished her well. On our return some years later we found Dorothea Mann still in the same house, fully established, and one of the best-known and most-esteemed practitioners in the city, with a large general practice, built up by hard work and medical skill. She was just the right person to be a doctor, kindly, generous-minded, full of charm and personality. Her patients adored her, for, beside giving of her best for their ailments, she was interested in them as persons and could advise in their ordinary lives in a wonderfully far-seeing way. A few years ago she had a serious illness which we thought had yielded to treatment, and about which she made light, going on with her work as selflessly as usual. Early this year, however, she realized she was a very sick woman and was persuaded to retire. Within six months the end came. Her loss is irreparable, and it will be a long time before we see her like again.

ELIZABETH HONOR BONE died at her home in Hampshire on July 9 at the age of 75. Owing to ill-health she had led a quiet life since her retirement from general practice in 1935. She was the second of three daughters of William John Bone, manager of the Tyne Iron Shipbuilding Company; the girls were brought up on Tyneside and eventually sent to school in Edinburgh. Later she studied medicine at the Royal Free Hospital and London School of Medicine for Women. She graduated M.B., B.S. in 1898, and proceeded M.D. in 1905. While a student she met the late Dr. Christine Murrell, and together they planned to equip themselves to start general practice in the West End of London in a professional and well-to-do district. Graduates from the school were already established in many varieties of consultant practice, but women general practitioners had usually settled in industrial and working-class districts, so that the plan was something of an innovation for women at the turn of the century. Dr. Bone went to Vienna and Berlin after qualifying, and then took an appointment as medical officer to the Women's Settlement in Liverpool. Here, while practising in the dock areas, she worked with Sir Robert Jones. This contact influenced her outlook in practice very greatly. The partnership planned by Dr. Bone and Dr. Murrell began in 1903 in Bayswater (the first year's takings amounting to £87). The practice grew rapidly and was well established by the beginning of the first world war. Third, fourth, and fifth partners were taken on. Dr. Bone was an ideal family physician. She was a very small person with the quiet gravity which is always reassuring to children. She paid meticulous attention to detail both in diagnosis and treatment, and many of her old patients recall the good years when she ruled the health of their growing families. She had perfected the use of her senses in eliciting physical signs to an unusual extent and had a great gift for training her assistants. She was a part-time school medical officer under the L.C.C. for some years and was one of the original medical officers at the North Kensington Baby Clinic before infant-welfare centres were established. Here she had full opportunity for the constructive paediatric work that was dearest to her. Her small stature and her wish for a quiet life with no public appearance of any sort were in striking contrast to the imposing figure and full public activity of her partner, Christine Murrell, but the association of these two doctors in practice for 30 years had the happiness which so often results from wide dissimilarities.—A. G.

Dr. EDWARD MOIR, who had been senior anaesthetist to the Manchester Royal Infirmary for many years, died suddenly at his home in Combs, Chapel-en-le-Frith, on July 25 at the age of 72. The son of the late Dr. Douglas Moir, he qualified in 1907 and obtained his D.A. at Manchester in 1939. In addition to his appointment as anaesthetist to the Manchester Royal Infirmary, he was on the staff of the Manchester Ear Hospital and the Macclesfield Infirmary. F. G. W. writes: Edward Moir was for many years one of Manchester's foremost anaesthetists. His proficiency in his specialty was well recognized among his surgical colleagues, and his services were in great demand, particularly with ear-nose-and-throat surgeons. He could give a difficult anaesthetic for a bronchoscopy or an oesophagoscopy as well as anybody, and a great deal better than most. He was one of the old school to whom chloroform was the ideal anaesthetic, and in his hands it certainly proved a very safe and effective drug. Moir was always kind to his patients, especially to children, with whom he would carry on a conversation during the induction period; this was of course before the days of premedication. To his colleagues he was courteous and most obliging in every way. The regularity of his attendance in his hospital work was exemplary, and he would never think twice about going to hospital for urgent work at any time of the day or night. Dr. Moir's other sphere was that of athletics. In his student days he first played "soccer" for the university, but soon transferred his affection to "rugger." He remained faithful to the latter game for the rest of his life, both as a player and later in an advisory capacity. He was vice-president of the Manchester University R.C. and president in 1911, and again from 1922 to 1926. He was life president of the University Athletic Club, and president of the Athletic Union in 1919 and 1920. Moir was an official starter at the University Athletic Ground, and his capacity was recognized by his appointment as starter to the Olympic Games at Paris in 1924 and at Amsterdam in 1928. He served as a representative on the Lancashire and English Rugby Unions, where his experience and knowledge were of great value. His loss will be felt not only in the medical world but also in the field of athletics, where he was a well-known and popular figure.

Dr. ERNEST SOLLY, of Harrogate, died on July 26 at the age of 87. He was educated at Rugby School and studied medicine at St. Thomas's Hospital. He qualified in 1886, graduated M.B. in 1887, and took the F.R.C.S. a year later. After a period as a resident at the Royal Free Hospital, he came to Harrogate in 1893, taking over the practice of the late Dr. Russell. He began as a general practitioner and spa physician. Later he specialized in surgery and was appointed surgeon to the Harrogate Hospital in 1905, a post which he held up to 1932, when he retired to the consulting staff. He was also honorary surgeon to the Yorkshire Home for Incurables and Chronic Diseases. As a surgeon he was deft with his fingers, meticulous in procedure, and of sound judgment. He took an early interest in municipal affairs, serving on the town council for nine years, and becoming mayor in 1898. His work during these years as liaison officer between the corporation and the medical profession was invaluable, for he took an active part in the development of the spa. He served in France during the 1914–18 war in the R.A.M.C., attaining the rank of major. Mr. Solly had been a member of the British Medical Association for 50 years. He was a vice-president of the Section of Dermatology in 1906 (when the Association met at Toronto); a member of the Central Ethical Committee from 1932 to 1939; and represented his constituency at the Annual Representative Meetings in 1905, 1926, 1928, 1929, 1930, and 1932–9. Apart from his profession he had wide interests. Philately was his chief hobby; he had a large and valuable collection of stamps. At carpentry he was an adept. In his earlier years he was a keen cricketer, and he took an active part in the development of the Boy Scout organization. He was a founder member of the Harrogate Rotary Club. A man of many parts, he was well read and had a good memory. His general knowledge was great. When called upon he could deliver an interesting address on almost any subject desired. Of late years he led a retired life owing to failing health. His wife died in 1932. He is survived by one son and three daughters; another daughter died in 1946. He will be greatly missed by all his contemporaries and friends.

Dr. JOHN HERBERT BANKES, of Lindfield, Sussex, died on August 1 in London, aged 71. He was related to the well-known family of lawyers and judges of that name. He was a student at St. George's Hospital, and he qualified in 1904. Afterwards he practised in South Kensington. He served in the R.A.M.C. during the 1914–18 war, and on demobilization did not resume general practice but took an appointment with the Ministry of Pensions. In this he was so energetic and successful that in 1929 his name was put forward for appointment as deputy lieutenant for the County of London, and he was duly chosen. Throughout his career Dr. Bankes was a keen Mason. He was Provincial Grand Master for the Province of Middlesex, and he was on the boards of management of both the masonic educational charities. He had lived in (professional) retirement for several years, but always came to London for meetings of the lieutenancy and for his masonic duties.—H. R.

The Services

Surgeon Captain G. F. Abercrombie, V.R.D., R.N.V.R., has been appointed an Honorary Physician to the King in succession to Surgeon Captain C. C. Elliott, D.S.C., V.R.D., R.N.V.R.

A *Supplement* to the *London Gazette* has announced the following awards:

"1st Clasp" to the Territorial Efficiency Decoration.—Lieutenant-Colonel S. W. Barber, M.B.E., T.D., R.A.M.C.

Territorial Efficiency Decoration and "1st Clasp."—Major (Honorary Lieutenant-Colonel) C. L. Heanley and Majors J. E. Elliott and P. H. Jobson, R.A.M.C.

Territorial Efficiency Decoration.—Majors S. Curwen and R. F. Ward (died by enemy action), Captains (Honorary Majors) F. D. Hindmarsh, A. D. Kelly, M.B.E., A. J. G. Newton, and J. M. Sturrock, Captains C. F. Fairlie and S. Howe, R.A.M.C., and Captain E. Saunsbury, T.A.R.O., R.A.M.C.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Frank Howarth, M.D., has been appointed a University Lecturer in Pharmacology with tenure for three years from October 1.

Nigel Dean Compston, M.D., has been elected to the E. G. Fearnsides Scholarship.

UNIVERSITY OF EDINBURGH

At a graduation ceremonial on July 19 the following degrees and diplomas were conferred:

M.D.—[3] [5]D. M. Blair, [3]H. M. Brown, [2]J. H. F. Brotherton, [5]J. Collins, Mary A. J. T. Douglas, Frances M. Earle, Audrey L. Ferguson, [2]D. C. Haig, S. P. Hall-Smith, Morag L. Insley (née Henderson), [2]Mary E. Lothian (née McLaren), [1]I. F. Sommerville, [2]T. Sommerville, [2]J. A. Tulloch, [2]J. Wallace, [1]G. M. Wilson.

D.Sc.—*In the Department of Pure Science:* R. F. Ogilvie, M.D.

PH.D.—*In the Faculty of Medicine:* F. H. Sims, M.Sc., M.B., Ch.B.

M.B., CH.B.—J. G. Abercrombie, W. T. C. Adamson, A. A. Akiwumi, D. S. Alexander, Jean M. Arkieson, Natalie H. F. Armstrong, J. D. Arthur, T. A. Ballingall, Rosemary A. Begg (née Kemp), Sheila M. Black, Jennifer P. Bland, R. Bliss, D. W. Bookless, Elizabeth S. Brown (née Bennett), J. R. Brown, L. S. Brown, Janet C. Bryce, Patricia M. Burke, I. D. Campbell, J. C. Cape, R. A. Caulfield, J. Chalmers, I. MacD. Clark, I. L. Clark, Agnes A. Cochrane, J. F. J. Collins, I. A. Colville, N. M. J. Cowan, F. J. Darby, A. H. Darling, A. S. Dawson, R. McN. Dean, I. Dial, G. M. Dobbie, C. G. B. Downie, R. W. Downie, J. J. Drever, Catherine W. Drysdale, R. Edmond, A. E. Elliott, D. J. Erskine, G. S. Fiddler, J. W. Fisk, J. I. McL. Forsyth, G. D. Forwell, Margaret C. Galloway, W. A. S. Georgé, J. M. C. Gibson, Deidre M. M. Gillies, Elsie M. Glennie, T. M. Goodall, A. B. Goorney, J. G. Gray, G. J. Green, D. C. Greig, S. C. C. Grieve, R. E. Gristwood, A. A. Gunn, G. K. M. Hall, A. M. Hall-Gardiner, W. A. Hanna, J. Harkness, Joan Harper-Ball, D. M. Hastings, R. E. Haworth, Daphne E. A. Healey, Ethna E. R. Henderson, Jean M. Higgins, J. Hill, G. F. A. Howie, R. Hutchinson, Margaret Jackson, F. D. Johnston, W. T. Jones, Victoria K. Kelly, D. S. S. Ker, C. O. R. King, [4]M. R. King, J. R. Kirkpatrick, A. W. Laing, [4]Anne T. Lambie, I. H. Lawrence, Barbara Leach, F. H. Lockwood, J. R. A. Luckas, R. McAdam, J. S. McP. Macaskill, R. H. McClure, P. W. McCormick, F. I. MacDonald, J. D. McDonald, J. S. Macdonald, Jill MacDonald (née Russell), Annie McL. McDougall, J. B. Macfarlane, P. S. MacGibbon, A. D. McIntyre, Patricia C. Mackay, G. L. MacLeod, D. C. McNutt, A. I. MacPhail, Margery A. Macpherson, Frances E. A. McVey, D. H. McVie, W. L. Marshall, J. A. McL. Martin, M. C. Maw, A. W. Maxwell, D. Maxwell, N. Mendick, G. L. Minter, Jean S. H. Mitchell, L. Mitchell, Pamela A. Moncrieff, B. McL. More, Donalda M. Morgan, J. A. L. Morrell, Hilary L. Morss, Mary W. Moss, J. R. Munro, Danuta Oktawiec, L. L. Ostrowski, I. V. E. Owen, J. C. Paterson, Joan Pears, D. Penman, W. A. Penman, N. B. Peterkin, A. F. Phillips, J. T. Rabie, B. A. Rapier, I. D. Reid, L. R. Roberts, J. G. Robertson, Elizabeth Rose, W. R. Ross, [4]G. F. M. Russell, I. A. Ruthven-Stuart, J. D. St. Clair, T. F. Sandeman, P. J. Scally, D. G. Scott, G. A. Scott, R. G. Scott, Kathleen J. C. Shaw, W. C. Shepherd, F. O. Simpson, W. T. Simpson, [4]A. W. McI. Smith, S. McC. Smith, Yvonne R. Sneddon, J. Spence, J. F. Stephen, W. I. Stuart, Pamela M. Sutherland, Elizabeth M. Sweet, Margaret E. Taylor, W. Taylor, B. Teelock, A. Thomson, W. G. Thomson, Priscilla E. Turnbull, D. H. Vaughan, Margaret A. Walker, W. C. Walker, W. G. Walker, J. J. Wallace, A. S. Watson, Alison A. P. Watson, A. St. J. Wilding, A. K. Wilson, G. C. Wilson, Pauline I. M. Winn, H. J. Woodliff, D. G. Wray, A. C. Wright, M. J. Wright, Sheena M. Yule.

B.Sc.—*In the Department of Pure Science:* P. N. Edmunds, M.B., Ch.B. (with first-class honours in bacteriology).

D.P.H.—M. D. B. Ahmad, A. McD. Allan, Doris M. Beaton, G. Dison, G. A. F. R. Gibson, R. Lwin, Phyllis E. Lyne, Joan M. McWilliam, J. McE. Neilson, C. A. Phillips, I. C. Wilson.

D.T.M.&H.—W. L. Barton, A. R. Duff, A. B. G. Laing, G. S. C. Nzegwu, W. T. Thom, A. V. Wells.

D.M.R.D.—R. J. Bruce, M. A. Caldwell-Nichols, R. Cuthbert, J. G. Duncan, G. Goodhall-Copestake.

D.M.R.T.—V. R. Naidu.

DIPLOMA IN PSYCHIATRY.—Helen C. S. MacLean.

The Cameron Prize in Practical Therapeutics has been awarded to Rudolph Albert Peters, M.D., F.R.S., Whitley Professor of Biochemistry in the University of Oxford and Fellow of Trinity College, Oxford, in recognition of his discovery of British anti-lewisite (B.A.L.) and the application of this drug in practical therapeutics.

The following scholarships, bursaries, prizes, etc., were also awarded in the Faculty of Medicine. *Ettles Scholarship and Leslie Medal, Scottish Association for Medical Education of Women Prize, Dorothy Gilfillan Memorial Prize,* and *Lawson Gifford Prize in Obstetrics and Gynaecology,* Anne T. Lambie. *Buchanan Scholarship in Obstetrics and Gynaecology,* A. W. McI. Smith. *James Scott Scholarship in Obstetrics and Gynaecology,* J. D. St. Clair. *Mouat Scholarship in the Practice of Physic,* G. F. M. Russell. *Beaney Prize in Anatomy and Surgery, Annandale Medal in Clinical Surgery,* and *Keith Memorial Prize in Systematic Surgery,* M. R. King. *Murdoch Brown Medal in Clinical Medicine,* F. O. Simpson. *Royal Victoria Hospital Tuberculosis Trust Medal,* Kathleen J. C. Shaw. *Wightman Prize in Clinical Medicine,* G. F. A. Howie. *Sir Robert Jones Prize in Orthopaedic Surgery,* I. A. Ruthven-Stuart. *Vans Dunlop Scholarship in Materia Medica and Medicine,* C. W. M. Wilson. *Gunning Victoria Jubilee Prize in the Practice of Physic,* Constance C. Forsyth. *Gunning Victoria Jubilee Prize in Chemistry,* A. B. Roy. *Thomson Memorial Medel in Child Life and Health,* Margaret J. Poole. *Stirton Bursary* and *Colonel Thomas Biggam Memorial Medal and Prize in Pathology,* S. H. Davies. *Maclagan Prize in Forensic Medicine,* K. Wood. *Wellcome Medal and Prize in the History of Medicine,* H. P. Tait. *Junior John Aitken Carlyle Bursary in Anatomy and Chemistry,* P. H. Jaques. *Whiteside Bruce Bursary,* J. C. J. Ll. Bath. *Mackenzie Bursaries,* H. A. Crispin, Mary G. Dunlop, Dorothy L. Grieve, C. M. Taylor. *Robert Wilson Memorial Prize in Chemistry,* W. C. Hartley. *Vans Dunlop Prize in Physics and Chemistry,* J. C. J. Ll. Bath and W. C. Hartley (equal). *Vans Dunlop Prize in Botany and Zoology,* Elizabeth M. Connell and Elizabeth L. Handasyde (equal). *MacGillivray Prize in Zoology,* Elizabeth M. Connell.

[1]Awarded medal for thesis. [2]Highly commended for thesis. [3]Commended for thesis. [4]With honours. [5]In absentia.

UNIVERSITY OF LONDON

Frederick Murgatroyd, M.D., F.R.C.P., has been appointed to the Wellcome Chair of Clinical Tropical Medicine, tenable at the London School of Hygiene and Tropical Medicine, from October 1.

Stephen Dyonis Elek, M.D., Ph.D., has been appointed to the University Readership in Bacteriology, tenable at St. George's Hospital Medical School, from October 1.

Bernhard Katz, M.D., Ph.D., D.Sc., has been appointed to the University Readership in Physiology, tenable at University College, as from October 1.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following candidates were duly admitted Licentiates in Medicine and Midwifery on July 7, having passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board of Ireland: J. C. C. Ryan, Louise Burleigh, Bridget Conlon, Norma A. C. Coogan, J. O. MacC. Craig, Margaret J. E. Dickinson, B. M. Gray, A. D. Kelly, J. A. Lagan, Eileen P. Leahy, E. W. A. Malone, Nora J. Murphy, Eibhlin M. MacCollum, D. F. McFeely, L. E. McLoughlin, Fiona M. O'Brien, R. V. Power, A. I. Roith, J. B. Sheils, Nualla P. Summerville, O. G. Tolkin, Maura V. Toner, F. P. Treacy, J. H. Walsh, A. E. O. Williams, P. J. Yoffe.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the Royal College of Obstetricians and Gynaecologists, held in the College House on July 22, with the President, Professor Hilda Lloyd, in the chair, the following officers were re-elected: *President,* Professor Hilda Nora Lloyd; *Vice-presidents,* Mr. John Eric Stacey and Dr. V. B. Green-Armytage; *Honorary Treasurer,* Mr. Arthur A. Gemmell; *Honorary Secretary,* Mr. Humphrey G. E. Arthure; *Honorary Librarian,* Mr. Frederick W. Roques; *Honorary Curator of the Museum,* Mr. Aleck W. Bourne.

The following candidates were elected to the Membership of the College: G. T. Altimas, J. D. Andrew, P. R. Blahey, G. T. Carson, C. J. Champi, F. L. Clark, T. R. Clarke, W. W. Coppinger, B. M. Corkill, E. D. Crichton, C. N. Degaris, W. Donovan, H. P. Dunn, Isabel L. Dyke, M. W. Elliott, B. Fatima, C. J. Farr, W. R. Foote, M. B. Fox, H. H. Francis, A. C. G. Frost, W. D. Giffen, C. A. Haxton, H. A. Henderson, H. F. Hills, R. Hodkinson, R. H. Horner, D. R. Hughes, T. G. Ingram, D. J. McI. Irvine, H. A. Kelsey, D. Kutty, J. F. Leaver, J. L. MacArthur, D. C. McEwen, K. T. MacFarlane, Ishbel M. Macrae, C. M. Mair, W. D. Marshall, G. B. Maughan, A. C. Naylor, Helen M. Noble, R. H. O'Hanlon, D. C. P. Paranjothy, M. G. Pearson, E. Quehl, G. J. Quigley, P. D. Rajaratnam, I. Ramamurthi, D. H. Rea, K. E. E. Read, H. A. Rowley, A. M. Rutherford, D. R. Sheumack, J. M. Slattery, E. M. Southern, D. W. Sparling, S. K. S. Roy, L. G. R. Van Dongen, D. B. B. Whitehouse, J. Wilbush, E. A. Williams, M. H. V. Young.

No. 30

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 29.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infections	28	2	14	1	3	28	1	10	—	2
Deaths		—	—				2	—		
Diphtheria	42	2	6	4	2	76	12	24	8	1
Deaths	—	—	—	—	—	—	—	1	—	—
Dysentery	166	7	83	—	—	90	6	54	1	—
Deaths		—			—				—	—
Encephalitis, acute	6	—	—		—	3	—	1	1	—
Deaths		—		—			—			
Erysipelas			16	2	1			17	10	4
Deaths							—			
Infective enteritis or diarrhoea under 2 years				35					53	
Deaths	6		3	—	—	31	4	3	4	3
Measles*	8,291	580	158	151	92	5,052	379	92	140	64
Deaths†		—	1	—	—			—	1	—
Ophthalmia neonatorum	24	—	11	—	—	37	4	11	1	—
Deaths										
Paratyphoid fever	7	1	—	5(B)	—	54	—	9(B)	—	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	277	14	2	—	1	329	16	1	5	8
Deaths (from influenza)‡	3	—	—	1	—	10	2	—	—	—
Pneumonia, primary			112	¶				114	17	
Deaths	97	18		3	2	129	23		5	7
Poliomyelitis, acute	305	25	52	2	15	99	7	7	1	—
Deaths§	17	2		—		6	1			
Puerperal fever		—	5				—	5		
Deaths										
Puerperal pyrexia‖	87	13	5	—	2	95	12	9	—	2
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,012	73	114	61	57	1,157	91	89	74	31
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—					—	—
Typhoid fever	10	—	—	1	—	8	—	3	3	—
Deaths	—	—	—		—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,714	268	297	63	34	2,004	86	29	54	82
Deaths	8	—	1	—	—	3	—	—	1	1
Deaths (0–1 year)	194	14	27	14	8	254	33	30	18	15
Deaths (excluding stillbirths)	3,917	572	478	127	98	3,926	659	530	154	112
Annual death rate (per 1,000 persons living)			9·6					10·6	9·5	
Live births	6,963	1118	817	387	219	7,295	1225	980	401	
Annual rate per 1,000 persons living			16·4					19·7	24·8	
Stillbirths	173	13	18			152	24	28		
Rate per 1,000 total births (including stillborn)			22					28		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending August 5 were: paralytic 262 (197); non-paralytic 105 (108); total 367 305). The figures for the previous week are shown in parentheses. The following county areas, with notifications as given, contributed some 69% of the total notifications for England and Wales in the week under review:

	Paralytic	Non-paralytic
London	16	12
Essex	14	3
Gloucester	6	5
Lancaster	15	7
Middlesex	8	3
Northumberland	8	6
Southampton	8	3
Stafford	21	12
Surrey	10	2
Warwick	24	14
Worcester	21	5
Yorks (West Riding)	18	6

The total increase for the week of 62 compared with the previous week was due to increases in notifications in a number of counties, of which the more important were Hertford, Kent, Lancaster, Lincoln (Holland, Kesteven, and Lindsey), Northumberland, Stafford, Surrey, Worcester, Yorkshire (West Riding). Notifications of non-paralytic cases dropped to 29% of the total compared with 35.4% in the preceding week.

Cases notified in the Isle of Wight in the week ended August 5 were paralytic 4, non-paralytic 3. Numbers have increased since that to a total of 28 confirmed cases (including 26 paralytic) by August 12. The medical officer of health has advised that visitors with children should not visit Freshwater and Newport for the time being.

According to the *Weekly Epidemiological Record* of August 2 of the World Health Organization, the following is a summary of the situation in countries other than Britain where a relatively high incidence of poliomyelitis is reported for 1950:

Australia.—Epidemic outbreaks occurred in 1949, and the incidence is still high in 1950. The number of cases has been decreasing since the week ending June 17, when 207 cases were reported. The figure fell to 116 during the week ending July 8. Corresponding figures for 1949 are 66 and 60.

United States.—The incidence is high, but not so high as last year at the same time. For the week ending July 15, 665 cases were reported, as against 1,014 in 1949. Total cases registered in the U.S.A. since January 1 number 4,328, against 4,883 for the corresponding period of 1949.

Germany.—There has been an increase of cases during recent weeks in the German Federal Republic. Whereas 41 cases had been reported during the week ending June 17, the number rose to 51 during the week ending July 8. The incidence in the corresponding weeks of 1949 had been 10 and 16 respectively.

Belgian Congo.—Poliomyelitis notifications in the Belgian Congo, which until 1947 had never been more than 53 per year (in 1936), rose to 111 in 1948 and 207 in 1949. This year 38 cases were reported for the week ending July 8, against 9 for the corresponding period of 1949 and 0 for the same week in 1948.

France.—The number of cases recorded from January 1 to July 15 is higher than that of the corresponding period during the years 1942–9: 519 in 1950 against 296 in 1949. Last year's incidence (1,957 cases) was the greatest for two decades.

Mexico.—During the period May 21–June 17, 53 cases were reported in the Federal District. In 1949 the May and June incidence in all Mexico was 18 and 32 respectively.

Philippines.—The number of cases of poliomyelitis reported at Manila is considerably higher in 1950 than during the preceding years. Up to July 8, 117 cases were reported, whereas the annual incidence in the years since 1939 never exceeded 63. For the week ending July 8, 32 cases were reported, against 0 for the corresponding period in 1949.

Discussion of Table

In *England and Wales* there were decreases in the notifications of measles 463, whooping-cough 167, and scarlet fever 141. The number of notifications of dysentery was the same, 166. The number of notifications of acute poliomyelitis (305) was 45 more than in the previous week.

In *Scotland* there was a decrease in the notifications of dysentery 26, while there were increases in the notifications of whooping-cough 92 and scarlet fever 16. There was a decrease in the number of notifications of acute poliomyelitis from 58 in the previous week to 52.

In *Eire* there were decreases in the notifications of measles 78 and whooping-cough 23. The notifications of scarlet fever increased by 8 to 61.

In *Northern Ireland* there were increases in the notifications of measles 17, whooping-cough 11, and scarlet fever 7. There were 15 cases of acute poliomyelitis notified, three fewer than the previous week.

Week Ending August 5

The notifications of infectious diseases in England and Wales during the week included scarlet fever 956, whooping-cough 3,687, diphtheria 45, measles 7,973, acute pneumonia 273, acute poliomyelitis 367, dysentery 179, paratyphoid 5, typhoid fever 8.

Medical News

Birth of a Princess

The following bulletin was issued from Clarence House on Tuesday, August 15: "Her Royal Highness Princess Elizabeth, Duchess of Edinburgh, was safely delivered of a princess at 11.50 a.m. to-day. Her Royal Highness and her daughter are both doing well." The bulletin was signed by Sir William Gilliatt, Mr. John H. Peel, Dr. V. F. Hall, and Sir John Weir.

Harveian Society at Papworth

The summer meeting of the Harveian Society of London was held in the Papworth Village Settlement on July 19. Members and their guests were entertained to lunch, after which Dr. R. R. Trail, the president of the Society and medical director of the Settlement, explained the principles on which Papworth worked. The three main principles were active treatment, rehabilitation, and resettlement. During the 32 years of its existence no child born at Papworth had developed pulmonary tuberculosis, and even those men from Papworth who were prisoners of war in Japanese hands in the recent war had not developed pulmonary tuberculosis as the result of their captivity. A visit was paid to the *x*-ray department, where demonstrations of cases were given. The industries were subsequently visited, and patients were seen at work making leather goods, furniture, and motor-car bodies, or engaged in printing and bookbinding. Dr. Hope Gosse proposed a vote of thanks to the committee of management for extending the invitation and to Dr. Trail and Miss Robinson, the matron.

Records of the Fallen

The R.A.M.C. War Memorial Fund has now issued a booklet entitled "The Book of Remembrance," which gives the roll of honour of the 437 officers and 2,026 N.C.O.s and men of the Corps who gave their lives in the 1939–45 war. In addition, it records the ceremony on June 27 in Westminster Abbey last year, when the original of the roll was placed beside the Golden Book which gives the names of the 743 officers and 6,130 other ranks who died in 1914–18. Both books are now housed in the Pyx Chamber of the Abbey.

History of Science

The *British Journal for the Philosophy of Science,* which began publication in May, is sponsored by the Philosophy of Science Group of the British Society for the History of Science. Its aim is to direct attention to the philosophical basis of the sciences, and it will deal among other things with problems of logic and methodology and the interrelation between the sciences. The journal will be published quarterly by Thomas Nelson and Sons at an annual subscription of 30s.

Health Services for Children

A committee convened by the World Health Organization has met to recommend measures designed to improve health services for children of the school-age group. Dr. Fraser C. Brockington, medical officer of health of Yorkshire West Riding, was elected chairman, and Professor Jacob de Haas, from The Hague, was elected vice-chairman. Among the problems discussed were the nutritional aspects of school health, preventive mental-health education, and medical supervision in schools.

Editor of Tuberculosis Journal

Dr. Philip Ellman is succeeding Dr. Clifford Hoyle in the editorship of the *British Journal of Tuberculosis and Diseases of the Chest*. He will be assisted by an editorial board which comprises Dr. Clifford Hoyle, Mr. T. Holmes Sellors, Dr. A. Brian Taylor, and Professor Cameron. Dr. Clifford Hoyle succeeded the late Dr. L. S. T. Burrell in 1938 and has edited the journal for 12 years.

New Members of M.R.C.

Professor W. E. le Gros Clark, F.R.S., professor of anatomy in the University of Oxford, and Professor F. G. Young, F.R.S., professor of biochemistry in the University of Cambridge, have been appointed members of the Medical Research Council from October 1.

Wills

Professor John Alfred Ryle, professor of social medicine in the University of Oxford, and formerly regius professor of physic at Cambridge, left £27,608. Dr. Bertram Henzell Pidcock, of Winchester, left £18,517; Dr. Harry Bowen Williams, of Goring by Sea, £11,922, bequeathing £500 to the Royal Medical Benevolent Fund.

COMING EVENTS

London Nursing Exhibition

The London Nursing Exhibition will be held at Seymour Hall, Seymour Place, London, W.1, on October 23–27 concurrently with the Professional Nurses and Midwives Conference. Information may be obtained from the organizer at the *Nursing Mirror*, Dorset House, Stamford Street, London, S.E.1.

International Society of Medical Hydrology

A meeting of the International Society of Medical Hydrology will be held in Florence, Italy, from October 3 to 7. The subjects under discussion will be "Sweat," on October 4, and "Gout," on October 5. Members of the medical profession who wish to attend the meeting should communicate with Dr. Donald Wilson, "Cranbourne," Southdown Road, Bognor Regis, Sussex.

Bengué Memorial Award Lecture

Dr. Nadia du Bouchet, head of the Anaesthetic Centre and chief instructor of the Teaching Centre, Broussais Hospital, Paris, will deliver the Bengué Memorial Award Lecture on "Modern Anaesthesia in France and its Developments related to Cardiac Surgery" at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W., on Wednesday, September 20, at 3 p.m. Admission to the lecture is free, without ticket, but applications for seat reservations may be made to the secretary of the institute.

London County Medical Society

The next clinical meeting of the London County Medical Society will be held at St. Stephen's Hospital, Fulham Road, Chelsea, S.W., on Thursday, September 14, at 3 p.m. All inquiries and communications should be made to Mr. J. Gabe, F.R.C.S., St. Alfege's Hospital, Greenwich, S.E.10 (Tel.: Greenwich 2655, Ext. 48).

British Postgraduate Medical Federation

The British Postgraduate Medical Federation has arranged a course of lectures on "The Scientific Basis of Medicine" to be given at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., on Tuesdays and Thursdays, at 5.30 p.m., from October 10 to March 20, 1951. The lectures are designed especially for research workers and specialists in training, and admission is free without ticket. Details will be published in the diary column week by week.

Malcolm Morris Memorial Lecture

Professor J. Earle Moore, M.D., of Johns Hopkins University, Baltimore, U.S.A., will deliver the Malcolm Morris Memorial Lecture under the auspices of the Chadwick Trust at St. Mary's Hospital Medical School, Norfolk Place, Praed Street, Paddington, London, W., on Thursday, September 21, at 4.30 p.m. His subject is "The Public Health Aspects of Venereal Disease Control." Admission to the lecture is free and no tickets are required.

SOCIETIES AND LECTURES

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

Wednesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, August 23, 3.30 p.m., "*Endocrine Control of Carbohydrate Metabolism*," by Professor F. G. Young, F.R.S.

APPOINTMENTS

Dr. Edward John Bury has been appointed an Appointed Member of the Executive Council of the Gambia.

AFFLECK, IAN, O.B.E., M.R.C.S., L.R.C.P., Factory Doctor for Farnworth, Lancs.

BREARLEY, BRIAN F., M.B., B.Chir., M.R.C.P., Consultant General Physician, Preston and Chorley Hospitals.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Senior Registrar in Radiology at White Lodge Hospital, Newmarket*, K. E. Barlow, M.R.C.S., L.R.C.P., D.M.R. *Consultant Psychiatrist at St. Andrew's Hospital, Thorpe, Norwich*, J. D. Fraser, M.D., D.P.M.

HUTCHISON, ALEXANDER, M.D., Ph.D., F.R.F.P.S., D.P.H., D.P.A., Medical Officer of Health and School Medical Officer, Bolton.

JONES, M. T. ISLWYN, M.D., D.P.H., County Medical Officer of Health and School Medical Officer, Denbighshire.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Baker.—On August 9, 1950, at Wednesbury, Staffs, to Hazel Baker, M.B., B.S. (formerly Hill), wife of Mr. T. A. C. Baker, M.A., a son—Robert Frederick.

Smillie.—On July 25, 1950, to Pamela (formerly Stevens), wife of Dr. T. G. Smillie, 195, Greenhill Avenue, Sheffield, 8, a son.

MARRIAGE

Forbes—Burbery.—On August 5, 1950, at Newton Abbot, John Ronald Forbes, M.D., to Pamela Stone Burbery, S.R.N.

DEATHS

Brand.—On August 7, 1950, at St. Andrews, William Gillon Brand, M.B., Ch.B., of 3, Elms Avenue, Lytham St. Annes, Lancs, formerly of Adlington, near Chorley.

Brims.—On July 31, 1950, Donald James Brims, M.R.C.S., L.R.C.P., of 8, Devonshire Place, London, W.

Craig.—On August 8, 1950, in Scotland, Douglas Craig, M.D., of Stanford-le-Hope, Essex.

Ferguson.—On August 3, 1950, at Hillcrest, Bodorgan Road, Bournemouth, James Henry Ferguson, M.R.C.S., L.R.C.P.

Hunter.—On July 29, 1950, at Nairobi, Ernest Villiers Hunter, L.M.S., of the C.M.S., Uganda, aged 73.

Jensen.—On July 30, 1950, at 25, Berkeley Square, London, W., Ernest Thomas Jensen, M.B., aged 76.

Lornie.—On August 8, 1950, at 7, Barossa Place, Perth, Peter Lornie, O.B.E., M.D., aged 68.

Morris.—On August 3, 1950, at Lew Down, Devon, Henry Gibbins Morris, M.R.C.S., L.R.C.P.

Oxley.—On July 30, 1950, Frederick John Oxley, O.B.E., T.D., M.R.C.S., L.R.C.P., of 66, Palmerston Road, Buckhurst Hill, Essex, aged 83.

Steele.—On August 9, 1950, in a nursing-home, William Frederick Steele, M.B., B.S., of 32, Severas Avenue, Acomb, Yorks, late of Tockwith and Darwin, Lancs.

West.—On July 29, 1950, at Hazelcombe, Dulverton, Somerset, Waldemar Shipley West, M.D., formerly of Aylesbury, aged 84.

Young.—On August 12, 1950, at 8, Ampton Road, Edgbaston, Birmingham, James Carruthers Young, M.C., M.D., M.S.

Any Questions?

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

Intravenous Procaine in Asthma

Q.—*I understand that in the U.S.A. intravenous procaine ½% has been used in the treatment of asthma. I have tried it on two occasions—giving 5 ml. intravenously—in status asthmaticus which had not responded to any familiar treatment. In both cases complete relief of the bronchial spasm resulted within half an hour. Is there any literature on this treatment, particularly on dosage, side-effects, dangers, contra-indications, etc.?*

A.—Intravenous procaine is recognized as a method of treating status asthmaticus both in America and in this country. Intravenous procaine has chiefly been used by the anaesthetists, and many of the references concerning its use are in the journals devoted to this specialty. A review by W. W. Mushin and L. Rendell-Baker on the uses of intravenous procaine (*Lancet*, April 9, p. 619) refers to its effect on allergic conditions, and a number of references are given. The following references may also be useful: Woolmer, *Progrès méd.*, 1945, **73**, 407; Gordon, R. A., *Canad. med. Ass. J.*, 1943, **49**, 478; Dirceu, H., Clerq, F., and Duprez, A., *Acta clin. belg.*, 1946, **1**, 150. Although its effect in status asthmaticus is sometimes dramatic, like that of other drugs which are useful in this condition, intravenous procaine is, however, no panacea. It has been suggested that its effect in allergic conditions is due to its antihistamine-like action, but there is no proof that this is the correct explanation.

The usual dosage in asthma is 4 ml. of 1% procaine given slowly intravenously, or 0.1% procaine in saline given as a drip up to a maximum of 500 ml. in 30 minutes.

Primary Carcinoma of the Other Breast

Q.—*Is there a higher incidence of primary carcinoma in the remaining breast in those women who have already undergone one successful operation for cancer of the breast, as compared with a control group? If the incidence is approximately equal in both groups, can this be taken as evidence in favour of an intracellular (genetic) origin for breast cancer, as opposed to any extracellular carcinogenetic influence? If the second carcinoma arises purely fortuitously, would not the incidence of cancer in those with only one breast be approximately half that of those who still possess two?*

A.—There does not seem to be on record any specific statistical study of the incidence of primary carcinoma in the remaining breast after successful radical mastectomy for carcinoma of the opposite breast. Clinical experience does not lead to the assumption that this is likely. If there is no greater incidence than in a control group it would be difficult to say what this means; it is generally considered that some ovarian hormonal influence is at work in the genesis of breast cancer. The disease starts in the ducts of the breast, but some extra-mammary influence is believed to be at work. There must also be borne in mind the question of "immunity" and resistance developing in a patient who has been treated successfully for cancer; if this happens it would presumably affect the possibility of malignancy supervening in the remaining breast.

Homologous Serum Jaundice

Q.—*Were cases of serum jaundice reported as a result of inoculating many recruits with the same syringe? At a training centre I used to inoculate several hundred recruits in an hour or two. A fresh needle was employed for each injection, but the same syringe was used for dozens of cases.*

A.—Homologous serum jaundice was reported in British and American troops after inoculation with a yellow-fever vaccine which contained small amounts of human serum. An outbreak occurred among troops after the injection of convalescent mumps serum, and several groups of workers reported a high incidence of jaundice in the Service V.D. clinics; this was controlled when care was taken to sterilize syringes and needles between injections (Salaman *et al.*, *Lancet*, 1944, **2**, 7). The transfer of the causative agent of serum jaundice has not apparently been reported after injections of T.A.B. vaccine and the like, but an unduly high incidence has been noted in a diabetic clinic. Usually it has been presumed that only the needle is contaminated after subcutaneous or intramuscular injections, but the recent report by Evans and Spooner (*Journal*, July 22, 1950, p. 185) indicates that the syringe itself may be contaminated by back suction when the needle is being removed. The risk of transferring infection by the "separate needle, common syringe" technique is obviously small in this country except possibly for the risk of conveying homologous serum jaundice. Until other means of overcoming this are devised, it may be advisable to sterilize both syringe and needle before each injection. For a fuller discussion of this point an annotation in the same issue of the *Journal* should be consulted (p. 204) and a letter from Sir Alexander Fleming, F.R.S., in the *Journal* of August 5 (p. 365).

Intravenous Iron

Q.—*Please outline the latest information on therapeutic intravenous iron with reference to the indications, contraindications, dosage, and the technique of administration.*

A.—A number of satisfactory proprietary preparations of saccharated iron oxide suitable for intravenous injection are now available in this country. Provided that excessive doses are avoided, there are no contraindications to this form of treatment, which is as well tolerated by children as by adults. Intravenous iron is indicated for those cases of hypochromic anaemia which do not respond to adequate doses of iron by mouth, either through failure of absorption, as in coeliac disease and idiopathic steatorrhoea, or because orally administered iron provokes severe gastro-intestinal symptoms. It has also been shown that the anaemia accompanying certain chronic toxic or infective states, such as rheumatoid arthritis, which is usually refractory to iron given by mouth, may be corrected by parenteral therapy. The dose for an adult is 200 mg. daily or every other day. However, it is advisable to start with a dose of 50 mg.; 100 mg. is given on the second day, and the full dose thereafter. The technique of administration is simple, the aim being to avoid any deposition of iron outside the wall of the vein, where it produces intense irritation. As the solution is very dark in colour it is difficult to detect a small quantity of blood in the barrel of the syringe on withdrawing the plunger; 3–5 ml. of blood should therefore be withdrawn before the injection is made. The subject was discussed fully in an annotation in the *Journal* of May 13 (p. 1127).

Inhibition of Micturition

Q.—*Some male patients complain that they are unable to begin the act of micturition unless they are in more or less complete privacy. They are incommoded when the only opportunity for emptying the bladder is in a crowded lavatory. There is no organic lesion to account for this difficulty. It is a psychological trouble, not uncommon among shy, sensitive males, micturition presenting no difficulty to them at home or in relative privacy. Has modern psychotherapy any assistance to offer?*

A.—Such a condition must be regarded in the nature of a conditioned reflex, and is found to be due to some experience of shame or threats connected with the genital organs in childhood, usually concerning micturition, masturbation, or exhibitionism. The forms of treatment are: (*a*) Reconditioning by gradually and stage and by stage getting accustomed to the presence of other people. The effectiveness of this is doubtful. Some men got over it spontaneously under Army conditions, others did not. (*b*) Suggestion, under hypnosis or otherwise, in an attempt to break the vicious circle, is often more effective. (*c*) Discovery of the "traumatic" cause and release of the pent-up emotion by analysis is certainly the most effective and

permanent method, but it takes more time. It is, however, well worth while if such treatment can be obtained in view of the distress suffered by many of these patients—distress far beyond the mere inconvenience, for the situation arouses to some extent the original feeling of shame.

Domiciliary Treatment of Tuberculosis

Q.—*Is there any antibiotic treatment which is worth trying in general practice for a case of chronic fibrocaseous pulmonary tuberculosis? The patient I have in mind is a man of 55 with chronic cavities and a positive sputum; he has been treated with P.A.S. for a long time. Could streptomycin be given while he is at home, or would "aureomycin" or "chloromycetin" or any other antibiotic be worth a trial?*

A.—Streptomycin is the only antibiotic that might benefit the patient, but this should not be given at home unless there are facilities for determining the streptomycin sensitivity of the tubercle bacilli in the patient's sputum. An exception to this general rule is the use of the drug as a palliative measure in cases of painful tuberculous laryngitis. From the description of the case it is unlikely that any permanent benefit will result from the use of streptomycin.

Treatment of Defective Fat Absorption

Q.—*Is "sorethitan mono-oleate" of proved value in the treatment of deficient fat absorption? Is it safe to take over long periods at the dose recommended—6 g. daily? My particular interest is in cases of subtotal gastrectomy with failure to gain weight.*

A.—Sorbitan polyoxyethylene mono-oleate (Tween 80) appears to be effective in improving fat absorption in certain cases, including the post-gastrectomy syndrome (C. M. Jones, P. J. Culver, G. D. Drummey, and A. E. Ryan (1948), *Ann. int. Med.*, **29**, 1), although it seems unlikely that the effect is due to any change in emulsification, since this is commonly normal in such cases. Extensive studies on the toxicity of this substance have also been carried out by P. J. Culver in Boston and by L. Emmett Holt, jun., in New York. In human subjects 4.5–6.0 g. per person per day have been administered for periods of up to two years and no ill effects could be demonstrated. Similar investigations were carried out in children; 50 mg. of "Tween 80" per gramme of fat ingested caused no demonstrable ill effects in premature infants. Care should be taken to see that unspecified impurities are not present with the sorbitan polyoxyethylene mono-oleate, since these may be toxic.

Artificial Parthenogenesis

Q.—*I should be interested to know whether any experiments on artificial parthenogenesis have been, or are being, carried out in this country.*

A.—It is not clear whether the questioner is referring to experiments on artificial parthenogenesis in mammals or in invertebrates. Very little work has been done anywhere on artificial parthenogenesis in mammals, but a great deal has been done on artificial parthenogenesis in invertebrates such as the sea-urchin. A useful and comprehensive review of this work was published in the British journal, *Biological Reviews* (1941, **16**, 291), by Dr. Albert Tyler.

Dioxyamidopyrine in Asthma

Q.—*A new proprietary for the relief of asthma is said to contain dioxyamidopyrine. Is this drug likely to lead in some cases to agranulocytosis? What is the action of the drug, and have any clinical trials been reported?*

A.—The proprietary preparation which this correspondent probably has in mind is made up of a large number of ingredients, and no clinical trials with it have been reported in the literature. Some of these ingredients are of known value in relaxing bronchial spasm, while others are valueless in this respect. This type of polypharmacy is to be deprecated. Reliance should be placed on official preparations of adrenaline, ephedrine, isoprenaline, or theophylline and ethylenediamine, each of which will be found to be just as effective as—and usually cheaper than—proprietary preparations containing many ingredients. One of the constituents of this particular preparation is a small dose of dioxyamidopyrine. It is true that amidopyrine has been found on occasion to produce agranulocytosis, and has in consequence acquired an unenviable reputation. However, the danger of using amidopyrine is probably considerably exaggerated. At one time almost all patent headache powders, which were consumed by thousands of people daily, contained a little amidopyrine, and yet agranulocytosis remained uncommon. Still, there is no point in including amidopyrine in prescriptions when other analgesics will do equally well without incurring this objection.

Thrush and Myasthenia Gravis

Q.—*Can you suggest any treatment for a thick white deposit on the hard palate and tongue of a woman aged 60 suffering from myasthenia gravis? Her symptoms are well controlled by prostigmin, but the condition of the oral mucous membrane has been present for about four years, and does not react to any ordinary local treatment.*

A.—It is difficult to recommend treatment for this condition in the absence of a precise diagnosis. The description suggests extensive thrush, which occurs in debilitated states, and which may here be related to the dysphagia. In some elderly patients this infection may clothe the entire buccal mucosa with a thick white deposit which is most resistant to treatment. Swabbing the mouth gently but thoroughly with a 5% solution of sodium metabisulphite and afterwards with borax, soda, and glycerol is usually effective. The possibility of leukoplakia must be considered; and, if lichen planus seems likely, a trial of arsenic is worth while.

NOTES AND COMMENTS

Prophylaxis Against Syphilis.—Dr. Arthur S. Wigfield (Worcester) writes: In your answer under this heading ("Any Questions?" July 22, p. 231) it is stated that "even 200,000 units to 300,000 units (of penicillin) taken by mouth within a few hours has been reported as preventing infection." If this report relates to clinical experiment it seems pertinent to ask by what method these "protected" patients were shown to be incubating syphilis. While not wishing to dispute the veracity of such an assertion, I would nevertheless like to express my doubts of the wisdom of making it under the heading of "Any Questions?" The answers to "Any Questions?" are primarily of general interest. Your brief dissertation on the prophylaxis against syphilis is presumably designed not for competent venereologists but for general practitioners. How many general practitioners will now administer 300,000 units of penicillin by mouth in order to allay the fears of apprehensive patients? If none, why mention this dangerous practice without due warning? The danger of such a procedure would seem to be not so much the possibility of masking syphilis as the creation of a fool's paradise in which further transmission of the disease might occur. In mentioning the "best" prophylaxis against syphilis the total dose of four million units of penicillin should be coupled with a reasonable duration of its administration—i.e., seven to fourteen days. It is difficult to escape the conviction that such "protected" patients should be regarded as sero-negative primary cases and followed up for two years. Is it not wiser to persuade these patients to refrain from coitus for three months and ask them to report for examination then?

Corrections

Dr. J. W. Dundee (Walton, Liverpool) has written to point out that in the Medical Memorandum "Acquired Sensitivity to Thiopentone" (August 5, p. 332) the dose of thiopentone given at the first operation was 0.3 g., not 0.3 mg.

In the report (August 5, p. 358) of a discussion at the Section of Tropical Medicine during the Annual Meeting of the B.M.A. in Liverpool we wrongly attributed Colonel E. H. Vere-Hodge's remarks to Dr. R. F. Vere-Hodge. Colonel Vere-Hodge has written to point out that his statement that santonin was non-toxic was qualified by the words "in therapeutic doses."

All communications with regard to editorial business should be addressed to The Editor, British Medical Journal, B.M.A. House, Tavistock Square, London, W.C.1. Telephone: Euston 2111. Telegrams: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). Telephone: Euston 2111. Telegrams: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. Telephone: Euston 2111. Telegrams: *Medisecra, Westcent, London.*
B.M.A. Scottish Office: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 26 1950

METHODS OF EDUCATION

BY

J. A. LAUWERYS, D.Sc., F.R.I.C.

Professor of Comparative Education in the University of London, Institute of Education

Last year's educational number of the *British Medical Journal* contained an introductory article on reform in medical education by Professor Melville Arnott, and thereafter a number of distinguished contributors considered, from the standpoint of their own special knowledge, problems which arise in the teaching of physiology, anatomy, biology, chemistry, and physics. Their papers displayed remarkable, indeed surprising, agreement regarding not only general aims and objectives but even regarding methods that deserve adoption. My own experience of teaching in school and university lies outside the field of medicine, and it would be unforgivably presumptuous on my part to criticize medical education or to offer suggestions for its improvement. I am encouraged, however, by Flexner's remark that "medical education presents a problem not of medicine but of education" to compare what is being said about the teaching of medicine with general trends of educational reform.

Those who are concerned with the professional preparation of young people who intend to become physicians or surgeons are faced, like all other teachers, by the effects of rapid social and political change. They face problems which arise through the adoption by statesmen and Parliament of policies the roots of which lie elsewhere than in the sciences. They are expected to deal with vast and growing numbers of students many of whom are insufficiently prepared for advanced or professional work and who come from social strata which a generation or two ago supplied few university entrants. They are puzzled, as we all are, by the rate at which scientific knowledge grows and theories change. They note, often with dismay, that new specialized fields of study constantly crystallize out, while on the other hand the need for an integration of studies becomes ever more apparent.

As for our colleagues in secondary schools, they too meet problems which, at their own level, are homologous with those which we face in higher institutions. They too have to deal with large numbers of pupils coming from homes materially and culturally poorer than those which sent their children to grammar schools thirty years ago—homes, moreover, where there is no tradition of independent reading and usually no trace of a professional outlook. The courses of study pursued in secondary schools have been much broadened by the introduction of new subjects in the curriculum: more modern languages, more art and music, social studies. Thirty years ago, boys usually learnt in science only physics and chemistry, girls only botany; now both sexes learn a little about each of the three, plus a little zoology and sometimes some astronomy and geology. The total time allotted to science, however, is no more than it was. Inevitably, standards of attainment suffer: those who now enter the university are not as well grounded in the basic sciences as the previous generation. Furthermore, all young people nowadays are to an ever greater extent distracted from serious study by the pervasive radio, the call of the cinema, the football pools, and the multitude of mechanized amusements which seduce the adolescent mind from pursuits of more permanent value.

The Student at the University

In framing proposals for the improvement of university education it is well to begin by considering as clearly and vividly as we can the conditions in which our students live and the nature of the attractions with which we have to compete. Many, if not most, of the young people who attend the first- and second-year courses have come from middle-class or working-class homes, and they are anxious to establish themselves in the world and thereby to live up to their parents' expectations. Our examinations are to them primarily a way of obtaining guaranteed social status, together with the appropriate income, rather than tests of scientific or professional competence. Many of these young people are living away from home for the first time and, in addition, they are forced to be very economical. Apart from the relatively small proportion who have rooms in hostels or college, they occupy modest and cramped rooms in what are often noisy houses. For the most part they cannot afford to buy books, while a visit to theatre or concert is a rare luxury. Under such conditions, and in such a frame of mind, wide and leisurely reading is not to be expected: it will be replaced very largely by the "swotting up" of condensed and potted lecture-notes that are thought to be the essence of the course on which the all-important examination will be based.

These young people are often deeply impressed by the surroundings of a university and by the supposed eminence and omniscience of their professors. Of course, very often they hide their embarrassment and lack of assurance behind a deceptive façade of bravura and nonchalance. But it shows itself by their hesitation in asking for help when they need it, by their attempts to hide their ignorance when

it would be better to expose it so that it might be removed, and by the inadequate support they give to general university functions and activities.

These beginners, who have never acquired the habit of reading or of individual self-directed study and have learned to rely overmuch upon the help and direction of devoted secondary-school teachers who coach with care their promising pupils, are suddenly flung into lecture-room or ward. Occasionally unable to hear what is being said or to see what is being shown, untrained in the art of picking out essential principles from a mass of material, they tend to scribble down unimportant details, often mentioned by the lecturer only by way of illustration.

Of course, the above picture has been painted quite deliberately in rather sombre hues, but it is not, I think, altogether false. Nor need we feel unduly gloomy, nor bemoan the fact that things would be better if they were different. After all, our students are perfectly prepared to work hard and to exert effort if they are shown the way and wisely directed. They are not less intelligent and are probably as devoted as preceding generations. We have at our disposal teaching methods, as well as instruments of communication or exposition, and a general equipment of laboratories and buildings superior to those available to our predecessors. Further, we have the satisfaction of knowing that our methods of selecting university students enable us to get intelligent people from all ranks of society. We shall meet with success if we learn to mobilize and to employ effectively the resources at hand.

Activity Methods

In the effort at adapting traditional university methods of instruction to changed conditions, it may be helpful to study what is happening in the schools and to take account of the views of educational reformers. Not, of course, that this implies that university teachers should copy what is done elsewhere. At most, they must take account of the practices of those who specialize in the process of instruction in order to see whether there are here methods that might be adapted to meet other needs.

Incidentally, it is noteworthy that many of the ideas defended by so-called "progressive educators" and recommended by them for adoption in teaching young adolescents resemble in large measure the practices of the best and wisest university teachers. For instance, "progressives" have long condemned didactic methods—that is, the simple dogmatic exposition of knowledge, by a method involving mainly chalk and talk, to a whole class who listen passively and attempt to memorize, sponge-like, verbal formulations. It is said that this involves enormous waste. First, because human beings learn imperfectly by listening. Their minds have to be activated and sensitized, which happens most easily when they are forced to face and to deal with problem situations. Secondly, because different human beings think and learn at different rates, so that class instruction is too slow in tempo for the more intelligent and too fast for the less bright.

It is evident that such criticism resembles that frequently urged against the lecturing to large numbers of students which is the central feature of most modern universities, and not only in Great Britain. It reminds one, too, of the attacks of Professor H. E. Armstrong, some half-century ago, against the methods of teaching chemistry then current in school and university.

Reformers have urged that the success of a teacher anywhere is to be measured, not by the number of words or verbal formulations which his pupils learn, but by the degree of purposive mental activity which he arouses in them. And in order to arouse this activity they have recommended the adoption of a number of methods and devices, partly intended directly to stimulate purposeful thinking about practical problems and partly intended to individualize instruction—these two being always connected.

The "Project"

Possibly chief among these activity methods is what is called the "project," a scheme of teaching analogous to what the French call the "*centre d'intérêt*." In its most extreme form a project method implies the abandonment of subject teaching; that is, children should no longer be taught mathematics, science, history, etc., but instead they should study and attempt to deal with a number of comprehensive problems. For example, as a result of joint discussion between teacher and pupils, the class (note: the class, not the teacher) might decide to spend a few weeks or months considering how the public water supply is obtained, purified, distributed, and got rid of; or how their city is governed and the public services paid for and administered. They would divide themselves into groups, to each of which a set task would be allocated or a definite problem assigned for study, again after joint discussion. During the course of the work the pupils would, so to say incidentally, be forced to learn some mathematics, science, history, etc. At the end, when the project is accomplished, the results would be displayed, shared, made public in a series of papers, an exhibition, perhaps a play.

Some years ago many schools, especially in the U.S.A., organized the whole of their curriculum in such a manner. Experience has shown quite clearly, however, that this is going too far. The result is inevitably that the young people do not, when they leave school, possess any worthwhile equipment of knowledge and skill organized in such a way as to make it generally usable. It is now accepted that it is wise to retain subject instruction but that the latter gains in value when the curriculum is enriched by a number of project activities.

Incidentally, projects nowadays are nearly always proposed and adopted in the form of problems which lead, when analysed, to subsidiary problems. Thus teachers go some way to meet the wishes of H. E. Armstrong, who, it will be remembered, urged that all science everywhere be taught by a heuristic method, modelled on the research work of investigators who attempt to find answers to problems. They go some way, too, to adopt the advice of modern psychologists, chiefly of the Dewey school, who have pointed out that active thinking takes place most easily when a human being faces a real problem of importance to him.

There are, I think, one or two things which can be learned from this experience, remembering that the university analogue to didactic teaching is the lecture. For example, one might suggest that an effort be made to provide for groups of students, even in their first or second year, as part of their general course, some project or other which they could investigate. And, further, one wonders whether the practical work which they are asked to do might not, in a great many cases, be set as the practical investigation of a problem, an attempt to find the answers to questions by methods of experiment, rather than as a simple manual exercise involving no more than the careful following of detailed instructions.

The second tendency, mentioned above, arises from the clear realization that the ability of pupils and students varies between very wide limits and that they work and learn at very different rates. There is, of course, no doubt that private tutorials—one pupil, one teacher—form the most effective of all methods. The way in which slow learners sometimes manage to pass, after a few months' coaching by a crammer, examinations which they had failed more than once illustrates the point. Again, it is clear that quick learners waste much time listening to lessons or lectures the speed of which is adjusted to the average. However, the cost of a full tutorial system of instruction would be much too heavy, in money and in personnel, to be borne at a time when universities have everywhere doubled in size.

The Dalton Plan

The Dalton plan—the name refers to a town, not to a person—worked out in the U.S.A. some thirty years ago, was an attempt to adapt methods of instruction to the requirement of individualization and to offer pupils the advantage of private attention without having to provide an excessively numerous staff. In essence, the plan consists in the careful preparation of detailed assignments telling the pupils what to read, which experiments to try, which problems to solve. These assignments are worked out together by teacher and pupil, and they provide a plan of activities intended to last for a month or six weeks. The pupil works at his own rate, distributes his time as he wishes among the different subjects, and consults his tutor whenever he meets a real and insurmountable difficulty.

Two points deserve mention. First, that many schools adopted the whole plan in the nineteen-twenties and thirties. Most have now gone back to a modified form of class teaching, devoting, say, only the afternoons to individual work on assignments. The chief reason was that the full "plan" overloaded the staff, even though the weaker pupils still failed to get sufficient attention. It seems that the scheme does not work well if the pupil:staff ratio is greater than about 8:1.

There is here, too, I think, a lesson to be learnt. The old "Oxbridge" tutorial system involved regular meetings between tutor and student, at which the latter read essays and had them thoroughly criticized. It is a system which admirably develops verbal facility and a happy command of language as well as a general interest in a rather vague and woolly philosophy. It is not particularly well adapted to the requirements of science-teaching. Tutors would probably find it well to spend most of the time available in planning courses of reading and laboratory work, taking care that these plans are duly noted down in a diary. American universities are certainly moving in this direction—indeed, many of us tend to think that they have already gone too far in supervising the work of their students, setting them tasks and problems, planning every minute of their day. However, we in Britain certainly have not gone too far and we usually leave our students too much to their own resources.

Social Aspects of Science

In all proposals put forward for the reform of school curricula and for changes in the content of instruction, there is one common factor. It is always urged that the material be selected and taught in such a way as to make evident its social importance. Some, indeed, go so far as to say that subjects or topics which have no social importance should not be taught at all. Now, in part, this tendency arises from the changed standpoint of the psychologists. The old faculty psychology is no longer defended by anyone. Nobody now thinks of the mind as a collection of mental muscles (called attention, memory, criticism, etc.) which are capable of being developed and trained by special exercises. Therefore one can no longer justify formal modes of teaching by urging that they develop powers of memory, observation, criticism, and so on. The justification has to make clear the social or individual value or utility of what is being done. In part, too, the new emphasis on social significance is the result of increased knowledge in the fields of sociology and of the history of science. But probably the true reason lies elsewhere: in the pervasive climate of thought, in the widespread realization that western civilization has to adapt itself to a changed technology and that it has to accommodate itself both to the challenge of Russian Communism and to the new conditions created by the emergence on to the world stage of the Asian nations.

However this may be, the point remains that our students are very receptive to lectures and talks on elementary sociology and on the social aspects of science. It seems that they learn more easily, are more receptive and attentive, when their teachers include references to such aspects in their courses. It would be a mistake to ignore or reject them as futile: their inclusion helps to activate the rest of the material by making it more evidently meaningful. In any case, one should not forget two facts. First, that one becomes a good doctor not simply by learning certain facts and skills, but also by acquiring certain attitudes and habits. Initiation into a great profession, with age-long traditions, is no easy matter. Secondly, as was pointed out earlier, most of to-day's university students come from homes where there is no professional tradition of any kind and where there has been no real contact with professional men and women. Thus, concentrating completely on pure subject-matter, and hoping quite simply that the professional attitude is sufficiently contagious to be caught across lecture desk or demonstration table, may not suffice. More direct methods may be called for.

The Process of Teaching

New inventions, of use in exposition, have always modified the business of teaching: one need think only of the invention of printing—or of the blackboard. The last fifty years have been particularly fertile in such—cheap linotype printing, new processes of colour reproduction, the episcope, the film strip, the moving film, the polygraph which allows easy reproduction of typed documents or even of diagrams and photographs. All these have found their way into class-room and lecture-room, but we have not yet discovered how to use them to best advantage. Potentially, the film is probably the most powerful of all these new media for the communication of ideas and of factual information. But it is also probably the most complicated and, because of its superficial attractiveness, the most prone to misuse. For instance, it is a mistake to use a film for showing the development of an animal from fertilized cell to adult. The whole point of the study is to show how one part develops into another. This study is most easily done on twenty or thirty still photographs, allowing detailed study. With a film each succeeding photograph wipes out the previous impression and the study becomes more complicated, the total idea more confused. Yet many of us would feel tempted to use a film in such cases—and would be disappointed by the result.

There is no room here to discuss the pedagogical problems arising from the use of such visual presentations. It must suffice to remark that their wider adoption, their more successful utilization, will depend upon our finding new ways of teaching. Our traditional methods have relied upon the spoken and the written word, and are adapted to

them. The new ways stem from the oldest of all methods of recording and transmitting knowledge—the drawing, the painting, the hieroglyph. But all of us, through the process of our own education, have been insulated from such direct modes, and many of us find it more difficult to interpret a visualization than a written page—except, for example, those skilled in reading radiographs.

One point arises directly and bears upon the much-discussed lecture-method of teaching. I have already indicated that educators and teachers, in general, continue to believe that the method has value, even though less than was thought. The tradition of university lecturing was established at a time when books were scarce and expensive. They are now cheap and numerous; and they contain all the facts that are needed. The lecture never was an instrument of great efficiency as regards teaching facts: its value was chiefly in inspiring zeal, in developing a liking and gift for criticism and analysis, in permitting some contact, albeit rather slight, with persons of distinction. The example quoted by Professor Pickering of a brilliant lecture by Sir Joseph Barcroft on the kidney shows that it can do all this. But would it not be wise to distribute duplicated notes, diagrams, photographs to the students wherever possible, thus leaving the lecturer free to concentrate on his proper business and taking little account of whether he is mentioning enough facts? The students must learn to get their facts elsewhere and in other ways than by scribbling quickly during lectures.

The Training of Teachers

I have left till last one of the most puzzling and difficult questions of all: whether university teachers need and would profit from special training in methods of teaching and in education. On the one hand, it is clear that the lack of teaching skill, and indeed common sense, of many brilliant research workers involves great waste of time. I remember listening to the lectures of a mathematician, whom I admired and still admire as a man of remarkable genius. I feel convinced I would have learned more had I been able to hear what he said: unfortunately he usually talked to the blackboard and not to his class. Again, I would have liked to copy down what he wrote on the blackboard: unfortunately he always stood in front of what he wrote and wiped it off immediately. I have often wished that someone had given him a few words of advice at the beginning of his lecturing career.

On the other hand, young university teachers know very well that their future career depends mainly on their research work and has very little to do with their teaching prowess. Many tend to regret, as an interruption to their serious scientific work, the need to teach young beginners. To suggest that they should set aside a year or six months would be felt by them to be quite intolerable, and in any case futile. Again, there is involved here—albeit in a very limited way—the principle of academic freedom. No university teacher will consent to have the content of his courses discussed or considered by others—except in the most general way.

Now, what in fact would it be well for the beginner in teaching to know? I suggest that he would be helped by knowing about the instruments (episcope, film projector, and so on) used in visual education and about the educational techniques involved in their use; that he would profit from advice about good methods of lecturing and of demonstration and that he needs criticism of his own methods so that he may remove his defects; that he would find it helpful to learn something about the psychology of the adolescent and young adult as well as about the process of learning; that he would enjoy the opportunity of discussing with men of experience the problems which he meets in his teaching work.

I venture to suggest, therefore, as a modest start: (*a*) that to every young beginner there be offered the opportunity of having an experienced teacher attend his lectures for a term or for a year. This experienced person would then discuss with him the method of arranging his lectures and his actual teaching: suggesting how best to introduce his topic, how to frame and word the problems, what aids to use, how best to demonstrate experiments, questions of voice production, and so on. It would be best if this adviser or critic were not himself an expert in the branch or subject being taught, for it would then be quite plain that there was no question of finding fault or of spotting mistakes. Possibly one might use for this purpose university teachers beyond the age of retirement: many would be glad to undertake so useful a job. (*b*) It would also be, I believe, highly advantageous if heads of departments made a point of calling together their staffs regularly to discuss various educational and pedagogical problems. Knowing how pressed for time all university teachers are everywhere, and realizing only too well how many committee meetings professors are expected to attend, one hesitates to suggest yet one more weekly or fortnightly meeting. Yet the advantages would be great, and it is not impossible that in the end time might well be saved. (*c*) Lastly, it is not inconceivable that week-end meetings of staff, say in one of the many conference homes now available, would be appreciated by all. At such meetings it would be possible occasionally to invite a psychologist or an educationist who might expound current views on some educational problem or tendency or on some new technique of teaching.

In my view, it would not be either wise or practical to attempt to go further than this at the moment. Indeed, some may find it slightly ludicrous to suggest forms of training for university teachers, remembering how many brilliant teachers there have been who have never had any training and who lacked all systematic psychological knowledge. One notes, however, that fifty years ago secondary teachers were never trained and had no systematic courses in education: now nearly all spend a year in a University Department of Education and, for the most part, enjoy this period and consider they have profited from it. In addition, one should not overlook the fact that the means and techniques now at the disposal of and used by university teachers are numerous and complex. In this situation it is unwise simply to trust to memory, to the powers of adaptation and imitation, or to native common sense. Something more is needed if the resources available are to be fully mobilized and wisely employed for the improvement of university education in general and of that highly important part of it which is medical education.

The Ministry of National Insurance announces that foreign students who come to this country during their vacation and take up temporary employment related to the nature of their studies will not be required to pay National Insurance contributions until they have been continuously resident in Great Britain for 26 weeks. They will, however, still have to pay Industrial Injuries Insurance contributions. Apprentices coming from other countries will also be excused from paying National Insurance contributions if they have not reached the age of 25 when they take up employment here in work which is related to their work abroad and the employment is not expected to last, and does not in fact last, for more than three months. These changes have been effected by the National Insurance (Residence and Persons Abroad) Amendment Regulations, 1950.

THE ART OF LECTURING

BY

G. PATRICK MEREDITH, M.Sc., M.Ed., F.B.Ps.S.
Professor of Psychology, University of Leeds

I am not a theologian, but I was once privileged to attend, at a week-end conference, a lecture by a professor of theology. It was twenty-five years ago and it is still vivid to me to-day. The subject was Amos, of whom I previously knew precisely nothing. By the end of the lecture I had not only a dynamic impression of the character and message of the prophet but also a clear and colourful picture of the contemporary economic, political, and social structure of the people of Israel. The professor used no notes. He padded round the room, with his hands behind his back, and wearing felt slippers. From time to time he raised one foot to scratch the calf of the other leg. Now and then he looked at one or other of us directly in the eyes, with a kind of challenging glare. At other times he gazed through the window into the extreme distance, as if looking at Palestine, and describing what he saw, taking our gaze with him. I recall that he pronounced Jahweh with the sort of sound one makes in clearing one's throat.

I have listened to Professor Massey lecturing on atomic energy in a London lecture-room with traffic roaring outside, clinging to the knob of a wooden balustrade on the platform, stock-still for an hour, also without notes, powerful, compelling, consecutive, telling a story he knew from the inside, with no mannerisms. And to Professor W. P. Milne, many times, on mathematics. For him the history of mathematics was a hilarious breath-taking adventure, massive bodies were always elephants and infinite planes were all as flat as gramophone records; he always mingled mirth with mathematics. And to a shy, reserved, precise lecturer in physics who announced one morning, "I am going to introduce spherical harmonics to you. The day I grasped this subject was the happiest in my life." And to the late Charles Spearman, who lectured in a somewhat staccato and confusing manner, committing many faults of delivery, but who compelled attention because this branch of psychology—the Noëgenetic theory—was his own creation. I get the same thrill and more listening to Professor Astbury, not only because he is a much better lecturer but because biomolecular structure is a subject which he has brought into existence.

Vitality

I now ask myself, What have these exceedingly diverse performances in common? I ask this because, desirable as it might be for all university lecturers to have a training in lecture techniques, I cannot persuade myself that this would usher in a millennium of enlightenment. Of the lectures I really remember (as distinct from the thousands which helped me get through my examinations and thereafter faded) I can see little or nothing as regards common techniques. What was common was something less tangible. Though some of the lecturers were actual creators of their subjects this was not so in all cases, and the circumstance is necessarily a rare one. Certainly all were masters of their subjects, but this is also true of many ineffably dull lecturers through whose performances I have dozed my way. Unfortunately, mastery of a subject seems to be not incompatible with an academic necrosis of the personality.

You can wander about, you can indulge in irritating mannerisms, you can hum and haw, you can remain glued to a desk, you can twiddle your fingers, you can commit all the crimes on the statute book (the latter would make entertaining reading if someone would write it: "The Deadly Sins of the Lecture Theatre"), and you can get away with all of them if only you have the one supreme virtue. What is that virtue? The name I would give it is *vitality*. This was the common factor in all my remembered lectures.

Vitality does not mean flamboyance. It is not exactly the same as energy. It is compatible with a considerable variety of surface qualities. It combines well with originality but is not identical with this. There are noisy, restless lecture-rooms which yet lack vitality, and there are lecture-rooms in which a quiet, subdued atmosphere testifies to intense, creative man-to-man contact—a contact of both learning and personality. The still, small voice may hold something which the thunder lacks. But of course there are personalities whose vitality needs a boisterous expression. There can be no holds barred.

Techniques

I have been asked in this symposium to write on "techniques" and I am trying to do so, but perhaps not quite in the sense intended by the Editor. For how could principles for the technique of lecturing be established? Only by the systematic analysis of lecture successes on a wide scale—not by the formal application of *a priori* educational principles excogitated by theorists. The extraordinary gap between educational theory and educational practice in the scholastic world would merely be paralleled in the academic world. At present the academic world gets along without any particular theories about study and lecturing. There is certainly plenty of dissatisfaction with the methods and results of academic education, and it is sometimes suggested, or implied, that an injection of educational theory might remove the complaint.

Personally, I think that a dose of empiricism would be more effective—that is, a study of how good lecturers get their results. And from my own limited sample I should say, as a preliminary generalization, that good lecturers get their results primarily by having sufficient vitality to give good lectures. Their techniques are a direct consequence of their vitality. But this vitality is not an easy thing to define. It is a force which is called up by the joint challenge of a topic and an audience, a challenge which stimulates the organizing capacity of the man's mind to draw upon whatever material and mental resources he has. After all, what is a "technique"? A technique is a way of doing something. When we observe a certain effect being achieved we may pin-point all the details of the procedure, item by item, and yet fail to account for the achievement. The technique is more than the sum of the details. It is the organization of those details which sustains the process. We must grasp the organization if we are to understand the achievement. I would say, soberly and reluctantly, that educational psychology to-day, with all its progress, is not yet in a position to say to the teacher or lecturer: "Here are all the tricks of the trade; follow these and you are bound to succeed." Indeed, I am not sure that educational psychology ever will, or ever should, fulfil this aim.

The last thirty years have witnessed an unprecedented outburst of experimental activity in education. Every dodge, trick, and stunt, every device, mechanism, and apparatus, every system, procedure, and method which the ingenuity of dissatisfied educationists could think up—all

these have been pressed into service. Most of them can claim successes. Most of them have their intrinsic merits. But none is the panacea claimed by its promoters, and there have been plenty of successes in which all were ignored. The literature of educational experiment gives, as a rule, an account of the successes. A much more voluminous literature could be compiled if we were honest, describing the failures. But, as so often, "the operation was highly successful, but the patient died without recovering consciousness."

Now I am not a reactionary in these matters. I regard the modern developments in educational techniques (many of them referred to in the article by Professor Lauwerys) as being no less important than the atomic bomb, and indeed part of the answer to the menace of the latter. But as the release of nuclear energy has gone astray because of human conflict so, too, the use of modern educational techniques is missing fire because of a neglect of the human problems attendant upon their use. I want to discuss these problems.

Human Interaction

Not only does the use of a specialized educational technique—for example, the film—involve human beings both in its preparation and in its presentation, demanding training and insight if full justice is to be done to the medium, the matter, and the method, but—and this is the crux—*the actual educational occasion is essentially a pattern of human interactions.* By an "educational occasion" I mean any period in which instruction, stimulation, training, etc., is being given to a group of students. Whatever media and methods are being adopted we always have some kind of a performance *by* human beings and *for* human beings. And we know enough to-day about the psychology of the learning process to know that the transmission of knowledge is very, very unlike the process of recording sound on a disk or an image on a photographic plate. The disk and the plate have no "attitude" to the process or to the person performing it. The human learner has, and his attitude both to the task and to the teacher is decisive in determining the outcome. This does not mean that the details of the task are unimportant or that an inspiring atmosphere can compensate for neglect of material completeness and accuracy. But it does mean that attention to the latter can be rendered ineffective by ignoring the human factors.

If we consider some other occasions of human interaction we may get some clues to what is involved. In the stage performance of a play the whole production is carefully designed precisely to take account of the attitude of the audience. Every movement, every gesture, every inflection of the voice, every beam of light, every piece of furniture—all are under the producer's control and all play an exactly calculated part in building up the developing pattern of dramatic tension. There are many background factors too. Not only the architecture of the theatre, the time of day, and the season of the year, but the name and prestige of the author, the reputations of the star actors, the press reviews of the play, the fashionableness or otherwise of the play itself and its theme, the tradition of the theatre—all these conspire to create or destroy that final outcome—namely, the dramatic experience of the audience which is the goal of the whole complex game.

Mutatis mutandis, similar considerations apply to a broadcast, and they should (though seldom do) apply to the screening of a film. But how do these points apply in a university lecture to a class of medical students? Is it suggested that each lecture should be regarded as a dramatic performance to be scripted, produced, rehearsed, with spotlights and music and all the *impedimenta* of the modern stage? If I proposed this the answer would, of course, be, "Not Pygmalion likely!" What I am suggesting is that if such lavish attention to the requirements of the occasion can be devoted to entertainment, surely no less attention should be devoted to the requirements of learning—especially the learning of those who will be responsible for the nation's health. And, although "the play's the thing," just as a good play can fail in its effect by reason of a bad production, so, too, the most carefully thought-out piece of medical knowledge can fail to get across if badly delivered. On the other hand, the best production cannot make much of a bad play. These two essentials, matter and method, must both receive equal weight in considering the requirements of medical education.

Morale

Perhaps we can arrive at more clues by considering the problem in terms of morale. This is really the military term for what I have been calling "attitude." Troops who believe they have a just cause to defend; who have good reason for confidence in those responsible for the "logistics" of the campaign, and faith in their leaders; who have had a good training; who know clearly what their immediate objective is; and who have the challenge of the enemy himself in view—such seem to be the regular winners, if military history is to be believed. Medical education is something of a campaign. The student is the individual fighter and the enemy is his own ignorance. He has a long gruelling war of five or six years' duration, with tough fighting all the way. How can his morale be sustained through this long ordeal? The full answer to this would give us the complete dynamics of medical education. I can venture only some of the main headings, those bearing particularly on the art of lecturing. Lectures, laboratory work, and clinical work are the three great forces in the campaign and each has its own problems.

The "pep talk" has its place in study as in fighting. Mr. Churchill's wartime broadcasts at one extreme, the final words of a briefing to bomber pilots or commandos before a sortie at the other extreme, illustrate the force of sheer words. Sheer words, but not mere words. The essentials of "pep" are not so much energy and verbiage as sincerity and vision. Education is not solely an intellectual process. The distant achievement, the entry into a life-saving profession with a great tradition and immense contemporary power and opportunity for humane service—this is not a trivial goal. It calls for all that is best in a man. And whatever the difficulties, the discontents and disputes, the petty rivalries and squabbles, the cynicism and cheap jokes, and all the other superficialities with which the word "medicine" can become encrusted, its own essential vision and purpose are too high in the scale of human values to be allowed to fade from men's minds. They need to be particularly bright and sharp in the minds of students. There is a place, then, for the occasional introduction of this element into the lecture-room by the right man, in the right way, at the right time.

Historical Element

Allied to this is the historical element. Doctors need to know the history of their craft, but there is very definitely a problem of technique in teaching it. A formal course of lectures on the history of medicine is not likely to achieve what is wanted unless handled with exceptional skill. We have to ask, "What is the function of historical knowledge?" Certainly as part of the doctor's culture and general education it is important, but, more than that, an insight into its past growth is needed to appreciate the present growth of medicine.

The student is not mastering a body of static knowledge which will last him throughout his career. He is being given a start, at a particular epoch in time, in a system of developing skills and achievements, a system which will go on developing while he is practising it. Moreover, it is a system closely linked to the current techniques of civilization and scientific resources, to the current ways of life of the people, and to current beliefs and superstitions. In a sense all medicine is social medicine, and must be interpreted in the light of statistical knowledge of sickness and death, of wars and plagues, of poverty and wealth, of housing and diet.

A full, rounded, perspective view of modern medicine can be given only by those whose teaching intuitively refers to history because their own understanding is informed by a grasp of history. The history of medicine is not a separate subject but a dimension of the subject. The lecturer's technique must include the process of imparting to the student a sense that he personally is entering into this historical stream. One may compare the immense pains taken by great regiments not only to maintain the historical sense of their own traditions but to see that every recruit comes to possess this sense. This may not have much to do with the logic of learning, but it is an undoubted factor in morale.

"Logistics"

Thirdly come the "logistics"—the supply and movement of men and materials. I take the analogue of this to be the technique of planning time-tables, of not only preparing lectures but lecture-rooms, demonstration materials, visual aids, supplementary notes and reading references, and the uses of libraries. How far such matters are determined by tradition and habit, or by considerations of mere convenience, or by casual day-to-day decisions no one can say. But if we look at these matters from the point of view of the student and imagine them asking themselves, as well they may, "Is this medical school going all out not only to train us in the best modern techniques of medicine but to train us by the best modern techniques of instruction according to a genuine thought-out educational plan, or are our lectures mere episodes in the life of busy men with too many other irons in the fire to leave time for thinking about our needs?" this may focus the issue.

Students need to be exposed to the stimulating contact with vital personalities who have themselves contributed, and are contributing, to the advances of medicine. But my earlier remarks about vitality must not be taken as a plea for spectacular histrionic exhibitions of personal prowess. Medicine is one thing and medical education is another. Each is a great creative job. Those taking part in the second must have their hearts not only in medicine but in education. They are building for future health as surely as present practice is building for present health. The students need the assurance that the lecturer is as much interested in them as in his subject. This interest may be shown in a variety of ways. It may not, it seldom can with large classes, take the form of direct individual concern with each particular student—though each needs at least one tutor whose business it is to treat him as an individual. But students have, I believe, more awareness than is commonly realized of the extent to which their educational needs are respected. And a well-planned campaign of instructional progress has not only the strength of its technical merits but the additional strength which arises from the effect on students' morale of their awareness that it *is* a planned campaign. So I would suggest that one of the most important techniques in lecturing is to take the students into one's confidence with regard to the general plan of the course, and the reasons for whatever particular methods are adopted.

One of the best reasons for adopting a particular method is that one knows how to use it successfully. One man's meat is another man's poison. Universal techniques cannot be prescribed. This does not mean that techniques do not matter. They matter supremely. The trouble is that so many lecturers assume unreflectingly that there is just one droning, repetitive technique—the vocal textbook technique—and that their personalities have nothing to do with the case. There is a great range of techniques. It is for each man to find for himself which particular techniques suit both himself and his subject.

The upshot is that lecture technique is not a matter of a few simple tricks of the trade but something to be studied as closely as a piece of surgery. Lecturers, particularly at the beginning of their careers, would do well to have occasional voice-recordings made so that they can hear their own delivery. They would do well to invite experienced critics to come in and sit at the back and tell them frankly whether they could clearly hear and see all that was said, written, and shown; whether exposition was lucid; whether timing was right; whether information was lively or dull, pretentious, or hackneyed; whether justice was done to the subject-matter; whether it was made to seem significant, made to seem part of a connected scheme of knowledge, given colour and perspective and brought to life.

In short the art of lecturing, like any other art, must be learnt through the painful experience of practice and criticism. It will then become evident, through this empirical process, that lecturing is a living art, an art of moving the thoughts and feelings of human beings, an art in which, whilst the talk and the topic are in the foreground, there is a background of interaction between personalities, of historical achievement, and, in Medicine, of movement towards a proud participation in the most humane of labours.

Social insurance in Austria is the theme of an article by Dr. Reinhold Melas in the *Bulletin* of the International Social Security Organization for April, 1950. He describes how all employees and members of their family are insured against sickness. The scheme provides sickness benefits, lying-in allowances, funeral grants, and family assistance. Free medical care is provided; insured persons choose one of the doctors under contract to the insurance fund. The relations between the doctors and the sickness fund are regulated by collective or individual agreements. The expenses of diagnostic tests are borne by the fund. Drugs and other medical products are obtainable free of charge by the insured person on presenting a prescription at a chemist's, though members of his family must pay 20% of the cost of products prescribed for them. The preparations that may be prescribed are approved by the public health office, and number about 4,000; there are about 400 which may be supplied only with the consent of the sickness fund. Hospital care is also provided under the scheme for 52 weeks as a free benefit to the insured person, and for 26 weeks for members of his family, who must pay 10% of the cost. There are also dispensaries where people may go to be regularly examined by a doctor even though not complaining of any symptoms.

METHODS AND MEN IN THE TEACHING OF CLINICAL MEDICINE

BY

Sir HENRY COHEN, M.D., LL.D., F.R.C.P., F.F.R.

Professor of Medicine, University of Liverpool

Recent reports on medical education have been concerned primarily with the content of the medical curriculum. They have emphasized how such influences as the vast expansion in the corpus of medical knowledge due largely to the application to medical research of the newly discovered implements of science, the triumph of the functional concept of "disease" over the earlier notion of "diseases" as specific entities, increasing specialization, and more readily available hospital services have rendered necessary fundamental changes in the structure and orientation of the curriculum. There has been general agreement on the pattern which these changes should follow, and they have been embodied in the most recent recommendations of the General Medical Council and in the educational provisions of the Medical Act, 1950.

Too little attention has been paid to what is equally important—the methods and techniques of medical teaching and the selection of medical teachers. For, whilst exceptional men are the product of their exceptional talents rather than of any system of education, the average student will be better trained by the teacher who has mastered the main principles of pedagogy. The contributions of distinguished educationists to this symposium leave no doubt of the general applicability of Flexner's observation that "medical education presents a problem not of medicine but of education." In a measure the problems of medical education may well be simpler than those of general education, for the medical student may be presumed to want to be educated, whilst the scholars in our primary and even secondary schools (to whom most educational research has been directed) are too often the unwilling victims of our system of compulsory education; moreover, the vocational component of medical education gives to it a more defined objective than that of general education.

In common with the vast majority of clinical teachers I have had no formal training in the art and science of education. In over twenty-five years of teaching I have had perforce to learn largely by the heuristic method, though I have learnt much, both to emulate and to avoid, by observing others. It is from the basket of this experience that I pick some impressions and a few convictions which will, I hope, be helpful to the young clinical teacher.

The Clinical Teacher

Although some clinicians are born teachers and some, however eminent in their profession, are abject failures as teachers, most clinicians who possess certain natural attributes can be trained in the art and methods of teaching. If we are to choose our clinical teachers skilfully we must appreciate what their business is. We must recognize that their purpose is not only to transmit knowledge but also to stimulate the student to think for himself to some purpose, and to show by example the techniques, simple and intricate, of the science of medicine and of its human and social relationships. They have to teach both how to observe and what to observe; the need for thoroughness, accuracy, and freedom from bias; the significance of the analysis and synthesis of observations and the reaching of rational judgments on them.

The clinical teacher must then know the practice of medicine through long and intimate contact, for he cannot give what he does not possess. But competence in practice or research is not enough. He must be interested in teaching and in the taught. For him, behind the power to teach a subject must be the power to train a doctor, so that he must be a man of character as well as ability, for many students will model their lives on his personality. To an equable temperament, and courtesy and patience in dealing with patients of all social groups and of all degrees of intelligence and stupidity (for manners proclaim interest), he should bring an orderly mind and a balanced outlook, a sense of proportion, an ability to think for himself and to question authority, confidence in his own judgment, and a ready acceptance of the fact that, from the nature of medicine, blunders are inevitable, because summary decisions on inadequate evidence are often needed for action where a reasoned judgment must be postponed because of limited knowledge.

There are certain qualities indispensable to any efficient teacher whatever his subject. He must have, or acquire by training, a clear and unhurried diction, and he must be able to express himself in simple language. Ruskin held that "he who hath truth at his heart need never fear the want of persuasion on his tongue." But mumbling inaudibility can never persuade. Such simple but important faults as speaking to the blackboard with his back to the class, writing illegibly, and others have only to be noticed to be corrected. The good teacher must be able to sense the response of his class so that he knows when to repeat, to emphasize, or to remodel his explanations. But amongst the major considerations of special application to medical teaching are (i) the need for a clear objective in all forms of instruction whatever their content or type, (ii) the need to adjust teaching to the stage of the pupil's knowledge and understanding, and (iii) the methods and techniques of teaching, and especially the tools of clinical teaching.

Certain aims are generally accepted. Thus progress must be from the known to the unknown; there must be constant reference back by way of explanation and illustration to earlier work. The need for this has been recognized in the importance attached to the transition period between preclinical and clinical studies and the increasing emphasis on interpreting disease in terms of anatomy, physiology, psychology, and pathology rather than in describing "diseases" as if they were equivalent to the species of plants and animals. Moreover, if its purpose is to be achieved there must be a clear, and preferably in the earlier years a single, objective in any given lesson. The teacher should repeatedly ask himself, What point am I trying to make? In this patient with a failing heart what am I trying to demonstrate? Is it a cardiac irregularity, the pleural effusion, the mechanism of oedema, or dyspnoea, etc.? He thus will appreciate constantly the need for dealing with one problem at a time.

These principles are specially important in relation to the stage of his clinical studies which the student has reached. For example, the patient with carcinoma of the pancreas should in the early stages of the student's ward work be an object-lesson in obstructive jaundice and not a text for a discussion of neoplasms of the pancreas. It is well also to recognize that there will be patients in the wards who can offer but little material which is appropriate to early clinical studies.

Whatever the special aim of any course of instruction may be, the general aims of medical education should not be overlooked, and topics far removed from its purpose should not be laboured at the expense of more rewarding studies for the basic training of the doctor.

Methods of Medical Teaching

These are here discussed with special reference to the teaching of clinical medicine, though what is written applies *mutatis mutandis* to other clinical studies.

The methods of clinical teaching ("tools of the teacher") may be roughly regarded as (i) didactic—e.g., the systematic lecture and the lecture-demonstration, (ii) those designed to encourage the student to observe accurately and to think for himself—e.g., some aspects of ward work, out-patients, clinical conferences, and discussions, and (iii) those in which he sees the trained practitioner at work—e.g., in consultative out-patients, in the operating theatre, or in general practice.

Systematic Lectures

Doubt has frequently been expressed about the value of a course of systematic lectures in the teaching of medicine, but, provided that the lecture is not a mere reproduction of what is in the textbooks but expounds essential principles vividly and clearly, embodies recent work, and approaches the subject of the lecture from an individual, fresh, and novel angle so as to present an integrated conception of a problem, it is a most valuable teaching instrument. The lecture must, however, be carefully prepared, for few are competent lecturers without preparation, and all are better for it. The lecturer should have advised at the beginning of his course which textbooks should be used and before each lecture which chapters should be read; he may supplement these by predistributed cyclostyled notes, blackboard summaries, and diagrams. The student's time must not be wasted in writing detailed notes of the facts recorded in his textbooks. The lecturer and the students can then devote themselves to the proper purpose of the lecture, which is to act as a guide and stimulus.

In preparing the lecture, attention must be given to its proper timing and length. Special care should be devoted to the introduction, which creates an atmosphere and which should explain the lecturer's aim. The theme should then be developed rationally on the basis of prior knowledge. Spoon-feeding must be avoided and is unnecessary if the student is properly directed in the use of his textbooks. In any event he is not a mere receptacle for the storage of information nor is the lecture solely a medium for its transmission. The need for reiteration ("repetitio est mater studiorum"), and for emphasizing what are important principles and what minor details, should be appreciated. The apt illustration from personal experience impresses itself on the student's memory. References to the literature will encourage and direct the student in his further studies. For classifications and diagrams the blackboard is as a rule the best medium of visual instruction, for the able teacher can show them expanding from the broader generalizations to smaller details. Lantern slides, the epidiascope, and filmstrips have their place in the lecture—for example, in demonstrating morbid anatomy and histology, the variations in the clinical pictures of disease, graphs, and statistics. Radiographs and pathological specimens should also be available for purposes of illustration in the systematic lecture.

The place of films in systematic instruction has been widely debated. There is general agreement that their novelty and superficial attraction has led to their over-use. The films recording many surgical operations reveal less than do a few simple line drawings. But where the emphasis is on movement they are valuable. They can be used, for example, to illustrate abnormal gaits and involuntary movements, the expansile pulsation of an aneurysm as shown by the "match sign," the dramatic effect of blowing out a candle with the air escaping from a needle inserted into an area of extensive surgical emphysema; or as records of a series of cases—for example, of cranial nerve palsies—not readily available when needed for demonstration. The film is not, however, an adequate substitute for the living patient. Another use of films is to show technical methods, such as ventriculography, with which the student should have an acquaintance, and in which the procedure which takes a considerable time can be shortened to illustrate its essential features. A third use of films in lectures is to provide animated diagrams; these are especially useful in showing, for example, the relation of the spread of the cardiac impulse to changes in the E.C.G. or in demonstrating labyrinthine reactions.

The fewer notes the lecturer uses the better. The reading of a lecture is usually uninspiring, and the student may pointedly ask, If the lecturer has not learnt the subject, why should I? But no attempt should be made to memorize the lecture verbatim, for this will defeat one of its most vital purposes. The lecturer should always be sensitive to the reactions of his class, especially to those he has not foreseen, and he must modify his lecture accordingly by repetition, emphasis, and recasting. Although the importance of this must be recognized, there is still a place in the training of the inexperienced teacher for "shadow teaching"—rehearsing the lecture without his class.

Lecture-demonstrations

Much of the foregoing applies to lecture-demonstrations, especially to clinical lectures of the old type (and the young teacher would be well advised to read those of the masters—for example, Trousseau, Graves, Charcot, Gowers, and others, not so much for their content as for their form). The clinical lecture should be a complete and orderly presentation of a special topic or a carefully prepared clinical demonstration of a patient or group of patients illustrating a particular theme. There is, however, another useful type of lecture-demonstration in which both pathologist and physician can fruitfully collaborate. In this a particular topic is chosen, such as cerebral tumour; the pathologist and clinician expound their special aspects and then question each other before the class to illustrate how certain symptoms and signs are produced and what is their pathological basis. The scheme can be widened to include the radiologist, the clinical pathologist, and other specialists.

Ward Work

The main purpose of work in the wards is, to use Professor Lauwerys' phrases, "to stimulate purposive mental activity and to individualize instruction," and also to introduce the student to those personal relationships essential to the eliciting of accurate histories, conducting physical examinations, and the handling of human material. To these ends are directed his term of clerking, ward classes and tutorials, and ward rounds. The wards should be open to the student whenever practicable so that he may have the opportunity of studying and observing the patients assigned to him at any time and throughout the course of their illness. Clerking should be a modified apprenticeship,

and the student should be encouraged to believe that under proper guidance he is responsible for the patient. He should accompany the patient to the various diagnostic departments and see the specialists at work. The period of clerking is in medical education most analogous to the Dalton plan in general education, and gives the opportunity to the tutor to instruct the student on his individual problem. Ward classes and tutorials must be regarded as complementary to, and not a substitute for, clerking. The class must always be small (not more than 10 to 12 students to each tutor), and each member of the group should be at the same stage of study; mixed classes of senior and junior students are educationally indefensible. The tutor should plan but not overplan the work of the individual clerks. These classes serve to throw light not only on the work of the student but also reveal to the senior teachers the calibre of the tutors. In the ward classes the Socratic method is to be encouraged, and in them the student must take an active part. They must, therefore, be neither too formal nor too discursive. "It is not seeing much but seeing wisely that is valuable" (Osler).

I have earlier stressed that the ward round by the senior clinical teachers must aim at being appropriate to the stage which the student has reached in his clinical studies. The wrong way of conducting a ward round was graphically described in the B.M.A. report on *The Training of the Doctor*: "The chief, attended by his satellites, and followed by a throng of leg-weary students, moves from bed to bed, down the ward, briefly demonstrates case after case himself, and delivers unprepared discourses (however wise) on the patients or their diseases." The duty of the chief is to reveal in his teaching a wisdom and judgment which the junior teacher cannot from his lack of experience possess, and he should aim at presenting a synoptic view and stressing the importance of fundamentals, for there is a real danger that the tutor, having recently studied for his higher examinations, will be a little prone to exhibit his mastery over advanced medicine, and to over-stress detail. Moreover, the senior teacher should as part of his ward round take the opportunity of interviewing not only the patient himself but also his relatives if they can provide useful information, in the presence of the students, and for this purpose a special consulting-room attached to the ward is, in the interests of privacy, most desirable. It is here also that the final interview with the patient should take place after the hospital has completed its service so that the students may hear the chief's discussion with the patient on his condition and treatment; here also the work of the almoner and other social agencies should be brought into the clinical picture. There is one other point which, in my experience, is rarely recognized; it is that a teaching ward round should be primarily directed to teaching. The physician should pay additional visits to the ward in the absence of students so that the required service to the patient may be given. There is then no temptation by the physician to go beyond the students' comprehension on his teaching rounds, and the patients receive all necessary attention; and even those who may not be so suitable for clinical demonstration are ready to co-operate in the work of medical education. I have found that patients with no spectacular physical signs too often feel themselves neglected in the wards of a teaching hospital.

Out-patients

Teaching in out-patients should come at a later stage when the student is familiar with the commoner expressions of disease. The teacher must here take the opportunity of stressing the earlier, less severe, and more reversible manifestations of illness, and he must emphasize that in out-patients is seen a cross-section of disease which more closely reflects that met with in general practice. The opportunity for seeing emergencies and minor accidents, especially in urban and industrial areas, should be taken. In teaching hospitals where out-patients are essentially consultative, the physician should stress the technique of consultation. It is here that he can show how to tackle the patient seen for the first time, how to put the patient at his ease, how to extract and assess the salient points in the history, how to pick out the essential features on physical examination and to decide what investigations might reveal the nature of the patient's complaint and so lead to rational management without the need for admission to hospital. But if admission is necessary then the teacher should ensure that there is continuity of teaching from out-patients to wards. For the senior students out-patients provide the opportunity for practical exercises in diagnosis. The provision of single rooms in which a student can examine a patient and then discuss his findings and conclusions with his teacher should be an essential feature of all teaching hospital out-patient departments. There are, of course, difficulties. The number of out-patients and the appointments system have led to a prior selection of cases which is educationally often disadvantageous. In out-patients, too, the opportunity should be made by the teacher to illustrate the course of disease and the effects of treatment by paying particular attention to the work of his follow-up clinics; and here again the precepts of social medicine should be stressed.

Conferences and Discussion Classes

In the wards and in out-patients the dominant emphasis is laid on accurate, thorough, and unbiased observation, and in this I include the taking of accurate histories, for history is essentially observation in time. Simple inferences in terms of structure and function and, as the student's knowledge increases, in pathology, aetiology, therapeutics, prognosis, etc., will be made. But in conferences and discussion classes the educational emphasis is on the rational inference, for in most instances observations will have been recorded and completed. Hence clinico-pathological and clinico-therapeutic conferences have most to give to the senior student, but conferences at the bedside in which clinicians and specialists take part are most valuable at all stages of the clinical course provided that the teachers modify appropriately their teaching. The discussion class in which such problems as pituitary disorders, disturbances of carbohydrate metabolism, malignant disease, etc. (the "projects" referred to by Professor Lauwerys), which may be suggested by the teacher or by members of the class, and in which by question and answer the student may be encouraged to develop a theme and after preliminary discussion be referred to patients, case records, the relevant literature, etc., and at a later session be asked to expound, demonstrate, and review, is for the best students a most valuable experience; but the less able tend to shrink from the publicity which this type of class entails, and we are still far from having convinced our students that to expose their ignorance is educationally sound.

Seeing the Teacher at Work

A valuable educational instrument for the advanced student is provided by the following type of demonstration. A patient who has been fully investigated and in whom a diagnosis has been established by a colleague is presented to the teacher, who has not previously seen the patient but who in the presence of a senior class takes the history and examines the patient; he then discusses the diagnostic problem presented and might venture on the relative probability of various diagnoses. After this he specifies the investigations which could serve to confirm his provisional diagnosis or clarify the problems of differentiation. He may, for example, examine *x*-ray films or take note of blood and marrow reports; he will then express his considered views, in the light of his examination and the investigations, on the diagnosis. Those who have seen this kind of class at work describe it as a vivid and memorable experience. As an illustration of method in observation and inference and their importance for clinical studies it can hardly be bettered, and it has on the teacher a sobering influence however well developed may be his *prima donna* instinct.

There is as yet too little experience on which to form a judgment on the place in which training in general practice or in a health centre is for the undergraduate a fruitful addition to our methods of medical teaching.

I have not attempted a systematic or exhaustive thesis on medical pedagogy. I concur wholly in the views expressed by other contributors to this discussion, about the need for the novitiate in medical teaching to know something of general educational principles and of the psychological factors involved in learning, and to be aware of the scope, uses, and potentialities of the various aids to teaching and of the educational techniques which their use involves; of the value in learning the art of teaching of observing the technique and methods of the most successful teachers, and of discussing his problems with them and seeking their criticism. I have, however, been impressed with the fact that most successful teachers have developed methods of teaching which are suitable to their own personalities and which cannot be fitted into a particular pattern, and that "in the long run systems of education stand or fall by virtue of effort and ideas, not machinery."

The Social Psychotherapy Centre which was recently opened at 7, Fellows Road, Hampstead, has held its first "view day," when groups of interested people—psychiatrists and social workers—were shown round the departments. The activities include art and occupational therapy, therapeutic social clubs, individual treatments, physical treatment in suitable cases, child guidance for those under 7 and those from 7 to 16, and remedial teaching. It is in fact a "day hospital," the patients to the number of a score or more attending at all times from 9 a.m. to 10 p.m. They sleep at home if the home environment is suitable, and if it is not an endeavour is made to find them suitable lodgings. Thus they retain touch with their ordinary environment, and their time at the centre is so fully occupied that they forget their own condition. Patients are also admitted who have been in a mental hospital and are in need of the rehabilitation which is brought about through social clubs, enabling them to return to ordinary life in the most favourable circumstances. Dr. Joshua Bierer, the medical director of the clinic, explained to the visitors the multidimensional treatment employed. He expressed his thanks to the Central Middlesex Group Hospital Management Committee, under whose auspices the centre is working, for making the experiment possible. It was really, he said, a very simple experiment. Its most important feature was co-operation, directed towards the encouragement of self-realization and self-fulfilment of the patients. Various schools of psychiatry were represented on the staff, but staff and outside friends and former patients all worked together in the effort to help the maladjusted and to give each patient the individual attention that he needed. The centre depended largely upon the group idea for its results. The patients at first tended to remain solitary, and then they discovered a group whose feelings they could share and the way was open for normal social life.

THE TRAINING OF CLINICAL TEACHERS*

BY

R. D. LAWRENCE, M.D., F.R.C.P.
Physician, King's College Hospital

This subject is very difficult and ploughs nearly virgin soil. So far as I know, no discussion has taken place directly on this question and little writing has been done. True, for years, and especially in current post-war years, voluminous publications have dealt with the curriculum and the training of medical students and, recently, of practitioners and the need for change. All this impinges closely on our subject but has not tackled the equally important question of the teachers, their capacity, their choice, their training—so fundamental a matter because on it the full success of medical education must be based. I am glad, therefore, to raise the question before a meeting of the best young brains and the future intellectual leaders of our College. I feel quite humbly inadequate, but shall do my best to stimulate more sense and knowledge than mine.

The argument behind the need for improving teaching and the teachers in medicine is simple and was briefly stated in my short letter in the *British Medical Journal* of September 10, 1949 (p. 594). It drew attention to the training, and criticism, that elementary teachers have, not only in the matter to be taught but in the method of presentation and how to teach. In the teaching of medicine, and perhaps especially clinical medicine and its application to practice, training is entirely lacking, and teaching capacity is not considered profoundly when the staffs of teaching hospitals are chosen. I consider that clinical medicine is, for many reasons, the most difficult of subjects to teach, and that some training in it is of paramount importance. Of course, if you accept the old platitude that teachers are born, not made, there is little to be done about it. But I am sure that the educationists would not agree, and I believe that, though bad teachers cannot be made good ones, moderate ability can be improved, and even the born teacher, too. Certainly, the definition of a good teacher would not be agreed upon; but he must, above all, be personally stimulating and questioning. The conference and the academic lecture need other treatment and qualities than those required of the all-important bedside teacher: the manner, the mode, and the material are quite different.

When I reflect that the material to be taught is vast in its details and ever changing, with all our temporary fixities and ultimates becoming penultimate, and that no clear philosophy of medical thought and teaching has been evolved, I am appalled by the complexity of the subject before us. I think, however, that it is possible, and useful, to regard the whole subject from two main aspects.

Diction and Delivery

The first aspect is relatively easy to deal with but is very important. We have all suffered on too many occasions, from our earliest lectures in physics and chemistry to such occasions as this, from inaudible whispering and mumbling, from humming and hawing, from distracting mannerisms, until our attention died and we relapsed into restless boredom or uncomfortable sleep; suffered, too, from mumbling into blackboard drawings, from boring over-explanations of a simple slide, or from bad and complicated diagrams with no explanation. Perhaps worst of all is the opener of a discussion (I must be careful) who wastes time with his prolixity or those following who take fifteen

*An address opening a discussion by Members of the Royal College of Physicians at Bristol.

minutes instead of three. I need not elaborate. Surely we could all be helped and improved in these venial sins by the elocutionists, the educationists, and the friendly criticism of our peers, especially at an early and malleable stage.

Mental Processes of Thought in Medical Teaching and Diagnosis

This second aspect is more deeply important and much more difficult, because it raises the unknown profundities of brain functions and capability, thinking habits and processes, and other abstruse matters.

There is no doubt that, innate ability being equal, the trained mind conscious of the processes and methods of thought will go further and truer than the untrained. This applies to all fields of science, philosophy, and perhaps art. It certainly applies to medicine, but so far as my reading goes I have not been able to find any profound and detailed exposition or analysis of the mental process and principles underlying medical practice and teaching. Many of the best minds in medicine have been aware of the lacuna, and in the last 25 years several authors have written on it—Crookshank, Ffrench, Capon, Lewis, Cohen, Walshe, being particularly stimulating. But nowhere has been enunciated a logical or philosophical approach to the difficult mental processes involved in making a diagnosis, mental methods to which we can systematically turn in dealing with the difficult and ever-widening problems to which the progress of medical science is continuously adding. Hence a well-ordered and wide-viewing mind is more necessary than ever, but its conscious production is entirely omitted in the training of the student and hence those who become teachers.

The mental background of the disciples of medicine has probably deteriorated in the last 50 years, for our forerunners were widely trained in the classics and the arts, and often in logic and philosophy. There is thus a big cultural gap which must be filled in the training of our students and still more of their teachers: some logic, philosophy, psychology of teaching processes, would help to develop and sharpen the mental acuteness and awareness which we need so badly to increase our capacity and diminish our errors.

I think that medical diagnosis, the application of a vast and expanding body of factual knowledge with no fixed ultimates to the problem of one sick person, is often supremely difficult. What makes our problems still more difficult is that we must usually work and make *rapid decisions* on partial ignorance and imperfect knowledge of disease. Philosophers and religionists can consider their arguments at leisure, and they have no immediate new decisions to make. The lawyer acts on social history and precedents. The man who applies the momentary stabilities of physics and chemistry to material ends has his fundamentals to build on. Patients who work with more inert matter than ours, such as engineers and architects, are often impatient with our ignorance of fundamentals and our incertitude about disease and diagnosis. We can remind them that man did not make the human body nor doctors invent disease—and, if necessary, that disorders even in our man-made motors often defy diagnosis.

The Process of Diagnosis

I propose now to touch on diagnosis and mental processes, more to raise questions than to solve them. The main object of medical education is to train doctors for their life-work in treating—preventing, curing, or alleviating—disease. The first step is the identification of the body disorder we have to deal with—what we call the *diagnosis* of the *disease*. The importance of diagnosis as the be-all and end-all in medicine has been stressed perhaps *ad nauseam*, and, while the word should really mean a thorough knowledge of the disease process and the body's reaction to it, it is commonly used to mean giving a name to the disorder to fit it into a suitable pigeon-hole in the vast system of nomenclature of disease. No doubt names must be given, but they have the drawback that the name may suggest an unreal entity by no means corresponding to all the facts of the case, and may close the mind to an appreciation of all the facts—the danger of undue nominalism.

The process of diagnosis involves two main steps—(1) the collection of facts, symptoms, and signs, and (2) their collation, interpretation, and meaning—and the teacher who does not separate these aspects can never teach well or practise at the highest mental level of efficiency.

The first of these steps is the easier, and the student is well taught in the collection of data, but in his first clinical year he is pitched too unguided into a new and bewildering world. He has, or should have, a sound glass-case background of the normal functioning and pathological processes of the body, but cannot relate these to the multitude of signs and symptoms and diseases of the patients he meets. It is at this stage, before his memory becomes overpacked with the names and nature of diseases and syndromes, that his mind is most malleable, most ready to feel the need for, and to accept, a co-ordinating system of thought to apply to and put in order the mass of new material. But I believe it is rare that his teachers, however well they instil the techniques of observation and examination, impart a clarifying and unifying system of critical thought, because they have no wide system of their own or are not conscious of it.

The second step—the collation and interpretation of these facts, the making of a diagnosis—is much more difficult and the process hard to analyse and describe, but let me attempt to probe into the mental processes of an expert clinician. By the time a careful history is taken he has already and inevitably formed a primary concept—a first idea of the case—a provisional diagnosis. He must then, by more questions or examinations, search for further evidence which his experience of disease shows is needed to support or refute his first idea. Backwards and forwards he goes from induction to deduction, from general laws, patterns, syndromes of disease he knows, down to the particular problem of the moment and the facts he has found. At any moment his clinical instinct (I prefer to call it intuitive experience) may make a "snap" diagnosis to his own satisfaction and the admiration of students. Such diagnoses are often right, but frequently they are wrong, and if not subjected to further critical analysis have the worst possible effect. The student with limited knowledge cannot see or appreciate such a mental process, which is the exact opposite of the reasoned approach he should be taught.

It seems to me that the detection of disease processes is one of the most difficult of mental exercises; the constant questions of where, what, and why have to be solved positively or negatively, and acted on immediately, as action in treating the patient cannot wait. The detective problems of criminology are relatively simple. Here, in contrast, the question "where and what?" is usually answered by the presence of a corpse and only "why and who?" remains, although I admit the latter question does not bother us in medicine. Fortunately these mental exercises, though hard, are fascinating and natural to the human brain, one of whose innate characteristic needs is to search for an explanation, a logical sequence or pattern of events in

everything. The natural and eternal "why" in human cerebration is seen at all ages, from the simple puzzles of the juvenile to the more complicated problems of the philosopher and doctor—a theory which I have elaborated in a little book (Lawrence, 1947). So if we are mentally alive at all, diagnosis is fun.

Need for a Systematized Method

Now let me stress from another aspect the necessity for acquiring a systematized method of thought in practising and teaching, a defence against the overwhelming difficulties of detailed knowledge, ever expanding. And these details are necessary—detailed knowledge and techniques—for the best treatment of our patients. How is the detailed specialist, in his necessary learning of "more and more about less and less," to retain sufficient knowledge of the "more" and wider aspects to avoid the calamities often arising from narrow specialisms? And how is the hurried practitioner, overwhelmed by superhuman details of all kinds, to be able to retain a balanced sanity by which he can bring to bear on the problem of the moment what wide knowledge he has learned? No doubt the medical curriculum must be changed and be pruned of its impossible burden on pure memory, but it is equally important that the student should acquire a definite basic mental process of thought as a stand-by for ever. This is difficult to evolve on paper, to elucidate in words, to inculcate to many illogical and unreceptive minds, but we must, in order to avoid incompetence, try to retain interest and to continue to progress.

There has been a tendency in certain quarters to suggest a partial division in medical education into two aspects: the first, theoretical or intellectually educative, to be mainly the concern of academic whole-time intellectual highbrows and research workers; the second, the vocational or technical, the concern mainly of part-time clinical practitioners of clinical medicine. Nothing, I think, could be more unreal or disastrous. Both aspects must be welded into a sound fundamental training from which all later activities must constantly stem.

Medicine: Art or Science?

So far I have not touched on the vexed question of the art and/or science of medicine, because to me medicine ought to be a science, and the former word mainly implies a humane and kindly consideration of our patients, an appreciation of their fears, their family ties, their social difficulties. Without the appropriate pat on the shoulder and the well-considered and blessed "white lie" no one can be fully either a good or a successful doctor. Can we teach the art of medicine? Probably only by kindly example. I find it useful, in emphasizing the human side, to ask the student, "If this were your father or mother, your brother or sister, how would you handle the situation and what would you do?" But I think the students, and we teachers in hospitals, too, are apt to neglect the social life and conditions of our patients and could be helped by the house-to-house and day-to-day experience and guidance of a wise and humane practitioner in our midst.

A Diagnostic System

And now may I give you, as an example, the defensive mental mechanism I have produced for my own use to safeguard myself against narrow specialism and to marshal the knowledge I may have vicariously absorbed, but which all too frequently lies latent and intangible—as I have a poor memory? Perhaps it is more an aid to memory than a scheme of thought. It is an attempt to recall always the where, what, and why of medicine in a simpler way than the "systems of nomenclature." I have put the aetiological "why" first, as it repeats itself constantly in relation to the "where and what."

Causal Agents (Why?)

I. *Physical and Mechanical.*—External: Trauma, heat, cold, radiations, habitat and environment, etc. Internal: Developmental, stones, obstructions, etc.
II. *Chemical.*—Poisons and drugs, inorganic and organic.
III. *Living Agents* (Biology).—Viruses: exanthemata, etc. Organisms: cocci, bacteria, etc. Multicellular: parasites, etc. ? New growths: benign and malignant.
IV. *Resulting Degenerations and Regenerations.*—Fibrosis, etc.

System Diseases and Syndromes (Where and What?)

Cardiovascular and blood and lymph. Respiratory. Alimentary. Urogenital.
Locomotion.—Bones and muscles. Skin and special senses: position obvious.
Nutrition.—Metabolism, chemical and vitamin disorders. Endocrines.
Nervous system.—Autonomic; central nervous system; psychosomatic ("functional").

There is nothing particularly original in this scheme except perhaps the arrangement of aetiological factors in the order of the subjects which we learn in the medical course. No doubt others will evolve different and better schemes to suit their own experience, needs, and individuality. No doubt, too, every specialist must evolve a more detailed sub-branch to cope with his own subject. But I have found the above of great value as an aid to memory to marshal and call to mind facts I really know but might not recall at the moment of need. If all students could acquire and be habituated to use some such scheme they would be equipped with something far more useful than the widest mass of detail that the best memory can hold.

Some Suggestions

You may think I have not said anything directly practical about the training of clinical teachers and that I have so far done little except air a few general principles for further discussion. Some others have written on and discussed the matters I have reiterated, and an address of Professor Capon's (1945) has covered the whole field. There is wide agreement that clinical medicine is supremely hard to teach, that the teachers are not trained, and that consequently their efficiency and their students suffer. I suggest that the following steps should be taken.

A special course on medical teaching must be established by concerted effort. This would be for the registrar grade; also for some junior and perhaps some senior consultants—perhaps even for some students. The teachers present a more difficult problem, but no doubt there would be some interested and capable people available from the medical profession; and it should be easy to find teachers of elocution, lecturers on logic, psychology, perhaps philosophy, and certainly the principles of education (if there are any!). In the first place the course would be short—perhaps a half-day for four weeks would suffice. It would be experimental—extremely so. If, in the first place, it only managed to improve the teachers' elocution and delivery it would have done enough to justify its existence. If it managed to inculcate general principles and an awareness of mental processes it would be doubly justified. In the long run I would hope that these teachers, getting together to form some group, might evolve a philosophy of medical teaching and thought, produce a stimulating book on the subject,

tackle the problem of the medical curriculum, and promote the essential rewriting of textbooks. The whole medical world would be stimulated and benefited. I think that, with the new medical system in Britain based as it is on the soundness of the past, it is possible for this country more than any other to start such an experiment and make it a success.

Conclusion

And who is concerned in originating this worth-while move we are discussing? Obviously the Royal Colleges, the Postgraduate Federation, and the universities. I know, too, that many important bodies such as the Rockefeller and Nuffield Foundations and Unesco are interested. But surely out of all these our own College seems pre-eminently suited, as it should be, to serve so uniquely useful a purpose in modern medicine. But what a pity it is that the conception of an Academy of British Medicine died stillborn.

I will finish by quoting some stimulating words from Walshe's (1948) Harveian Oration: "This College can, and, if it is to survive as something significant in the intellectual life of medicine, must remain a fountainhead of academic medicine, or true learning: the home wherein a philosophy of medicine finds a permanent abiding-place and disciples eager to learn and teach it." I hope this meeting will show we are imbued with this spirit, this faith, and this endeavour.

REFERENCES

Capon, N. B. (1945). *Proc. R. Soc. Med.*, 39, 65.
Lawrence, R. D. (1947). *'Happiness and our Instincts.'* Temple, London.
Walshe, F. M. R. (1948). *The Structure of Medicine and its Place Among the Sciences* (Harveian Oration). Livingstone, Edinburgh.

CLINICAL EVALUATION OF EFFECTS OF DRUGS ON MEDICAL STUDENTS AS A TEACHING METHOD

BY

ANDREW WILSON, M.D., Ph.D., F.R.F.P.S.
G. S. CROCKETT, M.A., M.B.
A. N. EXTON-SMITH, M.A., M.B., M.R.C.P.
AND
HANNAH STEINBERG, B.A.

(From the Department of Pharmacology, University College London)

In the past the medical student often first became acquainted with drugs when faced with the laborious task of trying to write and compound prescriptions to the satisfaction of his teachers. He had little first-hand knowledge of the action of drugs, and the clinical evidence of their effects on patients was often confusing and difficult to interpret. The drugs in use to-day are potent and valuable remedies. It is therefore the responsibility of those who train medical students to ensure, as a prerequisite to safe and effective therapy, a sound knowledge of the principles of pharmacological action.

Numerous experimental methods have been devised to demonstrate the action of drugs on isolated tissues and in the intact animal. Such methods provide the fundamental approach, but the criticism has been made that the student often fails to appreciate the connexion between these effects of drugs and their clinical application. The experimental study of the action of drugs on normal man is a logical step in the process of understanding the effects of drugs in disease. For this reason part of the practical course in pharmacology given to preclinical medical students at University College, London, consists in observing the effects of various drugs administered to members of the class. The experimental methods used and the results obtained in a class of approximately 70 students are described below.

The class was held once a week and lasted approximately five hours. The students worked in pairs, each acting in turn as subject and observer; during the experiment they were housed in cubicles, each cubicle accommodating two pairs of students and one member of staff acting as supervisor. The subjects were all normal healthy male or female medical students. In each experiment the selection of drugs to be studied was at random, and each student drew from a hat a numbered card representing a dose of a particular drug or inert substance the identity of which was not revealed until the experiment was concluded and the observations fully recorded.

Three types of experiment were carried out, in each of which the drugs were administered by a different route, in order to assess the following: (1) the analgesic activity of certain drugs when given subcutaneously; (2) the effects on voluntary sensory-motor co-ordination during inhalation of mixtures of nitrous oxide and oxygen; and (3) the effects of drugs, which were taken by mouth, on the performance of three tasks involving rate of voluntary movement, sensory-motor co-ordination, and sustained attention and muscular control respectively.

1. Assessment of Analgesic Activity

Method

Thirty-five subjects were used for estimating the analgesic potency of the following drugs: morphine, 10 and 15 mg., amidone ("physeptone"), 10 and 15 mg., pethidine, 100 and 150 mg., and physiological saline, 2 ml. Thus each dose of each substance was tested on five students.

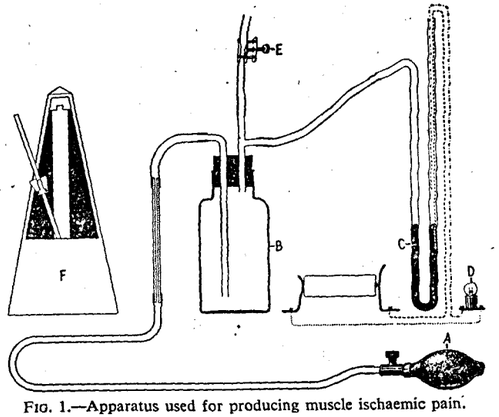


FIG. 1.—Apparatus used for producing muscle ischaemic pain.

The apparatus used to test the effect of these drugs was one that produced the pain of muscle ischaemia of the forearm in a manner resembling that originally described by Lewis, Pickering, and Rothschild (1931) and later modified by Harrison and Bigelow (1943).

The subject lay on a couch and a sphygmomanometer cuff was placed on each upper arm. Muscle ischaemia was produced by inflating the cuff to 160 mm. Hg, and the subject contracted the muscles of the corresponding forearm by squeezing the rubber bulb (A) shown in Fig. 1. The contraction of this bulb forced air into the bottle (B) and thus displaced the mercury in the U-tube (C). When the mercury was displaced sufficiently it completed an electric circuit and lit the lamp (D). To enable the apparatus to be adjusted for subjects with different strengths of grip the resistance to pressure could be modified by means of the variable leak (E) on the T-tube. The frequency of squeezing was determined by a metronome (F) set at 90 beats a minute.

Before each estimation the subject's arm was raised and gently stroked to empty the veins. The cuff was rapidly inflated to 160 mm. Hg and the arm lowered; simultaneously the subject began to squeeze the bulb, in time to the metronome, with enough pressure to light the lamp. The observer noted (1) the time of onset of pain, and (2) the time of onset of "exhaustion," which was determined by the failure of the subject to light the lamp in six consecutive attempts. When the exhaustion point was reached the cuff was deflated and the estimation was repeated on the other arm. The whole procedure was repeated every 15 minutes.

After three or four estimations on each arm the analgesic drug was given subcutaneously and observations were continued at 15-minute intervals for two to three hours. The observer also recorded changes in respiration, pulse rate, and the appearance of the skin; any sensations reported by the subject were also noted.

Results

The typical effects of one of the drugs on an individual subject are shown in Fig. 2. The times of onset of pain and of "exhaustion" were measured in seconds, and a curve for each has been plotted. The first three readings indicate the normal performance; after the drug was injected there was an increasing delay in the onset of pain and a decrease in the time before "exhaustion" occurred.

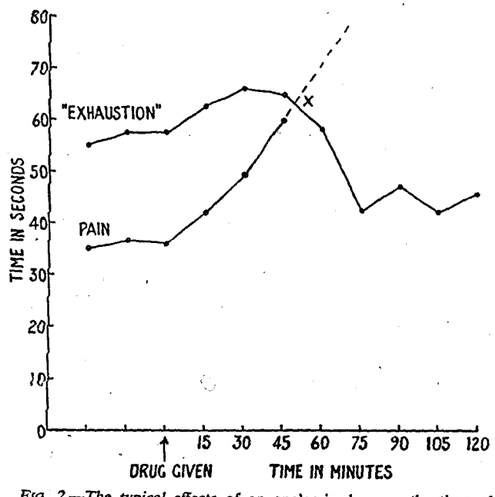


FIG. 2.—The typical effects of an analgesic drug on the time of onset of "exhaustion" and of pain. At about the time indicated by X the subject failed to compress the bulb for long enough to produce pain before the onset of "exhaustion."

This method of assessing pain is limited by the fact that the time of onset of pain cannot be measured when it is preceded by the onset of "exhaustion." For example, at the point X the subject ceased to contract his hand effectively, and useful estimations of the time of onset of pain could not be made unless and until pain occurred again before the onset of "exhaustion."

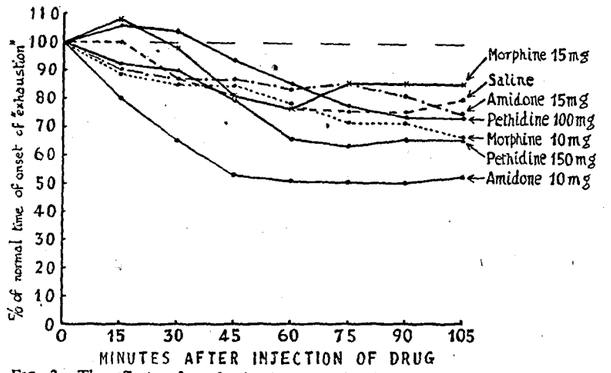


FIG. 3.—The effects of analgesic drugs on the time of onset of "exhaustion." Each curve represents the average results from five subjects.

Average curves (five subjects) of the percentage decrease in time before onset of "exhaustion" with each drug are shown in Fig. 3. In comparison with the relatively slight effect of the other drugs it is surprising to note that with amidone in the smaller dose of 10 mg. "exhaustion" occurred earliest of all.

The difference between the mean values for all "exhaustion" times for saline and amidone, 10 mg., was tested for the "significance of trend differences" (Lindquist, 1947). The F-ratio thus obtained was 2.37 (d.f. $n_1=7$, $n_2=56$, $0.05>P>0.01$). The difference in trend between the two curves is therefore significant. It is evident from inspection of the graph that significant differences are not to be expected in the case of the other drugs. We find it difficult to advance an explanation for this singular effect of 10 mg. of amidone, which was also observed in a previous class. This anomaly might be further investigated.

It was not possible, for the reasons already described, to construct complete average curves of the effect of the analgesic drugs on the time of onset of pain. However, if the drug had no analgesic effect, pain would have been expected to occur well before the onset of exhaustion, as in the case of saline. Since with all drugs except amidone, 10 mg., the onset

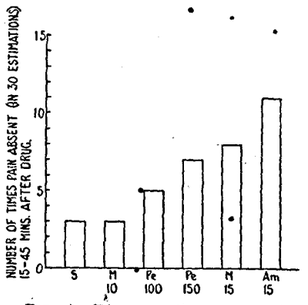


FIG. 4.—Diagrammatic representation of the comparative potencies of the analgesic drugs, assessed by the number of times pain was absent when the subjects were tested during the period 15 to 45 minutes after injection of the drug. S = saline, M = morphine, Pe = pethidine, Am = amidone. The number beneath each drug indicates the dose in mg.

of exhaustion did not differ significantly from that following the injection of saline, it is possible to assess the analgesic effect of the drug in terms of the number of times when pain failed to occur by the time "exhaustion" had set in. A block diagram (Fig. 4) has been constructed on this principle for each dose of each drug, from the results of estimations carried out at 15, 30, and 45 minutes after the injection of the drug. The height of each block may be regarded as an indication of the relative analgesic potency of the different drugs. Our experiments fail to distinguish between the effects of saline and those of 10 mg. of morphine, and the greatest analgesic activity was observed with 15 mg. of morphine and 15 mg. of amidone. Moreover, reference to Fig. 3 suggests that these two drugs in doses of 15 mg. produce the least effect on "exhaustion." In the choice of drug to be used clinically analgesic potency combined with minimum effect on "exhaustion" is obviously a factor to be taken into consideration.

Incidence of Subjective Effects

The numbers of subjects who reported side-effects are shown in Table I. Drowsiness and "muzziness" occurred in nearly three-quarters, and nausea and vomiting in more than half of the group. In one-fifth of the subjects the respiratory rate fell below 15 a minute.

TABLE I.—*Incidence of Subjective Effects in 30 Subjects Given Analgesic Drugs*

Subjective Effects	No. Showing Effects
Drowsiness and muzziness	23 (77%)
Dizziness	22 (73%)
Nausea (without vomiting, 8; with vomiting, 10)	18 (60%)
Sweating, pallor, and flushing	11 (37%)
Dryness of mouth	11 (37%)
Respiration below 15/min.	6 (20%)

With amidone, 15 mg., and morphine, 15 mg., nausea and vomiting, or dizziness, occurred more often than with pethidine, 100 and 150 mg., or amidone, 10 mg. These effects are particularly apt to begin when the subject assumes an upright position at the end of the experiment.

2. Effect of Gas Mixtures on Voluntary Sensory-motor Co-ordination

Method

This experiment was designed to show the effect of different mixtures of nitrous oxide and oxygen on a task involving sensory-motor co-ordination.

The gas mixtures were measured by rotameter type flowmeters (estimated accuracy within 2%) and delivered to a large reservoir bag of 3½ gallons (15.9 litres) capacity which was connected to an R.A.F. oxygen mask. This type of mask incorporates a small microphone by means of which the subject can communicate with the experimenter. All gas mixtures delivered to the mask were perfumed by inserting into the circuit a filter paper impregnated with lavender oil.

For the test of sensory-motor co-ordination we used a tubular apparatus with a hole at the top just large enough to admit small steel ball-bearings, which were inserted with a pair of forceps. (This apparatus resembles the R-V manual dexterity test developed by the National Institute of Industrial Psychology.) The subject's performance was measured by the average time taken to insert 25 ball-bearings.

Every subject first practised the task in sets, each of which consisted of four consecutive trials, until his performance did not improve further; this usually involved four to five sets. The average score of the last set was then taken as the subject's normal performance and was compared with his performance while inhaling the gas. The normal performance ranged from 41 to 56 seconds, the average being about 50 seconds.

Each subject, according to the card which he drew, was then given 40% nitrous oxide in oxygen, or 50% nitrous oxide in oxygen, or oxygen only. The subjects were told that they would be unable to distinguish between the gas mixtures and the oxygen on the basis of smell or taste.

After inhaling the gas for 1½ minutes at rest, the average performance on four trials of the ball-bearing test was again assessed during continuous inhalation of the gas mixture. Most subjects continued the experiment for six to eight minutes.

After the experiment they were asked to describe subjective effects noted during inhalation; any signs observed by the experimenter were also recorded.

Results

The mean scores on the ball-bearing test are shown in Table II. It will be seen that only a proportion of those subjects who received nitrous oxide mixtures were able to

TABLE II.—*Effect of Gas Mixtures on Ball-bearing Test*

	O_2		N_2O 40%		N_2O 50%	
	Before	During	Before	During	Before	During
No. of subjects who attempted experiment	10		10		15	
No. of subjects who completed experiment satisfactorily	10		7		5	
Mean scores (seconds)	49·0	54·9	50·3	76·0	50·8	96·2
Standard deviations of mean scores	±6·4	±7·4	±4·5	±17·7	±3·1	±16·6
Mean % decrease of speed under gas		11		52		89

complete the experiment. Several pulled off the mask; two, whose scores have not been included, completed the test only after continuous prodding and encouragement from the demonstrators; and seven lost consciousness.

The mean scores of the three groups of subjects before inhalation—that is, their normal performances—are practically identical. The mean scores during inhalation of the different gas mixtures all show an increase in the time taken, equivalent to a decrease in speed: 11% with oxygen, 52% with the 40% nitrous oxide mixture, and 89% with the 50% nitrous oxide mixture.

Analysis of variance has been applied to the differences in score of the three groups, and has shown the results to be highly significant ($F=16.2, [n_1=2, n_2=19]$; for $P=0.001$, $F=10.16$—that is, with the given degrees of freedom, one would expect an F-ratio as great or greater than 10.16 to arise less than once in a thousand times.)

The general trend of the quantitative results was very much what one would expect: the higher the dose, the less efficient the performance. The deterioration of performance under oxygen should also be noted. The difference from the normal of 11% may seem small, but it is consistent and statistically significant ($t=4.47$, [d.f.=9], $0.01>P>0.001$). Some of this might be attributable to

discomfort caused by wearing the mask, but it seems likely that psychological factors such as suggestion and expectation were also involved. This was confirmed by some of the reports given by the subjects, and by the fact that occasionally a subject showed quite marked symptoms with oxygen alone. For instance, one student, after inhaling oxygen for one minute, told the demonstrator that he was sure that it was nitrous oxide, and subsequently described his experiences in great detail as "typical nitrous oxide symptoms," such as giggling, talkativeness, difficulty in concentrating, and "twitchings."

The wide range of individual responses, especially under the higher drug concentration, is also noteworthy. One subject, for example, was no more inefficient under 50% nitrous oxide than another who received only oxygen, while, as has already been pointed out, seven others lost consciousness and could not complete the test at all.

Subjective Effects

The most commonly reported subjective effect was a general "muzziness," variously described as feeling vague, dreamy, or "being distant." One subject reported, "I've just had the most frightening dream about relativity I have ever had." Sporadic chuckling was quite frequent, though it decreased noticeably when no appreciative audience was present. Pleasant symptoms were often indicated by comments such as "Enjoyed the experience," "Was sorry to take the mask off," or "Nice giggly feeling." Several subjects described changes in time sense, asserting that time during inhalation seemed to drag and a few minutes appeared like several hours. One subject under 40% nitrous oxide persisted in dropping imaginary ball-bearings into the apparatus long after the experiment was over. These various symptoms, however, were usually of short duration.

3. Effects of Other Drugs which Stimulate or Depress the Central Nervous System

Methods

This experiment consisted of three types of tests, which were used to demonstrate the effects of drugs which stimulate or depress the central nervous system. The drugs were given by mouth and were selected as previously described, so that five students each received one of the following: amphetamine sulphate, 15 or 25 mg.; "seconal," 3 or 4½ gr. (0.2 or 0.3 g.); cyclobarbitone, 3 or 4½ gr.; tablets or capsules of lactose as control.

The tests used were: (*a*) The ball-bearing test (already described). (*b*) The tapping test, which was used to measure the speed and consistency of voluntary motor movement. The apparatus consisted of a morse key connected to an electric numeral counter, and the performances were scored as the number of taps which were recorded during a standard period of continuous tapping for three minutes. (*c*) A disk-dotting machine of the McDougall–Schuster type was used to test sustained voluntary attention and muscular control (Smith, Culpin, and Farmer, 1927). The performance was scored as the total number of dots aimed at and hit before five consecutive misses were recorded.

Two of these tests were chosen by each subject, who practised the tests until consistency in performance was attained, the last score being taken as his normal performance. The drug was then given with a draught of water; the tasks were repeated at intervals of 15 minutes for two to three hours.

Results

Average curves have been plotted showing the effect of several of the drugs on the performance of the tapping test. These are shown in Fig. 5 as the percentage increase

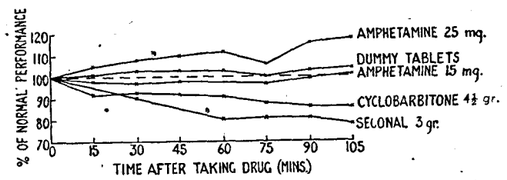


FIG. 5.—The effects on the performance of the tapping test after administration by mouth of amphetamine sulphate, cyclobarbitone, and seconal. Dummy tablets containing lactose were used as controls.

or decrease of normal performance. On the whole the dotting test provided the most sensitive index of the action of the various drugs.

We were unable to obtain sufficient records for statistical analysis of the effects of all the drugs on the three different tests. It was possible, however, to average the maximum responses for two doses of each of the sedative drugs on the tapping test, of which Fig. 6 is a diagrammatic representation. Although this gives no information about the time of onset or of maintenance of the maximum effect, it illustrates to the student one method of assessing the nature of and the quantitative differences in the effect of drugs. It is not intended to suggest that this is an ideal method for testing hypnotic drugs—the best way to do this is by observing their power to produce sleep. This they often did in the course of the experiment, but the conditions in the class were not quiet and consistent enough to make this effect a valid criterion.

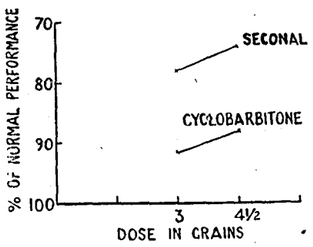


FIG. 6.—Comparative effects of seconal and of cyclobarbitone on the performance of the tapping test. The results are expressed as the maximum percentage decrease in performance for each drug given in doses of 3 and 4½ gr.

Discussion

It might be asked, "What does the medical student learn from this method of teaching pharmacology?" It is well to point out, of course, that these experiments are only part of the practical course in pharmacology and are, moreover, preceded and followed by systematic lectures on the subject, so that the student is able to appreciate the general nature of the action of drugs. We consider that the outstanding advantage of this part of the practical class is that the student experiences at first hand the effects of certain drugs and learns to assess some of the qualitative and quantitative changes produced. By comparing his own experiences with those of the other members of the class, he begins to appreciate the individual variation in response to the

same dose and drug. In addition, different methods of administering drugs are illustrated.

The importance of control observations and the influence of suggestion are illustrated by studying the effects of inert substances. This provides a valuable basis for the appreciation of the function of the "placebo" in therapeutic practice. The undesirable side-effects of drugs are also demonstrated, and the student learns that these effects must be taken into consideration in the choice of a drug for a particular purpose.

On the whole there was little disturbance of the normal routine of the student; the overall incidence of subjective effects in the class is shown in Table III. With the exception of five students, all the members of the class were

TABLE III.—*Total Incidence of Subjective Effects in 70* Subjects Performing Experiments 1 and 3*

Subjective Effects	No. Showing Effects
Nausea (without vomiting, 8; with vomiting, 13) ..	21 (30%)
Dizziness	33 (47%)
Other minor symptoms	39 (56%)
Sleep the following night:	
Sounder than usual	20 (29%)
Less sound than usual	13 (18%)
Same as usual	37 (53%)
Spent night in hospital	5 (7%)

* This number includes 11 who received dummy tablets or saline injections.

conducted safely and without incident to their home or lodgings by one or more persons not under the influence of any drug. Because of persistent vomiting or dizziness, or because the journey home involved a long period of travel, five students were accommodated overnight in hospital. For them it was an interesting experience, and they had all fully recovered by the next morning. There was little disturbance of sleep, except with those who had taken amphetamine, and this also served to illustrate the action of that drug.

Although it was clearly understood that attendance at the class was optional, all students eagerly participated and co-operated well in the arrangements necessary for the conduct of the experiments. Indeed, many of them welcomed the opportunity later of acting as subjects in further research on the action of drugs on man.

REFERENCES

Harrison, T. R., and Bigelow, N. H. (1943). *Res. Publ. Ass. nerv. ment. Dis.*, **23**, 154.

Lewis, T., Pickering, G. W., and Rothschild, P. (1931). *Heart*, **15**, 359.

Lindquist, E. F. (1947). *Psychometrika*, **12**, 65.

Smith, M., Culpin, M., and Farmer, E. (1927). "A Study of Telegraphist's Cramp," Med. Res. Coun.: Indust. Fatigue Res. Bd. Rep. No. 43.

According to *Time* magazine Dr. Willard Cole Rappleye, dean of the faculty of medicine at Columbia University, is reported to have said recently: "Medicine is becoming a social as well as a biological science. We would rather have a student with intellect . . . and a rounded capacity for life than one whose only view of humanity was gained as he passed from one laboratory to another. So-called 'premedical' education should be abolished in the colleges. . . . There is no such thing as 'premedical' education nor should students in colleges who plan to enter professional schools be regarded as premedical or predental students. [College] education is not 'pre' anything, but should be devoted to the objective of providing as broad a cultural education as the institution can provide. It should be a preparation not for medicine or dentistry or public health, but for life."

SOME MECHANICAL AIDS TO INSTRUCTION

BY

ROBERT OLLERENSHAW, B.M., D.M.R.D., F.I.B.P., F.R.P.S.

AND

PETER HANSELL, M.R.C.S., F.I.B.P., F.R.P.S.

(From the Departments of Medical Photography, Manchester Royal Infirmary and Westminster Hospital)

Over the last two decades there has been a very marked shift of emphasis in instructional method from the aural to the visual. The two are, of course, complementary and neither can readily stand alone, but perhaps one of the greatest positive experiences emerging from the war was the wide realization of the great efficiency of the eye compared with the ear as a receptor of instruction. The Army Bureau of Current Affairs (ABCA) succinctly modernized the old Chinese proverb "One picture is worth a thousand words" to "One in the eye is worth two on the ear."

The newer methods of teaching are undoubtedly of very great value. Yet they often run the risk of being "oversold" by their enthusiastic backers and of falling into disrepute for failing to do what they were never meant to do. They are "aids" to instruction, not instruction in themselves; they must never be used as a form of escape for the lazy teacher. To use these mechanical methods correctly requires more, not less, effort than the preparation of a lecture of the traditional type.

School-teachers have been quick to realize the value of the new methods, and many of the more enlightened local education authorities have set aside substantial resources to provide the material; to date most medical schools have lagged sadly, and the few that are progressing are often more impeded than helped by ill-informed enthusiasm. There is a widespread tendency to say, "Let's make a film of this, or a filmstrip of that," without consideration of the limitations or suitability of the media, or without proper understanding of the audience for which the

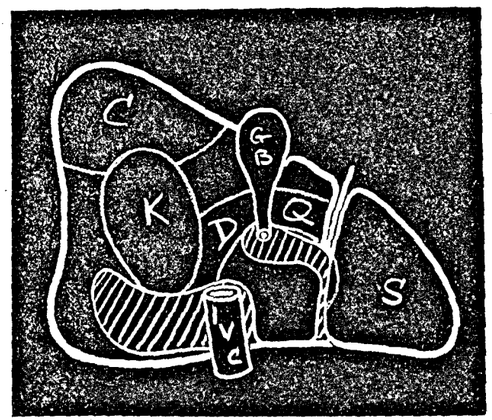


FIG. 1.—The simple type of drawing suited to the chalkboard.

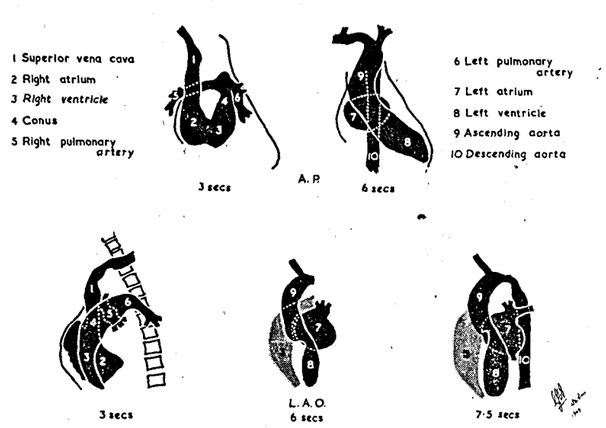


FIG. 2.—The wall chart is usually more detailed than the chalkboard drawing, but must still retain clarity.

material is to be produced. Medical-school budgets are not elastic, and their resources must be directed to the greatest good of the greatest number.

The present article is a précis only, describing mechanical aids to instruction as they now exist and designed for the teacher who is to use them; it sets out to summarize their capabilities and their limitations.

The Blackboard

Better called the *chalkboard*, for it is easier to see when the board is blue and the chalk yellow. This is the simplest and yet the most abused class-room accessory (Fig. 1). A technique must be acquired and teachers must avoid overcrowding and poor legibility. The surface requires, but rarely receives, regular maintenance, and the local illumination should be high. It is possible to project a partially completed diagram on to a well-cleaned board, finishing it in chalk during the class, with consequent saving of time. To meet the request for a board which can be used in a darkened room at the same time as a projector, experiments are being made with ultra-violet light and fluorescent chalks.

The Wall Chart

Not unlike a permanent blackboard, the wall chart can be prepared in greater detail, as this is done in advance (Fig. 2). As with the blackboard, overfilling should be avoided, and the maximum use may be made of symbols on the lines of the familiar "isotype." To leave several charts exposed during the whole of a class is merely to distract the attention of the audience, and arrangements should be made for a chart not in actual use to be covered or rolled. In the preparation of instructional charts much can be gained from a study of the best class of advertising, though it should be remembered that a wall chart is for study and a poster is for instant reaction.

Models

The use of models is rather restricted in medicine, except in association with museum display (Fig. 3). The modern plastics have opened up a new field in the presentation of anatomical material, and for the more elementary forms of instruction plastic bones and viscera are more robust than the earlier plaster casts (*B.M.J.*, 1950). Serial scale reproductions of histological sections, cut in plastic sheet and cemented together, provide striking three-dimensional reconstructions in such fields as embryology. If a model is to be used in the lecture theatre it must be big enough for all to see, and great care is needed to light it to advantage.

The Epidiascope

There are two main methods of projection of material on to a screen. The image of an opaque original may be transferred to the screen by intense reflected light in an *episcope*, or a transparent original, the more familiar lantern slide, may be lit by transmitted light and projected on to the screen in a *diascope*. The *epidiascope*, most commonly seen in lecture theatres, is a double instrument designed to fulfil either of these functions at choice (Fig. 4).

Opaque projection can never make efficient use of the available light, for reflection never approaches 100%, but in spite of this the episcope offers certain advantages. Material from books or existing photographs may be employed, and subject to a limitation on depth of about 2 cm. it is possible to project solid objects such as instruments. The field size varies slightly with the maker, but



FIG. 3.—Model in conjunction with other exhibits.

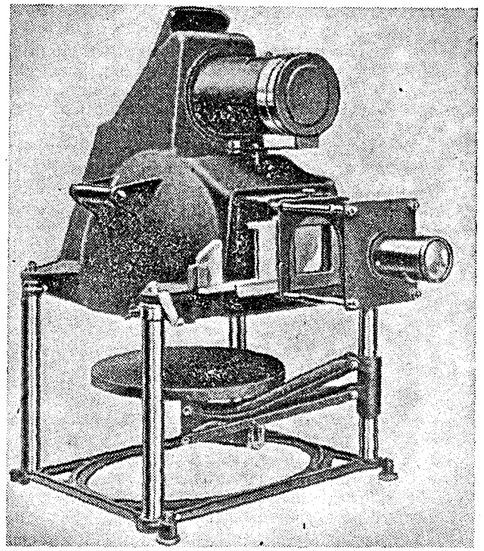


FIG. 4.—A modern epidiascope.

in general the effective area of the original may be taken as a 6-in. (15-cm.) square. This area should be *filled* if the projected image is to fill the screen, and much episcopic projection fails because of the selection of too small an original; few books, in fact, have figures of adequate size, nor is it possible to change the pages of a book without much distracting "fiddling," all of which is thrown on the screen. It is therefore desirable to have material of more than ephemeral value mounted on standard 8-in. (20-cm.) cards, or a series may be mounted on a fan-fold strip for ease in storage or filing. It will be seen that the proper use of this instrument involves rather more than merely picking a book off the shelf and marking the page. Because of the greater contrast, the episcope is most effective with line material.

Subilluminators

Certain epidiascopes have provision for lighting the platform from below. This enables the full area to be used for large transparencies—e.g., an 8½ by 6½-in. (21.5 by 16.5-cm.) radiograph or the larger sizes of colour transparency. A warning is, however, necessary regarding the density of the diagnostic radiograph, which is rarely seen to advantage by this method. A special instrument accepting 17 by 14-in. (43 by 35.5-cm.) radiographs has been described (Dillon and Murphy, 1949); but on this the smaller sizes of film will not fill the screen, and there seems little advantage, as the preparation of a reduced transparency is not unduly difficult.

An instrument of perhaps greater possibilities has been marketed recently. In this the subilluminator throws its light through a horizontal band of transparent plastic on which the lecturer writes in grease pencil. The image is thrown on the screen as he writes. The use of this on a second screen while slides are thrown on the main screen suggests another possible means of communicating with a class in a darkened projection theatre.

Lantern Slides

The *diascope*, the oldest and best known of the optical aids, needs little introduction, yet, like the blackboard, even the slide is not always used to the best advantage. As stated above, the transparency makes far better use of the available light than does any form of opaque projection, although it generally involves rather more work in its preparation. The common British size is 3¼ in. (8 cm.) square, though organizers of international meetings should not forget that the American slide is 3¼ by 4 in. (8 by 10 cm.) and the Continental sizes are 83 mm. square and 9 by 12 cm. The projector should be equipped with carriers for all these sizes. A more recent introduction is the 2-in. (5-cm.) square slide, which is discussed below (Fig. 5). The marking of the slide to ensure correct positioning in the lantern is now international (British Standard 777: 1947), consisting of a single spot in the lower left corner when the slide is held to be viewed in the hand. The older British system of two spots in the top corners is obsolete and should be discontinued.

One of the most vexed questions is the amount of information which may be included on a single slide. While not going to the extremes of a peripatetic correspondent of the *Lancet* (*Lancet*, 1947), who needed a telescope in the back row, it must be admitted that the obscure overcrowded slide is far too common. The textual slide should bear the same relation to the lecture as the headlines of the evening paper do to the news. It is rarely necessary to throw a mass of figures or a long involved statement on the screen. A few salient words will canalize the audience's attention while the lecturer supplies the verbal detail. Visibility is paramount, and it is not reasonable to assume that the back row of the audience have better vision than 6/6 Snellen. It is easy, by a simple similar triangle relation, to estimate the distance at which a slide should be viewed in the hand in order to produce the impression of its size when projected on a screen of known size.

In general, typescript should be avoided, but where some better form of lettering is not available it may be assumed that only the amount of ordinary typescript which will fit on a postcard will be legible on the screen. Furthermore, typescript for reproduction must be perfect, and be preferably done through a new carbon without a ribbon, after



FIG. 5.—The two British standards of lantern slides (showing correct spotting) and an emergency carrier for 2-in. slides in a 3¼-in. projector.

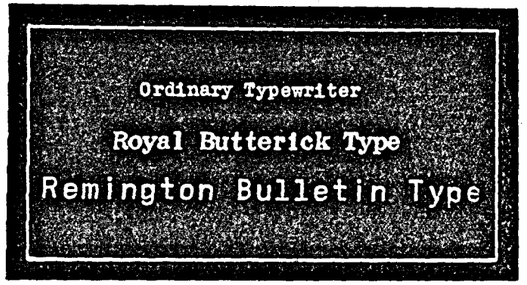


FIG. 6.—Special typewriter faces—showing the advantage of a clear image on an opaque ground.

cleaning the type. Certain bold-type machines are available and are of value (Fig. 6). It is the boldness rather than the size of the type which tells. Script is always more legible when projected as a white image on a black field than in the more usual black on white, as the glare is lessened; this has the additional advantage that selected words or lines may be washed in easily with transparent colour.

While discussing clarity it may not be inopportune to stress the need for regular cleaning and maintenance of both projectors and screens.

The 3¼-in. slide is firmly entrenched in British teaching, and it will not easily be replaced, if only because there are very large collections in existence. Furthermore, this size of slide is just big enough to be viewed directly when set up on an illuminator, and can thus be made part of a static display.

The Miniature Projector

Why, then, has the 2-in. slide made its appearance, and what are its advantages? The original demand arose from the provision of 35-mm. colour material for use in cameras of the Leica or Contax type, which produced small transparencies (24 by 36 mm.) requiring projection. These were too small when mounted up for 3¼-in. projectors, and special instruments were produced. From this idea the modern miniature projector (Fig. 7) has evolved as an extremely efficient optical instrument designed not only for the small slide but also for the handling of 35-mm. film in continuous lengths, the filmstrip, while several models can be fitted with a head for medium-power microscopical projection. The 2-in. slide may be mounted in glass in the traditional manner, or it can be satisfactorily preserved as a section of film in a cardboard mask, a method valuable in these days of air travel. It has every virtue of the large slide except the possibility of direct viewing, while it has the enormous advantage of being cheap, light, and virtually unbreakable. And it is an international standard, a point of increasing importance with the post-war resurgence of international conferences.

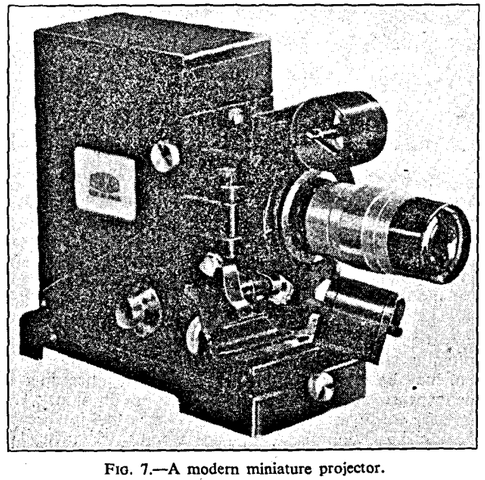


FIG. 7.—A modern miniature projector.

The miniature projector provides a meeting-point between the slide and the filmstrip, a medium generally less well understood. The 35-mm. filmstrip (Fig. 8), a series

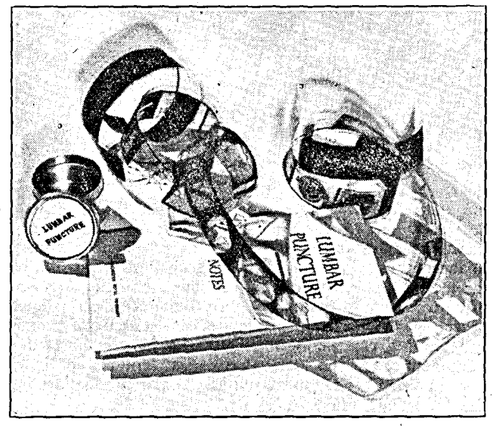


FIG. 8.—A 35-mm. medical filmstrip with its teaching notes and storage can.

of still pictures, with or without captions, is not merely a convenient substitute for a set of slides. Indeed, if that were the case the slides would be more suitable, for their sequence is easily changed. The strip is designed as a coherent whole, and the sequence must be logical and must evolve as a train of thought. The relation is far closer to the motion-picture film than to the slide. For the experimentally minded teacher it is, of course, perfectly simple to have a duplicate of the strip cut up and made into separate 2-in. slides, and if major changes are needed a strip can be reprinted. But essentially it is as complete as a book, and must be as carefully prepared and used.

There is a fairly wide range of filmstrips commercially available, but any teacher with a good illustration department behind him should be in a position to produce his own material. Furthermore, the projector is light and easy to handle, and there is much to be said for a medical school possessing a machine which the staff can borrow when they go afield to lecture to societies. This at least brings independence of the local projectionist, and ensures that the

machine will fit the film. It must not be forgotten, however, that there are still places where the electrical supply is not 230 volts 50 cycles A.C.

The Motion Picture

This is probably the most attractive and certainly the most dangerous of the mechanical aids to instruction (Fig. 9) : in most schools the film has not yet outgrown

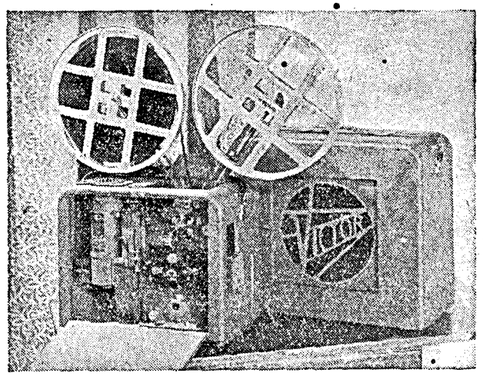


FIG. 9.—A 16-mm. sound film projector with its loudspeaker unit.

the status of an "extra"—a distraction thrown in, but not really part of the instructional sequence. In spite of this there exist many excellent films, due almost entirely to the enthusiasm of individuals ; such films are made by the teacher for his own ends, and because of this they are often parochial in outlook and are therefore rarely shown except by the maker. In view of the amount of money and work expended in making it the film is thus often uneconomical. The real value of the film will begin to be seen when the schools co-ordinate their production and the "prestige" film is no more.

The great need, which can be met with comparative ease within the schools, is for the short factual film which can be used with as little self-consciousness as a lantern-slide or a blackboard. Many simple techniques can be initially taught by film when they involve movement. Where there are, on the other hand, a series of static stages, the filmstrip is the better medium. A repetitive movement, or any cyclical event, is suited to the *film-loop*—a few feet of film joined end to end and allowed to run continuously, repeating the movement as often as required (for example, a kine-radiograph of a joint movement).

The instructional film is almost invariably made on 16-mm. stock, and may be either silent or sound (Fig. 10). Silent film, perforated along both edges, runs at 16 frames a second. Sound film is perforated on one edge only and runs at 24 frames a second. All sound projectors may be set to run at 16 f.p.s., and will project silent film satisfactorily. Silent projectors, having teeth on both sides of the driving sprockets, cannot be used to project sound film, and, moreover, would ruin the film. It is therefore essential to examine a film with great care before projecting it, to determine its type and to ensure that it is correctly wound, in order to avoid this disaster.

Many teachers, using films which they know in great detail, have been accustomed to speak a commentary while the film is run silent. This of course limits use of the film to occasions when the maker is present, and a new development has made it possible to get over this difficulty.

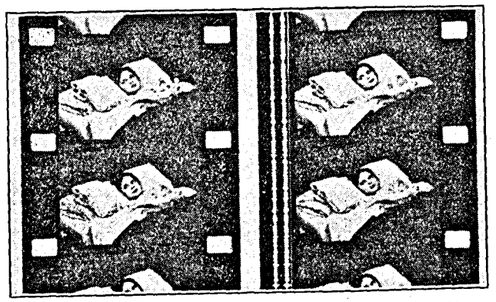


FIG. 10.—16-mm. silent film (double perforated) and sound film (single perforated), showing the sound-track.

Tape and Wire Recorders

In these machines sound is recorded magnetically on a moving tape or wire which can be played back any number of times. Sections can be erased and re-recorded at will.

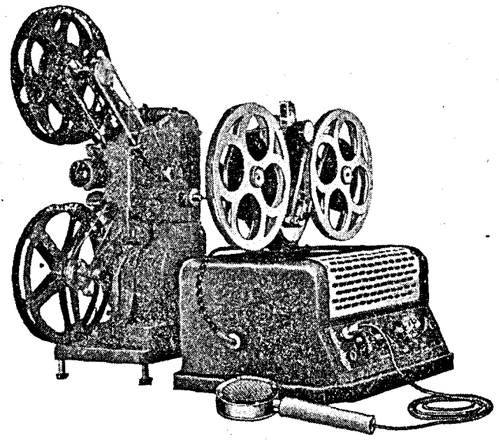


FIG. 11.—A tape recording outfit coupled to a 16-mm. projector.

A modern machine of this type is designed to be coupled to a film projector (Fig. 11) and thus, by simple synchronization marks at the beginning of the tape and the film, it is possible to fit a commentary to a film without the elaborate procedure of recording and placing the sound-track actually on the film. This machine has other uses which may be of value in the medical school. It can record discussions ; a lecturer may practise, and may hear himself (often a chastening experience) ; and commentaries for film may be rehearsed and polished before proceeding to the expense of a final recording session on film. The organizers of international conferences may find in the tape recorder a solution to the language problem when showing films.

Screens

Various types of projector have been mentioned ; it is necessary also briefly to discuss the screen. In most lecture theatres this is a neglected piece of apparatus, dirty and sagging. Yet as much care should be given to its selection as to the projector. The screen surface may be *silvered* (approximating to a mirror and therefore suited only to a long narrow room) ; *glass-beaded* (efficient, but costly and difficult to keep clean) ; or, best of all, a pure *matt white*, sprayed rather than brushed with zinc or titanium white, which does not darken in an industrial atmosphere. The size is a matter of some importance, and must be related to the projection equipment and to the room (Fig. 12).

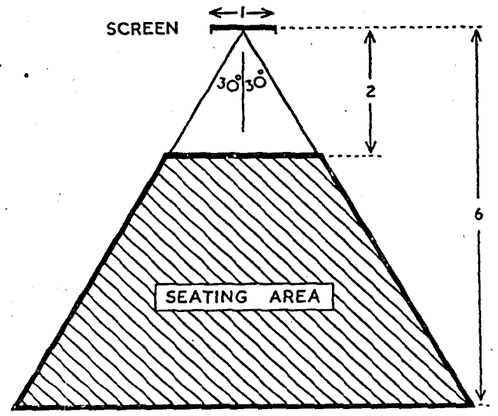


FIG. 12.—The recommended proportions of a projection theatre using a matt white screen.

The picture should not be wider than half the distance from the front row of seats, nor less than one-sixth of the distance from the back row. The frame should be of dead black material, to absorb any "overspill" of the projected picture. In many of the older theatres it will be found that certain side seats are quite unsuitable, as they put the observer at a very oblique angle to the screen. When possible, these seats should be removed. With a matt screen the permissible angle is 30 degrees either side of the projector axis.

Screen brightness is an involved subject, and it is not proposed to discuss absolute levels in foot-lamberts, but a practical test should aim at permitting a level of house-lighting which will allow the student to make essential notes without noticeable degradation of the screen image (*B.M.J. Supplement*, 1950). Where a higher light level is required, the possibility of *rear-projection* on to a well-hooded translucent screen should be considered. Many local education authorities have provided this equipment so that the teacher may have greater control over the class than is possible in a darkened room.

Television

The latest newcomer to the field of instruction is the television camera (*B.M.J.*, 1949 ; *Lancet*, 1950) (Fig. 13), now transmitting colour over closed circuits. It would seem that this is likely to be of value to the postgraduate audience in surgery, but that its applications to medicine beyond this will be rather limited, and its very novelty may make it dangerous—in the same way as the motion picture.

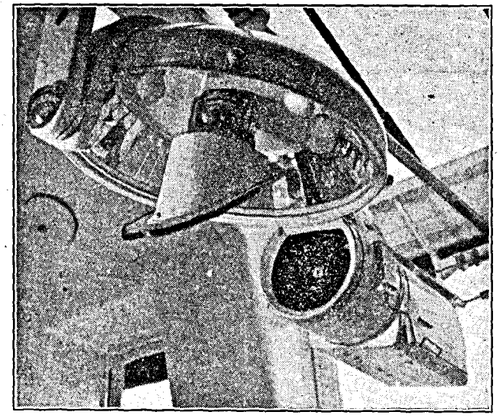


FIG. 13.—Television equipment in an operating theatre at Guy's Hospital.

Certainly television from the operating theatre permits of no cutting or editing, and it may well prove to be merely boring—as so many operations already are to the onlooker.

We acknowledge with gratitude the provision of illustrations by Miss S. Treadgold, Dr. K. D. Keele, Neville Brown and Co., Ltd., Electric and Musical Industries, Ltd., the Pullin Optical Co., Ltd., Scophony-Baird, Ltd., and the Victor Animatograph Corporation, Ltd. Our thanks are also due in no small measure to the staffs of our departments.

REFERENCES

Beale, C. (1949). *Look and See*. Edinburgh House Press, London.
British Medical Journal (1949). **1**, 909.
—— (1950). **1**, 482.
British Medical Journal Supplement (1950). **1**, 182.
Dillon, R. A., and Murphy, W. P., jun. (1949). *Amer. J. Roentgenol.*, **61**, 847.
H.M.S.O. (1938). *Optical Aids* (*Educational Pamphlet* No. 115). London.
Lancet (1947). **2**, 486.
—— (1950). **1**, 475.

A G.P. ON HIS CLINICAL TRAINING

BY

DONALD McI. JOHNSON, M.B., B.Ch.

My opening gambit in this article must be to shift the responsibility for what I have to say to higher authority in the shape of my friend, the Editor. First, in that he asked me to write this account of "what I found both good and bad" in my own hospital education as a preparation for general practice. Secondly, in that, despite my evasive assurances that anything I could possibly say seemed to be covered by those numerous excellent reports that are the feature of these enlightened times, he has insisted on my delving back into those dark ages of 25 years ago when, no doubt in expiation of the sins of some former incarnation, I was for the space of two years and six months a hospital student at one of our older teaching hospitals.

Though I have a natural reluctance to make sweeping remarks, particularly when they are damnatory, in a scientific journal, I have no alternative as regards the hospital part of my education 25 years ago, for I believe it was wholly bad. It had certain minor features that might be described as good, but they did not redeem the whole.

Surgical Training

Let me recall myself, therefore, in January, 1924, as the somewhat unwilling, but not entirely uninterested, student of medicine who, after completing the primary subjects at Cambridge, took up his first hospital student appointment as junior dresser in the Bart's surgery. "Somewhat unwilling," since I had, like many another, had my medical career chosen for me rather than choosing it myself, owing to my being a doctor's son. All the same, I had become interested enough in the primary subjects to obtain the entrance scholarship to Bart's in the previous October.

I was an unusual type perhaps, but not so unusual as all that. The Bart's surgery of that day, on the other hand, did not overcome unwillingness or stimulate interest. The sudden and unprepared jump from the cosy realms of theoretical learning to the harsh realities of human pain and suffering was a mental shock the effect of which persisted for some time to come: certainly it coloured my outlook throughout my hospital years. Every morning for three months I had the experience of seeing and inflicting pain in the Bart's surgery, entirely unaccompanied by any form of teaching. All I learnt during that time was a painful and unsatisfactory method of treating carbuncles, septic fingers, and so on (a method which I quickly taught myself to discard as useless once I was able to acquire experience for myself)—for it was to this offal of surgery that our experience was confined, except on those rare occasions when it was our firm's duty turn and our own personal turn on a roster of some six or eight dressers to see the fresh cases that arrived in the casualty department.

The "teaching" part of our day started when, at 1.30 p.m., we gathered in the Square to embark on the ward rounds as the least important part of the hierarchy which constituted the "firm." Here horror became replaced by boredom as one shambled round on the outer fringe of the cortège accompanying the chief, gathering up such crumbs of wisdom as one's general ignorance of what was going on allowed one to appreciate—one's appetite for this being sadly impaired by the ache in the leg that ensued during these many weary hours.

However, there was but three months to wait before I was promoted as senior dresser to the inner circle of this gathering. The principal advantage of this, so far as I was concerned, was that I could edge nearer the bottom of the patient's bed, where I could surreptitiously find support for each leg in turn on the horizontal rail which is the fortunate feature of most hospital beds. But, alas, there was no convenient bed rail in the operating theatre, which claimed my presence for so many hours a week during this appointment, where I stood, shifting from one foot to another, either doing nothing or perhaps, if particularly honoured, being allowed to hold one end of a tourniquet, and only occasionally, very occasionally, being allowed to look at what was going on, and still less often having this explained to me.

Thus passed six months of hospital education which seemed to lack any guiding principle behind it other than that common to most educational establishments of that day—namely, giving the neophyte a bad time to start with. As a summing up, I can lay claim to having learnt very little—a certain amount of operating-theatre drill, a certain amount of system in physical examination and taking case notes, and a small amount of surgery, though probably not as much as could have been learnt in a few afternoons' intelligent demonstration. There was no attempt at systematic teaching whereby the new opportunities of practical experience could be correlated with what had been learnt in the primary subjects. I believe that at Bart's we had one lecture on surgery a week, at 5 o'clock in the evening, but this was of a general nature and unrelated to what we had been doing during the day, so that, as attendance was optional, one did not often attend after spending a day in the surgery or the wards. Meanwhile the hard-learnt knowledge of primary subjects slipped away.

Who among those educated at one of the older teaching hospitals can doubt that the monastic tradition has descended in strong measure through the hundreds of years from their early foundation? Who but is conscious of the feeling that, once within these portals, one must acknowledge that the entire universe has contracted itself to the area within these walls, and that one is expected to make the mental surrender to this cosmos before partaking of such gifts as this foundation may confer? To the majority this mental surrender perhaps comes easily; it is made temporarily in most cases, permanently in some. In others, however, the reaction is the opposite, and I was one of the others. I became the victim of a wild, tearing claustrophobia.

Once through the ties of my surgical dressership and with my finals still in the distance my main object in life was to pass as little time as possible in hospital and, during the remainder of the considerable amount of time available, to gather the widest range of alternative interests. Literature, art, drama, sociology, all the things that in a liberally run educational establishment, however specialized its purpose, could have been used to build up and promote an interest in the main subject being taught, became in my own case escapist diversions that served to take me as far as possible from the narrow confines of the world in which I found myself.

Medical and Pathological Posts

My medical clerkship (spent amongst obscure diseases which, for the most part, I was not to see again) occupied the next three months. Here, at least, I picked up a certain amount of knowledge of chest signs and methods of examination. To a large extent I was free to pick and choose what I should do and to arrange my further activities as I saw fit. Reasonably confident that I could pass my final examinations by the acquisition of book knowledge, I was therefore concerned only with what I felt would be of use to me in the future—general practice being my acknowledged destination during my whole time at hospital. As I looked with a discriminating eye at the curriculum that lay before me, it seemed that most of the appointments suggested for me were just as little related to what I would be doing later as to what I had done before I came to hospital. With scarcely a sigh, and using all the artifice known to the medical student, I ruthlessly eliminated one after the other from my own programme. I soon concluded that special departments consisted merely of desultory standing on the fringe of a crowd in an overcrowded out-patient department—I eliminated special departments.

Pathological clerking promised but a further three months' tedium in counting blood cells, and, since my heretical mind told me that this was an occupation in which I was never likely to indulge, I took (in this case) the legitimate alternative of a pathological course at another hospital at which I not only saved some six weeks of my time but had the advantage of learning some pathology.

It might be argued that, in adopting these tactics, I missed something that might have been invaluable to me, but I did not miss very much—certainly nothing that would have filled in the gaps of my education as a doctor. I passed my final examinations, as I had expected, by the acquisition of book knowledge, combined with an element of practical experience culled from demonstrations in surgical out-patients—the one part of my training in which every minute seemed to be of some value and in which at least one could sit around on chairs in reasonable comfort and absorb useful knowledge. Here I actually learnt something about tumours and the necessity for their early diagnosis.

A Qualified Doctor

Eventually, of course, I became a general practitioner—a reasonably competent general practitioner, so I flatter myself. However, "reasonably competent" was scarcely the description that would have applied to me when, a qualified doctor, I returned home and was sent out by my father, who was still in practice, on an evening emergency call to see an elderly workman who had that afternoon started to lose the use of his right arm and right leg. I seem to remember recognizing hemiplegia, but so wrong was my prognosis that I remember even more clearly my surprise when the family attended the surgery next morning for a death certificate after having called on a near-by doctor later the same night. This was, of course, the first case of its kind that I had seen.

It is a sobering thought that I would have shown the same lack of knowledge if faced by a rash or, in fact, any skin trouble, whether of an infectious or non-infectious character. Words such as papules, macules, and erythema merely swam round in my head in meaningless fashion as the result of a short course in fevers. My lack of knowledge would have been the same had I been asked to write any prescription, other than that of plain mist. gent. cum rheo or perhaps mist. bismuth., in its composite form—I had no idea what the ingredients were. It would have been the same if faced with a sick baby, or if I had had to give even a hypodermic injection, or if I had been asked to give detailed instructions of any of the more elementary nursing treatments.

All this I eventually acquired: that is, with the exception of the last-named, which had to be replaced throughout my days in practice by a particularly haughty look of omniscience when ordering douches or other nursing treatments. But I did not gain my knowledge through teaching hospital or in any way remotely connected with it. My general diagnostic knowledge was won through trial and error when I had the good fortune to obtain a six-months appointment as casualty officer at the Metropolitan Hospital, Kingsland Road. My knowledge of the medical treatment of minor complaints, which was, after all, the means by which I was to make my living, I learnt from the "old-timer"—a graduate of Dalhousie University, Halifax, Nova Scotia, in the late nineteenth century—from whom I bought my practice. The treatment of skins and skin troubles I absorbed from my dispenser, a former warrant officer in the R.A.M.C., with many years' overseas service to his credit. Thus, in this highly fortuitous way, did I pick up my complement of knowledge that equipped me as a doctor.

What did I learn from my three years at hospital? The answer is: almost nothing, except for being impressed with the importance of systematic note-taking and of the early diagnosis of malignant disease; some chest signs and, again, the necessity for systematic examination. These, after all, are something, but they are scarcely enough to produce as a result of three years' training. To say that I also learnt to pass my exams will not do, for I could have passed these by virtue of book knowledge, regardless of anything I learnt in hospital.

Some Suggestions

Society, shocked at the incompetence and inexperience of its newly qualified doctors, has determined in the new Medical Act that they shall have a further year in hospital as "interns" before being unleashed on to the public. Proposals are put forward for increasing the period of tutelage even longer than this. However, it would seem that, before these are seriously considered, equal consideration might well be given to the possibility of taking some of the "slack" out of the existing curriculum, or to the improvement of the teaching methods adopted therein.

Frequently, since my student days, I have asked myself in the innocence of my own heart why some of those dreary hours spent in the operating theatre gazing at the back of the white gown in front of me, in the wards sidling up to beds with a view to gaining a foothold on the bed rail, or in making blood counts (this refers to others, if not to me) could not have been used in the inculcation of knowledge that would be of use in medical practice.

Also would it not have been possible, perhaps by a more gradual transition, to have made the new atmosphere of hospital more acceptable to the student coming in from the academic atmosphere of Cambridge or Oxford? Surely it would have been better to engage his interest first rather than to "throw him in at the deep end" and make him fend for himself? Instead of this, however, I was left to grope in haphazard and unguided fashion through an existence of boredom, and even worse, because of the lack of any systematic attempt to organize my studies so that they related to what I had done before or to what I knew I was going to do afterwards.

In my criticism of the teaching process it has not been my intention in any way to disparage the distinguished gentlemen in whose steps I followed: they were the victims of the system as much as I was. But inevitably the student had to take his place in their world, and in the world of hospital routine, as one of several competing interests. The first interest of a physician or a surgeon is naturally to be an expert physician or surgeon, it cannot be otherwise: the first interest of a hospital must be the cure of the sick. Into this *métier* the student must be fitted. However, even when the surgeon or physician is transformed into the teaching unit we still find competing interests that take precedence over the work of education. As in all scientific establishments, there is the pressing claim of research—a claim that is bound to take prior place so long as the teaching staff not only have to combine research with teaching but in addition have to depend on research results rather than on teaching prowess for their prospects of advancement. We inevitably find this position reflected in the nature of the cases that fill the beds in the hospital wards where the student must, or at least should, gain his experience that is to stand him in good stead in his future struggles with the commonplace of general practice. This in turn can but be a reflection of the position which the student occupies in the minds of those who instruct him. He is apt undoubtedly to come a rather poor third to the claims of practice and research, and real improvement cannot be expected until he is "upgraded" in the attentions of at least some of his instructors. It is not to be denied that many of the distinguished gentlemen who make up senior hospital staffs have developed in empirical fashion their own reasonably effective manner of imparting

knowledge; but who has so far had the temerity to suggest that, before they are qualified for their appointment, they should undertake a course at a teachers' training college to learn the elements of modern teaching methods? Who can deny that medical education would be much improved thereby?

SOME COMMENTS ON MEDICAL EDUCATION IN GREAT BRITAIN

BY

A LONDON MEDICAL STUDENT

This article was written when the author was a final year medical student. He found on inquiry that the curriculum varied so greatly in the medical schools of this country that it was impracticable to write an article which would represent student opinion as a whole. But, though he is to some extent expressing a personal point of view, the first draft of the article was read and discussed at a meeting attended by representatives of students from a number of medical schools in London, Scotland, and the provinces, and they expressed general approval of the theme.

The state of flux in British medicine at the present day is inevitably reflected in the unsatisfactory state of British medical education. The curriculum has been under discussion since organized medical teaching began, and during the past 30 years this debate has become increasingly heated. In the meantime, however, the training of the medical student continues to follow much the same lines as it has done since the beginning of the century. As each new report appears, some minor adjustments, amounting to no more than running repairs, are made. The system is patched up here and there, but remains essentially unaltered. Looking back, with the memory of the six-year course still fresh in one's mind, the feeling that medical education in this country is adrift becomes inescapable. Much of the time was wasted, much energy was misapplied, and the ultimate goal of qualification seems to have been achieved more by good luck than by effective training.

What are We Training For?

The test of any system of training or education is empirical—Do the means serve the ends? Does the system turn out good doctors?

Much heat has been generated in a fruitless argument about the kind of doctor which our training should produce. This is not the place in which to discuss the merits or demerits of general practice as it obtains in this country. It is enough that the general practitioners support the whole edifice of British medicine, that they far outnumber doctors in any other field, and that the medicine which they practise is the basis of all other medicine. Of the 2,000 doctors who qualify each year in the United Kingdom, about one-half become general practitioners. It is imperative that the remainder, whether destined to become consultants, public health workers, or any other breed of doctor, should first master the basic knowledge which is the stock-in-trade of the G.P. The further training required by specialists of all kinds (be they research workers or surgeons) should be additional to the basic knowledge required for general practice. For this cogent reason, and in accordance with a principle that underlies all forms of education, first things must come first, and the first things are the simple things.

Do First Things Come First?

If the above argument is accepted the newly qualified doctor should know more about sore throats than large spleens. He should be capable of treating the common cold, but he may be forgiven some uncertainty about the therapy of myasthenia gravis. In fact, however, the newly qualified man or woman can discuss at length the aetiology and treatment of acute osteomyelitis, but finds himself unable to advise his friends, relatives, or patients when they consult him about their corns. He is often incapable of composing a simple prescription, and may even be unfamiliar with the use of the *National Formulary*. To say that he will learn these things in general practice is to beg the question. The object of any training is to impart the knowledge required for the job, not to turn out glorified graduate apprentices. Furthermore, if it is agreed that the principal task ahead is to raise the standards of general practice, then it is essential that the appropriate knowledge should be acquired during training rather than picked up in the field. It is the latter practice which perpetuates the use of outmoded methods. One of the reasons for the demoralization of the general practitioner is the fact that he is doing a job for which he was not trained.

Where Does the Fault Lie?

The General Medical Council exercises its control over medical education in this country through the examining authorities. It lays down the courses which the student must have attended before presenting himself for the qualifying examination, and it approves the standard of the examinations that are set. It might be thought, therefore, that the weaknesses of our medical education could be attributed to the examination system. It is true that certain features, such as the unnecessarily long time devoted to surgical dressing, are based upon the stipulations of the G.M.C. So far as the actual examinations are concerned, however, it must be admitted that the questions set in the papers and asked in the "vivas" are usually simple and straightforward. The training of a medical student makes it unlikely that he will know much about the treatment of constipation, yet it is surprising how often the examiners set this very question. In fact, more students fail from ignorance of simple things than from inadequate knowledge of obscure conditions. It does not seem probable, therefore, that the examining bodies are responsible for the orientation of the student's learning, though it might be argued that the ever-present danger of a compulsory question on a rare disease necessitates the acquisition of much relatively useless knowledge.

On the whole, however, the atmosphere of his teaching hospital is the factor which ultimately determines a student's outlook. It is a mistake, often recognized but never corrected, for students to be taught solely by specialists; it is a calamity when these teachers fail to appreciate that most of their pupils are preparing for general practice.

"Appointments"

Turning from the general to the particular, it is not hard to discover specific weaknesses in the detailed working of the medical curriculum. Clinical teaching in the English and Welsh schools is based upon a series of student "appointments" to the various departments of the hospital. Our teachers like to think that this enables their students to acquire at first hand the practical and theoretical knowledge which a doctor needs. Whatever these appointments may have involved in the way of responsibility and activity in days gone by, they are now nothing less than a gigantic fraud. The chief may speak affectionately of "my clerks," suggesting that they are an integral part of his firm, as essential to its working as every other member, but the clerks know differently. They may correspond to the apprentices of an earlier age, but their duties and responsibilities have been so drastically reduced that they are left with the status of technicians, a constant nuisance to the nursing staff, performing for six months on end the simplest of tasks which they could master in a fraction of the time if they were properly taught.

There are, of course, a large number of practical procedures which a doctor must be capable of carrying out, and carrying out well. Only a small proportion of these are learned by clerks or dressers, however, and the time comes when any further advance in the art of, say, venepuncture is more than offset by the loss of time which it entails, time which could be better spent on ward rounds or in the library. It is preposterous that, as often happens, a clerk should miss a teaching visit in order to take a clean specimen of urine or do a pre-operative shave. It is equally preposterous that his appointed duties should not include the much more intricate lumbar puncture. If practical procedures are to be learned during the clinical course the number and nature of such procedures should be as clearly defined as they are for nurses. They should be properly taught and, once mastered, they should not be indefinitely repeated. Students still pay fees to be taught medicine: they should not be used as a form of cheap labour. If, on the other hand, it is decided that the practical aspects of medicine should be mastered during the pre-registration house appointment, then the students should be true students and should be allowed to make the best possible use of their time in the wards.

The student's principal task in the ward is to learn to examine a patient systematically from head to foot and to elicit physical signs. This art is well taught in the introductory course at most schools, but thereafter the student is largely left to his own devices, and it is rare indeed for a teacher to observe him examining a patient and developing the habits, good or bad, which will remain with him for life. In fact, too much ward time is spent in taking blood or washing out bladders, and too little in examining patients in the presence of an experienced teacher.

The above remarks apply particularly to the medical clerkship, but are equally true of the surgical dressership and, in a general way, of the other appointments. It seems so admirable that students should be responsible for surgical dressings, and it is true that during the first month or so some very useful knowledge is acquired. From then on, the rate of learning becomes very much slower, and at the end of six months the dresser is amazed to find that he still knows little of the elements of bandaging; less, in fact, than a boy scout or first-aid worker. Considering the relative positions of medicine and surgery in general practice to-day, it is remarkable that the surgical dressership should still occupy as many months as the medical clerkship, and equally strange that many surgeons should insist on "their" dressers being present at operations. Major surgery is essentially a postgraduate subject, and if six months are to be spent on surgical firms very much more of this time should be spent on minor surgery.

This brings us to a consideration of the part which the casualty department plays in a teaching hospital. Many students believe that their casualty appointment was not only the most interesting but also the most useful period of their training because it taught them simple surgery of immediate practical value and gave them for the first time some genuine responsibility. Even in this department, however, the lack of purposeful teaching may be as much in evidence as it is in the rest of a teaching hospital. Dressers may be expected to perform casualty duties within a few weeks of beginning surgical studies, and they may be entrusted with minor operations and stitching without ever having been taught how to do them correctly. However trivial the task may be, there is always a right way and a wrong way of doing it.

Systematic Teaching

In addition to the pseudo-apprenticeships discussed above, there is a varying amount of systematic teaching in every medical school. Pride of place is taken by the ward visit, but there are also lectures and tutorials.

The ward visit at its best is superb—at its worst it is unbearable. The British habit of gathering students round a bed and teaching on the case is the best feature of our system. Apart, however, from the frequent disregard for the patient's feelings, which is all too common in ward teaching, it may fail in its purpose for various reasons. One is that too long may be spent on a single case: half an hour standing still at one bed is about as much as most students can manage. Again, teachers may wander too far from the case they are discussing and allow the discourse to degenerate into a straightforward lecture. Finally, there may be such a lack of co-ordination between the teachers in the hospital that several similar cases are made the subject of visits in one week, to the exclusion of other conditions which have not been discussed for many months.

A full-dress systematic lecture is of little value. Routine bread-and-butter information which can be found in the standard textbooks provides poor material for a 60-minute discourse. Lectures should present aspects of medicine which are not discussed in the textbooks, and, whenever possible, they should be based on the personal experience of the lecturer. They should transcend the narrow limits of the set subjects and touch upon the wider implications of doctoring as seen in its historical and social setting. They should, in fact, serve as a stimulant rather than as a narcotic.

Finally, there is the tutorial or rag class—an intimate question-and-answer class for the benefit of a small circle of students which may be based upon bottles or specimens. Of the value of this class for teaching or revision purposes there is not the slightest doubt.

Teachers and Tutors

It is often alleged that medical teachers should be trained not only in medicine but in teaching. This point has been unduly laboured. Among the galaxy of talent available at every teaching hospital (thanks to our numerous part-time consultants) it is not hard to find several capable teachers, and it is almost surprising how many of our physicians and surgeons are outstanding in this respect. Their time is limited, however, and the burden of junior teaching is not adequately borne by those of registrar status. It should not be necessary to appoint full-time clinical teachers so long as the present surfeit of registrars continues, and it should be a part of the registrar's very

limited duties to teach junior students in the wards. This arrangement already exists on paper; it is time it was fully implemented.

Tutoring of a kind exists at a number of medical schools, but is applied throughout the course at very few. At many centres students do not have ready access to the dean, and they have no tutor to whom they can turn for advice on reading, for guidance on methods of work, or for help in choosing a career. This is unforgivable.

Art or Science?

The above remarks are aimed at some of the weaknesses in our present system of imparting factual, technical medical knowledge. It is, however, a striking feature of British medical education to-day that the non-technical aspects are scarcely mentioned. Medicine is a great liberal profession, not a trade, and one would have thought that some effort would be made to bring this home to medical students. In fact, very little is done to teach the doctors of to-morrow how to handle patients, how to tell them about their own disease, how to deal with their relatives, and how to tackle the host of more or less related problems which will begin to face them on their first day in practice. It may be contended that such lessons can be learnt only by experience, or that our teachers' example serves as the best guide to our future behaviour. Unfortunately, this example is not always worthy of emulation, though with the passage of time one becomes inured to those constant acts of thoughtlessness towards the patient which struck one with horror in the early stages. A patient expects sympathy and understanding from his doctor, not only technical skill. The selection of medical students for character rather than brains would be a step in the right direction, but it is equally important that emphasis should be placed throughout the course on those aspects of medicine which make it an art as well as a science.

Medical Memorandum

Spontaneous Amputation of Cervix

The following case is worth recording in view of the interesting cases reported by Arnott (1949) and Uhma (1949).

Case Report

The patient, a woman aged 33, had had two previous pregnancies, one in 1945 resulting in the birth of a normal infant weighing 9¼ lb. (4.3 kg.) at term, and the other in 1946 ending in miscarriage at five months. Her present pregnancy had been uneventful and the expected date of delivery was January 21, 1949. She was admitted in labour as an emergency case at 2.30 p.m. on February 6, 1949, as the district midwife found her unmanageable. Labour had apparently started at 2.5 a.m. that day, and from the beginning she had insisted on using strong expulsive efforts. Unfortunately there is no record of the exact time of rupture of the membranes.

On admission her general condition was good. The foetus was in the left occipito-transverse position, with the head engaged in the pelvic brim. Vaginal examination revealed a cervix which admitted three fingers, which was markedly oedematous, and which had two old lateral lacerations, one on each side. The membranes had ruptured. She was given 200 mg. of pethidine and the midwives were instructed to prevent her "bearing down."

At 6 p.m. I was summoned by the Sister, who reported that a fleshy mass had presented at the vulva. This was found to be the posterior part of the cervix, which had become almost totally avulsed, being attached only by a narrow pedicle of tissue. There was some bleeding. Preparations were made to deliver the infant by forceps, but, before these were complete, delivery of a female infant weighing 10 lb. (4.5 kg.) occurred spontaneously, the placenta following in ten minutes.

As there was still some bleeding, the woman was anaesthetized and the cervix explored. It was confirmed that the whole of the posterior part, limited by the two lacerations, had been amputated. A few bleeding points were secured and ligated and thereafter bleeding stopped. The puerperium was uneventful.

On June 22 all that remained of her cervix was a small finger-like process anteriorly which was the seat of an erosion. There did not seem to be any pronounced fibrosis such as one finds after operative amputation, and what remained of the cervical canal admitted the tip of a finger. The erosion was cauterized.

Comment

In many cases of spontaneous amputation of the cervix one of the main underlying factors seems to be some organic condition preventing dilatation of the cervix, and the majority of cases have occurred in primigravidae (De Lee and Greenhill, 1943b). Other factors are contracted pelvis, prolonged labour, and premature rupture of membranes (De Lee and Greenhill, 1943a, 1943b), though the latter two are probably results of the other causal factors rather than contributory causes. In most cases of amputation after operative treatment the de Ribes bag has been used (Uhma, 1949; De Lee and Greenhill, 1943b).

In my case the factors concerned were undoubtedly the size of the child and the strong expulsive efforts used by the woman from the beginning of labour. Her pelvis was of average size, and with an infant of 10 lb. there must have been considerable nipping of the soft tissues. This would tend to cause oedema of the cervix as in contracted pelvis, which in turn would prevent full dilatation, and the strong expulsive efforts of the uterus aided by the abdominal muscles would force the head downwards, carrying the cervix in front of it (De Lee and Greenhill, 1943b), the line of separation occurring where the head was compressing the cervix against the sacral promontory.

The line of separation was bounded at each side by the two old cervical lacerations. It would be interesting to know to what extent separation would have occurred had the cervix previously been intact.

Opinion seems to vary on the question of future pregnancies and labours. De Lee and Greenhill (1943b) consider that the resulting scar nearly always closes the uterus but agree that spontaneous deliveries do occur after the injury. In Arnott's case subsequent delivery was easy. In many cases following surgical amputation of the cervix there is difficulty in labour (Calvert, 1949; Kosmak, 1949). In my case there did not seem to be any pronounced fibrosis and the cervical canal did admit the tip of a finger. It will be interesting to observe events should the patient become pregnant again.

IAN F. MACMATH, M.B., Ch.B., B.Sc., D.R.C.O.G.,
Obstetrician, Bradford-on-Avon Maternity Hospital.

References

Arnott, W. (1949). *British Medical Journal*, **1**, 157.
Calvert, W. (1949). Ibid., **1**, 58.
De Lee, J. B., and Greenhill, J. P. (1943a). *Principles and Practice of Obstetrics*, 8th ed., p. 501. Philadelphia.
—— —— (1943b). Ibid., 8th ed., p. 773. Philadelphia.
Kosmak, Geo. W. (1949). *British Medical Journal*, **1**, 823.
Uhma, C. (1949). Ibid., **1**, 501.

Reviews

FRESH APPROACH TO PATHOLOGY

An Introduction to Pathology. By G. Payling Wright, D.M., F.R.C.P. (Pp. 569; illustrated. £1 10s.) London: Longmans, Green and Co. 1950.

The teaching of pathology over the last twenty years or so has evolved along dangerous lines. More and more emphasis has been laid on the practical application of laboratory investigations to the purely clinical problems of diagnosis and the control of treatment, while less and less care has been taken to ensure that the student shall acquire an adequate understanding of the basic mechanisms which underlie disease processes. As the author of this book points out, "any further curtailment in the study of what is conveniently known as general pathology . . . would, by starving the student of a training in principles, have undesirable repercussions in clinical subjects also." Professor Payling Wright has planned his book to meet this danger. It is "an introductory exposition of the principles of pathology in terms of the more fundamental sciences of biology and physiology."

The treatment of the subject is above all things dynamic, and the functional approach to pathology forms one of the main themes running through the book. The author tells the story of disease against the background of time and pathogenesis, and emphasizes the march of events in the evolution of disease. The old static facts of morbid anatomy and histology are skilfully blended with the relevant modern discoveries in biology, physiology, experimental pathology, and immunology. The student is persuaded that to understand disease he must train himself to think in terms of morbid physiology, but he is warned that to define his problems he must acquire knowledge of altered structure by personal observation of the "stilled" life of the post-mortem room, the museum jar, and the microscope slide.

The book is written in lucid and distinguished English, and will be read with ease and enjoyment. The introduction is impressive. It consists for the most part of a skilfully condensed account of the history of pathology in terms of the evolution of science and has the same dynamic quality as the rest of the book. Other arresting chapters are those on the body's defences against infection, the inheritance of abnormalities, haemorrhage, thrombosis, and the aetiology of tumours. The references have been selected with care and cover an exceptionally wide field, and the illustrations, more than half of which are photomicrographs, are of excellent quality.

Those who teach general pathology and are convinced of its importance in undergraduate and postgraduate education have been waiting for such a book as this for a long time. They will be gratified to discover that it has at last been written by an English author with so wide a knowledge of the scientific aspects of pathology and so outstanding a talent for accurate generalization.

GEOFFREY HADFIELD.

INTRODUCTION TO PATIENTS

Clinical Examination of Patients. By John Forbes, M.D., M.R.C.P., and W. N. Mann, M.D., F.R.C.P. (Pp. 323; 60 illustrations. 18s.) London: Edward Arnold and Co. 1950.

This book is intended to be a guide to the student during his introduction to clinical medicine, and the authors hope that it will help to clarify and to systematize bedside instruction. They emphasize the importance of history taking, devoting a chapter to this essential feature of the clinical examination. There follow chapters on the general examination of the patient and on the investigation of the special systems and of abnormal psychological states. All these sections are excellent. The laboratory tests and *x*-ray and electro-cardiographic findings are of necessity considered somewhat briefly. The chest radiographs, such as Fig. 17, are blurred and poorly produced. In the introductory chapters the authors give advice on good manners during the clinical examination, and tell the student that he must refrain from sitting on the patient's bed without asking his permission. I have never witnessed this formality; perhaps it is an old Guy's custom.

The authors have achieved what it is possible to achieve in an elementary book of this size, and the student who reads it during his introductory course to clinical medicine should derive much profit. He will, however, soon outgrow it and require stronger meat.

G. E. BEAUMONT.

DIAGNOSIS

Major Symptoms in Clinical Medicine. By John Almeyda, M.R.C.P., D.P.H.(Lond.), M.R.C.S. Volume I. With foreword by Sir Adolphe Abrahams, O.B.E., M.D.(Camb.), F.R.C.P. (Pp. 378; 185 illustrations, including 10 in colour and 13 charts. £1 5s.) London: Henry Kimpton. 1950.

Practical Procedures in Clinical Medicine. By R. I. S. Bayliss, M.D.(Camb.), M.R.C.P. (Pp. 445; 62 illustrations. £1 5s.) London: J. and A. Churchill. 1950.

In his foreword to Dr. Almeyda's *Major Symptoms in Clinical Medicine*, which should be read by anyone wanting a favourable review, Sir Adolphe Abrahams speaks of the necessity in the practice of medicine of recognizing physical signs and eliciting symptoms by clinical and extra-clinical methods. In his own preface Dr. Almeyda expresses his intention of discussing the anatomical and physiological aspects of symptoms, their mechanism, significance, and mode of investigation.

I do not think he has been successful in these intentions, for the student will learn little about the scientific elicitation or understanding of symptoms from this book. It is true that a number of phenomena such as obesity, pruritus, haemoptysis, and constipation are discussed, but the author's powers of description are weak and he lacks the basic knowledge for the analysis of symptoms. I do not think Mackenzie or Lewis would have approved of the sections on dyspnoea and thoracic pain, and that on purpura will merely confuse those who are not knowledgeable enough to be exasperated. The lists in which symptoms are classified are rarely helpful and sometimes inaccurate. Pigmentation is arranged in an arbitrary colour scheme, in which pernicious anaemia is classified as brown, brown-black, or reddish-brown, without reference to the lemon and biscuit tints with which the patient's colour is commonly compared. Mepacrine is not included in the list of exogenous pigments which discolour the patient by the actual deposition of the chemical in the tissues of the body, but sulphonamide is. Surely sulphanilamide cyanosis is due to methaemoglobin? This is not a complete manual of physical diagnosis like "Hutchison and Hunter," and there are no references or bibliography. The book is reasonably priced and well printed, but the originals of the clinical photographs and sketches must often have been poor.

Bayliss's *Practical Procedures in Clinical Medicine* is a much better book and can be whole-heartedly recommended.

A little time ago I compared the length of stay in the same hospital thirty years ago with that to-day, and was surprised to find that it had not greatly diminished. It is the pace which has changed, and the time formerly spent in quiet observation is now devoted to special investigations and treatment. The range of knowledge which a house-physician must have for these purposes is extensive and requires the medical equivalent of the manual of surgical handicraft. It is this which Dr. Bayliss has provided, and his book can be regarded as a supplement to the still essential manual of physical diagnosis.

In twelve chapters he discusses the methods of laboratory investigation of the various systems and the different special procedures. From artificial pneumothorax to A.C.T.H., these last thirty years have kept the house-physician busy, and this book will save him a good deal of time in discovering how to do it all. A book of this kind is out of date before the manuscript leaves the hands of the author. There is no mention of such fashionable topics as potassium infusions or the eosinophil count, or of the growing volume of criticism of the cricothyroid route for bronchography. New editions will clearly be needed, and in these one would like to see rather more references to the original papers from which methods are taken.

L. J. WITTS.

SIGNIFICANT DOODLES

On Not Being Able to Paint. By Joanna Field. (Pp. 173; 48 figures. 10s. 6d.) London: William Heinemann. 1950.

The sale of the Graham Robertson collection of Blake's drawings last year inevitably raised speculation on how they were received when Blake created them in comparison with how they are assessed now. Surely we can perceive something of their significance better now than could Blake's contemporaries.

With charcoal, ink, and paint Miss Field has set down over the years the apparently aimless movements of her undirected hands. We might call them her doodles. And she has latterly found a significance in them and recalled the delight in their execution far different from the arid response that followed her earlier more normal representational efforts. The reality of these emotions is partly responsible for her efforts to find a significance in these doodles, which she interprets as the expression of her thwarted inner life. Critics may find plenty to carp at in such interpretations. Yet the reviewer notes that psycho-analytic theories are expressed in a much less disturbing way than they often are. Some of Miss Field's conclusions are set out in ways that convince by their simplicity. She claims that her drawings enabled her to solve the problem of falling short of her ideals and yet being calm and not ashamed. And she hints that the task of education is to allow, whether by free-drawing or otherwise, the expression of those sides of our imagination which tend more and more to be denied expression in a sophisticated age.

This book, therefore, should be welcome to many besides amateur artists. It might be said to be an introduction to surrealism, to aesthetics, and for all who genuinely wish to appreciate children's paintings, psychotic drawings, or modern art. Miss Field's work approaches philosophy, and in so far as she quotes Traherne (extensively), Donne, Blake, and Francis Thompson she raises many fascinating and unsolved questions. It is not a primer for holiday sketching.

HENRY WILSON.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

A History of the Teaching of Anatomy in Oxford. By H. M. Sinclair and A. H. T. Robb-Smith. (Pp. 103. 3s. 6d.) Oxford: University Press. 1950.

Transactions of the Ophthalmological Society of the United Kingdom. Session 1949. Vol. 69. (Pp. 708. 40s.) London: Churchill. 1950.

Essays in the History of Medicine. By G. Gask. (Pp. 209. 30s.) London: Butterworth. 1950

Analgesia for Normal Childbirth. By E. H. Seward, M.A., B.M., B.Ch., D.A., D.Obst.R.C.O.G. (Pp. 19. 2s.) Oxford: Blackwell Scientific Publications. 1950.

The Child's Microbial Heritage. By L. M. J. Kramer, M.A., Ph.D., F.L.S., F.Z.S. (Pp. 17. 1s.) London: British Social Hygiene Council. 1950.

The Task of Rationalism. By A. Gowans Whyte. (Pp. 22. 6d.) London: Watts. 1950.

The Microtomist's Vade-Mecum (Bolles Lee). Edited by J. B. Gatenby, M.A., Ph.D., D.Phil., D.Sc., and H. W. Beams, M.A., Ph.D. 11th ed. (Pp. 753. 45s.) London: Churchill. 1950.

Progress in Biophysics and Biophysical Chemistry, 1. Edited by J. A. V. Butler and J. T. Randall, F.R.S. (Pp. 279. 50s. Postage 1s. extra.) London: Butterworth-Springer. 1950.

Human Embryology for Medical Students. By S. R. Nair. (Pp. 398. 42s.) Bombay: The Popular Book Depot. 1950

Adrenal Cortex. Edited by E. P. Ralli and others. (Pp. 189. $2.) New York: Josiah Macy, jun., Foundation. 1950.

Public Health and Demography in the Far East: Report of a Survey Trip September 13—December 13, 1948. By M. C. Balfour and others. New York: Rockefeller Foundation. 1950.

Human Sterilization: Techniques of Permanent Conception Control. By R. L. Dickinson, M.D., and C. J. Gamble, M.D. (Pp. 40. No price.) Princeton, N.J., and New York: Birthright, Inc., Sterilization for Human Betterment. 1950.

La Dissociation Auriculo-ventriculaire dans l'Infarctus du Myocarde. By R. Vialard. (Pp. 200. No price.) Paris: Librairie Arnette. 1950.

L'Arachnoidite Optique Canaliculaire et Orbitaire. By R. Cazaban. (Pp. 102. No price.) Paris: L'Expansion Scientifique Française. 1950.

La Luxation Congénitale de la Hanche. By P. Le Damany. (Pp. 123. 600 francs.) Paris: Librairie Maloine. 1950.

Atti del XVI Congresso Nazionale di Radiologia Medica. Vol. 1. Part 1: *La Radiodiagnostica dei Tumori Cerebrali.* By F. Mascherpa. (Pp. 125. No price.) Messina: Tipografica Ditta D'Amico. 1950. Part 2: *La Radioterapia dei Tumori Maligni del Sistema Reticoloendoteliale.* By G. F. Gardini. (Pp. 78. No price.) Messina: Tipografia Ditta D'Amico. 1950. Part 3: *Radioterapia E Radiobiologia dei Tumori delle Ossa.* By A. Grilli. (Pp. 201. No price.) Rome: Abruzzini. 1950.

Klinische Hämatologie. By H. Fleischhacker. 2nd ed. (Pp. 627 50 Swiss francs.) Vienna: Wilhelm Maudrich. 1950.

Stufen der Malignität. By R. Rössle. (Pp. 35. M. 2.25.) Berlin: Akademie. 1950.

Klinische Psychopathologie. By K. Schneider. (Pp. 179 M. 11.40.) Stuttgart: Georg Thieme. 1950.

Gastritis Ulkus und Karzinom. By J. Bücker. (Pp. 89. M. 11.50.) Stuttgart: Georg Thieme. 1950.

Kinesiterapia Tecnica. Vol. 3 of *Tratado Argentino de Kinesiologia.* Part 1. (Pp. 144. No price.) Buenos Aires. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY AUGUST 26 1950

TEACHING THE TEACHER

Six years ago the Goodenough Report observed that "too little attention has been paid to the training of teachers of medical students," and suggested that the intending teacher might benefit if he received some instruction in this difficult art. In last year's Educational Number Professor R. W. Niblett contributed a short paper on the training of the teacher, and in a leading article in the same issue of the *Journal* comment was made that "it is unusual, to say the least, to find so plainly stated the need to improve the teachers as well as the taught and the teaching." This stimulated Dr. R. D. Lawrence to suggest in a subsequent issue that there was need for a school for medical teachers, a suggestion made in this *Journal*[1] by Dr. Ffrangcon Roberts in 1944. During the past year many teachers of clinical medicine have been discussing their training as teachers, and the subject was debated at a meeting in Bristol attended largely by members of the Royal College of Physicians. Dr. Lawrence's contribution to this debate is included among a number of articles published this week on the methods and techniques of teaching.

As Sir Henry Cohen points out, recent reports and articles on medical education have been concerned almost entirely with the content of the medical curriculum, and too little attention has been paid to methods and technique and to the selection of teachers. The purpose of teaching, Cohen notes, is not only to transmit knowledge but to stimulate the student to think. Dr. Johnson's account of how he was taught as a medical student 25 years ago, and the article by an anonymous medical student—from a different hospital—suggest that at least in some of our medical schools the system of teaching does neither of these things very well, or at least not well enough for training the student in the general practice of medicine.

While many would disagree with Dr. Roberts's projected school for medical teachers if it were a permanent institution, few would deny that the young man or woman appointed to the teaching staff of a hospital would benefit from some pedagogical instruction. As Professor Niblett observed last year, the doctor in training and the teacher in training have much to give one another. We should therefore go to those who make a special study of education and see what help and advice they can provide us. In our opening pages Dr. J. A. Lauwerys, professor of comparative education in the University of London, and Mr. G. P. Meredith, professor of psychology in the University of Leeds, have set down for the benefit of those who teach medicine some of their observations on the technique and art of teaching. As Professor Lauwerys suggests, the problems of teaching and what is taught cannot be separated from a consideration of the times in which we live and the shifting scenes of social and scientific thought. "All teachers," he says, "face problems which arise through the adoption by statesmen and Parliament of policies the roots of which lie elsewhere than in the sciences." One result of these policies is that more boys and girls are seeking higher education. They come, Professor Lauwerys points out, often enough from homes which may have a poor educational background. They have not acquired the habit of reading "or of individual self-directed study." Their anxiety is more to acquire knowledge to pass examinations than to become educated in the widest sense of the word. But Professor Lauwerys adds the comforting observation that they are not less intelligent than students of previous generations. An awareness of the conditions of life and the social background of the modern student is essential if the teacher is to choose wisely methods and techniques which will not only instruct the student but bring out of him the best he has to give. In medicine, especially, the length and burdensome nature of the curriculum, and the economic anxiety to pass a series of examinations at the first attempt, put a premium on cramming and encourage passive reception of facts and figures and so-called theories. This, too, encourages the lazy, or indifferent teacher to use the method which Professor Lauwerys describes as one "involving mainly chalk and talk," instead of what he calls "activity methods." The essence of these is that students are encouraged to solve certain problems themselves, a method intended to encourage purposive mental activity. Professor Lauwerys suggests that students could learn by attempting to find answers to questions by experiment.

An account of an attempt to use this method is given by Dr. Andrew Wilson and his colleagues of University College, London, in which they describe how, as part of the pharmacology course, students, under the supervision of instructors, tried the effects of various drugs on each other. "We consider," they state, "that the outstanding advantage of this part of the practical class is that the student experiences at first hand the effects of certain drugs and learns to assess some of the qualitative and quantitative changes produced." This

[1] *British Medical Journal*, 1944, 1, 728.

experiment of Dr. Wilson and his colleagues would seem to be an admirable example of an "activity method" in the teaching of pharmacology, and at a time when this is a subject of such rapidly growing importance it may be hoped that other schools will try the same method. If it were widely adopted its influence on the future practice of medicine would be considerable.

The modern teacher now has many technical aids at his disposal, some of which are discussed elsewhere in this issue. Professor Lauwerys makes the interesting observation that these new ways of imparting information come from the oldest of all methods—the drawing, the painting, the hieroglyph. When books were scarce and television and the filmstrip undreamt-of, the lecture had perforce pride of place in the teaching process. Any student not possessed of a photographic memory or the ability to write at the speed of shorthand was able to transmit only some of the information to his notebook. Too often he was torn between the desire to listen and the obligation to scribble down facts and figures. Surely the time has come when *all* students should be given in advance of the lecture cyclostyled notes containing the main facts, and should listen to the lecture with the aim of enlarging their comprehension of them.

On the art of "putting it across" Professor Meredith has many wise and witty things to say. His vivid description of a few outstanding lecturers who have influenced him would seem to demonstrate that there are no short cuts to effective lecturing. From his own experience he concludes that the one quality that is desirable in a lecturer is vitality, which he defines as "a force which is called up by the joint challenge of a topic and an audience, a challenge which stimulates the organizing capacity of the man's mind to draw upon whatever material and mental resources he has." It is obvious that some knowledge of the technique of lecturing would help the inexperienced to avoid the mistakes referred to by various writers in this symposium; and it is equally obvious that no educational device or trick of lecturing will turn a bad lecturer into an inspiring one.

From his experience as a professor of education Dr. Lauwerys is opposed to any systematic instruction of the university teacher in the art of instruction. He suggests that every beginner should be given the chance of having an experienced teacher attend his lectures during the first year. It would, too, he believes, be an advantage if departmental heads were to have regular conferences with their staff at which they could discuss educational and pedagogical problems. His last proposal for helping the young teacher is the holding of week-end meetings of the staff in one of the many conference homes now available. It is much to be hoped that some of those responsible for medical teaching will take the initiative in trying out some of the suggestions made by Professor Lauwerys. It seems evident that, though there may be exceptions in this school or that, the present methods of teaching medical students are unsatisfactory. If the methods were reformed it might be easier for some teachers to become more accomplished in their performance.

DOCTORS AND POPULATION

The average population served by a medical practitioner varies greatly between one country and another, and has to some extent varied in Britain during the last 50 years. The *Medical Directory* includes a table which shows the numbers of doctors whose addresses are recorded as being in England and Wales and in Scotland when the volume is made up each year. Other particulars are given also, but it is these that are analysed below. The figures for Northern Ireland and Eire are tabulated together, but since conditions differ in the two countries it was thought desirable not to use them in the comparisons made here.

The numbers of doctors tabulated in the *Medical Directory* are not an exact account either of the number of doctors practising or of the number of doctors living in England and Wales and in Scotland. For various reasons a few doctors do not have their names recorded in the *Directory*. On the other hand, some of those recorded are retired and therefore ought not to be counted as serving a population. The difference between these figures is unknown.

The figures for populations in Tables I and II are derived from the Registrar-Generals' publications and are for civilian populations. They are given in thousands to the nearest thousand. Although the figures for population per doctor in Table I and for population per general practitioner in Table II are not exact, they are probably correct to within a hundred.

Table I.—*Medical Practitioners and Population in England and Wales and in Scotland*

Year	England and Wales		Scotland		Population per Doctor	
	Doctors	Population in Thousands	Doctors	Population in Thousands	England and Wales	Scotland
1901	23,501	32,413	3,569	4,464	1,379	1,251
1910	25,398	35,792	3,947	4,739	1,409	1,201
1920	26,619	37,596	4,544	4,864	1,412	1,070
1930	31,936	39,801	5,905	4,828	1,246	817
1939	37,429	41,460	6,091	5,007	1,108	822
1949	45,547	43,785	8,607	5,175	961	601

It is clear from Table I that during the last 50 years there has been a higher proportion of doctors to the population in Scotland than there has been in England and Wales. The difference cannot be accounted for by the fact that a higher proportion of people qualify as doctors in Scotland, and that some of these subsequently

migrate to England and Wales, for the Scottish doctors enumerated have given their addresses as being in Scotland, and it seems to be a reasonable assumption that if any of them later travel south they will be replaced in Scotland by a roughly similar number. That every six-hundredth person in Scotland should, in 1949, have been a medical practitioner seems to be a remarkable achievement.

In both countries the last 50 years have seen a great reduction in the average number of people per doctor, but the reduction by one-half in Scotland is striking. This reduction has occurred in spite of the increasing population of both countries and is the result of a more rapid increase in the number of doctors.

In order to gain some idea of the average number of people served by a general practitioner in England and Wales and in Scotland some figures obtained by the B.M.A. for the years 1947–8 were used. It was found by counting in 1947–8 that there were 17,769 active general practitioners in England and Wales, and 2,636 in Scotland. These figures were divided, for the respective countries, by the mean of the number of medical practitioners recorded by the *Medical Directory* for the two years 1947 and 1948. In this way the number of general practitioners in England and Wales was found to constitute 0.4 of the number of doctors shown in the *Directory* as living in England and Wales, and the number of general practitioners in Scotland 0.31 of the whole body of Scottish doctors shown.

On the somewhat hazardous assumption that these fractions have not changed much in the last 50 years, they were applied to the figures in the last two columns of Table I to show (in Table II) the average population served by one general practitioner in England and Wales and in Scotland during the last 50 years.

Table II.—*Average Population Served by One General Practitioner in England and Wales and in Scotland*

Year	Population per General Practitioner	
	England and Wales	Scotland
1901	3,447	4,035
1910	3,522	3,874
1920	3,530	3,452
1930	3,115	2,636
1939	2,770	2,652
1949	2,402	1,939

The decrease in the figures for Scotland is again of interest. From having more people per general practitioner in 1901 than England and Wales, Scotland came to have fewer in 1949.

In 1948 the World Medical Association gave some figures in a draft report[1] on the numbers of doctors and of general population in various countries. These have been treated somewhat differently here and are shown in Table III. The figures have been rounded off, but are probably not very accurate for some countries.

[1] *Draft Report on the Medical Profession in Twenty-three Countries.* W.M.A., New York.

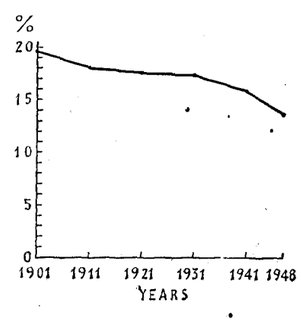
Table III.—*Average Population Served by One Medical Practitioner and by One General Practitioner in Various Countries*

Country	Population per Doctor	Population per G.P.
Palestine (Jewish)*	260	
United States	710	1,400
Great Britain	880	2,400
Iceland	880	1,000
Denmark	950	2,000
Canada	970	
New Zealand	970	
Australia	1,100	1,700
Switzerland	1,100	1,900
Sweden	1,100	
Spain	1,100	
Norway	1,100	1,400
Netherlands	1,100	2,300
Luxembourg	1,200	1,900
Czechoslovakia	1,300	4,300
France	1,300	1,500
Eire	1,500	
Bulgaria	1,500	2,400
Finland	2,200	
Union of South Africa	2,400	2,800
Egypt	4,200	11,100
Palestine (Arab)	4,500	
China	25,000	

* The low figure "for the Jewish section of Palestine is probably attributable to special temporary circumstances."

The young men and women wanting to become doctors continue to outnumber the vacancies in the medical schools, and the numbers admitted by the medical schools have remained fairly constant for some time. There does not in the near future seem to be any likelihood of a shortage of aspirants to medical training. But the age group from which most of them are drawn is shrinking in relation to the total population.

The great majority of medical students start their medical training when they are aged 15 to 24 inclusive. The percentage of the total population (including the Services) in England and Wales represented by this age group is depicted for a number of years in the Graph.



The actual number of young people in this age group increased from 1901 to 1931, but the total population increased faster. However, while in 1931 there were 6.9 million men and women aged 15–24, in 1939 there were 6.6 million, and in 1948 there were 5.99 million (approximate figures). Between 1901 and 1948 the percentage that this group forms of the total population has declined from 19.58 to 13.76. That is, in 1948 the percentage was 0.7 of what it was in 1901. The "ageing population" in England and Wales is responsible for this, and the relative lack of young people may some time in the future have a serious effect on recruitment to the medical profession.

TRAINING FOR THE JOB

In an attempt to find out what students themselves think of their clinical education we asked one of them coming to the end of his course to draft a short report which would be based on a questionary sent to students in different medical schools in Britain. He found, however, that there were such variations in the curriculum that anything like a succinct report would be impossible to draft. So he wrote down an account of his own reactions and observations, and having done this discussed his paper with a member of the staff of this *Journal* and with students from medical schools in London, the Provinces, and Scotland. As a result of this discussion some minor amendments of the paper were made. It stands, of course, as a record of personal experience, but the small conference of students generally approved and endorsed what our anonymous student-author has written. The essence of his charge against present clinical teaching is that it does not prepare the student for the job the majority have to do—the general practice of medicine. He makes the sound suggestion that all students should "first master the basic knowledge which is the stock-in-trade of the G.P."; and those who are going to take up other kinds of work should have subsequent specialist training. It is possible that those who teach students imagine that they are doing something like this, but the students are satisfied that this is not the case. If confirmation were needed it is amply provided by Dr. Donald Johnson, who, having spent many years in general practice, looks back to his student days of 25 years ago in order to discover how far the training he received was in fact the training for the job. Dr. Johnson's condemnation of the system, though perhaps exaggerated in parts, is as emphatic as that of the student of to-day. It is a melancholy reflection that despite all that has been said and written about medical education so little has been done in the past 25 years to get to grips with the real problems of training those who have to care for the sick. Thousands upon thousands of words have been written and volumes of eloquence have been poured out on this subject, yet the inertia of the medical schools has been so great that practically nothing seems to have been done to remedy a state of affairs that everyone must deplore. There are of course exceptions, and devoted teachers have here and there made efforts which deserve to be emulated. But in general the painful accusation that the medical schools are not really training students to be practical doctors seems to be substantiated.

The student-author observes that "the atmosphere of his teaching hospital is the factor which ultimately determines a student's outlook." According to Professor Lauwerys, the common factor in all proposals for the reform of school curricula is the stress laid on the social importance of what is taught. He believes that the true reason for this is the realization that Western civilization has to adapt itself to a changed technology and to meet the challenge of Russian communism and of the new conditions created by the reawakening of Asia. Whatever may be the explanation, he finds students most receptive to lectures on sociology and the social aspects of science. Professor Meredith echoes this in an observation that "in a sense all medicine is social medicine, and must be interpreted in the light of statistical knowledge of sickness and death, of wars and plagues, of poverty and wealth, of housing and diet." He stresses the need for the medical man to have a sense of the history of his profession. He finely says that medicine's "own essential vision and purpose are too high in the scale of human values to be allowed to fade from men's minds. They need to be particularly bright and sharp in the minds of students." The teaching of medicine should be set in the framework of its history and with a far more lively awareness of the sociological implications of health and disease. This is not likely to happen if students have to stuff their memories with facts about rare diseases they are never likely to see and with unsubstantiated theories of the causes of disease the cause of which is unknown. They have to learn these because of the examination bogy. And yet, as the student-author points out, examination questions are often refreshingly simple. There would seem to be a strange dichotomy in the teacher's mind. He teaches his students one thing and questions them on another. This may be because he fears that other examiners may set those questions he would not be likely to set himself. Perhaps the examiners in the qualifying examinations could come to some agreement about the exclusion of questions remote from the ordinary practice of medicine and let the students know this.

MORE ON MEDICAL EDUCATION

Two years ago Dr. Ffrangcon Roberts, in a book[1] which is as pertinent to-day as it was then, probed with good and trenchant English many of the themes touched on in this number. The individual has the advantage over the formal committee in that he has not the same compulsion to accommodate other views besides his own or to indulge in an excess of tact when he comes to a critical examination of the findings of august medical institutions. The committee approach, however, gains strength from the fact that no conclusion is reached without a thorough sifting of the evidence through diverse minds exposed in different ways to the educational process. The final formulation will depend much upon the character and mastery of the chairman. The report of the Goodenough Committee in 1944, of the Royal College of Physicians in 1944, and of the two B.M.A. Committees in 1948 and 1950 presided over by Sir Henry Cohen, all had an authority which any individual contribution must necessarily lack. These reports will have, and are having, an effect on medical education. But the reformer must feel impatient over the slowness with which change takes place, with the inertia of the schools and the conservatism of the teacher moving comfortably along well-worn tracks. The value of such a contribution as Dr. Roberts's is that this impatience is kept alive and saves us from the rosy optimism of Dr. Pangloss. Much of what he notes in his book is echoed in this symposium. Discussing the training of teachers, he reminds us that more than a hundred years ago Pestalozzi and Froebel insisted on educating a child through its own activity, and tells us of the current observation of the County Education Officer for Cambridgeshire: "In my experience the daily struggle in education is to get away from the printed word to the

[1] *Medical Education.* By Ffrangcon Roberts, M.D. H. K. Lewis. 12s. 6d.

reality, from the abstract to the concrete. Words are always being substituted for things." The clinical student reads the report of special investigations instead of observing the patient by the classical approach of inspection, palpation, percussion, auscultation. At least that is the trend. There is a great risk that the modern student may be encouraged to believe that the former is more scientific than the latter. Dr. Roberts is surely right when he says: "The lively interest shown in child education stands in marked contrast to the stagnation which pervades the medical schools." In the school, he observes, the emphasis is on method; in the hospital, on the subject taught. Roberts advocates the establishment of a college for training medical teachers in the techniques and methods of education. This may well be impracticable, but, even if it were, could we feel sure that stagnation would not once more set in? What is needed is something more flexible, more experimental. Professor Lauwerys's suggestion of country-house conferences would offer a chance for the lively interplay of active minds drawn from various teaching schools. There they could learn much from educational theorists and psychologists.

"Schools have been classroom-ridden, lesson-ridden, textbook-ridden, information-ridden." Such is the view of the Cambridgeshire Education Officer. How much more true it is of medical schools. Dr. Roberts, with his interest in adding things up, tells us that in 1907–12 the number of words in five textbooks of anatomy and physiology was 2,186,000: in the current editions of these books the number has increased by more than a million. In 1907–12 the number of words in five standard textbooks respectively of medicine, surgery, midwifery, gynaecology, and pathology was 4,562,000: the number of words in the current editions has increased by just short of two million. It may be possible to read, mark, and even learn this surfeit of words: but attempt at inward digestion can lead only to flatulent dyspepsia. Dr. Roberts shows himself to be an "activist" in education, and is in line with those who rightly believe that a student should learn by doing. The big fault in education, he considers, is the failure "to inculcate the habit of accurate observation"; and the biggest task before the medical schools "is to reform teaching so that curiosity is not deadened." Some of the observations made in this issue of the *Journal* suggest that the medical schools generally have a long way to go before they attain this end.

TEACHING BIOLOGY

Discussion of biological education in school and university has been particularly active in recent years, stimulated in part by the ferment of ideas about medical teaching. Most of it has a strangely unscientific flavour when one considers that the discussion is carried on by trained scientists. It tends to consist of confident assertions the evidence for which, made up as it is of rather intangible personal impressions, is rarely mentioned. Consider this bald statement, which appeared in a distinguished educational report: "The teaching of science to the young student needs to be essentially dogmatic until, at the age of 16 or 17 years, the mind of the average boy is becoming attuned to the dialectic method." Who would guess (if he did not know from long experience of educational pronouncements) that a questionable hypothesis, not an established fact, is here put forward? What scientist would phrase an equivalent remark in his scientific work in such an unqualified way? A vast tissue of hypotheses about education has been given authoritative tone in the same way. Much of it is of course stimulating; and we need not doubt that much of it, based on the experience, however casual, of very acute minds, will prove to be right when we are at last able to assess its validity. But an attitude which seems so often to disregard the importance of objective validation surely ought to trouble the consciences of scientists.

There is a different approach—to treat biological education as a scientific problem, capable of examination in the light of the evidence, subject even to experimentation. This attitude permeates a most stimulating recent book on biological education.[1] Professor T. L. Green, the author, deals mainly with schools, though he takes occasional despairing glances at the universities. He shows that there already exists objective evidence on many problems. Admittedly much of it is weak, much of it only partly relevant to present conditions in this country. It needs the critical and cautious handling which Professor Green gives it; but it certainly does not merit the neglect it usually receives. This book, however, does more than call attention to the literature; it should have the effect of encouraging investigation, the results of which are the only sure foundation for educational advance. The need for such experimentation in medical education was repeatedly emphasized in the report of the Medical Curriculum Committee of the B.M.A.[2] Of course, education, like the patient, cannot always wait for scientific advance before being taken in hand. But the least teachers can do is to seek objective evidence and, when it cannot be obtained in time, to treat subjective "hunches" with the cautious respect they deserve. Meanwhile a steady trickle of research on problems of school biology has for a long time appeared in such journals as *School Science Review*. The universities on the whole have preferred pontificating; but it is gratifying that a few preclinical departments are in the vanguard of the scientific approach to biological education.

EXAMINATION RESULTS

Examinations are always looming up in the life of medical students, and both they and their teachers will find points of interest in Dr. Lewis-Faning's analysis[3] of examination results in a group of 517 medical students who enrolled at University College, Cardiff, during 1933–42. Ninety-five of the students were exempted from taking not more than two, and 58 were exempted from all three, preliminary subjects. The different standard of teaching in boys' and girls' schools is shown by the proportions exempted. Of the 329 men and 141 women who studied for the Welsh degree 18.8% of the men were let off the examination in physics compared with 7.8% of the women, but for biology 28.4% of the women were granted exemption against 14.9% of the men. Approximately one-quarter of both males

[1] *The Teaching and Learning of Biology in Secondary Schools—With Special Reference to Grammar Schools*, 1949, London.
[2] *The Training of a Doctor*, 1948, London.
[3] *Report on the Examination Performance of Medical Students, 1933-1948.* Published in 1950 by the Welsh National School of Medicine, Cardiff.

and females were allowed to omit chemistry. The percentage of students who obtained the Welsh degree without a single examination failure was 24 for the group without any exemptions in the preliminary subjects, 40 for the group with partial exemption, and 48 for the group with total exemption. The average number of unsuccessful attempts per student for these three groups were 2.7, 1.5, and 1.0 respectively. These comparisons are subject to the limitation that the students who obtained one or more exemptions had fewer examinations to sit than those who were not let off preliminary subjects and hence had a smaller risk of failure; but it does seem that the groups excused one or more subjects contained the most successful students.

The proportion who passed an examination at the first attempt varied considerably for the different subjects. In the final examinations the group which had to take all the preliminary subjects found medicine and forensic medicine the most difficult, with 74% passes in each, while hygiene and surgery, each with 82% passes, were their best subjects. The group with partial exemption also found medicine the most difficult (76% passes), with forensic medicine next (84% passes), while their best efforts were hygiene (94% passes) and pharmacology (90% passes). The experience of the group excused all the preliminary subjects was different: they found surgery and obstetrics and gynaecology the most difficult final subjects, each with 85% passes, while 94% passed in medicine and hygiene at the first attempt. For each subject separately approximately 10% more passed at the first attempt in the groups with exemptions of preliminary subjects than in the group that had to take the lot. Among 2nd-M.B. subjects physiology gave each of the three groups of students some trouble. This examination had the largest average number of unsuccessful attempts of any subject: for the group without exemptions in the preliminary subjects the percentage of unsuccessful attempts was 59, for the partial-exemption group 27, and for the group with total exemption 19.

The report also discusses the performance of students at examinations for the Welsh degree, the conjoint board diploma, and the London degree. Of the 517 students enrolled, 52% attempted the Welsh degree only; 10% the London and Welsh; 23% Welsh and conjoint; 4% Welsh, London, and conjoint; 1% London only; 5% London and conjoint; 2% conjoint only; and 3% never sat an examination. A comparison of performance by kind of qualification is difficult, since only a small number persist in attempts to obtain a dual qualification, and a larger number, after failure in the examinations of one body, concentrate entirely on the other. This self-selection introduces some bias into any comparison of results of different examining boards. The duration of study must also be considered, since almost any student can eventually graduate if the period of study is prolonged. In the final examination the percentage who passed at the first attempt in pathology, obstetrics and gynaecology, and surgery was the same for the Welsh degree and the conjoint diploma, but in medicine 89% passed the conjoint at the first attempt compared with 70% in the Welsh final. These figures do not support the common belief that the conjoint examinations are easier than those for a University degree.

HOW MANY DOCTORS?

It is commonly said that the answer to the problem of the harassed G.P. with an overlong list and to the drooping patient waiting hours in out-patients is simply "We must have more doctors." Enthusiasts for regular health examinations for all in the Peckham manner also base their plans on an increase in the size of the profession. Meanwhile, to judge by the hordes of applicants who continue to besiege medical schools, the National Health Service does not seem to have lessened the attractiveness of medicine as a profession in spite of pessimistic forecasts, and numbers if not quality are certainly available. Bart's, for instance, reports roughly 2,000 applicants for about 100 places this year, King's College Hospital has over 600 for the 40-odd vacancies for men, and the same picture emerges from the general survey of the schools given elsewhere in this issue. The Goodenough Committee in 1944 recommended an annual intake of 2,500–2,600 students in Great Britain and Eire, a range which came close to the *1939–40* entry of 2,623 and which has been followed in all the post-war years. Should this figure be reconsidered and the entry increased?

A glance at the tables under "Doctors and Population" on page 502 of this issue at once reveals three little-known facts with an important bearing on the answer. Since 1920 the average number of people per doctor has dropped very considerably and is now down to about 2,400 per general practitioner; this means we have relatively more doctors for our size of population than any other country except the United States (and Israel); and meanwhile the number of young people in the 15–24 age group from which the majority of students come has shrunk markedly. This group at the same time has other increasing demands on it. The Barlow Committee on scientific man-power estimated the number of qualified scientists in the United Kingdom in 1946 as about 55,000 and reckoned on a demand for 90,000 by 1955. This need has not yet been fully met, but already there is a serious shortage of science teachers, and more applied scientists are wanted in industry.[1]

Since the number of young people capable of higher education to the requisite standard is finite and decreasing, any further increase in the proportion of doctors inevitably implies a decrease in some other category of professional employment. Where do we propose to cut down? It seems more reasonable to accept the present size of the profession as satisfactory, and to concentrate on making more efficient use of its members. It is foolish to spend six or more years training a man and then demand routine work for him which could be much better done by a clerk or auxiliary after six months' instruction. There is clearly an ideal ratio of consultants to general practitioners. And last, but not least important, there is medical training itself, which must produce an efficient man competent for the job he has to do. General practice is very different from hospital practice, and a man who is merely a failed hospital officer is not fully prepared for his work.

[1] *Third Annual Report of the Advisory Council on Scientific Policy (1949-50).* Cmd. 7992. H.M.S.O., 1950.

POSTGRADUATE EDUCATION IN LONDON

The British Postgraduate Medical Federation, which is a school of the University of London, comprises the Postgraduate Medical School at Hammersmith Hospital, with its university departments of general medicine, general surgery, and pathology, and Institutes of Cardiology, Child Health, Dermatology, Diseases of the Chest, Laryngology and Otology, Neurology, Obstetrics and Gynaecology, Ophthalmology, Orthopaedics, Psychiatry, Urology, and Dental Surgery, each associated with a special hospital. These institutes are in various stages of development, and the number of students who can be admitted to the clinical practice of some of the hospitals is limited. Appointments of the house-officer and registrar types in the hospitals and institutes provide the most valuable form of postgraduate education, and there are opportunities for research for selected graduates. At all the institutes courses of instruction are given throughout the academic year; these are suitable for graduates in the early stages of their specialist education, and also for those who have completed their practical training. Two or more years of hospital work in general medicine and general surgery after graduation are normally advisable before beginning work in the special branches. The work at the institutes is of an advanced type and is comprehensive enough to enable graduates with suitable practical experience to prepare for higher degrees and diplomas. Emphasis is placed on clinical and laboratory teaching, supplemented by lectures and demonstrations. The address of the British Postgraduate Medical Federation (director, Sir Francis Fraser) is 3, Gordon Square, London, W.C.1.

To effect co-operation between the Federation and the three Royal Colleges in providing postgraduate education in the medical specialties in London, supplementing the provisions of the undergraduate medical schools and teaching hospitals, there is a Joint Board. Each of the three Royal Colleges arranges courses of lectures in the clinical aspects of its specialty, and the Royal College of Surgeons provides, in addition, courses of lectures and demonstrations in the basic sciences for those intending to be surgical and dental specialists, and in anaesthetics. Each Royal College also provides expert advice and guidance on suitable hospital appointments and programmes of study for candidates for its higher qualifications and other graduates visiting this country for further study.

The Federation is arranging a course of advanced lectures entitled "The Scientific Basis of Medicine" on Tuesday and Thursday afternoons during the autumn and winter terms of the *1950–1 sessions*. The lectures are held at the London School of Hygiene and Tropical Medicine, and are designed specially for research workers and specialists in training; they are open to all registered medical practitioners without fee. A detailed syllabus of the course appeared in the advertisement columns in last week's *Journal* (p. 38).

The regional advisers in postgraduate education to the four metropolitan regions of the National Health Service have continued their surveys of the hospitals in their regions with a view to ascertaining the educational facilities for specialist and general-practitioner training and grading them accordingly. Attendance on the practice of these hospitals and their resident appointments afford valuable opportunities for graduates in need of further clinical experience. Information on these facilities is available at the Central Office of the Federation.

A programme of refresher courses for general practitioners has been arranged at the non-teaching hospitals of the four metropolitan regions. These include several week-end courses and courses spread over two months. Those interested are referred again to the programme of these courses which appears in our advertisement columns.

Prospective postgraduate students should make their arrangements well in advance. Those sponsored by their universities, governments, or other official bodies receive first consideration in the allotment of vacancies. Established specialists from overseas, here for a relatively short time, who wish to see something of the practice in this country, are always welcome; they are regarded as visiting colleagues, and the experts in their specialties are always ready to receive them and let them accompany them in their work and teaching. The Federation maintains an information bureau of postgraduate activities in London and other university centres. All inquiries should be directed to the office of the Federation at the address given above.

Specialist Institutes

Below are given brief particulars of the Postgraduate Medical School and the Institutes associated with the Federation:

Postgraduate Medical School of London (associated with Hammersmith Hospital, Ducane Road, W.12).—University departments in medicine, surgery, and pathology. Teaching in clinical departments, which is of an advanced nature and based on ward work, continuous throughout the year and supplemented by lectures and demonstrations during three 10-weeks terms beginning in October, January, and April. A formal 12-months course beginning in October available for the postgraduate diploma in clinical pathology of the University of London; selection of students usually made in June. Department of pathology has separate suites of laboratories for bacteriology, histology, biochemistry, haematology, and experimental pathology. Department of radiology provides courses for D.M.R. of the University of London and Conjoint Board. Students accepted for practical training in anaesthetics for periods of from two weeks to six months. Resident clinical appointments usually made from suitable students at the school.

Institute of Cardiology (associated with National Heart Hospital, Westmoreland Street, W.1).—Seven appointments of registrar type available each year for physicians in training as cardiologists. Three terms annually, beginning October, January, and May. Training includes clinical cardiology, radiology of the heart, and electrocardiography. Research facilities available for limited number of advanced students. General physicians may enrol for full or part-time instruction for one or more terms of three months' duration. Three intensive courses of lectures and demonstrations, each lasting a fortnight, held in February, June, and November.

Institute of Child Health (associated with Hospital for Sick Children, Great Ormond Street, W.C.1, Postgraduate Medical School at Hammersmith Hospital, and Queen Elizabeth Hospital for Children).—Tuition provided throughout the year in three terms, beginning September, January, and April, and in addition a series of lectures by specialists and experts in various spheres is given each term. Every student has the opportunity of holding a clinical clerkship for one month during his study.

Institute of Dental Surgery (associated with Eastman Dental Hospital, Gray's Inn Road, W.C.1.).—Dental practitioners are trained in the special branches of preventive and therapeutic dentistry, and departments are being developed for orthodontics, children's dentistry, periodontia, prosthetics, and oral surgery. Appointments of house-officer, registrar, and clinical assistant types available for selected graduates.

Institute of Dermatology (associated with St. John's Hospital for Diseases of the Skin, Lisle Street, W.C.2).—Clinical teaching takes place in out-patient department twice daily. A long and systematic course of lectures during winter months and a shorter course during the summer. Owing to restricted accommodation, no ward instruction is yet possible.

Institute of Diseases of the Chest (associated with Brompton Hospital, S.W.3, and London Chest Hospital).—Courses of instruction in diseases of the chest, including tuberculosis, conducted during three terms of twelve weeks' duration, beginning in September, January, and April. Courses consist of clinical work in the wards and out-patient departments, lectures, and demonstrations. A larger number of graduates can be accepted for part-time study. Part-time courses of instruction in radiology of the chest, each lasting twelve weeks, are held three times a year for suitably experienced graduates.

Institute of Laryngology and Otology (330, Gray's Inn Road; associated with Royal National Throat, Nose, and Ear Hospital, Gray's Inn Road, and Golden Square).—Full-time comprehensive courses of lectures and demonstrations, lasting for nine months, begin in February and September. First three months spent in the study of the anatomy, physiology, and pathology of the subject, and following six months with clinical aspects. Part-time advanced revision course, suitable for students preparing for higher qualifications, held twice yearly. A number of paid appointments open to students after completion of basic training in specialty.

Institute of Neurology (associated with National Hospital for Nervous Diseases, Queen Square, W.C.1, and Maida Vale Hospital for Nervous Diseases).—Teaching mainly by attendance on hospital practice; more advanced students appointed as clinical clerks in wards or attached to special departments and research laboratories. Two 10-weeks whole-time courses in clinical neurology held in autumn and spring terms, and in summer a six-weeks course in neurosurgery.

Institute of Obstetrics and Gynaecology (associated with Queen Charlotte's Maternity Hospital, the Chelsea Hospital for Women, and the Department of Obstetrics and Gynaecology at the Postgraduate Medical School).—Teaching based on ward work and supplemented by lectures and demonstrations during three 10-weeks terms, beginning in October, January, and April. Short intensive revision courses of a fortnight's duration held twice a year, in June and December. During vacation selected postgraduates may attend practice of hospital at Queen Charlotte's or Hammersmith. Resident house appointments and registrarships available for selected graduates.

Institute of Ophthalmology (Judd Street, W.C.1; associated with Moorfields, Westminster, and Central Eye Hospital).—Clinical work in out-patient department, wards, and operating theatres of the hospital, supplemented by lectures, practical classes, and tutorials at the institute. A routine lecture and tutorial course, normally covering two terms of about eighteen weeks each, begins in March and October each year. Laboratories for bacteriology, histology, and biochemistry, and research in all associated fields.

Institute of Orthopaedics (associated with Royal National Orthopaedic Hospital, Great Portland Street, W.1).—Training in orthopaedics to selected graduates afforded by means of clinical appointments covering a period of from two to three years, with opportunities for research. Formal courses of varying lengths on selected subjects connected with the specialty are given during the academic terms. Twice a year, in April and September, a short revision course.

Institute of Psychiatry (associated with the Maudsley Hospital, Denmark Hill, S.E.5, and Bethlem Royal Hospital, which jointly form a teaching hospital).—Training normally covers two to three years after adequate experience elsewhere in general medicine, and is based on responsible hospital duties under supervision. Appointments available as registrars and research assistants. Regular series of lectures and demonstrations by experts in various fields relating to psychiatry are given throughout each of the university terms, which begin in October, January, and April. Clinical teaching continues throughout the year, and includes seminars and case discussions. Besides the wards and clinical departments there are laboratories in neuro-anatomy, electro-physiology, biochemistry, and psychology.

Institute of Urology (associated with St. Peter's and St. Paul's Hospitals, Henrietta Street, W.C.2)—Three courses of fourteen weeks' duration held annually, beginning in September, January, and April. These courses include systematic lectures covering the whole subject of urology, out-patient sessions, ward visits, operation sessions, and tutorial demonstrations. In addition an intensive revision course of two weeks' duration is held in September, March, and June. Resident appointments and clinical assistantships available for selected students already adequately trained in general surgery.

Advanced Revision Courses in Surgery

Of the London Medical Schools, Guy's, the London, St. Bartholomew's, St. Thomas's, and Westminster provide full-time advanced revision courses in surgery of from eight to twelve weeks. The fee is 40 guineas, save at Westminster, where it is 50 guineas. The North London Postgraduate Medical Institute provides an eight-weeks course (fee 25 guineas). The Royal College of Surgeons has a part-time demonstration and lecture course, lasting 2½ weeks and beginning in October and April, the fee being 12 guineas.

The Royal College of Surgeons has also arranged a number of other lectures and demonstrations. Between October and January and also between April and July there will be a series of 20 lectures and practical demonstrations in anatomy, applied physiology, and pathology. In anaesthesia two series, each of 45 lectures, will be given in October and April. In addition courses extending over a period of from one to two years are being arranged. Lectures and demonstrations in oral, dental, and general surgery, in conjunction with the Eastman Dental Clinic, will be given in October and November and also in March and April, and lectures and practical demonstrations on the application of the basic sciences to dental surgery have been arranged. In surgery two series, each of 24 lectures, will be given during October and April.

Facilities are available for advice on postgraduate orthopaedic training through the Postgraduate Orthopaedic Committee which, with its headquarters at the College, has been established under the aegis of the College, the Royal College of Surgeons of Edinburgh, the Royal Faculty of Physicians and Surgeons of Glasgow, the British Orthopaedic Association, the Institute of Orthopaedics of the British Postgraduate Medical Federation, and the Department of Orthopaedics of the University of Liverpool.

Residential accommodation is now available within the College at Lincoln's Inn Fields for postgraduate students.

The Royal College of Physicians of London holds a series of lectures for postgraduates on advanced clinical subjects. The lecturers are specially distinguished in their respective fields and are drawn from the provinces as well as London.

Courses of advanced postgraduate lectures are given at the Royal College of Obstetricians and Gynaecologists, and there are frequent special lectures by men and women eminent in this field. There is a library and museum in the College House at Queen Anne Street which is open to all who are interested in these subjects.

An important step forward has been taken by the Middlesex Hospital in increasing the number of registrars. This means that more men can receive postgraduate instruction with a view to becoming future consultants and specialists.

The North London Postgraduate Medical Institute (Prince of Wales's General Hospital, London, N.15) holds courses in advanced medicine, advanced surgery, and obstetrics and gynaecology, and instruction is given in pathology, anaesthetics, and radiodiagnosis. Clinical instruction is given at Bearsted Memorial Hospital, Chase Farm Hospital, North Middlesex Hospital, Prince of Wales's Hospital, and St. Ann's General Hospital. During the coming year there will be eight-week courses in advanced medicine suitable for those taking the M.R.C.P. examination, eight-week courses in advanced surgery suitable for those taking the F.R.C.S. examination, and two-week courses for those taking the D.Obst.R.C.O.G. examination.

The Tuberculosis Educational Institute (Tavistock House North, Tavistock Square, W.C.1), which is composed of representatives of the Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis, undertakes responsibility for the organization of regular refresher courses for doctors, nurses, and social workers. A course, for doctors only, dealing with the pathology and immunology of tuberculosis will be held at the Sir William Dunn School, Oxford, from September 19 to 22. Preliminary arrangements are being made for a course in industrial tuberculosis at Birmingham in 1951. Three-day clinical courses are held at certain provincial sanatoriums throughout the year.

The Royal London Homoeopathic Hospital (Great Ormond Street and Queen Square, London, W.C.1) provides a course of lectures in homoeopathy for postgraduates. These include a course on homoeopathic materia medica and therapeutics on Mondays and Thursdays from October, 1950, to March, 1951, and a course at the Glasgow Homoeopathic Hospital from January to March, 1951.

A refresher course for general practitioners, extending from September to December, 1950, and covering general medicine and obstetrics and gynaecology, is being held under the auspices of the British Postgraduate Medical Federation at various hospitals in and around London, including hospitals at Rochester, Folkestone, Brighton, Southend-on-Sea, Horsham, and Ilford. Some of the courses are for one or two weeks, and others for the week-end. These courses are available to N.H.S. practitioners for whom fees and allowances (travelling expenses, fees for locumtenents, etc.) are provided for courses equivalent to 22 half-day sessions a year, on certain conditions. Other practitioners may attend on payment of a fee of 10 guineas for two weeks, 5 guineas for one week or for equivalent extended courses, and of 1½ guineas for week-end courses.

Fellowship of Postgraduate Medicine

The Fellowship of Postgraduate Medicine (1, Wimpole Street, W.1) provides general information on postgraduate work and arranges courses of instruction as follows:

1. Courses suitable for, though not restricted to, candidates for the D.A., D.C.H., D.Obst.R.C.O.G., M.R.C.P., and F.R.C.S. (Final). These include general medicine, general surgery, neurology, neuro-ophthalmology, proctology, obstetrics, and children's diseases. Some are full-time courses lasting from one to two weeks; others are spread over longer periods, either in the mornings, afternoons, or late afternoons, and are intended particularly for postgraduates who are not free for full-time study.

2. Week-end courses, occupying the whole of a Saturday and Sunday. These are given in various hospitals, and include such subjects as general surgery, general medicine, orthopaedics, rheumatic diseases, and infectious diseases.

THE LONDON UNDERGRADUATE SCHOOLS

The past year has seen little change in the London medical schools. One of the deans, in answer to our request for information, writes regretting that his account is "an annual monotony and a lack of really exciting things."

To begin in the East, the London Hospital Medical College has seen no major changes in the clinical curriculum. The introductory course has been further co-ordinated, and the system of lectures is being reorganized to provide greater integration. The students benefit increasingly from the tutorial system, and the fact that this system requires a large number of registrars increases the facilities for giving postgraduate training. Registrars meet once a fortnight for a ward-round, during which cases of interest in different parts of the hospital are shown and discussed. The clinico-pathological conferences held every two weeks during the last three years have become a valuable addition to the training of undergraduates and postgraduates alike. Structural alterations have much improved the facilities of the departments of anatomy and physiology.

The London Hospital now maintains 885 beds, of which 699 are at the hospital itself and 186 at the annexe at Brentwood. About 40 students are admitted to the clinical course each half-year.

At the Medical College of St. Bartholomew's Hospital the total number of students remains at approximately 800. Until the new regulations for the work to take the place of that now done in the first and second M.B. are agreed and passed from the University to the schools it is not possible to do very much in the way of altering the preclinical curriculum. Preparations are being made for knitting together the work of the zoologists with the anatomists, and that of the chemists and physicists with that of the physiologists, biochemists, and pharmacologists. But so long as the first and second M.B. remain very much in their present form these plans cannot be put into full action. In the clinical years the policy at "Bart's" still remains to teach medicine as a single subject, and not let its main branches of surgery, obstetrics, and clinical medicine fly into too many splinters and specialties. The pressure to do so is great, because with the increasing specialization in the clinical work it is difficult to avoid any special courses in thoracic surgery, neurosurgery, cardiology, and the like; but it is felt that such courses are for the postgraduate rather than the undergraduate.

Many of the problems at West Smithfield are still wrapped up with the difficulty of getting sufficient buildings. Progress is being made, but much more is expected in the replacement of war damage and in catching up with the new buildings which would have been needed in any case had a war not taken place.

Across the river at Guy's there are 80 vacancies in the preclinical period, of which roughly two-thirds are for the first year, the remaining third entering the second year, the first M.B. having been already passed. In addition, 25 places are reserved for Oxford and Cambridge men for the clinical period of studies. All students take a three-months preliminary course before entering the wards.

The accommodation at Guy's has been increased during the year by a small extension to the new pathology building which, with some additions to the existing building, has provided accommodation for a department of bacteriology. An academic department of bacteriology was instituted in October of last year, when a professor was appointed. The extension has also afforded some additional animal-house accommodation, and a research laboratory for the clinical departments has been provided by reconstructing a floor of the old pathology building. Most departments of the School are in need of more space, and it is hoped to begin to provide this during the course of the next year. An important development will be the institution of a number of research fellowships in the clinical departments, made possible by the Endowments Committee of the hospital.

Reorganization at St. Thomas's

The past year at St. Thomas's Hospital Medical School has seen a complete reorganization in equipment and accommodation of the medical and surgical clinical units; the former has a particularly fine range of laboratories. The School is now back to pre-war conditions, except for shortage of beds and temporary loss of hostel accommodation, though extra space is badly needed in nearly all departments. Various small research laboratories have been completed and work is actively proceeding in them. The photographic department is proving a great boon to both school and hospital. At Cobham, Surrey, which is 45 minutes away, the athletic ground purchased two years ago is now fully developed and provides excellent facilities.

Over 70 new students have entered the Westminster Hospital Medical School in the academic year now closing. This brings the total of clinical students to 175, of whom 20 are women. It is not the policy of the School to exceed this entry, but it is considered that there are adequate clinical facilities for such a number.

With the object of increasing the clinical material available for Westminster students a medical "firm" of 12 students is sent to the near-by St. Stephen's Hospital every three months, and this arrangement is working well. Five members of Westminster staff are also on the St. Stephen's staff, and with the keen co-operation of the remaining St. Stephen's physicians a very sound course is assured. In addition, two students at a time are resident at St. Stephen's for practical midwifery instruction, and this arrangement substantially augments the facilities available in the parent hospital. During the past year the surgical teaching resources have been greatly increased by attaching a surgical "firm" to the Gordon Hospital, Vincent Square, a hospital which originally specialized in diseases of the rectum but now admits general surgical cases. The paediatric course is held each three months at the Westminster Children's Hospital, Vincent Square. The incorporation of this hospital and of the Gordon and All Saints' Hospitals in the teaching group has added enormously to the clinical facilities since the "appointed day," and has permitted a balanced clinical curriculum to be secured. An inspection was held by the University in December, 1949, and the inspectors' report commented favourably on the standard of work and facilities in the School.

Medical Curriculum Revised

At King's College Hospital Medical School, Denmark Hill, the medical curriculum has been revised and has been operating successfully since January of this year. The tradition of the apprenticeship method has been maintained, and students are allocated to medicine, surgery, and obstetric "firms" for periods of six months, as it is considered impossible for teachers to get to know their students properly in less than that time. The new curriculum provides for the integration of some of the specialties into the six-monthly periods of medicine and surgery and also for an additional period of three months' senior medical clerking and three months' senior surgical dressing in the third year, when the student is attached to a different "firm." Three months is devoted to child health, including attendance at school and infant-welfare clinics and a two-weeks residential period at the Belgrave Hospital for Children. Revision courses on the work of the clinical period are conducted by the tutors preceding the final degree examinations. During the 12 months up to May, 1950, 43 students gained qualifying degrees in medicine in the Universities of Oxford, Cambridge, and London, including two with honours in one or more parts. A student of the School was awarded the University of London Medal in the April, 1950, M.B., B.S. examination.

Each year 50 medical and 25 dental students are admitted to the King's College Hospital School. The School provides the clinical training for men and women students reading for the medical degrees of the above-named universities. The preclinical course for students reading for the University of London

degrees of B.M. and B.S. is taken in the Faculty of Medical Science, King's College, Strand, where students are admitted once a year, in October. Thus for the first two to three years of their medical training King's College students have the great advantage of college life in association with students of all faculties. Students are admitted for clinical training twice a year—in April and October. The first three months are occupied by an intensive introductory course designed to familiarize the student with clinical methods, the examination of patients, hospital nursing and routine, and the basic principles of pathology.

Eighty students have been accepted for entry into St. Mary's Hospital Medical School, and the number of applications for places available is still very large. Arrangements have been made for St. Mary's students to attend at Paddington Hospital for part of their medical and surgical appointments, thus increasing the number of beds available for the teaching of these important subjects. Use is being made of the hospitals associated with the St. Mary's group for clinical teaching. A new appointment has been made to the chair of surgery, and new readers in anatomy, bacteriology, pharmacology, and physiology were also appointed at the beginning of the session. Alterations are being made to the anatomy, physiology, and physics departments in order to increase the facilities for teaching and research. It is hoped to provide new laboratories for the surgical and paediatric units shortly. A large block of houses near the medical school has been purchased for conversion into a students' hostel for the accommodation of about 200 students, to be ready in two years' time. No great changes have been made in the curriculum, but consideration is being given to the period of each clinical appointment in order that the best use may be made of the 36 months available to cover the clinical course.

New Plans for Charing Cross

On the basis of the present entry at Charing Cross Hospital Medical School about 40 students will qualify each year. In addition to the 27 house posts available in the parent hospital, there are nearly as many at the associated hospitals—Harrow, Mount Vernon, and Wembley—and it is not anticipated that there will be any difficulty in providing every student with satisfactory posts. The plans of the new Charing Cross Hospital and School to be built at Northwick Park have been formally presented to the Ministry of Health, the Court of the University, and the University Grants Committee. They provide for a hospital with 800 beds and a school to admit 80 medical and 40 dental students a year to cover all subjects of the medical curriculum. The plans of the school include a hostel, a union building, a teaching block, refectory, hall, library, and administrative section with their ancillaries. It is hoped that official approval will shortly be given to the plans and that the work of building will begin. As a measure of short-term expansion a lease has been taken of certain premises in the vicinity of the School at Charing Cross, and when alterations are complete the departments at present housed in the School will be transferred there, enabling extension to be effected not only of the transferred but also of the departments remaining at Chandos Place.

The Royal Free Hospital School of Medicine is now open to men as well as women, and this year has had 487 students in attendance. Candidates for admission in 1951 will be selected by an interviewing committee during the coming autumn term.

The new wing which is being added to the School building in Hunter Street will be available for use next session and will provide additional teaching and research laboratories and a students' common-room. Clinical teaching is given throughout the hospitals associated with the Royal Free Hospital group, which includes the main hospital in Gray's Inn Road, the hospitals in Liverpool Road, Islington, and Lawn Road, Hampstead, the Elizabeth Garrett Anderson Hospital, and the Hampstead General Hospital. This provides a total of 800 beds, and it is hoped that more beds will shortly be available at Liverpool Road. Arrangements have been made for the sharing of social and recreational clubs between the Students' Union of the School and the Students' Union of Guy's.

The West London Hospital Medical School at Hammersmith is for the moment admitting no further undergraduate students, and the present undergraduate population will probably all have completed their course by 1952. The only change at this School during the past year has been that a certain number of postgraduate students from the Postgraduate Medical School at Ducane Road, Shepherd's Bush, have been attending during the past two academic terms. The extent of future co-operation with the Postgraduate School is still undecided.

The Middlesex Hospital has now been fully reopened, and in fact there are more beds available for teaching than before the war. Facilities for instruction in the clinical period are enhanced by the fact that the majority of students in their clinical period have the advantage of being attached to the Central Middlesex Hospital, Willesden, for at least three months' instruction. Two improvements in the clinical period have been recently introduced. The students now do three weeks' resident instruction in infectious diseases at the North-Eastern Fever Hospital. Still more recently the students have been enabled to visit the Harefield Hospital for instruction in pulmonary tuberculosis.

The advantage of the link with associated hospitals is also enjoyed by most of the London Schools. University College Hospital, for example, has associated with it the Obstetric Hospital and the Royal Ear Hospital in Huntley Street, the Hospital for Tropical Diseases, and the St. Pancras Hospital (formerly an L.C.C. institution).

King's College (University of London) provides education in the preclinical stage for the University of London, M.B., B.S. degree. On completing their preclinical studies students proceed to King's College Hospital, St. George's Hospital, or Westminster Hospital, according to their personal choice. No student is allowed to begin preclinical studies at the College who has not also been provisionally accepted by the hospital for clinical training. Men making application for entry to King's College should apply at the same time to one of the hospitals. The maximum number of women to be admitted in any one year is eight for King's College Hospital Medical School, six for St. George's, and six for Westminster. Applications for women students should reach the Sub-Dean of the Faculty of Medical Science, King's College, Strand, W.C.2, by the end of the year preceding the session in which admission is desired.

POSTGRADUATE COURSES OUTSIDE LONDON

We cannot pretend to give a complete list of the courses of postgraduate instruction held at universities and colleges in the United Kingdom outside London. Courses of advanced instruction in general medicine and in general surgery are held at Edinburgh (Postgraduate Board for Medicine, Surgeons' Hall, Nicolson Street, Edinburgh) and advanced revision courses in general medicine at Liverpool and Sheffield. A nine-months course in general surgery at Liverpool, beginning in October, is directed towards the Ch.M.(Liv.), but is suitable also for F.R.C.S. candidates. Courses in anaesthetics are given at Bristol, Liverpool, and Oxford; in anatomy, physiology, and pathology at Edinburgh; in neurology and in ophthalmology at Birmingham; in orthopaedic surgery at Liverpool; in paediatrics at Bristol, Glasgow, and Liverpool; in physical medicine at Bristol; and in psychiatry at Bristol, Edinburgh, Glasgow, and Leeds. Some information about other courses is given under the heading of "Special Diplomas."

The course in general medicine at Liverpool is part-time, and intended for postgraduates holding registrar or similar appointments and at the same time studying for a higher degree. Graduates attending the course who do not hold hospital appointments may be offered facilities for clinical experience in the wards. Part-time extended courses in obstetrics and gynaecology are held at Liverpool from time to time, as well as refresher courses for general practitioners, but it is said that the number of general practitioners seeking to avail themselves of such courses does not appear to be very great.

At Leeds there is a part-time course for the Diploma in Psychological Medicine. The course lasts two years. For general practitioners, weekly clinical meetings are organized at Leeds University from October to May, while week-end courses on special subjects are also held at intervals throughout the year.

At Glasgow postgraduate medical instruction is available, in the form both of clinical attachments and of organized courses. The transition from the Class I and Class III Government-subsidized posts to the registrarships of the National Health Service has led to the abandonment for the present of prolonged full-time postgraduate courses in general medicine and general surgery, but it is hoped to resume organized instruction in these subjects during the coming session. Courses in child health and in mental deficiency have been held during the past year, and the latter will be repeated at the beginning of the ensuing session. Periodic refresher courses for general practitioners are also held.

The Postgraduate Medical Education Committee of the University of Oxford (91, Banbury Road) has arranged a programme of ward rounds, clinics, and lecture-demonstrations at the United Oxford Hospitals. Some eight or ten of these in different departments take place each week-day. The programme extends from September to December, and another programme, with other physicians and surgeons on duty for postgraduate teaching, is arranged for January to July, 1951. Short courses in special subjects (otolaryngology, paediatrics, and dermatology) are available at the United Oxford Hospitals during the Michaelmas term provided that not less than six general practitioners apply to attend each course. These programmes provide for practitioners who wish to attend one or more short courses, those who wish to spend a week, a fortnight, or longer in intensive study, and those who wish to attend any number of "sessions" convenient to themselves during the postgraduate year. The programmes are circulated to general practitioners by the various executive councils in the Oxford region.

UNIVERSITY MEDICAL CENTRES OUTSIDE LONDON

All the provincial medical schools report an excess of applicants. Birmingham: "The number of students wishing to enter the Faculty still far outnumbers the vacancies." Bristol: "The applications for admission remain extremely high, and we are able to accept only about 1 in 10 of the applicants." Liverpool: "The number of applications for admission is slightly less than in previous years, but is still greatly in excess of the number of places available." Durham: "Selection of candidates for entry to the courses has again been difficult owing to the very large list of applicants." Leeds: "Applications for entry to the School have continued to exceed by many hundreds the places available."

In the Faculty of Medicine at Birmingham a new method of selection has been used. Those whose names are included in a preliminary short-list made by the sub-dean are interviewed by a selection committee. It is thought that by this means greater emphasis can be placed on the personality and general suitability of the candidate; the academic record, although important, is not regarded as the sole criterion for entry. The committee has two or three permanent members, but in addition all the professorial members of the Faculty and some of the senior members of the staff of the teaching hospital are asked to serve in rotation. At Leeds also, while examination results and headmasters' reports are taken into account, considerable weight is also attached to the impression made by a candidate at interview. This interview is carried out by a panel of interviewers, each candidate being seen by three members of the panel.

Integration of Subjects in Curriculum

The integration of subjects in the medical curriculum in the Birmingham Medical School has been carried a step further during the present year. Following the three-months introductory clinical course in medicine and surgery, obstetrics, paediatrics, pharmacology, pathology, and social medicine, the teaching in these subjects is now spread over the whole of the three clinical years, and these subjects are all included in the final examination. This examination has been divided into three parts, the first of which can be taken 12 months before the other two. There is now only one examination between that in anatomy and physiology and the final examination. Moreover, for the final examination boards of examiners have been formed so that, for instance, the professor of pathology will take part in the examination in surgery and medicine. In this way it is hoped to demonstrate to the student an essential unity in the subjects which he has to study and, particularly, that pathology is the fundamental basis of medical practice. In the School of Medicine at Leeds a major review of the entire curriculum is being undertaken, and in this the views of the Goodenough, the B.M.A., and the Royal College of Physicians Committees, together with the recommendations of the General Medical Council, are being taken into account.

At the Medical School, King's College, Newcastle-upon-Tyne (University of Durham), several changes will be made in 1951 in the courses of study for the M.B., B.S. degree. The pharmacology course will be spread over a period of three terms, in place of the previous two terms, and will be given in the first clinical year. The course in pathology and bacteriology will be increased from three to six terms, and the examination, which forms Part I of the third M.B., B.S., will be taken at the same time as Part II (public health and medical jurisprudence)—that is, in the Epiphany term of the fifth year. There will also be changes in the arrangements for clinical appointments in the teaching hospital. The introductory clinical course will be given during the Easter term of the third year, and clinical appointments will begin in July in place of the previous arrangement whereby these appointments began in October. The clinical appointment in midwifery and gynaecology has been increased from three months to six months, and the requirements as to residence in midwifery increased from one month to two months. Junior and senior appointments will be held with one month's residence in each period. By agreement with the Newcastle-upon-Tyne Regional Hospital Board and the Newcastle Management Committee, part of this residence will be at the Newcastle General Hospital.

At Liverpool there have been no changes of a major kind in the curriculum, but classes in clinical pathology and clinical psychiatry are being more closely related to the study of clinical medicine in the wards. Dressing in the casualty department has also been more closely related with surgical ward work.

One interesting departure at Liverpool is the extension of facilities to students (already exempted from some of their premedical subjects) to attend, without further fee, classes of general cultural interest in other faculties. Many students have availed themselves of this, and it has proved a very successful venture. The classes attended have been principally in languages, social science, psychology, law, philosophy, and statistics, all of which will prove of undoubted use at a later stage of their career.

New developments at Leeds Medical School during the year include the institution of a chair in medical physics, and it is hoped that full-time chairs in surgery and in obstetrics and gynaecology, which have long been planned, will be filled in the near future. Accommodation in the School of Medicine is now insufficient for the needs of many departments, including the library, where the problem is very acute. The difficulty is being overcome so far as possible by the acquisition and conversion of suitable houses in the neighbourhood. This, of course, is a temporary expedient, and the problem will not be wholly met until the long-term plans for a new medical school are put in operation.

Curriculum Rearrangements

At Bristol the curriculum for social and preventive medicine is being rearranged, and the teaching in this subject has been advanced into the preclinical years, some lectures on vital statistics being given in the second year, and the main course of social and preventive medicine proper will in future begin in the third year, and be continued with lectures and demonstrations in the fourth and fifth years. By this means it is hoped

to give the students an insight into social problems from their earliest years and to maintain this interest throughout their course.

In the Sheffield Faculty of Medicine, from October of this year, the chair of obstetrics and gynaecology will be established upon a full-time basis. The first occupant of the chair under the new conditions will be Mr. Charles Scott Russell, lately reader in this subject in the University of Manchester. The new orientation in regard to respiratory disease is shown in the change of title of the lecturer in tuberculosis to that of "lecturer in chest diseases." The recently appointed venereologist for the Sheffield area becomes lecturer in this subject at the University.

The increasing number of students at Sheffield has recently raised difficulties in relation to residential hospital accommodation and refectory facilities. These difficulties have been greatly eased by the opening of a residency within the precincts of the Royal Hospital, providing living accommodation for 10 students and refectory facilities for some 70 to 80. The student health service (which, of course, covers not only the Faculty of Medicine but the whole University, as well as the nursing staff of the United Sheffield Hospitals) continues to expand. A second assistant medical officer has just been appointed. B.C.G. vaccination is available to all who require or wish it.

From Birmingham Medical School it is reported that the experiment of appointing two professors of pathology is proving a great success, and the extent of the research work now being undertaken by them is impressive. The provision of new accommodation for cancer research is almost complete, and negotiations are being undertaken with the British Empire Cancer Campaign whereby the cancer research laboratories will be taken over by the department of pathology. The anatomical research laboratories are, at long last, nearing completion. The department of neurological studies still lacks a professor or a reader in psychiatry, but the staff has been strengthened by the appointment of a first assistant. The dean mentions the continued help and encouragement which the medical faculty and the teaching hospital receive from the regional hospital board. "The occasions on which this has occurred are too numerous to detail, but mention should be made of the joint appointment of regional consultant advisers in plastic surgery, neurosurgery, and thoracic surgery, and of the provision at Dudley Road Hospital of residential quarters for students attending that hospital for clinical instruction in obstetrics. The cost of this building has been defrayed by the University Grants Committee."

Clinical Research Laboratories at Manchester

Before the war, laboratory facilities for clinical research in the Faculty of Medicine in the University of Manchester were confined to one laboratory. An important development in recent years has been the provision of clinical research laboratories for the departments of medicine, haematology, research in rheumatism, and cardiology at the Manchester Royal Infirmary. A new operating theatre and ancillary accommodation for neurosurgery was opened by Lord Webb-Johnson earlier in the summer. In addition, a temporary clinical sciences building is now in course of erection and this will provide accommodation for research in pathology, rheumatic diseases, experimental medicine and surgery, occupational health, child health, and oto-rhino-laryngology. There are also laboratory facilities at the Manchester Royal Eye Hospital for the department of ophthalmology.

The first full-time professor of psychiatry at Manchester has now taken up his appointment, and it is hoped shortly to provide more extensive accommodation and better arrangements than now exist for undergraduate and postgraduate teaching in psychiatry.

Until a year ago the clinical subjects in the final examination for the degrees of M.B., Ch.B. had to be taken together. A recent development has been the division of this section of the final examination into Part II (obstetrics and gynaecology, and paediatrics) and Part III (medicine and surgery), though both parts of the examination may be taken concurrently if the student so desires.

When the period of compulsory residence is introduced about 100 posts will be required, but there should be no difficulty in providing these in the hospitals of the Manchester Regional Board and of the board of governors of the United Manchester Hospitals.

Lectures in the history of medicine are to be instituted next session.

The Welsh National School of Medicine

The most important development in the Welsh National School of Medicine (University of Wales) is in connexion with an entirely new medical teaching centre. This scheme has been under continuous consideration and negotiation for several years, but is now taking concrete form. The Cardiff City Council has agreed to sell land—at present open space within easy reach of the centre of the city—extending to 53 acres for an entirely new general hospital and medical school. It is possible that other units serving the Welsh Regional Hospital Board will also be erected on this site. Application has been made to the Treasury to acquire the site and proceed with the scheme.

Other developments in the Welsh National School have included the reallocation among the visiting staff of beds in the Cardiff Royal Infirmary and the Llandough Hospital (formerly municipal but now one of the United Cardiff Hospitals), and transport to Llandough has been arranged which enables the beds to be much more fully used for teaching. A new chair and department of child health have been established, centred mainly on Llandough Hospital. A new central library for the Medical School was formally opened by the vice-chancellor of the University, and in conjunction with it an examination-room has been added in order to cope with the increased number of candidates for the Welsh degrees. The new Institute of Pathology, which has been under construction for some years, is nearing completion. When it is finished accommodation at present used for pathology will become available for research in anaesthetics, which is recognized as the responsibility of the Medical School. A new maternity hospital of 87 beds, with accommodation for teaching students in midwifery and in the health of the newborn, the erection of which was begun before the war, but was suspended, is now being completed.

QUALIFYING DEGREES AND DIPLOMAS

In Great Britain medical degrees or diplomas are awarded by the universities and also by certain licensing corporations. The abbreviations for registration following a pass in the final examinations are: M.B., Ch.B., U.Birm.; M.B., Ch.B., U.Brist.; M.B., B.Chir., U.Camb.; M.B., B.S., U.Durh.; M.B., Ch.B., U.Leeds; M.B., Ch.B., U.Lpool.; M.B., B.S., U.Lond.; M.B., Ch.B., V.U.Manc.; B.M., B.Ch., U.Oxfd.; M.B., Ch.B., U.Sheff.; M.B., B.Ch., U.Wales; M.B., Ch.B., U.Aberd.; M.B., Ch.B., U.Edin.; M.B., Ch.B., U.Glasg.; M.B., Ch.B., U.St.And.; M.B., B.Ch., Q.U.Belf.; M.B., B.Ch., U.Dubl. (also L.Med., L.Ch., U.Dubl.); M.B., B.Ch., N.U.Irel.; L.M.S.S.A.Lond.; L.A.H.Dubl.; L.R.C.P.Lond., M.R.C.S.Eng.; L.R.C.P., L.R.C.S.Ed.; L.R.F.P.&S.Glas.; L., L.M., R.C.P.Irel.; L., L.M., R.C.S.Irel.

The Conjoint Boards

About one-fifth of those who qualified last year took the diplomas in the English Conjoint. Candidates for the English Conjoint are examined by the examining board in England of the three Royal Colleges (Examination Hall, Queen Square, W.C.1). Three examinations have to be passed: a pre-medical examination; a first examination in anatomy, physiology, pharmacology, and materia medica; and a final examination in pathology and bacteriology, medicine, surgery, and midwifery and gynaecology. Candidates are required to complete the medical curriculum extending over not less than 57 months of study at recognized medical schools and hospitals, and to pass the professional examinations in accordance with the regulations after passing any two parts of the pre-medical examination.

The examining board does not itself conduct the preliminary examination in general education, but it recognizes a number of matriculation examinations and school-leaving certificates.

The board's examinations are conducted four times a year, and candidates are required to give notice to the secretary of the board 21 days before the examination. The first medical examination is in two parts: (1) anatomy and physiology, written, oral, and practical, and (2) pharmacology and materia medica, oral only. In the final examination, medicine and surgery and midwifery and gynaecology are written, clinical, practical, and oral; pathology is written and oral only, and may not be taken alone as the last part of the examination.

Candidates with evidence of not less than 27 months' recognized clinical study subsequent to passing in anatomy and physiology are admissible to any one part only of the examination; on the completion of 30 months' study they are admissible to one or two further parts, or to three parts if presenting themselves for the first time. Candidates may not enter for the last part of the examination until they have completed 33 months' clinical study.

The board will be issuing new regulations regarding the acceptance of the general certificate in education, but as the Royal Colleges have not yet given final approval to those regulations they cannot be incorporated in this article.

The two Royal Colleges of Edinburgh and the Royal Faculty of Glasgow have an arrangement by which after one series of examinations students may obtain diplomas of the three co-operating bodies. Each of these bodies grants its single diploma after examination, but this does not confer the right to qualifying registration. Professional study embraces a certified period of not less than five academic years, in the last three of which clinical subjects must be studied. The first examination embraces physics, chemistry, and biology; the second, anatomy and embryology, and physiology, biochemistry and biophysics; and the third, pathology, materia medica, and pharmacology. The final examination is in two parts: the first, forensic medicine and public health; and the second, medicine, surgery, and obstetrics and gynaecology. Candidates for the Scottish Conjoint may work at any of the medical schools of Great Britain and Ireland. Details may be obtained from the Registrar, 18, Nicolson Street, Edinburgh, 8.

The Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland issue a joint licence in medicine, surgery, and midwifery, and candidates are accepted from most of the medical schools at home and overseas. The regulations are obtainable from the secretary of the Conjoint Board, Royal College of Surgeons, St. Stephen's Green, Dublin.

Other Registrable Diplomas

The Society of Apothecaries of London (Apothecaries' Hall, Blackfriars Lane, London, E.C.4), which was constituted by the Royal Charter of James I in 1617, confers a diploma registrable under the Medical Act, 1886. Examinations for the final subjects are held monthly except in September. Examinations in anatomy, physiology, and materia medica are held in January, April, July, and October.

The licentiateship of the Apothecaries' Hall of Ireland (95, Merrion Square, Dublin) also entitles to registration under the Medical Act, 1886. It enables the holder to practise pharmacy as well as medicine, surgery, and midwifery, which means that he may if he so desires open a medical hall.

Diplomas in medicine and surgery registrable in the Commonwealth List are granted by the Universities of Sydney, Queensland, Adelaide, and Melbourne, Ceylon Medical College, University of Ceylon, University of Hong Kong, Royal University of Malta, Newfoundland Medical Board, University of New Zealand, the Universities of South Africa, Capetown, and the Witwatersrand, the King Edward VII College of Medicine, Singapore, and the University of Malaya. Under certain conditions diplomas of universities and colleges in the several provinces of Canada are registrable; also, with some exceptions, and subject to dating, the Universities of India, the Punjab University, Pakistan, and the University of Rangoon.

Higher Qualifications

The Royal College of Physicians of London confers its membership (M.R.C.P.Lond.) by examination. The pass for membership is a written examination in the form of a paper on questions of medical anatomy, pathology, principles of medicine; a paper on questions of the practice of medicine, including the principles of public health, and on psychological medicine; a clinical examination in the clinical wards of a hospital; and oral examinations. Fellowship of the College is subject to election by the Fellows.

The Royal College of Surgeons of England grants its Fellowship (F.R.C.S.Eng.) to those who pass its primary and final Fellowship examinations. The primary examination, partly written and partly oral, is held in January and July, and the final examination, partly written, partly practical, and partly oral, and including the examination of patients, is held in May and November. The College also grants a Fellowship in Dental Surgery (F.D.S. R.C.S.Eng.) to those who pass its primary and final Fellowship examinations.

The examination for the Membership of the Royal College of Obstetricians and Gynaecologists is designed for practitioners who wish to specialize in obstetrics and gynaecology. All candidates must have been entered on the *Medical Register* for at least three years. Before entering the examination they must fulfil regulations by holding resident appointments recognized by the College for six consecutive months in general medicine, six consecutive months in general surgery, 12 months in obstetrics, and 12 months in gynaecology. Following this training candidates are required to present records of cases under their care and written commentaries, all of which must be accepted before the candidates proceed to the examination. The examination consists of two written papers of three hours each, a clinical examination, and a *viva voce* examination including pathology. The Fellowship (F.R.C.O.G.) is granted to members who are considered to have advanced the science and art of obstetrics and gynaecology.

The Royal College of Physicians of Edinburgh elects as a member any licentiate of a British or Irish College or any graduate in medicine of an approved university with whose knowledge of medical and general science the College is satisfied. No candidate is admitted to the examination before the expiration of two years from the date of original qualification. The examination is in the principles and practice of medicine and also in a department of medicine selected and offered by the candidate and approved by the council, in which a high standard of proficiency is expected. The fee for the membership examination is 35 guineas. Fellows of the College must, before election, have been Members of the College for at least three years. Elections are made at quarterly meetings of Fellows, and a three-fourths majority by ballot is necessary.

The Fellowship examination of the Royal College of Surgeons of Edinburgh consists of two parts: the first, a written paper and an oral examination in anatomy and physiology and in pathology and bacteriology; the second, a written paper, a clinical or practical examination, and an oral examination in the principles and practice of surgery, and in an optional subject chosen by the candidate from the following: surgical pathology and operative surgery; laryngology, otology, and rhinology; obstetrics and gynaecology; and ophthalmology.

The Royal Faculty of Physicians and Surgeons of Glasgow grants, after examination, a Fellowship *qua* physician and a Fellowship *qua* surgeon registrable by the General Medical Council as an additional qualification (F.R.F.P.S.G.). Admission is by examination and subsequent election. Candidates for the Fellowship in medicine must have been in possession of a recognized medical qualification for not less than three years and must have been engaged during one of these years in full-time clinical work in a recognized hospital and have spent two other postgraduate years in approved medical work. The examination comprises a clinical examination in medicine, written and oral examinations in the principles of medicine and medical pathology, and written and oral examinations in the practice of medicine and therapeutics. Candidates for admission to the Fellowship in surgery are required to possess

a recognized medical qualification and to pass a primary and a final examination. The primary examination consists of written and oral examinations in anatomy, physiology, pathology, and bacteriology. For admission to the final examination candidates must have been in possession of a recognized medical qualification for not less than three years and produce evidence that they have been engaged, after qualifying, for one year in full-time clinical work in a hospital approved by the council and a further two years in the study of surgery. The Final examination comprises a clinical examination in surgery, written and oral examinations in surgical anatomy and surgical pathology, and written and oral examinations in surgery. Alternatively, candidates may submit themselves for examination in one of the following subjects: obstetrics and gynaecology, ophthalmology, and oto-rhino-laryngology, with such medicine and surgery as is related to the special subject.

The Royal College of Physicians of Ireland grants to registered medical practitioners, as the result of examination, its membership (M.R.C.P.I.), its licence in medicine (L.M.), and its licence in midwifery (L.Mid.). The College grants its Fellowship (F.R.C.P.I.), for election to which only members of the College are eligible.

The Royal College of Surgeons in Ireland requires two examinations — primary and final — for its Fellowship (F.R.C.S.I.). The first is in anatomy, physiology, and pathology, and the second in surgery. A one-year course for the primary starts in October each year and lasts three terms.

All the universities confer the higher qualification of Doctor of Medicine and Master of Surgery. Liverpool confers the degree of Master of Orthopaedic Surgery (M.Ch.Orth.U.Lpool.), intending candidates for which must be holders of an F.R.C.S. or F.A.C.S. before beginning the course. The Mastery of Midwifery of the Society of Apothecaries of London (M.M.S.A.) is designed to give evidence of practical experience in antenatal care, midwifery, and infant welfare, and their relation to hygiene and preventive medicine. Examinations are held twice yearly, in May and November. The Irish universities offer the degree of Master in Obstetrics (M.A.O.).

The Mastery of Surgery of Oxford, which is conferred as the result of an examination, is a degree admitting primarily to the *Register*. To obtain the D.M.Oxfd. requires the presentation of a thesis satisfactory to the Faculty Board. University requirements for the higher qualifications vary, and particulars should be obtained from the one selected.

THE ENROLMENT IN MEDICINE

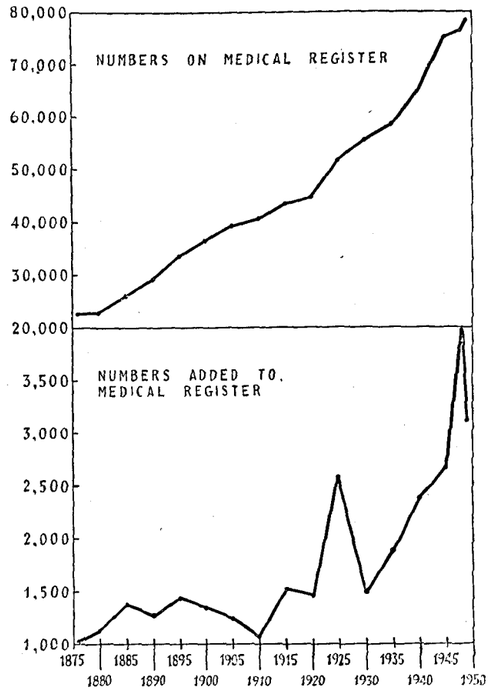
The total number of names in the current *Medical Register* is 78,140, which is higher by 5,000 than the average of the last ten years. Of these registrations, 69,611 were in Great Britain and Ireland; 6,570 were in the Commonwealth, and 1,905 were foreign. Only 54 remained on the temporary list, from which, following the passage of the Medical Practitioners and Pharmacists Act, 1947, over 4,400 names were removed in 1948. The names remaining are those of persons whose applications under the new Act have not been finally determined.

The following table gives the position of the *Medical Register* during the last ten years:

Year	Added by Registration	Restoration	Death or Removal	Total No.
1940	2,384	37	1,102	64,697
1941	3,296	16	996	66,992
1942	3,556	7	1,127	69,428
1943	3,532	13	1,091	71,882
1944	2,971	11	1,218	73,646
1945	2,666	11	1,190	75,133
1946	2,237	14	1,092	76,292
1947	2,787	10	1,160	77,929
1948	3,968*	16	4,467*	76,292
1949	3,109	19	1,280	78,140

*Unusual figures due to removals from temporary list and (in lesser number) additions to permanent list.

The numbers of medical practitioners on the *Register* at each five-yearly period since 1876, when the information was first compiled, as well as the number of additions, are shown in the following graphs:



The task of training students to be doctors is shared between the teaching hospitals and the universities. In London the twelve undergraduate teaching hospitals, each with its group of satellite institutions, have been designated as teaching centres. In the regional hospital centres of England and Wales the existing teaching hospitals, again with their groups of associated hospitals, have been similarly designated. The teaching hospitals remain separate from, though closely linked with, both the regional services and the university. They are specially selected centres for medical training, drawing their patients from a wider area than the ordinary hospital. The board of governors of each teaching centre comprises nominees of the university, of the regional board, and of the doctors actually teaching in the hospital, as well as other persons appointed by the Minister in consultation with local health authorities and other interested bodies. In Scotland, hospitals are not designated as teaching hospitals, and all of them come under the jurisdiction of the five regional hospital boards, but special provision is made for inclusion in the boards of management of these hospitals of nominees of the university on which the region is centred and also of the teaching staff of the hospitals. In Northern Ireland there is a duty upon the hospitals authority—a body corporate appointed by the Minister of Health and Local Government—to provide the Queen's University of Belfast with adequate facilities for medical teaching.

The Student Entry

The number of medical students admitted to the schools of Great Britain and Ireland during the academic year 1949–50 was approximately 2,734. Returns are still awaited from three of the schools, but an estimate has been made of the number of admissions in these schools, based on the average of the last four years.

The table of student admissions for recent years is as follows:

1942–3	2,468	1946–7	2,533
1943–4	2,426	1947–8	2,797
1944–5	2,612	1948–9	2,653
1945–6	2,610	1949–50 (approx.)	2,734

The number of passes and rejections in the final or qualifying examinations held in 1949 by the various examining bodies was as follows:

	Passes	Rejections
Medicine	2,925	1,561
Surgery	2,933	1,802
Midwifery	2,916	1,615

The proportion of passes in all three subjects was highest at St. Andrews (86, 87, and 91% respectively), and lowest at Leeds (47% in all three).

In the examinations in anatomy and physiology the highest percentage of passes was in the University of Wales for anatomy (86%) and in the University of Durham for physiology (90%). Nearly a quarter of the students took these examinations in the University of London, where the pass rate was 79 and 78% respectively.

The following table, which has been compiled from the report of the University Grants Committee (H.M. Stationery Office, 1949), shows the number of professors and other teachers in the London medical schools:

Medical School	Professors	Readers, Assistant Professors	Lecturers	Assistant Lecturers and Demonstrators	Others
Charing Cross	4	2	1	8	—
Guy's	8	5	8	19	—
King's College	2	1	5	4	—
London	7	7	12	8	—
Middlesex	10	4	3	12	16
Royal Dental	1	—	—	—	4
Royal Free	3	7	5	18	—
St. Bartholomew's	8	3	2	36	—
St. George's	—	—	4	4	—
St. Mary's	6	6	17	6	—
St. Thomas's	7	4	7	9	3
University College	7	2	2	18	—
Westminster	2	—	8	7	1
British Postgraduate Medical Federation	9	5	47	13	12
London School of Hygiene and Tropical Medicine	11	5	13	4	1

The number of students in these schools was 4,491 men and 785 women. Just over 20% of the full-time students in British universities are training for medicine and dentistry.

The number of men and women entering as medical students is not yet up to the level of 1947–8, the year which saw the influx of those whose studies had been delayed by war service, but it is likely that the number will grow despite the difficulty of the schools in accepting a larger admission. It was estimated in 1948 that that year's output of qualified people from the schools (2,156*) would need to be increased by at least 14% if the demands of the Health Service were to be met, and probably that figure was an underestimate.

The Dean of the Faculty of Medicine of Birmingham University writes as follows:

"The National Health Service has had one unfortunate effect on medical education because a far greater number of students than previously wish to become consultants and not general practitioners. Complaints have been received that the recruits for general practice from this university have been few in number. Professon Smout is making inquiries abut the subsequent careers of all medical students who have gone down from the University during the last ten years.

"A large number of young graduates, after holding a house appointment, now become registrars in teaching and other hospitals, intending to train as consultants. Whilst holding these appointments, which may last for seven years, they are paid a salary rising from £670 in the first year to £1,200 in their last year. Although larger numbers of consultants are required, saturation point, or financial consideration, may call a halt, and it is estimated that less—some people believe much less—than 20% of new medical graduates will be able to secure positions as consultants; the great majority will have to go into general practice. Although the holding of a junior registrarship should be of great advantage to anyone taking up general practice it will be unfortunate if general practitioners have to be recruited from the ranks of disappointed 'trainee consultants.'"

*The registration figure for 1948 given in the table includes a very large number of foreign and Commonwealth registrations.

THE TRAINING OF PATHOLOGISTS

In 1948 the Royal College of Physicians appointed a Committee on Pathology "to inquire into the training and recognition of medical specialists in pathology, and to make recommendations concerning this branch of medical practice in the future." The following were the members: The president; Dr. J. H. Dible (chairman); Dr. G. S. Wilson; Sir Lionel Whitby; Dr. S. C. Dyke; Dr. E. N. Allott; Dr. R. J. Pulvertaft; Dr. W. G. Barnard; Dr. G. Payling Wright; Dr. T. F. Hewer; Dr. S. P. Bedson; Dr. W. H. McMenemey; Dr. A. H. T. Robb-Smith; Sir Philip Panton; Dr. A. W. Downie; Dr. A. F. S. Sladden; and the registrar.

The committee's report emphasizes that the specialist in pathology should be adequately acquainted with clinical work. To ensure this it is recommended that a minimum of one year should be spent in clinical training after registration; six months of this should be spent as a resident house-physician in general medical wards and the remainder in clinical appointments, not necessarily medical. Service in the Forces should be counted as clinical training up to a maximum of six months. A higher qualification in general medicine or surgery is regarded as valuable, but the report also recommends that the Colleges should consider instituting a joint postgraduate diploma in pathology. "Such a diploma should ensure that a high standard is demanded of the trainee pathologist, clarify the status of pathologists, and be of assistance to administrative bodies concerned with the grading and appointment of hospital pathologists." Though the acquisition of a diploma is considered desirable it should not be regarded as the hallmark of a specialist or as entitling its possessor to consultant or specialist status.

Specialist Training

The specialist, continues the report, should receive at least five years' training, most of it in a teaching hospital. Since teaching hospitals now have insufficient facilities for training all the pathologists required, the committee recommends that during the first two years the trainee should receive a general training in all branches of clinical pathology in a laboratory approved for this purpose by the university of the region. Of the subsequent three years, one year should be spent in a university laboratory or a laboratory associated with a university department of pathology, where the trainee should be free from routine responsibility and able to study fundamental principles. Alternatively, he might spend this year on an approved course or holding a research scholarship. For the remaining two years the trainee would study the specialty in which he intends to work. A generous provision of posts is needed in hospital laboratories and in the departments of clinical pathology of universities and teaching hospitals. Candidates for training should be selected by boards of governors or by regional boards in consultation with the appropriate university, though this recommendation is not intended to interfere with the freedom of selection now exercised by such bodies as the universities and the Medical Research Council.

Recognition of Pathologists

The recognition as consultants or specialists of those holding appointments in the National Health Service should be based in particular on the following criteria:

(1) Age. This should be the same as that recommended in the Spens Report for full consultants in other specialties—namely, in general 32, and in exceptional cases 30–31.

(2) There should have been a minimum of five years' work in a pathological laboratory after qualification.

(3) Consideration should be given to the position now held—whether in charge of a laboratory of fair size, or a department in a large laboratory, or comparable post. The fact of holding such a post should not of itself necessarily qualify the incumbent as a consultant.

(4) It is desirable that a consultant should have had an adequate training and experience in all branches of pathology, but the absence of experience in all branches should not necessarily be a disqualification.

(5) The general training of the consultant should have been in a laboratory of satisfactory status with special training appropriate to the post held.

(6) Consideration should be given to the possession of special experience, whether clinical experience or training in some other branch of science, before entering into pathological work.

(7) Consideration may be given to the possession of higher degrees or qualifications, but the absence of these should not be a disqualification.

(8) Due consideration should be given to contributions to knowledge in the subject.

(9) Consideration should be given to the professional standing of the pathologist among his colleagues.

TRAINING COURSES IN PSYCHIATRY

A full training in psychiatry is obtainable in London at the Institute of Psychiatry, associated with the Maudsley Hospital and Bethlem Royal Hospital (see also "Postgraduate Education in London" at p. 507). Basic training normally covers a period of three years after adequate experience elsewhere in general medicine, and is based on responsible clinical work under supervision. The aim is to provide a wide training in the many branches of clinical psychiatry and its basic sciences.

Vacancies for registrars and house officers are available each quarter with the Maudsley Hospital and Bethlem Royal Hospital. The fees payable by those who attend the teaching at the Institute of Psychiatry without holding hospital appointments are: for clinical instruction only, 10 guineas for three months; 15 guineas for six months, and 20 guineas for twelve months; for clinical instruction and all first- or second-year lecture and demonstration courses, 20 guineas for one term and 50 guineas for one year; and for first- or second-year lecture and demonstration courses only, 12 guineas for one term and 30 guineas for one year. The enrolment fee is £1. By arrangement with certain regional authorities, trainees in psychiatry holding posts at mental hospitals in the region in question are granted a reduction in fees. Fuller information may be obtained from the Dean, Maudsley Hospital, Denmark Hill, S.E.5.

The National Association for Mental Health (39, Queen Anne Street, W.1) arranges training courses in child psychiatry. Fellowships are given to enable qualified psychiatrists to obtain special training in child guidance at a recognized training clinic, and these are tenable at a number of clinics in Great Britain. The usual course of training covers 12 months, half-time, and is recognized as a qualification for the medical directorship of a child-guidance clinic. The association also runs each year two courses, each of three weeks, on educationally subnormal children and mental defectives. These are in conjunction with the extra-mural department of the University of London and are recognized by the Ministry of Education in relation to the approval of medical officers under the Handicapped Pupils and School Health Service Regulations. A week's refresher course is being organized in conjunction with the same department of the University for doctors who attended the association's three weeks' course prior to the passing of the Education Act, 1944.

The Tavistock Clinic (2, Beaumont Street, W.1) specializes as a centre for the out-patient treatment of children and adults with psychiatric disabilities. The educational programme includes courses for psychologists and social workers as well as doctors. It organizes with the National Association for Mental Health (see above) the 12-month half-time course for psychiatrists specializing in child psychiatry.

The Institute of Psycho-Analysis (96, Gloucester Place, W.1) furnishes a part-time course, lasting about four years, in psychoanalytic theory and technique. It includes a personal analysis, attendance at lectures and seminars, and clinical work under supervision. The Institute does not set out to teach all aspects of psychiatry, and general psychiatric experience must be obtained at other clinics and hospitals.

Courses in psychiatry, full-time, beginning in October, are given at Bristol (two terms) for Part I D.M.P.(Bris.), fee 15 guineas; at Edinburgh (five weeks) for Dip.Psychiatry(Ed.), fee 25 guineas; at Glasgow (two and a half weeks) for course in mental deficiency, fee 15 guineas; at Leeds (two and a half years) for D.P.M.(Leeds); and at Manchester (one year). These courses are usually taken in conjunction with clinical appointments at a mental hospital or similar institute. Arrangements have been made in Birmingham for full courses of instruction for the Diploma in Psychological Medicine.

ENTRY INTO PRACTICE*

The young doctor newly admitted to the *Medical Register* will usually begin his professional career by serving one or more terms as a resident hospital officer, but very soon he will have to decide in which branch of practice his future lies, and once this choice has been made he should seek the training and experience which will best fit him for his vocation. It may become more difficult as time goes on to change from one form of practice to another without retracing his steps and starting again from the beginning.

Specialist Practice

A young practitioner who contemplates a specialist career should seek guidance from a senior consultant in the specialty of his choice, from the dean of the medical school, or from the director of the British Postgraduate Medical Federation. The introduction of the National Health Service has not affected the mode of entry into specialist practice. After the initial house appointment the trainee specialist competes for promotion to more senior resident posts, his ultimate aim being appointment to the staff of a hospital or hospitals in either a whole-time or a part-time capacity. Meanwhile, one of his first steps should be to obtain the higher qualifications and diplomas, without which he cannot hope to compete for suitable appointments in the hospital or public health services. The crucial step is that from registrar or similar status to the higher grades, and it is to be hoped that, once the needed increase in hospital establishments can take place and the demand for specialists be equated with the supply from new entrants, allowing for the normal wastage, the would-be specialist will be able to plan ahead with confidence in his ability to obtain appointments appropriate to his ability and experience.

General Practice

The impact of the National Health Service has been most felt in the field of general practice. The introduction of a service available to the entire population has brought about changes in the distribution of doctors which have profoundly modified entry into practice. These changes, together with the cessation of the buying and selling of goodwill, have swept away many traditions and introduced new problems.

Every doctor who has chosen a career in general practice will aim at becoming a principal as soon as possible. But he must first gain experience, and to this end should seek a post as an assistant. It is now possible for a young doctor who has had no previous experience in general practice to serve an apprenticeship as a "trainee assistant" with a senior practitioner selected for the purpose, the principal receiving a grant for training and also a sum intended to cover the assistant's salary and other expenses involved. A trainee assistantship lasts only for one year, after which the young doctor may wisely seek other temporary appointments, designed to secure him experience in different types of practice.

There are three methods of becoming a principal in general practice:

1. *To put up a plate.*—Always an uncertain and expensive method. A doctor starting a new practice may apply for a basic salary of £300 a year, the granting of which is vested in the executive council or on appeal to the Minister. But there are other factors to be considered, such as obtaining a house, a car, furniture, and equipment. Even in advantageous conditions the outlook facing the "squatter" is hard.

2. *To take over a practice vacant by death or retirement.*—It is the responsibility of the executive council to fill such vacancies, though actual appointments have to be approved by the Medical Practices Committee (see below). There is very keen competition for vacancies with large lists or in desirable surroundings. When the list is smaller it may be easier to obtain a vacancy, but the successful applicant faces, though in less degree, the difficulties that beset the "squatter." Even when there is no delay a practice suffers to some extent on change of hands.

3. *To obtain an assistantship with a view to succession or partnership.*—This method offers security from the outset and is the method of choice for those who cannot command the resources to enable them to wait for their list of patients to grow. Introduction is effected by the Medical Practices Advisory Bureau or one of the medical agencies, and after a probationary period the assistant either becomes logical successor when his principal retires or is made a partner.

Where a practitioner wishes to become a principal in a practice he is required to apply for admission to the list of practitioners undertaking to provide general medical services under the Act. His application is to the executive council, and permission to practise is granted as a matter of course unless the area has been officially declared by the Medical Practices Committee to be adequately served.

*Condensed from Section IV of the B.M.A. Annual Handbook, 1950–1.

The Medical Practices Committee

The Medical Practices Committee is mainly a professional committee with headquarters in London, established to supervise the distribution of general practitioners under the National Health Service Act. It determines those areas in which the number of doctors is adequate, and in these areas no additional principal is likely to be accepted on the list except where replacement is necessary. The Medical Practices Committee has also an important function in relation to transactions which might be thought to involve concealed sales of goodwill.

The Medical Practices Advisory Bureau

Soon after the Act came into force there was seen to be a need for some central source of information where advice could be obtained by practitioners needing partners, assistants, or locumtenents, and by practitioners seeking such appointments or desiring to transfer to another area. It was felt that advisory functions of this kind should be undertaken by a body which was not linked with central or local government, yet with a status and resources enabling it to establish and maintain effective liaison with executive councils, local medical committees, and the Medical Practices Committee, and at the same time commanding the confidence of the profession.

The Medical Practices Advisory Bureau was accordingly established as a department of the British Medical Association, under the direction of a member of its medical staff. Its functions are to maintain an information service about openings, to introduce partners, assistants, and locumtenents, and to advise on all associated problems. The facilities of the Bureau are available to any doctor, and free of charge to members of the British Medical Association.

Address inquiries: Medical Director, Medical Practices Advisory Bureau, B.M.A. House, Tavistock Square, W.C.1, or to the Branch Offices: 33, Cross Street, Manchester, 2, and 7, Drumsheugh Gardens, Edinburgh.

PROFESSIONAL TRAINING OF ARMY MEDICAL OFFICERS

Officers appointed to a regular commission in the Royal Army Medical Corps receive postgraduate professional training at the Royal Army Medical College, Millbank, S.W.1. This College has a director of studies and a tutorial staff for the teaching of Army health, military surgery, tropical medicine, psychiatry, radiology, dermatology, venereology, and entomology.

At the College newly commissioned lieutenants on first appointment are given an introduction to the clinical problems and procedures peculiar to military service in both temperate and tropical climates. Regular R.A.M.C. officers between their eighth and tenth years of service pass through the senior officers' postgraduate course of professional studies. This course, divided into two parts, lasts approximately for five months. The first part, of 10 weeks' duration, includes revision in Army health and certain of the other subjects mentioned above. The second part, which lasts for three months, consists of demonstrations and tutorials in clinical medicine and surgery, dermatology, and venereology. Those officers who qualify at the termination of this course and are recommended by the College council may undergo up to 12 months' individual advanced study for different specialties at approved university medical centres.

The Queen Alexandra Military Hospital, Millbank, also provides clinical instruction, tutorials, and demonstrations for R.A.M.C. officers.

The Department of Army Health at the College, in addition to the teaching of military hygiene, provides facilities for special study in the maintenance and enhancement of the health of the Army. There are laboratories for instruction in chemistry as applied to hygiene, and also in biochemistry, while in addition there is an instructive and well-equipped hygiene museum. Officers intending to specialize and become Army health officers are given the opportunity of taking the D.P.H. during their specialist course and are assisted in obtaining their D.T.M.&H.

The Department of Military Surgery gives instruction in the principles and practice of up-to-date military surgery, both general and regional. The syllabus includes the surgery of tropical diseases and the management of surgical conditions peculiar to service both at home and abroad.

The Department of Tropical Medicine provides instruction and clinical demonstrations in tropical medicine, particularly in those disease processes to which Service personnel and their families are exposed in tropical areas. The College is recognized for the full course of instruction for the D.T.M.&H.

The Entomology Department provides instruction in applied entomology as it affects Service personnel, while research is also carried out into insecticides, insect repellents, and various methods of pest control. Insects from all commands at home and overseas are referred to this department for identification.

In the Department of Pathology there are lectures, demonstrations, and practical classes covering the laboratory diagnosis and pathological aspects of general, tropical, and preventive medicine and military surgery. Candidates for specialization in pathology receive six months' training at the College, comprising bacteriology, haematology, chemical pathology, and morbid anatomy. A further period of six months' study in a particular branch of pathology is taken at a selected university medical centre.

Finally, the Department of Psychiatry provides lectures and clinical demonstrations in psychiatry and psychopathology and the application of psychological principles to morale, discipline, personnel selection, and other purely military matters. Clinical demonstrations of cases and the use of modern methods of physical treatment and group therapy are held at Banstead Military Hospital and Belmont Hospital, Sutton. Demonstrations of selection tests are given by a personnel selection officer.

Two revision courses in surgery a year are held at Westminster Hospital Medical School for senior officers of the Millbank College.

Commissions in the R.A.M.C.

Civilian doctors and released medical officers who have held a non-permanent commission in the Royal Army Medical Corps during the emergency will be considered for appointment to short-service commissions in the R.A.M.C. for a total of eight years, the first period of which will be on the Active List and the remainder in the Regular Army Reserve of Officers. Civilian doctors will have direct appointment in the rank of lieutenant, and released medical officers, on certain conditions, in the rank of captain. Candidates must at the time of application be (*a*) normally not over 30 years of age; (*b*) British subjects or citizens of the Irish Republic, and sons of British subjects or citizens of the Irish Republic; and (*c*) registered under the Medical Acts in force in Great Britain and Northern Ireland. During their service on the Active List they will be considered for appointment to a regular commission, and if they do not want, or are not selected for, such commission they will receive

at the end of their period of service on the Active List a gratuity of £150 a year for each year's completed service (three years or over).

Conditions of service and forms of application can be obtained from the Assistant Director-General, Army Medical Services (A.M.D.1), Lansdowne House, Berkeley Square, London, W.1 (GROsvenor 8040; Ext. 548).

On the nomination of the Central Medical War Committee (B.M.A. House, London) doctors are appointed to national service commissions in the rank of lieutenant. During their service they can apply for a short-service commission and subsequently be considered for a permanent commission under the conditions stated above.

MEDICAL SCHOOLS AT OXFORD AND CAMBRIDGE

At Oxford University the number of new preclinical students continues to be restricted by decree. During the coming academic year 55 men and 10 women will again be admitted. Students who have done recognized national service and who were born before January 1, 1929, may be admitted in addition. The selection of candidates is made by a central university committee from names put forward by colleges, so that preliminary acceptance by a college is essential for any prospective medical student.

All new students at Oxford are required to take the second public examination of the University in order to qualify for the B.A. degree. Although almost all medical students continue to take the final honours school of animal physiology, a few students take instead the final honours school of psychology, philosophy, and physiology. This course normally occupies a medical student for two years after he has passed the first B.M. examination in anatomy and physiology, and the number of students who may read for this honours school is limited. A new final honours school of biochemistry has been created which lasts four years and is not primarily intended for medical students. A new University laboratory of physiology is now being built, and some of the other preclinical departments will be enlarged in due course.

The clinical section of the medical school at Oxford continues to develop. Despite increases in the number of applications for admission, it has been decided to limit the entry to 32 students during the year 1950–1, so that a high degree of personal supervision (including the tutorial system) and opportunities for practical experience may be retained. A limited number of the available places are open to students from other universities who elect to do their clinical training in Oxford and take the degree of their own university. The Radcliffe Infirmary (520 beds) remains the main teaching hospital, but the other hospitals of the United Oxford group (1,250 beds) also provide clinical material. In addition the Wingfield-Morris Orthopaedic Hospital is available for orthopaedic training. Students are taught partly by the whole-time Nuffield professorial units of medicine, surgery, obstetrics and gynaecology, anaesthetics, orthopaedic surgery, and plastic surgery, and partly by the consultant staff of the Radcliffe Infirmary. In this way they are provided with a mixture of academic and vocational training. For example, in general medicine all students spend three months with a consulting physician and three months with the professor of clinical medicine. The Radcliffe Infirmary is an active centre of clinical research, and it is hoped that students will be stimulated by being taught in this environment. At the same time the large share in the teaching taken by the consultant staff ensures that the course is rich in practical instruction.

Rearrangements at Cambridge

In 1949 the regulations for the Cambridge degrees in medicine and surgery were revised. The most important change consists in a rearrangement of the final M.B. examination. Part I of this examination, which may be taken after two and a half years of clinical study, will in future include pathology and pharmacology and therapeutics instead of surgery, midwifery, and gynaecology. Part II, which may be taken after three years of clinical study, will include medicine, surgery, and midwifery and gynaecology, instead of medicine, pathology, and pharmacology and therapeutics. Under the new arrangements a candidate who fails in only one or two of the subjects in Part II will not necessarily have to sit the whole of that part again, provided he attains a reasonable standard in the subjects in which he has failed to satisfy the examiners. Papers in medicine will cover the ancillary subjects of paediatrics, social medicine, and psychiatry, which are mentioned in the General Medical Council's recommendations. The revised regulations will come into operation in December, 1950, with latitude for the taking of the examination under the old regulations for all who matriculated before October, 1946.

The Long Vacation course at Cambridge in elementary clinical methods for undergraduates who have qualified in anatomy and physiology covers adequately the intermediate period between preclinical and clinical work in accordance with the G.M.C. recommendations. Teaching is directed to the fundamental principles of how to examine patients at the general and special departments of a hospital. Undergraduates also have the opportunity of attending an introductory course in psychology during the Long Vacation term of their residence, as well as lectures on the social background of disease, epidemiology, and medical genetics.

The staff of the United Cambridge Hospitals now regularly gives courses on various special subjects for postgraduates, including general practitioners, who are offered an attractive programme of "at home" days in each department on regular days of the month, whilst one-day symposiums on set subjects have proved popular.

The most important plans in the University of Cambridge concern the further development of the department of human oecology, in which a chair was established in October, 1949. A permanent building for the department will be ready in 1951. Epidemiological and statistical studies are proceeding. The University department of radiotherapeutics has pursued research work designed to improve the treatment of cancer and allied diseases by the combined use of radiotherapy and chemotherapeutic agents, and the department of experimental medicine has carried out studies on various aspects of undernutrition.

SCOTTISH AND IRISH SCHOOLS

In the Faculty of Medicine of the University of Edinburgh the number of applicants for admission to the School to study for the degrees of M.B., Ch.B. again greatly exceeds the number of places available, and many applicants who might in ordinary circumstances have been accepted have had to be refused admission. There is no sign of any marked falling off in the demand for places in the School. A new curriculum covering a period of six years' study for the degrees of M.B., Ch.B. was introduced in October, 1948, and during the session 1950–1 the medical students enrolled will comprise first-, second-, and third-year students under the six-year curriculum, along with fourth- and fifth-year students and a comparatively small number of third-year students under the old five-year curriculum.

Courses and examinations for the various medical diplomas granted by the University have been conducted during the past year with the exception of the Diploma in Industrial Health. The five-weeks intensive course which candidates for the Diploma in Psychiatry are required to take in the University after completion of the prescribed hospital work and special study, and before they appear for the Diploma Examination, was held for the first time in the autumn term 1949. Ten graduates attended.

In Glasgow University the number of students in attendance continues at a high level, especially in the clinical years, where the classes are augmented by a large number of students transferred from the extramural colleges in 1947, when they were then in the preclinical stages of their studies. The preclinical classes of to-day, however, are returning to more normal proportions, with advantage to both students and teachers. The session just ended sees the termination of the former five-year curriculum in so far as it governed preclinical instruction, and from 1950–1 onwards the preclinical students will all be undergoing a six-year curriculum in accordance with the recent recommendations of the General Medical Council.

At Aberdeen also the medical curriculum now extends over six academic years. After the present summer vacation there will be no vacation term for medical students as there has been during the last few years.

In the School of Medicine of the University of St. Andrews instruction in the clinical years is given in Dundee, while the pre-medical and preclinical subjects can be taken either there or at St. Andrews. The annual intake of students is limited to between 70 and 80. The six-year curriculum, recommended by the General Medical Council, was introduced in 1948. At both St. Andrews and Dundee there are excellent student residences which accommodate undergraduates from all or any of the faculties, and there is also the William Low Residence for Medical Students situated near the principal teaching hospital, which is devoted exclusively to undergraduates in their clinical years of study.

At Queen's University, Belfast, clinical teaching is carried on at the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Belfast City Hospital, and certain special hospitals in Belfast, totalling a very large number of beds. A department of child health has lately been established, and the department of social and preventive medicine (formerly public health) has been reorganized to meet the requirements of the General Medical Council.

The School of Physic at Trinity College, Dublin, will start in October with a full complement of students. The number of applications has greatly exceeded the number of available places. Arrangements for post-qualification hospital appointments to be introduced under the new British Medical Act are being considered in consultation with the other Dublin Schools. The Dublin teaching hospitals will not be able to provide such posts for all the graduates of the three Dublin Schools, but it is hoped that suitable accommodation can be found in some of the provincial Irish hospitals, and perhaps in some English hospitals. Professor D. S. Torrens succeeds Professor J. W. Bigger as Dean as from October 1.

The National University of Ireland has three constituent University Colleges—those of Dublin, Cork, and Galway. Over 200 students graduated in medicine from these Colleges last year. The winter session begins in October. Address inquiries to the Registrar, National University, 49, Merrion Square, Dublin.

VISUAL EDUCATION

The Medical Teaching Film

The film as an aid to teaching is becoming more appreciated. Four years ago the deans of the medical schools were asked for suggestions for subjects on which films would be welcomed, and the results of the questionary showed that what were chiefly wanted were short illustration films for use with lectures. Recently a British Universities Film Council was set up, but, having much ground to cover with only limited resources, it was decided that the field of medical films should be left in the hands of the Medical Committee of the Scientific Film Association (4, Great Russell Street, W.C.1). This committee has recommended that the British Film Institute through its national library should be asked to take over the running of a central medical sciences teaching film library, to which the medical schools should make an annual grant for the purpose of acquiring suitable films. It is estimated that a grant of £2,000 would permit of the purchase of 10 films at £50 each, the copying of 20 films at £15 each, and the re-editing of 20 films at £35 each, as well as meet the expenses of arranging viewing and collection and so forth.

More recently the British Film Institute has set up in its distribution section a library of films for use in university teaching. Films will be placed in this library on the recommendation of the British Universities Film Council, which will, in the case of medical films, be advised by the Medical Committee of the Scientific Film Association. The British Film Institute has already made a grant to the Universities Film Council for the copying of films, but it is hoped that owners of films which have been made for research and teaching purposes will consider making a gift of copies wherever possible.

The Central Film Library of the Central Office of Information holds the largest number of good modern medical films, but the increasing demands on its services and the restrictions of the Treasury have meant that on several occasions it has had to suspend bookings.

In addition to films made specially for use in medical schools, films on medical subjects, which are often suitable for use in medical schools, are made by the Ministry of Health and by the Services. Such bodies might welcome suggestions from medical school teachers.

B.M.A. Film Library

The British Medical Association has a Film Library to which during the past year a considerable number of films have been added both by presentation and by purchase. A B.M.A. film on "Infections of the Hand"—a sound film in colour, made at the Hand Clinic of University College Hospital—has been produced and is considered excellent by all who have seen it. It was the main feature of the film showings at the recent Annual Meeting of the British Medical Association at Liverpool. A film theatre has lately been completed in B.M.A. House.

The British Medical Students' Association has presented its film "Acute Inflammation" to the B.M.A. Film Library in appreciation of the generous concession by the B.M.A. of free access to the library by the Students' Association.

There are many good medical films in overseas countries, but at present licences to purchase films from hard currency areas are withheld. An approach has been made to the Ministry of Health by the Film Committee of the B.M.A. with a view to facilitating the purchase of films from abroad.

Wellcome Museum of Medical Science

A teaching institution in which visual aids to learning are widely used is the Wellcome Museum of Medical Science (183–193, Euston Road, N.W.1), which was founded in 1912. The museum consists of descriptions of diseases under the following headings: general, aetiology, epidemiology, pathology, clinical, diagnosis, treatment, prognosis, and prevention. The teaching standard aimed at is general medical postgraduate, but the museum is equally useful to medical undergraduates. Most, but not all, of the material has been rearranged since the war. The museum is divided into bays by screens erected at right-angles to the walls, and on these screens are panels in which summaries of diseases with illustrations and diagrams are mounted. Accurate, up-to-date, and useful descriptions are given, and the emphasis is entirely on usefulness in practice. Pathological and entomological specimens and drugs are placed on a single shelf below the screens, and in boxes attached are files of abstracts from journals under the same headings as in the panels. The museum is open on weekdays from 9 a.m. to 5.30 p.m., without fee or formality, to all medical graduates and students, nurses and student nurses, and workers and students in the medical sciences. It is not open to the general public, for whom the material and arrangement are unsuitable.

The Wellcome Historical Medical Library is installed in the same building. It contains approximately 200,000 books and journals concerning the history of medicine and the allied sciences, some 5,000 MSS, and 100,000 autograph letters of medical and scientific interest. The Wellcome Historical Medical Museum is now installed at 28, Portman Square, W.1. Its collections cover all aspects of the history of medicine and certain allied sciences, from the earliest times to the nineteenth century. The prehistory, classical, and eighteenth and nineteenth century collections are especially important. Exhibitions of material from the collections are constantly held, and are open to the public from 10 a.m. to 5 p.m. daily (except Sundays). At present the main exhibition deals with "Medicine in 1850." Catalogues of the various exhibitions are published by the Oxford University Press. Students working on special branches of historical research may obtain permission to study individual items in the collections on application to the director.

SPECIAL DIPLOMAS

Public Health

Diplomas in sanitary science, public health, and State medicine are registrable in the *Medical Register* as additional qualifications. The D.P.H. is conferred not only by the universities but by the Royal College of Physicians of London and the Royal College of Surgeons of England (D.P.H., R.C.P.S.Eng.), the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow (D.P.H., R.C.P.S.Ed. and R.F.P.S.Glasg.), and the Royal College of Physicians and Surgeons in Ireland (D.P.H., R.C.P.S.Irel.). The degrees of Bachelor and Doctor in Hygiene are conferred by the University of Durham (B.Hy., D.Hy.Durh.), of Bachelor of Science in Public Health by the University of Birmingham (B.Sc.(P.H.)Birm.), and of Bachelor and Doctor of Science in Public Health by the University of Glasgow (B.Sc., D.Sc.(P.H.)Glasg.).

At most of the universities there is a full-time course in public health, lasting for nine months and beginning in October. A preliminary three-months course for the Certificate in Public Health is included. The University of Wales has a three-months full-time course for the C.P.H., preliminary to the D.P.H., and a 12-months part-time course for the D.P.H. The fees at most of the universities are round about £50.

The London School of Hygiene and Tropical Medicine (Keppel Street, W.C.1) offers a course for the Certificate and Diploma in Public Health, beginning in October and lasting for one academic year (the preliminary part, from October to December, being followed by the examination for the Certificate). During the second part of the course students may elect to make a special study of (1) industrial health; (2) statistics and epidemiology; (3) institutional administration, or (4) tropical hygiene. The elective course in industrial health is recognized in part as qualifying for the examination for the Diploma in Industrial Health (see below), and opportunities are given for visits to factories and other industrial establishments.

References to a paucity of candidates for the D.P.H. come from several quarters. From Birmingham it is stated that postgraduate courses in public health (as well as in radiology and ophthalmology) have been in abeyance this session owing to the lack of sufficient applicants. Now that the post-war rush for diplomas has ceased, the number of graduates choosing these specialties is insufficient to justify the many courses now advertised, and it is considered that it might be wiser for such instruction to be given mainly in special postgraduate institutes which do not have the burden of undergraduate teaching. Provincial universities might, by mutual agreement, concentrate on one or two subjects for which they have special facilities, rather than try to cover the whole field of postgraduate instruction. In Birmingham public health and industrial medicine would seem obvious choices. At Durham postgraduate courses were held for the C.P.H. and the D.P.H., but very few students entered, and it has been decided not to hold courses in public health during the next academic year.

In 1949 there were 172 passes in examinations for the D.P.H. and 13 rejections. London had the largest number of examinees (50), followed by the English Conjoint Board (38). The number of passes in the examinations held for the C.P.H. was 182, with 29 rejections, and here again the examining bodies having the largest numbers were London (58) and the English Conjoint Board (46). None were examined for the diploma in Durham, Manchester, and St. Andrews, and none for the certificate in Birmingham, Manchester, and Aberdeen.

Other Diplomas

The London School of Hygiene and Tropical Medicine also provides courses for the academic postgraduate Diploma in Bacteriology and for the Diploma of the Conjoint Board in Tropical Medicine and Hygiene, and a short course in medical statistics. The course for the Diploma in Bacteriology, starting in October, lasts one academic year and is intended to give advanced instruction to graduates in medicine or veterinary science who intend to follow a career in bacteriology. Two courses in tropical medicine and hygiene are held each year, beginning in March and October and continuing for five months. No course for the new *academic* D.T.M.&H. will be offered in the current year. The course in medical statistics occupies two days a week for three months, beginning in April, and also in January if applications are sufficient.

The Incorporated Liverpool School of Tropical Medicine (Pembroke Place, Liverpool, 3) offers two courses of instruction, each lasting about five months, for the Diploma in Tropical Medicine and Hygiene (D.T.M.&H.). The fees for the course are 40 guineas and for the revision course 20 guineas, and there are fees by arrangement for research and advanced students. The examination for the diploma by Liverpool University is held twice yearly, in January or February and April or May. The syllabus includes tropical medicine, dermatology, ophthalmology, and surgery, also bacteriology, entomology, parasitology, and tropical hygiene. The Liverpool School also gives courses of instruction in public health, parasitology, and entomology for students taking the D.P.H., and in veterinary parasitology and entomology for students taking veterinary diplomas or degrees.

The University of Edinburgh has courses for D.T.M.&H.Ed., lasting two terms, beginning in October.

The Royal Faculty of Physicians and Surgeons of Glasgow grants a Diploma in Industrial Health. Candidates for the diploma (D.I.H.Glasg.) must complete courses of instruction and pass the examination. Copies of the regulations respecting the diploma may be obtained from the secretary of the Royal Faculty, 242, St. Vincent Street, Glasgow, C.2. The Diploma in Industrial Health is granted by the Conjoint Board, the University of Edinburgh, and other bodies. Full-time postgraduate courses in industrial health are given at Edinburgh, Glasgow, and Manchester, all beginning in October and lasting for nine months. The Society of Apothecaries of London holds an examination for this diploma, taking the history of the subject, legislation, occupational diseases, the industrial environment, the practice of industrial medicine, and clinical medicine and surgery as applied to industry.

London and Manchester have Diplomas in Bacteriology. Edinburgh, Bristol, Leeds, and the Conjoint Board have Diplomas in Psychiatry or Psychological Medicine. Bristol, Edinburgh, Liverpool, and London Universities and the Conjoint Board have Diplomas in Radiodiagnosis and in Radiotherapy. At Liverpool holders of the Diploma (Dip.Rad.) may be awarded the degree of M.Rad. after a further two years' study and the presentation of an acceptable thesis.

At Sheffield University there has recently been introduced a Diploma in Microbiology. This will be awarded after a full-time course of study extending over one University session, and it is intended that the first course shall start in the Michaelmas term, 1950. Entrants upon the course will normally be expected to be graduates of a university, but the senate may deem other qualifications as equivalent for this purpose. The course will embrace (*a*) cultivation and isolation of micro-organisms; morphology, structure, growth, taxonomy; (*b*) metabolism, nutrition, and genetics of micro-organisms; (*c*) oecology of micro-organisms—symbiosis, commensalism, parasitism, antibiosis; and (*d*) pathogenicity and immunity.

The Faculty of Medicine of the University of Bristol offers ordinary postgraduate facilities—and in addition special courses—for the University's Diplomas in Radiology, Public Health, and Psychological Medicine, and also courses of instruction for the Diploma of Child Health and the Diploma of Anaesthetics of the Conjoint Board. It adds, however, that unfortunately there has been a diminishing admission for these diploma courses during the past year, and no evidence of any increased interest on the part of general practitioners for other postgraduate facilities, in the form either of fortnightly courses or of weekly demonstrations.

A Diploma in Ophthalmology is granted by the University of Oxford, a Diploma in Clinical Pathology by the University of London, and the English Conjoint grants Diplomas in Anaesthetics, Ophthalmic Medicine and Surgery, Child Health, and Laryngology and Otology, and the Irish Conjoint grants diplomas in the first three of these subjects. The University of Wales has a Diploma in Tuberculous Diseases. For other special diplomas available the programmes and prospectuses of the various bodies should be consulted.

Fellowship in Radiology

The Faculty of Radiologists (45, Lincoln's Inn Fields, W.C.2) offers a Fellowship (F.F.R.) to medical graduates of five years' standing who have spent at least one year in general clinical work at approved hospitals, hold a radiological diploma, and have practised radiology exclusively for at least two years after obtaining that diploma. Candidates are required to pass an examination and submit a thesis. Candidates who hold higher medical or surgical qualifications may be exempted from the examinations in general medicine, general surgery, or pathology.

Royal Institute of Public Health

The Royal Institute of Public Health (23, Queen Square, London, W.C.1) furnishes recognized courses of instruction for the Certificate and the Diploma in Public Health and for the Diploma in Industrial Health. The course for Part I of the latter examination is the same as, and runs concurrently with, that for the C.P.H., and holders of the latter are exempt therefrom. The courses for the Certificate start, approximately, at the beginning of April and October, and those for the D.P.H. (Final Examination) in February and August. The course for Part II of the examination for the D.I.H. begins in February and July of each year. All these courses, which may be taken as either whole-time or part-time, are conducted at the Institute.

MEDICAL SOCIETIES

The advice given to the newly qualified man or woman to become a member of the British Medical Association and to join one or other of the defence organizations is as cogent as ever. The introduction of the National Health Service has made it even more desirable that practitioners should seek unity in the profession for the purposes of establishing the Service on right lines so that the doctor can carry out his work under acceptable conditions and that the greatest good for his patients can be secured. The practitioner has also the same need as ever to safeguard himself against the medico-legal hazards which attend medical practice, however careful and conscientious he may be.

The British Medical Association

The British Medical Association (Tavistock Square, W.C.1) has a membership of more than 62,000. In the United Kingdom its membership represents 76% of the total profession and 78% of the working profession. Members are elected by the council of the Branch in whose area they reside, or, if not resident in a Branch area (for example, serving in the Forces), by the Central Council. The privileges of members include participation in all activities, local and central, in its government and the formulation of its policy; the weekly receipt of the *British Medical Journal* and its *Supplement*; the use of the houses of the Association in London and Edinburgh; and the help of the central staff in professional matters. The Association offers a number of prizes for research and the encouragement of important work. It has a library of over 50,000 volumes. Two new developments in the Association—an Empire Medical Advisory Bureau and a Medical Practices Advisory Bureau—are referred to elsewhere in this number.

The ordinary subscription for members resident in Great Britain and Northern Ireland is four guineas per annum, but certain classes of members come in at lower rates, and the newly qualified practitioner who is elected within two years of registration pays only two guineas per annum during the four years after registration. Members residing outside Great Britain and Northern Ireland pay one and a half guineas, and Service members, wherever resident, two and a half guineas.

The British Medical Guild is an independent parallel organization for the better protection of the interests of the profession in disputes with public authorities and other bodies and the compensation of members for financial loss incurred through loyal acceptance of B.M.A. policy. Local organizations of the Guild are being formed.

The National Insurance Defence Trust was formed in 1919 to assist in defraying expenses incurred in protection of the interests of the profession in connexion with the National Health Insurance system, and to give, where required, financial support to practitioners who may be suffering owing to action taken by them in accordance with the policy laid down by the former Conference of Local Medical and Panel Committees. With the inception of the National Health Service Acts a new General Medical Services Trust has been formed, the trustees of which are the members for the time being of the General Medical Services Committee of the B.M.A. Its principal objects are to take such action as may be deemed expedient in the interests of general practitioners in the National Health Service, and to assist financially practitioners or classes of practitioners who have suffered or are likely to suffer hardship in consequence of loyalty to approved policy.

Society of Medical Officers of Health

The Society of Medical Officers of Health (Tavistock House South, Tavistock Square, W.C.1) is a society of medical officers engaged in public health work in all its branches. Its official organ is *Public Health*. In matters of policy it works in conjunction with the British Medical Association, and nominates two members to the Public Health Committee of the Association, and the Association has similar representation on the Society's council.

Medical Women's Federation

The Medical Women's Federation (Tavistock House North, Tavistock Square, W.C.1) is the only professional organization in this country consisting solely of medical women. It was founded in 1916, but its forerunner, the Association of Medical Women, dated from 1879. It endeavours to bring before the main body of the profession the special minority difficulties of medical women and when necessary to press for the full application of the principle of equality. It works in close and friendly relationship with the British Medical Association. The Federation has active local associations all over the country and in Northern Ireland, as well as a large London association and an overseas association linking up members all over the world. The Federation is non-political.

Defence Societies

The Medical Defence Union (address from mid-September, Tavistock House South, Tavistock Square, W.C.1) has a membership of over 34,500. It has thrown open its doors to dental as well as to medical practitioners, and has made special provision for overseas medical and dental practitioners practising in the Dominions and other countries. Its work has been increasing by leaps and bounds during the past three years. It furnishes advice and unlimited financial indemnity to any member threatened with or involved in litigation raising a question of professional significance or, more commonly, based upon a charge of professional negligence. The accumulated funds are now about £140,000, while the subscription income is mounting annually, though costs of litigation and of settlements out of court are mounting even more rapidly. Since its foundation the Union has spent £300,000 on damages and costs incurred in protecting members.

The Medical Protection Society (Victory House, Leicester Square, W.C.2) has a membership of over 26,000. During the past year it has gained nearly 2,000 new members—a record in the history of the Society. Membership is open to registered medical and dental practitioners. There are special provisions for members practising overseas and also for practitioners who visit the United Kingdom for postgraduate work. Members are afforded advice and assistance in all matters of professional difficulty, with unlimited indemnity against adverse costs and damages. This indemnity is secured by financial resources exceeding £150,000 and a reinsurance at Lloyd's for an unlimited amount. The council considers the financial position is such as not to justify any increase of the subscription, which is £1 per annum.

The Medical and Dental Defence Union of Scotland (115, St. Vincent Street, Glasgow, C.2) has a membership of 6,634, but with the summer influx of new graduates it is expected that at the time of the annual balance the membership will be in the region of 6,700. The total assets are about

£40,000. The policy of the council has always been to give careful consideration to the interests of its members who have claims made against them for negligence.

BRITISH MEDICAL STUDENTS' ASSOCIATION

The British Medical Students' Association (B.M.A. House, Tavistock Square, W.C.1) was founded in 1941 to promote the interests of medical students. It is a highly enterprising body, publishing a lively quarterly journal, organizing clinical conferences in university centres, and holding an extended annual general meeting in the autumn. One proposal which the association is considering is the establishment of a rehabilitation centre for tuberculous students. This year its main activities have been in connexion with the Medical Bill before Parliament, which vitally affects the future of medical students. Its executive has vigorously pursued a well-determined policy with regard to this Bill, has been in constant touch with Members of Parliament and with the Minister of Health, and has seen that the various points of principle have been ventilated in the national press. It has also taken up the question of student health, various international relations, medical teaching films, and vacation residences. With regard to this last, for the past three years it has assisted students to obtain posts in hospitals during their vacations. With the object of retaining the interest of its old members the B.M.S.A. has created a category of membership for qualified men and women.

EMPIRE MEDICAL ADVISORY BUREAU

The Council of the British Medical Association in 1948 decided to set up at B.M.A. House, Tavistock Square, London, W.C.1, an Empire Medical Advisory Bureau with a view to welcoming and providing a personal advisory service to practitioners visiting the United Kingdom from the Dominions and Colonies. An Advisory Committee has been formed under the chairmanship of Sir Lionel Whitby and is fully representative of Government departments and societies interested in the welfare of Empire and Overseas visitors during their stay in this country for postgraduate or other purposes.

One of the main objects of the Bureau is to welcome overseas visitors. All such visitors are most cordially invited to contact the Bureau as soon as possible after arrival and talk over with the Medical Director (Dr. H. A. Sandiford) any points on which advice or assistance may be needed. During its first two years nearly 1,500 inquirers have made use of the Bureau's services and over 800 visitors have visited the Bureau.

Detailed information is available at the Bureau on postgraduate education facilities and on the courses of study necessary for higher qualifications. The Bureau is in close touch with the British Postgraduate Medical Federation and other organizations and authorities concerned with postgraduate work, and, where required, the necessary contacts and introductions can be provided. The visitor who wishes to see something of the latest medical and surgical techniques can be put in touch with the appropriate experts.

A register of suitable hotels and lodgings is maintained by the Bureau. "At Homes" and other social functions are held at regular intervals, and practitioners from the Dominions and Colonies are enabled to meet each other and prominent members of the profession in this country. A number of United Kingdom doctors have notified the Bureau of their wish to entertain overseas visitors, usually for week-ends, in their homes.

General information is afforded by the Bureau concerning food rationing, Customs duties, facilities for sport and travel, exhibitions, and the like. It will enable the Bureau to be of most service if a visitor gives as long notice as possible of his intended visit to this country, date of arrival, mode of travel, period of stay, and so forth. On arrival a letter of introduction from the local honorary secretary of the medical association to which the visitor belongs, whilst not essential, would be welcome and might be helpful if references are required when taking furnished flats. All communications should be sent to the Medical Director.

SERVICE OVERSEAS

Colonial Medical Service

The Colonial Medical Service offers an interesting career. Vacancies occur in all parts of the Colonial Empire, the greatest number in tropical Africa and Malaya. Candidates must ordinarily be British subjects holding medical qualifications registrable in the United Kingdom, and should have had at least 12 months' postgraduate hospital experience before appointment. Those applying for entrance into the permanent service must be under 40 or 45 years of age, according to the age of compulsory retirement (50 in West Africa and 55 in most other territories) in the area to which they are appointed. Contract appointments for short terms are available for candidates who are above the age limits or who, while below the age limit, do not wish to commit themselves to a colonial career at the outset. Officers appointed to the permanent service are normally required to take a course in tropical medicine and hygiene either before proceeding overseas or during their first leave.

In the first instance medical officers are usually appointed for general duties, often involving the charge of a district hospital and responsibility for the medical administration of a district, though many officers are employed on clinical duties in the large hospitals. Some posts are concerned purely with public health work, and for these the possession of the D.P.H. or special experience in preventive medicine is necessary.

A large number of specialist appointments, calling for a very high standard of professional attainment, are normally filled from within the service by officers possessing the necessary aptitude and qualifications. Senior administrative appointments are also almost invariably filled by the promotion of serving officers. Officers possessing qualifications or experience in pathology would be considered for appointment to the laboratory establishments. Vacancies exist for women doctors, particularly for those with special experience in obstetrics, school health, child welfare, and nutrition.

Doctors in the National Health Service may also avail themselves of a scheme which is to be brought into operation in most Colonies whereby they take up appointment in the Colonial Medical Service for temporary posts up to six years without loss of pension rights in the National Health Service. The scheme provides for the payment of a generous gratuity at the conclusion of the doctor's service abroad, but those wishing and eligible to transfer to the permanent and pensionable establishment of the Colonial Medical Service will have opportunities to do so. The Colonial Medical Service offers special opportunities and experience not obtainable at home, and that experience will be of great value to the doctors both in practices and in hospital appointments if they elect to return to this country.

Full particulars of terms and conditions of service may be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

During the past year the British Medical Association has been in negotiation with the Colonial Office concerning the revision of salary scales in the Colonial Medical Service. The endeavour has been to arrive at a fair colonial equivalent of the Spens recommendations for the remuneration of the profession in the United Kingdom, but the Colonial Empire has a wide range of variation in taxation, cost of living, and conditions of work, so that a scale which would be a fair equivalent in one colony would be far from fair in another. The attempt to draw up a single uniform scale applicable to all colonial territories has therefore been abandoned in favour of the achievement of a broad equality of real reward. The conclusions reached up to the end of last year were set out in the *Supplement* of December 31, 1949 (p. 278).

Medical Missions

To medical men and women with a sense of vocation and a desire to express and spread their faith through their professional work, medical missionary service offers vast opportunities. In China, Christian missions have given the country a medical and a nursing profession, and despite recent restrictions and difficulties doctors continue their witness. In Africa they have responded to the urgent call of physical need, have pioneered rural health services, and contributed to leprosy research and control, as well as taking a part in the building up of the Christian Church. In India and Pakistan they have helped to maintain high ethical and professional standards, and demonstrated in time of crisis the Church's ministry of reconciliation.

The missionary societies regard 18 months' postgraduate work in resident appointments as a minimum, and often advise work for specialist diplomas or higher degrees. In addition special missionary training is recommended. Terms of service vary in length from 18 months to six years, according to climatic conditions. While it is generally hoped that offers of service will be for life, short terms are also considered. Salary is on a missionary basis, with children's allowances and a pension scheme.

Applications from students and qualified men and women should be made direct to the missionary societies or through local branches of the Student Christian Movement or the Intervarsity Fellowship, or to the chairman of the Medical Advisory Board of the Conference of British Missionary Societies, Edinburgh House, 2, Eaton Gate, London, S.W.1.

THE SYRIAN UNIVERSITY

FACULTY OF MEDICINE

The Faculty of Medicine of the Syrian University at Damascus consists of branches in medicine, pharmacy, dentistry, midwifery, and nursing. The Medical Faculty is the University's oldest institution and was originally known as the Arab School of Medicine. It was established in 1919 to succeed the Turkish School of Medicine, started in Damascus under Sultan Abdul Hamid II in 1901.

A decree passed in 1925 placed under the Medical School the Syrian General Hospital, which hitherto had been run by the Ministry of Health. The radiology department was established in 1926, the maternity section in 1937, and the children's department in 1948.

The teaching staff includes in its 44 members ten professors, eight assistant professors, five lecturers, and eight assistant lecturers. There are 327 students of medicine.

Inquiries about vacancies on the staff should be addressed to the Middle East Secretariat, Foreign Office, London, S.W.1.

The faculty has the following laboratories: anatomy; physiology; biochemistry; pathology; bacteriology, parasitology, and hygiene; medicine; forensic medicine; chemical pharmacy and chemistry; clinical dentistry; dentistry (three).

The faculty's hospital has 365 beds. It is divided into eight sections attached to the different branches as follows: internal medicine; surgery; gynaecology; nose, ears, and throat; eyes; children; skin diseases; infectious diseases. In addition to these sections the hospital has an out-patient department, a radiology department, a special laboratory for medical and chemical analysis, and a blood bank. The students in their last year receive intensive training in practical medicine and surgery at Government and military hospitals as well as at the various branches of the faculty's own hospital.

THE PUBLIC HEALTH SERVICE

Many departments of the Government have health functions. The Ministry of Health makes annual grants to local authorities as a contribution towards the expenses of local health services, and receives an annual report from the medical officer of health for each area. The Ministry of Education makes similar grants to local education authorities for the administration of school medical services. The Ministry of Labour administers the Factory Acts; the General Post Office provides a medical service for certain of its employees; the Ministry of Fuel and Power appoints medical officers for mining districts. The Ministry of Food has its own medical advisers. Over a period of nearly 20 years the local authorities ran rate-aided general hospitals, but these, along with the voluntary hospitals, have, save in a very few cases, been taken over under the National Health Service Act by regional hospital boards.

The entrant into public health work usually begins as an assistant medical officer, doing maternity and child welfare or school medical work or both. Such medical officers are now tending to specialize more directly either on the obstetric or on the child health side. The Society of Medical Officers of Health has suggested that special experience in maternity or children's hospitals and the acquirement of such a diploma as the D.C.H. might be more useful than the D.P.H. itself. But the Certificate in Public Health is regarded as the basic qualification for entrance into the public health service.

The L.C.C. Medical Service

The London County Council employs a larger number of medical staff than any other local authority. Sir Allen Daley, Medical Officer of Health and School Medical Officer to the council, kindly sends the following note:

"Whole-time appointments in the Public Health Department of the London County Council, apart from those of medical officer of health, deputy medical officer of health, and principal medical officer, include five senior medical officers, nine divisional medical officers, five senior assistant medical officers, nine assistant divisional medical officers, and 73 assistant medical officers. Their duties in the higher grades are mainly administrative. The officers, speaking generally, have graduated through the clinical field and have special knowledge in at least one branch of the service. The assistant medical officers are mainly engaged in the school health and maternity and child welfare services. Suitable qualifications are the D.C.H. and the C.P.H. or the D.P.H. Arrangements are made for some of them to have clinical responsibilities at hospitals and to gain experience of the environmental health services in the Metropolitan boroughs.

"For the grades assistant medical officer to senior or divisional medical officer the present salaries range from £910 to £1,800 per annum, but a Whitley Council, at national level, is now reviewing public health salaries.

"In addition the council employs nearly 500 part-time medical officers in a variety of work—for example, in residential nurseries, welfare institutions, staff examinations, and sessional work at clinics, and in school medical inspection. By arrangement with the London School of Hygiene, the Institute of Child Health, and several undergraduate schools, students are given opportunities of gaining experience in the council's various medical services."

MEDICAL AUXILIARY SERVICES

The desirability of having a national register of trained persons engaged in technical work or practice ancillary to the work of the medical profession was seen clearly many years ago by the British Medical Association, and it was principally at its instance that there was formed a Board of Registration of Medical Auxiliaries (Tavistock House North, Tavistock Square, W.C.1). The register comprises many thousands of names and includes radiographers, dispensing opticians, chiropodists, speech therapists, orthoptists, dietitians, and physiotherapists and biophysical assistants. The Board, the majority of whose members are members of the medical profession, is a registering and disciplinary body, not an examining one. Examining bodies in the various branches are approved by the Board and appoint representatives to its council.

The function of the Board is to co-ordinate the work of these various auxiliaries, to ensure that they are qualified, to maintain and improve their standard of training, and to afford liaison between them and medical practitioners. All those whose names appear on the register hold a qualification in their particular sphere recognized and approved by the Board. With the exception of the chiropodists, all those on the register, as a condition of admission, undertake not to carry out any medical auxiliary work save under a medical practitioner's direction

and control. The chiropodists, while not acting under medical direction, confine their practice to the treatment of malformed nails and superficial excrescences occurring on the feet.

The qualifying bodies for the respective branches are the Society of Radiographers, the Association of Dispensing Opticians, the Society of Chiropodists, the College of Speech Therapists, the British Orthoptic Society, and the British Dietetic Association. All the qualifying bodies have established periods of training. That for the radiographers, for example, is two years at a recognized training centre, and for speech therapists a three-years full-time course at a recognized school.

Correspondence

Ministry of Health Streptomycin Conference

SIR,—In your issue of August 12 (p. 413) you kindly published a summary of the findings of the conference organized by the Ministry of Health to investigate the use of streptomycin in the treatment of tuberculous meningitis. Your introductory note to this summary is liable, however, to give a wrong impression of the history of this conference, and this is due, no doubt, to the fact that the body organizing these trials was, owing to its very large size, called a conference instead of a committee. The facts of the matter are that preliminary trials on this treatment were carried out by the Medical Research Council, who in 1947 informed the Minister of Health that their results to date justified the wider use of streptomycin in the treatment of tuberculous meningitis and acute generalized miliary tuberculosis. It was decided, therefore, that the Ministry of Health should organize clinical trials in relation to these two conditions, and teaching hospitals in different parts of England and Wales, as well as the Department of Health for Scotland and the Ministry of Health and Local Government of Northern Ireland, were invited to organize groups known as centres to carry out these trials. The first supplies of streptomycin for this purpose were issued in August, 1947, and thereafter quarterly meetings of representatives of the centres were held at the Ministry of Health under my chairmanship. In January of this year a report on the results of this investigation was approved which, for various reasons, it was decided should be confidential, and in July a short summary was approved for publication.

You will see, therefore, that though the original limited trials were carried out by the Medical Research Council and their experience and the co-operation of their experts were of the greatest assistance in the later trials, yet the latter were the responsibility of this Ministry and the "conference" was not a meeting held on a single occasion but an organization conducting and assessing these larger trials.—I am, etc.,

Ministry of Health, S.W.1. W. DALRYMPLE-CHAMPNEYS.

Science before History

SIR,—In the *British Medical Journal* of August 12 we have had the privilege of reading two outstanding addresses. In the first, Dr. F. M. R. Walshe (p. 379) points out that a full diagnosis must be based on the integration of two different disciplines; first, the technique of the natural scientist is needed in order to elicit and evaluate physical signs and laboratory investigations; secondly, the method of the historian is used to elucidate and interpret what the patient and relatives say. He suggests that in medicine the discipline of the historian is usually the more difficult one. Dr. F. Gray (*Supplement*, p. 85) states that the essential activity of the general practitioner should be the detection of small but significant degrees of ill-health. He also says that teaching hospitals are mainly concerned with the diagnosis and treatment of patients displaying major deviations from the normal and that knowledge of these, though an important step, is by itself quite inadequate to make a good doctor.

The logical result of these ideas would be that the student should first be grounded in the elicitation and interpretation of physical signs and laboratory tests, both relatively easy techniques which link up naturally with his scientific studies. When he has learned the essentials of physical diagnosis the student should then be initiated into the difficult art of taking a history, for which his preclinical studies have been a *poor preparation*. This programme is the reverse of what usually occurs nowadays, where the student is set to take a history but the teacher examines the patient. *I believe that the traditional procedure* of taking a full personal and family history before examining the patient is usually a mistake, both in teaching and in practice. It is often wiser first to discover whether the patient suffers from any detectable abnormality and then from the history to try to determine its significance, and this is the order in which students should be instructed.—I am, etc.,

Liverpool. ROBERT ROAF.

Preparing Students for General Practice

SIR,—Dr. Frank Gray in his very fine address "The Way Divides" (*Supplement*, August 12, p. 85) says that one way of raising the status of general practice is for general practitioners to pool their experiences and help to educate each other. I suggest that a more fundamental method is necessary—*namely*, to have lectures by general practitioners to future general practitioners in our medical schools. The gap between the teaching of the consultants and the practice of *the family doctor* is very great. The young doctor entering general practice, even after a year or two in hospital, still has to learn by bitter experience how to deal not only with the "*trivial*" complaints but with many other aspects of medicine requiring a great deal of knowledge. I am recently enough qualified to remember how *little* I was taught in medical school about domiciliary midwifery, breast-feeding, the investigation of sterility, the control of the common fevers in the home, the treatment of *the rheumatic* diseases, and above all the psychological approach which is the hallmark of the good practitioner.

Few consultants have the necessary experience of these subjects, as encountered from the viewpoint of the general practitioner, to teach them well. For instance, how many consultants can lecture about breast-feeding as ably as Dr. Charlotte Naish, who opened the discussion on the subject at the Annual Meeting last month? Her book, written as a result of her own observations in general practice, leads to a deeper understanding of this difficult subject than any other literature I have read. Dr. William N. Pickles and Dr. Grantly Dick Read are well qualified to lecture on their own subjects, and there are many other able "physicians and surgeons" who have not hit the medical headlines but whose abilities should be made use of by the teaching schools. The bulk of any good doctor's medical education is acquired after he qualifies, but let him at least have a good grounding in the fundamentals of individual and family as well as scientific medicine.—I am, etc.,

Clare, Suffolk. D. CRADDOCK.

The Teaching of the Medical Student

SIR,—When I graduated in 1888, the course of teaching was limited to four years, provided you jumped the hurdles as they came along. The first winter was devoted to chemistry, zoology, and anatomy, and the following summer to botany (at 8 a.m.), practical chemistry, and anatomy. The second year was devoted to anatomy and physiology, and we started clinical surgery. The surgery was easily learned, as it was chiefly concerned with fractures, tuberculous abscesses of bones, hip-joint, glands, etc. Strictures of the urethra were common and were treated by bougies, and occasionally by Syme's operation. Cancer of the breast was not uncommon, and usually removed by operation. We also saw some patients suffering from fracture of the base of the skull. Amputations were rather common, especially of the foot and occasionally at the knee-joint. Lister's antiseptic technique was half-heartedly applied. No surgeon, so far as I know, had ever seen the staphylococcus, nor, I fancy, believed in germs causing so much disease. Every major operation I saw was followed by local sepsis and suppuration, and actually two forms of pus were recognized: the healthy pus was called laudable, and was expected as a matter of course. Only once in three years did I see the abdomen opened, and that was in a stout woman, when the bowels gushed out and were with great difficulty replaced, the patient dying in the night.

In the dispensary we picked up some useful knowledge regarding diseases of the ear from Dr. T. Barr, but Dr. Maitland Ramsay gave an excellent course of operative surgery on the eye on Saturday mornings; and Dr. Walker Downie, just beginning his career, on throat diseases. Looking back over the vista of years, I think, so far as I was concerned, botany and zoology should have been left out, and we should have got to grips with anatomy, physiology, and chemistry straight away. A good grounding in practical anatomy, to know when we are examining a patient what really lies below the skin, whether it be nerve, artery, muscle, or valves of the heart, the topography of the organs, the distribution of nerves, and the anatomy of the spinal cord and brain, is in my humble judgment the most valuable knowledge any general practitioner should aspire to, particularly for diagnostics. The new course for a student is going to be a tremendous task, practically requiring him to profess an encyclopaedia of medicine.

After I was a few years in practice I studied bacteriology with Dr. Arkle at Charing Cross Hospital, having the laboratory to myself, and diseases of the skin with Morgan Dockrell at Leicester Square; he summed up the treatment of diseases of the skin in these words: "Ask yourself if the skin requires to be stimulated or soothed, then add the suitable antiseptic." Following that advice I have had little trouble in treating the ordinary run of skin cases. I had the pleasure of the company of two American doctors in visiting many of the hospitals in London. Their opinion was that there was far too much theory and far too little ocular demonstration of patients and their diseases.

I believe there is now room for two classes of doctors: one class who will take, say, a B.Sc. in scientific knowledge, and another class who are content with practical knowledge and who are not mentally fitted to carry too many impedimenta in their heads for their day's work.—I am, etc.,

Renton, Dunbarton. J. T. MACLACHLAN.

Amoebiasis and Personality

SIR,—The paper by Dr. C. A. Hoare (July 29, p. 238) and your annotation on amoebiasis (p. 259) stress the point that *E. histolytica* lives mainly as a commensal in the bowel. It seems probable that the higher incidence of amoebic dysentery in hot countries is due to the mucosa being often rendered susceptible to the invasion of *E. histolytica* by bacillary dysentery or non-specific epidemic entero-colitis. Recovery from these attacks is usually complete with treatment and in many cases probably without it. There are, however, a group of patients who persistently relapse in spite of all forms of therapy for some years, even after leaving the Tropics. The evidence seems to point to differences in individual susceptibility. I should like to offer some personal observations which may be relevant to this matter.

In 1948, while investigating the incidence of the colitis personality among controls, I took a patient from a surgical ward who was recovering from appendicectomy. My assessment of his personality was that he was potentially a case of colon neurosis (irritable colon) or even ulcerative colitis. Examination of case notes then revealed a long history of recurrent bouts of abdominal pain with diarrhoea and mucus since he had been in Iraq in 1943. (On closer questioning he admitted attacks of "enteritis" in this country before the war, usually related to stress.) The operation note recorded that his caecum was inflamed, and that the purse-string sutures tended to cut out. I examined the abdomen and found a soft, enlarged, and slightly tender liver. After discussing my suspicions with the surgeon we made a sigmoidoscopic examination, and I was able to demonstrate active haematophagous forms of *E. histolytica* from small ulcers in the rectum. I then remembered some of the chronic relapsing cases I had treated during the war, and, though I had not made a psychological study at the time, my memory of a few of them fitted well with certain traits I have since found associated with the colon personality. In the next few months I pursued and interviewed a further three cases of chronic relapsing amoebic dysentery, and my findings were similar. Since then only one more has come my way, but again he had a colon personality. I drew attention to these observations in 1948,[1] and at about the same time Crede and his colleagues[2] recorded a similar case. It therefore seems possible, apart from changes due to infection by the dysentery group of organisms, that the hyperaemic, oedematous, and even ulcerated mucosa found in colon neurosis and colitis may be important in rendering the bowel wall vulnerable to invasion by *E. histolytica*. Such an explanation, though it may seem far-fetched to those who have not studied personality traits in colitis, might account for some of the mystery of the symptom-free cyst-passer in relation to the chronic amoebic invalid.—I am, etc.,

Woodbridge, Suffolk. J. W. PAULLEY.

REFERENCES

1 Paulley, J. W., *Proc. R. Soc. Med.*, 1949, **42**, 241.
2 Crede, R. H., Rosenbaum, M., and Ferris, E. B., *Psychosom. Med.*, 1948, **10**, 223.

Nurses and Tuberculosis

SIR,—At the annual conference of the National Association for Maternity and Child Welfare, Dr. Fraser Roberts is reported (*B.M.J.*, July 22, p. 211) to have said that people with a bad family history of tuberculosis should be discouraged from entering the tuberculosis nursing service. Whatever justification there may have been for such a statement in the past, these remarks surely do not apply to-day when the nursing profession as a whole, especially in sanatoria and general hospitals, is subjected to more detailed supervision, with the use of B.C.G. vaccination as necessary, than men or women in other walks of life? In point of fact the person with a bad family history entering the nursing profession, and developing active disease, is in a much more fortunate position than her opposite number employed in some other occupation. In the one instance the disease will be detected at an early treatable stage, whereas in the other the disease may drag on undetected until she becomes an advanced sputum-positive case for whom nothing can be done, thus adding yet further to the reservoir of infection in our midst.

As regards rehabilitation this should present little difficulty in the case of the nurse, but in the other case the matter is frequently extremely complicated, despite the provisions of the 1944 Disabled Persons Act.

It is hoped that Dr. Roberts's remarks will not be taken seriously and that candidates for the nursing profession who are deeply convinced that their life's work lies in this direction and who are themselves in good health will not be deterred from entering the service simply because of their family history.—I am, etc.,

Birkenhead. DAVID W. TOUGH.

Sulphapyridine for Dermatitis Herpetiformis

SIR,—In your issue of August 12 (p. 408) Professor Dunlop says unkind and mostly quite justifiable things about sulphapyridine. Curiously enough, however, and any dermatologist will so testify, it is often the only drug which will control dermatitis herpetiformis. In a disappointing number of cases the drug cannot be endured by the patient, but there are also those who can tolerate the drug, sometimes for years, and their lives are bearable only when they take a regular maintenance dose. For the moment, may we continue to prescribe it?—I am, etc.,

London, W.1. DAVID I. WILLIAMS.

Domiciliary Treatment of Tuberculosis

SIR,—I was glad to see the answer in the *Journal* (August 5, p. 369) by Dr. FitzGerald and others to the allegation made by Dr. William D. Gray at the meeting of the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the B.M.A. at Liverpool. I, however, am certainly not satisfied with his reply. Does Dr. Gray really believe that we should ask the permission of the tuberculosis officer before treating our patients with streptomycin or P.A.S.?

Perhaps Dr. Gray also believes that we should also ask the permission of the medical officer of health before treating a case of puerperal sepsis with penicillin.

It is the primary responsibility of the general practitioner to treat these diseases, and he is certainly under no obligation to consult the tuberculosis officer first. I have long since by-passed the tuberculosis officer in all cases of tuberculosis. All *x*-ray examinations, sputum tests, and E.S.R. determinations are arranged at the local hospital, and all difficult cases referred to the chest physicians at the teaching hospitals. Previously I found it so difficult to prevail on the tuberculosis officer to arrange these investigations that I found it essential to make the arrangements. If a tuberculosis officer did arrange an *x*-ray examination I found it almost impossible either to see the film or to obtain a report.—I am, etc.,

London, S.W.2. R. CROSBIE WALSH.

Carcinoma of Islets of Langerhans

SIR,—In the *British Medical Journal* of April 29 (p. 982) Drs. B. F. Brearley and J. W. Laws reviewed a case of carcinoma of the islets of Langerhans accompanied by hypoglycaemia. The patient died. Microscopical examination showed carcinoma of the islet cells of the pancreas with metastases in the abdominal organs. Some years ago, in 1932, I had the opportunity to observe a similar case. The history of this case is as follows.

The patient, a man of 63 years of age, owner of a public-house, suffered from diabetes mellitus for three years. He consumed alcoholic drinks regularly before the diabetes. Since his illness was discovered he drank regularly daily about 1–1.5 l. of wine on prescription, besides following a meat and vegetable diet. On this diet he had glycosuria. During half a year he lost considerable weight. Before he weighed 200 lb. (90 kg.), but now, even with his huge ascites, he weighed altogether 168 lb. (75.6 kg.). The legs were also swollen. Later no sugar was to be found in his urine. He was admitted to hospital on February 25. On this occasion, and later too when undergoing regular examination, there was no sugar in the urine, but urobilinogen was positive and the blood-sugar level was 120 mg.%. The patient had no jaundice. The Wassermann reaction was negative. The patient suffered permanently from high temperature up to 102.2° F. (39° C.). After some "novurit" diuretic injections we performed puncture of the ascites and drained more than two gallons of the ascites fluid. After puncture a tumour as big as two fists became palpable in the epigastrium. Glycosuria did not occur though his diet contained pure carbohydrates. The general state of the patient gradually grew worse and he died on March 12. Some of the more significant details of the necropsy were as follows. There were about two gallons of ascites fluid in the abdomen. The liver had a granular surface, and under the stomach and on the lesser curvature a mass of lymph glands as big as a child's head was situated. The head and body of the pancreas were changed into a big soft mass of tumour tissue, which together with the lymph glands formed one body. The tumour was soft like marrow, with an abundant pulp and sulphur-yellowish necroses and haemorrhages. The stomach was intact: the tumour did not touch it. The liver was full of granules of a greenish-red colour; metastases were found in the liver too. Diagnosis: interstitial hepatitis, and carcinoma of the pancreas with metastases.

No histological examination took place; therefore it could not be precisely ascertained which cells of the pancreas were the source of the tumour; but it was a fact that simultaneously with the growth of the tumour the diabetes disappeared and the patient showed no glycosuria in spite of the pure carbohydrate diet, and his blood-sugar level also became normal. Consequently the tumour contained insulin-producing cells.—I am, etc.,

Csorna, Hungary. ALEXANDER FERENCZI.

Sulphonamide Dosage in Kidney Infection

SIR,—Professor D. M. Dunlop in his paper on sulphonamide therapy (*Journal*, August 12, p. 408) states that in coliform urinary infections it is unnecessary to give large doses of sulphonamides, as they are concentrated by the kidneys in their passage from the blood into the urine. This would be true if we could be certain in any given case that the infection has not penetrated into the interstitial tissues of the kidney. In these cases it is obvious that what matters is not the urinary concentration of the drug but the blood concentration. This was pointed out clearly and vigorously by Birchell and Alexander in an outstanding paper on the medical aspects of pyelonephritis. The distinction at the bedside and in the clinical side-room between pyelonephritis and more innocent infections of the urinary tract is notoriously difficult. Pyelonephritis is responsible for a not inconsiderable number of cases of hypertension and renal failure in children and young adults. It is, therefore, a disease which merits great consideration and thorough treatment. For these reasons Birchell and Alexander very correctly advocates that sulphonamides be given in full doses and for five to seven days in all cases of coliform urinary infections.—I am, etc.,

London, N.21. E. MONTUSCHI.

REFERENCE

Birchell, R., and Alexander, J. E., *Medicine*, 1950, **29**, 1.

Imported Helminthic Infections

SIR,—Your annotation under this title (July 22, p. 206) recalls how little is reliably known of the incidence of these infections in communities in this country. It is indeed as much a matter of clinical as of epidemiological importance that surveys should be undertaken and reported on the prevalence of parasite eggs and larval excretion not only of tropical helminths but also of endemic cestodes and nematodes. The possibilities of diphyllobothrium becoming established as a public health risk here have been mentioned by some of your contributors (July 22, p. 188). Immigrants and returning Servicemen, prisoners of war, and civilians from countries where helminthiasis is widespread may unwittingly harbour one or more species of intestinal parasite acquired abroad and responsible for deceptive or equivocal symptoms.

Last week I found 48 West Africans living at one of the more salubrious of London's common lodging houses, and was reminded of the findings in 1945 during a survey of the stools of 100 apparently normal uncomplaining West African native soldiers stationed at Benghazi (Cyrenaica). Ninety-nine showed helminthic ova or larvae; 72 of these were infected with two, three, or four different species, and one man's stools showed five. The species identified were *Taenia saginata* (3), *Ascaris lumbricoides* (31), *Trichuris trichiura* (59), *Ankylostoma duodenale* (55), *Trichostrongylus columbriformis* (77), and *Strongyloides stercoralis* (14). Seventy-eight of the 100 "normal" men showed a blood eosinophilia of 10–40%. There is another important aspect of this problem. So many helminths invade the lung at one stage of their life cycle in men that lung symptoms due to their unsuspected presence may create difficulties in accurate diagnosis, especially when such symptoms are accompanied by changing areas of radio-opaque pulmonary collapse or consolidation and marked eosinophilia.

In some of the puzzling lung cases met with in practice parasitological examination of sputum and stool for ova or larvae can be very helpful. Similarly, ova and developing *Enterobius vermicularis* may sometimes be demonstrated in the purulent nasal discharge of young children and indicate the more appropriate orifice to which treatment should be directed. —I am, etc.,

Westminster, S.W.1. W. HARTSTON.

Hyperemesis Gravidarum and Oestrogens

SIR,—I was interested to read in your issue of July 29 (p. 275) that Professor W. I. C. Morris, a renowned and revered obstetrician, had asserted that "hyperemesis gravidarum was the one complication of pregnancy in which obstetricians had accepted the major importance of the psychological component."

Although nausea and vomiting in early pregnancy can be caused by several conditions—e.g., pyelonephritis—hyperemesis gravidarum is a characteristic syndrome. The most prominent symptoms are intense wretchedness, depression, nausea, vomiting, and the development of marked acetonuria within a period of a few weeks. In my cases the onset of symptoms has been abrupt and they have increased in severity with alarming rapidity. In my opinion, hyperemesis gravidarum, far from being caused by psychological factors, is a toxaemia caused by an endocrine or metabolic upset with a vicious-circle action.

In my first case, in 1947, after a trial of all the usual methods of treatment, when termination of pregnancy was being considered, I hit on the idea of giving synthetic oestrogen (*dienoestrol*) in comparatively large doses by mouth. Within two to three days the effect was dramatic and the condition cleared up completely. My last case occurred this year. During the sixth week of pregnancy it became necessary to institute treatment. Ethinyl oestradiol was used and the dose was 2 mg. t.i.d. At the 13th week this dose was gradually reduced over a period of one month, at the end of which it was discontinued. This method completely controlled the hyperemesis gravidarum. When dummy tablets were substituted, the condition recurred. I might add that in the few cases of the disorder I have seen there was no evidence whatever of psychological disorder.

There is one piece of laboratory evidence in favour of treatment with oestrogen. Smith and Smith[1,2] found in the toxaemias of pregnancy an increased output of gonadotrophin and a diminished output of oestrogen and progesterone.—I am, etc.,

Carlisle. JAMES ROSS.

REFERENCES

1 Smith, G. V., and Smith, O. W., *Amer. J. Physiol.*, 1933, **103**, 356.
2 —— —— *J. clin. Endocrinol.*, 1941, **1**, 477.

Intermittent Dosage with Streptomycin

SIR,—I was interested to read Dr. R. Munro Ford's letter (August 5, p. 369) commenting on a recent paper in the *Journal* concerned with intermittent dosage in the treatment of pulmonary tuberculosis with streptomycin (May 27, p. 1224). I quite agree that there are theoretical reasons for suggesting that a dosage of, say, 3 g. of streptomycin every third day might diminish the high incidence of streptomycin-resistant organisms which occur when 1 g. is given every day. In addition, such high intermittent dosage might be more effective clinically, and there is evidence to suggest that it would be no more toxic. In fact, a clinical trial of such a regime has been advocated from time to time in this country, but it has not been possible to arrange it owing to pressure of other investigations. The great success of P.A.S. in reducing the incidence of streptomycin-resistant tubercle bacilli now makes it unjustifiable to try out any regime using streptomycin alone. It is possible that a high intermittent dosage of streptomycin might be employed in an attempt to avoid streptomycin resistance completely, but a very large number of cases would have to be used to demonstrate that it had any advantage over the more conventional regime. In the meantime, I do not think that high intermittent dosage should be advocated for general use until there is practical evidence both of its value and of its freedom from undesirable effects. We thought there were good theoretical reasons for hoping that one of the methods of intermittent dosage which we tried would succeed in at least postponing the emergence of resistant organisms, but we were wrong.

I should add that these are my personal views and do not necessarily represent those of the other authors of the paper or of the Medical Research Council.—I am, etc.,

London, W.12. JOHN W. CROFTON.

Folic Acid and Pernicious Anaemia

SIR,—I have read Dr. Rutledge W. Howard's letter in the *Journal* of August 12 (p. 417), and also the articles in the *New England Journal of Medicine* of March 23, 1950, to which he referred, and which were not printed at the time when I submitted my article to the *Journal*. I failed, however, to find any evidence of the proof that folic acid does not harm the nervous system in pernicious anaemia in either the editorial or the article by Harvey, Howard, and Murphy, who are concerned only with the effects of folic acid on normal persons or patients not suffering from P.A. On the other hand, the experience of several workers in this country and the United States appears to be that there is more than a suspicion that folic acid treatment of pernicious-anaemia patients may either bring about or accelerate the development of neurological lesions, which are, of course, not primarily caused by folic acid but are a part of the P.A. syndrome. From this point of view I agree with Dr. Howard that folic acid by itself is not the causal factor of the neuropathy.

I cannot agree with his suggestion that folic acid should be given in combination with liver extract or vitamin B_{12} in the treatment of pernicious anaemia. I think this would be a dangerous procedure, as it would rob us of the only criterion with which to judge the adequacy of our therapeutic measures. It is only by keeping the red cells up to 5,000,000 and the haemoglobin up to 100% that we can prevent subacute combined sclerosis of the cord. The simultaneous administration of folic acid and liver or vitamin B_{12} will blur the picture. It would be impossible to assess how far a normal blood finding was due to folic acid or due to the liver principle which alone can prevent neurological lesions.

I agree with all Dr. Howard said about the value of folic acid in certain types of anaemias, other than P.A., although I have quite recently found vitamin B_{12} most effective in a case of idiopathic steatorrhoea in which folic acid had failed.—I am, etc.,

Liverpool, 1. H. FULD.

A Simpler Method of Bronchography

SIR,—Dr. E. G. Sita-Lumsden has described a simple method for introducing iodized oil into the trachea (*Journal*, June 24, p. 1491). I will describe one which is simpler still.

The patient sits on a chair facing the operator, who holds the tongue forward while the following four steps of the procedure are done.

(*a*) The pharynx is thoroughly painted with a 10% solution of cocaine.

(*b*) Three minutes later 2 ml. of 2% cocaine in a syringe without the needle is slowly poured down the nostril, along the floor of the nose on the desired side, while the patient's head is held upwards and slightly towards the side concerned.

(*c*) After three minutes step (*b*) is repeated.

(*d*) After five minutes the required quantity of the oil in a syringe is poured down in the same way, only a bit more slowly.

No premedication is necessary. It is easy to do and definitely more comfortable for the patient than injection and catheterization. There is no coughing out of oil. I have a very limited experience with this method. The results have been very good. I learnt this technique from another Indian Army doctor—Lieutenant-Colonel H. B. Lal, A.M.C.—I am, etc.,

Military Hospital, Jullundur (India). JAGDISH CHANDRA CHUGH, Captain, A.M.C.

Collapse During Spinal Analgesia

SIR,—Much interest has been shown recently in the matter of collapse following spinal analgesia, and we consider the following case to be of sufficient interest to be reported.

Wilson Hey prostatectomy was proposed for a male aged 71 for relief of acute retention of urine of 36 hours' duration. He suffered from dyspnoea and palpitations on exertion and there was radiographic evidence of left-sided cardiac enlargement. Pulse was 84 per min., regular in rhythm; B.P. was 150/100 mm. Hg. Following premedication with morphine 1/6 gr. (10 mg.) and atropine 1/100 gr. (0.65 mg.), spinal analgesia was induced with 1.4 ml. 1:200 "cinchocaine" in 6% glucose ("heavy nupercaine"). He was turned on to his back immediately and appeared very pale and shocked. His pulse rate was now about 160 per min. and grossly irregular; systolic blood pressure was 100 mm. Hg. A 1:250,000 adrenaline drip was started immediately and the blood pressure raised to 130/90 mm. Hg within 30 seconds. Oxygen was administered, and as the patient would not tolerate the face-mask sleep was induced with 10 ml. 2½% thiopentone. It was not possible to adopt a steep Trendelenburg position for fear of spread of the solution to the upper thoracic segments. As the operation was no longer considered feasible, the patient was catheterized and 50 oz. (1.5 l.) of urine withdrawn. On return to the ward one hour later his pulse rate was 100 per min. and rhythm was still grossly irregular; B.P. was 140/100, without adrenaline. An E.C.G. taken 24 hours after the spinal showed auricular fibrillation with right bundle branch block of the Wilson type and ventricular extrasystoles.

As catheterization only produced temporary relief of his prostatic obstruction he was given a general anaesthetic (curare, thiopentone, nitrous oxide, oxygen, and ether), and the operation was successfully completed 30 hours after the first attempt. Digoxin 0.5 mg. was given

intravenously during the anaesthetic, the course of which was uneventful. The auricular fibrillation continued for eight days, when normal rhythm returned spontaneously. An E.C.G. on the tenth day showed nodal rhythm with frequent extrasystoles.

Dr. Wyn-Jones (physician to the Heart Department, Liverpool Royal Infirmary) comments: "The patient had sufficient evidence of myocardial damage that a lumbar puncture alone, or the psychological upset of preparation for operation, may have been enough to bring on auricular fibrillation without any fall in blood pressure due to the spinal. His pre-operative condition could have been termed pre-fibrillation, but there was, unfortunately, no E.C.G. taken before the operation."

Skin sensitivity tests were carried out on the patient and on 100 medical students as controls, 0.1 ml. solution being injected intradermally. With 1:1,500 cinchocaine the patient reacted with a flare and a ½-in. (1¼-cm.) weal. Of the controls 6% showed a flare only. Using 1:200 cinchocaine the patient produced a flare and weal 1¼ in. (3.2 cm.) in diameter. In the control series only five weals were seen, and none more than ½ in. across.

These tests show that our patient had a definite sensitivity to nupercaine given intradermally, but it is not easy to say whether this sensitivity played a part in initiating or aggravating his original collapse. This occurred so suddenly after the spinal tap that it is difficult to visualize even a minute quantity of cinchocaine entering the circulation in such a brief interval.

The advisability of giving adrenaline in the presence of auricular fibrillation can be questioned, but it has been used for control of blood pressure in a large series of prostatectomies, many of which were fibrillating, with no untoward effects.

It might be argued that on account of his poor circulatory state general anaesthesia should have been used on the first occasion. He was a big man with a thick neck, and an endotracheal tube would certainly have been used; and the mere insertion of such a tube, or the inflation of its cuff, might have initiated auricular fibrillation as easily as the prick of a spinal needle.—We are, etc.,

Liverpool. E. H. WINTERBOTTOM.
J. W. DUNDEE.

Forms of Consent for E.C.T.

SIR,—The form of consent for E.C.T. prepared by the council of the Medical Defence Union and published in the *Journal* of August 5 (p. 370) may well be made obligatory in some hospitals, and one wonders if the council could consider the matter again. The sentence beginning "Notwithstanding . . ." is frightening and can be justified only if it is legally necessary. Personally I do not think it is, for once consent to the treatment has been given the question of breaking bones is not relevant to trespass, and an action would turn upon whether the practitioner had been negligent in the way he carried out the treatment. If he was in fact negligent, the M.D.U.'s form would not save him, for the patient cannot be taken as consenting to negligent treatment. If he exercised proper care, then the form does not bear upon the matter.

It is insufficiently recognized that bony injury in E.C.T. is uncommon. In the case of the most usual complication—compression fracture of a vertebra—disability is only material in a manual worker and then only for a few weeks, and is certainly much less than would have accrued from his untreated depression. Since this is so, why frame a form which it is difficult to imagine any volitional patient agreeing to sign? It corresponds with a surgical invitation to have one's appendix out provided it is clearly understood that one may develop pulmonary collapse, acute retention of urine, or subsequently find the surgeon has left the scissors behind inside one.

I wonder if the council of the M.D.U. could look at this again, and produce something that would be "considered appropriate" by the doctors and patients as well as by the solicitors. As well as deleting the offending sentence, I would suggest replacing "convulsive therapy" by E.C.T. or electroplexy, which somehow make one shudder a good deal less.—I am, etc.,

London, W.1. GERALD GARMANY.

Haemorrhage from Peptic Ulcer

SIR,—Perhaps you will allow us to reply to the comments of Dr. A. M. Nussey (August 5, p. 366) on our recent article reporting a series of cases of haemorrhage from peptic ulcer (*Journal*, July 15, p. 138). First of all, there is absolutely no selection of patients admitted to the Royal Victoria Infirmary. All those who are sent to us, and who require in-patient treatment, are admitted. We have not claimed that a larger series would not have resulted in a higher mortality. Quite possibly, and even probably, it would have done so. We simply do not know. Our personal experience has, however, led us to favour the present practice of the medical management of these cases, provided that the surgeon is called in as required: and we wished to record this.

Our main object in publishing our figures, however, was to urge that in future reports the deaths should be more fully analysed. We ourselves have frankly admitted that in two cases out of four death might perhaps have been avoided. It is our opinion that the records of every fatality should be reviewed and that the mortality should be recorded as "inevitable" or "preventable." We believe that this would be much more helpful than a mere total mortality figure, and would be a healthy exercise. It is, surely, to the close study of the individual case rather than to any radical change in the control or general principles of treatment that we must look for a reduction in mortality.—We are, etc.,

A. G. OGILVIE.
Newcastle-upon-Tyne. I. O. B. SPENCER.

The Dumping Syndrome

SIR,—May I respectfully suggest that the two syndromes referred to by Mr. T. J. Butler (*Journal*, July 22, p. 218) are well recognized by most men interested in gastric surgery? The delayed syndrome is of little practical interest.

With regard to the operative procedure (July 1, p. 15), I did not claim it to be original, though I had found no evidence to the contrary. Before publication I tried, with the kind help of the secretary of the Royal Society of Medicine, to unearth every type of gastrectomy with gastro-jejunal anastomosis; this search failed to disclose any description of a central stoma with double valve anastomosis. In the last analysis all such anastomoses are modifications of the Billroth II operation. In this connexion, Lake (1948), quoting Ogilvie, says, "If we must have names let credit be properly attributed and call the operation the high posterior Finsterer–Lake–Lahey modification of the Mikulicz–Krönlein–Hofmeister–Reichel–Polya improvement of the Billroth II gastrectomy with a large valve and a small stoma." To my knowledge none of the methods published by any of these authors resembles the one I described.

Wakeley (1947) includes a figure showing 12 different types of gastric anastomoses, one of which, attributed to Willns and stated to have been published in 1911, shows a central gastro-jejunal stoma. I failed to find a report of this operation, the nearest I could get to it being an article by Wilms in, I think, 1918. The latter infolded the edges of the lesser and greater curvatures, but could not be said to have produced a central stoma with double valve anastomosis. I should therefore appreciate it if Mr. Butler would kindly give the reference of the article he refers to.

Finally, I think the description of the operative technique is difficult to follow, as it was found possible to include two only of the ten sketches submitted. I hope to publish descriptive details later.—I am, etc.,

Dublin. T. O'NEILL.

REFERENCES

Lake, N. C., *British Medical Journal*, 1948, **1**, 285.
Wakeley, Sir Cecil, *Ann. Roy. Coll. Surg. Engl.*, 1947, **1**, 308.

SIR,—Whatever the mechanism of this syndrome it generally appears to become operative immediately after operation, partial gastrectomy, gastro-enterostomy, etc. The following case history is unusual in that symptoms appeared only after an interval of 23 years.

The patient, aged 61, is a sheet metal worker and follows a strenuous occupation. In December, 1949, he called me in after collapsing at work, but he was quite recovered when examined. In the past two years he has had queer attacks occurring about half an hour after meals. These are characterized by a feeling of nausea, palpitation, cold sweats, and general weakness, leading to fainting on several occasions. The attacks have varied in severity, but, the more strenuous his activity after food, the more severe were the resultant symptoms—e.g., on the particular occasion referred to above he had been late for work and had taken a short cut which required climbing up and down a long steep flight of steps to cross a bridge, and "at the double" to make up lost time. The attacks have lasted about 20 minutes, with spontaneous recovery. He has discovered that eating a toffee hastened such a recovery, and, if taken about the time of onset, prevented or lessened the severity of the attack.

Physical examination revealed no cause for the symptoms, the only unusual feature being a very neat upper abdominal operation scar. The blood sugar curve was 80 mg. fasting; 280 mg. at half-hour after 50 g. glucose; 160 at 1 hour; 70 at 1½ hours; 60 at 2 hours; 70 mg. at 2½ hours; the urine containing sugar in the 1-hour specimen. Barium meal showed a gastro-enterostomy, with the stomach emptying through the stoma and afferent loop: no ulceration was present.

This gastro-enterostomy was performed 25 years ago for intractable peptic ulcer with vomiting, until with a little care and diet he has been symptom-free until the onset of the "dumping syndrome" two years ago.—I am, etc.,

Lancaster. GRAHAM H. ANDERSON.

Division of Popliteal Vein for Varicose Ulceration

SIR,—It was a pleasure to me to read in the August 5 number of the *Journal* your annotation on varicose ulceration (p. 338), in which, in my opinion, the whole problem is very fairly stated. There is, however, one point upon which I do not wholly agree with the opinion voiced by you. Your statement that in the resting patient the pressure in a dependent vein (in this case the popliteal vein), whether normal or abnormal, will represent the hydrostatic pressure exerted by a column of blood extending up to heart level is without a doubt true, provided that no ligatures have been applied to the vein. In the test, mentioned by you, which I have devised for the purpose of making sure, at the operating table, that femoral-vein incompetence is present, the most important detail is the ligation of the popliteal vein below the point of introduction of the needle connected with the pressure manometer. This technical detail may have escaped your notice, probably because it was not sufficiently emphasized by me in the Liverpool discussion; it is, however, quite clearly described in my original article. It seems to me that by the application of this distal ligature the hydrostatic pressure must be eliminated, and that the rapid rising of a blood column in the manometer glass tube must necessarily indicate a valvular incompetence in the femoral vein. If blood is allowed to escape from the popliteal vein, blocked at its lower end, this must result in a lowered pressure in the vein and immediate closure of all valves above, if functioning normally. The blood column in the glass tube could not rise more than a few centimetres, and not, as it has been observed to do in over 200 pathological cases, 50 to 70 cm. Hence, I do think that this test is of considerable value. If positive, there probably is no need for hesitation in proceeding with the final steps of the operation.—I am, etc.,

Mariestad, Sweden. GUNNAR BAUER.

Lung Cancer and Petrol Lighter

SIR,—Amongst the many causes of lung cancer listed to-day, from road-tarring, exhaust from motor-cars, and excessive tobacco smoking, there appears to be one important factor which has so far been overlooked: the almost universal use of the petrol lighter. The smoker to excess uses this method of igniting tobacco at least twenty to thirty times a day and must inhale the end-products of petrol combustion.

My excuse for this letter is that it may prove to be of some help in research on this difficult problem.—I am, etc.,

London, S.W.1. R. W. IRONSIDE.

Every Breech an Abnormality

SIR,—I have read with much interest the letter from Dr. Jean Hallum (August 12, p. 418) with regard to breech deliveries, and I should like to support her contention that every breech should be considered an abnormality. Dr. T. Redman (April 8, p. 814) has shown that, contrary to general opinion, the outlook for the foetus in the primiparous breech is not notably worse than in the multipara. Miss Hallum has shown what excellent results can be obtained in hospitals with the use of a properly trained team. I would differ with her on the question of anaesthesia. I consider that any internal manipulations, including the application of forceps to the after-coming head, are applied with less trauma to the child if general anaesthesia is used, and for this purpose I have found it important to have an anaesthetist standing by, prepared to induce anaesthesia with thiopentone. The use of pudendal block, with its relaxant effect on the perineum, is of enormous value.

There is no doubt that many thousands of breech deliveries have been successfully performed by midwives, and many thousands more by doctors under domiciliary conditions, but the difficult case cannot be successfully managed at home, and it should always be remembered that breech presentation may indicate a pelvic deformity or some other abnormality which can seriously complicate delivery. Only hospital management, with the best facilities available, will give the best results, and in fairness to the mother and child this service should be available for every case of breech presentation.—I am, etc.,

Inverness. J. A. CHALMERS.

SIR,—Dr. J. L. Hallum (August 12, p. 418) urges the revision of the Central Midwives Board rules regarding breech deliveries, and I wish to support this suggestion most strongly. All midwives seek medical aid with a primigravid breech delivery, but there is far too much complacency about the breech presentation in a multipara. Only recently I saw a case of shoulder presentation in which quite an experienced midwife had diagnosed a breech presentation and did not realize anything was amiss until the arm prolapsed. It should be quite clearly laid down that a breech presentation is a malpresentation and medical aid must be summoned.

Another subject which might be dealt with by the rules is the operation of manual removal of placenta. Most obstetricians will agree that this operation should be performed only under general anaesthesia with full aseptic precautions, preferably with an intravenous drip set up. Now that midwives have been granted permission to give ergometrine intramuscularly before the birth of the placenta in cases of severe post-partum haemorrhage, there can be no justification for a midwife attempting this operation on her own, save under the most exceptional circumstances, such as where medical aid would be unobtainable for a number of hours. In teaching pupil midwives I am most reluctant to describe this operation at all, but I am constantly urged to do so "in case some examiner asks them how to do it."—I am, etc.,

London, W.12. SAMUEL LASK.

Saving Money on N.H.S. Prescriptions

SIR,—It has been stated that much of the expense of the National Health Service is due to doctors prescribing a proprietary prescription instead of the standard equivalent. Though this may sometimes be deliberate, from my own experience I would suggest that it is frequently due to the doctor being ignorant of the name of the standard preparation. For instance, I was taught as a student to use "theominal," and it was not until I had been in general practice for some years that I discovered that tab. phenobarbiton. et theobrom. *B.P.C.* was a much cheaper preparation; more recently I have been impressed by the effects of "benzedrine," and have only just found—and memorized—the more complicated name of amphetamine sulphate. It is not practical to ask a busy practitioner to write out a list of all the drugs he uses, to check whether any of them has a standard equivalent, and to memorize all these for

future prescriptions; on the other hand every pharmacist must know at once if such a preparation exists. This difficulty could be easily got over by printing just above the signature space on E.C.10, "Please substitute the standard equivalent for any proprietary preparation prescribed above"; this could be struck out by the doctor if he wished the proprietary preparation to be prescribed. I for one would welcome this, as it would show that I was anxious to co-operate in reducing expenditure and at the same time relieve me of continually searching pharmacopoeias for standard equivalents—particularly of new preparations.—I am, etc.,

Henley-on-Thames. K. NEVILLE IRVINE.

Amalgamation of Radiological Societies

SIR,—In a recent number of the *Journal* (August 12, p. 410) you have devoted a long notice to the International Congress in Radiology which has recently taken place in London. This congress was magnificently organized and managed with the utmost efficiency, and the greatest possible credit should be given to all those concerned. There was a great number of foreign visitors, and all those to whom I spoke were most enthusiastic about the arrangements, and there can be no doubt that the organizers have done a great service to radiology in general and to British radiology in particular.

Before the competent team that ran the congress disbands, there is one domestic problem to which I feel they might with advantage turn their attention, and this is the co-ordination of radiological activity in this country. There can be no doubt that radiologists, as a whole, are perturbed about the multiplicity of radiological bodies in this country. The British Institute of Radiology, the Faculty of Radiologists, and the Radiological Group of the B.M.A. all have a hand in looking after the interests of radiologists; while the B.I.R., the Faculty, and the Section of Radiology of the Royal Society of Medicine are all concerned in promoting knowledge of radiology. There are, in fact, four bodies to which radiologists should belong. In addition, there are certain local radiological bodies which are concerned with their own business matters in their respective areas. It cannot be denied that there is a certain amount of rivalry between these bodies. Would it not be possible for those who ran the congress to get together and evolve some sort of amalgamation of all the bodies referred to above, so that there would be only one radiological authority in the country?

Nobody is more conscious than I am of the difficulties inherent in this suggestion, but I am certain that the present schism leaves us all at a disadvantage, and there can be no doubt that if the various radiological bodies in this country could be co-ordinated the greatest possible benefit would ensue. This is a problem which bristles with difficulties, but I am sure that the team that ran the congress could surmount them.—I am, etc.,

Newton Abbot, Devon A. ROBINSON THOMAS.

An Adjustable Bed for Patients at Home

SIR,—Just before the war while on holiday in Skye I came across a simple lightly constructed bed which appeared to fill a real need for the bed-ridden patient; it was certainly in constant demand in that district. The frame was so balanced and jointed that by pulling a lever at the side of the bed the patient could change from the lying to the sitting posture at will. The lever was detachable and could be inserted in a slot on either side of the bed.

When I saw it in use, the patient was a frail lady of 70 with a right-sided hemiplegia, yet by having the lever on the left side she was able to manipulate it unaided and could sit propped up for meals or for reading or for receiving visitors, and could equally well lie down flat when she wished. In these days when so many patients cannot get admission to hospital or sanatorium a bed of this sort would seem to meet a real need; there may possibly be disadvantages in a hospital ward in having the adjustment of a cardiac type of bedstead under the patient's own control, but in the home it would often add enormously to the patient's comfort and well-being. Have any of your readers had experience of this type of bed, and is it still obtainable?—I am, etc.,

Ilkeston. T. H. GILLISON.

Inoculation Certificates Required Abroad

SIR,—I wish to refer to a letter by Sir Philip Manson-Bahr in the *Journal* of July 22 (p. 215). The British Overseas Airways Corporation has the most up-to-date information in this country on the requirements of various Governments regarding certification of vaccination and inoculation needed for travellers by air. This information is obtained from the World Health Organization through their *Weekly Epidemiological Record* and their daily broadcasts, as well as from the Ministry of Health by means of their *Weekly Record of Certain Infectious Diseases*, and by day-to-day advice received from the Corporation's agents in various countries throughout the world. If the British Medical Association secretariat were to maintain such an up-to-date dossier of information as recommended by Sir Philip Manson-Bahr, doubtless it would be necessary for them to obtain the information through the British Overseas Airways Corporation. It is considered, therefore, that the simplest procedure is for any medical practitioner who wishes up-to-date information on this matter to apply to the Medical Department, British Overseas Airways Corporation, Stratton House, Piccadilly, W.1, Telephone Mayfair 6611, or to the representative in this country of the country or countries which the traveller intends to visit in transit.—I am, etc.,

London, W.1. HAROLD E. WHITTINGHAM, Director of Medical Services, B.O.A.C.

POINTS FROM LETTERS

Amoebiasis in Great Britain

Mr. JAMES MILLER (Painswick, Glos) writes: Although Dr. Cecil A. Hoare's paper on this subject (July 29, p. 238) has special reference to the question of carriers and quotes only literature from 1913 onwards, it may be of interest to recall what the authors claimed (and the claim has, so far as I know, not been denied) was the first published case in a patient who had never been abroad. The paper was published by Sir Robert Saundby and myself in the *British Medical Journal* of March 27, 1909. Here are the main facts: A male aged 40 who had never been out of the Birmingham district was admitted to the Birmingham General Hospital, where Sir Robert Saundby was at that time senior physician and I was pathologist. The patient died after nine days, during which period his only localizing symptom was the passage of one stool containing a considerable quantity of blood. He developed fluid in the right side of the chest, whence 15 oz. of blood-stained fluid was removed. At the post-mortem a large abscess was found around the head of the caecum, where there was a rupture blocked by slough. On opening the gut a large ulcer with black adherent slough was present in the caput coli, with numerous smaller ulcers, most of them the size of a pea, in the ascending and transverse colon, becoming less numerous in the lower portion of the bowel. These ulcers had raised overhanging margins and contained adherent sloughs. In these and in the neighbouring bowel wall amoebae were found. The liver, which weighed 102 oz. (2.9 kg.), showed a large abscess the size of a foetal head. It contained brownish-red pus and necrosed liver. Cultures from this material proved sterile. The pus, necrotic material, and the surrounding liver showed numerous amoebae, some of them in bile ducts. So far as we were able to ascertain at the time of publication, this was the first case of the kind recorded in Great Britain. The case, with slides, was shown at a meeting of the Pathological Society of Great Britain and Ireland. No doubt it is one of the cases of amoebiasis, stated by Dr. Hoare to number now not more than three dozen, reported among persons who had never been abroad.

Refresher Course on Psoriasis

Colonel S. HAUGHTON (I.M.S., retired) writes: No mention is made of any internal medicine for psoriasis (July 22, p. 207), yet the fact remains that sulphur given by the mouth is most helpful. Suck one to three *large* sulphur tablets daily, if necessary for one to three months. In spite of all teaching and textbooks there is nothing that eases the condition so quickly in many patients. Of course it does not cure it. I learned this many years ago from a psoriasis patient who complained he could get no large sulphur tablets during the war. I was sceptical, but obtained them. The result after two weeks was dramatic, and his psoriasis remained under control, with no other treatment, for years. I have had equally good results with some half-dozen other patients.

Obituary

P. L. DANIEL, F.R.C.S.

Mr. R. W. Raven writes: May I be permitted to pay my tribute to the memory of my friend and colleague, the late Mr. Peter Daniel (about whom an obituary notice appeared in the *Journal* of August 19)? An outstanding feature of his work, carried out over a period of so many years, was the great kindness and consideration given to his patients. He never spared himself where their welfare was concerned, and there are many with cause to be profoundly thankful for all he did for them and their families. The appeal exerted by the "widow and the fatherless" was very real to him. At the Gordon Hospital, where he was a member of the surgical staff for 44 years, we loved him, and at the staff meeting—with nursing, medical, and administrative representatives—which was held on his retirement, the affection and esteem in which he worked were apparent to all. Although he had reached the age of 77 his mind was always searching for new ideas, and it was a real joy to talk with him about new aspects and techniques of surgical work. Since he possessed a sound and mature surgical judgment, we sought his advice in our work and valued his opinion. In committee he was excellent in every way and never afraid to speak his mind or to carry out that which, after careful consideration, he considered to be right. He came from another generation fast dying out, and these men leave behind them indelible impressions and influences for good on those who follow. Belonging to a different age from ours, they speak of those things which inherently we love so well and perhaps stand in danger of losing awhile.

Dr. WILLIAM LYLE, M.P., who died with tragic suddenness at his home in Belfast, was a son of the manse. He was educated at the Intermediate School, Newtownstewart, and at Queen's College, Belfast. Entering the medical school, he graduated M.B., B.Ch. in 1893 at the Royal University. He then practised for a year as an assistant at Bacup, Lancashire, returning to Newtownstewart as dispensary doctor and medical officer of health. A skilled physician, he was much esteemed by all the people of the district in which he practised. When he retired in 1936 he was succeeded by his son, Dr. Leslie A. Lyle, who is carrying on the family tradition of public service. Dr. Lyle also took an active interest in public affairs and was a member of Tyrone County Council for several years. After his retirement he came to Belfast in 1936. Always imbued with the spirit of service to the community, he succeeded the late Colonel A. B. Mitchell in 1942 as a representative at Stormont of Queen's University. During this period he took a keen interest in Parliamentary affairs, and it was largely owing to his efforts that the Select Committee on Health Services, which sat in 1943 and 1944, was set up under the chairmanship of the late Howard Stevenson, M.P., F.R.C.S. Following the report of this committee the present Ministry of Health and Local Government was established. At the 1945 election Dr. Lyle was narrowly defeated, but he regained his seat at the election held in February, 1949. In Parliament he was a fearless advocate of the rights of the people of Northern Ireland, and his speeches in the debates of the House were always marked by a singleness of purpose and a forthrightness of utterance that were characteristic of the man. During his long career Dr. Lyle held many offices. He was president and treasurer of the Northern Ireland Branch of the British Medical Association; he was a representative for six years on the Representative Body; and he was a member of Council. He acted as chairman of the Poor Law Medical Officers' Association, and was a county director and later president of the Belfast Branch of the British Red Cross Society. He was also joint honorary secretary and treasurer of the Ulster Joint Committee of the Order of St. John of Jerusalem and the British Red Cross Society. Dr. Lyle took a practical interest in education and was for many years a Governor of Princess Gardens School, Belfast. A vice-president of Queen's University Unionist Voters' Association, he acted for many years as its honorary treasurer and as a member of its executive committee. He was a Past Provincial Senior Grand Warden of the Masonic Province of Tyrone and Fermanagh, and when he came to live in Belfast he affiliated to Queen's University Masonic Lodge, No. 533, to which he rendered service for several years as honorary treasurer. During the recent war and up to the time of his death Dr. Lyle was a very capable chairman of a medical board for the examination of recruits. Busily engaged up to the last in his multifarious duties, he has left behind him treasured memories among his many friends. He is survived by his widow and daughter, and by three sons who are engaged in general practice.

Dr. CLIVE ROWLAND BISHOP VINCENT was killed in a motor-cycle accident on July 11 aged 28 years. He was house-surgeon at the Brook General Hospital at the time of his death. He was educated at the Lancaster Royal Grammar School, where his father had been a popular master for well over 30 years, King's College, London, and King's College Hospital. He qualified in 1947 and obtained resident appointments at the Connaught Hospital, Walthamstow, and the Nelson Hospital. Later he worked as resident anaesthetist at the Miller General Hospital, Greenwich, for over a year and commenced to study for the D.A. He designed and made several instruments for intubation for his own use. Dr. Vincent had a very real love of nature, and he was a remarkably successful landscape photographer. With his sensitive and conscientious temperament, his quiet and ready wit, and his dry sense of humour he will be greatly missed by his colleagues and his patients, whose sympathy will be extended to his widow.

Dr. HUGH LLOYD-WILLIAMS, of Waenfawr, Caernarvonshire, died on July 23 in his eighty-eighth year. He was the younger son of the late Mr. and Mrs. Pierce Williams, of Waenfawr, and was educated at George Watson's College, Edinburgh, and at the Middlesex Hospital and the Royal Dental Hospital, London. He qualified as a dental surgeon in 1885 and as a doctor in 1886. He was appointed dental surgeon to the Royal Dental Hospital and also dental surgeon and lecturer to the Post-Graduate College at the West London Hospital in 1890. He held the latter post until 1920, when he was appointed consulting dental surgeon to the West London Hospital. He was at one time president of the Odontological Section of the Royal Society of Medicine—being on the finance committee of the R.S.M. when the new premises were built in Henrietta Street—and of the Metropolitan Branch of the British Dental Association. He was appointed a justice of the peace for the county of Middlesex in 1920. Dr. Lloyd-Williams, who was a member of the B.M.A. for 50 years, retired from practice in 1932 and had lived ever since at his old home at Waenfawr. He was made a justice of the peace for the county of Caernarvon in 1935. He is survived by his wife and by two sons.

Dr. ROBERT WATT died in Belfast on July 24, aged 88. He was born in Aberchirder, Banffshire, and served his apprenticeship as a pharmaceutical chemist in Huntly. He qualified as a chemist in 1885 and did not become a medical student until 1889, when he entered Queen's College, Belfast. His academic career was marked with many distinctions, including the Coulter Exhibition in medicine and surgery in 1893. He qualified M.B., B.Ch. in 1894, and, after holding a residential appointment in the Belfast Union Hospital, he became a general practitioner in Agnes Street, Belfast. He remained in general practice for 53 years, retiring to a new home in Belfast only a year ago. He was an examiner for the Pharmaceutical Society of Ireland. Throughout his lifetime he strongly advocated the rightful place of the family doctor, and he was a worthy example of honesty and integrity to his fellow practitioners and to all his patients. His presence, bearing, and ever-ready wit invariably inspired confidence in the sick-room. He was clerk of session in the Rosemary Street Presbyterian Church for many years. He was also a keen freemason. Dr. Watt married in 1895, but his wife died suddenly 24 years ago. He is survived by two daughters.—D. C.

Dr. JAMES WILSON HENEY, tutor in anaesthetics at the Royal Victoria Hospital, Belfast, died at his home in Belfast on July 30. He was born in 1900 at Mosside, Co. Antrim, where his father, the Rev. Thomas Heney, was Presbyterian minister. He studied medicine at the Queen's University of Belfast and graduated M.B. in 1922. He took the D.P.H. in 1923 and proceeded M.D. in 1927; he obtained the D.A. of the English Royal Colleges in 1929. He was a most skilful anaesthetist, and as tutor in anaesthetics in the Royal Victoria Hospital he was an excellent teacher of his subject. He was also anaesthetist to the Belfast Ophthalmic Hospital. The active phase of James Heney's life was ended all too soon by the onset of chronic myelitis, and for the past six years he was an invalid. But this tragedy never dimmed his courage or the brightness of his welcoming smile; no visitor ever heard him complain. Dr. Heney is survived by his wife, who was Dr. Gertrude Glenn, and whose unremitting care maintained his life and made it bearable.—R. M.

Dr. MARGARET RANKEN, of Sunderland and Newcastle, died on August 7 after a short illness. She studied medicine at Durham University and graduated M.B., B.S. in 1924. After holding various resident appointments she specialized in ophthalmology as her life's work. She had been associated with the eye department of the Royal Victoria Infirmary, Newcastle-upon-Tyne, for almost 25 years as house-surgeon, refractionist, registrar, and associate surgeon. Miss Ranken was surgeon in charge of the orthoptic department at Sunderland Eye Infirmary from its inception. This is the orthoptic teaching school of the region, turning out a steady flow of qualified orthoptists. In 1943 she was appointed ophthalmic surgeon to Durham County Hospital, where she was in charge of the eye department until 1946, when she was appointed ophthalmic surgeon to the Ingham Infirmary, South Shields. Miss Ranken's great interest was in the treatment of squint, on which she was a recognized authority, and she elected to operate while the patient was still very young. Her success in this field of ophthalmology was due to her surgical skill, her unlimited patience, and her fondness for children, whose confidence and friendship she could always win. She had an entirely altruistic outlook on life, and if she could do a good turn to anyone she did so without counting the cost to herself. She was concerned with the benefits which she in her profession could convey to humanity rather than in any personal gain. Among her general interests Miss Ranken was a member of the Central Orthoptic Board and an active member of the Medical Women's Federation. By her death the community has lost a modest and well-loved doctor and the profession a skilful and dependable ophthalmic surgeon and a colleague who will be difficult to replace.

Major-General RICHARD HEARD, who retired from the Indian Medical Service in 1927, died in Peebles on August 16 at the age of 80 after a long illness. He was educated at Trinity College, Dublin, and graduated M.B., B.Ch. in 1892. Later he proceeded M.D., Belfast, in 1912. He obtained a commission in the Indian Medical Service in 1893 and soon saw active service on the North-West Frontier of India in Wazaristan and with the Chitral Relief Force. He received the campaign medals with clasps. A little later he entered the civil branch of the service and in 1909 became professor of midwifery and gynaecology at the Lahore Medical College, where he was a valued colleague. On the outbreak of the first world war he returned to military duty and served throughout the war; he was promoted to brevet-colonel for his good work. Soon after his return to civil employment in India he became Inspector-General of Jails in Assam and in 1924 was promoted to the more responsible post of Surgeon-General with the Bengal Government. A little earlier he had been Surgeon to the Viceroy, and in 1924 he was awarded the C.I.E. and also became honorary surgeon to the King. He was the author of a work on feeding in infancy and early childhood. Major-General Heard was an unassuming but thoroughly competent officer, always ready to lend a helping hand to brother officers, with whom he was deservedly popular. He was typical of those who have lent distinction to the Indian Medical Service, most of his contemporaries in which he outlived.—L. R.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended August 12 were: paralytic 275 (262); non-paralytic, 117 (105); total, 392 (367). The figures for the preceding week are in parentheses. There was therefore during the week under review an increase of only 13 paralytic and 12 non-paralytic cases—a total of 25 over the previous week, which is very much less than might have been expected.

The main increases compared with the previous week were: Lancashire 10 and 4, Cumberland 7 and 1, and Glamorgan 6 and 1 paralytic and non-paralytic cases respectively; Isle of Wight 10 and Kent 8 paralytic; and Lincs (Kesteven) 14 non-paralytic. These were offset by small decreases fairly generally distributed.

The following county areas, with notifications as given, contributed 73% of the total notifications for England and Wales in the week under review:

	Paralytic	Non-paralytic
London	13	12
Essex	10	2
Gloucester	12	3
Kent	12	4
Lancashire	25	11
Lincs (Kesteven)	4	14
Middlesex	11	3
Northumberland	8	6
Stafford	15	7
Surrey	8	7
Warwick	25	9
Isle of Wight	14	1
Worcester	13	3
Yorks (W.R.)	15	6
Glamorgan	9	4
Totals	194	92
Grand total	286	

Isle of Wight

A statement issued by the medical officer of health on August 20 says that centres in which no cases of poliomyelitis have so far occurred include the towns of Ryde, Cowes, Sandown, Ventnor, Yarmouth, Bembridge, and other populated areas. There are outbreaks in Newport and Freshwater only, and visitors with children have been advised to avoid these places. The statement goes on to say that apart from these areas "the hazards of a holiday in the island are no greater than anywhere else in the country."

The Isle of Wight is one of the 62 counties in England and Wales. It contains six sanitary districts. The permanent population is 92,000 and there are 28,000 inhabited houses. In the holiday season about 80,000 are added to the population. Notifications have been as follows:

Week Ending		Newport M.B.	Cowes U.D.	Rural District	Ryde M.B.	Sandown-Shanklin U.D.	Ventnor U.D.
July 22	Paralytic	—	—	—	—	—	—
	Non-paralytic	—	—	—	—	—	—
July 29	Paralytic	1	—	3	—	—	—
	Non-paralytic	1	—	2	—	—	—
Aug. 5	Paralytic	2	—	2	—	—	—
	Non-paralytic	2	—	—	—	—	1
Aug. 12	Paralytic	3	1	8	1	—	1
	Non-paralytic	—	—	1	—	—	—
Aug. 19	Paralytic	4	1	8	—	2	—
	Non-paralytic	—	—	3	—	1	—
Totals	Paralytic	10	2	21	1	2	1
	Non-paralytic	3	—	6	—	1	1

These notifications include five relating to visitors who were infected outside the county. The remaining 32 paralytic cases have occurred in 22 households. With a few exceptions permanent residents are involved, and the infection appears to have moved through a very limited line of contacts originating with three cases in the infants' class of a school at Freshwater in the rural district council.

Quarterly Report for England and Wales

The infant mortality rate during the first quarter of this year was the lowest ever recorded for this quarter, being 37 per 1,000 related live births, compared with 40 in the corresponding quarter of 1949, and an average of 59 for the 10 March quarters 1940–9. The stillbirth rate was the lowest on record; the rate was 22.9 per 1,000 total births, being 0.2 lower than the rate for the first quarter of 1949. The birth rate was 16.7 per 1,000 and was 0.6 below the rate for the preceding first quarter. The general death rate was 14.0 per 1,000 and was 0.9 below the rate for the March quarter of 1949 and 0.6 below the average for the first five quarters 1944–8.

Quarterly Report for Eire

The birth rate during the March quarter of this year was 21.2 per 1,000, which was 0.7 below the rate for the first quarter of 1949. Infant mortality was 59 per 1,000 registered births, 4 above the rate for the preceding first quarter. The general death rate was 15.0 per 1,000, being 0.3 above the rate for the first quarter of 1949. There were 578 deaths attributed to respiratory tuberculosis and 131 to other forms of tuberculosis; these were 53 and 22 respectively fewer than in the first quarter of 1949.

Discussion of Table

In *England and Wales* a decrease was recorded in the number of notifications of measles 318, scarlet fever 56, whooping-cough 27, and an increase was reported for acute poliomyelitis 62 and dysentery 13.

The largest decreases in the number of notifications of measles were Cheshire 162, Yorkshire West Riding 153, Middlesex 76, and the largest rises were Lincolnshire 89, London 84. The only variation of any size in the local trends of scarlet fever was a decrease of 26 in London. No changes were reported in the regional incidence of diphtheria. A decrease of 98 in the number of notifications of whooping-cough in Yorkshire West Riding was the only fluctuation of note in the returns.

The increased incidence of dysentery was mainly contributed by Leicestershire, where the cases rose from 2 to 24 (Leicester C.B. 22). The other important centres of infection were Lancashire 53 (Middleton M.B. 13, Preston C.B. 11); Yorkshire West Riding 39; London 14.

The largest returns of acute poliomyelitis were Warwickshire 38 (Birmingham C.B. 18, Coventry C.B. 9); Staffordshire 33 (Rowley Regis M.B. 7); London 28 (Lewisham 11, Woolwich 5); Worcestershire 26 (Dudley C.B. 11, Halesowen M.B. 5); Yorkshire West Riding 24 (York C.B. 7); Lancashire 22; Lincolnshire 20 (East Kesteven R.D. 9); Essex 17; Surrey 12; Southampton 11; Middlesex 11; Gloucestershire 11 (Bristol C.B. 9).

In *Scotland* the only fluctuation in the trends of infectious diseases were decreases in the number of notifications of whooping-cough 86 and measles 53. The largest returns of dysentery were Glasgow 51 and Edinburgh 14. The largest centres of acute poliomyelitis were Glasgow 13, Dundee 5, Kirkcaldy 5, and Fife county 5.

In *Eire* an increase of 21 was recorded in the number of notifications of measles and a decrease of 27 was reported for scarlet fever. In Dublin C.B. a decrease of 16 was recorded in the notifications of measles; the largest fresh outbreaks during the week were Meath, Dunshaughlin R.D. 18, and Westmeath, Mullingan R.D. 17.

In *Northern Ireland* decreases were reported for measles 56 and scarlet fever 9. The fall in the incidence of measles was mainly due to the experience of Antrim county, a decrease of 16, and Down county, a decrease of 23. The largest returns of acute poliomyelitis were Down county and Belfast C.B. 4.

Week Ending August 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 695, whooping-cough 3,422, diphtheria 49, measles 6,420, acute pneumonia 256, acute poliomyelitis 392, dysentery 211, paratyphoid fever 2, typhoid fever 5.

No. 31

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 5.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	1950 (b)	1950 (c)	1950 (d)	1950 (e)	1949 (Corresponding Week) (a)	1949 (b)	1949 (c)	1949 (d)	1949 (e)
Meningococcal infections	26	3	19	—	1	27	4	13	2	3
Deaths		1	—				—	—		
Diphtheria	45	3	9	3	3	98	8	21	4	5
Deaths	—	—	—	—	—	—	—	—	—	—
Dysentery	179	14	87	1	1	94	10	40	2	—
Deaths		—			—				—	—
Encephalitis, acute	6	—	—		1	—	—	—	1	—
Deaths		—		—			1			
Erysipelas			14	6	1			14	6	—
Deaths							—			
Infective enteritis or diarrhoea under 2 years				28	8				102	
Deaths	8		—	3	2	25	1	3	5	1
Measles*	7,973	664	105	172	36	4,266	303	63	145	85
Deaths†		—	—	—	—			—	1	—
Ophthalmia neonatorum	45	—	10	—	—	47	4	2	—	2
Deaths										
Paratyphoid fever	5	1	1 (B)	2 (B)	—	50	—	10 (B)	3 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	273	12	1		2	263	14	—	5	—
Deaths (from influenza)‡	4	—	1	—	—	2	—	—	—	—
Pneumonia, primary	103	13	106	¶ 3	4	103	18	94	20 5	11
Deaths										
Poliomyelitis, acute	367	28	53	3	12	169	20	15	—	—
Deaths§	20	1		—		11	3			
Puerperal fever		—	3				—	10		
Deaths										
Puerperal pyrexia‖	82	8	5	—	3	99	9	9	1	2
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	956	47	115	34	48	1,045	91	112	59	31
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—					—	
Typhoid fever	8	1	2	—	—	3	1	—	4	1
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	3,687	282	211	69	37	1,795	84	33	110	77
Deaths	9	2	—	—	1	6	1	—	1	—
Deaths (0–1 year)	200	22	25	17	9	248	32	30	21	8
Deaths (excluding stillbirths)	4,038	611	499	156	83	4,205	680	493	162	93
Annual death rate (per 1,000 persons living)			10·0					9·9	10·0	
Live births	7,272	1190	841	359	204	7,876	1232	850	325	207
Annual rate per 1,000 persons living			16·9					17·0	20·1	
Stillbirths	176	20	17			176	24	29		
Rate per 1,000 total births (including stillborn)			20					33		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

Medical News

A Ross Commemoration

To commemorate the discovery by Sir Ronald Ross on August 20, 1897, that malaria is transmitted by *Anopheles* mosquitoes, members of the Ross Institute in London laid a wreath on his grave in Putney Vale cemetery on August 21. Sir Eric Macfadyen, chairman of the standing committee of the Ross Institute, said that they did well on an anniversary such as this to recall the great benefits to mankind which had followed from Ross's discovery. Sir Malcolm Watson, who also participated in the ceremony, said that the Poet Laureate had described Ross as the most gifted, most beneficent, and most forceful man it had ever been his privilege to know. His work had been neglected for many years, and people were inclined to say that while it was interesting scientifically it was of no practical value. But it was now being applied, said Sir Malcolm, in every part of the tropical world in increasing volume. The Ross Institute, which was founded at Putney in 1926, and of which Sir Ronald Ross was the first director-in-chief, now has branches in India, Ceylon, and Africa. In 1933 it amalgamated with the London School of Hygiene and Tropical Medicine, whose origin is linked with Ross's great collaborator, Sir Patrick Manson.

Colyer Prize

The Colyer Prize was founded in June, 1926, to commemorate the twenty-five years' service of Sir Frank Colyer as Honorary Curator of the Odontological Museum at the Royal College of Surgeons of England. The accumulated income of this fund is used every third year for the purpose of awarding a prize for the best original work in dental science completed during the previous five years by a dental surgeon educated at any duly recognized dental school in Great Britain or Northern Ireland, and who has not been qualified to practise for more than five years at the date of the award. The prize committee has power to withhold the prize if they consider there has been no work submitted of sufficient merit to justify the award. Applications from candidates, together with a general account of their researches, should be submitted to the prize committee at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, not later than December 1.

Alvarenga Prize

On July 14 the College of Physicians of Philadelphia awarded the Alvarenga Prize for 1950 to Ephraim Shorr, M.D., Associate Professor of Medicine, Cornell University Medical College, for his outstanding work in shock which has provided a clearer understanding of the mechanism of this condition. The prize was established by the will of Pedro Francesco DaCosta Alvarenga, of Lisbon, Portugal, an Associate Fellow of the College of Physicians of Philadelphia, to be awarded annually by the college on the anniversary of the death of the testator, July 14, 1883.

Medical Women's Federation

Dr. Doris M. Odlum has been elected president of the Medical Women's Federation for 1951, and will take office at the annual general meeting of the Federation in October. Among the many posts held by Dr. Odlum is that of senior psychiatrist at the Elizabeth Garrett Anderson Hospital, and she is chairman of the B.M.A. Committee on Psychiatry and the Law.

Report on Midwives

The report of the Central Midwives Board for the year ended March 31, 1950, shows that in 1949 there were 18,053 midwives practising. The number of midwives and pupil midwives trained in the administration of nitrous-oxide–air analgesia was 19,447 at March 31; of these 11,118 were in practice in 1949. The most pressing administrative problem under the National Health Service was found to have arisen from the division of the maternity services under separate types of authority each entrusted with powers and duties to operate a particular section of the Service. A marked decline in domiciliary midwifery is recorded, particularly in cases available for the training of pupil midwives. The report comments that if the present standard is at least to be maintained the co-operation of the separate authorities responsible for domiciliary and hospital midwifery in each area must be assured. The board has decided to conduct experiments on training at some six or seven centres, chosen so far as possible with differing local conditions. It will take at least another year for the first of the experiments to be completed.

COMING EVENTS

Royal College of Obstetricians and Gynaecologists

The annual dinner of the Royal College of Obstetricians and Gynaecologists will be held at Dorchester Hotel, Park Lane, London, W., on Friday, September 29, at 7 for 7.30 p.m.

Middlesex Hospital Medical School

The annual dinner of the Middlesex Hospital Medical School will be held at the Savoy Hotel (Victoria Embankment entrance), London, W.C., on Thursday, September 28, at 7 for 7.30 p.m.

Law of Abortion

After the annual meeting of the Abortion Law Reform Association a public meeting will be held at 7.30 p.m. on September 27 at the Conway Hall, Red Lion Square, London, W.C.1.

British Medical Students Association

The Liverpool National Clinical and Preclinical Conference will be held at Liverpool on September 12–15. *Full details* may be obtained from the Liverpool University Medical Students Society, Medical School, Liverpool University, Liverpool.

Refresher Courses for General Practitioners

The British Postgraduate Medical Federation (University of London) has arranged a programme of refresher courses for general practitioners to be held at certain non-teaching hospitals of the four metropolitan hospital regions during the months September to December. The programme includes several week-end courses and extended courses spread over two months as well as concentrated courses of one or two weeks' duration. Further information will be found in the advertisement columns of this week's *Journal*.

SOCIETIES AND LECTURES

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

Thursday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, August 31, 4.30 p.m., "*Muscles in Action*," by Professor R. D. Lockhart.

Correction.—In the *Journal* of August 12 (p. 402) we listed under "Books Received" *Illustrations of Anatomy for Nurses*, by Dr. E. B. Jamieson. The price of this should have been given as 12s.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Marshall.—On August 13, 1950, at The Croft, Buxton, to Dorothy (formerly Ead) and Dr. W. E. S. Marshall, Chapel-en-le-Frith, a *second child*—Desmond John.

Roads.—On August 11, 1950, at St. Mary's Hospital, Paddington, London, W., to Evelyn (formerly Daniel), wife of Dr. Peter Roads, a son.

Snaith.—On August 13, 1950, at Newcastle General Hospital, to Mr. and Mrs. Linton Snaith, a daughter.

Varian.—On August 8, 1950, at the Forbes Fraser Hospital, Bath, to Katha (formerly Greene), wife of S. N. Varian, *M.B.E., F.R.C.S.I., a daughter.*

Zaki.—On August 14, 1950, at Beach Lawn Nursing Home, to Irene (formerly Hope), wife of Dr. Y. E. Zaki, Wintonlea, Dowhills Road, Blundellsands, Liverpool, a brother for Stuart—Michael Simpson.

DEATHS

Ball.—On August 13, 1950, Ralph William Codrington Ball, M.R.C.S., L.R.C.P., of 40, Keswick Road, Putney, London, S.W.

Barton.—On August 16, 1950, at his home, 61, Wellington Road, Hatch End, Pinner, Middlesex, Bertram Henry Barton, M.C., M.D., aged 67.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 2 1950

EFFECTS OF HYPERVITAMINOSIS A ON FOETAL MOUSE BONES CULTIVATED IN VITRO

PRELIMINARY COMMUNICATION

BY

HONOR B. FELL, D.Sc.

Foulerton Research Fellow, Royal Society

(From the Strangeways Research Laboratory, Cambridge)

AND

Sir EDWARD MELLANBY, G.B.E., K.C.B., M.D., F.R.C.P., F.R.S.

(From the Nutrition Building, National Institute for Medical Research, London, N.W.7)

It was shown in 1938 that vitamin A has the remarkable property of controlling the shape and texture of certain bones in young animals, so that when it is deficient or absent from the body these bones grow abnormally (Mellanby, 1938). The effect of this loss of ability of vitamin-A-deficient animals to control the shape and texture of bone is that the growing bones fail to adapt themselves to the developing nervous tissue and often destroy the nerves, both peripheral and central, by pressure. It was later shown that this dysplasia of bone is due to the fact that vitamin A has the function of controlling the position and intensity of activity of osteoclasts and osteoblasts (Mellanby, 1944). In some places normal osteoclastic and osteoblastic activity in growing bone of vitamin-A-deficient animals was reversed, so that where bone ought to have been removed it was laid down and vice versa, with disastrous effects on the nervous system. The restoration of vitamin A to the defective diets brought back the osteoclastic and osteoblastic activity to the normal position and the bone to a nearer normal shape.

The question was asked in the 1943 Croonian Lecture at the Royal Society whether this action of vitamin A was direct on the bones, or indirect by an action on some intermediary organ or humoral mechanism, and it was pointed out that an answer to this question could probably be obtained by tissue-culture experiments. This was one of the reasons why the present investigation was undertaken.

Although, in view of the foregoing results, it might be thought more natural to investigate the effect on bone growth of reducing the vitamin-A concentration in the culture media, for technical reasons it was found easier at first to test the effect of abnormally large quantities of this vitamin. As these experiments not only gave interesting results but also answered the question of whether the action of vitamin A on bone is direct or indirect, this preliminary account is being published.

The effect on bones of giving animals diets containing excessive amounts of vitamin A has often been observed. Collazo and Rodriguez (1933) and Bomskov and Seemann (1933) described the fragility and subsequent fracture of leg bones in rats given large amounts of vitamin A concentrates in their food. Similar observations were made by Davies and Moore (1934), Strauss (1934), and many others. It was later demonstrated that bone fragility and fracture could be produced by large doses of pure vitamin A (Herbst, Pavcek, and Elvehjem, 1944; Pavcek, Herbst, and Elvehjem, 1945; Moore and Wang, 1945).

As for the pathological processes in bone associated with the production of fragility and fracture, Strauss (1934) found that in hypervitaminosis A there was retardation of osteogenesis, reduction of endochondral bone formation, and a variable degree of osteoclasis only in the region of fractures. A more detailed description of the histology of this condition was given by Wolbach and Bessey (1942), who pointed out that the decalcification and osteoporosis were accompanied by a large number of osteoclasts, and that there was a greater degree of osteoporosis where the remodelling of bone was a normal process—namely, at the ends of long bones. Wolbach (1947), in studying the effect of hypervitaminosis A on bone in growing dogs, found that it accelerated the growth sequences. It caused rapid consumption of epiphysial cartilage and, in appropriate species, greatly premature closure of epiphyses and excessive rapidity of remodelling processes unrelated to linear growth of bone. He also found that the substitution of compact bone for cancellous bone in conformity to normal growth patterns was greatly accelerated, and stated that the fractures and sites of occurrence were fully explained by acceleration of remodelling.

Barnicot (1948) studied the direct action of vitamin A on bone by applying crystalline vitamin-A acetate locally to the bone. He found that it caused intense absorption by osteoclastic action, and suggested that the fractures observed in rats with hypervitaminosis A might be due to local action on the bones.

It will be seen in the following work that, in tissue cultures, bones under the influence of excessive vitamin A develop many of the changes described in the feeding experiments referred to above, and the results show that these changes are due to the vitamin acting directly on the bone.

Material and Methods

Material.—The tibiae, fibulae, radii, and ulnae of 17- to 21-day foetal mice were used. At this stage the epiphyses and the distal part of the diaphysis are cartilaginous, but for most of its length the shaft consists of a well-developed tube of bone enclosing a marrow cavity. These foetal mouse bones were particularly suitable for our purpose,

because their extremely small size made it possible to cultivate them *in vitro* at an advanced stage of development.

Tissue Culture.—The bones were dissected from the limbs, cleaned of all but a few tags of muscle, and grown by the watch-glass method described by Fell and Robison (1929). The culture medium consisted of a mixture of 6 drops of fowl plasma and 2 drops of a concentrated extract of 12- to 14-day chick embryo; the embryo extract contained about 130 i.u. of vitamin A per 100 ml., so that the concentration of vitamin A in the plasma was thus diluted by from one-fourth to one-sixth in the final medium. The extract was made with Tyrode's solution to which 4% glucose and, to improve the calcification, 0.2% calcium glycerophosphate were added; the addition of the glycerophosphate made it necessary to omit the acid phosphate to avoid precipitation, but the *p*H of the solution remained constant at 7.6. The explants were transferred to fresh medium every two to three days. Fresh embryo extract was made for each subculture and fresh plasma was usually drawn once a week.

For most of the experiments on the effects of "artificial" hypervitaminosis pure vitamin-A acetate in an alcoholic solution was added to normal plasma. In one experiment the physiological activity of vitamin A from "avoleum" (a commercial preparation kindly supplied by British Drug Houses, Ltd.) was compared with that of vitamin-A acetate. In order to study the effects of "natural" hypervitaminosis A, the explants were grown in plasma from fowls suffering from hypervitaminosis produced by a diet very rich in vitamin A.

Methods Used in Collection and Treatment of Bird Plasma.—For tissue-culture work it was necessary to obtain the blood and subsequently the plasma not only sterile but in such a condition that it did not clot until this was required—that is, until the embryo extract was added to make the final culture medium. All the syringes and vessels used were sterilized and coated with peanut oil or paraffin wax. Precautions were also taken to chill the vessels, including the centrifuge tubes, and the blood and plasma at all stages. About 30 ml. of blood was drawn from the wing vein of each bird into a syringe containing 3 ml. of a heparin solution (10 i.u. per ml.), so that the blood contained about 1 i.u. of heparin per ml. It was immediately centrifuged and about 20 ml. of plasma was obtained from 30 ml. of blood.

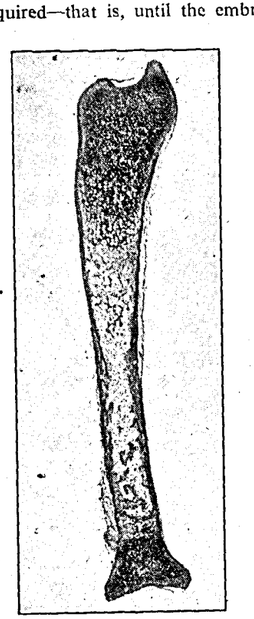


FIG. 1.—Radius from a late mouse foetus, cultivated in normal medium for seven days. The terminal cartilage is strongly basophil. (× 25.)

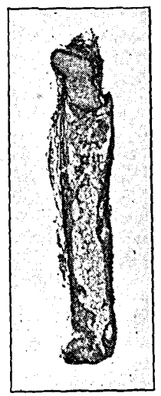


FIG. 2.—Radius from the opposite side of the same foetus as in Fig. 1, after seven days' cultivation in medium containing 1,287–1,490 i.u. of vitamin A per 100 ml. of plasma. The cartilage has nearly disappeared and has completely lost its basophilia; the bone also is being absorbed. (× 25.)

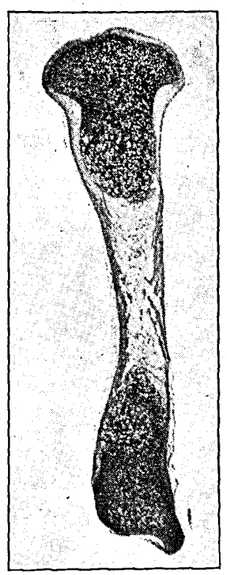


FIG. 3.—Tibia cultivated in normal medium for seven days. (× 25.)



FIG. 4.—Tibia from the opposite side of the same foetus as in Fig. 3, after seven days' cultivation in medium containing about 4,000 i.u. of vitamin A per 100 ml. of plasma. Very little cartilage or bone remains. (× 25.)

Natural Hypervitaminosis-A Plasma.—Cocks were fed on diets very rich in vitamin A. For this purpose avoleum containing 30,000 i.u. of vitamin A per ml. was used: 5 ml. was given each day—2 ml. in the food and 1 ml. by mouth at 9 a.m., 2 p.m., and 5 p.m. Thus each bird received 150,000 i.u. of vitamin A daily. The normal plasma of control untreated birds contained about 300 i.u. of vitamin A and about 300 i.u. of carotene per 100 ml. In the birds fed for about 14 days, as described above, the vitamin-A content rose to 1,400–1,500 i.u. per 100 ml., while the carotene content diminished to about 125 i.u. per 100 ml. Whether the decrease was due to a diminished intake of carotene during the feeding period or to a direct action of the large amount of vitamin A given is not known.

"Artificial" Hypervitaminosis-A Plasma.—This was obtained by adding an alcoholic solution of pure vitamin-A acetate of known strength to the normal bird's plasma. The amount added varied according to the degree of vitamin-A concentration in the plasma required, but the alcohol in the plasma never exceeded 1% and usually it was 0.5%. The same amount of pure alcohol was added to the normal control plasma used in the same experiment. In the earlier experiments vitamin-A acetate in alcohol was added to normal plasma to bring its content up to 4,000 i.u. or more per 100 ml. In all the later experiments, however, the content of vitamin A in this artificially treated plasma was only about 1,400–1,500 i.u. per 100 ml. to make it comparable with the natural hypervitaminosis plasma. In one experiment the vitamin A added to the plasma was obtained from avoleum: 8 ml. of alcohol was shaken up with 2 ml. of avoleum for about 5 minutes, centrifuged, and the clear alcohol, which contained about 6,000 i.u. of vitamin per ml., was withdrawn. A small amount of this solution was added to the normal plasma so as to bring the vitamin-A concentration up to the required amount. Here, again, the same amount of alcohol was added to the control plasma without added vitamin A.

Estimation of Vitamin A and Carotene in Bird Plasma.—These substances were determined in all the plasma specimens even where known amounts of vitamin A had been added to normal plasma. In such cases the calculated and determined results agreed fairly well. The method of estimation used closely followed that described by Yudkin (1941), a modification of Kimble's method (1939), and in detail was similar to that used by the Cambridge team in the investigation of the Medical Research Council (1949) on the vitamin-A requirements of human adults. Two modifications of detail were made: (*a*) a sealed glass tube was used instead of a corked centrifuge tube when the plasma and alcohol mixture was extracted with petroleum ether; and (*b*) acetic anhydride to prevent turbidity in the absorptiometer was not added, as, under the experimental conditions employed, it was not necessary. The standard curves of reference used in the determination of carotene and vitamin A respectively were made from specimens of carotene and vitamin A which had been standardized in terms of international units.

Histological Technique.—Most of the explants were fixed in acetic Zenker's fluid and were serially sectioned. Some were fixed in absolute alcohol and mounted whole in glycerin jelly, a method which gave a very clear general picture of the bones.

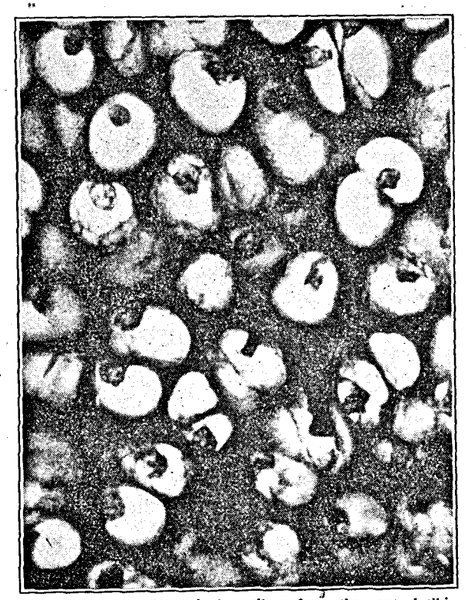


FIG. 5.—Area of terminal cartilage from the control tibia shown in Fig. 3. Note the broad, deep basophil partitions of matrix between the cells. (× 850.)

Effect of Vitamin-A Acetate

In these experiments one of each pair of bones was explanted in medium containing the alcoholic solution of vitamin-A acetate, and the corresponding bone in normal medium containing the same amount of alcohol. The vitamin was added to produce concentrations ranging from 960 to 8,000 i.u. per 100 ml. of plasma. The vitamin-A content of normal bird plasma is about 300 i.u. per 100 ml. Forty-six pairs of bones were cultivated in this way.

The control bones in normal medium did not lengthen much during cultivation, but deposition and absorption of bone continued *in vitro*. During the first three days most of the haemopoietic tissue of the marrow degenerated, but usually the necrotic remains had almost disappeared by the fifth day, and the other tissues remained healthy for the longest period of cultivation (12 days). The soft tissue investing the bone grew profusely and formed a large zone of migrating cells.

The effect of the vitamin-A acetate on the experimental bones was remarkable. In a concentration of 2,000–4,000 i.u. per 100 ml. the soft tissue grew as richly as in the controls, but in three days the bone of the shaft began to be absorbed and the cartilaginous ends to soften and shrink. The process progressed rapidly, and the entire bone rudiment seemed to melt away like a lump of sugar in hot water; in extreme cases, by the tenth day only a few crumbs of bone were left scattered in the sheet of actively growing soft tissue. It was noted that, the more healthy the culture appeared and the more actively it grew, the more dramatic was the effect of the vitamin-A acetate. It was rather toxic at a concentration of 8,000 i.u. per 100 ml., and produced a less striking result than was obtained at 3,000–4,000 i.u. per 100 ml.

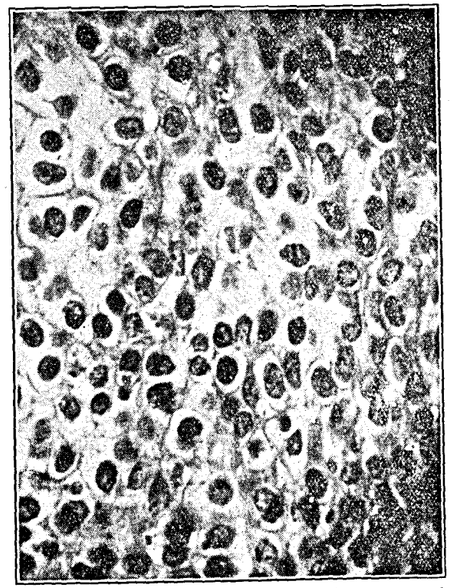


FIG. 6.—Area of terminal cartilage from the experimental tibia shown in Fig. 4. Note the healthy appearance of the cartilage cells, which are much closer together than in Fig. 5, owing to the almost complete disappearance of the cartilage matrix. (× 850.)

Histological sections of the experimental bones (Figs. 1–6), all stained with Delafield's haematoxylin and chromotrope, showed that the cartilage matrix soon lost its basophilia and at the same time shrank, while the cells appeared normal (cf. Figs. 5 and 6). Finally, the matrix of the epiphyses vanished completely, leaving only a compact mass of chondroblasts, while the diaphysial cartilage was rapidly invaded and replaced by the highly cellular connective tissue of the marrow cavity. Exactly how the bone was absorbed was not clear, and although osteoclasts were fairly numerous it was doubtful whether they accounted for all the destruction.

Effect of Vitamin A Prepared from Avoleum

One experiment was made in which "artificial" hypervitaminosis was produced by adding vitamin A in the form of an alcoholic extract of avoleum to the plasma. Six bones were grown in medium containing vitamin A from avoleum (1,558 i.u. per 100 ml. of plasma), six in medium containing vitamin-A acetate (1,538 i.u. per 100 ml. of plasma), and six in normal medium (286 i.u. per 100 ml. of plasma). For purposes of comparison, one bone of each pair was explanted in one of the experimental media and its fellow was grown in either normal or the other experimental medium.

The effect of the avoleum vitamin A seemed identical with that of vitamin-A acetate. By the fifth day the cartilage in both series of explants had begun to shrink and the bone to be absorbed, while the soft tissue grew profusely; after nine days' cultivation the explants were only one-third to one-half the size of the controls, but the soft tissue was still growing actively.

Effect of Plasma from Fowls Suffering from Hypervitaminosis A

Two experiments were made to find how the effect of pure vitamin-A acetate compared with that of the same concentration of vitamin occurring "naturally" in the plasma of birds suffering from hypervitaminosis A. Fowls were maintained on a diet containing large quantities of avoleum. When the vitamin A in the blood had reached a level of 1,200–1,500 i.u. per 100 ml. the plasma was drawn, mixed with embryo extract, and used as a culture medium.

In one experiment eight pairs of bones were explanted. The experimental member of each pair was grown for 12 days in plasma containing 1,435 i.u. of vitamin A per 100 ml. The control bones were cultivated in plasma from normal birds containing 487 i.u. per 100 ml. In the explants grown in the plasma from the birds with hypervitaminosis A the diaphysial bone appeared less dense than in the controls, but the difference was slight. This contrasted strongly with the results obtained in the experiments with pure vitamin-A acetate, in which a concentration in the plasma of only 950 i.u. per 100 ml. produced severe shrinkage of the cartilage and rarefaction of the bone after four to five days' cultivation.

In the second experiment the mouse foetuses were slightly younger than those in the first. Six bones were grown in plasma from fowls with hypervitaminosis A; the plasma used for the first seven days of cultivation contained 1,235 i.u. of vitamin A per 100 ml. and that for the next five days 1,545 i.u. per 100 ml., a rather higher level than was reached in the first experiment. Six bones were grown in normal plasma to which approximately the same concentration of vitamin-A acetate had been added, and six were cultivated in normal medium (320 and 296 i.u. per 100 ml.). All three sets of plasma contained the same amount of alcohol. The experiment was arranged so that one of each pair of bones was explanted in an experimental plasma, and one in either normal plasma or the other experimental plasma.

Apart from a slight rarefaction of the bony shaft, the explants grown in the plasma from birds with hypervitaminosis A showed little change for the first seven days; then the cartilage began slowly to shrink and the bone to be extensively absorbed. The effect, however, was far less drastic than in the corresponding bones cultivated in the same concentration of vitamin-A acetate; after 12 days the changes produced by the "natural" hypervitaminosis were about equivalent to those seen after four to five days' growth in the medium containing the same quantity of the acetate.

Discussion

These results showed that when vitamin A in tissue culture medium is increased from about 300 to 1,200 i.u. per 100 ml. by adding pure vitamin-A acetate to the plasma there is a dramatic effect on foetal bones explanted in such a medium. Plasma drawn from birds with natural hypervitaminosis A of the same order—that is, 1,200–1,500 i.u. per ml.—produced by a diet containing an excess of this vitamin, affects bone explants in a similar way, but its action is much less drastic than that of the artificially enriched plasma. What this quantitative difference in action is due to is not known.

One of the most striking observations described above is the disintegrating effect on the cartilage of foetal mouse bones of vitamin A in abnormally high concentrations. This action is primarily on the matrix, which softens, shrinks, and loses its basophilia, while the cartilage cells remain normal in appearance. In the hypertrophic cartilage at the ends of the diaphysis these changes are associated with a very rapid invasion and replacement of the cartilage by the tissue of the marrow cavity.

This destruction of cartilage *in vitro* is clearly related to the changes produced in cartilage *in vivo* by hypervitaminosis A and described by Strauss (1934), Wolbach and Bessey (1942), and Wolbach (1947). In both conditions there is abnormally rapid excavation of hypertrophic cartilage by the tissues of the marrow, but in the present work the most conspicuous effect is the dissolution of the matrix in the uninvaded cartilage, while in Wolbach's description the chief feature is an acceleration of the normal cartilaginous sequences. Again, in both the *in vivo* and *in vitro* experiments there is destruction of bone, but in the explants nearly all the bone eventually disappears, probably only partly by osteoclasis, whereas Wolbach states that *in vivo* the destruction is limited to osteoclasis in those regions where shaping of the bone normally takes place. Thus, although the effects of hypervitaminosis A are of the same general character *in vivo* and *in vitro*, there are considerable differences in detail. This is probably due to the very different environmental conditions *in vitro* and *in vivo*, and especially to the absence of a blood circulation in the explanted bones.

Summary

Long bones from late mouse foetuses were cultivated by the watch-glass method in medium containing abnormally high concentrations of vitamin A.

When pure vitamin-A acetate was added to the culture medium in concentrations of 1,000–3,000 i.u. per 100 ml. the matrix of the terminal cartilage softened, shrank, and finally almost or completely disappeared, though the cartilage cells appeared normal; in the shaft the cartilage was rapidly replaced by marrow tissue; the bone was resorbed, sometimes completely; the soft tissue surrounding the explant grew as vigorously as in the controls cultivated in normal medium.

The same results were produced by similar concentrations of an alcoholic extract of avoleum, a commercial preparation rich in vitamin A, made from liver.

Similar concentrations of vitamin A obtained by using plasma from fowls fed on a diet rich in the vitamin had a much less drastic effect on the explants.

We are indebted to Mr. L. J. King, technician at the Strangeways Research Laboratory, for his assistance with the tissue culture; to Mr. R. J. C. Stewart, chief technician of the Nutrition Building, National Institute for Medical Research, for his valuable help with the preparation of the birds' plasma; and to Mr. V. C. Norfield for the photographs.

REFERENCES

Barnicot, N. A. (1948). *Nature*, **162**, 848.
Bomskov, C., and Seemann, G. (1933). *Z. ges. exp. Med.*, **89**, 771.
Collazo, J. A., and Rodriguez, J. S. (1933). *Klin. Wschr.*, **12**, 1732, 1768.
Davies, A. W., and Moore, T. (1934). *Biochem. J.*, **28**, 288.
Fell, H. B., and Robison, R. (1929). Ibid., **23**, 767.
Herbst, E. J., Pavcek, P. L., and Elvehjem, C. A. (1944). *Science*, **100**, 338.
Kimble, M. S. (1939). *J. Lab. clin. Med.*, **24**, 1055.
Medical Research Council (1949). *Spec. Rep. Ser.*, No. 264, p. 91. London.
Mellanby, E. (1938). *J. Physiol.*, **94**, 380.
—— (1944). *Proc. roy. Soc.* B, **132**, 28.
Moore, T., and Wang, Y. L. (1945). *Biochem. J.*, **39**, 222.
Pavcek, P. L., Herbst, E. J., and Elvehjem, C. A. (1945). *J. Nutrit.*, **30**, 1.
Strauss, K. S. (1934). *Beitr. path. Anat.*, **94**, 345.
Wolbach, S. B. (1947). *J. Bone Jt Surg.*, **29**, 171.
—— and Bessey, O. A. (1942). *Physiol. Rev.*, **22**, 233.
Yudkin, S. (1941). *Biochem. J.*, **35**, 551.

Speaking at the fourth annual conference dinner of the Society of Radiographers, Sir Andrew Davidson, Chief Medical Officer, Department of Health for Scotland, said that the Health Service Acts had made profound changes in the administration of the health services—changes made necessary mainly because of new and progressive trends in medical science and a fuller appreciation of the social, economic, and industrial effects of sickness and disability. There were many gaps to be filled and many deficiencies to be repaired. The new health service claimed to be doing that. Many agreed that the changes had brought real and appreciable public benefits; but they heard less of them than of the weaknesses. The new arrangements had immensely widened the opportunities for the prevention and treatment of ill-health wherever it arose. But could they take advantage of the opportunities? It was of great advantage that Scotland was not too large to prevent personal contacts, yet large enough to be able to maintain a full range of service. Important also was the happy circumstance that they had four flourishing medical university centres, all of the first rank, which together produced about one-third of the new doctors in the United Kingdom. It was fortunate also that the pattern for medical care in rural districts had been set up by the Highlands and Islands Medical Service. Again, Scotland had a well-developed public health service in the counties and burghs. It was too early to make any general assessment of positive achievements, but two facts stood out: (1) The Service has been accepted and indeed welcomed by the public, as 97% of the population are included on doctors' lists; and (2) those who were concerned in operating the Service were making strenuous and helpful efforts to make it a success. The proper balance between the various elements of the Service must be struck. More attention would need to be paid to those working in the homes of the people, whether they were concerned with prevention or cure. The co-operation of the public was needed on how to use the Service. Abuses would destroy it. Doctors had told him that much of the expenditure on expensive drugs was in response to demands by many patients for what they themselves wanted. Surely that was wrong. The public should not regard the Service merely as a machine which would turn out medicine, or spectacles, or dentures, or any other apparatus on demand.

RESPIRATORY STUDIES IN PARALYTIC POLIOMYELITIS

BY

R. B. BOURDILLON, C.B.E., D.M.
E. DAVIES-JONES, M.B., B.S., D.A.
F. D. STOTT, D.Ph.

AND

L. M. TAYLOR, B.M., B.Ch.

(From the M.R.C. Electro-medical Research Unit, Stoke Mandeville Hospital; the Department of Neurology, Oxford; and the Western Hospital, Fulham)

The following notes are based on studies at the Western Hospital, Fulham, by two of us (L. M. T. and E. D.-J.) during the 1949 epidemic of poliomyelitis, and on laboratory studies at Stoke Mandeville Hospital. While many of the conclusions are tentative, it has become clear that there is much need for improvement in both the design and use of breathing machines. These notes are published in the hope of facilitating such improvement.

The tidal air of a patient in an iron lung can be measured without difficulty by the use of a spirometer of the type commonly employed in hospitals for the measurement of basal metabolism. There are, however, few published measurements of this type in cases of poliomyelitis, and very few detailed measurements taken from patients in tank respirators. Drinker and Shaw (1929) and Shaw and Drinker (1929) showed that in healthy subjects in tank respirators it was easy to produce a large tidal air with minute volumes of over 20 litres a minute at pressures of 20 cm. of water. Elam (1948) showed figures for six cases of poliomyelitis in respirators, but gave few details of the patients' condition. Binet, Bochet, and Bour (1948) gave figures for one patient and four healthy subjects.

Our studies have been concerned chiefly with the effects on tidal air and minute volumes of varying respirator suction pressures and stroke frequency. We have also studied the effects of varying the patient's posture while in a respirator, and the changes occurring in convalescent patients during and after weaning from their respirators. These experiences have indicated a need for a number of alterations in the Both type of respirator, which are discussed later.

Technique

1. *Spirometers.*—A commercial spirometer, using a rubber bellows instead of a float, was found to give too high a resistance to air flow for accurate work. A spirometer of the water-sealed gasometer type was therefore constructed. The counterweight guides and pulley were fitted with ball-races to reduce friction, and thus the pressure required to start the spirometer moving was reduced to only 2 mm. H_2O. As the spirometer was required to measure much smaller tidal airs than normal, the counterweight pulley system was designed to give an optional multiplication ($\times 2$) of the float movement. The sensitivity when this was used was 3.67 in. (9.32 cm.) per litre. The spirometer included an absorbent for CO_2, and was refilled with pure oxygen as and when necessary.

2. *Recording Drum.*—The recording drum used with this spirometer was 12 in. (30 cm.) in diameter and 16 in. (40 cm.) high, and gave paper speeds variable at will from about 2 in. (5 cm.) a minute to 1 in. (2.5 cm.) a second. The highest speed was adequate to display clearly the wave-form of each respiration.

3. *Recording Pressure Gauge.*—A recording pressure gauge was constructed by modifying an ex-R.A.F. air-speed indicator. This gave a pen movement of about 1.75 mm. per cm. water gauge. The time constant of the instrument was less than 1/20 second, so that its response was fast enough to record all details of the pressure wave-form of the respirators. The pressures were recorded on the same drum as the spirometer, so that simultaneous records of respirator pressure and tidal air were obtained.

4. *Alveolar CO_2.*—This was estimated by a Haldane gas analysis apparatus after collection in sampling tubes by the method of Haldane and Priestley (1935).

5. To avoid leakage all measurements of tidal air were made with a nose-clip and a rubber mouthpiece having a flange between the patient's lips and teeth.

Glossary

We use the terms listed below as follows :

Carina. The bifurcation of the trachea.

Hypocapnia. A condition with a subnormal concentration of carbon dioxide in the blood.

Minute volume. The volume of air inhaled or exhaled during one minute.

Regression line (as used in Fig. 2). The calculated straight line for which the sum of the squares of the deviations of volume from the line is a minimum.

Reserve air (="supplemental" air). The volume of air which the subject can expel with an effort after the end of a normal expiration.

Tank respirator. A breathing machine in which the whole of the patient's trunk and limbs are enclosed in a nearly rigid box.

Tidal air. The volume of air inhaled or exhaled during a single respiration.

Vital capacity. The maximal volume of air which a subject can exhale after the fullest possible inspiration.

All volumes quoted in this paper are measured at approximately 18° C. and include water vapour at approximately 15.5 mm. Hg.

Subjects Tested

Among the subjects studied were nine patients for whom respirator treatment was considered essential. Five of these were considered too ill for experimental tests and died without having had any measurements of tidal air. Particulars of the four surviving respirator cases and of the healthy subjects studied are given in Table I (M. C. and D. P. died in June and July, 1950).

Measurements of Tidal Air in Respirators

Effect of Negative Pressures on Tidal Air

About 600 measurements of tidal air were made and correlated with the amount of negative pressure in the Both and Drinker respirators. The results showed wide variations, both between different persons and from day to day in the same person. Fig. 1 shows curves relating negative

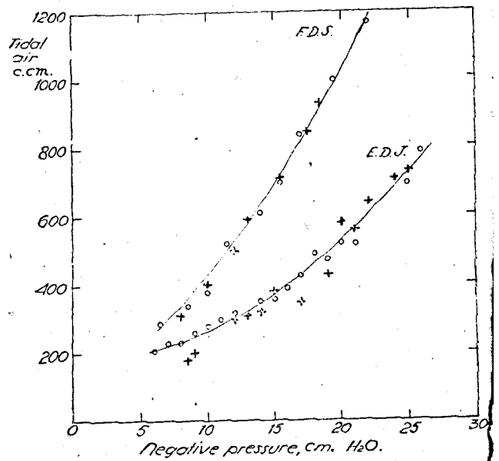


FIG. 1.—Tidal air and respirator suction pressure in two healthy adults. Rate of pressure change approximately 20 cm. H_2O a minute (*too rapid* for equilibrium). Circles show points measured with rising suction pressure, crosses those when pressure was falling. Respirator frequency 20 cycles a minute. Peak positive pressures 2 cm. H_2O.

pressure to tidal air in two healthy subjects. It was found easy to obtain smooth curves of this type by altering the pressure quickly so that unconscious physiological adjustments of the respiration rate did not have time to cause major alterations in the tidal air. In contrast to this, Fig. 2 shows points observed in other tests after the respirator adjusting valves had been left *unaltered for a* time sufficient for the tidal air to appear constant—usually at least one minute after any changes of pressure. These graphs show all tests of this type made at a respirator

TABLE I.—*Particulars of Subjects Studied in Respirators*

Initials	Sex	Age	Height approx.	Weight	Respiratory Muscles Paralysed, and Date of Onset	Total No. of Days in Respirator	Vital Capacity, Supine	
							First Measurement	Last Measurement
					Patients			
A. B.	M.	33	5 ft. 7½ in. (1·71 m.)	9 st. 2 lb. (58·1 kg.)	Intercostals and diaphragm. 16/11/49	65 approx.	180 c.cm. 6/12/49	840 c.cm. 15/3/50
M. C.	F.	20	5 ft. 6 in. (1·68 m.)	7 st. 8 lb. (48·1 kg.)	Intercostals and diaphragm. 10/11/49	More than 125	215 c.cm. 11/1/50	
R. J.	M.	17	5 ft. 6 in. (1·68 m.)	7 st. 7 lb. (47·6 kg.)	Intercostals and abdominal wall, not diaphragm.	31	1,100 c.cm. 30/11/49	1,600 c.cm. 26/1/50
D. P.	F.	26	5 ft. 6½ in. (1·69 m.)	8 st. (50·8 kg.)	Intercostals and diaphragm complete. 30/7/49	150 approx.	450 c.cm. 1/12/49	600 c.cm. 15/3/50
					Healthy Subjects			
D. J. D.	F.	34	5 ft. 2½ in. (1·59 m.)	8 st. (50·8 kg.)			3,200 c.cm.	
E. D. J.	F.	35	5 ft. 9½ in. (1·77 m.)	10 st. 4 lb. (65·3 kg.)			3,000 c.cm.	
F. D. S.	M.	26	5 ft. 7½ in. (1·71 m.)	10 st. 5 lb. (65·8 kg.)			4,400 c.cm.	
L. M. T.	F.	28	5 ft. 4 in. (1·63 m.)	9 st. 5½ lb. (59·6 kg.)			3,100 c.cm.	

The weights given for the patients are those stated by them as observed before their illness. During these studies all patients showed great muscular wasting with consequent loss of weight.

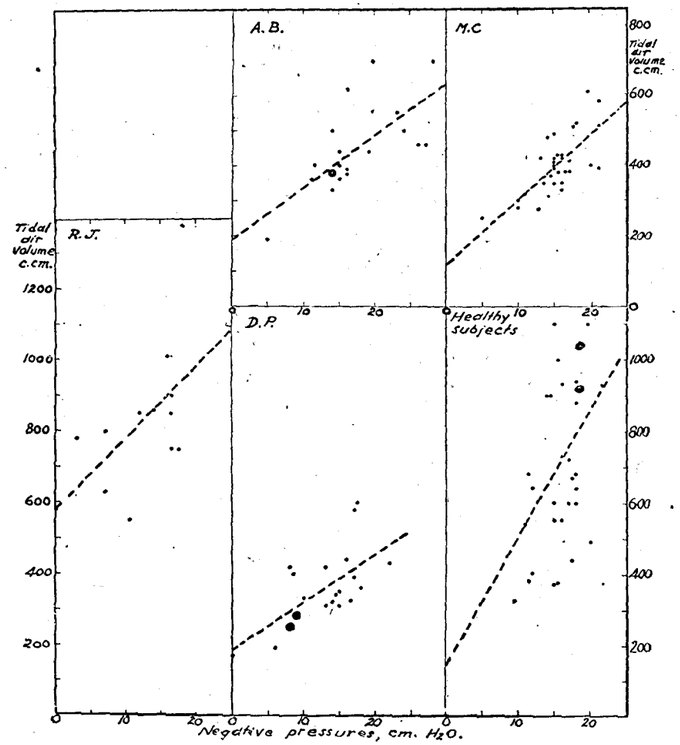


FIG. 2.—Tidal air and respirator suction pressure in four poliomyelitis patients and four healthy adults. All measurements taken at steady valve settings, some time after any change of conditions. The large dots indicate two coincidental observations. Dotted lines show the calculated regression lines.

stroke rate of 20 a minute, and include 86 tests on the patients with poliomyelitis and 33 on healthy subjects. The points show a wide scatter, and even if those measured in fairly quick succession—that is, at a few minutes' interval—are joined by lines to give curves, these show wide variations in slope, especially in the healthy subjects. The causes of the wide scatter shown in these graphs are only partly known. In the patients, some of the higher values of tidal air were due to an irrepressible desire to be "helpful"—that is, to a voluntary effort added to the effect of the respirator. This was especially marked in R. J.

The healthy subjects practised as complete relaxation as possible. The tests were done at varying times after meals, and one subject (E. D. J.) habitually showed unconscious resistance to hyperventilation, presumably by contraction of trunk muscles or of the glottis.

Table II shows certain values calculated from the dotted lines in Fig. 2 and from curves similar to those in Fig. 1. Owing to the wide variations found, the figures in Table II should be taken only as a rough guide. The data for R. J. in particular show the effect of movements of the diaphragm, which remained functional. The healthy subjects all show less resistance to the respirator action than do the patients. This may be due to many causes, such as unconscious co-operation of voluntary muscles in the healthy subjects, the development of chest rigidity in the patients, or possibly to resistance of the laryngeal or other muscles against hyperventilation, which might occur in the patients at unusually low volumes of tidal air owing to their wasted condition.

Optimum Pressures for Tank Respirator

It is obvious that the correct suction pressure for respirator patients can be best judged by studies of blood oxygen and of either blood CO_2 or alveolar CO_2. If reliable measurements of that type are not available, it seems reasonable to assume that, unless fever is high or obstruction by fluid or mucus is present, the normal values of tidal air for healthy subjects should be satisfactory—that is, that for adults lying at rest, with their lungs in a healthy state, the tidal air should not exceed 600 c.cm. and should not be less than 400 c.cm. for a respiration rate of 15 cycles a minute. It should be measured if possible, but if this is impracticable the above data suggest that for adolescents or adults a suction pressure of −12 to −15 cm., according to the freedom of chest movement, is likely to be of the right order, and should be tried as a starting point. This agrees closely with the conclusions of Wilson (1947).

Effect of Positive Pressure on Tank Respirators

In some tests (not quoted above) positive pressures of 9 to 10 cm. H_2O were used with negative pressures of from 10 to 19 cm. Over this range such increase in tidal air as may have occurred with the change from 2 to 10 cm. of positive pressure was too small to be detected in our tests.

TABLE II.—*Relation Between Tidal Air and Respirator Pressure*

	Patients				Healthy Subjects		
	D. P.	A. B.	M. C.	R. J.			
Negative pressure (cm. H_2O) giving tidal air of 400 c.cm.	−16·0	−14	−15·3	No mechanical aid needed	−7·15		
Ditto for 500 c.cm.	−23·5	−21	−20·7	"	−10·0		
C.cm. increase in tidal air for each cm. increase in negative pressure, for "equilibrium" data	13·1	14·5	18·2	19·9	35·4		
					E. D. J.	D. J. D.	F. D. S.
Ditto for points taken during rapid changes of pressure					19·4 and 17·4	39	51·5 and 64

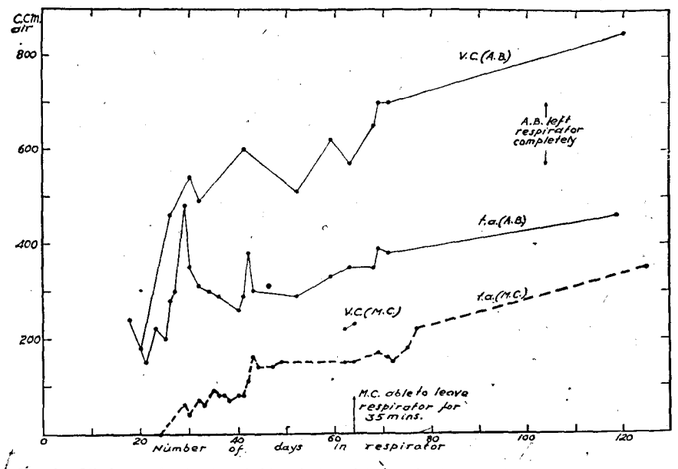


FIG. 3.—Vital capacity (v.c.) and tidal air (t.a.) with unaided respiration for two convalescent poliomyelitis cases.

This agrees with the results of other workers—for example, Wilson (1947). While suggesting that positive pressures of this order are not of much value in increasing tidal air, these tests do not warrant the conclusion that they are useless, since it seems possible that they help to maintain flexibility of the chest and to assist circulation in the lungs, liver, etc. Such observations as were made tended to confirm the belief that positive pressure at part of each stroke does help patients to cough. Both A. B. and D. P. developed atelectasis at one time, and this aid to coughing was then thought to be of definite value, especially if combined with a tilt of 15 degrees head downwards.

Pressure Selected by Patients

In Fig. 2 the graphs for M.C., A.B., and D.P. all show a concentration of points at about −15 cm. pressure. This represents the smallest suction with which these patients felt comfortable during the later portion of their stay in respirators. In the first weeks M. C. became very uncomfortable at pressures less than −22 cm. (at which her tidal air varied from 250 to 590 c.cm.). At −16 cm. she felt "unable to breathe from the bottom." Even at −22 cm. (and +2 cm.) she showed signs of anoxia at this period. R. J., with a milder extent of paralysis and a relatively flexible chest, also appeared to like −15 cm. pressure, though this gave him a tidal air of over 800 c.cm. and a minute volume of 13 to 14 litres.

From these four cases it would seem that the patients' desires may be a useful guide to correct respirator pressures in the absence of all measurements of tidal air or of alveolar or blood gases. Owing, however, to the ease with which the respiratory centre becomes adapted to abnormal concentrations of CO_2, the patient may in time come to prefer a pressure which causes either alkalosis or acidosis (Brown *et al.*, 1948 ; Elam, 1948).

Effect of Stroke Frequency on Tidal Air

The patients concerned were not well enough to tolerate tests of varying respirator frequency over an extensive range. Tests on three healthy adults showed in each case a gradual fall with increasing frequency, the tidal air at 30 cycles a minute being approximately half that at 12 cycles a minute. In contrast to this Shaw and Drinker (1929) reported that in anaesthetized cats treated with curare the tidal air was practically identical at 22 and 37 cycles a minute for all pressures from ±6 to ±20 cm. H_2O. This difference may be due to narrowing of the bronchi during expiration in our healthy subjects (who reported feeling unable to finish expiration at the higher speeds), or to unconscious resistance to over-ventilation. We think the latter explanation improbable.

All healthy subjects found 20 cycles a minute, which is the minimum frequency of the normal Both respirator, uncomfortably fast. They preferred speeds of 12 to 16 cycles a minute, more nearly resembling those of normal respiration when lying down. We see no reason to think that adult patients without fever need higher frequencies than this in most cases. The obvious advantage of using a relatively low frequency is that it facilitates a tidal air large enough to make atelectasis unlikely, and gives less risk of hyperventilation. In the presence of active infection other considerations may become dominant and make higher frequencies preferable.

Tidal Air in Patients Removed from Respirators

Measurements of tidal air and vital capacity form a useful aid in judging the rate at which patients can be weaned from respirators. Fig. 3 shows such measurements for two patients who showed both diaphragmatic and intercostal paralysis. In each case the patient was supine either on a bed or on the respirator mattress with the box front open and no pump running.

The lowest curve (for M. C.) is of interest in showing what low values of tidal air can be tolerated in a wasted convalescent patient. By the 63rd day, with a tidal air of 150 c.cm., she could tolerate periods of 35 minutes without mechanical aids to respiration. At the 125th day she was able to stay out for periods of six hours daily, and showed an unaided tidal air of 350 c.cm., with an alveolar CO_2 of 5.9%. The two higher curves in Fig. 3 show tidal air and vital capacity for A. B., again when unaided by the respirator. On the 20th day he showed collapse of the lower lobe of the right lung, with a tidal air of 150 to 180 c.cm. By the 49th day he was out of the respirator all day and night, with a tidal air of 290 c.cm. A few days later return to the respirator seemed advisable, and he finally left it on the 101st day. On the 119th day he showed the tolerable figures of 460 c.cm. for tidal air and 850 c.cm. for vital capacity. He was fortunate in regaining at least partial control of the upper intercostal muscles, although the diaphragm and lower intercostals remained wholly paralysed.

Fig. 4 shows spirometer curves for tidal air and vital capacity tests for one healthy subject (F. D. S.) and three convalescent patients drawn to the same scale. It shows graphically how great the damage to respiratory muscles may be in cases which survive. The reserve air is shown approximately in each case by the depth to which the curve falls below the dotted line. The vital capacities of the patients are so low as to leave little or no margin for emergencies such as an acute respiratory infection.

Posture in Respirators

It is customary in most hospitals to nurse respirator cases in the supine position, tilting the head downwards only when fluid collects in some part of the respiratory tract. While convenient for both nurses and patients, any constant posture is dangerous, and the supine position is exceptionally dangerous owing to the difficulty of draining the pharynx without excessive tilt and the increased danger of inhalation of gastric contents if vomiting occurs. This applies to all cases needing respirators, and especially to bulbar cases whether in respirators or not.

Statistics of deaths from poliomyelitis show that a large majority of respirator patients die —for example 86% of 834 cases (Bergman and Huldt, 1948), 82% of 98 cases (Edwards, 1948), 57% of 63 cases (Brahdy, 1936), 80% of 76 cases (Nielsen, 1946). Useful data for earlier epidemics are given in the Medical Research Council's Special Report on Breathing Machines (1939). A large number of these patients die with atelectasis and pneumonia, probably accentuated, if not chiefly caused by, accumulation of mucus and fluid in the respiratory tract. While making due allowance for the cases in which death is due to overwhelming invasion of the central nervous system it seems reasonable to suspect that a good many such deaths could be averted if continuous drainage of the main bronchi were assured. Postural drainage is therefore of very great importance in many cases. It is well known as a life-saving measure in bulbar poliomyelitis, but its possibilities during respirator treatment have been little explored.

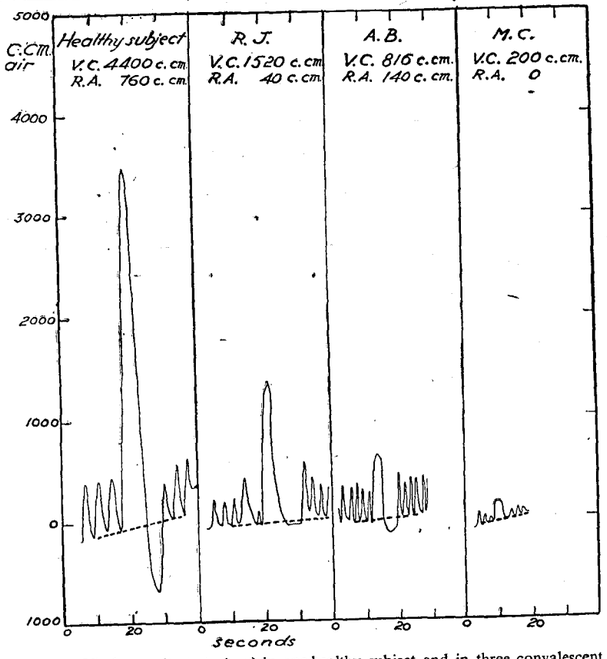


FIG. 4.—Vital capacity tests (v.c.) in one healthy subject and in three convalescent respirator patients. R.A. = Reserve air.

The great advantage of the prone position over the supine in facilitating drainage is not always appreciated. In the supine position, lying flat on a hard surface, there is an upward slope from the carina to the lower corner of the mouth (with the head turned sideways) of approximately 15 degrees. Hence a downward tilt of over 15 degrees is necessary before drainage can even begin, and about 20 degrees is necessary for a useful effect. (These figures are only approximate, since the exact angle of slope is affected by the shape of the chest, the yield of the mattress, and especially by the position of the head at rest.) The reverse holds in the prone position. With the body lying on a horizontal surface, and with the chin in a comfortable position about 1½ in. (3.75 cm.) below the surface supporting the trunk, there is a downward slope of about 15 degrees from the carina to the mouth, so that rapid drainage can occur without any tilting of the patient. The difference between the prone and the supine position thus corresponds to a tilt of about 30 degrees when considering the respiratory tract from carina to mouth. For drainage of all the bronchi distal to the carina no single position can be satisfactory, and changes of posture are indispensable.

Side-effects of Tilting.—The drawbacks to lying with the head tilted downwards deserve consideration. In our tests, two healthy subjects lying prone in an open Drinker respirator tilted head down at 20 degrees for one hour showed oedema of the face, congestion of the nasal mucosa, and alterations in the pitch of the voice. This suggests that even this moderate angle may cause appreciable cerebral oedema, and provides a further reason for using the prone position, where a small angle of tilt may suffice. The drastic procedure of tilting to 30 or 35 degrees is, however, advised by Galloway and Seifert (1949), who report successful results in 15 consecutive bulbar cases.

Posture in Both and Drinker Respirators.—These respirators have sloping fronts, which are advantageous to patients when supine, but tend to interfere with the shoulders in the lateral position and with the chin in the prone position. In this respect the Both with the wooden front 7/8 in. (2.2 cm.) thick, sloping at 20 degrees, is worse than the Drinker with a metal front 3/32 in. (0.24 cm.) thick, sloping at 15 degrees. However, changes of posture were studied in two patients. The prone position was found practicable for A. B. in a Drinker respirator for periods up to two hours at a time. The left lateral position was also found useful in this patient, following collapse of the right lower lobe, but this position was tolerated only for periods of two hours at a time, since his left hip became tender. A boy of 3 was also nursed in a Drinker for long periods in the right and left lateral positions.

When in the prone position the patient needs one or two pillows under the chest and thighs to allow of free abdominal movement in respiration, and two pillows under the shins to protect the knees and feet from pressure. We have found it easy to construct a chest and shoulder support from one of the wedge-shaped cushions of foam rubber sold commercially for upholstery. The removal of the central part of the thin end of the wedge facilitates abdominal movement, and the addition of two pads of foam rubber projecting above the thick end of the wedge effectively protects the shoulders when the respirator is tilted head downwards.

Effect of Posture on Tidal Air in Respirators.—A series of tests on A. B. at different dates showed no decrease in tidal air on changing from the supine to the prone or lateral positions, at the same respirator pressure. In many tests an increase occurred, but it is uncertain if this was due to conscious or unconscious use of the accessory respiratory muscles or to decreased mechanical resistance. When nursing in the prone or lateral positions no increase in respirator pressures seemed necessary to secure comfort. In two healthy subjects tests showed no regular change in tidal air on changing from the supine to the prone position.

Respirator Mattresses.—In wasted patients the properties of the mattress become of great importance. It is customary to use foam-rubber mattresses in respirators, but these are often covered with a thick waterproof covering of red rubberized fabric. A series of tests made on the yield and elasticity of mattresses (to be published later) have shown that the use of covers of this type greatly increases the local pressure on bony points and removes many of the great advantages of the foam-rubber mattress. The patient A. B. when in the lateral position on a mattress covered in this way soon complained of sore hips. Since "dunlopillo" material is easily washed, and since we are informed by the makers that it can be steamed at 100° C. (but not 110° C.) without appreciable damage, we would strongly advocate the use for all respirator patients of foam-rubber mattresses with thin porous cotton fabric covers only.

Conclusions on Posture.—The advantages of the prone position with slightly lowered head seem to need the greatest emphasis, above all in bulbar cases, whether these are treated out of respirators, as is common in this country, or in them, as strongly recommended by Galloway and Seifert (1949). Improvements in the design of tank respirator fronts to facilitate changes of posture are badly needed. Training of the nursing staff in team-work when changing the posture of respirator patients is also important.

Hyperventilation

The ease with which hyperventilation can be produced in tank respirators was noted by Drinker and Shaw (1929) and should not be forgotten. In healthy subjects considerable hyperventilation can be continued for 24 hours or more as shown by Brown *et al.* (1948), though during sleep some mechanism (possibly closure of the glottis) reduced the ventilation in at least one of their subjects. In this respect tank respirators are in striking contrast to manual methods of artificial respiration in which hyperventilation is usually impossible, owing to an ensuing rigidity of the chest sufficient to overcome its natural elasticity (Henderson and Turner, 1941).

The possible dangers of hyperventilation in respirator cases of poliomyelitis need consideration. They are difficult to assess not merely because the conclusions of workers who have studied hypocapnia vary considerably but also because different persons vary greatly in their response to hyperventilation. Some of these dangers have been described by a number of workers, including the following.

Henderson (1910) and Henderson and Haggard (1918) described some very severe tests on anaesthetized dogs, in which three dogs died. In human beings with less severe hyperventilation Hinshaw, Rushmer, and Boothby (1943) found that in tests in which "the rate and amplitude of respiration were merely doubled" two out of ten aeroplane pilots collapsed in 20 minutes, with partial or total unconsciousness, and four others developed troublesome symptoms. The authors refer to this as "such moderate hyperventilation," but, since the alveolar CO_2 was in all cases reduced to half the normal figure within five minutes of starting, we infer that the minute volume was four times the normal figure, a rate which we should regard as giving considerable hyperventilation.

Rahn *et al.* (1946) give quantitative data on the effect of hypocapnia on manual steadiness, mental arithmetic, and other faculties, and find a slight drop in efficiency as the alveolar CO_2 pressure falls to 30 mm. Hg and a rapid fall when this pressure sinks below 25 mm., corresponding to a concentration at normal pressures of approximately 3%. (The partial pressure of alveolar CO_2 with normal ventilation is usually taken as 40 mm.)

Carryer (1947) stresses the dangers of respiratory alkalosis and describes it as causing anxiety, confusion, and often a sense of suffocation tending to cause yet further hyperpnoea; sensations of tingling or numbness in the extremities, muscle tetany (especially carpopedal spasm) follow. He attributes some of these symptoms to tissue anoxia. This can be caused by hyperventilation, because the readiness of oxyhaemoglobin to give up oxygen is lessened by a reduction in the CO_2 content of the blood stream. This has long been recognized as the "Bohr" effect.

A further possible cause of tissue anoxia from hyperventilation is suggested by the studies of Gibbs *et al.* (1942), who conclude that a reduction in the arterial CO_2 content of arterial blood causes constriction of the cerebral arterioles. While these authors hold that such constriction will not be sufficient to cause anoxia, others such as Davis and Wallace (1942) believe that at least sufficient anoxia to produce delta waves is easily caused in this way.

The tetany produced by hyperventilation in man has been recorded by many workers, including Grant and Goldman (1920) and Schneider (1930). The latter observed great spasticity of the chest or shoulder muscles in some of his subjects after about 22 minutes of voluntary forced breathing. This seems of possible interest in considering the "rigid chests" of some respirator cases. The effects of hyperventilation during anaesthesia are discussed by Seevers *et al.* (1939, 1940). If hyperventilation is prolonged a rapid adjustment of the blood alkali occurs, tending to restore the *p*H of the blood to its normal value. The kidneys aid in this process by secreting a more alkaline urine. As a result of these adjustments, overbreathing is not known to cause death in healthy unanaesthetized human beings or dogs. It is, however, uncertain whether hyperventilation in respirators has often proved lethal in the acute stage of poliomyelitis.

Practical Tests on Hyperventilation in Drinker or Both Respirators.—Table III gives the results of a few of our tests on healthy subjects, and is intended to show at what pressures appreciable hyperventilation occurred. In three out of four healthy adults suction pressures of -13 to -16 cm. H_2O at respirator rates of 14 to 20 a minute caused pronounced symptoms of respiratory alkalosis in less than 90 minutes from the start, with a reduction of alveolar CO_2 to less than 3%—that is, to less than 25 mm. Hg pressure. These findings agree well with those of Rahn *et al.* (1946) quoted above.

Hyperventilation in Patients.—With patients the respirator pressures were generally adjusted to the lowest value at which the occupants felt comfortable, and no signs of overventilation were detected. In three of the patients this was only to be expected, since their tidal air was small. With R. J., however, a tidal air of about 800 c.cm. and a minute volume of 16 litres or more was common, as is seen in Fig. 2. Even on the first morning after entry into the respirator a minute volume of 17 litres was observed (at pressures of -17 cm. and $+2$ cm. H_2O). It seems certain that some hyperventilation occurred, though conceivably only during spirometer measurements. No symptoms or signs of overventilation were detected.

TABLE III.—*Respirator Pressures Causing Hyperventilation in Healthy Subjects*

Subject	Negative Pressure (cm.H_2O)	Stroke Frequency	Tidal Air (c.cm.)	Minute Volume (litres)	Duration Since Start of Pump (min.)	Alveolar CO_2%	Symptoms of Alkalosis
L. M. T.	−15	19·5	1,000	19·5	0 15 30 40	4·46 2·45 2·25 1·95	Tingling + Chvostek's sign at 12 min. Carpal spasm at 38 min.
L. M. T.	−16	16	900	14·4	0 25 38 50	4·4 3·94 2·74 2·45	Tingling in arm and bilateral Chvostek's sign at 42 min. Carpal spasm at 48 min.
L. M. T.	−13	14–16	900	13·5			Tingling, carpal spasm, and Chvostek's sign at 3 min. Brief loss of consciousness and sweating hands at 45 min.
F. D. S.	−15·5	16	980	15·6	0 16 30	5·5 3·1 3·45	Tingling at 13 min. Chvostek's sign at 23 min.
F. D. S.	−13	20	650	13·0	0 14 34 70 93 124	5·96 4·14 3·85 3·23 2·85 2·95	Tingling at 82 min. Chvostek's sign at 92 min.
D. J. D.	−14	20	600	12·0	0 26 61 83	— 3·44 2·88 2·43	Tingling + Chvostek's sign at 72 min. Trousseau's sign + carpal spasm at 83 min.
E. D. J.	−16	14·5	575	8·2	0 32 69	5·85 4·75 4·1	No symptoms.
E. D. J.	Voluntary hyperventilation		2,066	31·0	19·5	Not measured	No symptoms after 19¼ min.

Note: Positive pressures used varied from 0 to 1 cm.H_2O.

Indications for Respirator Treatment

The high percentage of deaths observed in cases of poliomyelitis treated in respirators has led many physicians to postpone respirator treatment until the patient is obviously struggling for breath. Thus Stimson (1949) remarks: "The contraindications to the use of the respirator, however, are so definite that a number of us feel that a patient should not be put in until you really have to." While realizing that the dangers of respirator treatment may be appreciable, especially when there is a shortage of nurses, we would like to emphasize the physiological grounds for thinking it important to use respirators at the earliest detectable signs of involvement of the respiratory motor neurones.

Ritchie Russell (1949) has pointed out the close correlation between muscular paralysis and exercise in the 72 hours preceding the onset of paresis. He remarks: "Severe physical activity at this stage is almost suicidal." This seems to be especially true in the last 24 hours of the pre-paralytic stage. Now the vital capacity of most people is about eight times as great as their tidal air when at rest. Hence a patient at rest will not show distress from failure of respiratory muscles until a very large fraction of their power is lost. It seems probable that by that time many of their neurones are already out of action, and that the remaining ones are being grossly overstimulated by hypercapnia or hypoxia. It therefore seems most important to rest these muscles before this stage is reached. A further reason for prompt respirator treatment is summarized in the well-known adage "Anoxia breeds anoxia." It therefore seems important that respirator treatment should not be postponed until gross signs of underventilation such as cyanosis, difficulty in answering questions, or twitching of the alae nasi have developed.

In the four surviving respirator cases discussed in this paper the procedure customary in most hospitals was followed, in that the patients were kept under close clinical observation but respirator treatment was not begun until respiratory difficulties were obvious. The time intervals between the first symptoms of respiratory insufficiency and the use of a respirator were as follows: D. P., 26 hours 50 minutes; M. C., 24 hours approximately; R. J., 5 hours 30 minutes; A. B., 4 hours 30 minutes. It is of interest that of these patients the least recovery of respiratory power was shown by D. P. and M. C., who had the longest intervals before respirator treatment. Both these patients died within a year with acute dilatation of the stomach and, in one or both cases, pneumonia.

In determining the first onset of respiratory weakness a rough estimate can be formed by finding how many numbers the patients can count out verbally in one expiration. But if the apparatus is available, some kind of spirometer is much more accurate. In our opinion a spirometer of the type commonly supplied for estimating the basal metabolic rate should be kept as an accessory in every ward where an appreciable number of respirator cases are expected. In the absence of a spirometer of this type, simple apparatus can be constructed for measuring "vital capacity," using either an expanding bellows of paper or cloth, or a metal float chamber as in spirometers. It is even possible to measure vital capacity by using an anaesthetist's rubber bag (the 2-gallon (9.1-litre) size may be needed for adult males), by tying up the orifice and noting the volume of water displaced on immersing the bag in a large vessel. By taking measurements of this sort at suitable intervals it should be possible to detect a weakening of respiratory muscles in the earliest stages, and to justify beginning respirator treatment much sooner than is now customary, at least in hospitals where the staff are fully trained in the management of respirators.

As this conclusion was reached only in the later part of our studies, we have not yet had practical experience of the difficulties which might ensue from this procedure. We do not know if the net result would be to increase or decrease the number of respirators needed, since a shorter period of stay might outweigh an increase in the number

of patients given the treatment. It would of course be important to avoid respirator treatment in bulbar cases, unless they were efficiently drained by tilting or other methods.

Matching of Respirator Frequency to Patient

The normal respiration frequency of an adult lying down is said to be 14 to 16 a minute, falling to about one-quarter of this rate during sleep (Sunderman and Boerner, 1949). All our healthy subjects when first put in a Both respirator found it difficult to adjust to the frequency of 19–20 a minute, which is the lowest that the belt of the A.C. power unit supplied with the Both outfits can give. These subjects felt as if they were not allowed time to breathe out properly, and it was difficult at first to adjust their muscles to the unduly early onset of inspiration. On the other hand, with the D.C. motor of the Drinker outfit, giving speeds down to about 10 strokes a minute, no such difficulty was noticed.

The logical procedure for matching respirator to patient would consist in noting the unaided frequency of the patient's respiration and, when this was not excessive, adjusting the respirator stroke frequency to the same rate. This should give least fatigue to the muscles concerned. It seems important to avoid hyperventilation, since this is normally resisted (at least in healthy subjects) by contraction of respiratory or laryngeal muscles which presumably need rest.

Hypoxia

It seems clear from the observations of Elam *et al.* (1948) that the use of an oximeter may be of great value in the respirator treatment of poliomyelitis. This would make the detection of underventilation easy but would give no guide to hyperventilation. For the detection of this, measurements of alveolar CO_2 would be of great value, and the combined procedure would make it possible to determine the best value of the minute volume for a patient in any particular phase of his illness. In the absence of such facilities it seems wisest to assume that hypoxia is more dangerous than hypocapnia, especially when the latter is of gradual onset so that the acid-base balance can be adjusted by the kidneys. It is therefore reasonable to choose a minute volume rather greater than the optimum theoretical value for a patient at rest. As is well known, many cases require, or at least benefit from, the use of oxygen for a considerable period after treatment has begun. Further, in order to avoid hypoxia when the tank respirator is opened for nursing attention, it is very important to have some auxiliary apparatus available, such as an Oxford inflator or a McKesson or E. & J. resuscitator.

Suggested Alterations to the Both Respirator

Experience has led us to think the following alterations desirable. The first two seem of considerable importance.

1. Provision for running at lower speeds than the present minimum of 20 strokes a minute. We suggest that if, for economic reasons, an A.C. motor and stepped pulley is retained, ratios should be provided giving 12, 15, 18, 21, and 24 cycles a minute. This would make it possible to give patients rather deeper breaths without so much overventilation, and would, we think, often make it easier to match the respirator speed to the natural rate of the patient.

2. Alterations to the front of the tank to make the prone or lateral positions less uncomfortable. A reduction of slope to 10 degrees or even less is suggested, and the replacement of the thick wood by light alloy 3/32 in. (0.24 cm.) thick. If the front were made in an upper and a lower half, with the upper half easily removable, it would be much less difficult to change the patient's posture.*

3. The valve flaps giving control of pressure are at present too easily misplaced or obstructed—for example, by a pillow placed on top of the respirator.

4. The provision of an alarm signal to call attention if undue leakage or other causes produce a cessation of adequate pressure changes.

5. The addition of a metal pressure gauge in addition to the existing water gauge. A note on the errors found in the water gauges of existing Both and Drinker respirators is added as an appendix.

6. The tilting mechanism is unsatisfactory and should be made easier to operate quickly.

7. A series of minor details could be improved: softer sponge-rubber collars, more side openings, castor wheels, and an internal low-temperature heater could make the machine safer for the patient and easier for the nursing staff.

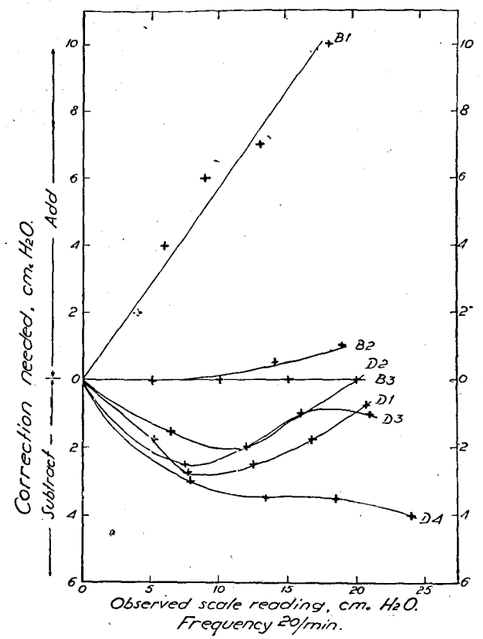


FIG. 5.—Correction curves for water manometers at 20 cycles a minute. These curves and those in Fig. 6 show the amount to be added to or subtracted from the observed reading in order to obtain the correct pressure. They were obtained by comparing the water manometers with a critically damped diaphragm type of pressure gauge. B1, B2, B3 = three different Both respirators. D1, D2, D3, D4 = four different Drinker respirators.

Summary

Numerous measurements of tidal air have been made with a spirometer on patients and on healthy subjects in Both and Drinker respirators, and on patients after respirator treatment for poliomyelitis. These measurements show a wide range of variation from day to day in most cases.

It is considered that in the treatment of poliomyelitis with respiratory involvement there is much need for measurements of vital capacity and tidal air, unless frequent measurements of blood O_2 and CO_2 are practicable.

Early measurements of vital capacity are suggested in order to detect the first signs of respiratory involvement, with a view to resting the muscles concerned by the prompt use of a respirator. The tidal air measurements are indicated as a rough guide to the correct setting of respirator pressures so as to avoid under- or over-ventilation.

The potential dangers of hyperventilation are discussed, and measurements are given showing the ease with which this is produced in respirators.

Tests on the use of the prone position in respirators are described. The importance of using this position is emphasized, especially in bulbar cases.

Some possible improvements in the Both respirator are discussed, in particular provision for slower speeds and a reduction in the angle of slope and in the thickness of the front panel.

*We have to thank Dr. Ritchie Russell for this suggestion.

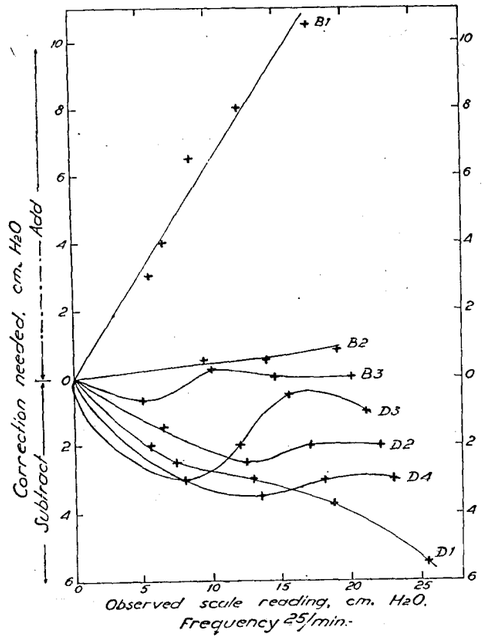


FIG. 6.—Correction curves for water manometers at 25 cycles a minute.

We wish to acknowledge our thanks to Dr. Ritchie Russell, who initiated this work and who has given constant advice throughout it, and to Dr. W. Howlett Kelleher, physician-superintendent of the Western Hospital, for allowing us free use of clinical material and facilities in the hospital, and for his continued co-operation.

APPENDIX

Note on Water Manometers in Both and Drinker Respirators

The water manometers normally fitted to the Both and Siebe Gorman Drinker respirators have the great merit of simplicity; they may, however, give very misleading readings because of (*a*) zero error caused by evaporation of the water; (*b*) overswing due to the momentum of the water column, causing too high readings; and (*c*) overdamping by viscosity, causing too low readings. Of these (*a*) is not serious provided the level is adjusted at regular intervals; (*b*) and (*c*) may compensate each other to a considerable extent, but as these two effects depend on both the amplitude and the frequency of the motion of the water column they cannot generally be made to cancel each other at all pressures and rates.

Figs. 5 and 6 show correction curves plotted for seven different respirators. In two of the Boths, the cancellation of errors (*b*) and (*c*) above is good, but the remaining Both, reading low by about 40%, demonstrates one of the special dangers inherent in the design of the pressure gauge; this large error was apparently due to an accumulation of foreign matter in the manometer and shows the need for a drainage plug at the bottom of all water manometers on respirators. The existing Both gauge cannot be cleaned out without unscrewing it from the respirator, which has to be done from the inside. The Drinker gauges show clearly the variation of the error with different rates and pressures. As gauges differ in diameter, these errors vary considerably from one gauge to another.

Since it does not seem possible to eliminate these errors over the whole range of pressures and rates required, the provision of an additional dial-type gauge has much to recommend it. A pressure gauge of this type can be made critically damped and still rapid enough in response to give true readings at the highest rates and pressures ever required. It has the advantage that it provides an indication of the correct functioning of the respirator which is visible from a much greater distance than the water manometer.

REFERENCES

Bergman, R., and Huldt, S. (1948). *Nord. hyg. Tidskr.*, **29**, 135.
Binet, L., Bochet, M., and Bour, H. (1948). *Biol. méd., Paris*, **37**, 1.
Brahdy, M. B. (1936). *N.Y. St. J. Med.*, **36**, 1147.
Brown, E. B., Campbell, G. S., Johnson, M. N., Hemingway, A., and Vischer, M. B. (1948). *J. appl. Physiol.*, **1**, 333.
Carryer, H. M. (1947). *Proc. Mayo Clin.*, **22**, 456.
Davis, H., and Wallace, W. McL. (1942). *Arch. Neurol. Psychiat., Chicago*, **47**, 606.
Drinker, P., and Shaw, L. A. (1929). *J. clin. Invest.*, **7**, 229.
Edwards, W. M. (1948). *Calif. Med.*, **69**, 367.
Elam, J. O. (1948). *Pediatrics*, **1**, 691.
—— Hemingway, A., Gullickson, G., and Visscher, M. B. (1948). *Arch. intern. Med.*, **81**, 649.
Galloway, T. C., and Seifert, M. H. (1949). *J. Amer. med. Ass.*, **141**, 1.
Gibbs, E. L., Gibbs, F. A., Lennox, W. G., and Nims, L. F. (1942). *Arch. Neurol. Psychiat., Chicago*, **47**, 879.
Grant, S. B., and Goldman, A. (1920). *Amer. J. Physiol.*, **52**, 209.
Haldane, J. S., and Priestley, J. G. (1935). *Respiration*, p. 19. Clarendon Press, Oxford.
Henderson, Y. (1910). *Amer. J. Physiol.*, **25**, 310.
—— and Haggard, H. W. (1918). *J. biol. chem.*, **33**, 355.
—— and Turner, J. M. (1941). *J. Amer. med. Ass.*, **116**, 1508.
Hinshaw, H. C., Rushmer, R. F., and Boothby, W. M. (1943). *J. Aviat. Med.*, **14**, 100.
Medical Research Council (1939). "Breathing Machines and Their Use in Treatment." Spec. Rep. Ser. No. 237, p. 23. H.M.S.O., London.
Nielsen, E. M. (1946). *Ugeskr. Laeg.*, **108**, 1341.
Rahn, H., Otis, A. B., Hodge, M., Epstein, M. A., Hunter, S. W., and Fenn, W. O. (1946). *J. Aviat. Med.*, **17**, 164.
Russell, W. R. (1949). *British Medical Journal*, **1**, 465.
Schneider, E. C. (1930). *Amer. J. Physiol.*, **91**, 390.
Seevers, M. H., Stormont, R. T., and Hathaway, H. R. (1940). *J. Pharmacol.*, **68**, 365.
—— and Waters, R. M. (1939). *J. Amer. med. Ass.*, **113**, 2131.
Shaw, L. A., and Drinker, P. (1929). *J. clin. Invest.*, **8**, 33.
Stimson (1949). *Poliomyelitis*, p. 131. Papers and discussion at the First International Poliomyelitis Conference. Lippincott, Philadelphia.
Sunderman, F. W., and Boerner, F. (1949). *Normal Values in Clinical Medicine*, p. 201. Saunders, Philadelphia.
Wilson, J. L. (1947). *The Use of the Respirator in Poliomyelitis*. National Foundation for Infantile Paralysis, New York.

Before the last war the General Nursing Council for England and Wales required candidates for entry into the nursing profession to hold certain minimum standard qualifications. Among these was the passing of the school certificate or matriculation examination. Since these are soon to be replaced by the general certificate of education, the G.N.C. has discussed what subjects of this certificate will be acceptable and what the minimum standard should be. It has decided that, when it can once again require a minimum standard of education for entry into the nursing profession, it will accept a pass at ordinary level in two of the following subjects, of which one must be English language or English literature: English language, English literature, history, geography, and religious knowledge. The G.N.C. cannot at present require these qualifications.

POISONING BY ORGANIC PHOSPHORUS INSECTICIDES*

BY

P. LESLEY BIDSTRUP, M.B., M.R.C.P.

(From the Department for Research in Industrial Medicine (Medical Research Council), London Hospital)

The need to increase food production in all parts of the world has led to the use of many potentially dangerous substances for the control of weeds and insect pests. The value of D.D.T. in the control of mosquitoes, flies, and certain insects is undisputed, and many other chlorinated hydrocarbons have found a special use in pest control. Some of these substances are extremely toxic to man. Control of weeds with sprays containing dinitro-*ortho*-cresol (D.N.O.C.) has increased the yield in cereal crops, but in Great Britain alone seven agricultural workers have died from D.N.O.C. poisoning in the past five years. The average period during which D.N.O.C. is used is only six weeks in each year.

The organic compounds of phosphorus have been most recently introduced into the group of potent agricultural chemicals. These are effective insecticides but extremely dangerous to man unless they are handled with extraordinary care. There has been a tendency to release agricultural chemicals for use by workers of varying experience before the toxic properties have been adequately studied. We know little enough about the acute toxicity of some of these substances, and almost nothing about the long-term effects of repeated small doses.

Substances Now Used

During the 1939–45 war organic compounds of phosphorus possessing a nicotine-like action were described by Schrader, in Germany, and recommended for use as insecticides. It was recognized, also, that these substances might prove effective agents in chemical warfare. At the end of the war the formulae and methods of synthesis of these substances were made available simultaneously to scientists in Great Britain and the United States of America, and in both countries many of them have been developed and tested for use in the control of insect pests. Hexaethyl-tetraphosphate (H.E.T.P.), tetraethyl-pyrophosphate (T.E.P.P.), and diethyl-*para*-nitrophenyl-thiophosphate ("parathion") are now used in many countries throughout the world. They are effective in the control of a wide variety of pests such as aphides and red spider, and are of particular value against insects which may be resistant to D.D.T. and the older insecticides (Porter, 1948). More recently octa-methyl-pyrophosphoramide (O.M.P.A.) has been studied, but its use is not recommended on crops which will be used for food.

These substances are alkylpolyphosphates and potent cholinesterase inhibitors resembling in their effects upon man di-*iso*propyl fluorophosphate (D.F.P.). O.M.P.A. does not inhibit cholinesterase *in vitro* but becomes converted *in vivo*, probably by the liver, to an active anticholinesterase substance (DuBois *et al.*, 1950). H.E.T.P. owes its action as an insecticide to the presence in the manufactured product of T.E.P.P. These substances are heavy syrupy liquids which hydrolyse readily in the presence of moisture or alkali and lose their toxicity. Pure parathion is a clear, colourless, and odourless oily liquid, but the commercial product contains amine impurities which give it a brownish coloration and a distinctive unpleasant odour. Parathion is only slightly soluble in water and hydrolyses slowly. At 25° C. and *p*H 7 only 50% hydrolysis occurs in 120 days (Grob, 1950). Moreover, it is more soluble in lipoids than in aqueous media. These properties enhance greatly its efficiency as an insecticide, and also its action as a poison to man and domestic animals. In a single dose both T.E.P.P. and nicotine are more toxic than parathion, but experience and experiment have demonstrated that the effects of parathion are more insidious and more deadly, especially if exposure is repeated day after day.

Cases of Poisoning

H.E.T.P. and T.E.P.P. are mixed with a suitable wetting agent to prevent hydrolysis of the concentrated material, which is diluted with water immediately before use. Sixteen cases of poisoning with these substances have been recognized in the United States of America since 1947. Although moderately severe symptoms occurred in persons affected, there were no deaths. By contrast more than 100 cases of poisoning and at least six deaths have been reported among persons handling parathion in one spraying season. Towards the end of 1948 the use of parathion increased and in many cases replaced H.E.T.P. and T.E.P.P. because of its more prolonged insecticidal action.

In the United States of America concentrated parathion is adsorbed on to attapulgus or bentonite clay to form wettable powders containing 15 or 25% of the active ester. These may be blended with inert materials to form 1 to 2% dusts or diluted with water for use as aqueous sprays. Methods of applying dusts and sprays vary considerably and include dusting from aeroplanes, mechanical spraying from tractors, and hand spraying. In greenhouses, aerosols or smoke canisters containing parathion are used. In Great Britain parathion is supplied to the user as a concentrated liquid for dilution and use as an aqueous spray. Until 1950 relatively small quantities of parathion had been applied and only four cases of poisoning have been recognized up to the time of writing.

Poisoning has occurred in agricultural workers such as field-workers, entomologists, dusting pilots, fruit pickers, and nurserymen, and in industrial workers, including chemists, formulators, packers, and men employed on maintenance in manufacturing plants.

A welder accidentally cut into a pipe containing parathion. Within ten minutes he experienced nausea, vomiting, vertigo, and headache. He recovered completely in twenty-four hours.

A pilot employed in dusting crops from aeroplanes had been up twice in one day and crashed into a row of trees on his third flight. The man who assisted in loading for the last flight said that the pilot had remarked about his eyesight diminishing, but passed it off as a minor matter. The investigation in this case revealed little, as both the aeroplane and the pilot were destroyed by fire (Abrams and Leonard, 1950).

A plant foreman and a fellow worker were splashed with parathion. The foreman made his assistant wash with soap and water and change his clothing at once, but neglected to do so himself. Eight hours later nausea, vomiting, abdominal cramps, diarrhoea, and constriction of the pupils developed. These symptoms persisted and he was admitted to hospital nine hours after the onset of his illness. At this time there was fibrillary twitching of voluntary muscles and signs of pulmonary oedema. Treatment with atropine produced a temporary improvement, but death occurred in coma twenty-one hours after exposure to parathion.

*Read in opening a discussion at a meeting of the Section of Occupational Health at the Annual Meeting of the British Medical Association, Liverpool, 1950.

Signs and Symptoms

The symptoms and signs of parathion poisoning are similar to those produced by D.F.P. and T.E.P.P. They are due to inhibition of both pseudo- and specific cholinesterase. It is possible that other factors, such as accessibility to the central nervous system, may operate in altering the clinical manifestations produced by different cholinesterase inhibitors. It has been suggested that an additional mechanism of toxic action is responsible for some of the symptoms of parathion poisoning which have not been observed with D.F.P. or T.E.P.P. *In vitro* the depression of cholinesterase activity by parathion is 1/30 of that caused by D.F.P. or neostigmine and 1/300 of that caused by T.E.P.P. All four substances affect plasma cholinesterase more than that of red blood cells, brain, and muscle. The rate of inhibition by parathion is slower, but this does not result in lessened toxicity. In experimental animals the toxicity of parathion equals that of D.F.P. and is one-tenth that of T.E.P.P. Both in animals and in man symptoms of poisoning with T.E.P.P. are more transient (Grob, 1950).

Inhibition of cholinesterase occurs as the result of the combination of the inhibitor with cholinesterase. In the case of D.F.P. irreversible combination occurs almost immediately and recovery depends upon regeneration of cholinesterase. This takes several weeks in the case of plasma cholinesterase and several months for red blood cell and tissue cholinesterase. Although no symptoms may be present until the cholinesterase activity of the effector organs is reduced to between 25 and 50% of normal, an individual is unduly susceptible to the effects of any cholinesterase inhibitor until normal cholinesterase activity of the enzyme is restored. The combination of cholinesterase with T.E.P.P. or parathion is reversible for several hours after combination occurs, but subsequently becomes irreversible (Grob, 1950). It is therefore important that atropine should be given promptly and in adequate doses.

Parathion is lipoid-soluble and readily penetrates the skin. Absorption may also occur through the conjunctiva or by inhalation or ingestion. It causes no local symptoms or signs in the skin, so that absorption by this route may pass unrecognized until the characteristic symptoms begin. Grob, Garlick, and Harvey (1950) report the toxic effects of exposure to parathion in 32 men and 8 women. Death occurred in 6 men, severe symptoms in 2 men and 2 women, and mild to moderate symptoms in 24 men and 6 women. In most of these cases exposure occurred in mixing liquid parathion with attapulgus clay, but included among the fatal cases are field workers and others reported from several sources.

Length of Exposure to Parathion

The length of exposure to parathion before the occurrence of symptoms varied from several days to several weeks. In the fatal cases and in most of the others exposure averaging twelve days had occurred during the month preceding the onset of symptoms, but in five persons with symptoms of mild to moderate severity no exposure is known to have occurred prior to the day on which illness developed. Warning symptoms, including intermittent nausea, vomiting, giddiness, weakness, drowsiness, and fasciculation of the eyelids, were noticed by five persons before more serious manifestations of poisoning appeared. These symptoms were present at intervals for one week, but were ignored by the workers. The concentration of parathion in the working atmosphere at the time that this incident occurred is not known.

Half of the patients studied by Grob, Garlick, and Harvey (1950) began to have symptoms while still exposed to parathion. In other cases the illness began from one to eight hours after the last exposure. The first symptoms are usually anorexia and nausea characteristically increased by smoking or taking food and followed within half to two hours by vomiting, intense abdominal cramps, excessive sweating, and salivation. Giddiness, apprehension, and restlessness usually follow the onset of anorexia, but occasionally these may be the initial symptoms of intoxication.

Constriction of the pupils is found in all patients with moderately severe symptoms, but may be minimal or absent in mild cases. Where parathion has been conveyed direct to the eye pin-point constriction of the pupil occurs and may be unilateral. It is resistant to dilatation with atropine, and may take several weeks to return to normal size. Muscular twitchings beginning in the eyelids and tongue follow shortly after the occurrence of nausea and vomiting. In severely poisoned persons the twitching spreads to the muscles of the face and neck and involves the extraocular muscles, causing jerking movements of the eyes suggestive of nystagmus. Generalized muscular twitching and extreme weakness may develop in spite of adequate doses of atropine, and death can occur from this neuromuscular paralysis.

In addition, diarrhoea, tenesmus, involuntary defaecation and micturition, and signs of pulmonary oedema with broncho-constriction occur in acutely ill persons. A raised blood pressure, returning to normal as symptoms subside, is a constant finding in parathion poisoning. This is unusual, since most directly acting cholinergic drugs cause the blood pressure to fall (Grob, Garlick, and Harvey, 1950). Symptoms and signs of effects upon the central nervous system develop *pari passu* with the muscarine-like and nicotine-like effects. Giddiness and apprehension are accompanied or followed soon by intense headache, and in mild cases insomnia or unusual dreaming may be noticed. In more severe cases ataxia, tremor, drowsiness, diminished concentration, mental confusion, and sometimes disorientation and slurring of speech occur. Multiple repetition of the last syllable of a word is characteristic.

Coma develops gradually, and occurs from one to nine hours after the onset of symptoms. All the patients who died and two who recovered were deeply comatose, with absence of all peripheral reflexes. Coma lasted on an average for three hours. Generalized convulsions almost invariably occur in comatose patients. Three people who subsequently died regained consciousness for several hours following the administration of atropine. Examination of the fundus in one patient revealed two dioptres of papilloedema, and the cerebrospinal fluid was found to be under pressure but otherwise normal.

In fatal cases death has occurred from one to twenty-one hours after the last exposure to parathion, and, on an average, nine hours after the onset of symptoms. The immediate cause is not known, but may be due to the combined effects of neuromuscular paralysis and direct depression by parathion of respiratory and circulatory centres in the medulla.

Cholinesterase Activity

Except for a moderate leucocytosis of 12,000 to 20,000 white blood cells, there were no abnormal findings in ancillary investigations. The urine was normal. Cholinesterase activity of plasma and red blood cells was determined. In four persons severely poisoned, two of whom

died, plasma cholinesterase activity was less than 5% of normal, and that of the red blood cells 14% of normal. In six less severe cases the enzyme activity was reduced to 10% and 22% respectively. The rate of return to normal activity was determined in eighteen cases and found to be for plasma cholinesterase 27% for the first three days, 5% on the fourth day, and only 3% by the tenth day. The enzyme in the red blood cells returned at the rate of 10% for the first three days and subsequently at the rate of 1 to 2% daily. The rate of recovery of cholinesterase activity of both plasma and red blood cells seems to be independent of the degree of exposure or the initial depression. At necropsy, which was performed in five cases, capillary dilatation hyperaemia and oedema of the lungs is described in four cases, oedema of the brain in addition in two cases, and in one there was some pneumonitis present, which was not considered sufficient to cause death (Grob, Garlick, and Harvey, 1950).

Death has occurred after absorption of parathion through the skin and in other instances where the main portal of entry seems to have been the respiratory tract. It has not been possible to determine the exact dosage of parathion which has proved fatal in any single case, either on the day on which symptoms appeared or as a result of previous exposures. On the basis of animal experiments the acute lethal dose has been estimated at 12–20 mg. (1/5–1/3 gr.). Gilman (1950—personal communication) considers that this calculated lethal dose is too high and suggests that the fatal dose is probably a fraction of a milligram per kilogram, a total dose of less than 10 mg. There is no indication at present that any permanent disability results from poisoning by parathion. Acute symptoms last from eighteen to thirty hours in severe cases, and from six to twenty-four hours in patients less severely affected. Mild anorexia, giddiness, and anxiety, with headache and insomnia, may persist for several days, and in a few cases for several weeks. Persons of all ages and of either sex appear to be equally susceptible to the effects of parathion (Grob, Garlick, and Harvey, 1950).

Too little is known about the possible effects of long-term exposure to small amounts of parathion. Provided that the recommendations on the interval between spraying and harvesting of edible crops are rigidly observed it is unlikely that residues on food sprayed with the stable compounds—parathion and O.M.P.A.—will be sufficient to cause symptoms in persons eating such foods. It is less certain that workers harvesting crops or loading and unloading market trucks are not at risk. Twenty-two men developed symptoms of parathion poisoning while picking pears in an orchard which had been sprayed ten days previously. In handling large quantities of materials even slightly contaminated with parathion the risks of absorption through the skin and respiratory tract should be considered and the safety of workers ensured by suitable protective clothing and alternation of work.

Treatment

Symptoms due to overstimulation of the autonomic nervous system and those due to the action of parathion on the central nervous system will respond to the administration of atropine in adequate doses : 1 to 2 mg. (1/60 to 1/30 gr.) should be given at the onset of symptoms and repeated at hourly intervals until the pupils are dilated or the symptoms and signs of pulmonary oedema and excessive salivation and sweating have subsided. Atropine does not protect against the effects at the neuromuscular junction, and artificial respiration may be necessary if neuromuscular paralysis develops. Facilities for prolonged artificial respiration must be available for immediate use in all cases of parathion poisoning.

Where exposure has occurred from splashing of the skin, the clothing should be removed immediately and the patient bathed with soap and water. Since hydrolysis of parathion occurs more rapidly in the presence of alkali, the addition of a mild alkali to the water assists in removing it from the skin. It is important that the person who removes contaminated clothing should be protected against absorption of parathion through the skin by wearing natural rubber gloves. If parathion has been ingested, vomiting should be induced, and this is probably advisable in all cases, since it is likely to be swallowed with nasal mucus. Postural drainage may be necessary when fluid has accumulated in the lungs before atropine has become effective.

The onset of neuromuscular paralysis may occur suddenly and without warning. The patient must be under constant observation so that artificial respiration may be started immediately if this complication develops. It is suggested that equipment for carrying on artificial respiration should be placed at the patient's bedside as soon as he is admitted to hospital. Where muscular weakness results in difficulty in swallowing, tracheotomy should be performed without delay. Relapse has occurred following apparent recovery after the administration of atropine, so that the patient must be kept under observation for at least twenty-four hours after symptoms have subsided. Since susceptibility to small doses of any cholinesterase inhibitor persists until cholinesterase activity of plasma and tissues is restored to normal, persons who have been affected should not return to work with organic phosphates until cholinesterase activity has been shown to be normal. The treatment of poisoning by H.E.T.P. or T.E.P.P. is the same as that of parathion poisoning.

Experience in the United States of America in the 1949 spraying season has demonstrated that, unless all the recommendations made for the safe handling of organic phosphorus insecticides are carried out in detail, serious illness and even death will occur. The stability of parathion and its ready solubility in lipoids may account for the fact that most recorded cases have been observed from the use of either H.E.T.P. or T.E.P.P. Moreover, exposure to minute amounts of H.E.T.P. or T.E.P.P. in spray mist or drift causes immediate constriction of the pupils. The interference with vision is so great that a man is obliged to give up work at once and so avoids any further exposure (W. E. Ripper, 1950—personal communication).

Preventive Measures

Preventive measures both in the factory and in the field should be directed against the risks of absorption by any route. The skin must be protected by overalls which fasten tightly at the neck and at the wrists. Natural rubber gloves, apron, and boots are essential in handling concentrated materials, and sprayers should wear waterproof clothing, including a hat which protects the head and the back of the neck. Complete protection from inhalation can be achieved only by means of a full-face gas-mask with canister designed for protection against organic vapours, acid gases, and smokes (R. A. Fulton, 1950—personal communication).

Chemical cartridge respirators with a facepiece of the half-mask type may reduce the inhalation hazard considerably, but such respirators must be tested and approved for use. The cartridge must be changed at least twice daily, and the facepiece washed in warm water and soap after use. This type of respirator does not give adequate protection for aeroplane pilots, greenhouse sprayers, or those handling concentrated parathion in enclosed spaces. Moreover, up to 16 mg. of parathion may filter through in an eight-hour period, and this together with absorption through the skin around the mask may constitute a fatal dose. Several accidents, some fatal, have occurred where faulty or untested respirators have been used.

Protective clothing, including socks and underclothing, must be laundered each day. Adequate facilities for washing must be available and persons exposed to parathion are advised to remove all working clothes and take a bath at the end of each day's work. If parathion is splashed on to clothing this must be changed completely, and all areas of the skin which have been in contact with the soiled clothing must be washed immediately. The hands and face should be washed thoroughly in hot water and soap before eating and smoking. Whereas these precautions may be enforced in factories it is almost impossible to ensure that they are carried out in the field.

Routine estimations of cholinesterase activity of plasma and red blood cells should be made at weekly intervals in all persons exposed to parathion, H.E.T.P. and T.E.P.P. Davies and Rutland (1950) have investigated the variation in cholinesterase activity of plasma and red blood cells in 200 healthy adults of both sexes. Normal activity may vary from the mean by as much as 40% (see Table). Moreover,

Plasma and Red Blood Cell Cholinesterase: Normal Limits of Variation in Healthy Adults (Mean = 100)

Group	Coefficient of Variation	Mean Normal Limits %
Plasma cholinesterase:		
Service	19·9	60·2–139·8
Males (G.P.)	19·1	61·8–138·2
Females (G.P.)	23·7	52·6–147·4
All Groups	21·2	57·6–142·4
R.B.C. cholinesterase:		
Service	11·8	77·2–122·8
Males (G.P.)	14·4	71·2–128·8
Females (G.P.)	12·1	75·8–124·2
All Groups	15·7	68·6–131·4

After Davies and Rutland (1950).

there is an individual variation of up to 26% for red blood cell cholinesterase and 37% for the plasma enzyme. There may also be a seasonal difference. It is therefore obvious that the significance of reduced cholinesterase activity in random samples of blood is difficult to assess. Every effort should be made to estimate cholinesterase activity in each individual before exposure to organic phosphorus insecticides occurs, and subsequently at weekly intervals. Clearly a more decisive and a more simple test of exposure to these substances is urgently required. Organic phosphorus insecticides should be used only by experienced operators who fully understand the hazards and who are adequately protected and constantly supervised in their work.

I am indebted to the Medical Research Council and particularly to Dr. Donald Hunter for the opportunity to study the toxicity to man of the new insecticides. Special acknowledgment is due to Dr. A. McGhee Harvey and Dr. David Grob, Department of Medicine, Johns Hopkins Hospital, Baltimore, and to Dr. D. R. Davies, Chemical Defence Experimental Establishment, in the United Kingdom.

REFERENCES

Abrams, H. K., and Leonard, A. R. (1950). *Toxicology of Organic Phosphate Insecticides*. American Conference of Governmental Industrial Hygienists, Chicago.
Davies, D. R., and Rutland, J. B. (1950). Paper to the Biochemical Society, London.
DuBois, K. P., Doull, J., and Coon, J. M. (1950). *J. Pharmacol.* In press.
Grob, D. (1950). *Bull. Johns Hopk. Hosp.* In press.
—— Garlick, W. L., and Harvey, A. M. (1950). Ibid. In press.
—— —— Merril, M. D., and Freimuth, H. C. (1949). *Ann. intern. Med.*, **31**, 899.
Porter, B. A. (1948). *American Fruit Grower*, February.

FOOD-POISONING IN SHEFFIELD IN 1949

BY

E. L. M. MILLAR, M.D., M.Sc., D.P.H.
Deputy M.O.H., Sheffield

AND

MARGARET POWNALL, M.B., Ch.B., D.P.H., Dipl.Bact.
Bacteriologist, Public Health Laboratory, Sheffield
(From the Public Health Department, Sheffield)

During the long hot summer of 1949 seven small outbreaks of food-poisoning in Sheffield produced 36, 4, 20, 37, 9, 1, and 1 cases of illness respectively. Of these 108 cases only 13 were notified by general practitioners and three by hospitals. The remainder came to light through a few of the victims contacting the public health department direct and by the staff of the department making inquiries among other persons likely to be affected.

A food preparer with a septic hand was found to be associated with each of the four outbreaks described below, but the association was not necessarily the cause of the third and fourth outbreaks.

First Outbreak

At 10 p.m. on Wednesday, July 27, 1949, the superintendent of the Infectious Diseases Hospital informed the medical officer of health that he had admitted two patients who were very ill with food-poisoning. A visit was paid immediately to their home and the possible cause of the trouble was ascertained to be a chicken-and-rabbit preparation bought from a near-by shop the previous day.

The shop was visited the following morning and the source of the meat product was traced to a small local food factory which was very clean and well equipped. The chicken and rabbit had been prepared the previous Saturday by two men who boiled the carcasses in a large cauldron, removed the flesh from the bones by hand, and immediately reheated the flesh before packing it into moulds, adding melted gelatin, and then pressing. After cooling, the preparation was stored in a refrigerator until the Monday evening, when it was distributed to five shops where it was kept in refrigerators until sold on the Tuesday and Wednesday. The manufacturer estimated that between 500 and 700 persons would eat the meat.

Although food-poisoning is notifiable in accordance with the Food and Drugs Act, 1938, the great importance of *immediate* notification seemed not to be generally realized. Inquiry was therefore made at the shops, and lists of customers were obtained. When these were visited, a total of 36 persons who had been supplied from one or other of four of the five shops were found to have been affected. Of these, 35 had eaten the chicken and rabbit, and one had eaten black-pudding from the same food factory. Of other persons who had eaten the chicken and rabbit in company with those who were later affected, only three groups (comprising one, two, and three persons respectively) remained unaffected. Two dogs in different households fed on the leavings of the victims remained well.

Of those persons affected, 13 had consumed the meat on the day of purchase and 23 on the following day. One man was unaffected after eating the product on the

day of purchase but had a moderately severe attack of illness when he ate a further portion 20 hours later. There were no complaints regarding taste or appearance. In every case between 1 and 4 oz. (28 and 113 mg.) of meat was eaten.

On the whole the symptoms were severe, five persons being admitted to hospital and several others being in bed at home for some days, with the doctor in attendance. The seven most severely affected persons had all consumed the food about 24 hours after purchase.

Every case suffered from diarrhoea or vomiting, or both. Only five cases did not vomit and in these the illness began 5, 7½, 8½, 10, and 22 hours after eating the food. All but four cases had diarrhoea, and in these four the illness began ½, 2, 5½, and 5½ hours after the food was eaten.

Of the 36 persons affected, five had symptoms beginning within an hour, 21 in one to five hours, and nine in five to ten hours after eating, the longest period between eating the food and the onset of symptoms being 22 hours. This victim was the only one in whom the period was over 10 hours. In the worst cases the period between eating the food and the onset of symptoms was less than 2½ hours and there was pyrexia, dizziness, collapse, abdominal pain, and muscular cramp. One woman was affected even though she had cooked her meat by making "hash."

A total of 13 unaffected households were visited. In 10 of these families the meat had been eaten on the day of purchase, and in three on the following day. In no case had a domestic refrigerator been used.

The weather was exceptionally hot at the time of this outbreak, the maximum and minimum shade temperatures on the Tuesday and Wednesday being 76 and 61° F. (24.4 and 16.1° C.) and 76 and 64° F. (24.4 and 17.8° C.) respectively.

One of the two men who made the galantine was found to have a mild dermatitis of the hands and wrists. The condition had been present since infancy, and he had been employed in his trade for over 30 years. His hands and nose were swabbed at the time of investigation, though an interval of five days had elapsed since he helped to make the galantine. A heavy growth of *Staphylococcus aureus*, coagulase-positive, phage type 6/47/53/54 (that is, the strain was attacked by phages Nos. 6, 47, 53, and 54) was obtained from the hands, but *Staph. aureus* was not isolated from the nose.

Hand and nose swabs were also taken from the four remaining persons employed in the factory. *Staph. aureus* was isolated from the nose and hands of one of these and from the nose of another. Their strains proved untypable, but neither of them had had any contact with the food in question.

Staph. aureus of the same phage type was isolated from portions of galantine removed from the homes of the victims. The number of bacteria per gramme exceeded 20 million, staphylococci predominating. An untypable strain was isolated from a paper bag in which one of those affected had taken the meat in sandwiches for lunch.

From one specimen of vomit and six specimens of faeces, *Staph. aureus*, coagulase-positive, was isolated. Some of these proved untypable, but the following were typed: vomit: phage type 6/47/53/54 (staphylococci numerous on primary plates); faeces: 6/42E/47/53/54 (staphylococci numerous on primary plates); faeces: 6/47/53 and 53/54 (staphylococci isolated only after cultivation in 10% salt broth).

The staphylococci isolated from the faeces were considered by the Central Public Health Laboratory to be probably of the same type as that in the food and as that from the hands of the food preparer. After a week's treatment with penicillin ointment the staphylococci were still present on his hands, but none were isolated after a second week's treatment, though the clinical appearance had altered very little.

Second Outbreak

The second outbreak, on Tuesday, August 23, was associated with an ox tongue brought home from his shop by a butcher on the previous Saturday evening. It was partially cooked the same evening in a domestic pressure-cooker, and cooking was completed the next morning (Sunday) in the same vessel. The butcher's wife then skinned the tongue, and the family of three, consisting of the butcher, his wife, and their adult son, had meals of tongue on the Sunday and Monday, and the wife also had some for Tuesday's lunch, all without ill effect.

On the Tuesday afternoon about ¼ lb. (113 g.) of the cooked tongue was given to a neighbouring family of three persons who ate it between them for tea at 5.15 p.m. The butcher and his wife also had some of the remainder at about the same time. Between 9 and 10 p.m. that evening the butcher's wife and her three neighbours were all seized with severe diarrhoea and vomiting, but the butcher himself escaped. Two of the victims were admitted to hospital and *Staph. aureus*, coagulase-positive, was isolated from the faeces of one of them but unfortunately was not phage typed.

Apart from some weakness, the four victims had recovered by the Thursday morning, when the butcher and his wife and son (who also worked at the shop) were examined. The butcher had a cut on his left thumb which was covered with adhesive plaster; it was very soddened and would not heal. The wife had a slowly healing shallow ulcer the size of a lentil on one of her knuckles. It had been caused by a burn. There were also a few papules on her face. The son appeared healthy.

The bacteriological results were as follows:

Tongue.—Approximately 2,520 million organisms per g. were found, rather more than half of the colonies being *Staph. aureus* coagulase-positive. Three strains were all of phage type 53.

Butcher's Wife.—*Staph. aureus* of phage type 53 was isolated in large numbers from swabs of her hands and nostrils and in smaller numbers from her face. *Staph. aureus* was not isolated from her faeces. She was in fact quite well again by the time a faeces specimen was obtainable.

Butcher.—*Staph. aureus* phage type 53 was obtained in small numbers from swabs of his hands, including the cut, but there was a heavy contamination of faecal organisms which he alleged arose through handling offal. His nose and faeces were negative.

Butcher's Son.—*Staph. aureus* phage type 53 was found on his hands but was not numerous, and *Staph. aureus* of phage type 52A was present in fair numbers in the nostrils.

Staph. aureus could not be isolated from the brine in which the tongue had been salted.

One suspects, therefore, that the butcher's wife was probably the source of the staphylococcal infection which, on the one hand, contaminated the tongue and produced toxin from which the food-poisoning arose, and, on the other hand, infected her husband and son. We particularly noted that this home was exceptionally clean. There was no domestic refrigerator and the weather at the time was very hot.

Third Outbreak

A third outbreak of food-poisoning occurred among a group of 80 probationer nurses who on September 14 consumed a lunch between 12 noon and 1.15 p.m. consisting of braised mutton, gravy, creamed potatoes, boiled dried peas, and sponge pudding with custard. Between 1 and 5 a.m. the next day 20 of them were seized with diarrhoea, colic, vomiting, and dizziness, and a further 40 had mild abdominal pain with no other symptom.

The whole of the food had been prepared by five people on the morning of consumption and it was found that the only items which all the victims had eaten were the meat and gravy and the peas.

When the investigation was made the man who prepared the meat and gravy was not at work; it was later found that he had septic fingers. Apparently he had sustained a small burn on a finger a month previously. This had healed but still remained somewhat inflamed. In addition, two days before the food-poisoning outbreak he had again burned his fingers, and septic blisters had developed, which resulted in his absence from work. A fairly heavy growth of *Staph. aureus*, coagulase-positive, was isolated from each hand.

Unfortunately none of the suspected food remained for examination, and it is unlikely in any case that many organisms would have been found in it as it was eaten hot almost immediately after cooking. The stool specimens from the affected nurses were also negative.

Fourth Outbreak

The fourth outbreak of food-poisoning followed an evening dinner at a café on October 15. The menu comprised soup, roast chicken, stuffing and bread sauce, potatoes, cauliflower, carrots, apple tart with synthetic cream, and coffee. There were 55 diners, of whom 37 were taken ill during the early hours of the following morning, the symptoms being diarrhoea and vomiting. Owing to a delay of almost three days in the notification of this outbreak, nearly a week elapsed before faeces specimens could be obtained from all those persons affected. No *Staph. aureus* or pathogens of the coli-typhoid-dysentery group were isolated from any of the 35 specimens submitted.

None of the food suspected could be obtained, but it was ascertained by interviewing all the diners that only the soup and chicken had been eaten in common by all the victims. The soup had been made entirely from a powder immediately before the meal. A sample of this powder gave a satisfactory bacteriological result.

The chickens were all prepared by one woman who received, cleaned, cooked, and sliced them on the afternoon before the meal. The slices were distributed on plates and remained in a hot chamber for two hours until they were served at about 7.45 p.m. The woman who prepared the chickens was constantly sustaining cuts and scratches from the chicken bones. All swabs of her hands and nostrils taken five days after the dinner gave a fairly heavy growth of *Staph. aureus*, and when one of us examined her nine days after the dinner she was found to have a deep septic puncture wound in the web between two fingers. This she had had for 10 days.

Conclusions

Four outbreaks of food-poisoning in Sheffield during 1949 were associated with *Staph. aureus* infection of the hands of the food preparer. In one outbreak we traced the organism through the food and through the victims. In another we traced the organism to the food, but in the last two outbreaks the specimens required for bacteriological proof of the cause were not available. *Staph. aureus* strains are very common in the nose and septic lesions of people who have never given rise to food-poisoning, and indeed they are not very uncommonly found in the faeces of normal persons. For this reason cultures for phage typing should be made from separate staphylococcal colonies, and more than one colony from each specimen should be examined. From our own cases staphylococci of phage types other than the one incriminated were also obtained. Before concluding that an outbreak of food-poisoning is due to *Staph. aureus*, a strain of a type generally associated with food-poisoning should have been isolated from a number of victims or from one or more victims and food. This evidence was forthcoming only in the first two outbreaks here described.

It is evident that the immediate notification of an outbreak, together with speedy investigation, in which attention is paid to the hands which prepared the food, is important for successful elucidation.

Summary

Four outbreaks of food-poisoning are described, all associated with *Staph. aureus* infection of the hands of the food preparers.

Our thanks are due to Dr. R. E. O. Williams and Miss J. E. Rippon, of the Central Public Health Laboratory, who phage typed the staphylococcal cultures and from whom we obtained most valuable advice. We thank also the sanitary inspectors of the Sheffield Public Health Department for their team-work in obtaining information and specimens for examination.

THROMBOCYTOPENIC PURPURA DUE TO QUINIDINE

BY

G. MOODIE, M.B., B.S.

Although there is a recognized association between quinine and purpura (Wintrobe, 1946), it is very rare for a haemorrhagic state to result from quinidine therapy. In fact, so far as can be ascertained, this is the first case to be reported in England, though five cases have been published in foreign journals.

Case Report

A married woman aged 48 was admitted to hospital on December 28, 1949, in early congestive failure following the onset of auricular fibrillation. She was found to have mitral stenosis, and gave a history of paroxysms of regular tachycardia and paroxysms of auricular fibrillation. There was no past or family history of allergic diseases or of any haemorrhagic diathesis. She asserted that she had not previously received quinidine, and this was checked with other hospitals that she had attended. The auricular fibrillation was confirmed by electrocardiograms and the patient rapidly responded to "digoxin."

Quinidine sulphate, 3 gr. (0.2 g.), was given on December 30 and 31 and regular sinus rhythm resulted. Ten days later (see Chart) a daily maintenance dose of 3 gr. of quinidine sulphate was started after three attacks of paroxysmal regular tachycardia. A slight epistaxis began on January 12, 1950, before the third dose was given, and continued all day. In the evening the patient had a slight vaginal haemorrhage and developed purpura; quinidine was then discontinued, after 9 gr. (0.6 g.) had been given. At first numerous petechiae were present on the legs and the mucous membranes of the lips and gums, with isolated ones on the face, trunk, upper arms, and thighs. During the next twelve hours the rash became more profuse and several ecchymoses developed.

On January 13 a blood smear showed: platelets greatly reduced (fewer than 20,000 per c.mm.); white cells, 5,100 per

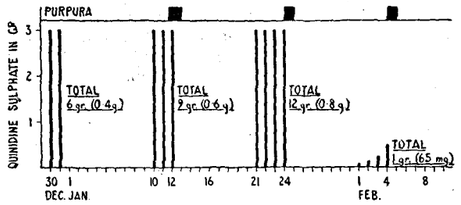


Chart showing the amount of quinidine sulphate given and the time relation between its administration and purpura.

c.mm. (neutrophils 56%, eosinophils 6% (360 per c.mm.), lymphocytes 22%, monocytes 16%). On January 16 the bleeding and clotting times were normal. On January 19 a blood smear showed platelets present in normal numbers; white cells, 7,100.

After nine days' rest quinidine, 3 gr. (0.2 g.) daily, was again started. After the second dose the patient complained of a headache, but this was possibly related to a commencing menstrual period. On January 24 the fourth dose was given in the morning, and that evening the patient developed purpura in a similar distribution.

At 10 a.m. on January 25 Hess's test was normal; a blood smear showed: platelets greatly reduced (fewer than 20,000 per c.mm.); white cells, 4,600 per c.mm. (neutrophils, 60%, eosinophils 12% (552 per c.mm.), lymphocytes 27%, monocytes 1%). No fresh purpura developed, and next day Hess's test was again normal, the platelet count at 3 p.m. was 135,000 per c.mm., but blood taken at this time showed no retraction after 18 hours.

An attempt at desensitization was started on February 1. Quinidine was given in the following very small daily doses—1/12 gr. (5.4 mg.), 1/6 gr. (11 mg.), ¼ gr. (16 mg.), ½ gr. (32 mg.)—but two to three hours after the ½-gr. dose (total 1 gr. (65 mg.) in four days) the patient again developed purpura. This was quite as severe as in the previous episodes, but four days later a blood smear showed platelets present in normal numbers.

Summary of Six Cases of Purpura Due to Quinidine Sulphate

	No. of Times Purpura Occurred	Quantity of Quinidine Sulphate Given Before Purpura	Smallest Dose of Quinidine Sulphate Evoking Thrombocytopenia	Degree of Thrombocytopenia in Each Episode	Platelet Count: Rate of Fall	Platelet Count: Rate of Rise	Eosinophilia
Brock (1941)	2	252–315 gr. (16·4–20·5 g.) 8–6 months before, also 252 gr. (16·4 g.) in previous 14 days	6 gr. (0·4 g.)	23,000 and 24,000/c.mm.	345,000 to 24,000/c.mm. in 6 hours	24,000 to 105,000/c.mm. in 6 hours	—
Burstein and Lamberg (1948)	1 (also thrombocytopenia once without purpura)	66 gr. (4·3 g.) in previous 10 days	15 gr. (1 g.) (i.e., 5 gr. (0·3 g.) 3-hourly for 3 doses)	1,200 and 9,360/c.mm.	Normal to 42,000/c.mm. in 12 hours from start of 3 × 3-hourly quinidine	1,200 to 130,680/c.mm. in 1 day; 9,360 to 65,940/c.mm. in 6 days	—
Larimer (1949)	2	3 gr. (0·2 g.) 3-hourly for previous 4 days	½ gr. (16 mg.)	2 occasions zero	240,000 to 5,000/c.mm. in 4 hours	5,000 to 170,000/c.mm. in 1 day; Zero to 140,000/c.mm. in 4 days	—
Nudelman, Leff, and Howe (1948)	2	9 gr. (0·6 g.) a day for previous 10 days	1½ gr. (0·1 g.)	4,000/c.mm. and zero	Normal to 17,000/c.mm. in 1 hour	4,000 to 152,000/c.mm. in 7 days; Zero to normal in 7 days	—
Soisalo (1947)	1	60 gr. (3·9 g.) 12–6 months before: also 135 gr. (8·8 g.) in previous 28 days	135 gr. (8·8 g.) in previous 1 month	22,000/c.mm.	Not known	22,000 to 94,000/c.mm. in 2 days	480/c.mm.
Present case	3	3 gr. (0·2 g.) a day for 2 days 10 days before	¼ gr. (30 mg.) (1 gr. (65 mg.) in previous 4 days	2 occasions fewer than 20,000/c.mm.	,, ,,	Less than 20,000 to 135,000/c.mm. in 17 hours	360 and 552/c.mm.

Discussion

The time relation between the appearance of purpura and the administration of quinidine sulphate leaves no doubt that the purpura can be attributed to the drug. Brock (1941) published a similar case of thrombocytopenic purpura following quinidine sulphate and also mentioned an oral report of a case observed by Seyderhelm in 1927. Subsequently four other cases have been reported (Soisalo, 1947; Burstein and Lamberg, 1948; Nudelman, Leff, and Howe, 1948; and Larimer, 1949).

It is interesting to compare the findings in the six case reports available. They show several points of similarity; these are summarized in the Table. There are several facts which support the view of Brock (1941) and Soisalo (1947) that this is an allergic type of reaction. In all but one case quinidine is known to have been given over a long enough period for allergy to have developed. In the present case it is interesting to notice that the time relation between the first two courses of quinidine was highly suitable for the development of hypersensitivity. The very small doses required to cause purpura and the eosinophilia in two cases (see Table) also favour the idea of an allergic basis. There is other suggestive evidence, in that a very rapid fall in platelets occurred, and this was usually followed by a rapid remission.

Although it is known that purpura and thrombocytopenia can occur independently of one another (MacKay, 1931), in the cases under discussion marked thrombocytopenia was a constant finding and, when looked for, preceded the appearance of purpura. Thus it seems that a fall in platelets is at least a factor in the production of purpura in these cases, and it is possible that they must fall below a critical level before it occurs. In one case (see Table) thrombocytopenia occurred once without any purpura, which makes it unlikely that the fall in platelets is due to an increased rate of removal to repair capillary damage. Ackroyd (1949) has made an interesting study of "sedormid" purpura, and has produced experimental evidence of both allergic capillary injury and a platelet deficiency. The general features of purpura due to sedormid and that due to quinidine are very similar, and it seems probable that they have a similar pathogenesis.

I am grateful to Dr. H. E. S. Pearson for permission to publish this case, and I wish to acknowledge his help, and the help of Dr. A. L. Jacobs.

REFERENCES

Ackroyd, J. F. (1949). *Clin. Sci.*, **7**, 249.
Brock, O. J. (1941). *Nord. Med.*, **10**, 1542.
Burstein, J., and Lamberg, B. A. (1948). Ibid., **37**, 473.
Larimer, R. C. (1949). *Canad. med. Ass. J.*, **60**, 508.
MacKay, W. (1931). *Quart. J. Med.*, **24**, 285.
Nudelman, P. L., Leff, I. L., and Howe, C. D. (1948). *J. Amer. med. Ass.*, **137**, 1219.
Soisalo, P. (1947). *Ann. Med. intern. fenn.*, **36**, 181.
Wintrobe, M. M. (1946). *Clinical Hematology*, 2nd ed., p. 620. Kimpton, London.

OLLIER'S DISEASE: DYSCHONDROPLASIA

BY

SYDNEY G. NARDELL, B.Sc., F.R.C.S.
Surgeon, Whipps Cross Hospital, London, E.11

The introduction of Roentgen rays enabled Ollier in 1899 to describe the disease now generally known by his name. He summarized it as "an affection characterized by irregularity in development, evolution, and distribution of cartilaginous tissue in the bones in process of development, the cartilage seeming to be of normal structure and changing more or less in the direction of ossification." Put more clearly, we may say that Ollier's disease, dyschondroplasia, is characterized by the presence of persistent areas of cartilage in the diaphyses of long bones and short long bones as a result of the failure of normal ossification of cartilage to take place.

Ollier's dyschondroplasia is now clearly differentiated from Keith's diaphysial aclasis, a disease having as its main features multiple exostoses with a strong hereditary factor. Sir Arthur Keith (1920) showed that the so-called exostoses in diaphysial aclasis were in reality bony outgrowths due to defective tubulation in the remodelling process of the long bones during growth. In Ollier's disease there are gradations from persistent islands of cartilage in the metaphysis and diaphysis seen only in the radiographs (and here the importance of radiographs of the whole skeleton is emphasized) to large palpable masses of cartilage. In addition there are small exostoses of irregular formation, not pedunculated and not characteristically pointing away from the end of the bone as are those in diaphysial aclasis. It was partly the presence of these exostoses which has caused confusion in the literature between Ollier's disease and Keith's diaphysial aclasis, but, in addition, it is evident that there are cases occupying an intermediate position.

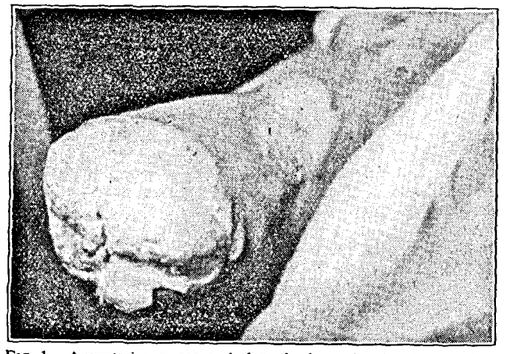


FIG. 1.—Amputation stump and ulcers in the groin, showing the thick everted edges.

The failure of normal ossification of cartilage to take place in the growing ends of bone has as its result that there remain behind in the diaphysis areas of cartilage which do not ossify. These may not be discernible clinically or there may be palpable masses of cartilage to which the term "tumour" in the broadest sense of a lump may be applied. This abnormal growth is not, then, primarily one of true tumour formation, but it is evident that the distinction between a mass of cartilage due to abnormal growth and a true chondroma or neoplasm of cartilage will be a narrow one. The fact that these masses are actually cartilage has been well established by biopsy.

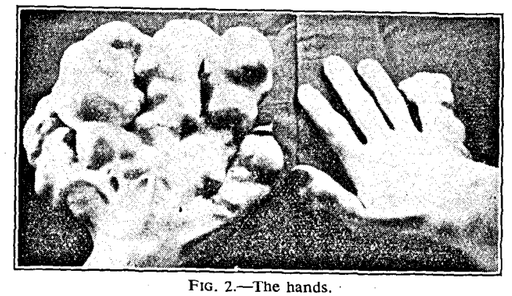


FIG. 2.—The hands.

Certain additional features in the case here reported clearly identify it as belonging to the Maffucci syndrome. This consists of the characteristic features of dyschondroplasia, mostly on one side of the body, with haemangiomata more or less confined to the opposite side. Malignant changes have been observed in some cases in the literature, and they also supervened in the following case.

Case Report

The patient, a man aged 34, was admitted to Whipps Cross Hospital on January 14, 1948. He was apparently normal at birth. Swellings of the left hand were first observed at the age of 5, after his hand had been caught in a door. Later on a nodule came up on the right hand, after it had been struck by a cricket ball. He said he had fractured his left leg eight times while playing football, the last time being in 1930. There was no family history of similar disease.

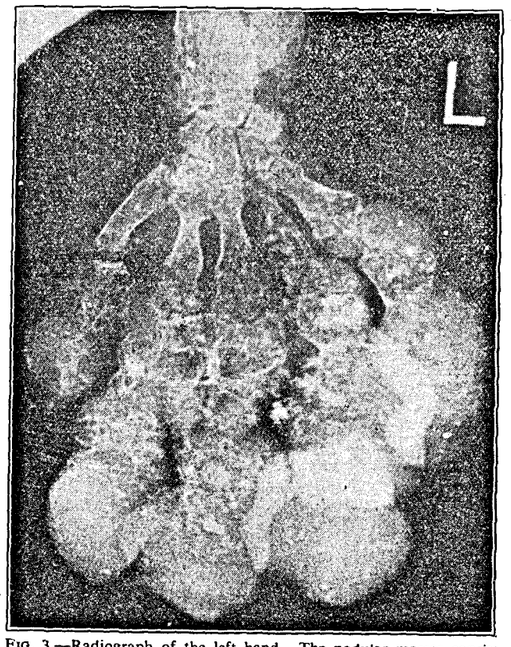


FIG. 3.—Radiograph of the left hand. The nodular masses consist of cartilage with areas of calcification.



FIG. 4.—The left foot, showing multiple hard nodules of the phalanges.

I am much indebted to Dr. H. G. Close and Dr. Malcolm Pearson for the following notes taken after his admission to the Southern Hospital, Dartford, Kent, on February 12, 1945. He was then complaining of pain and a swelling of the right ankle and foot. The right leg was found to be 1 ft. (30 cm.) longer than the left. On the outer side of the right foot was a hard spherical mass with ulceration of the skin below. Biopsy showed this to be a lymphangioma without definite evidence of malignancy. On September 4, 1945, a right below-knee amputation was performed. The skin flaps did not heal satisfactorily, and in January, 1946, enlarged glands were palpable in the right groin. On June 5, 1946, a mid-thigh amputation was performed with the flaps left open, with subsequent secondary suture. On August 14, 1946, inguinal lymph nodes were removed and reported on by Dr. A. H. T. Robb Smith as a "malignant lymphangioma." He subsequently returned home and worked on a barge until Christmas, 1947. The amputation stump then broke down and he developed an ulcer of the right groin.

On admission to Whipps Cross Hospital his condition was as follows. The amputation stump of the right thigh was the seat of a malignant ulcer some 6 in. (15 cm.) in diameter with a thick everted edge and a sloughing floor. There was profuse foul-smelling discharge. In the groin were two ulcers with similar thick everted edges (Fig. 1): a large lower one 4 in. (10 cm.) in diameter over Scarpa's triangle and an upper smaller ulcer near the symphysis pubis. The healed biopsy incision can be seen in the photograph, the ulcers evidently being due to fungation of further malignant glands in the groin.

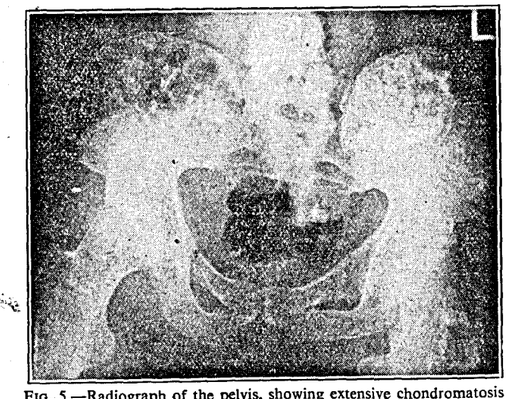


FIG. 5.—Radiograph of the pelvis, showing extensive chondromatosis of both wings of the ilia.

The hands are seen in Fig. 2. The fingers and thumb of the left hand show hard, irregular, but fairly smooth masses over which the skin is tightly stretched. Blue veins course over the cartilaginous masses. He was able to move his fingers a little and some nails were still present. Sensation was present. The right hand showed chondromata of the thumb and little finger only, and was a useful member.

The radiograph of the left hand (Fig. 3) shows the nodular masses on the fingers to be cartilage with areas of spotty calcification. The phalanges and the interphalangeal joints have almost disappeared, but a thin layer of cortical bone remains in some places. The metacarpals approach more nearly to normal, but they are shortened and there are obvious areas of cartilage with spotty calcification in the epiphyses, metaphyses, and diaphyses. The carpus is practically normal. The lower ends of the radius and ulna are broadened and somewhat striated, and there are areas of cartilage and spots of calcification. No Madelung's deformity is present.

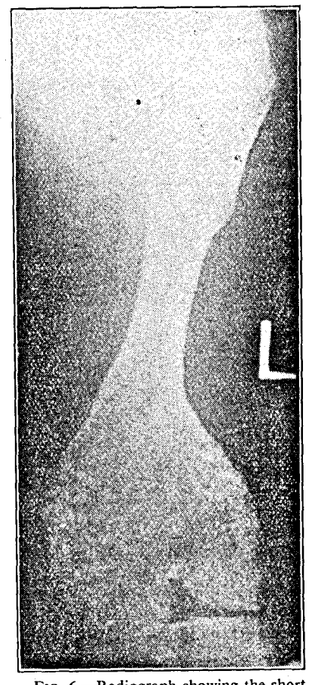


FIG. 6.—Radiograph showing the short left femur, the lower end of which is seen to be greatly broadened.

Fig. 2 shows the Madelung deformity of the right hand, and a radiograph showed the shortened broad radius with some persistent cartilaginous areas, although the lower end of the ulna is not much affected and does not illustrate the bayonet shape mentioned in the literature. There are irregular cartilaginous and bony outgrowths of both phalanges of the right thumb, and a nodule of cartilage in the head of the metacarpal. Two areas of calcification are seen in the head of the second metacarpal, but otherwise the metacarpals and phalanges of the index, middle, and ring fingers are normal. The little finger shows areas of cartilage and bony outgrowths in the distal end of the metacarpal and all phalanges. The carpus is normal.

The left foot (Fig. 4) showed multiple hard nodules of the phalanges, especially of the second, third, and fourth toes, with the remainder of the foot normal. A radiograph showed the tarsus to be more or less normal, though the astragalus has some deformity of its articular surface. There is a clear area in the os calcis near the calcaneo-cuboid joint. Broadening and striation of the lower end of the tibia and short irregular bony outgrowths are present. The masses in the toes are translucent and largely cartilaginous.

The face and skull were normal and showed no asymmetry. The sclerotics were of normal colour. The patient was of good intelligence and stated that he had been getting around on crutches and working on barges until shortly before admission to hospital. A radiograph of the skull was normal. There were no patches of pigmentation on the skin. The cardiovascular system and lungs were normal clinically. The urine was normal—no Bence-Jones proteose was present.

The abdomen was normal to palpation, but a radiograph of the pelvis (Fig. 5) showed extensive chondromatosis of both wings of the ilia. These were not abnormal to palpation. The absence of dense radiating lines in the ilia (raies sombres of Voorhoeve) is noteworthy. As pointed out by Hunter and Wiles (1935), this is probably due to the age of the patient, the radiating lines appearing in the pelvis and other parts of the skeleton in children only.

An *x*-ray film showed a little broadening of some ribs, but no evidence at that time of metastases in the lungs.

The left thigh was short for the patient's general build, and hard masses were felt at the lower end of the femur and upper end of the left tibia and fibula. He had a good range of movement in the knee-joint. Fig. 6 shows the rather short left thigh, but the lower end of the femur is particularly interesting. The lower end broadens in the trumpet-like fashion of diaphysial aclasis, with a broad metaphysis, its sides being approximately parallel. There are extensive areas of cartilage persisting in the metaphysis and epiphysis, and some deformity is evident in the lateral view (Fig. 7). The areas of cartilage in the tibia and the irregular small exostoses, not pointing towards the ends of the bone, are seen.

The angular bends of dyschondroplasia described by Jansen are well seen in the radiograph of the humerus (Fig. 8). The shoulder- and elbow-joints are normal, though the upper ends of the humerus are somewhat broadened. There is a spindle-shaped swelling of well-calcified bone in the middle of each humerus with angulation. There has evidently been dysplasia earlier in growth, with "healing" as Ollier described. Little persistent cartilage is here seen in the shafts.

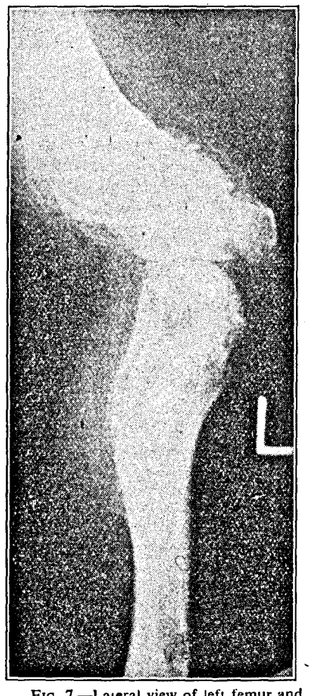


FIG. 7.—Lateral view of left femur and tibia, showing areas of cartilage in the tibia and irregular small exostoses.

A blood count showed: haemoglobin, 76%; red cells, 5,100,000; colour index, 0.74; mean diameter of red cells, 7.3 μ; white cells, 13,500 c.mm. (polymorphs 79%, lymphocytes 10%, monocytes 5%, eosinophils 6%). Serum calcium was 10 mg. per 100 ml.; plasma phosphate 2.3 mg. per 100 ml.; serum acid phosphatase 3.2 units; serum alkaline phosphatase 5.5 units. The Wassermann and Kahn reactions were negative. Biopsy of the amputation stump showed malignant lymphangioma.

Course. — Deep *x*-ray therapy at the London Hospital under Dr. Frank Ellis caused considerable improvement in the fungating ulcers of the amputation stump and groin. The ulcers cleaned up, the thick everted edge became flat, and some epithelization from the edges took place. Subsequently, however, his condition deteriorated and metastases appeared in the lungs. He died in November, 1949, and permission for necropsy was not obtained.

Comment

This case illustrates the essential features of Ollier's disease recorded in the considerable literature on the subject, and the history and appearances may be regarded as typical. The prognosis as regards life appears fairly good, considering that the Maffucci syndrome must be regarded as a mesodermic dysplasia beginning in foetal life. Our patient was 35 years of age at death, and of the 20 cases traced by Carleton *et al.* (1942) the average age was 33. The high proportion of cases (25%) which became malignant is noteworthy.

I am indebted to Mr. B. Cook, of Messrs. Cook and Perkins, Tottenham, London, for the photographs of this case and for the reproduction of the radiographs.

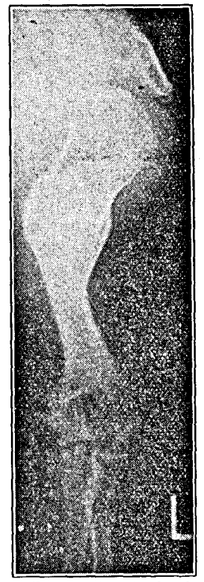


FIG. 8.—Angular bends of dyschondroplasia in the humerus.

BIBLIOGRAPHY

Bentzon, P. G. K. (1924). *Acta radiol., Stockh.*, **3**, 89.
Brailsford, J. F. (1935). *Brit. J. Radiol.*, **8**, 533.
Brockman, E. P. (1931). *Proc. R. Soc. Med.*, **24**, 1377.
Bromer, R. S., and John, R. L. (1931). (1931). *Amer. J. Roentgenol.*, **26**, 428.
Carleton, A., Elkington, J. St. C., Greenfield, J. G., and Robb-Smith, A. H. T. (1942). *Quart. J. Med.*, **11**, 203. (With a full account of the Maffucci syndrome.)
Cleveland, Mather (1928). *Surg. Gynec. Obstet.*, **57**, 338.
Cohn, I. (1946). *Ann. Surg.*, **123**, 673.
Dahl, B. (1930). *Acta orthop. scand.*, **1**, 127.
Hunter, D., and Wiles, P. (1935). *Brit. J. Surg.*, **22**, 507.
Jansen, M. (1928). *Robert Jones Birthday Volume*, p. 43. London.
Keith, A. (1920). *J. Anat.*, **54**, 101.
Krause, G. R. (1944). *Amer. J. Roentgenol.*, **52**, 620.
Mahorner, H. R. (1937). *J. Pediat.*, **10**, 1.
Monro, J. K. (1935). *Lancet*, **1**, 858.
Nielson, J. L. (1941). *Bull. Los Angeles neurol. Soc.*, **6**, 104.
Ollier (1900). *Bull. Soc. Chir. Lyons*, **3**, 22.
Sanderson, G. H., and Smyth, F. S. (1938). *J. Bone Jt Surg.*, **20**, 61.
Voorhoeve, N. (1924). *Acta radiol., Stockh.*, **3**, 407.

Sports facilities for hospital patients and staff are among the amenities on which Exchequer money may properly be spent, according to a circular sent by the Ministry of Health to hospital boards and committees. Free moneys should be used to the maximum extent compatible with other claims on them, but, where there is not enough, reasonable expenditure may be met out of Exchequer funds if the necessary provision has been made in the estimates as approved. Wireless may be provided at Exchequer cost, as may a film projector when considered necessary on therapeutic grounds—for example, in mental hospitals. Concerts, dances, and parties should be regarded as a proper charge on free moneys, but newspapers and magazines in the wards may be provided out of Exchequer money. Amenities provided exclusively for the benefit of the staff should normally be paid for from free moneys and only exceptionally by the Exchequer.

LYSIVANE THERAPY FOR PARKINSONISM

BY

HAROLD PALMER, M.D., M.R.C.P., D.P.M.

AND

D. J. A. GALLAGHER, M.B., Ch.B., M.Med.Sc.

(From the Department of Psychiatry, Dunedin Public Hospital, N.Z.)

The claims made by French workers (Bovet *et al.*, 1947; Sigwald, 1947, 1949; Sigwald *et al.*, 1947) for "diparcol" in the symptomatic treatment of parkinsonism have been confirmed by Duff (1949), Gray (1949, 1950), and Palmer and Black (1949), but the mortality may be in the region of 5%. This paper reports our findings with "lysivane" (N-(2-diethylamino-n-propyl)phenothiazine hydrochloride), a member of the same series of drugs as diparcol.

Both lysivane and diparcol are substituted phenothiazines (the substitution group being the active principle) which have been evolved by Bovet *et al.*, followed by Sigwald *et al.*, whose interest seems to have been derived from the observation that certain drugs of the antihistamine series were capable of benefiting patients suffering from parkinsonism. This benefit they thought was due to the relatively specific action of this series of drugs on the extrapyramidal centres. In addition to this selective action, these drugs (which include such members as "benadryl," "phenergan," diparcol, and lysivane) have a general pharmacological action on the central nervous system, promoting drowsiness, and have other more specific actions, including parasympathicolytic (ganglioplegic) properties. They also have sympathicolytic activity and an anti-acetylcholine and spasmolytic action.

The Parkinson syndrome comprises two main varieties—that which is associated with old age (paralysis agitans), and that which follows encephalitis lethargica. Both varieties have in common a tendency towards muscular tremor which can be coarse or fine (noted in this study to be fairly constant at 5 a second), rigidity and weakness, and an alteration in the psyche. No adequate descriptive term can be given for the change in the mental attitude of these patients, but it includes some apathy, depression, and peevishness, and a paucity of interest, all of which in combination place a peculiar burden on those relatives who are called upon to look after the patients. In many cases this change constitutes the major incapacitating symptom. Parkinsonism following encephalitis lethargica has, in addition, its own peculiar mode of expression, both in the psychical and in the somatic sphere, and in this type oculogyric crises (not encountered in paralysis agitans) are amongst the more troublesome symptoms. In both conditions orthopaedic deformities are apt to develop. Anything one can do to help these patients relieves in turn the despondency which so often descends upon their relatives. In the more practical realm of everyday life a return of the ability to perform the finer movements involved in dressing, writing, feeding themselves, and attending to their toilet is a tremendous contribution to their own and their family's welfare.

This paper reports our experience with 16 patients treated with lysivane, the general purpose of the research having been promoted by the Otago Old People's Welfare Council.

Dosage

The drug is supplied in 0.05-g. tablets. All patients, in the course of one week, were placed on their characteristic effective dose, which varied from 4 to 10 tablets a day. At first we confined our maximum to five tablets daily, but it seems that this leaves a very large margin of safety and some patients did not achieve maximum benefit on this dosage. Up to 20 tablets a day have been used by Sigwald. In view of the fatality encountered with the use of diparcol we have been cautious. We believe that, as further experience is gained and more is known about the clinical toxicity of these drugs, a higher dose may be permissible and better results than those we are recording will be achieved.

The accompanying Table records the effects of our treatment on individual symptoms, as well as the general effect on the patient.

Analysis of Cases

Case No.	Age and Sex	Aetiology	Major Cause of Disability	Disablement	Rehabilitation
1	52 M	Post-encephalitic	Tremor, rigidity, weakness, depression, festination	Walks with aid; fed, shaved, dressed. Partial invalid	Walks, feeds, shaves, dresses unaided. 5 tabs./day for 3 m. (2) Stramonium 15 gr. daily
2	62 M	Senile	Rigidity, weakness, depression, festination	Total invalid	Walks, feeds, shaves, dresses unaided. 10 tabs./day for 3 m.
3	36 F	Unknown	Unilateral tremor	Writing difficult; patient a teacher	Writes normally; tremor absent. 4 tabs./day for 3 m.
4	37 M	Post-encephalitic	Oculogyric crises daily; rigidity, tremor, depression	Crises confine patient to house	Crises 2 a week on diparcol; 1 a week on lysivane 6 tabs./day for 3 m.
5	46 M	Senile	Tremor (arms)	Tremor interferes with fine movements	Can roll cigarette; tremor absent. 6 tabs./day for 2 m.
6	73 F	,,	Tremor, rigidity, weakness, festination, retropulsion, extreme retardation	Total invalid; appearance of senile dementia	Walks, feeds unaided. Mental activity restored. 6 tabs./day for 2 m.
7	59 M	,,	Tremor, depression, slow indistinct speech	Socially incapacitated	Tremor absent, speech clearer. 4 tabs./day for 1 m.
8	60 F	,,	Tremor, rigidity, weakness, depression, retropulsion	Total invalid	Walks, dresses unaided; tremor absent. 6 tabs./day for 2 m.
9	59 F	,,	Tremor, rigidity, weakness, depression, deformity	,, ,,	Walks with aid, dresses; deformities reducing; tremor reduced. 8 tabs./day for 2 m. (2) Stramonium 30 gr. daily
10	53 M	,,	Tremor, weakness, depression	Difficulty in dressing and writing	Writing and ability to dress regained; tremor absent. 6 tabs./day for 1 m.
11	72 F	,,	Tremor, weakness, slow speech, depression, festination	Walks with aid; cannot dress or feed unaided; given up social life. Partial invalid	Walks, dresses, feeds unaided. Loss of depression. 4 tabs./day for 1 m.
12	63 M	,,	Tremor (unilateral)	Socially incapacitated	Tremor controlled. 4 tabs./day for 2 w.
13	68 M	,,	Tremor, rigidity, weakness, depression, festination	Walks with aid; fed and dressed. Partial invalid	Walks unaided; stronger. 4 tabs./day for 2 w.
14	62 F	,,	Tremor, weakness, depression	Foot drags; difficult to manage housework. Given up social life	Improving. 4 tabs./day for 1 w.
15	49 M	Post-encephalitic	Tremor, oculogyric crises, slow speech, festination. Focal epilepsy	Surgical treatment left slowness of speech (and focal epilepsy)	No further improvement on 4 tabs. daily
16	65 F	Senile	Tremor, rigidity, festination, retropulsion, depression	Difficulty with walking and fine movements	Improved on 4 tabs. daily. Treatment not continued owing to isolated home conditions

Results

Rigidity responds better than tremor when the two occur in combination. Tremor alone responds best of all.

We believe that restoration of that controlled background of muscular tone upon which all voluntary movement is based determines the favourable response to lysivane, though some degree of tremor may persist. Festination and retropulsion disappear, the patient ceases to be the important claimant on his relatives' attention, and the tremor becomes a matter of the transient emotional tension to which even normal individuals are prone.

In our opinion the most striking case, and one which illustrates the importance of viewing a patient as a whole as opposed to estimating the effect of the treatment on symptoms, is Case 6. On admission to hospital this patient resembled a senile dement. She was confined to bed in a rigid, hopeless state, with little contact with the outside world, and with all the implications which this state of affairs had for the nursing staff of the home for the aged where she was being nursed. She walked out of hospital unaided, had assumed quite a charming personality, and returned to the home to gladden the hearts of her fellow patients and to encourage the staff in their humanitarian care of the ageing and chronic sick. In a case like this we do not feel disposed too narrowly to estimate benefit in terms of isolated symptoms alone.

Of our 16 cases 12 were treated as out-patients, receiving no other form of therapy. We mention this fact since the remainder whilst in hospital may have derived benefit from rest in bed and the physiotherapy which was given. One patient (Case 15) suffering from post-encephalitic parkinsonism and showing tremor, oculogyric crises, and festination, who had received surgical treatment in the U.S.A. which relieved all symptoms, except bradyphasia and depression (partly due to a post-operative complication of focal epilepsy), obtained no benefit from lysivane.

Toxicity

The laboratory findings of the French workers place the available drugs in the following descending order of toxicity (in rats): phenergan, diparcol, lysivane.

As we have had no deaths with lysivane in spite of one patient stopping the treatment suddenly, and in view of our one fatality with diparcol, we infer that our experience bears out the laboratory findings.

Clinical toxic events are as follows: (1) Drowsiness and lassitude, with or without vertigo, appearing half an hour after dosage and lasting one to two hours, most apparent early in treatment. These effects eventually disappear and are countered effectively by strong coffee or by amphetamine sulphate. (2) Formication, irritation, and cramps are paraesthesiae related to parkinsonism rather than to drug therapy. These are perhaps, strictly speaking, not toxic effects so much as release phenomena consequent upon the treatment of the basic condition. They are relieved by aspirin and disappear in some weeks. (3) Dryness of the mouth, transient diplopia, vasomotor reactions; these are rarely found, and disappear spontaneously.

In the present study only the first group of toxic symptoms was observed and in no case was it necessary to discontinue treatment. In Sigwald's series six out of 106 patients treated suffered vertigo or cramps, necessitating discontinuation of treatment.

An interesting feature was the tendency for patients to show a marked initial improvement followed by some relapse and then a final upward movement until stability had been reached. This probably refers to the placebo effect of encouragement which operates at a maximum initially.

One case (No. 4) previously treated with diparcol gave an improved response to lysivane.

Sigwald has recorded, however, that lysivane was greatly superior to all other forms of treatment in 46 out of 106 cases, identical in 29, and inferior in 4.

Relation to Other Forms of Treatment

One of the advantages of lysivane therapy is that the drug can be combined with other forms of treatment—for example, stramonium. Indeed, in two of our cases which had previously derived benefit from stramonium, lysivane alone was to some extent disappointing, though improvement undoubtedly occurred. When, however, the two drugs were given in combination the final effect was far superior to that achieved by stramonium, or, indeed, by either one separately. It would seem, therefore, that patients suffering from parkinsonism should also be tried with lysivane in combination with stramonium.

With lysivane alone one patient who suffered from oculogyric crises, and who formerly had had attacks daily, had the attacks reduced to one or two a week.

All the remarks concerning withdrawal which apply to diparcol apply by inference to lysivane, but one old lady stopped her treatment while having five tablets a day, with no untoward result. For the time being, however, it would seem to be mandatory that all patients should be carefully instructed never to withdraw the drug suddenly.

Conclusion

Lysivane is capable of affecting beneficially any symptom or complex of symptoms from which the parkinsonian patient is suffering—notably his mentality. We would estimate our findings in general as follows: complete alleviation, 1; good result, 10; improved, 4; and no change, 1 (patient and relatives concurred in cessation of further treatment).

We wish, however, once more to reiterate the dangers of attempting to evaluate results on too narrow a symptomatic basis and are content to assert that in our opinion lysivane does all that is claimed for it in a manner which is safe for the patient. It may confidently be recommended, therefore, as a valuable remedy in the treatment of this condition.

We propose to extend our work to the other drugs for which claims have been made, and this will be reported in a subsequent paper.

We wish to thank Messrs. May and Baker Ltd. for a very generous supply of lysivane, and those practitioners of Dunedin who have so kindly sent patients for clinical treatment.

REFERENCES

Bovet, D., *et al.* (1947). *Thérapie*, **2**, 115.
Duff, R. (1949). *British Medical Journal*, **1**, 613.
Gray, R. M. (1949). *Lancet*, **2**, 34.
—— (1950). *British Medical Journal*, **1**, 416.
Palmer, H., and Black, H. (1949). *N.Z. med. J.*, **48**, 487.
Sigwald, J. (1947). *Thérapie*, **2**, 108.
—— (1949). *Pr. méd.*, **57**, 819.
—— *et al.* (1947). *Rev. neurol.*, **79**, 683.

A booklet on the *Superannuation Scheme for Those Engaged in the National Health Service* has been prepared by the Ministry of Health. It will be issued to new entrants to the Health Service free of charge, and is also obtainable from H.M. Stationery Office for 3d. The scheme is described in plain language, and specific examples are given on how it works.

RELATIVE INCIDENCE OF GASTRIC AND DUODENAL ULCERS

BY

EILEEN M. BROOKE, M.Sc.

General Register Office

The relative incidence of gastric and duodenal ulcers is a subject about which there is some divergence of opinion. Before the war, owing to the absence of any national morbidity statistics, the only sources of information were records of individual hospitals and the Registrar-General's returns of deaths. During the war a study was made of the causes of admission to E.M.S. hospitals, thus providing a rather larger and more uniform, though admittedly biased, set of data. The Survey of Sickness was also begun, involving sampling over the national field, though the data may be open to question as depending on the memory of the person interviewed and his statement of diagnosis. Both death returns and hospital studies showed a preponderance of gastric over duodenal ulcers, yet it was a commonly held opinion that the proportion of duodenal to gastric ulcers was five to one or possibly higher.

The Registrar-General's returns distinguish duodenal ulcer from ulcer of the stomach. The latter term includes, in the *International List of Causes of Death*, the somewhat vague term "peptic ulcer," but where a certificate bears this term inquiry is made regarding the exact site, so that only those ulcers whose site is not known are left in this group. The numbers of deaths in England and Wales for the periods 1929–38 and 1939–47 are shown in Table I.

TABLE I.—*Deaths from Ulcers of Stomach and Duodenum, 1929–47*

	No. of Deaths				Average Annual Deaths†			
	1929–38		1939–47*		1929–38		1939–47	
	M.	F.	M.	F.	M.	F.	M.	F.
Duodenal ulcer	11,644	2,034	14,149	2,243	1,164	203	1,540	249
Ulcer of stomach ..	21,109	8,391	22,080	7,398	2,111	839	2,413	822
Ratio D.U./G.U. ..	0·55	0·24	0·64	0·30				

* Including non-civilians. † Non-civilians only.

In the earlier period duodenal ulcers formed 36% of all ulcer deaths among males, and in the latter period, 39%. There is a significant difference between these percentages (difference = 3.47 ; 2 S.E. = 0.74). In the case of female deaths, duodenal ulcers accounted for 20% and 23% of all ulcer deaths, showing also significant difference between the two periods (difference = 3.76 ; 2 S.E. = 1.16). Among non-civilian males there were 361 deaths from gastric ulcer and 292 from duodenal ulcer during 1939–47. Excluding non-civilians on the grounds that Service men may be subject to conditions of strain which would tend to produce a high incidence rate of duodenal ulcer, and comparing the average annual deaths in the two periods, duodenal ulcers showed an increase of 32% compared with 14% for gastric ulcers among males, while female deaths showed corresponding changes of + 23% and −2%. New rules for assignment in cases of death from joint causes were in force from 1939 onwards. If correction factors be applied to the death figures for 1929–38 to make them comparable with those for 1939–47, the corresponding increases or decreases in the average annual deaths would be: males, duodenal ulcer +30%, gastric ulcer +12% ; females, duodenal ulcer +20%, gastric ulcer −5%.

The percentage increases or decreases in male deaths from ulcers in various age groups are shown in Table II.

TABLE II.—*Average Annual Deaths from Gastric and Duodenal Ulcers, 1929–38 and 1939–47. Males*

	1929–38	1939–47		Increase per cent.			
		Civilians Only	All	Civilians Only		All	
					*		*
Ulcer of stomach							
Ages 15–54 ..	1,068	905	944	−15·4	−17·4	−11·6	−13·8
,, 55–64 ..	573	768	771	+34·2	+31·1	+34·6	+31·6
,, 65 up ..	466	736	736	+56·4	+54·6	+56·4	+54·6
Duodenal ulcer							
Ages 15–34 ..	118	82	97	−30·5	−31·7	−17·8	−19·2
,, 35–54 ..	484	556	572	+14·9	+12·3	+18·2	+15·6
,, 55 up ..	562	896	897	+59·4	+56·4	+59·6	+56·5

* Based on figures for 1929–38 to which correction factors have been applied.

Whether all males are considered, or only civilians, the average annual deaths from gastric ulcer in 1939–47 were fewer than in 1929–38 in all the five-yearly age groups from 15 to 54, the overall decrease for these ages being more than 10%. From 55 upwards each quinquennial age group showed an excess in the second period, the increase at ages 55–64 being 34%, and at 65 and over 56%. The average annual deaths from duodenal ulcer were fewer in each five-yearly age group from 15 to 34, the decrease being 31% in the case of civilians only and 18% if non-civilian deaths are included. At ages 35–54 the rate was 18% higher in the second period, and at ages 55 and upwards 60%. The striking increase in deaths from both types of ulcer in the higher age groups is out of all proportion to the alteration in the age structure of the population. The effect of applying conversion ratios to the figures for 1929–38 is to reduce the increases by 2 or 3%.

In a one-fifth sample of male Service patients admitted to E.M.S. hospitals as in-patients during 1940–7 there were 1,395 cases of gastric, 5,199 of duodenal, and 387 of peptic ulcer. Hence there were 3.7 times as many admissions for duodenal as for gastric ulcer, while the ratio of duodenal to gastric and peptic ulcers was 2.9. Whereas in civilian life it may be possible for patients with duodenal ulcers to carry on with the aid of treatment from their family doctors, while those with stomach ulcers would more often have to go to hospital, it seems probable that most Service men with duodenal ulcers would be sent to hospital, owing to the difficulties of treatment and diet. It may well be, therefore, that the E.M.S. figures give a truer picture of the relative incidence of duodenal and gastric ulcers than other sources. Table III shows the age distribution and the ratio of duodenal to other ulcers of the stomach among male Service patients admitted to E.M.S. hospitals.

The ratio of duodenal to gastric ulcers for all ages rose from 2.9 in 1940 to 4.7 in 1942 and then declined to 4.1 in 1946–7. This may reflect not so much a change in relative incidence as the fact that in the later war years, when owing to the increase in battle casualties there was more demand for hospital beds, it was no longer policy to send so many cases of duodenal ulcer to hospital. For the whole period 1940–7 there were 4.3 times as many men admitted with duodenal as with gastric ulcers in the age group 15–34 and three times as many at ages 35–44. The proportion of duodenal to gastric ulcers was generally greater in the age groups under 34. Although the ratio in these age groups declined in 1943 and 1944, it was rising again by 1947.

TABLE III.—*E.M.S. Hospitals. Men admitted for Gastric, Duodenal, and Peptic Ulcers, 1940–7. (One-fifth sample)*

Year	Diagnosis	Ages					
		15–24	25–34	35–44	15–44	45 and Over	All ages
1940	Gastric ulcer	40	75	88	203	20	223
	Duodenal ulcer	116	279	197	592	47	639
	Ratio D.U./G.U.	2·9	3·7	2·2	2·9	2·4	2·9
	Peptic ulcer	8	44	37	89	17	106
	Ratio D.U./(G.U. and P.U.)	2·4	2·3	1·6	2·0	1·3	1·9
1941	Gastric ulcer	40	114	80	234	18	252
	Duodenal ulcer	157	469	197	823	35	858
	Ratio D.U./G.U.	3·9	4·1	2·5	3·5	1·9	3·4
	Peptic ulcer	15	31	20	66	5	71
	Ratio D.U./(G.U. and P.U.)	2·8	3·2	2·0	2·0	1·5	2·7
1942	Gastric ulcer	28	86	73	187	8	195
	Duodenal ulcer	174	438	260	872	36	908
	Ratio D.U./G.U.	6·2	5·1	3·6	4·7	4·5	4·7
	Peptic ulcer	3	27	21	51	1	52
	Ratio D.U./(G.U. and P.U.)	5·6	3·9	2·8	3·7	4·0	3·7
1943	Gastric ulcer	28	71	66	165	11	176
	Duodenal ulcer	111	308	234	653	23	676
	Ratio D.U./G.U.	4·0	4·3	3·5	4·0	2·1	3·8
	Peptic ulcer	5	5	6	16	3	19
	Ratio D.U./(G.U. and P.U.)	3·4	4·1	3·3	3·6	1·6	3·5
1944	Gastric ulcer	35	86	81	202	14	216
	Duodenal ulcer	126	392	281	799	36	835
	Ratio D.U./G.U.	3·6	4·6	3·5	4·0	2·6	3·9
	Peptic ulcer	8	20	27	55	3	58
	Ratio D.U./(G.U. and P.U.)	2·9	3·7	2·6	3·1	2·1	3·0
1945	Gastric ulcer	30	115	98	243	16	259
	Duodenal ulcer	158	495	302	955	24	979
	Ratio D.U./G.U.	5·3	4·3	3·1	3·9	1·5	3·8
	Peptic ulcer	10	29	16	55	3	58
	Ratio D.U./(G.U. and P.U.)	4·0	3·4	2·6	3·2	1·3	3·1
1946 and 1947	Gastric ulcer	19	32	23	74	—	74
	Duodenal ulcer	98	147	53	298	6	304
	Ratio D.U./G.U.	5·2	4·6	2·3	4·0	—	4·1
	Peptic ulcer	5	8	6	19	4	23
	Ratio D.U./(G.U. and P.U.)	4·1	3·7	1·8	3·2	1·5	3·1
Total 1940–7	Gastric ulcer	220	579	509	1,308	87	1,395
	Duodenal ulcer	940	2,528	1,524	4,992	207	5,199
	Ratio D.U./G.U.	4·3	4·4	3·0	3·8	2·4	3·7
	Peptic ulcer	54	164	133	351	36	387
	Ratio D.U./(G.U. and P.U.)	3·4	3·4	2·4	3·0	1·7	2·9

Comparison of the E.M.S. admissions may be made with those for the New York Hospitals, 1933, and Cardiff Royal Infirmary, 1946, which are shown in Table IV.

TABLE IV

	E.M.S. Hospitals (Males), 1940–7	New York Hospitals, 1933	Cardiff Royal Infirmary, 1946
Ulcer of stomach ..	1,782	1,783	67
Duodenal ulcer ..	5,199	2,248	58
Total ..	6,981	4,031	125
U. of S. as percentage of total	25·53	44·23	53·60

The differences between the percentages of stomach ulcers and those of all ulcers in these three groups are:

E.M.S. and New York ..	Difference, 18·70	..	Standard error,	1·88
E.M.S. and Cardiff ..	,, 28·07	..	,, ,,	8·98
New York and Cardiff ..	,, 9·37	..	,, ,,	4·52

The differences between the E.M.S. figures and those for Cardiff and New York are therefore highly significant ; that between New York and Cardiff is barely so. It seems reasonable to infer from this, either that E.M.S. patients were drawn from a population more subject to duodenal ulcers than the general one, or else that, while they showed the same proportion of duodenal to gastric ulcers as the general population, more cases of duodenal ulcer came into hospital.

TABLE V.—*Social Survey, 1947. Total Illnesses—New, Recurrent, and Continuous*

Diagnosis	Males				Females			
	16–44	45–64	65 Up	All	16–44	45–64	65 Up	All
Gastric ulcer ..	77	81	23	181	18	39	21	78
Duodenal ulcer ..	128	126	19	273	27	28	6	61
Peptic ulcer ..	21	12	4	37	—	6	4	10
D.U./G.U.	1·7	1·6	0·8	1·5	1·5	0·7	0·3	0·8
D.U./(G.U. and P.U.)	1·3	1·4	0·7	1·5	1·5	0·6	0·2	0·7

Table V shows the number of people recorded by the Survey of Sickness as reporting ulcers during 1947. The figures given are for all illnesses reported, whether new, recurrent, or continuing from a month prior to that of interview. Those who were in hospital at the time were not included in the inquiry. For men of working age these figures again show a preponderance of duodenal over gastric ulcers. The same is roughly true of women, since relatively few are in gainful occupations after they reach the age of 45. The proportion of duodenal to all ulcers differs significantly between the sexes (difference, 11·20 ; S.E., 4.59), but not between men aged 16–44 and 45–64 (difference, 0.29 ; S.E., 4.69).

Statistics of cause of death do not distinguish cases of haemorrhage and perforation. The relative proportions in the E.M.S. sample and the Cardiff Royal Infirmary discharges are shown in Table VI.

TABLE VI

	E.M.S. Hospitals, Males, 1940–7		Cardiff Royal Infirmary, 1946	
	Proportion %	Case Fatality Rate (%)	Proportion (%)	Case Fatality Rate (%)
Gastric ulcer:				
Perforation ..	24·9	6·1	40·4	26·1
Haemorrhage ..	4·6	3·1	17·5	10·0
Unqualified ..	70·5	0·2	42·1	4·2
Duodenal ulcer:				
Perforation ..	10·6	4·7	13·8	12·5
Haemorrhage ..	2·2	3·5	12·1	28·6
Unqualified ..	87·2	0·2	74·1	4·7

Tidy (1944) has stated that the case fatality rate taken over a long period at St. Thomas's was 12.5% for gastric and 10% for duodenal ulcers. This may be compared with 13% for gastric and 7.6% for duodenal ulcers in the New York Hospitals in 1933, and with 11.9% for gastric and 8.6% for duodenal ulcers at Cardiff Royal Infirmary in 1946. The experience in the New York Hospitals in 1933 showed 2,248 duodenal ulcers with 172 deaths and 1,783 gastric ulcers with 225 deaths. On this basis the expected deaths from 1,782 cases of gastric ulcer in the E.M.S. sample would be 225, compared with 21 actual deaths, while from 5,199 cases of duodenal ulcer 398 deaths would be expected, compared with 37 actual. This strengthens the impression that cases were admitted to E.M.S. hospitals which would not normally be treated in hospital. It may be hoped that when statistics become available from the Ministry of National Insurance and from the Registrar-General's National Morbidity Inquiry, fresh light will be shed on the relative incidence of duodenal and gastric ulcer.

REFERENCES

Cardiff Royal Infirmary Clinical Record, 1946.

Hospital Discharge Study. An analysis of 576,623 patients discharged from hospitals in New York City in 1933. Welfare Council of New York City.

Tidy, Sir H. (1944). *British Medical Journal*, **1**, 677.

The Ministry of Health has issued a third list of amendments to the National Health Service Hospitals Directory.

Medical Memorandum

Chronic Subdural Haemorrhage Associated with Schizophrenic Reaction

Subdural haematoma has been described as "an entity which despite its comparative frequency still remains, on occasion, a neglected or unsuspected lesion for the general practitioner, and one that is difficult of diagnosis for the neurologist or neurosurgical specialist" (Oldberg, 1945). An early diagnosis makes all the difference in prognosis, as timely surgical intervention yields favourable results. The following case was, unfortunately, diagnosed only at necropsy.

CASE REPORT

A Gurkha soldier aged 20 was admitted to a military hospital in August, 1946, in a state of excitement, mumbling some unintelligible phrases. He had been sleeping poorly and been dirty in his habits. The duration of these symptoms was two days. A careful physical examination was negative and he was afebrile. There was no history of a similar illness in the past or of an accident or other trauma. Two days later he was transferred to the psychiatric centre of a larger military hospital, where he was found to be dull, apathetic, self-absorbed, and withdrawn. He had no impairment of orientation or memory, but there was definite evidence of visual hallucinations associated with abnormal conduct. A detailed physical examination, including the cerebrospinal fluid and the fundi, made at this stage was again negative.

As the symptoms were typical of a schizophrenic reaction type clinically, a course of "phrenazol" shock therapy was prescribed. Three injections of 10% solution, 7 ml. each, were given at two-day intervals, and each resulted in a good convulsion. There was a slight improvement, but the treatment had to be discontinued because the stock of the drug was exhausted. About six weeks later (50th day of the illness) another phrenazol injection was given, but this produced no change in the patient's condition, so convulsive therapy was discontinued. He remained the same until nineteen days later (69th day), when he refused food and drink and vomited frequently. He was still afebrile; there was no neck rigidity and Kernig's sign was negative. Systemic examination did not reveal any abnormality. Next day the vomiting stopped and he started taking fluids. On the 79th day of illness his condition became worse and he suddenly went into coma with a temperature of 100° F. (37.8° C.), and dilated and inactive pupils. His breathing became stertorous and he died a few hours later. He had a neutrophil leucocytosis (14,200 per c.mm.) a few hours before death, the differential count being polymorphs 86% and lymphocytes 14%. The cerebrospinal fluid was clear and transparent; a manometer was not available, but the pressure seemed appreciably increased. The specimen revealed: cells, 2 per c.mm.; proteins, 30 mg. per 100 ml.; globulin, not increased: chlorides, 740 mg. per 100 ml.; sugar, normal. The Wassermann reaction was negative. Urine showed no abnormal ingredient. Examination of the nervous system did not reveal any localizing signs even a few hours before death, and the fundi appeared normal.

Post-mortem examination showed that the scalp was free of any evidence of old haematoma and no skull fracture was found in any part; the meninges were not under pressure. On the left side overlying the entire cerebral hemisphere and filling the upper fossa, with replacement pressure on the brain tissue, was a huge subdural haematoma which showed evidence of long standing. No tear of venous sinuses or aneurysm of vessels could be found, and the source of bleeding remained obscure. The haemorrhage itself was becoming liquefied and not organized; much of it, however, was still a spongy gelatinous clot with formation of a kind of false membrane about it but no definite attempt at localization, except that it seemed to be most closely associated with the dura itself and limited by its boundaries. No leak had occurred into the subarachnoid space, and the cerebrospinal fluid in the ventricles was clear without even discoloration. Gross softening of the brain tissue itself was not evident in any part, but in the substance of the pons small centrally placed haemorrhages had occurred apparently as a terminal effect of stem pressure. In the opinion of the pathologist conducting the necropsy (Major Elkarton) the most reasonable explanation of the collection of this large chronic subdural haemorrhage was a minute venous leak over a prolonged period, most probably due to unrecognized trauma.

COMMENT

The possibilities in this case are: (1) That the patient's original mental symptoms eleven weeks before death were due to a subdural haemorrhage following a minor injury which he had forgotten, and that the convulsive therapy possibly aggravated the condition. The last phrenazol injection was, however, given a month before the patient's death, and no worsening in his condition was noticed until 19 days later. (2) That the patient's original symptoms were due to a true schizophrenic illness, and that he sustained a minor trauma, which was unnoticed, while under treatment in hospital for his mental condition, resulting in a subdural haemorrhage which proved fatal. (3) That the subdural haemorrhage was a complication of the convulsive therapy.

The first appears to be the most plausible explanation, though the others cannot be conclusively ruled out.

Subdural haemorrhage is not known to have been reported as a complication of convulsive therapy or of epilepsy, and authorities like Henderson and Gillespie (1944), Curran and Guttmann (1945), Sargant and Slater (1948), and Price (1946) do not mention it at all. It is possible, however, that such treatment may initiate a subdural haemorrhage, for the trauma required to produce it is very trivial. An already existing haemorrhage may of course be aggravated by convulsive therapy.

My thanks are due to Major Elkarton for the post-mortem report and to the D.G.A.F.M.S. for permission to publish this paper.

KIRPAL SINGH, M.B., B.S., Major I.A.M.C.,
Military Hospital, Poona, India.

REFERENCES

Curran, D., and Guttmann, E. (1945). *Psychological Medicine*, 2nd ed. Livingstone, Edinburgh.
Henderson, D. K., and Gillespie, R. D. (1944). *A Textbook of Psychiatry*, 6th ed. Oxford Univ. Press. London.
Oldberg, E. (1945). *Med. Clin. N. Amer.*, **29**, 62.
Price, F. W. (1946). *Textbook of the Practice of Medicine*, 7th ed., p. 1646. Oxford Univ. Press, London.
Sargant, W., and Slater, E. (1948). *An Introduction to Physical Methods of Treatment in Psychiatry*, 2nd ed. Livingstone, Edinburgh.

The Minister of Health and the Secretary of State for Scotland have notified hospitals of changes in the arrangements for the payment of travelling expenses of patients attending hospital. Hitherto the patient's claim for his fare has depended solely on the length or frequency of his journey. But a number of patients have claimed and been paid their fares when they could themselves have met the cost without financial hardship. From September 1, therefore, payment will be made only where the National Assistance Board is satisfied that the patient would suffer financial hardship by reference to the general standard of the regulations, and hospitals will pay travelling expenses only to patients authorized by the National Assistance Board to receive them. Patients whose condition makes it impossible for them to use public transport will be able, as before, to be carried free of charge by ambulance or sitting-case car when this is authorized by a medical practitioner or other appropriate person.

Reviews

TEXTBOOK OF ELECTROENCEPHALOGRAPHY

Electroencephalography. A Symposium on its Various Aspects. Edited by Denis Hill, M.B., F.R.C.P., and Geoffrey Parr, M.I.E.E. (Pp. 438; illustrated. £3 18s.) London: Macdonald and Co. 1950.

This is the first comprehensive textbook to be written on electroencephalography. It is edited by Dr. Hill and Dr. Parr, the first a clinician, the second an electrical engineer, but chapters have been written by a number of different workers in the subject whose combined interests embrace its whole field. Appropriately, a principal contributor is Dr. Grey Walter, who has written five of the eleven chapters. He has covered the physical and technical background, the interpretation of records, and also given an account of the normal electroencephalogram and that of epileptic subjects. In the latter sections he may have emphasized his own techniques of electrical wave-band analysis rather to the simple reader's confusion, but the earlier chapters on method are excellent. Professor Whitteridge has contributed a long account of the physiological basis of electroencephalography, and in other chapters Dr. Heppenstall discusses biochemistry and Dr. Grevile pharmacology. Dr. Cobb and Dr. Hill describe the electroencephalography of organic lesions and of psychiatry. A series of appendices include nearly all the information that anyone might need to start a department of electroencephalography, although the very information might prove a healthy deterrent.

This is a very specialized book, to be used by those actively concerned with the subject. Clinical neurologists will be discouraged by the mass of technical description which necessarily abounds even in the clinical chapters, and they will be confused by the reservations in description entailed by the tenuous relation so often present between clinical and electroencephalographic phenomena. How can the neurologist looking for guidance on cerebral tumours possibly feel at home with "The alpha rhythm is an almost constant example, a bilateral 4–7 a second rhythm is common, and slower rhythms are not rare"; or with "Rhythmic quasi-sine-waves, having much in common with the spike and wave complex, are not so easily dismissed; they certainly occur significantly in epilepsy, and equally certainly are sometimes associated with tumours."

It must be accepted that the application of electrophysiology to clinical problems is a whole-time job which does not attract the clinician and that this text is intended for those to whom the subject appeals. There will be further editions, for the bibliography of the first is already old, and by then new knowledge may have limited academic compromise and so have given the same clarity to the clinical sections as that of the technical one.

DENIS WILLIAMS.

NEUROPHYSIOLOGY

Physiology of the Nervous System. By John Farquhar Fulton, O.B.E., M.D., D.Sc., LL.D. Third edition, revised. Oxford Medical Publications. (Pp. 667; illustrated. £3 15s.) New York: Oxford University Press. London: Geoffrey Cumberlege. 1949.

This work established for itself a front place in the literature of physiology and neurology immediately on the appearance of the first edition. The third edition maintains that position. The book is up to date and written in an interesting manner, and the contents are well classified. Neurophysiology has made such rapid strides during the past few decades, and especially in the last, and so much of the progress has been made in the United States, that a presentation of the subject as it now stands represents no small task. With confidence it can be said that the task has been well done.

The fashionable obsession of synaptic transmission naturally occupies an important position in the earlier chapters, with the increasingly complex relations of acetylcholine and cholinesterase in dominant roles. Acetylcholine is considered to play an essential part in conduction, not only across junctional structures but along nerve fibres, too, an opinion from which the views of some British physiologists 'would differ'. The difficulties are explained away by the observation, made with isotope studies, that the neuronal surface membranes are impermeable to acetylcholine, whereas synaptic structures are permeable.

Recent study of the cerebral cortex has brought to light many important new facts, and viewpoints have changed. Thus the relation between the suppressor areas of the cortex and anterior cerebellum and the facilitatory and inhibitory regions of the reticular formation is of first importance. So also is the fact that definite areas of the forebrain have close connexion with the hypothalamus and thus have functions in autonomic control. In the anterior lobe of the cerebellum it is claimed that precise functional localization has been demonstrated, cortically induced movements being facilitated or inhibited according to whether the rate of stimulation is high or low.

These are only instances taken at random from among the many new features with which the author's tireless pen —or dictaphone—has enlivened a book which is fascinating throughout. The bibliography, as would be expected, is full and valuable, and the illustrations are well and clearly reproduced.

C. LOVATT EVANS.

GYNAECOLOGICAL OPERATIONS

Die Gynäkologischen Operationen und Ihre Topographisch-Anatomischen Grundlagen. By Heinrich Martius. 6th edition. (Pp. 436; 422 illustrations. M. 60.) Stuttgart: Georg Thieme. 1950.

The sixth edition of Martius's textbook of gynaecological operations has appeared relatively soon after the last edition was published. The script has been altered only slightly and most of the diagrams are the same. A few additional pictures have been incorporated, but they are not quite of the high standard of those in previous editions. The success of the book is remarkable, even for a classical German textbook. The publishers have provided excellent paper and print and they have been generous with illustrations.

Martius's pictures are widely known, partly because of their high quality, but mainly because of his exceptional ingenuity and judgment in picking out the salient features of gynaecological operations. Most of the illustrations are coloured. The book can be easily read even by those who have only a superficial knowledge of German. The approach to gynaecological surgery is often quite different from what is found in such American and British textbooks as those of Te Linde and Bonney. It is perhaps natural for the German school to emphasize the work of such masters as Wertheim, Schauta, Stoeckel, and Wagner, but the contributions of other nations are worthy of more mention. Nevertheless, all gynaecological surgeons should study the book very closely.

WILFRED SHAW.

EFFECTS OF NEPHRITIS

The Natural History of Bright's Disease. A Study from the Standpoint of Paediatrics. By G. E. M. Scott, M.B.(Melb.), L.R.C.P.Ed., L.R.F.P.S.(Glasg.). (Pp. 62. 15s.). Melbourne: W. Ramsay (Surgical) Pty. 1950.

Perhaps a more appropriate title for this little book would be "A Study of the After-results of Nephritis in Children," for that is what it is about.

After a brief but adequate survey of the literature on the classification of nephritis since that of Volhard and Fahr, the author gives details of the follow-up of 68 patients who were discharged from hospital with some urinary abnormalities from five to eight years previously. Except in one particular, the results do not differ materially from those published in many similar series. The exception is the very high proportion of patients (49.3%) who were subsequently found to have arterial hypertension.

Since age of onset is known to be an important factor in the development of post-nephritic hypertension, and the mean age at onset in the author's series was only 7.4 years, it must be presumed that the residual hypertension was largely due to nervousness when being re-examined. This is further suggested by the author's statement that in no case was a raised diastolic pressure recorded or cardiac enlargement observed. An analysis of the causes of death in a further 36 patients is also made, but again no new facts are recorded.

The book is well written and well produced, and should serve to accomplish the author's purpose of encouraging practitioners and students of medicine to cultivate the habit of carefully recording their clinical observations.

A. A. OSMAN

RECOLLECTIONS OF A GENERAL PRACTITIONER

My Life in Three Counties. By H. W. Pooler, M.B., B.Ch., M.R.C.S., L.R.C.P., L.S.A. (Pp. 247; illustrated. 15s.) London: Christopher Johnson.

The publisher of this book (a "truant" doctor, by the way) did well when he induced Dr. Pooler to follow up *My Life in General Practice* with this sequel. The author has gone one better in his second essay. It ought to have an even wider appeal than his first. Its outstanding merit in my eyes is the gusto with which it is written and successfully imparted to the reader.

Dr. Pooler is an enthusiastic Salopian, and gives good reasons for his pride in his native county. To a keen eye for scenery he adds an attractive curiosity about the historical events in which Shropshire took part and the many interesting and sometimes famous characters it produced. When, after a memorable career as a general practitioner in Birmingham, he adopts Derbyshire as his future sphere of action, he does so with the same infectious enthusiasm. A good deal of attention is given to local medical celebrities, and the author has many good stories about Birmingham doctors which will be welcomed by old students. He dives into the history of Birmingham, and rescues from oblivion many who well deserve remembrance. I was surprised that among these he did not mention Mr. Hector, the surgeon and lifelong friend of Samuel Johnson, who lived with him for some time and found his wife there. But one can't have everything, and this is indeed a full and joyous book. It is very well illustrated and produced with the good taste one associates with the publishers. I would, however, suggest that it ought to have had an index.

ALFRED COX.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Biological Standardization. By J. H. Burn and others. 2nd ed. (Pp. 440. 35s.) London: Geoffrey Cumberlege. 1950.

A Primer of Venous Pressure. By G. E. Burch, M.D. (Pp. 174. 28s.) London: Henry Kimpton. 1950.

Coronary Circulation in Health and Disease. By D. E. Gregg, M.S., Ph.D., M.D. (Pp. 227. 31s. 6d.) London: Henry Kimpton. 1950.

British Journal of Radiology. Supplement No. 2. Some Applications of Nuclear Physics to Medicine. By W. V. Mayneord, D.Sc., F.Inst.P. (Pp. 290. No price.) London: British Institute of Radiology. 1950.

The Future in Medicine. (Pp. 160. 16s.) London: Geoffrey Cumberlege. 1950.

The Harvard List of Books in Psychology. (Pp. 77. 6s. 6d.) London: Geoffrey Cumberlege. Oxford University Press. 1949.

Light Therapy. By R. Kovacs, M.D. (Pp. 112. 16s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

S. Weir Mitchell: Novelist and Physician. By E. Earnest. (Pp. 279. 28s.) London: Geoffrey Cumberlege. Oxford University Press. 1950.

Pre-frontal Leucotomy. By M. Partridge, M.A., D.M., D.P.M. (Pp. 496. 42s.) Oxford: Blackwell Scientific Publications. 1950.

Exhibitionism. By N. K. Rickles, B.S., M.D. (Pp. 198. 40s) London: Lippincott. 1950.

The Results of Radium and X-ray Therapy in Malignant Disease. Compiled by R. Paterson and others. (Pp. 167. 10s. 6d. Postage 7d.) Edinburgh: Livingstone. 1950.

Psychiatry and the General Practitioner. The Medical Clinics of North America. Mayo Clinic Number. (Pp. 1,251. No price.) London and Philadelphia: Saunders. 1950.

Annual Review of Biochemistry. By J. M. Luck and others. Vol. 19. (Pp. 596. $6.) Stanford, California: Annual Reviews, Inc. 1950.

Manual of Rheumatic Diseases. By W. P. Holbrook, M.D., and D. F. Hill, M.D. (Pp. 182. $4.25.) Chicago: Year Book Publishers. 1950.

Recherches Expérimentales sur l'Asthme. By R. Benda and D. A. Urquia. (Pp. 83. 450 francs.) Paris: Librairie Maloine. 1950.

Dermatologie. By H. and L. Gougerot. 7th ed. (Pp. 730. 3,200 francs.) Paris: Librairie Maloine. 1950.

Pathogénie de la Tuberculose, Oxyaminothérapie, Allergie et B.C.G. By D. Hervouet. (Pp. 155. 240 francs.) Paris: Maloine. 1950.

Tous les Diagnostics et Tous les Traitements. By M. Monnerot-Dumaine. 3rd ed. (Pp. 683. 1,800 francs.) Paris: Librairie Maloine. 1950.

Lobotomia Frontal. By A. Martí-Granell and J. U. Mariné. (Pp. 99. No price.) Barcelona: Ediciones BYP. 1950.

Afecciones Crónicas de los Ganglios Linfáticos del Cuello. By L. R. Badía. (Pp. 167. No price.) Barcelona: Ediciones BYP. 1950.

La Infección por Proteus en el Recién Nacido. By E. Peluffo and others. (Pp. 89. No price.) Montevideo: Editorial Medica GAMO-MER. 1949.

Histoplasmosis. By J. C. Freijo. (Pp. 128. No price.) Montevideo: Instituto de Tisiologia. 1950.

Rh Organization and Research in the Netherlands. By various authors. (Pp. 185. 5 florins.) Leiden: Stenfert Kroese's Uitgevers-Mij N.V. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY SEPTEMBER 2 1950

VITAMIN A AND THE SKELETON

Bone growth is affected in a number of nutritional disorders, but at least three vitamins influence it specifically. In scurvy vitamin-C deficiency affects bone through a failure of synthesis of intercellular collagenous material. In rickets and osteomalacia the deposition of minerals in bone—a mechanism in which vitamin D has a specific action—is disturbed. The relation between vitamin A and bone tissue is not so generally known as these two familiar examples, though both clinically and experimentally there is good evidence that vitamin A has an important place in controlling the growth and development of the tissues of the skeleton. Clinicians have paid some attention to hypervitaminosis. Fried and Grant[1] suggest that the scarcity of reports about it is probably due to unfamiliarity with the syndrome. In children hypervitaminosis A is marked by anorexia, loss of weight, fever, pruritus, and pain in the bones. Skeletal disturbances can be demonstrated radiologically by signs of abnormal periosteal bone formation. Bone growth is also affected if the diet does not contain enough vitamin A, for it has been shown that growth at the epiphyses cannot proceed normally in young animals reared on deficient diets. Bone development is selectively retarded, and the disproportion between the rates of growth of bone and of the nervous system results in overcrowding of the spinal canal and cranial cavity. Mechanical pressure on the brain, spinal cord, and nerve roots causes paralysis. It is of interest that developmental abnormalities of bone have been observed in the offspring of rats reared on diets deficient in vitamin A.[2] One of the effects of giving excessive amounts of vitamin A to an experimental animal is an exaggerated degree of osteoclastic "remodelling" of bone, with resulting fragility and fracture. In 1946 Wolbach[3] reviewed the many experimental studies of bone growth in conditions of excess and deficiency of vitamin A.

About six years ago Mellanby[4] showed that the bony changes in experimental vitamin-A deficiency are the result of interference with the distribution and intensity of osteoblastic and osteoclastic activity. There has been some uncertainty whether vitamin A brings about bony changes directly or through some indirect mechanism, but the consensus of opinion has favoured a direct interference with normal cellular processes. Barnicot,[5] for instance, was able to show that vitamin A caused intense destruction of bone—apparently due to local osteoclastic activity—when crystals were attached to implanted bone fragments. In an outstanding paper appearing in the opening pages of this issue Dr. H. B. Fell and Sir Edward Mellanby establish the fact that the effect of a high concentration of vitamin A on developing bone tissue is a direct one. These workers (one of whom has been associated for many years with studies of explanted tissues at the Strangeways Research Laboratories) grew the bones of foetal mice in tissue culture and studied the effects of altering the concentrations of vitamin A in the media. They observed a remarkable interference with the development of the bones at concentrations of 2,000–4,000 i.u. per 100 ml., though the growth of soft tissues was not affected. How this rapid destruction of developing cartilage matrix and bone tissue takes place has not yet been found out, but Fell and Mellanby suggest that, particularly in the case of cartilage, it is independent of ordinarily understood cell processes and that the intercellular material is directly concerned. This work provides another important link between the mechanism of bone growth and the now numerous chemical factors known to control it. It remains to be seen how the selective effect of vitamin A on bone in tissue culture can be related with observations on the more mature tissues of intact animals which are fed on diets containing either too much or too little of this substance.

1 *Amer. J. Dis. Child.*, 1950, **79**, 475.
2 Warkany, J., and Nelson, R. C., *Anat. Rec.*, 1941, **79**, 83.
3 *Proc. Inst. Med., Chicago*, 1946, **16**, 118.
4 *Proc. roy. Soc. B.*, 1944, **132**, 28.
5 *Nature, Lond.*, 1948, **162**, 848.

RADIATION IN THE SHOE SHOP

Of workers exposed to radiation hazards those at the Atomic Energy Research Station at Harwell are probably safer than most. Very elaborate precautions are taken to ensure that the accepted tolerance dose of radiation is not exceeded, and the measurements made indicate that they succeed in their object. In view of this and of the similar precautions taken in *x*-ray departments in hospitals throughout the world it is disturbing that any man, woman, or child can subject his or her own feet to unknown doses of radiation in a shoe shop. Attention has been drawn to this method of salesmanship during the last two years in several articles in American medical journals,[1-4] and our comment here is based on work done in the U.S.A. and not in this country. Nevertheless, although shoe-fitting fluoroscopes are less commonly used here, there is little doubt that more machines will be installed in shops if they improve sales.

The customer who wishes to use the shoe-fitting fluoroscope places his or her foot over an *x*-ray tube from

1 Williams, C. R., *New Engl. J. Med.*, 1949, **241**, 333.
2 Hempelmann, L. H., ibid., 1949, **241**, 335.
3 Frederick, W. G., and Smith, R. G., *Amer. industr. Hyg. Ass. Quart.*, 1948, **9**, 89.
4 Lewis, L., and Caplan, P. E., *Calif. Med.*, 1950, **72**, 26.

which a beam of *x* rays passes through the foot and casts an image on a fluorescent screen. Reflections from the screen can be seen at three openings in the top of the apparatus—by the customer, the salesman, and a third party. The *x*-ray beam is made to pass for a set time by pressing a button, and during this time radiation will be absorbed by the foot being examined, by the group of three at the apparatus, and by others in the shop or room. It must be accepted that the absorption of such radiation is harmful, but so is ultra-violet light in sunlight, and the degree of danger obviously depends on the amount of radiation absorbed. The apparatus usually works at 50 kV. It is mounted in a lead housing on a steel cabinet. Pressing the button will produce an *x*-ray beam lasting for 5–30 seconds, during which time a dose of 10–120 r could be given to the foot (the distance between the target and the skin being 7.5–20 cm.). There is nothing to prevent the button from being pressed repeatedly, and of course the customer can go from one shoe shop to another, undergoing the same experience in each.

To the customer the dangers of the apparatus are through direct radiation and to the salesman through scattered radiation from the foot-opening of the apparatus. At a distance of about 3 ft. (90 cm.) the dose received in one day might be approximately 1 r—about five times the recommended British and 10 times the American tolerance dose which should not be exceeded by those working with radiation. In practice, of course, apart from the salesman using the apparatus, the staff will usually be further away than 3 ft., and it is unlikely that one salesman would be concerned with as many as 150 exposures, which would be the number required, at 20 seconds each, to give this dose. Williams[1] considered that the fluoroscopes he examined were efficiently protected everywhere except at the bottom and back. Often there was a table just behind the apparatus, and salesmen working at it were thus in danger. Lewis and Caplan[4] measured the amount of radiation received by 77 shoe salesmen in California by issuing "film badges" to be carried when at work: two-thirds received no detectable amount of radiation, and of the rest only two received a dose in the neighbourhood of the tolerance dose, and that at foot level (one of the film badges being carried in the trouser cuff). Generally speaking the customer appears in greater danger than the salesman. In one shoe-fitting of 20 seconds—a common length of exposure—doses ranging from 12.8 r to 116 r have been recorded. It is possible that the exposure may be repeated at once in the same shop and again in other shops, and it is clear that large doses might be given. A growing child may receive unknown doses of radiation several times at different ages. An erythema can result from 250 r, and 300 r is considered capable of causing epiphysial growth disturbance in children. Apart from these dangers there is the possible risk of cancer many years later.

Is the shoe-fitting fluoroscope really necessary? Points of pressure on the fleshy parts probably escape detection in any case. According to Lewis and Caplan half of nearly 80 salesmen said that it was not of great practical use in shoe fitting: most considered its chief value was in sales promotion. It would seem desirable that this question should be considered by an appropriate panel of experts, who should decide first whether or not the use of the apparatus should be discontinued—a step which would probably result in no hardship to the customers' feet. If such fluoroscopes are to be used, however, they should be efficiently serviced, they should meet standard requirements of protection, including the bottom and the back of the case, and they should be kept in a separate room used for no other purpose. This room should be dimly lighted to improve the view of the image. The dangers of giving a large dose of radiation to the customer's foot or of demonstrating with his own hand or foot should be made clear to every salesman. A short limit to the exposure time is a suggestion made by health authorities in the U.S.A.—2 seconds in New York and 5 seconds in Detroit. A device to ensure this can be incorporated in the apparatus. It should also be possible to prevent repeated exposures at the same fitting. In addition, customers could be given a card recommending not more than a certain number of such exposures—the New York City Health Department, for instance, specifies not more than three per day and 12 per year. It should be made an offence to tamper with the screen or filter so as to give a brighter image.

It is easy to make regulations to control the shops, but no control of customers is possible, and subsequent disability or disease may arise without apparent cause. In view of the doubtful value of the apparatus and the uncontrollable danger to health, it might be wiser to discontinue its use altogether.

DANGERS OF BREATHING-MACHINES

When poliomyelitis is epidemic physicians and nurses in fever hospitals must come to dread the appearance of "yet another" patient with respiratory paralysis. There can be few methods of treatment which are more trying for the patient to endure or for the physician and nurse to direct than that of respiratory failure, especially with the inadequate facilities generally available in this country. Even the most important fever hospitals are short of staff, and the highly trained nurses who are required to "special" patients in respirators cannot be found. A mobile group of specially trained volunteers is probably what is needed to help with local outbreaks of the disease. An added difficulty is the fact that most

of the box respirators in this country are of the Both type and lack many features now considered desirable in respirator design. On another page Drs. R. B. Bourdillon, E. Davies-Jones, F. D. Stott, and L. M. Taylor record many observations on respiratory physiology, the subjects being patients with respiratory paralysis and healthy volunteers. They point out that measurements of the patient's tidal air may be of great value, and can be made with a spirometer such as is used in measuring basal metabolism. This can indicate, first the degree of respiratory failure, and secondly whether ventilation in the respirator is correct. Later it is most helpful to observe the gradual recovery of respiratory power with the object of judging the right time for the patient to be weaned from the respirator. The use of the spirometer in this way is an obvious advance and should be widely adopted.

The observations of this group of workers about the possible dangers of hyperventilation—especially with the Both machine, which will not run at less than 20 cycles per minute—are also very important. The symptoms and disturbance of consciousness which may be caused by prolonged hyperventilation have been studied by several workers.[1] In respirator-treated patients the symptoms may be mistaken for those of hypoxia, with the disastrous consequence that the negative suction of the machine will be increased further. It may be that hyperventilation contributes to the high rate of death in these cases. Certainly a good rule in practice is to keep trying to use the least necessary pressure, though periods of high pressure are often appreciated by the patient and can do no harm if maintained for only a few minutes: indeed one modern American respirator periodically gives an extra deep breath. The Both type of respirator has so many faults that a policy of improvement or replacement should be devised forthwith. The breathing machine should and could be made safe and comfortable, so that patients can be put in it early in the disease to obtain rest and sleep. There is in fact reason to think that early rest for the respiratory muscles will reduce the extent of respiratory paralysis. It should be possible to give nursing attention to the patient without causing respiratory distress, and without having to hear a terrified plea not to be taken out again. For even simple nursing attention the patient in the Both machine has to be taken out of the respirator, and therefore an efficient lung inflator should be available to maintain respiration.

There is still too much in the treatment of poliomyelitis which is unscientific, but it will be a great advance if rules of respirator treatment can be drawn up on a sound basis. Important studies on respiration and poliomyelitis have been and are being made in the U.S.A., and these should hasten understanding of the many problems yet unsolved.

[1] Cerrycr, H. M., *Proc. Mayo Clin.*, 1947, **22**, 456.

PHONOCARDIOGRAPHY

Graphic recording of heart sounds and murmurs, first practised at about the same time as electrocardiography, has failed to make similar progress. Owing to technical difficulties the early results were neither consistent nor comparable, but during the last decade the application of new physical methods has revived interest in the subject. An instrument which served as a model for subsequent workers was built by Rappaport and Sprague[1 2]; it consisted of crystal microphones, improved electrical amplifiers, and recording apparatus. They stressed the need to take three records in every case, and called them linear, stethoscopic, and logarithmic.

The linear phonocardiogram represents graphically the vibrations set up by cardiac action at the surface of the chest. This bears only distant relation to clinical auscultation, for as Leatham[3] has emphasized, if the low-frequency vibrations are to appear on a record of ordinary dimensions the higher frequency murmurs will not be seen. The stethoscopic record is modified by the same attenuation of low-frequency components as is caused by the average acoustic stethoscope. The logarithmic record is modified further, according to the practically logarithmic attenuation of low-frequencies exerted by the human ear, and is therefore an actual representation of what should be heard clinically. Murmurs are seen clearly in logarithmic records, while heart sounds will dominate linear records. Both sounds and murmurs will usually be seen reasonably distinctly in the stethoscopic record. Since some standardization of phonocardiographic records is long overdue this method seems practical. A reference tracing of some kind is necessary for the interpretation of the sound record. A simultaneously recorded electrocardiogram is the most usual, but is of value only as an indication of the beginning of ventricular systole and therefore of the ventricular part of the first sound. For the important problem of identification of events in diastole it may be necessary to record the jugular venous pulse, though the linear phonocardiogram usually gives a clear indication of the second and third heart sounds. The application of phonocardiography is particularly helpful in the analysis of triple heart rhythm. Evans[4] has shown that the placing and identification of additional sounds, often a difficult problem clinically, may be a simple matter graphically. Studies of the first heart sound have shown a wide range of normal variation. In eight cases reported by Alimurung, Rappaport, and Sprague[5] a diagnosis of mitral stenosis had been made on hearing a typical presystolic murmur at the apex. Phonocardiography proved this to be an auditory illusion due to several forms of variation of the first heart sound, in all of which the whole sound complex assumed a crescendo configuration.

Much of the evidence about phonocardiography of heart murmurs is conflicting, and serves to emphasize the fact that meticulous technique with good instruments in a quiet room is essential to avoid misleading results. Cowen[6]

[1] *Amer. Heart J.*, 1941, **21**, 257.
[2] Ibid., 1942, **23**, 591.
[3] *Post-Grad. med. J.*, 1949, **25**, 568.
[4] *Brit. Heart J.*, 1943, **5**, 205.
[5] *New Engl. J. Med.*, 1949, **241**, 631.
[6] *Brit. Heart J.*, 1949, **11**, 360.
[7] Ibid., 1947, **9**, 1.
[8] Ibid., 1947, **9**, 225.
[9] *Clinical Auscultation of the Heart*, 1949, London.

was unable to substantiate some of Evans's[7 8] earlier observations, particularly those on the important apical systolic murmur. In his series Cowen found that, while all the "innocent" murmurs started later than the S-wave of a simultaneous electrocardiogram, so also did many of the "systolic murmurs associated with definite valvular heart disease." In addition Levine and Harvey[9] have been unable to demonstrate a mid-diastolic murmur in all cases of mitral stenosis. Leatham[3] found that aortic systolic murmurs have a characteristic shape on sound records which distinguishes them from those of mitral origin: this should assist recognition of those cases of aortic disease with loud apical systolic murmurs. In theory, clinical auscultation should be more sensitive at the higher frequencies associated with the murmur of aortic incompetence. For murmurs of comparable intensity this is certainly true in practice, particularly when the diaphragm chest-piece is used. Conversely, the low-pitched murmurs associated with mitral stenosis can be more easily detected by phonocardiography than by clinical auscultation. The graphic method should prove most useful in confirming the diagnosis of mitral stenosis, or in providing evidence for its exclusion. It may be particularly helpful in the assessment of apical systolic murmurs in children with loud third heart sounds which may be confused with mid-diastolic murmurs.

For teaching purposes a loudspeaker may replace the recording apparatus of the phonocardiograph, the result being an amplifying stethoscope. It is very difficult to obtain faithful reproduction by this or other mechanical devices, and indeed, however faithful the reproduction, the method seems to be of very limited value. There can be no effective substitute for the practice of the close personal application of the acoustic stethoscope.

OPTIMISM IN MENTAL HOSPITALS

All psychiatrists are aware that mental-hospital practice is an entirely different thing now from what it was 20 or even 15 years ago. The extent of the revolution is made clearly evident by some recent statistics given in the annual report of the Crichton Royal Hospital, Dumfries. Twenty years ago most well-managed hospitals were able to secure a discharge rate of 30%, but much higher figures are now being recorded. During the three years 1945–7 the general discharge rate at the Crichton Royal has been 74%, 81%, and 85%. The change is very largely due to the widespread adoption of physical methods of treatment—electroshock, insulin coma, and leucotomy. At the Crichton Royal rather more than half the patients admitted have been subjected to one or more of these treatments, and among them the discharge rate has gone up from 88% in 1945 to 95% in 1947. But the advance is by no means confined to patients treated in this way: the discharge rate among the others is also very high, and has risen from 63% in 1945 to 73% in 1947. It is not to be supposed that the Crichton Royal is very exceptional among mental hospitals, and no doubt there are others which could publish figures nearly as satisfactory. In fact there is probably not a mental hospital in the country where the discharge rate has not taken a sharp upwards slant during the past 15 years. These bare figures reveal in cold statistical form a radical change in the atmosphere of the hospitals. Where there was once hopelessness, lethargy, and cynicism, there is now hopefulness, even confidence, and a willingness to undertake trying duties in the certainty that many of the patients will benefit. The improved results obtained even with patients not submitted to physical treatments shows how much can be done by other methods, by personal interest in the patients, simple psychotherapy adjusted to their needs, and efforts at rehabilitation. There are now very few patients for whom all efforts at treatment can be foreseen as hopeless: much improvement can often be obtained even in those most intractable cases where leucotomy is eventually thought necessary, as is shown by the fact that in different years the Crichton Royal could discharge 73–83% of these patients.

Therapeutic success is attended by a greatly increased interest in clinical problems. At many mental hospitals the medical staff forms itself into a society with regular meetings, which are also often attended by other members of the hospital team, including nurses, psychiatric social workers, and occupational therapists. At some hospitals this society is a centre at which medical men from the neighbourhood also forgather to hear guest lecturers and take part in discussions. Perhaps the most important change of all is shown in a different attitude on the part of patients and their relatives: a nervous or mental illness is now at least beginning to lose its stigma, and patients willingly seek admission for treatment. Thus the mental hospital is showing signs of at last becoming integrated into local society. So much gain could hardly have been made without loss. The debit side is seen in the greater demand for beds. Hospitals are overcrowded and often have long waiting-lists. Their administrators may refuse admission to any patient from outside the hospital area. Worst of all, admission is sometimes denied to patients who are willing to come voluntarily unless their relatives will permit them to be certified. If this tendency is allowed to progress it will cancel much of the gains that have been made. The present difficulty can be surmounted only by increasing the facilities for mental treatment; but in the meanwhile it should be possible to arrange priorities so that the mournful need for certification is not extended beyond its proper boundary.

SKIN CANCER AND CUTTING OILS

Study of malignant tumours of the skin yields an increasing fund of knowledge that should ultimately assist in the elucidation of the problem of cancer, for the pathology of disease in one organ does not differ materially from that in other organs. Since Percivall Pott described scrotal cancer as an occupational hazard in chimney-sweeps careful clinical observation backed by statistical analysis has established the carcinogenic role of many irritants, external and internal, in skin cancer. Oils and tar products, *x* rays and radium emanations, chronic infective diseases—such as lupus—ulcers, and scars are well-recognized causes of cancer. Much has been written about ultra-violet light and cancer of the exposed skin, and Neubauer's review[1] of arsenical cancer suggests that a number of patients with multiple carcinomata of the skin and trunk and limbs suffer in consequence of the ingestion of arsenic many years

[1] *Brit. J. Cancer*, 1947, **1**, 192.
[2] *Brit. J. industr. Med.*, 1950, **7**, 1.
[3] Sulzberger, M. B., *Brit. J. Derm. Syph.*, 1950, **62**, 53.

previously. Heredity, race, age, sex, hormonal and other influences, and obscure individual factors may play their part, but it is nevertheless true that in many cases the agent causing cancer of the skin can be recognized. It is possible to cure almost all skin growths, and great advances have been made in prophylaxis. Such successes are of course partly due to the ease with which the skin can be examined and treated.

Many of these points about skin cancer are brought out by Cruickshank and Squire,[2] who have recently investigated the effects of skin contamination with mineral oils among workers in the engineering industry in Birmingham. Cutting oils used with the automatic machine tool contaminate the skin of the worker, and this is not effectively controlled by splash guards and other devices, though improvements in such measures are suggested. Oil acne and folliculitis are seen in 80% of the workers, and over half of those who have been exposed for fifteen years or more develop "shark skin" or "shagreen skin"—a condition recognized as predisposing to cancerous change. One man with scrotal cancer was found among 138 patients examined, but a review of the cases of scrotal cancer observed in hospitals in the region during the previous ten years showed that about half of the patients concerned had worked with oil in the engineering industry. The skin changes observed by Cruickshank and Squire were related to the duration of exposure and not to the age of the patient. They draw attention to the fact that the light engineering industry is comparatively young and that the evidences of damage they present should be regarded as a warning of more serious trouble ahead unless effective prophylaxis is established. The question of the identity or the relationship of those factors in oil which provoke folliculitis and dermatitis to the carcinogenic properties of oil demands careful study. If "eczematogens" may, as suggested by some American workers, be carcinogenic, it would seem that the worker who reacts by dermatitis is fortunate in that he cannot tolerate the duration of exposure necessary for carcinomatous changes to develop.[3]

DRUG TREATMENT OF PARKINSONISM

We have recently referred[1] to some of the new synthetic compounds used in the treatment of parkinsonism, and in this issue of the *Journal* Drs. H. Palmer and D. J. A. Gallagher describe the encouraging results they have obtained with "lysivane"—a member of the same group of drugs as "diparcol." They believe that the results obtained with lysivane are better than those obtained with diparcol or "artane,"[2] but they are careful to state that it is dangerous to draw conclusions about the drug treatment of parkinsonism on too narrow a symptomatic basis. The history of "parpanit," for example, shows how the first enthusiasm for a new drug may have to be modified later. Parpanit, which is a di-ethylaminoethyl ester, was first investigated by Domenjoz[3] in 1946. He found it to have properties which are now recognized to be common to many substances, such as atropine, procaine, or papaverine—that is to say, parpanit relaxes smooth muscle, being a spasmolytic, paralyses the action of the vagus like atropine, and has a local anaesthetic action like procaine. It was, however, the observations of Grünthal[4] which led to its wider therapeutic use. He found that when it was given to normal subjects it produced a sensation of "rubber knees." They walked with uncertainty, as if on cotton-wool, and with freer, though less-controlled, movement: it was difficult to be sure of the position of the limbs; the body seemed lighter, and fatigue disappeared. The subjects complained of dizziness and were obliged to remain still. There was, however, no muscular weakness. In larger doses than 60 mg. there was a disagreeable alteration of personality.

Because of these findings parpanit was applied to the treatment of post-encephalitic parkinsonism, in which muscular rigidity is so marked, and great success was claimed.[5 6] Patients who for years had been reduced to complete immobility and required permanent nursing were able to look after themselves once more and even to resume their professional work. The effect of the drug was to reduce rigidity and improve mobility. Other symptoms such as tremor, the slowness of speech, and the typical parkinsonian posture were modified irregularly or perhaps not at all. Fleisch and Baud[7] provided objective evidence that parpanit does in fact reduce muscle tone. They were able to measure this effect in rabbits as the dose was raised from 8 to 40 mg. per kg. (These amounts are far greater than those given to man, which are about 1 mg. per kg.) They found that in man doses of 100 mg. of parpanit caused a drop in the tonus of the quadriceps, greatest after 90 minutes. This dose also caused a rise in the threshold stimulus for the patellar reflex and a diminished appreciation of a change in a weight supported by the hand. They concluded that the action of parpanit was on the sensory nerve endings for deep sensibility, which were depressed.

Clinical trials with parpanit have been reported by Schwab and Leigh[8] in the U.S.A. and by Dunham and Edwards[9] in this country. The latter gave some of their patients who were receiving the usual treatment with solanaceous drugs increasing doses of parpanit until side-effects appeared. Other patients were given optimal doses of parpanit as well as solanaceous drugs, and the latter were then gradually withdrawn. In a third group of patients a sudden change was made from solanaceous drugs to parpanit. The authors concluded that parpanit was certainly a useful drug in Parkinson's disease but that it had no clear advantage over solanaceous drugs. Some patients were better when taking parpanit, others when taking solanaceous drugs. When parpanit was effective it was equally so whether given alone or together with solanaceous drugs. The side-effects—dizziness, sensation of weakness, dryness of the mouth, and blurring of vision—were similar with both forms of treatment, but the first two were commoner with parpanit and the last two with the solanaceous drugs. Dunham and Edwards found no criteria by which they could forecast the effect of either treatment in any patient, except that patients who responded well to one also responded well to the other. It will be wise to suspend final judgment on the new drugs used in the treatment of parkinsonism until publication of the results of controlled tests.

[1] *British Medical Journal*, 1950, **2**, 29.
[2] *Lancet*, 1950, **2**, 307.
[3] *Schweiz. med. Wschr.*, 1946, **76**, 1282.
[4] Ibid., p. 1286.
[5] Ibid., p. 1289.
[6] *Rev. méd. Suisse rom.*, 1947, **67**, 708.
[7] *Helv. physiol. pharmacol. Acta*, 1948, **6**, 331.
[8] *J. Amer. med. Ass.*, 1949, **139**, 629.
[9] *Lancet*, 1948, **2**, 724.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

POLIOMYELITIS

BY

W. HOWLETT KELLEHER, M.D., D.P.H.

Physician Superintendent, Western Hospital, London

The current outbreak of this baffling disease should soon be reaching its peak, July, August, and September being almost invariably the months of greatest prevalence. In Britain the latter part of September may confidently be expected to show a decline in case incidence, although cases will continue to crop up sporadically during the winter months. Winter epidemics, however, have been encountered in some countries, although rarely. An instance of this was a recent severe outbreak in an Eskimo village during an exceptionally hard winter.

It is likely that the disease has been with us for thousands of years, though its ravages have not been apparent until comparatively recent times. Scandinavia had the unenviable distinction of providing the first real outbreaks, and the disease still remains a serious problem in Northern Europe. Somewhat later the United States suffered from serious outbreaks, notably that in New York in 1907, with more than 2,000 cases. But it was nine years before that city had its most serious outbreak, with over 9,000 cases and a mortality of more than 20%.

It is not within the scope of this article to discuss the theories held to account for the epidemic conflagration of poliomyelitis after it has been known to smoulder for many years. What we must accept as ominous is the expectation, borne out by the experience of other countries, that it will remain with us as a serious menace until more is known about its source and methods of control.

Causal Agent: Prophylaxis

A filterable virus, one of the smallest known, is the cause. There are several groups of poliomyelitis virus, the great majority of human infections being due to one group only, which can be transmitted to monkeys and contains several antigenic strains. The virus is inactivated by a temperature of 55° C. for 30 minutes, and by a 1 : 5,000 solution of potassium permanganate in normal saline. The virus in infected spinal cord can be inactivated by 0.3% formalin in 3½ days. Virus in suspensions of cord in acid solution is inactivated in 10 minutes in the presence of 0.05 p.p.m. of free chlorine. The usually adopted water-chlorination methods are believed to be ineffective in practice, especially in the presence of organic matter: if there is none, however, 0.2 p.p.m. of chlorine should be effective.

The virus has been isolated from sewage and sewage-contaminated water, and from flies, and may occur on unwashed fruit and vegetables. It can be recovered from the patient's oropharynx in the first week or so of the clinical disease and from the faeces in at least the first month or two. Healthy carriers are also known, while some people have been found to excrete the virus for some weeks before the onset of symptoms. These facts help in planning prophylaxis.

During the incubation period (see below) contacts should be kept under close observation and visits to infected households forbidden. During epidemic periods in localities where cases have occurred all unnecessary gatherings, especially of children, should be avoided. Exhausting physical exercise by children or young adults may facilitate infection or lead to more extensive paralysis if undertaken when the disease is beginning.

Some authorities have expressed the view that during a poliomyelitis outbreak inoculations which are not urgently required should be postponed. Operations such as tonsillectomy, adenoidectomy, and dental extraction should also be held over. A damaged mucous membrane may facilitate the entrance of infection.

Age Incidence and Immunity

Although the earlier epidemics in Britain showed up to a 90% attack rate in infants and young children, this group now accounts for little more than one-third of the cases, the other two-thirds being in children of school age and in the adolescent and adult population. Infants under 1 year old enjoy a relative immunity or may suffer a mild attack only. An example of this is the experience on more than one occasion in the Western Hospital that young nursing trainees in infant nurseries have suffered from non-paralytic or from severe paralytic attacks while their protégés appeared to escape entirely.

The mechanism of immunity is as yet unexplained. Plenty of evidence exists of the presence of a neutralizing antibody in the blood of both convalescents and infected adults in communities frequently affected by epidemics, but its presence does not guarantee immunity from attack. Second attacks of poliomyelitis can occur, although the risk of a second attack may be somewhat less for a year or two. Some, if not all, of the recorded cases may have been instances of infections with strains differing from the original infection. It is said that immunity is strain-specific. Serum therapy and prophylaxis have proved a failure.

Incubation Period

This has been variously estimated as between a few days and four or five weeks, but is commonly believed to be between 7 and 14 days. The disease experimentally produced or following injury or operation generally shows itself after 7 to 10 days. Where it has followed local tissue damage from inoculation, it may be noted in from two to four weeks.

Clinical Manifestations

The majority of clinical attacks show two phases. In the first, a stage of general systemic disturbance, it will be impossible in the majority of instances, particularly in the absence of an outbreak, to do more than keep the possibility of poliomyelitis virus infection in mind.

First Phase

The initial constitutional symptoms may closely simulate a virus respiratory tract infection. Cough, however, is only infrequently met with, but pharyngitis is common. Temperature varies within wide limits and no positive conclusions may be drawn from it. More significant may be severe headache, particularly frontal, and vomiting, probably of nervous rather than toxic origin. General muscular pains and lethargy are more noticeable than irritability at this stage. This phase of the disease is most variable in duration, and although it may occupy several days it is important to emphasize now that the briefest and slightest disturbance, a mild malaise and a temperature of 98.8° to 99.6° F. (37.1° to 37.6° C.), may be the only manifestation of poliomyelitis. That, of course, is the true abortive type. It is obvious that its identity, apart from laboratory assistance, can only be inferred—particularly if previous contact is known.

Second Phase

This may be separated from the initial phase by several days of comparative well-being, but in many cases it either merges into it or it may predominate from the start. Where the phases are clearly separated the temperature chart will characteristically show a "camel" (dromedary) curve. It is obvious both clinically and from histological studies that the second phase represents the inflammatory reaction due to viral attack on the central nervous system. It is a true meningo-encephalomyelitis, and the clinical signs vary little from those of any other infective or post-infective viral meningo-encephalitis. This true meningeal phase is almost invariably present in some degree before paralysis, but the paralysis may come on very rapidly, especially in infants, even within a few hours of onset of the first general symptoms. This is particularly so in those cases in which a monoplegia has been suspected to have been influenced by inoculation reaction.

Except in the rare encephalitic types, one of the most striking objective signs in the majority of patients, particularly in the presence of considerable pyrexia and other discomforts, is alertness merging into irritability, at least in young children (the adult is usually more apprehensive than irritable). Frontal headache is often very severe, and vomiting may recur. Generalized hyperaesthesia or pain and tenderness may be complained of, but, apart from that evoked through movement of muscles, painful spasm is not generally a common feature of cases in the pre-paralytic stage seen in the Western Hospital, however troublesome this may be at the onset or after the paralysis has become evident. Tendon and superficial reflexes may be temporarily exaggerated, and there may be fibrillary twitching of muscles.

It is obvious that where, as quite commonly happens, an inflammatory reaction in the mid-brain is marked, any degree of objective signs indicative of encephalitis may be encountered. Nystagmus is quite common and should always be looked for. Complaint is often made of insomnia, even in young persons, and when this is obviously not due to pain it should excite suspicion of early irritative encephalitic involvement.

Almost invariably present at this stage is some spasm of muscles with stiffness of posterior cervical and spinal groups and of the hamstrings, but it is a very variable sign. The elicitation and significance of this sign are amplified below. Retention of urine due to temporary bladder dysfunction is common, particularly where the lumbar cord is heavily damaged. Constipation may also be troublesome.

Methods of Examination and Assessment

For practical purposes and simplicity the following broad classification of cases may be adopted:

I. *Non-paralytic:* Abortive, meningeal, peripheral neuritic, cortical.

II. *Paralytic:* Bulbar, spinal, or combinations of both (bulbospinal).

The term "bulbar" is rather loosely used for any clinical type resulting from inflammation in any part of the brain-stem, although only applicable directly to the much more limited area of the medulla oblongata.

Abortive and Non-paralytic Poliomyelitis

"Abortive" is the name generally given to cases which have not shown signs of inflammation of the central nervous system, whereas non-paralytic cases have progressed to that stage but show no muscle weakness. It is obvious that the abortive case is normally diagnosed only by inference as a contact or with laboratory help. The only symptom may be a slight pyrexia of brief duration, and an abnormal cerebrospinal fluid (a protein level of more than 55 mg. per 100 ml.) alone aids the diagnosis. The real importance of diagnosis lies only in the potential infectivity of the abortive case, which is often a carrier. There is certainly no danger to life or health. Since abortive and non-paralytic infections are said to be 100 times more frequent than paralysed cases, the impracticability of hospital isolation of every abortive case is clear. A very large proportion of cases admitted to our special hospitals to-day on suspicion of poliomyelitis cannot be confirmed as even abortive attacks. Hospitalization is therefore not justified where definite neurological signs are absent. The practitioner's difficulties in face of the possibilities and of family apprehension can be understood, but both the patient and his family may best be served by allowing him to remain under daily supervision at home, and the burden on the hospitals will be considerably lightened, often by more than 50%.

Non-paralytic poliomyelitis includes all cases with the subjective and objective disturbances of the central nervous system known as meningeal irritation. This also is a large group. The hospitalization of such cases is fully justified and indeed important unless their removal creates physical or mental trauma with subsequent worsening of paralysis. Strict rest can be prescribed and a look-out maintained for the earliest signs of dangerous complications. If paralysis ensues it is often evident within a day or two of the onset of meningeal signs, but it may be delayed for many days. Although paralysis becomes maximal within 48 hours of its appearance, instances not infrequently occur where fresh lesions may continue to crop up for as long as seven days after the initial paralysis. For example, respiratory muscle involvement often takes some days to become apparent, a further reason for the hospitalization of the suspected case with meningeal signs.

Paralytic Poliomyelitis

As stated above, this may be spinal, bulbar (brain-stem), or combinations of both. As it still accounts for the largest number of paralytic cases, the spinal will be considered first.

It must be remembered that spinal paralysis includes not only cases of limb paralysis but trunk muscle lesions, including diaphragmatic and intercostal. Constipation and retention of urine probably come into a different category: function generally recovers in a few days.

The symptoms which usher in an attack differ in no respect from those enumerated above in relation to non-paralytic and abortive poliomyelitis. An amplification of the indications of muscle spasm is, however, called for.

(1) *Neck Rigidity.*—This is rarely so marked as in acute suppurative meningitis, but the differentiation from that seen in early tuberculous meningitis may be difficult. Only very rarely is true head retraction noted. Infants and young children

will often naturally resist any attempt at flexion, simulating a true rigidity. By attracting their attention so as to cause neck flexion or by raising them by the shoulders from the supine position (when they should normally flex the head) it is possible to remove the doubt.

(2) *Back Rigidity.*—This varies greatly. In some cases the condition may be so extremely painful as to make it impossible to get even slight flexion, and in others it may be so slight as only to be elicited by asking the sitting-up patient to kiss his knees, which are fully flexed, the thighs also being fully flexed and in the adducted position. Intermediate degrees are often seen, as where the patient can get himself into the sitting posture but because of rigidity or shortening cannot sustain it without using his extended arms placed behind him as in a tripod (Amoss's sign). Very often the difficulty in maintaining the sitting position is not due to stiffness of the spinal muscles but to hamstring muscles in spasm or shortened, and this can readily be demonstrated by sitting him on the edge of the bed with flexed knees, when he is found to be able to straighten his back fully. Incidentally this is an excellent position in which to make tests of the serratus and rhomboid muscles. Spasm of the neck and back muscles may, if prolonged and severe in a patient who is allowed to assume any comfortable position, result in considerable shortening with marked opisthotonus.

(3) *Kernig's Sign.*—This is frequently very marked in poliomyelitis, but it may be absent, especially in infants. Indeed, any or all of the muscular rigidities described above may be absent.

It should be emphasized that all these signs commonly occur in non-paralytic poliomyelitis as well as in all degrees of the paralytic disease. No information regarding the paralysis may be deduced from their intensity.

Paralysis or weakness when it occurs may be so slight as to require the finest tests for its detection, or it may be extreme. It is of lower motor neurone type with diminished or absent tendon reflexes. Even in the most extensively paralysed cases the asymmetry which is typical of poliomyelitis may be detected. Sensory loss should not be encountered, but there may be subjective disturbances—i.e., a feeling of numbness—and in later stages poor circulation and trophic changes may give rise to local sensory disturbances.

The commonest sites of paralysis are the lower limbs and the shoulder girdle, in that order. In the leg the quadriceps, the anterior tibial, and the peroneal groups are most commonly affected, in the arm the deltoid and triceps muscles. When a whole limb is involved the lesion is, except possibly in infants, easily recognized, and one will be concerned merely with making a differential diagnosis. It is, however, with the lesser degrees of dysfunction that detection is difficult, and this makes a meticulous examination necessary. A suggested scheme of examination has been set out in detail by the present author.*

Useful Clinical Points

The examination should be systematic, commencing with the head and neck and proceeding to the upper extremities and shoulder girdle, the trunk muscles and the lower extremities. Certain points must be noted:

(1) With shoulder-girdle involvement look out for diaphragmatic and/or intercostal weakness.

(2) With lower extremity weakness watch for retention.

(3) Immobilization due to pain may give rise to an erroneous impression of the severity of the paralysis.

(4) The abdominal recti are often asymmetrically attacked.

(5) Even in very young children substitute movements to correct the defect of paralysis can very quickly be learned. A frequent example of this is rotation of the scapula to produce abduction of the arm, and tilting the pelvis to help the dorsiflexion of the foot.

(6) In examination of infants accurate estimates of power may be made by the active resistance of the infant to handling. The more annoyed he is the better for one's purpose. Tempting with a toy or a sweet, or stimuli such as plantar tickling, will help greatly. Even assessment of minor weakness may quite accurately be made in this way.

(7) No single examination in a suspected case will suffice. Quite apart from the possibility of an extension of the paralysis or weakness, there are the factors of uncooperativeness and pain which may distort the picture. Continued raised temperature in the pre-paralytic phase or an unsettled one after the onset of the paralysis should make one alert to the possibility of extension. Following such stages a settled temperature for several days almost invariably denotes quiescence, with little further risk.

(8) Paresis when slight may often be detected only when the suspected muscle or group is compared with the opposing limb.

(9) Wasting may be hidden, in babies particularly, by fat. It is usually evident after about a fortnight.

(10) Absent or sluggish reflexes do not necessarily denote the presence of paralysis or even of paresis, but where an asymmetry of response is undoubted it is rarely misleading. The triceps and ankle jerks of normal infants are often difficult to elicit.

(11) Rapid deformity—e.g., foot-drop—may develop through spasm and shortening of opposing muscle groups; hence early diagnosis is of importance in prevention. Over-stretching of paretic muscles may seriously limit their recovery.

(12) Early recognition of respiratory muscle damage is necessary in order to avoid fatigue and further, perhaps irreversible, neurone damage through anoxia.

In any event an early consultation with a specialist colleague will help to avoid occasional pitfalls. Even those with extensive experience are not infrequently humiliated.

Prognosis in Spinal Paralysis

A flail limb in which no partial recovery has occurred in a few weeks is unlikely eventually to show even reasonable recovery. If there is no sign of return of power after four or five months the prognosis is almost negative. Where some recovery is evident early one may expect that with proper supervision the recovery will continue up to 18 months after onset. If neuronal recovery is to take place it does so within a few weeks.

The prognosis in recovery of movement is naturally greatly influenced by physical and orthopaedic treatment; full mobility of joints must be present before any power which remains can be utilized.

Bulbar (Brain-stem) Lesions

This is a most important group, to which full justice cannot be done in this necessarily condensed review. The 1947 admissions to the Western Hospital showed cranial nerve lesions in about one-third of all cases, which was considerably more than previously recorded. As in the spinal group, asymmetry and variability in symptomatology are the rule, ranging from the slightest of attacks to the most virulent. Rarely severe encephalitic symptoms are seen, but in the great majority of bulbar cases paralysis or weakness of certain cranial nerves is the only manifestation. Lesions of the upper group of cranial nerves (third to eighth) must be carefully looked for. For the detection of fifth-nerve involvement it may be necessary to make tests against resistance. Seventh-nerve lesions are relatively common and may occur alone. They are almost always of lower motor neurone type. Eighth-nerve (vestibular) disturbance is not uncommon, but frequently of brief duration.

*Kelleher, W. H., *Med. Pr.*, 1947, **218**, 452.

The lower group of cranial nerves is far more important because of the threat to life which extensive lesions involve. The ninth, if affected alone, and especially if unilateral, may cause little inconvenience. The more extensive combinations of the ninth, tenth, and twelfth cause great inconvenience and danger, due to obstruction of the airway by unswallowed buccal secretions. Another serious threat to life arises from complete laryngeal abductor paralysis, the approximation of the vocal cords causing great difficulty in inspiration. The difficulty is increased with spasm of the adductors. A common enough occurrence is eleventh-nerve paralysis, often detected only by muscle resistance tests.

By far the most fatal of all complications arises from inflammation of the respiratory centre in the medulla, giving rise to variations in depth, rate, and rhythm of breathing, or from defects of the vasomotor centre in the same area leading to circulatory failure.

No examination of a poliomyelitis patient is complete, therefore, until a careful test of the cranial nerves has been made. The pharynx should always be carefully inspected, as prompt treatment (e.g., postural drainage) may avert disaster.

Respiratory Failure

In addition to the commonly fatal type of respiratory failure arising from bulbar damage, it is most important to be able to make an early diagnosis of the more treatable muscle (spinal) paralysis or weakness. Careful and repeated inspection is necessary, particularly where shoulder-girdle paralysis is present. Serious anoxaemia may have occurred long before mechanical defect is obvious. When dyspnoea is present the patient is in urgent need of artificial respiration. Among the earlier signs are an increasing restlessness, anxiety, sweating, dilatation of pupils, and an increasing pulse rate. Later, accessory muscles may be brought into play. Dilatation of alae nasi may be noted, and speech tends to become staccato or jerky. Stethoscopic examination should reveal poor air entry to the lungs, especially at the bases. Defective epigastric excursion may be seen or such excursion may be entirely absent. Often only the upper intercostals may be found active, aided by accessory muscles. Attempts at coughing will be noted as extremely ineffectual.

Unfortunately, a not uncommon combination is that of pharyngeal or laryngeal dysfunction with a blocked airway and a respiratory (spinal) failure. The prognosis here is extremely serious. Central (medullary) respiratory failure is almost invariably fatal.

Differential Diagnosis

This bristles with difficulties as judged by hospital admissions of suspects. In the initial stages with general systemic disturbance many cases of tonsillitis, otitis media, rheumatism, and catarrhal respiratory infections arrive in hospital. There is also an increasing number of cases of pyrexia of unknown origin. Admittedly, many of these could be abortive poliomyelitis and justify diagnostic lumbar puncture, but in inter-epidemic periods or where there is no question of contact it can be justified only on academic grounds.

In the meningeal stage and in the absence of paralysis the examination of the cerebrospinal fluid is fully justified, particularly where tuberculous meningitis must be excluded, since early treatment of that condition is now imperative; this is true also of pyogenic meningeal infections and cerebral abscess. Subarachnoid haemorrhage can be a cause of confusion, in the author's experience.

When paralysis develops the toxic neuropathies must be excluded, rarely with difficulty. Cerebral vascular lesions even in children (thrombosis) are not rare. Trauma of nerve tissue, myelitis, and tumours have all caused confusion. Acute toxic polyneuritis (Guillain-Barré syndrome) is often difficult to differentiate from severe forms. Pseudoparalysis may simulate poliomyelitis, and here mistakes are less excusable.

Pain fixation from any cause (rheumatism, arthritis, or injury) must be excluded. Spasm of muscles due to pelvic inflammation may immobilize the hip. Erythema nodosum and acute osteomyelitis occasionally cause confusion. Again, less excusable are fractures and dislocations.

Treatment

There is no specific for this disease. None of the newly developed antibiotics appear to have any activity against the virus. There is almost universal agreement that the claims for serum (convalescent or gamma-globulin fraction) cannot be supported, even if administered in the pre-paralytic stage. The value of any method is most difficult to assess owing to the very large number of abortive and non-paralytic cases, and also because spontaneous recovery may occur in paralytic cases.

Physical and Orthopaedic Treatment.—Strict rest is necessary for pre-paralytic and early paralytic cases, both for avoidance of discomfort and for the prevention of the spread of paralysis as a result of fatigue. Sedatives and analgesics have their uses in diminishing pain and irritability, but must be cautiously used in the presence of respiratory paralysis. Apart from dealing with mechanical defects (e.g., respiratory dysfunction) and the correction of physiological upset, treatment will be directed to the prevention of deformity in paralysed limbs and the encouragement by various physical methods of the action of muscles or parts.

In former days the idea of treatment by strict immobilization held the field. This is now regarded by many orthopaedists as harmful and by others as certainly no better than methods involving freedom of movement of limbs. The important thing is to transfer responsibility for the treatment of the paralysed condition very early to the physical-medicine department of a hospital where the advice of an orthopaedic surgeon can be obtained. The majority of the authorities believe that passive movement with or without hot moist packs is ultimately of the greatest benefit in preventing deformities, wasting, and trophic changes. Gradually introduced and carefully graded active exercises are commenced quite early. These measures are greatly assisted when carried out in a warm bath or with the aid of supportive slings.

The Kenny Treatment.—The principles of treatment advocated by Miss Elizabeth Kenny make a heavy demand on staff and time. A modified technique is in use in many orthopaedic departments in this country. Few, however, can afford to omit splinting entirely. The majority combine a modified splinting technique with passive and active movements assisted by hot packs in the earlier stages. If no splints are employed the part must be frequently examined and the position corrected, measures hardly obtainable in the comparatively sparsely staffed physiotherapy departments of to-day.

Respiratory Failure.—This can be treated only in hospital, spinal paralysis cases being placed in a respirator, while postural drainage and aspiration, perhaps combined with tracheotomy, may help the bulbar group.

PORPHYRIN METABOLISM AND PORPHYRIA

A University of London lecture was recently given at the London School of Hygiene and Tropical Medicine by Professor C. J. Watson, who holds the chair of medicine in the University of Minnesota. Professor Claude Rimington presided.

Professor Watson said that the first published work on the subject of porphyrin metabolism was Sir Archibald Garrod's Bradshaw Lecture in 1900. Much work had been done since then, and in his own studies he had received a great deal of stimulus and pleasure from contemporary British workers on the porphyrin problem, particularly Rimington and Gray. It was not surprising that the earlier investigations in this field were confused, and that there was difficulty in recognizing the porphyrins. Fisher was the first to differentiate natural and artificial porphyrins, and he gave them the classification which was generally in use to-day and was being amplified as the work proceeded. With regard to uroporphyrin, until two or three years ago it was not possible to determine which isomeric type was preponderant in any sample of urine except by very costly and time-consuming methods, but Schmidt had now worked out a method of analysing the isomer ratio with small amounts of urine, such as 50 ml., although sometimes 200 ml. had to be used. During the past two years also a good deal of interest had been taken in the precursors or chromogens of the porphyrins, and it had become clear that not enough attention had been given to the chromogen of coproporphyrin. It had been generally accepted that the chromogen was converted quickly to a porphyrin, and that its quantitative determination was of no concern. The problem in this field was not quite so simple. When urine was extracted with ethyl acetate a certain extraction of porphyrin was obtained, but if the solution were exposed to violet light or iodine a considerable additional amount of porphyrin, which had been left behind by the ethyl acetate and overlooked because it neither fluoresced nor had colour, was forthcoming. It had been calculated that the chromogens in the urine constituted 75% of the total porphyrin excreted. In the faeces the proportion was from 5% to 20%, but this amount might be larger, since the extraction method used might serve to convert chromogen to porphyrin.

With the congenital type of porphyria, known as the photosensitive type, the patient developed skin lesions over the years, exhibited haemolytic anaemia and hepato-splenomegaly, and had an excess of uro- and coproporphyrins in the urine. The patient with the intermittent or acute type of disease might go on for years in good health, and then develop severe symptoms, with a fatal result. This disease was more common in females, whereas the photosensitive type was more often seen in males, although this difference had been over-emphasized in previous literature. In this type the nervous manifestations were striking, and it was characterized also by severe abdominal pain, which might imitate that attending any abdominal condition. Pigmentation of the skin of a dark brown or blackish colour, which might be confused with Addison's disease, was noted. Often there was impairment of hepatic function and sometimes a development of cirrhosis. Waldenström's porphyrins were excreted. Waldenström was the first to isolate the porphyrins in crystalline form and work with them in considerable detail. There was also a third type of the disease which might be described as mixed, the patients showing some photo-sensitivity and some nervous and abdominal manifestations. In the photosensitive type there was an absence of what Waldenström called porphobilinogen, but in the intermittent acute type this substance was found.

The lecturer said that he and his associates were inclined to the view that coproporphyrin was the precursor of uroporphyrin, but the question was still open and must be left for future discussion. Coproporphyrin did not occur in the red blood cells of patients with porphyria. Schmidt produced acute lead poisoning in rabbits, killed them, and analysed the bone marrow, finding protoporphyrin in considerable amount, but no higher coproporphyrin than in the circulating red cells.

Putting these various findings together, said Professor Watson in conclusion, a rather significant observation had recently been made by one of the workers in his laboratory. He had set out to study photo-dynamic activity in porphyrin metabolism because he had found large amounts of one type of coproporphyrin extracted in patients with pemphigus foliaceus. Finding an enhanced photo-dynamic reaction, he had tried out various substances to determine whether any of them would inhibit or prevent such reaction. Nicotinic acid in large amount appeared to have a mild but definite moderating effect, and folic acid almost completely prevented the excretion of coproporphyrin. The significance of this in relation to other disturbances of porphyrin metabolism remained to be determined.

Correspondence

The G.P.'s Clinical Training

SIR,—Dr. D. McI. Johnson's article (*Journal*, August 26, p. 493) on his clinical training of twenty-five years ago makes strange reading. He has not a good thing to say of his medical school. It is incredible. Should he be allowed to get away with this murder? We have often read the boast—a corollary to the other one about the G.P. being the backbone of the profession—that the British medical student is taught to use his eyes, ears, and hands rather than gobble up the output of a machine. A quarter of a century has redeemed Dr. Johnson, but is there not evidence in his account that a major defect in his student experience was his own lack of interest? Dumped unasked into the profession by a professional father, did he have any sense of the importance of what was going on? What would a Martin Arrowsmith have done with his chances?

Someone may rise to the challenge on behalf of the Bart's of that time; my purpose is to counter with the good things in another medical school (Belfast) of a little over twenty-five years ago.

In your first clinical year you were placed, one of a small class, in charge of a tutor who was willing to discuss, and sometimes had to argue. During your second clinical year you could be selected for six months' residence. You really "dressed." You did side-room pathology. You did jobs in the extern and took charge of it at night. You spent Sunday morning dilating strictures for old gonorrhoeal heroes. You anaesthetized for cold lists and emergencies. By the end of the second clinical year you could, if diligent, be in possession of all your class certificates. That meant that in your final hospital year you could direct your own activities; pick the teachers from whom you learned best or, if you preferred it, immure yourself with the patient in the ward and see if you really could detect the presence and nature of valvular and other cardiac lesions by studying the behaviour of the pulse before resorting to your stethoscope. Or you could take a trip to the poor-law hospital and expand or fill-in amongst an astounding wealth of long-stay clinical material.

It would be impossible nowadays to shake hands over your qualifying script with fifty or sixty anaesthetics for major operations behind you—such lushness would be frowned on; but what the medical student in the crowded teaching hospital needs is the liberty of the large non-teaching hospital. The bugbear of the snob teacher is bad teaching, and he is loth to let the fledgling out of his sight. Bad teaching, however, means often enough somebody else's, as a good shoot-up at the Royal Society of Medicine will reveal. The country is full of good clinical material going to waste. Properly used, it would thin out the ranks around the ward beds; pupilships would bring students into intimate clinical medicine, the daily following of the morbid process that Sydenham taught us, as a refreshing change from watching the pointing finger of an academic Cratylus.—I am, etc.,

London, E.7. ROBERT POOTS.

SIR,—I rejoice at Dr. D. McI. Johnson's article (August 26, p. 493). I would like to add a point, and I consider it as important as all that he has written. I desire to protest against the system of student "ragging." It was the etiquette *not* to

ask questions of qualified students, and to ask questions on cases of the students, even those just up from their second examination (I speak of 30 years ago). The exact reverse should be the case. The student should not be expected to know anything. He should be told the diagnosis, etc., and given the opportunity to examine, it being explained what to look for. It is recorded of even Faraday, among the greatest of observers, that he expressed appreciation when, before an experiment was demonstrated to him by another physicist, he was told what to look for.

Personally I used to blush with confusion and went through untold suffering. It was perfectly unreasonable to expect me to know anything about it. Also I venture to say that, owing to this system, fully half of the clinical teaching time was completely wasted. "Teaching" as such—i.e., "drumming in"—was not called for at all. Most of us were highly intelligent, and it would have been better etiquette and kinder to have assumed that we all were. All that was necessary was to pass on the clinical knowledge; association of ideas, judgment, and differential diagnosis would all come from its accumulation. I may mention that I also was an entrance scholar.

I am not sure that I entirely agree with Dr. McI. Johnson's concluding sentences. Teachers in general are born, not made. It is, however, essential for our teachers to be told what a G.P. should be expected to know. They just do not know. At the date that I started in general practice as an assistant I had never seen a piece of wax in any ear.

This idea of a year extra at hospital as intern is perfectly ridiculous. Hospital practice and general practice are mutually exclusive. It is the function of general practice to treat minor or moderately important cases and to sort out major cases for hospital or specialist (of course bearing in mind that the former may later become the latter). Also, in general practice we have to treat the patient as well as the disease. At hospital really only the disease is thought of. The psychology of the patient, what his own ideas may be and what he (or she) comes to the doctor expecting; to what extent he is influenced by advertisements and newspapers and how to deal with this psychology for his or her benefit *and keep the patient*: all this can only come from actual general practice—half a century of hospital practice would be useless.—I am, etc.,

Dagenham, Essex. M. MELGRAVE.

SIR,—I have read with interest the article by "A London Medical Student" (*Journal*, August 26, p. 496), as, having myself qualified but a few years ago, I realize how well he has summed up the problem of medical education from the students' point of view.

I find, however, that I disagree with his recommendation that "it should be part of the registrar's very limited duties to teach junior students in the wards." Looking back on my time in the wards I remember that the teaching done by a registrar was too often most unsuitable for students—especially junior ones. There were, I think, several reasons for this.

First, the registrar has had little or no experience of teaching, and to put him before a group of students at their most impressionable time when they are newly thrust into the wards from the altogether different atmosphere of their preclinical studies is unfair to both parties.

Secondly, the registrar is himself working for a higher examination and his mind tends to be full of abstruse facts, which are precisely what a junior student does not need or want.

Thirdly, the registrar has had but a small experience of medical practice, whether in hospital or "outside," and so has not the wider knowledge necessary to be able to put across to his pupils in an interesting manner the *centre d'intérêt* of his teaching.

This last is, I feel, the most important point. A student must be interested in his subject, and a lot can be done towards this end by a man with many years in practice who is liked and respected and who can make the student interested by drawing on his experiences of people and patients to illustrate and italicize his teaching.—I am, etc.,

Swindon. DAVID F. ALEXANDER.

Pernicious Anaemia and Gastric Carcinoma

SIR,—I like to argue that pernicious anaemia and gastric carcinoma arise together more often than they should by chance; but that there is no evidence that gastric carcinoma has an excessive incidence in the long-standing P.A. patient. Your annotation (August 12, p. 405) states that Mosbech and Videbaek's data fail to support me and that the increased risk of gastric carcinoma is spread out throughout life. If this is so, the risk at any one moment must be approximately trebled. The risk of a P.A. patient aged 50 developing a carcinoma of the stomach would be about the same as the risk in a man aged 60 without P.A.; and the risk in a P.A. patient aged 60 would be about the same as in a healthy man of 70 (Jennings, 1947). The patient with P.A. behaves as if his stomach is ten years older than he is. The additional risk is small and insufficient to justify annual barium meals, or gastroscopies as Schindler recommends.

The facts as stated can, however, be interpreted differently. Mosbech and Videbaek have not as yet published detailed figures, but the following calculation, based on their paper (August 12, p. 390), is quite accurate enough. Since 219 women are followed up for an average period of 10.7 years, there are 2,343.3 female patient-years (10.7 × 219); and there are eight female deaths from gastric carcinoma instead of the 3.5 which we are told would be expected in a similar population without P.A. The 2,343.3 patient-years can be divided into 982.5 patient-years within five years of the onset of P.A. and 1,360.8 patient-years during the period 5–25 years from the onset.

The figure 982.5 is calculated as follows. The 174 women who were followed up for more than five years—i.e., throughout the first five years—give 870 patient-years (5 × 174). The 32 women who die in the first five years can be assumed without substantial inaccuracy to average two and a half years each and give 80 patient-years (2½ × 32); and the 13 patients who have been followed up for less than five years can also be assumed to average two and a half years each, giving 32.5 patient-years (2½ × 13).

If the risk per 1,000 patient-years was the same in the two periods, the 982.5 patient-years within five years of diagnosis would give an expected figure of 1.5 deaths; and the 1,360.8 patient-years during the subsequent 20 years would give two deaths. Actually, however, the patients during the second period must on an average be about 10 years older, and hence the risk per 1,000 years in the second period must be about three times higher. We are thus justified in constructing our table as follows:

Incidence of Gastric Carcinoma in 219 Female P.A. Patients

	Number of Deaths	
	Actual	Expected
Within 5 years of onset of P.A.	5	<1
From 5–25 years after onset of P.A.	3	>2.5
Total	8	3.5

A less than 1 in 1,000 chance should not turn up five times in 982.5 patient-years, and the increased incidence in the first five years after diagnosis is significant. Many of us now believe that latent slow-growing gastric carcinomata are not uncommon. If this is true, full investigation of these 219 women when their P.A. was first diagnosed might have led to the discovery of four or five neoplasms in a relatively hopeful stage.

It is difficult to offer any explanation for Mosbech and Videbaek's male group, but a number of points suggest that there is a sampling fallacy. Could something like this have happened and led to the inclusion of two or three patients who should have been omitted? A patient is treated by his own doctor for pernicious anaemia for a number of years and then something happens. Either he or his doctor becomes dissatisfied. He is sent to a first-class hospital with a P.A. clinic and with special diagnostic facilities. Nothing is found. Two years later he develops carcinoma of the stomach and he is classified as one of the hospital P.A. series who develops carcinoma. In reality he only went to the hospital because his carcinoma was developing; and his neighbour across the street with P.A. who develops a coronary thrombosis or obstruction from a colonic cancer continues to be treated by the general practitioner until he has to be admitted to the little local hospital. In a small series this only needs to happen in 5–10% of cases and

most misleading figures will result. Ordinary hospital records are almost useless for statistical purposes because one can never feel confident that one knows exactly how and why the patient came to the hospital in the first place.—I am, etc.,

London, E.1. DENYS JENNINGS.

REFERENCE

Jennings, D. (1947). *Brit. J. Radiol.*, **20**, 522.

SIR,—In their paper on gastric carcinoma in pernicious anaemia Drs. J. Mosbech and A. Videbaek (*Journal*, August 12, p. 390) refer to other series of cases in addition to their small series, but they make no reference to the large series reported from my clinic at intervals in the past years. As recently as 1948 I reported[1] perhaps the largest series of patients personally observed in the course of 20 years—my present number being 1,820 patients. The causes of death during this period of 301 patients (20%) out of 1,480 who had been treated with liver and/or stomach preparations showed only 1.1% (17) had died of pernicious anaemia, owing to refusal or discontinuance of treatment; the commonest killing diseases in my observed and adequately treated pernicious anaemias were non-gastric cancers (42), cerebral haemorrhage (38), gastric cancer (28), pneumonia (26), and cardiac diseases (18). I have referred in the past to the probability of an increased frequency of carcinoma in these cases in consequence of their much greater expectations of life on modern treatments. This is now being borne out, as time goes on, for, of 1,820 patients with pernicious anaemia seen and treated by me during the last 21 years, 81 have already developed malignant disease; of these, only 34 had gastric carcinomata (19 males, 15 females), the remaining 47 being affected in the caecum, colon, and rectum (5 male, 6 female), oral, pharyngeal, and oesophageal tissues (6 male, 5 female), breast (6), cervix and vagina (5), epithelial tissues (3 male, 1 female), pancreas (1 male, 2 female), bones (1 male, 1 female), prostate (2), and one each liver, bladder, lung. Their sex distribution was 42 females and 39 males.

These are in contrast with the much smaller numbers of Drs. Mosbech and Videbaek, who had 115 deaths (a mortality of 38%) in 301 cases, finding 14 gastric carcinomata and only seven other neoplastic conditions (13 females, 8 males). Apart from the mortality rate in Drs. Mosbech and Videbaek's series, which is almost double that seen in my own group, the sex frequencies are different, for they had 219 females and 82 males (2.67:1), whereas my patients were divided into 1,097 females and 723 males (1.51:1). The familial occurrence of achlorhydria and of pernicious anaemia is well known, as well as in other conditions such as, among others, hypochromic anaemia, diabetes, and perhaps gastric carcinoma. I would refer to previous papers in which these have been very fully considered.[1 2 3] Of course, achlorhydria can hardly be expected to play much part in the greater occurrence of non-gastric neoplasms in pernicious anaemia. I propose to report further on my results at an early date.—I am, etc.,

Manchester, 13. JOHN F. WILKINSON.

REFERENCES

1 Wilkinson, J. F., *Lancet*, 1949, **1**, 249, 291, 336.
2 —— and Brockbank, W., *Quart. J. Med.*, 1931, **24**, 219.
3 Oliver, T. H., and Wilkinson, J. F., ibid., 1933, n s., **2**, 431.

Psychological Polemics

SIR,—In his review of my book *Freud or Jung* (August 19, p. 446), Dr. Eliot Slater breaks an antique lance in support of eclecticism in matters concerning the psychology of the unconscious. "It is perfectly possible," he says, "to build new theories from fragments taken from Freud and Jung." This is a truism which no one who has followed the development of clinical psychology in this and other countries would dream of disputing. Nor would anyone dispute Dr. Slater's right to engage in this popular pursuit.

His further contention cannot, however, be allowed to pass unchallenged. In my final chapter I maintained that since Jungian theory is completely incompatible with Freudian theory, a fact which Jung himself would not be inclined to deny, the psychological eclectic, however well-intentioned, cannot have it both ways. "This," says Dr. Slater, "is not the way in which science has progressed." But surely this is precisely one of the ways in which science has progressed. No doubt in their time there were astronomers to spare who favoured a compromise between the Ptolemaic and the Copernican systems. There may even have been flat-earthers who gained a passing reputation for scientific detachment by their readiness to agree that the world was also round. But, however much they may have supported their "new" theories by a "capacity for making predictions which prove true when subjected to the test of experience," it may be doubted whether their efforts to get the "best" out of opposing theories contributed any more to the progress of science than does Dr. Slater's naive incursion into the polemics of unconscious psychology.—I am, etc.,

London, W.1. EDWARD GLOVER.

Foetal Pathology and Vitamin A

SIR,—In your leading article on foetal pathology (August 12, p. 404) you mentioned the effect of maternal German measles in producing congenital abnormalities of the eyes and heart, but you did not mention that lack of vitamin A in the maternal diet produces congenital abnormalities in the eyes of piglets[1] and in the eyes[2] and hearts of rats.[3] The latter "are of particular interest because they show remarkable similarity to many congenital cardiovascular conditions that occur in man."[3] As even trivial infections or fever greatly reduce the level of vitamin A in the blood, the foetus must be exposed to a sudden severe deficiency of vitamin A whenever the mother develops an infection. It is therefore tempting to suggest that German measles acts on the foetus indirectly, by its effect on the level of vitamin A in the maternal blood. If this is indeed so, then in those cases of mothers with German measles where the termination of the pregnancy is not considered wise vitamin A should be given. Since during fever the level of vitamin A in the blood cannot be raised by giving it orally, the active vitamin A alcohol should be injected as an aqueous dispersion.—I am, etc.,

London, W.1. FRANKLIN BICKNELL.

REFERENCES

1 Hale, F., *Tex. St. J. Med.*, 1937, **33**, 228.
2 Warkany, J., and Schraffenberger, E., *Arch. Ophthal*, *Chicago*, 1946, **35**, 150.
3 Wilson, J. G., and Warkany, J., *Pediatrics*, 1950, **5**, 708.

Chemotherapy in Tuberculosis

SIR,—The value of any treatment in tuberculosis needs critical assessment, and conditions of therapeutic trial of a new drug or procedure to be controlled. In assessment of results, one must recognize that bed-rest regimen by itself will improve many cases of pulmonary tuberculosis or bring about clinical recovery. The results of treatment by the newer drugs—antibiotic or other—can sometimes better be judged when treatment is begun after some months of strict bed rest. Only then are we entitled to impute beneficial results entirely to chemotherapy, when we have carefully watched progress under conservative treatment alone and judged thereby of the degree of native resistance possessed by patients. Too often such an expectant attitude is overruled both in regard to treatment by pneumothorax or other collapse measure and to chemotherapy, the consequence being that treatment is inaugurated occasionally without a preliminary trial of bed rest and relaxation.

From the practical viewpoint of wishing to do quickly all possible to promote recovery in tuberculosis, it is understandable that specific treatment by drugs may be commenced sometimes precipitately. From the scientific aspect we think it injudicious that papers should be published, cases demonstrated at clinical meetings, etc., purporting to show the efficacy of chemotherapy in tuberculosis either without an adequately controlled series or without taking into account the effects of an initial period of solely conservative treatment.

At a time when the use of the new drugs has advanced little beyond the stage of clinical trial it seems opportune to draw attention again to types of pulmonary tuberculosis prone to heal spontaneously. Chronic and subacute generalized miliary tuberculosis of lungs and also miliary infiltration localized in one lobe or segment ("localized miliary tuberculosis"[1]) are among the categories in which healing tends to occur, unaided by collapse or drug therapy. Where miliary infiltrates are accompanied by thin-walled cavities seen radiologically ("cavitation complex"[2 3]) it is our experience that spontaneous healing and cavity-closure are particularly liable to take place, given sufficient time. Strict and prolonged bed rest and supportive treatment can heal or cause to become quiescent other types of disease which cannot be fitted into any of the above groups. Numerous phthisical persons have been regularly followed-up over a period of years and their lung condition observed by serial radiography during the same period.

The plea in this letter is not to decry the great benefits now afforded by chemotherapy, of which the value in selected cases is beyond dispute and is often outstanding. Our purpose is to induce others, in recording results of treatment, to weigh in the balance the results obtainable by bed rest alone for a preliminary period of months.

One may question, for instance, the validity of conclusions reached where chemotherapy has been begun without delay in those who have had a recent haemoptysis. Cases have been put on record in which rapid clearing of *x*-ray shadows in the lungs has been attributed to chemotherapy. In "post-haemoptysis" patients it has long been recognized that abnormal *x*-ray appearances may be due to numerous small atelectases, or to non-specific lesions, as well as to spread of tuberculous disease. It is indispensable to show by serial radiography during the ensuing weeks or months whether or not these *x*-ray manifestations after haemoptysis are specific tuberculous lesions. If they are non-specific, they will usually resolve without chemotherapy. If they are tuberculous they, too, may clear in time under bed rest and conservative measures. When antibiotics or other drugs are given in these cases without preliminary observation and assessment of the results of bed rest, then one is not justified in attributing success solely to the drug or combination of drugs that is being used. There are types of tuberculosis in which one should not deprive the patient of chemotherapy instituted at the earliest moment—toxic, exudative, or acute miliary disease, cases of advancing early or intermediate disease, painful ulcerative lesions of larynx or pharynx, etc. One does not blame, either, the doctor who gives an immediate trial of specific therapy to those in whom alternative treatment is not feasible and the prognosis appears grave.

Nevertheless we feel that, as has happened to some extent in the use of sulphonamides and penicillin in certain non-tuberculous conditions, misuse of chemotherapy in tuberculosis may soon arise, if it has not already, unless the considerations mentioned in this letter and others are constantly borne in mind by doctors, both in and outside institutions, who are called upon to treat the disease.—We are, etc.,

Hull. LASAR DUNNER.
R. HARDY.

REFERENCES

1 Dunner, L., *Amer. J. Roentgenol.*, 1947, **58**, 283.
2 —— *Brit. J. Radiol.*, 1944, **17**, 274.
3 —— *Tubercle, Lond.*, 1947, **28**, 144.

Crisis in Tuberculosis

SIR,—Dr. W. H. Tattersall (*Journal*, August 12, p. 416) made a plea for the necessary facilities for the chest physicians to do their job. This relates in particular to the provision of beds under the control of the chest physician in local hospitals. Speaking as one who has no beds, I must agree wholeheartedly, but I cannot share his implied optimism that Ministry of Health memorandum R.H.B. (50) 64 (see *Journal*, July 15, p. 162) will quickly improve the bed position. There is far too much deep-rooted opposition to the provision of beds for pulmonary tuberculosis in general hospitals. With regard to the question of central control of beds, it is obvious that a proportion of any such beds must be under the control of the local chest physician if the Central Middlesex scheme (to which the Minister has given his blessing) is to be duplicated in other areas.

In the meantime the responsibility for treatment of the tuberculous patient during the first 6–12 months after diagnosis falls on the local chest physician. While domiciliary treatment of tuberculosis is no new thing (tuberculous patients spend a large proportion of their lives outside sanatoria), an organized attempt to treat all classes of pulmonary tuberculosis in the patient's home from the time of diagnosis is something which has never been a necessary part of the tuberculosis service. It is at least gratifying that the Minister has given his approval to the efforts of some chest physicians to offset the breakdown of the tuberculosis service by instituting active domiciliary treatment of the tuberculous.

In the Borough of Southwark such a scheme has been in operation for over four years. We try to bring a sanatorium regime into the patient's home, and no treatment is begun until it has been proved that the patient understands and obeys the fundamental principle of bed rest. At the end of the first month the patient is brought to the chest clinic by ambulance for a further *x* ray, B.S.R., etc., and the case is then reviewed and subsequent treatment is planned. This treatment may include artificial pneumothorax, pneumoperitoneum, phrenic crush (done at local hospitals), or chemotherapy. A further period of bed rest may often be necessary before collapse therapy is considered safe. The induction of a P.P. or A.P. is done in the patient's home, followed by two refills at two- and five-day intervals. The patient is brought to the clinic by ambulance 13 days after induction for radiography and refill, and subsequently every week until fit enough to attend by public transport. Owing to the difficulty of getting a thoracoscopy, pneumothorax is not attempted if there appears to be any risk of complications. In a case needing thoracoscopy urgently, I am able to arrange for this to be done only through the personal courtesy of a thoracic surgeon and a physician. The regional hospital board can give me no assistance in this direction. As a result of this a P.P. is much more often found to be the safer operation, and with the increasing use of chemotherapy the time between diagnosis and the induction of collapse therapy is becoming longer.

This scheme has proved remarkably satisfactory, but it has of course involved considerable extra work not only for the medical staff but also for the health visitors and clerical staff. There is no doubt that the psychological effect on the patient who knows that something is being done for him must be considered, as well as the institution of sound treatment at the time it is required rather than when the impersonal central waiting-list permits.

The Ministry memorandum also refers to the desirability of early diagnosis and to the necessity for co-operation with general practitioners. In my view the general practitioners will co-operate only if the chest clinic gives them a good service. In 1942 in Southwark I instituted a scheme for radiography of the chest of all cases with minor symptoms of respiratory disease. The response to this has progressively increased. In 1949 nearly 3,000 films were taken. During the past eight years between 2% and 3% of hitherto undiagnosed tuberculosis in need of treatment has been found, besides many other interesting non-tuberculous conditions.—I am, etc.,

London, S.E.17. E. K. PRITCHARD.

Bact. coli and Infantile Gastro-enteritis

SIR,—Your recent editorial comment (*Journal*, July 22, p. 205; see also August 19, p. 460) on the confused terminology of those members of the *Bact. coli* group which are now being studied in association with infantile gastro-enteritis was not undeserved. The terms "alpha" and "beta" types, which were applied by us[1] to organisms isolated in Aberdeen during the 1947 epidemic of gastro-enteritis, were only labels which seemed useful at the time to identify certain serological types. Bray[2] used the term *Bact. coli neapolitanum* for organisms with which our alpha type was serologically identical. However, this term suggests a uniformity of biochemical properties, which is far from being the case. The alpha type, which has since been antigenically classified by Kauffmann as O:111; B3; H −, shows several biochemical variants and has in fact been isolated as a non-lactose fermenter. Taylor[3] in her original paper called the organism D 433, and Rogers[4] named it the B.G.T. strain of *Bact. coli*. In view of the fact, however, that there is at least one more distinct serological type of *Bact. coli* which is frequently found in cases of infantile gastro-enteritis—namely, the beta type (in Kauffmann's classification, O:55; B4, H −)—it might be advantageous to group both organisms together under a common name.

When Kauffmann's serological classification of the coli group is complete we may find that all potentially pathogenic strains associated with gastro-enteritis have certain antigenic properties in common, and it may then be possible to devise a more rational nomenclature. Until such time and in view of their clinical association with gastro-enteritis, I suggest that the two types be labelled *Bact. coli* G.E., types a and b respectively.

Should further serological types of organisms in this group be found in association with gastro-enteritis in infants, or even in adults, they could then simply be styled *Bact. coli* G.E., types c, d, . . . , etc. I hope that this will meet widespread criticism of ambiguous terms originally introduced by us.—I am, etc.,

Stoke-on-Trent. C. GILES.

REFERENCES

1 Giles, C., Sangster, G., and Smith, J., *Arch. Dis. Childh.*, 1949, **24**, 45.
2 Bray, J., *J. Path. Bact.*, 1945, **57**, 239.
3 Taylor, J., Powell, B. W., and Wright, J., *British Medical Journal*, 1949, **2**, 117.
4 Rogers, K. B., Koegler, S. J., and Gerrard, J., ibid., 1949, **2**, 1501.

Training in Preventive Medicine

SIR,—In his presidential address reported in the *Journal* of August 12 (*Supplement*, p. 85) Dr. Gray performs a service in drawing attention to the fact that the main qualification for the practice of preventive medicine is an attitude of mind rather than special experience, and that teaching arrangements as we know them to-day are in many ways ill suited to the task of developing this approach in the future doctor. The student learns from, and has before him as examples, men who have spent the bulk of their professional lives—and that is usually synonymous with their working lives—in the specialized atmosphere of hospitals and in addition, generally speaking, whose daily work is confined to a relatively small section of medicine. Furthermore, the private practice of the hospital consultant has its own peculiar characteristics.

Throughout his three clinical years and during his resident post—the formative years as far as medical education is concerned—the student is in contact with his patients in circumstances divorced from the daily life of the latter. The patient is away from his family, friends, and work, and is quite outside his normal environment. In professional life, however, most doctors meet their patients in their home or working surroundings, and on leaving hospital find they have to see health and sickness in relation to other characteristics of society in quite different perspective—a re-orientation which would be at least minimized if the student were given a broader basis of training during his clinical years.

The medical curriculum has been subject to much criticism and some revision, but I am stimulated by Dr. Gray's address to suggest that some profit might accrue from the institution of ward rounds primarily intended for the purpose of teaching and discussing the social, industrial, and legal aspects of disease. These rounds would best be taken by industrial medical officers, public health medical officers, and some general practitioners who have the background best suited for the task. It seems to me that such rounds could also be integrated with a very much modified course of lectures on public health (I am of course referring only to undergraduate education).—I am, etc.,

Long Stratton. A. E. BROWN.

Antenatal Separation of Umbilical Cord

SIR,—I was much interested in Dr. Annie Sydenham's case of antenatal separation of the umbilical cord (*Journal*, July 1, p. 50), for I had a similar experience about 18 months ago.

The patient, a European primigravida aged 23, had a perfectly normal pregnancy until the 37th week, when she reported that, after some excessive foetal activity, movements ceased and had not reappeared during three days. On examination everything appeared normal except that no movements could be detected, nor could the foetal heart be heard. A radiograph showed overlapping of the cranial bones. Labour not having supervened in a week, an artificial rupture of the membranes was done, and the liquor was found to be heavily coloured with old blood. Owing to the softness of the head the subsequent labour had to be assisted by forceps, but was otherwise normal, and on the birth of the child the cord was observed to be detached at the umbilicus. The placenta was normal. The severed end of the cord was sealed over by membrane over retracted tissue, and the vessels were full of blood clot. The baby weighed 7 lb. 2 oz. (3.2 kg.), and the cord was 28 in. (70 cm.) in length.

The possibilities are extreme torsion of the cord, or several turns round the foetal body or limbs, and a sudden foetal movement causing avulsion. No other explanation could be found, and she has recently had a normal delivery of a full-term baby.—I am, etc.,

Nairobi. KEITH DUFF.

Obituary

SIR JOHN STRATHEARN, C.B.E., M.D.

Sir John Strathearn, who was warden and chief surgeon of the Ophthalmic Hospital of St. John in Jerusalem for the greater part of his professional life, died in Wimborne on August 14 at the age of 71.

John Calderwood Strathearn was educated at the Glasgow High School and at the Universities of Glasgow, Edinburgh, and Berlin. He graduated M.B., Ch.B. in 1901, and proceeded M.D. in 1905. He became a Fellow of the Royal College of Surgeons of Edinburgh in 1911. After holding a number of resident appointments in hospitals in Glasgow he decided to specialize in ophthalmic surgery. In 1908 he was appointed assistant surgeon at the British Ophthalmic Hospital in Jerusalem, but he returned to Scotland in 1911 and set up in practice as an ophthalmic surgeon in Dundee. He was appointed ophthalmic surgeon to the Dundee school board and to the education committee of the Fife County Council.

During the first world war his work in Egypt and Palestine was recognized by the award of the O.B.E. After the war he returned to Palestine, where he remained until his retirement in 1940. During this period his work at the Ophthalmic Hospital of St. John in Jerusalem earned him fame and honour. His advice on ophthalmic problems was often sought by the Government of Palestine, to which he was appointed consultant ophthalmic surgeon. In a country where trachoma is rife and the percentage of blindness as great as, if not greater than, anywhere in the world, his work was of unfailing value. He was promoted C.B.E. in 1928 and was knighted in 1936. He published a number of papers, the best known of which was on the subject of blindness in Palestine. When he returned to England in 1940 his health was not good, but after he had recovered from a serious illness he worked as a surgeon in the E.M.S. In 1946 he finally retired to his house in Dorset.

Dr. Norman Wren writes: The Ophthalmic Hospital of the Order of St. John of Jerusalem has behind it a long tradition of service. It traces its descent from "a little hospital for Christian pilgrims dedicated to St. John the Baptist under the rule of a certain brother Gerard" which the crusaders found in existence when they captured the city of Jerusalem in 1099. Many men have carried on this tradition since then, but John Strathearn did more, he raised it so that the name of the hospital became a household word throughout the scattered towns and small villages of Palestine, Syria, and Transjordan. Even in more distant Arabia his name was known among the wandering Bedouins. I was privileged to work as his sub-warden in the troublous years between 1933 and the early days of the last war. His never flagging patience, his calm unassuming manner, his keen sense of humour, and his great skill as a surgeon were both an education and an inspiration which members of his staff cannot easily forget. The patients at his hospital were his guests, and were treated with the same unfailing courtesy which he accorded in his own home. He spoke Arabic fluently, and had a deep understanding of the ways and customs of those among whom he worked, so that in his contact with them proverb met with proverb, and their difficulties were often solved by the kindly advice he was ever ready to give. Throughout his busy life in Palestine he received untiring help from his wife, who survives him. Such men as John Strathearn need no memorial. It is for ever written in the minds of those among whom they have worked.

E. D. F. writes: In Palestine there is a high incidence of diseases of the eye, and the Ophthalmic Hospital of St. John in Jerusalem is correspondingly hard pressed. To picture a session in such a hospital—a crowded English "out-patients" transposed into an Oriental key—is an exercise for the imagination. Heat and smell and colour contribute generously to tumult. But where Strathearn was working there was quiet, and he was able to exhort and to encourage, to treat and to teach, without raising his voice. For many years he worked with a complete lack of ostentation, and his personality made an imprint on the whole country. Townsfolk, villagers, and nomads all knew, even if they could not pronounce, his name. Doctors and nurses came to St. John's to learn from his deep experience, and his friends came to enjoy his hospitality, and, if he might be persuaded, to hear him play the piano. He slept but ill, and during the night would plan his complicated time-table and gather reserves of quietude for the noisy daylight. Quietude was his genius. Clinical insight, surgical skill, musical talent, patience, wisdom, and humour seemed only secondary attributes of a quiet and modest man.

W. J. DILLING, M.B.

Professor W. J. Dilling, holder of the chair of pharmacology in the University of Liverpool since 1930, died suddenly at his country home in Coniston on August 18 at the age of 64.

Walter James Dilling was educated at Robert Gordon's College and Aberdeen University. He graduated M.B., Ch.B. with honours in 1907. Shortly afterwards he was appointed second assistant in the department of physiology under Professor MacWilliam and became Carnegie research scholar in physiology. Two years later as Carnegie research fellow in pharmacology he went to Rostock University to work under Professor Rudolf Kobert, to whom he became first assistant. He returned to Aberdeen as lecturer in pharmacology, organizing there the first student course in experimental pharmacology in Great Britain. In 1914 he was appointed Robert Pollok Lecturer in materia medica and pharmacology at Glasgow, a post which he held till 1920, when he went to Liverpool as lecturer in pharmacology. His pre-eminence in his own subject and his talents in the larger sphere of academic statesmanship were speedily recognized. He was accorded the title of associate professor in 1926, and in 1930 became the first holder of the chair of pharmacology. His help was sought by most of the universities in the British Isles as external examiner. He was an honorary member of the Pharmaceutical Society. His gifts as an administrator found an outlet in his appointment as Dean of the Faculty of Medicine of Liverpool University in 1924, a position which he held for the next 11 years and again throughout the strenuous war years. On the national level he was a member of the General Medical Council and a Privy Council representative on the Council of the Pharmaceutical Society.

Dilling was the author of many papers on pharmacological subjects, and his best-known work was the *Pharmacology and Therapeutics of the Materia Medica*, which he had just revised for the nineteenth edition at the time of his death. His erudition and his immense capacity for work were seen to advantage in the zeal and thoroughness with which he carried through the task of revision at frequent intervals over a long period of years. He was also the joint author of *Dental Materia Medica, Pharmacology and Therapeutics*.

He served with the R.A.M.C. in both world wars. From 1915 to 1919 he was attached to the Royal Herbert Hospital at Woolwich. During the second world war he added to the duties of professor and dean the arduous task of commanding the medical company of the University Senior Training Corps, holding the rank of major. Long hours superintending the reception of convoys of sick and wounded, often by night, took heavy toll of health and vigour, but the sacrifice was cheerfully made. Dilling took an active part at several of the Annual Meetings of the B.M.A., and was vice-president of the Section of Therapeutics and Pharmacology in 1928 and 1932. He was a member of the Medical Planning Commission set up in 1940.

Professor Dilling was a man of exceptionally varied interests, and he had many friends. He never failed a colleague, and his staff were devoted to him. Harsh criticism was completely foreign to his nature, and his tolerence and understanding were an encouragement to many who sought his help. An easy and friendly manner coupled with a shrewd tongue endeared him not only to his own students but to the Students' Union as a whole, to which he was for years senior treasurer. His name is honoured in the city of Liverpool because of his services to music. His enthusiasm for opera dated back to early days in Germany, and of his many recreational interests music always held pride of place. As its president he was a tower of strength to the University Musical Society. He was a member of the committee of the Liverpool Philharmonic Society for 20 years. He was elected chairman in 1936 and was again chairman when the new Philharmonic Hall, of which the city is justly proud, was opened in 1939.

He leaves a widow and two daughters, one a doctor and the other a senior medical student. A host of friends share their sorrow.—R. W. B.

G. DRUMMOND ROBINSON, M.D., F.R.C.P.

Dr. G. Drummond Robinson, Consultant Obstetric Surgeon to the Westminster and West London Hospitals, died at Royston on August 19 at the age of 85.

George Drummond Robinson, the son of a doctor, was born in Jamaica, and was educated at Bedford School and St. Bartholomew's Hospital. He graduated M.B. in 1889 and proceeded M.D. in 1891. He took the M.R.C.P. in 1893 and became a Fellow of the Royal College of Physicians in 1906. After qualification he held a number of appointments at St. Bartholomew's Hospital, including that of tutor in obstetrics and gynaecology, and he was appointed assistant obstetric physician at the West London Hospital in 1896. He joined the staff of the Westminster Hospital in 1900 and became obstetric and gynaecological surgeon there in 1908; he was also on the staffs at the British Lying-in Hospital, the Western Dispensary, and the West End Hospital for Nervous Diseases. He was examiner in obstetrics and gynaecology for the Conjoint Board and for the Universities of Cambridge, London, and Wales, and published a number of papers on subjects connected with his specialty. Robinson married in 1906 and is survived by his widow and two daughters.

Mr. A. Goodwin writes: Drummond Robinson belonged to a generation in which clinical teaching was regarded as the very essence of medicine. Those were the days when the patient was everything; her look, her own description of her symptoms, her own history (however trivial the details might appear) were all important in trying to find out why she felt ill. In those days the students were taught by him to use their eyes, their hands, their ears, and even their

noses in striving to arrive at a diagnosis. 'Charts, graphs, x-ray photographs, and laboratory reports were regarded as assets to drive home the findings at the bedside and not as a means of making a diagnosis fit someone who had hardly been looked at. There must be many like myself who met him in the later years of his active hospital service who will ever remember his teaching as a classical example of how to approach a patient.

In his earlier days gynaecology was only slowly being recognized as one of the important branches of general surgery, and gynaecologists were apt to be regarded as rather doubtful hybrids of physicians and surgeons. Perhaps because of this his interests were centred more upon the diagnosis than upon the surgical treatment of women's diseases, but he had a progressive mind that was always open to suggestions. He was quick to recognize the great value of cinematography in teaching, his film of normal labour being one of the first of such teaching films to be produced in this country. He remains in the memory of those of us who had the privilege of walking round the wards and working with him as a great teacher of clinical medicine and a most gracious, kindly, and gentle man who never forgot those who had worked for him; indeed, his wonderful letters spurred them on to yet greater efforts.

Dr. FLORENCE LOUIS died on August 16 in London at the age of 46. She studied medicine at the Royal Free Hospital and graduated M.B., B.S. in 1927. She proceeded M.D. in 1932, and took the M.R.C.P. in 1930. She won a number of distinctions at the London School of Medicine for Women, including the Julia Cock postgraduate scholarship and the Gant Medal. She was in turn house-physician, resident pathologist, medical registrar, and curator of the museum at the Royal Free Hospital, and at the time of her death she was physician to the South London Hospital for Women. While she was still a young resident in hospital she discovered that she had diabetes, and with characteristic courage decided that this should not influence her way of life. She married during her appointment as medical registrar and had two sons. During the war she lost her much-loved doctor brother at Arnhem and her younger son, and from that time she drove herself hard, seeing patients, performing post-mortem examinations, and teaching students. During the last year she suffered a succession of illnesses so severe that those who saw her marvelled at her recovery. Her amazing courage and tenacity enabled her to surmount each crushing blow, for she knew too much to be in any doubt of their significance. She was a lovable and lovely person, relentless in her pursuit of knowledge and in her efforts to help her patients. She was a woman of great integrity who had suffered all her life from "the slings and arrows of outrageous fortune" and had not become embittered in the process. Her husband and son have the sympathy of all her friends in the departure of so rare a person.—D. J. K. B.

The Need for Emotional Adjustments in the Elderly, by Dr. L. Cosin, is a pamphlet published by the National Council of Social Service, Inc. (price 1s., from 26, Bedford Square, London, W.C.1), which, though primarily addressed to the wardens of old people's hostels, should prove useful to all who care for the elderly. He tells the story of an old lady who became quarrelsome and suspicious after a few months in a well-organized and economically run hostel, and shows the importance of taking a careful social history in such a case. It emerged that the warden had no knowledge of the emotional attitudes and medical condition of her old people, and when she began to run the hostel like a family instead of like a hotel things improved. Incontinence in the elderly may sometimes be an expression of an unbearable feeling of loneliness. Old people need plenty of encouragement, and work, however simple, which can give them self-confidence and a social position, and the author outlines how this can be done.

No. 32

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 12.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	21	1	19	2	—	19	—	18	3	—
Deaths		1	—				—	1		
Diphtheria	49	5	12	1	3	89	7	26	2	3
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	211	9	80	—	—	45	5	81	—	1
Deaths		—			—					—
Encephalitis, acute	9	—	—		—	—	—	—	1	—
Deaths		—		—			—			
Erysipelas			13	2	1			11	8	6
Deaths							—			
Infective enteritis or diarrhoea under 2 years	14		2	32	—	21		4	92	1
Deaths				2					5	
Measles*	6,420	474	90	149	54	3,683	273	71	121	66
Deaths†			1	1	—			—	—	—
Ophthalmia neonatorum	37	1	23	—	—	26	2	8	—	—
Deaths										
Paratyphoid fever	2	—	—	1 (B)	—	37	1	1 (B)	2 (B)	1 (B)
Deaths	—		—		—	—		—		—
Pneumonia, influenzal	256	14	1		2	220	15	2	2	—
Deaths (from influenza)‡	7	—	—	1	—	4	—	1	—	—
Pneumonia, primary			109	¶				103	14	
Deaths	135	26		3	5	94	16		2	5
Poliomyelitis, acute	392	25	58	3	16	186	31	10	3	—
Deaths§	23	—		—		12	1			
Puerperal fever		—	7				—	6		
Deaths										
Puerperal pyrexia‖	93	4	7	1	—	78	6	12	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	695	27	96	49	48	854	45	134	41	28
Deaths†			—	—	—			—	1	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	—	3	1	1	5	—	1	9	2
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths		—		—	—		—		—	—
Whooping-cough	3,422	253	256	54	21	1,566	74	43	67	85
Deaths	4	—	1	1	—	4	—	—	—	—
Deaths (0–1 year)	191	20	28	24	8	198	31	29	11	6
Deaths (excluding stillbirths)	3,963	577	503	145	91	3,632	563	465	135	103
Annual death rate (per 1,000 persons living)			10·1					9·3	8·4	
Live births	6,627	1094	863	386	228	7,121	1161	868	356	219
Annual rate per 1,000 persons living			17·3					17·4	22·1	
Stillbirths	167	12	19			169	24	20		
Rate per 1,000 total births (including stillborn)			22					23		

* Measles is not notifiable in Scotland and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended August 19 were: paralytic, 375 (275); non-paralytic, 175 (117); total, 550 (392). The figures for the previous week are shown in parentheses. The increase in total notifications compared with the preceding week was 158, and of these the bulk was due to more numerous notifications in the county areas indicated below:

	Week Ending Aug. 12	Week Ending Aug. 19	Increase
Yorks (W.R.)	21	45	24
London	25	38	13
Warwick	34	47	13
Yorks (N.R.)	4	15	11
Essex	12	23	11
Gloucester	15	26	11
Worcester	16	26	10
Devon	4	14	10
Middlesex	14	23	9
Bucks	—	6	6
Cornwall	—	6	6
	145	269	124

The proportion of non-paralytic cases in the week under review was approximately 32%. The only county areas with no notifications in the two-week period ending August 19 were Huntingdon, Suffolk (West), and the Welsh counties Cardigan, Merioneth, and Radnor. The following counties contributed only 1 notification in these two weeks: Suffolk (East), Anglesey, Brecknock, Caernarvon, Pembroke, and Soke of Peterborough.

The uncorrected notifications in 1947, 1948, and 1949 for the week corresponding to that under review were 691, 78, and 296, respectively.

Discussion of Table

In *England and Wales* decreases were recorded in the number of notifications of measles 1,553, whooping-cough 265, and scarlet fever 261, while the only rises were dysentery 32 and acute poliomyelitis 25.

The largest decreases in the number of notifications of measles were London 190, Gloucestershire 183, Warwickshire 159, Lancashire 112, and the largest rise in incidence was Shropshire 67. No changes were reported in the local trends of diphtheria. Only small variations occurred in the trends of scarlet fever; the largest were decreases in Nottinghamshire 24 and Southampton 23. The only fluctuations of note in the trends of whooping-cough were a fall of 72 in Nottinghamshire and a rise of 42 in Lancashire.

A further rise in the outbreak of dysentery in Leicestershire was reported, 46 cases being notified during the week (Leicester C.B. 43). The other large returns were: Lancashire 52 (Oldham C.B. 14), Yorkshire West Riding 49 (Morley M.B. 24), Durham 10.

The largest returns of acute poliomyelitis were: Lancashire, 36 (Liverpool C.B. 12, Blackpool C.B. 5, Manchester C.B. 5); Warwickshire, 34 (Birmingham C.B. 23, Sutton Coldfield M.B. 5); London, 25 (distributed over 14 boroughs); Lincolnshire, 25 (East Kesteven R.D. 13); Staffordshire, 22 (Wolverhampton C.B. 5); Yorkshire West Riding, 21 (York C.B. 5); Worcestershire, 16 (Dudley C.B. 5, Halesowen M.B. 5); Surrey, 15 (Godstone R.D. 6); Isle of Wight, 15 (rural district 9); Gloucestershire, 15 (Bristol C.B. 7); Glamorganshire, 13; Essex, 12.

In *Scotland* an increase of 45 was reported in the number of notifications of whooping-cough, and decreases were recorded for scarlet fever 19 and dysentery 7. The notifications of acute poliomyelitis were 5 more than in the preceding week. The largest returns were Glasgow 17, Dundee 9, and Fife county 4. The largest centres of dysentery were Glasgow 47, Edinburgh 11, Dundee 7, Lanark county 5. Three cases of typhoid fever were notified in Glasgow.

In *Eire* decreases occurred in the number of notifications of measles 23 and whooping-cough 15, and an increase for scarlet fever 15. The trend of scarlet fever and whooping-cough was mainly due to the experience of Dublin C.B.

In *Northern Ireland* the number of notifications of measles increased by 18 and those of whooping-cough decreased by 16. Sixteen cases of acute poliomyelitis were notified, the largest number during the present outbreak. The returns for acute poliomyelitis were Belfast C.B. 5, Down county 5, Antrim county 4, and Armagh county 2.

Returns for Week Ending August 19

The notifications of infectious diseases during the week in England and Wales included: scarlet fever 614, whooping-cough 3,939, diphtheria 31, measles 5,529, acute pneumonia 233, acute poliomyelitis 550, dysentery 141, paratyphoid fever 9, typhoid fever 9.

Medical News

W.H.O. Appointment

Dr. Pierre Dorolle has been appointed Deputy Director-General of the World Health Organization. Born in 1899, Dr. Dorolle completed his medical studies in Paris and Bordeaux and specialized in tropical medicine. He has had a wide experience of the control of epidemic diseases in the East.

Poland Withdraws from W.H.O.

Poland has withdrawn from the World Health Organization. The nine other countries which have done so are Albania, Bulgaria, Byelorussia, China, Czechoslovakia, Hungary, Rumania, the Soviet Union, and the Ukraine.

Price of Cortisone Reduced

The price of cortisone has been reduced from $95 to $50 per gramme by the manufacturers, Messrs. Merck and Co. The initial price was $200 per gramme.

Control of Smallpox

In the light of experience during the outbreak of smallpox in the West of Scotland in the spring of this year the Minister of Health has reviewed the arrangements for co-operation between hospitals and medical officers of health in regard to the control of epidemic disease and for the protection of hospital staffs who are liable to be brought into contact with such disease. A circular from the Ministry to hospital boards and committees states that boards should now examine the existing arrangements for co-operation between hospitals and medical officers of health to ensure that they are comprehensive, fully worked out, and generally understood. There should be standing arrangements to provide for the prompt transmission to the M.O.H. of the area, by channels which should be precisely defined in agreement with him, of information concerning any actual or suspected case of smallpox or other epidemic disease which may arise in or be admitted to the hospital. The M.O.H. should be consulted on preventive measures within the hospital to combat the spread of infection. The M.O.H. should send the hospital authorities information on the incidence of epidemic disease, since it may assist in early diagnosis. Nurses and other members of the hospital staffs who are liable to be exposed to risk of infection should be adequately protected against smallpox. Special arrangements should be made in those hospitals where the staff are specially at risk—e.g., in general, children's, and infectious-diseases hospitals. Staff should be offered vaccination or revaccination at least once in every three years. If a case or contact of smallpox arrives at the hospital or is likely to be admitted, vaccination should immediately be offered to all staff and their vaccinal state should be carefully checked. No general rule can be laid down making vaccination compulsory or requiring its acceptance as a condition of employment. In hospitals designated for the reception of smallpox cases special care must be taken to ensure that all members of the staff are adequately protected at all times. In offering vaccination to unvaccinated adolescents or adults the remote chance of complications should be explained.

International Congress of Haematology

On August 23 a dinner in honour of the International Congress of Haematology was held in the Guildhall, Cambridge. Delegates from all over the world were present. In proposing the toast to the Congress, Sir Lionel Whitby, the president, greeted in particular those who had come from distant parts, and said how grateful he was that so many representatives had come from North and from South America. One of the objects of the Congress was discussion on a friendly and personal level of the problems that interested them all. Here they had the opportunity of meeting face to face those whose writings they had read and perhaps criticized or admired.

The size of the Congress (more than 400 sat down to dinner) bore witness to the world-wide interest in haematology. Sir Lionel ended by paying a tribute to those responsible for the organization of the Congress, especially the secretary, Dr. Martin Hynes. Spurning the microphone, Dr. Chevallier, president of the European Society—and perhaps the only professor of haematology—responded eloquently to the toast, observing that the publication of Sir Lionel's book had shown him that Cambridge was not merely a place where young men rowed for exercise.

British Pharmacopoeia Commission

Mr. T. C. Denston, F.R.I.C., has been appointed secretary to the British Pharmacopoeia Commission in succession to Dr. C. H. Hampshire, who will retire on October 4.

Birmingham Medical Library

Birmingham University Medical School has been offered a donation sufficient to provide a new medical library. Plans for the library and a lecture theatre to accommodate 600 people have already been approved at an estimated cost of £100,000. The anonymous donor has been associated with the medical school all his life. During the past 12 years the annual intake at the school has risen from 60 to 110 students, and the library and lecture theatre will ease the difficulties of accommodation which have arisen during that period.

Prize for Investigation into Chest Disease

The American College of Chest Physicians offers a cash prize award of $250 for the best original contribution, preferably by a young investigator, on chest disease. The prize is open to contestants of other countries as well as those residing in the United States. The paper must be submitted to the executive office of the college, from which full particulars may be obtained, at 500, North Dearborn Street, Chicago 10, Illinois, not later than April 1, 1951.

Brussels Treaty Powers Health Committee

The sixth session of the Health Committee of the Brussels Treaty Powers is to be held in St. Andrew's House, Edinburgh, on September 7–9, under the chairmanship of Sir Andrew Davidson, chief medical officer of the Department of Health for Scotland. The committee was set up by the Governments of the Brussels Treaty countries—Belgium, France, Luxembourg, the Netherlands, and the United Kingdom—to consider the development on corresponding lines of health services in these countries. Some of the subjects to be considered at this session are the comparison of medical education, the exchange of medical and auxiliary medical personnel, the protection in wartime of the health of the civil population, and the standardization of blood transfusion apparatus.

Westminster Medical School

The inaugural address of the Westminster Medical School will be delivered by Sir Cecil P. G. Wakeley, President of the Royal College of Surgeons of England, at Church House, Great Smith Street, London, S.W.1, on Monday, October 2, at 3 p.m.

Film Congress

The Fourth Congress of the International Scientific Film Association will be held in Florence on October 14 to 22. There will be a Festival of Scientific Films during the congress. A special committee of the British Scientific Film Association has been formed to recommend films for submission to this festival, and the committee would be glad to have information as soon as possible about recent films. Full details about films for submission should be sent, including running time, gauge, date of production, brief synopsis, etc. Particulars may be obtained from the Scientific Film Association, 4, Great Russell Street, London, W.C.1.

Broncho-oesophagology

A theoretical and practical course in broncho-oesophagology will be held in the Amphithéâtre d'Anatomie des Hôpitaux de Paris on October 19–28. The number participating is limited to 24. Particulars may be obtained before September 30 from Dr. Jean Braine, l'Amphithéâtre d'Anatomie des Hôpitaux, 17, Rue du Fer à Moulin, Paris, 5e.

Courses in Psychiatry

A prospectus of training courses to be held in 1950–1 for psychiatrists, psychologists, and ancillary workers by the Tavistock Clinic may be obtained from the clinic at 2, Beaumont Street, London, W.1.

COMING EVENTS

Digestive Tract

A course on the pathology of the digestive tract will be held at the Hospital de la Santa Cruz y San Pablo, Barcelona, from October 5 to December 16. Particulars may be obtained from the director, Dr. F. Gallart Monés, Escuela de Patología Digestiva, Hospital de la Santa Cruz y San Pablo, Barcelona.

SOCIETIES AND LECTURES

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

Monday

CAMBRIDGE UNIVERSITY.—At Biochemical Laboratory, Cambridge, September 4, 3 p.m., "*Hormones and the Anterior Pituitary Gland*," by Dr. H. M. Evans (University of California). Free to all members of the University.

Friday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, September 8, 4.30 p.m., "*The Paralysis of Autonomic Ganglia*," by Dr. W. D. M. Paton.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Craib.—On August 20, 1950, at Devonshire Lodge, Eastbourne, to Ann (formerly Neely), wife of Dr. David Craib, a daughter.

Darke.—On August 17, 1950, at Shearwood Road Nursing Home, Sheffield, to Margaret (formerly Wild), wife of Dr. Christopher Darke, a sister for Jonathan and Christopher—Elizabeth Margaret.

Evershed.—On August 8, 1950, at the British Military Hospital, Nairobi, Kenya, to Elizabeth, wife of Squadron Leader T. A. Evershed, M.B., B.Chir., R.A.F., a daughter—Jennifer Margaret.

Lund.—On July 5, 1950, to Dr. Elizabeth Lund, wife of Dr. Maxwell Lund, F.R.C.S.Ed., of 65, Hosking Road, Pietermaritzburg, Natal, a son—Charles Robert.

Peach.—On August 13, 1950, at Colchester, to Pauline (formerly Ward), wife of A. N. Hamilton Peach, F.R.C.S., a daughter—Caroline Hamilton.

MARRIAGE

Molloy—Millett.—On August 5, 1950, at Canterbury, John Molloy to Joan Millett, M.B., B.S.

DEATHS

Bates.—On August 15, 1950, John Vincent Bates, *M.C.*, M.B., B.Ch., of West Malling, Kent.

Dodd.—On August 17, 1950, at 222, Woodstock Road, Oxford, Frederick Henry Dodd, M.R.C.S., L.R.C.P.

Foreman.—On January 15, 1950, Joseph Foreman, M.R.C.S., L.R.C.P., of 125, Macquarie Street, Sydney, Australia.

Glover.—On August 12, 1950, at Brailsford House, near Derby, Norman Glover, B.M., B.Ch.

Heard.—On August 16, 1950, at 7, Crossland Crescent, Peebles, Richard Heard, C.I.E., M.D., Major-General I.M.S., retired, aged 80.

Kerr.—On August 14, 1950, at the Royal West Sussex Hospital, Chichester, Arthur Edgar Kerr, M.B., B.Ch., of Tripp Hill House, Fittleworth, Sussex.

Ranken.—On August 7, 1950, at Royal Infirmary, Sunderland, Margaret Ranken, M.B., B.S., of St. George's Square, Sunderland.

Robinson.—On August 19, 1950, at Ivy Court, Royston, Herts, George Henkell Drummond Robinson, M.D., F.R.C.P., aged 85.

Any Questions?

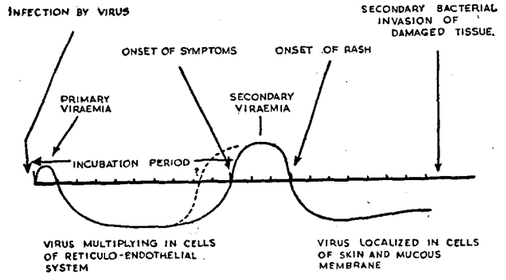
Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Treatment of Smallpox

Q.—*(a) Has chloromycetin any effect on smallpox? During a recent epidemic in India I had a patient with a continued rising pyrexia of six days' duration; she was delirious and seriously ill. Thinking that she was suffering from enteric fever, and without waiting for blood reports, on the sixth day I gave her chloromycetin, 3 g. immediately and 0.25 g. two-hourly. On the seventh day she had large areas of purpura and haematuria. On the eighth day there was no increase in the purpura and a rash very like the smallpox prodromal rash appeared. On the ninth day the typical smallpox rash began to appear, and the chloromycetin was discontinued. Her temperature gradually fell from 104.4° F. (40.2° C.) on the sixth day to normal on the ninth day. The smallpox rash was confluent, the entire dorsum of each of the hands and fingers and feet and toes being covered with one large vesicle. In spite of the severity of the disease, this patient showed no marked secondary rise of temperature. As soon as smallpox was diagnosed she was given sulphonamides and daily injections of liver extract, with the local application of concentrated solution of potassium permanganate. This case was by far the most serious that I treated in this epidemic, but with the exception of very mild cases was the only one in which there was no secondary rise in temperature. The only difference between the treatment of this case and the others was the chloromycetin. In spite of the severity of the rash she had practically no pitting—much less than the other cases—though there was much residual pigmentation of the skin, which now (six weeks after discharge from hospital) is gradually fading. I cannot help but feel that the chloromycetin had a marked effect on the outcome of this case. Is there any other evidence of its having a beneficial effect in the treatment of smallpox?*

(b) I have recently been treating cases of confluent smallpox with intravenous injections of potassium permanganate. I believe that this treatment lessens the risk of septic complications. It was noticed that the lesions remained dry, that irritation was diminished, and that the characteristic smell of confluent smallpox was hardly noticeable. Is the permanganate reduced by the haemoglobin in the blood and is there any risk in treating patients with an intravenous injection of 10 ml. of 1/1,000 potassium permanganate daily for several days?

A.—As a background to the treatment of smallpox the following diagram may be of value. Like all rationalizations it may tend to over-simplify, but, so far as our present knowledge goes,



it gives a fair picture of what is happening during the different stages of the infection.

The purpose of the diagram is really to make two points. First, the virus, which probably multiplies only intracellularly, is free in the blood stream—and therefore susceptible to antiviral substances—at only two periods in the disease—namely, at the primary infection and again just before and during the initial stages of the onset. During most of the incubation period and after the true rash has made its appearance the virus is probably to a large extent beyond the reach of therapeutic substances by reason of its intracellular position. Secondly, the effect of virus damage to the cells of the skin is to encourage bacterial invasion with the formation of the characteristic pustules. Such a picture of the infection permits certain broad generalizations about treatment, which may be listed as follows:

(i) Direct attack upon the virus (as is suggested in the use of potassium permanganate) is likely to be effective only if used either at the moment of initial infection—which is usually impossible to time accurately—or at the end of the incubation period when the virus is again released into the blood stream. The timing of the latter event would also present obvious difficulties. The use of some of the newer antibiotics, say "aureomycin", or chloramphenicol, at this stage might be worthy of trial, however, in view of the suggestion that they may have anti-viral properties. During the remaining period of the illness it is unlikely that any medicament at present known is capable of reaching and neutralizing the virus.

(ii) Chemotherapy, however, has a place in the management of smallpox in inhibiting the secondary bacterial invasion which is a part of every attack. It should be appreciated that the character of such invasion varies from case to case, so that the substance to be used should be aimed at the organism. Sulphonamide will not always be effective, and penicillin may well fail because the responsible bacteria are insusceptible. Chloramphenicol and aureomycin, because of their wider range of action, will therefore suggest themselves.

(iii) Despite the successful use of antibacterial chemotherapy, the patient with severe confluent smallpox may still die from the effects of virus damage and virus toxaemia.

As to the questions themselves, the first raises the interesting point whether this case was in fact treated during the period of the secondary viraemia and should encourage further attempts to repeat the experiment. Of the value of chloramphenicol in reducing the secondary infection there is no doubt, but in the confluent case the patient may die (even when the "pustules" have been rendered bacteriologically sterile) from the gravity of the virus toxaemia. In regard to the second question it seems unlikely that potassium permanganate could have any useful effect in the dosage suggested, and so far as virucidal properties are concerned its value would be subject to the conditions outlined above.

Tuberculous Cervical Adenitis

Q.—*Is P.A.S. a suitable preparation for the treatment of tuberculous cervical adenitis? Would a clinical response be expected in this form of tuberculosis? Would P.A.S. in combination with streptomycin be better? Is there any evidence that this type of treatment with P.A.S. alone, or combined with streptomycin, should be undertaken in this intractable disease?*

A.—The treatment of cervical adenitis with P.A.S., with or without streptomycin, is still very much in the experimental stage. So far the results have not been encouraging. In view of the lymphatic character of the lesion it is hardly to be expected that the drugs in question would have much effect. The administration of streptomycin in these cases is a useful prophylactic measure before operative procedures, but it is doubtful if much benefit can be expected from its use as a routine treatment for this condition.

Chronic Bact. coli Pyelitis

Q.—*How should one treat a chronic Bact. coli pyelitis? Would streptomycin or any other antibiotic be worth a trial?*

A.—Provided that pyelography has excluded any underlying lesion, this remains simply a problem of finding a drug to which this organism is sufficiently sensitive, and the help of the bacteriologist must first be enlisted for this purpose. *Bact. coli*, properly so-called, is usually sensitive to sulphonamides, but more so to some than to others, and if tests show, for instance, that it is more sensitive to sulphathiazole than to other sulphonamides, and this drug has not yet been given, it might

be tried with advantage. If the organism is sensitive to streptomycin, this offers the best chance of a rapid cure. Before this drug is administered the urine must be rendered consistently alkaline, as indicated by a test of the first morning specimen, and the administration of alkali should be continued throughout treatment. It may be necessary to prescribe as much as 2 g. sodium bicarbonate four times a day. Streptomycin is given by intramuscular injection, and in order to keep its concentration in the urine continuously high it is advisable to give three daily doses, which should be of 0.5 g. each. Fluids should not be forced, but if anything restricted. This treatment is usually effective within three days or less. "Aureomycin" is also an excellent urinary antiseptic, and one which might be considered in this type of case.

Stilboestrol and Prostatic Enlargement

Q.—*A 78-year-old man suffering from prostatic enlargement had on several occasions passed urine containing a great deal of blood. On administering 1 mg. of stilboestrol t.d.s. the urine became free from blood after two days. The patient spent the next few weeks in an institution where he had no stilboestrol. Two days after returning home he complained of pain in the pubic region and inability to pass urine except for a few drops now and then. Pending admission to hospital, I ordered stilboestrol again, and the next morning was surprised to find the bladder—which had been up to the umbilicus—empty and the pain gone. If this is a malignant case can the improvement be attributed to stilboestrol? Can a good response to stilboestrol in any case of prostatic enlargement of unknown pathology be interpreted as an indication of malignancy, and does the converse hold good? What are the ill-effects of stilboestrol in cases of benign prostatic enlargement? Is mastitis one of them?*

A.—The ups and downs of a patient suffering from enlargement of the prostate are in any case so great that it is important to be very careful before attributing a temporary improvement to a remedy. Most surgeons would hesitate to attribute the sudden relief of this patient's bladder distension to the stilboestrol, but at the same time the possibility of its being so cannot be denied. Nothing has been stated about the feel of the prostate per rectum, the existence of pain or not, and whether there has been any loss of weight. If anything else suggests the possibility of malignancy it would be worth while continuing with the small doses of stilboestrol already given. Should this lead to still further improvement in the symptoms, then it would not be unreasonable to suspect that there was a malignant focus. Clinically neither stilboestrol nor testosterone have been found to have any effect on the adenomatous prostate. Stilboestrol may produce enlargement and soreness of the nipples, but not a general mastitis.

Neurodermatitis of the Scalp

Q.—*An elderly female patient has suffered from a neurodermatitis of the scalp for a number of years. Clinically there are several "bald" areas where the hairs have broken off; the hairs themselves are split, and the most distressing feature is the formation of a grey crystalline dust which sets up a most intense irritation. Only by constant brushing and combing can some degree of relief be obtained. Is there any line of treatment likely to assist this condition?*

A.—This circumscribed type of neurodermatitis is very persistent and difficult to relieve. It is described by the French as *fausse teigne amiantacée*. Fractional doses of *x* rays carefully administered, tar, as in the following ointment, and such sedatives as phenobarbitone are helpful.

℞ Acid. salicyl. } āā gr. 20 (1.3 g.)
Pic. carb. prep. }
Ung. hydrarg. ammon. aquosum ad 1 oz. (28 g.)
Ft. ung.

The underlying constitutional and psychological factors are naturally of great importance in treatment. The apparent baldness and the broken and split hairs are the result of trauma. Constant brushing and combing, rubbing, and scratching aggravate and perpetuate the affection.

Wart-weed and Spurge for Warts

Q.—*What is the active ingredient in the white juice of the common wart-weed, or spurge, which is sometimes used successfully in the treatment of warts?*

A.—Wart-weed (chelidonium) and spurge (euphorbia) are not synonymous. The juice of chelidonium is yellow rather than white—that of euphorbia is whiter. There are several references in the botanical literature to the destructive effect of both these juices on the vitality of warts, but there is no medical literature on this matter, and it is highly doubtful if they have much effect. As no scientific work has been done on the subject it is sheer speculation to guess at the active ingredients, if indeed they are active. They are possibly euphorbone ($C_{26}H_{44}O_2$), an amorphous resin ($C_{29}H_{32}O_4$), and—it may be—a crystalloid alcohol called euphorbol for which there is apparently no formula.

Iodine, Thyroid, and Aspirin

Q.—*I have recently received samples of a preparation made up as follows: thyroid B.P. ¼ gr. (32 mg.); iodum B.P. ¼ gr. (16 mg.); acid. acetylsalicyl. B.P. 4 gr. (0.25 g.). The powder is in gelatin non-keratinized capsules which smell strongly of iodine. Is it safe to give ¼-gr. doses of metallic iodine? Is there any interaction between the iodine and the other ingredients?*

A.—Chemical interaction between the components of the mixture is not likely to occur. After liberation from the capsule the metallic iodine will be converted to iodide in the intestine. In a dose of ¼ gr. it will have no deleterious effect except on the occasional patient who is sensitive to iodides. The real objection to the preparation is that there seems to be little point in prescribing such a combination of drugs. The only indication for such a dose of iodine is in the pre-operative treatment of thyrotoxicosis, when thyroid should not be used. Similarly, nothing is gained when treating cretinism or myxoedema with thyroid by giving iodine in addition. Finally, there is no evidence that the analgesic effect of acetylsalicylic acid is potentiated by thyroid or iodine.

Nocturnal Cramps

Q.—*A man, aged 60, otherwise in good health, suffers from regular nightly spasm of the adductor muscles of both legs. He is awakened every night by these cramps and has to massage his legs. Mild sedatives have now lost their effect. What do you suggest?*

A.—These nocturnal cramps can be most distressing and are a common cause of sleepless nights in the middle-aged and elderly. The two drugs most effective in their relief are: quinine bihydrochloride gr. 10–15 (0.65–1.0 g.) or nicotinic acid 50 mg. on retiring. It is probably advisable to give a barbiturate as well when starting treatment.

NOTES AND COMMENTS

Methodist Missionary Society.—The Medical Secretary of the Methodist Missionary Society (25, Marylebone Road, London, N.W.1) announces that the Methodist Missionary Hospital at Ilesha, Western Nigeria, is in urgent need of a locum for four to six months. He should have at least two years' postgraduate experience. The society will be responsible for return air passage and for allowances at missionary rates, plus a small outfit allowance. Particulars may be obtained from the society.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 9 1950

STUDIES ON THE NATURE OF THE INTRINSIC FACTOR OF CASTLE*

BY

BYRON E. HALL, M.D.

Division of Medicine, Mayo Clinic, Rochester, Minnesota

In the years immediately following the demonstration by Minot and Murphy (1926) of the therapeutic efficacy of orally administered liver in pernicious anaemia, Castle and his associates (Castle, 1929; Castle and Townsend, 1929; Castle, Townsend, and Heath, 1930a; Castle, Heath, and Strauss, 1931; Castle and Ham, 1936; Castle, Heath, Strauss, and Heinle, 1937), in a series of brilliant investigations, concluded that there was in normal gastric juice from human beings a substance (intrinsic factor) which acted on a dietary substance (extrinsic factor) to produce a material required for the normal maturation of erythrocytes. Patients having pernicious anaemia lacked intrinsic factor.

Since these publications first appeared an intensive search has been made to isolate and to identify substances essential to haematopoiesis and to define the relationships between them. In recent years two pure compounds possessing marked haematopoietic activity have been obtained from liver. The first, pteroylglutamic acid, was isolated in 1943 (Pfiffner *et al.*, 1943) and synthesized in 1945 (Angier *et al.*, 1946). The second, vitamin B_{12}, was isolated in crystalline form in 1948 (Rickes *et al.*, 1948; Smith and Parker, 1948). Both substances possessed the property of converting megaloblastic erythropoiesis to a normoblastic type of regeneration, but only one, vitamin B_{12}, when administered parenterally, was found to be fully as effective as extracts of liver in controlling all manifestations of pernicious anaemia. Pteroylglutamic acid stimulated haematopoiesis, but failed to prevent the development or progression of the neurodegenerative changes characteristic of this disorder.

Vitamin B_{12}, therefore, appeared to be either the anti-pernicious-anaemia component of liver or a substance closely allied to it. However, in contrast to the haematopoietic activity of orally administered extracts of liver, vitamin B_{12}, in doses known to be effective parenterally, failed to produce a haematopoietic response when it was administered by mouth to patients having pernicious anaemia in relapse, unless gastric juice or other known sources of intrinsic factor were given simultaneously with it. Thus it appeared that vitamin B_{12} functioned also as extrinsic factor (Berk *et al.*, 1948; Hall *et al.*, 1949). Confirmation of the extrinsic-factor activity of this substance subsequently was obtained by the demonstration that it was an active haematopoietic component of beef muscle (Gardner *et al.*, 1949; Morgan *et al.*, 1949; Wolf *et al.*, 1950).

Since Minot and Castle (1931) had shown that liver extracts given by intramuscular injection were from thirty to sixty times as active as when administered by the oral route, it appeared to be advisable to determine the therapeutic activity of vitamin B_{12} administered orally in the absence of intrinsic factor, in doses in excess of those known to be effective parenterally. Few data are available in the literature concerning the minimal effective dose of orally administered vitamin B_{12}. In most instances only small quantities have been employed. However, Spies and his associates (1949) presented evidence to show that approximately fifty times the minimal effective parenteral dose is required when vitamin B_{12} is administered by mouth. On the other hand, Meyer and his associates (1950) observed no haematopoietic response to the daily oral administration of 150 μg. to one patient and of 250 μg. to a second patient. These quantities represent doses of from 150 to 250 times the minimal effective parenteral dose.

Oral Administration of Vitamin B_{12} in the Absence of Intrinsic-factor Activity

Nineteen patients having pernicious anaemia in relapse received vitamin B_{12} alone by mouth. Sixteen of the 19 were given the vitamin daily in doses varying from 5 to 100 μg. for periods of from seven to thirteen days (average ten days). The haematopoietic responses elicited are summarized in Table I.** Among 10 of 11 patients who ingested 5 to 10 μg. of vitamin B_{12} daily, haematopoietic

TABLE I.—*Oral Administration of Vitamin B_{12} in Absence of Intrinsic Factor to 19 Patients Having Pernicious Anaemia in Relapse*

Case	B_{12} Given Daily (μg.)	Days Observed	Erythrocytes (Millions per c.mm.)		Maximal Reticulocyte Response		
			Onset	End	% Observed	Day Observed	Expected*
1	5	7	1·52	1·63	4·9	2	22·3
2	5	12	2·64	2·05	3·5	1	7·5
3	5	10	1·89	1·27	—	—	15·6
4	5	9	2·50	2·84	2·3	9	8·4
5	5	10	2·53	2·81	—	—	8·4
6	5	9	2·40	2·02	2·7	5	9·4
7	10	9	1·64	1·95	—	—	20·4
8	10	13	2·32	2·74	6·1	10	10·5
9	10	9	2·30	2·36	3·6	2	10·5
10	10	9	2·39	2·31	—	—	9·4
11	10	9	2·08	1·90	—	—	12·9
12	25	11	2·63	3·43	5·2	12	7·5
13	25†	6	1·73	1·91	—	—	18·7
14	75†	7	1·47	1·50	8·0	5	22·3
	150†	9	1·50	1·60	4·9	9	22·3
15	1,000†‡	12	2·33	2·74	3·8	9	10·5
16	50	13	2·31	2·39	10·2	13	10·5
17§	100‡	13	1·65	2·10	7·1	6	20·4
18	100	8	2·01	2·29	5·7	7	14·1
19	100	10	1·35	2·17	13·0	8	26·5

* Sturgis. † Single oral dose. ‡ Vitamin B_{12} concentrate. § Received one meal of cooked liver by error on second day of therapy.

*To be read at the First International Congress of Internal Medicine, Paris, September 11–14, 1950.

**Detailed data concerning the haematopoietic responses noted in these 19 patients have been published elsewhere.

responses either were not observed or they were of such minor degree that they were listed as being insignificant. One patient who received 10 μg. a day showed a significant although suboptimal response. Of the remaining five patients who received daily doses of vitamin B_{12} three were given 100 μg. daily, one 50 μg. daily, and one 25 μg. daily. It is of interest that the patient who ingested 25 μg. a day showed an optimal haematopoietic response, whereas two patients who received 100 μg. daily manifested distinctly suboptimal responses. The patient who was given 50 μg daily and one who was given 100 μg. a day had good but suboptimal responses.

Three of the 19 patients were given single oral doses of vitamin B_{12}, one receiving 25 μg., one 75 μg. on one occasion and 150 μg. seven days later, and one 1,000 μg. No haematopoietic response was observed in the patient ingesting 25 μg. of the vitamin, and the other two patients had suboptimal responses.

Studies on the Nature of Intrinsic Factor

Earlier studies on the nature of intrinsic factor in the gastric juice of human beings have demonstrated that the activity of the material is destroyed by heating to a temperature of 40° C. for three days, of 70° to 80° C. for thirty minutes, and by boiling for five minutes (Castle, Heath, and Strauss, 1931). Intrinsic factor may be separated from the enzymes pepsin and renin by precipitation with casein without losing its activity (Castle, Townsend, and Heath, 1930b; Helmer *et al.*, 1934) and it is not destroyed by a degree of alkalinity (*p*H 9.8 for thirty minutes) which will inactivate pepsin and pepsinogen (Ungley and Moffett, 1936).

Intrinsic factor does not pass through a semi-permeable membrane which permits the passage of extrinsic factor. It is partially soluble in 80% alcohol and 80% acetone and is precipitated on saturation with ammonium sulphate (Helmer and Fouts, 1937; Goldhamer and Kyer, 1938).

The observations of Fouts, Helmer, and Zerfas (1935) on the intrinsic-factor activity of a powdered liver extract are of current interest in view of the isolation of vitamin B_{12} from liver. In 1935 these authors reported that the intrinsic factor contained in from 50 to 100 ml. of normal gastric juice seemed to be the minimal amount necessary to produce an optimal response when incubated with an extract derived from 100 g. of liver and administered by mouth daily to a patient with pernicious anaemia. Some response was obtained from as little as 10 ml. of the juice. The vitamin B_{12} content of the liver extracts employed in these studies is not known, but it seems probable that the daily dose supplied at least 10 μg.

In December, 1948, Berk and his associates demonstrated that vitamin B_{12} functions as food or extrinsic factor when administered by mouth simultaneously with gastric or intrinsic factor to patients having pernicious anaemia in relapse. Normal gastric juice from human beings was used as a source of intrinsic factor. They confirmed the observation of Castle and Ham (1936) that a haematopoietic response was not elicited if an interval of twelve hours elapsed between administrations of sources of extrinsic and intrinsic factors.

The findings of Berk and associates (1948) were confirmed by my associates and me (Hall *et al.*, 1949) in February, 1949. Berkefeld-filtered pooled gastric juice obtained from patients who had either duodenal ulcer or functional disturbances of the gastro-intestinal tract was employed. The haematopoietic activity of the simultaneous oral administration of 5 to 10 μg. of vitamin B_{12} and 100 to 150 ml. of Berkefeld-filtered pooled gastric juice of human beings is shown in Table II.

TABLE II.—*Oral Administration of Vitamin B_{12} and Pooled Filtered Gastric Juice of Human Beings*

Case	Period	Daily Oral Therapy: B_{12} (μg.)	Daily Oral Therapy: Source of Intrinsic Factor	Days Observed	Erythrocytes (Millions per c.mm.): Onset	Erythrocytes (Millions per c.mm.): End	Maximal Reticulocyte Response: %	Maximal Reticulocyte Response: Day
20	1	—	150 ml. of gastric juice	6	1·43	1·50	—	—
	2	5	,, ,,	18	1·50	2·92	31·7	10
21	1	5	,, ,,	12	1·63	2·40	16·5	9
15	1	1,000*	—	12	2·33	2·74	3·8	9
	2	10	100 ml. of gastric juice	11	2·74	2·71	11·8	7

* Single dose of vitamin B_{12} concentrate.

Since, as has previously been shown by others, intrinsic factor passes readily through a Berkefeld filter, the risk of the transmission of bacterial infections, such as tuberculosis, may be avoided when pooled gastric juice is administered to patients. It also makes possible the collection of relatively large quantities of gastric juice of normal or high acidity in the routine gastric laboratory for the purpose of studying the effects of various physical and chemical agents on intrinsic factor. A preliminary survey of the results of some of these studies has been reported (Campbell *et al.*, 1949).

Some of the earlier observations on the properties of intrinsic factor, derived either from gastric juice of human beings or from the stomach and intestines of swine, have been confirmed in our studies on the effectiveness of orally administered vitamin B_{12} when given in conjunction with various derivatives of gastric juice or gastro-intestinal substances to patients having pernicious anaemia in relapse.

Gastric juice heated to a temperature of 63° C. for thirty minutes was ineffective as an intrinsic factor when given to a patient with pernicious anaemia in a daily dose of 150 ml. together with 5 μg. of vitamin B_{12}. The patient subsequently responded well to 75 ml. of unheated gastric juice daily, with 5 μg. of vitamin B_{12} (Case 2, Table III).

TABLE III.—*Oral Administration of Vitamin B_{12} and Pooled Filtered Gastric Juice of Human Beings: Effect of Heat on Intrinsic Factor*

Case	Period	Daily Oral Therapy*: B_{12} (μg.)	Daily Oral Therapy*: Intrinsic Factor	Days Observed	Erythrocytes (Millions per c.mm.): Onset	Erythrocytes (Millions per c.mm.): End	Maximal Reticulocyte Response: %	Maximal Reticulocyte Response: Day
2	1	5	150 ml. of gastric juice previously heated to 63° C. for 30 min.	12	2·64	2·05	—	—
	2	5	75 ml. of unheated gastric juice	13	2·05	3·38	11·3	11
3	1	Mixture of 5 μg. of B_{12} + 100 ml. of gastric juice stored at 25° C. for 24 hours, then heated to 70° for 1 hour		10	1·89	1·27	—	—
	2	Unheated mixture of 5 μg. of B_{12} + 100 ml. of gastric juice stored at 25° C. for 24 hours		14	1·27	1·91	5·2	14
	3	Single intramuscular injection of 20 μg. of B_{12}. Same dose repeated 3 and 5 days later		8	1·91	2·64	—	—

* Unless otherwise specified.

Since a temperature of 63° C. is required to destroy most viruses, the administration of pooled gastric juice of human beings which possesses intrinsic-factor activity could result in the transmission of a virus infection, such as infectious hepatitis.

Vitamin B_{12}, unlike intrinsic factor, is not destroyed by relatively high temperatures. A thermostable combination of intrinsic factor and vitamin B_{12} was not obtained by allowing a mixture of the vitamin and neutralized gastric juice to stand for twenty-four hours at a temperature of 25° C. before heating to 70° C. for one hour. Such a mixture, containing 100 ml. of gastric juice and 5 μg. of vitamin B_{12}, administered daily to a patient having pernicious anaemia in relapse failed to produce a therapeutic response. During a second period an unheated mixture of the two substances after standing for twenty-four hours at 25° C. was administered orally each day. While the reticulocytosis was suboptimal, there was a significant rise in the erythrocyte count, and the subsequent administration of vitamin B_{12} intramuscularly did not elicit a second reticulocyte response (Case 3, Table III). It was concluded, therefore, that either vitamin B_{12} and intrinsic factor present in human gastric juice did not combine chemically, or if chemical union did occur the product of the interaction was also thermolabile.

Pooled Berkefeld-filtered gastric juice from human beings, collected and stored for three months at a *p*H of 1.7 and a temperature of 5° C., retained intrinsic-factor activity although it appeared to be less active than the fresh material. The results of the daily oral administration of 5 μg. of vitamin B_{12} and 100 ml. of stored gastric juice to two patients having pernicious anaemia in relapse are shown in Table IV. One patient (Case 22, period 2)

TABLE IV.—*Oral Administration of Vitamin B_{12} and Pooled Filtered Human Gastric Juice: Presence of Intrinsic Factor After Storage for Three Months at pH 1.7 and 5°C.*

Case	Period	Daily Oral Therapy*: B_{12} (μg.)	Daily Oral Therapy*: Intrinsic Factor	Days Observed	Erythrocytes (Millions per c.mm.): Onset	Erythrocytes (Millions per c.mm.): End	Maximal Reticulocyte Response: %	Maximal Reticulocyte Response: Day
22	1	—	100 ml. of fresh gastric juice	10	2·91	2·78	5·8	2
	2	5	100 ml. of gastric juice stored 3 months at *p*H 1·7 and 5° C., then neutralized to *p*H 7	11	2·78	2·66	7·0	10
	3	5	100 ml. of fresh gastric juice	6	2·66	3·18	6·3	6
23	1	—	100 ml. of fresh gastric juice	7	1·25	1·31	3·3	7
	2	5	100 ml. of gastric juice stored 3 months at *p*H 1·7 and 5° C., then neutralized to *p*H 7	12	1·31	2·20	13·5	7
	3	10 μg. of B_{12} administered intramuscularly daily for 5 days, then weekly		21	2·31	3·56	—	—

* Unless otherwise specified.

manifested a reticulocyte peak equal to the estimated maximal response calculated for the initial level of erythrocytes, but there was no rise in the erythrocyte count during administration of the mixture. Since secondary reticulocytosis was demonstrated during period 3, when the patient received vitamin B_{12} and fresh gastric juice, the haematopoietic response to the oral administration of the vitamin and the stored gastric juice probably was suboptimal. The other patient (Case 23), on the other hand, showed a significant haematopoietic response that approached an optimal figure.

At low temperatures the enzymic action of pepsin is largely inhibited, and previously reported observations by Castle and Ham have indicated that loss of the intrinsic-factor activity of gastric juice on standing may be due to inactivation by the native pepsin contained in the juice.

A 95% solution of ethyl alcohol apparently destroys intrinsic factor, inasmuch as no significant haematopoietic activity could be demonstrated in either the precipitate or the soluble fraction of gastric juice when these fractions were administered with vitamin B_{12} successively to a patient having pernicious anaemia in relapse (Case 24, Table V).

TABLE V.—*Oral Administration of Vitamin B_{12} and Precipitates of Gastric Juice of Human Beings*

Case	Period	Daily Oral Therapy: B_{12} (μg.)	Daily Oral Therapy: Intrinsic Factor	Days Observed	Erythrocytes (Millions per c.mm.): Onset	Erythrocytes (Millions per c.mm.): End	Maximal Reticulocyte Response: %	Maximal Reticulocyte Response: Day
24	1	5	Cold alcohol precipitate derived from 150 ml. of gastric juice	10	2·44	2·22	4·5	7
	2	5	Alcohol-soluble fraction derived from 150 ml. of gastric juice	9	2·22	2·10	5·7	5
	3	5	75 ml. of gastric juice	11	2·10	2·87	9·8	8

In November, 1949, Ternberg and Eakin reported that normal gastric juice contained a heat-labile non-dialysable substance which combined with vitamin B_{12} in such a manner as to make the vitamin unavailable for the growth of certain bacteria (*Bacterium coli, Lactobacillus lactis* Dorner, *Lactobacillus leichmannii*). The application of heat to the complex thus formed liberated vitamin B_{12}, whereupon the vitamin again became available for microbial growth. Heated gastric juice did not contain a principle capable of combining with vitamin B_{12}. Ternberg and Eakin (1949) postulated that the heat-labile factor in gastric juice, which they called "apoerythein," either was intrinsic factor itself or an important component of this factor. Commercial preparations of gastric mucosa of swine made for therapeutic use were found to contain a principle which seemed to be analogous to the apoerythein in gastric juice.

Subsequently, Eakin (unpublished data) reported that apoerythein possessed all of the known chemical properties of intrinsic factor. Its concentration was found to be greater in the gastric juice of normal subjects than in that of patients having pernicious anaemia. Eakin estimated that 25 μg. of vitamin B_{12} could be bound by the apoerythein contained in 1.5 litres of gastric juice. This amount of juice is an approximation of the volume secreted by a normal person in twenty-four hours. Apoerythein was found in the lining of the gastro-intestinal tract of all vertebrates studied. Its presence was not demonstrable in other tissues.

In a collaborative study with Dr. Frank Bethell and his associates of the University of Michigan, my associates and I (unpublished data) reported recently the enhancement of haematopoietic activity of orally administered vitamin B_{12} when preparations of stomach and duodenum of swine were given with the vitamin. The results of the simultaneous administration of vitamin B_{12} and extracts of gastric mucosa of swine to two patients with pernicious anaemia in relapse are shown in Table VI. The lyophilized preparation had greater activity than the non-lyophilized material. However, of the extracts employed by us, greatest intrinsic-factor activity was found in the lyophilized non-dialysable fraction of a dilute hydrochloric acid extract of duodenal mucosa. A dilute acid extract of ground whole duodenum, prepared at a *p*H of 3 to 4, was found to be moderately effective when given daily in a dose of 2 g. of desiccated material together with 5 μg. of vitamin B_{12}. Desiccated duodenal mucosa without extraction or fractionation also possessed considerable therapeutic

TABLE VI.—*Oral Administration of Vitamin B_{12} and Extracts of Gastric Mucosa of Swine*

Case	Period	Daily Oral Therapy* Time	Material Given	Days Observed	Erythrocytes (Millions per c.mm.) Onset	End	Maximal Reticulocyte Response %	Day
25	1	10 p.m.	5·4 g. of non-lyophilized extract of hog gastric mucosa	7	2·01	1·89	3·9	3
	2	10 p.m.	5 μg. of B_{12} + 5·4 g. of non-lyophilized extract of hog gastric mucosa	13	1·89	1·30	7·2	11
	3	10 p.m.	5 μg. of B_{12} + 75 ml. of pooled human gastric juice	11	1·30	1·32	8·6	5
	4		5 μg. of B_{12} intramuscularly	9	1·32	2·57	20·5	4
26	1	10 a.m. 10 p.m.	10 μg. of B_{12} 4 g. of lyophilized extract of hog gastric mucosa	9	1·64	1·95	—	—
	2	10 p.m.	10 μg. of B_{12} + 4 g. of lyophilized extract of hog gastric mucosa	15	1·95	2·04	11·3	10
	3		5 μg. of B_{12} intramuscularly	7	2·04	2·37	—	—

* Unless otherwise specified.

activity when administered by mouth in a dose of 2 to 4 g. together with 5 μg. of vitamin B_{12}.

Bethell and his associates have assayed the vitamin-B_{12}-binding power of these materials and of the gastric juice of normal human beings, according to the method of Ternberg and Eakin, employing the test organism *Lactobacillus leichmannii*. The materials, after sterilization by passage through a Berkefeld filter without heating, were added to the culture medium. The highest binding activity of the duodenal materials tested was shown by the water-soluble non-dialysable fraction of duodenal mucosa. The acid extract of ground whole duodenum possessed about half and the desiccated unfractionated duodenal mucosa about an eighth of the activity of the water-soluble non-dialysable material.

The property of binding vitamin B_{12} shown by derivatives of the lining of the gastro-intestinal tract, which inhibits the characteristic stimulation of microbial growth exerted by the vitamin, should serve as a useful adjunct to the concentration and purification of intrinsic factor. Nevertheless, it seems probable that natural substances other than intrinsic factor may possess the property of combining with vitamin B_{12} in a similar manner. Thus

TABLE VII.—*Oral Administration of Vitamin B_{12} and Egg-white Lysozyme*

Case	Period	Daily Oral Therapy* B_{12} (μg.)		Days Observed	Erythrocytes (Millions per c.mm.) Onset	End	Maximal Reticulocyte Response %	Day
7	1†	10	100 mg. of egg-white lysozyme	13	2·32	2·74	6·1	10
	2†	10	"	14	2·74	2·61	3·0	8
	3*	Complex formed by 10 μg B_{12} + 200 mg of egg-white lysozyme		11	2·61	2·71	—	—
	4	10	2·1 g. extract of hog duodenum	11	2·71	3·03	4·0	7
	5	10	150 ml. of gastric juice	11	3·03	3·68	—	—
	6	10 μg. of B_{12} intramuscularly		7	3·77	3·92	—	—
12	1	25		11	2·63	3·43	5·2	12
	2	Complex formed by 25 μg. of B_{12} + 500 mg. of egg-white lysozyme		16	3·43	3·27	—	—

* Unless otherwise specified.
† Vitamin B_{12} and egg-white lysozyme administered separately at an interval of twelve hours each day.

C. E. Meyer and his associates (1950) reported that lysozyme derived from egg white formed a complex with vitamin B_{12} which prevented stimulation of the growth of the test organism *Lactobacillus lactis* Dorner by the vitamin. Therapeutic trials on two patients with pernicious anaemia in relapse, employing daily oral doses of a complex of egg lysozyme and amounts of vitamin B_{12} up to 25 μg., have indicated that lysozyme has no significant potentiating effect on orally administered vitamin B_{12}. The results of these observations are shown in Table VII. Recently, two extracts of the gastric mucosa of swine, which showed a strong binding capacity for vitamin B_{12}, as determined by the Ternberg–Eakin method, were found to possess little or no intrinsic-factor activity when tested clinically on patients with pernicious anaemia in relapse (Table VIII).

TABLE VIII.—*Oral Administration of Vitamin B_{12} and Extracts of the Gastric Mucosa of Swine: Poor Haematopoietic Response from Extracts Showing a Strong Binding Capacity for the Vitamin*

Case	Period	Daily Oral Therapy* Time	Medication	Days Observed	Erythrocytes (Millions per c.mm.) Onset	End	Maximal Reticulocyte Response %	Day
9	1	10 a.m. 10 p.m.	10 μg. of B_{12} + 0·5 g. of gastric mucosa of swine	9	2·30	2·36	3·6	2
	2	10 p.m.	10 μg. of B_{12} + 0·5 g. of extract of gastric mucosa of swine	10	2·36	2·86	3·4	8
	3	10 p.m.	10 μg. of B_{12} + 1 g. of extract of gastric mucosa of swine	8	2·86	3·22	—	—
	4	10 p.m.	10 μg. of B_{12} + 150 ml. of pooled gastric juice of human beings	9	3·22	3·20	3·3	9
	5		10 μg. of B_{12} intramuscularly for 6 days	9	3·20	3·68	—	—
27	1	9 p.m.	5 μg. of B_{12}	9	2·40	2·55	2·7	5
	2	9 p.m.	5 μg. of B_{12} + 1·2 g. of extract of gastric mucosa of swine	11	2·55	3·00	2·0	4

* Medication administered orally unless otherwise specified.

Comment

Vitamin B_{12}, administered parenterally, is as effective as extracts of liver in the treatment of pernicious anaemia. However, when it is administered by mouth the presence of a potentiating agent is required for its effective utilization. In the absence of such an agent the haematopoietic responses to the oral administration of vitamin B_{12}, in doses up to 100 times the minimal effective parenteral dose, are variable and unpredictable.

Potentiation may be provided by known sources of intrinsic factor, such as the gastric juice of human beings and extracts of the stomach and intestines of swine. Extracts of stomach or duodenum of swine possess intrinsic-factor activity, the activity in duodenal mucosa of swine appearing to be greater than that contained in the entire wall of the stomach or duodenum. However, concentrated preparations that yield consistently effective and reliable therapeutic results when given in relatively small doses have not yet been produced. The barrier to the manufacture of dependable commercial products of this nature has been the destruction of a portion or all of the activity of the intrinsic factor during the process of concentrating gastric or duodenal substances. Until methods for preserving intrinsic-factor activity have been devised, patients with pernicious anaemia who are receiving preparations containing vitamin B_{12} by the oral route must be observed closely, and parenteral therapy substituted if the

haematopoietic and clinical response to oral therapy is not satisfactory.

It would appear that the solution to effective oral therapy is dependent on a clearer understanding of the factors governing absorption in the gastro-intestinal tract. The demonstration by Ternberg and Eakin that vitamin B_{12} may be "bound" by a substance or substances in normal gastric juice of human beings and in the lining of the gastro-intestinal tract of vertebrates, thereby rendering the vitamin no longer available for the growth of certain bacteria, is important, even though present evidence suggests that this method cannot be used, solely as an *in vitro* test for intrinsic-factor activity.

The assumption seems warranted that the role of intrinsic factor must be concerned with absorption of vitamin B_{12} by (1) altering the chemical or physical nature of the compound so that it more readily traverses the intestinal barrier; (2) protecting the vitamin from destruction by secretions of the digestive tract; or (3) preventing the removal of the vitamin from the contents of the upper part of the gastro-intestinal tract by micro-organisms. Little direct evidence has been brought forward in support of any of these hypotheses.

With respect to the possible removal of vitamin B_{12} by bacteria within the gastro-intestinal tract of patients with pernicious anaemia it is pertinent to recall some conclusions to which Davidson (1928) was led by his studies on the gastro-intestinal flora in pernicious anaemia. In 1928 Davidson stated: "A great numerical increase of organisms, normal inhabitants of the bowel—e.g., *Bact. coli*, streptococci, and especially *Cl. welchii*—was found in the gastro-intestinal contents of cases of pernicious anaemia. . . . The great quantitative increase of bacteria, especially at levels of the small intestine which in normal persons are relatively bacteria-free, may be a factor of great aetiological importance." Dick (1941) reported his finding of the almost constant presence of bacteria of the colon and lactis-aerogenes group in the fasting gastric contents of patients with pernicious anaemia, and suggested that there was a profound derangement of the whole gastro-intestinal tract in persons with this disease, which permitted the return of colon bacilli from the colon to the stomach. Recently Davis and Mingoli (personal communication) have shown that *Bact. coli* have an avidity for vitamin B_{12}, and Lichtman, Ginsbert, and Watson (unpublished data) have reported that the daily oral administration of 3 g. of "aureomycin" and 3 μg. of vitamin B_{12} to patients having pernicious anaemia in relapse is followed by haematopoietic responses. Since aureomycin would be expected to reduce greatly the number of coliform organisms in the gastro-intestinal tract, vitamin B_{12} may thereby be made more available for absorption. Studies along this line would appear to be a promising field of investigation.

Summary and Conclusions

In pernicious anaemia, orally administered vitamin B_{12} requires for its effective utilization the presence of a potentiating agent (intrinsic factor of Castle). In the absence of this factor the haematopoietic responses obtained from the oral administration of the vitamin, in doses up to 100 times the minimal effective parenteral dose, are variable and unpredictable. Potentiation may be provided by known sources of intrinsic factor, such as gastric juice of normal or elevated acidity from human beings and extracts of the stomach and intestines of swine. Concentrated preparations that yield consistently effective and reliable therapeutic results, however, have not yet been produced, owing to the ready destructibility of intrinsic factor and the consequent loss of a portion or all of the intrinsic-factor activity during the process of concentrating gastric or duodenal substances. It is believed that the studies herein reported support the concept of the enzymic nature of intrinsic factor.

References

Angier, R. B., Boothe, J. H., Hutchings, B. L., Mowat, J. H., Semb, Joseph, Stokstad, E. L. R., SubbaRow, Y., Waller, C. W., Cosulich, Donna, Fahrenbach, M. J., Hultquist, M. E., Kuh, Erwin, Northey, E. H., Seeger, Doris R., Sickels, J. P., and Smith, J. M., jun. (1946). *Science*, **103**, 667.
Berk, Lionel, Castle, W. B., Welch, A. D., Heinle, R. W., Anker, Rudolf, and Epstein, Martin (1948). *New Engl. J. Med.*, **239**, 911.
Campbell, D. C., Hall, B. E., and Morgan, E. H. (1949). *J. Lab. clin. Med.*, **34**, 1590.
Castle, W. B. (1929). *Amer. J. med. Sci.*, **178**, 748.
—— and Hain, T. H. (1936). *J. Amer. med. Ass.*, **107**, 1456.
—— Heath, C. W., and Strauss, M. B. (1931). *Amer. J. med. Sci.*, **182**, 741.
—— —— —— and Heinle, R. W. (1937). Ibid., **194**, 618.
—— and Townsend, W. C. (1929). Ibid., **178**, 764.
—— —— and Heath, C. W. (1930a). Ibid., **180**, 305.
—— —— —— (1930b). *J. clin. Invest.*, **9**, 2.
Davidson, L. S. P. (1928). *J. Path. Bact.*, **31**, 557.
Davis, B., and Mingoli, E. S. Personal communication.
Dick, G. F. (1941). *Amer. J. digest. Dis.*, **8**, 255.
Eakin, R. E. Unpublished data.
Fouts, P. J., Helmer, O. M., and Zerfas, L. G. (1935). *Ann. intern. Med.*, **8**, 790.
Gardner, F. H., Harris, J. W., Schilling, R. F., and Castle, W. B. (1949). *J. Lab. clin. Med.*, **34**, 1502.
Goldhamer, S. M., and Kyer, Jean (1938). *Proc. Soc. exp. Biol., N.Y.*, **37**, 659.
Hall, B. E., Bethell, F. H., Cintron-Rivera, A. A., Miller, S., Campbell, D. C., and Morgan, E. H. Unpublished data.
—— Morgan, E. H., and Campbell, D. C. (1949). *Proc. Mayo Clin.*, **24**, 99.
Helmer, O. M., and Fouts, P. J. (1937). *Amer. J. med. Sci.*, **194**, 399.
—— —— and Zerfas, L. G. (1934). Ibid., **188**, 184.
Lichtman, H., Ginsbert, V., and Watson, J. Unpublished data.
Meyer, C. E., Eppstein, S. H., Bethell, F. H., and Hall, B. E. (1950). *Fed. Proc.*, **9**, 205.
Meyer, L. M., Sawitsky, Arthur, Cohen, B. S., Krim, Mendel, Fadem, Robert, and Ritz, N. D. (1950). *Bull. N.Y. Acad. Med.*, **26**, 263.
Minot, G. R., and Castle, W. B. (1931). *Ann. intern. Med.*, **5**, 159.
—— and Murphy, W. P. (1926). *J. Amer. med. Ass.*, **87**, 470.
Morgan, E. H., Hall, B. E., Campbell, D. C. (1949). *Proc. Mayo Clin.*, **24**, 594.
Pfiffner, J. J., Binkley, S. B., Bloom, E. S., Brown, R. A., Bird, O. D., Emmett, A. D., Hogan, A. G., and O'Dell, B. L. (1943). *Science*, **97**, 404.
Rickes, E. L., Brink, N. G., Koniuszy, F. R., Wood, T. R., and Folkers, Karl (1948). Ibid., **107**, 396.
Smith, E. L., and Parker, L. F. J. (1948). *Biochem. J.*, **43**, viii.
Spies, T. O., Stone, R. E., Lopez, G. G., Milanes, Fernando, Toca, R. L., and Aramburu, T. (1949). *Lancet*, **2**, 454.
Ternberg, J. L., and Eakin, R. E. (1949). *J. Amer. chem. Soc.*, **71**, 3858.
Ungley, C. C., and Moffett, Robert (1936). *Lancet*, **1**, 1232.
Wolf, D. E., Wood, T. R., Valiant, John, and Folkers, Karl (1950). *Proc. Soc. exp. Biol., N.Y.*, **73**, 15.

The World Health Organization reports a striking reduction in the malaria rate among the rural population of the Mymensingh District of East Bengal (Pakistan), where a W.H.O. malaria control demonstration team for the past year has been carrying out residual spraying operations with D.D.T. Dr. G. Gramiccia (Italy), the leader of the team, states that not a single case of new infection has been detected in people living in the area which has been covered since this time last year in the spraying operations. There has been a reduction in the rate of enlarged spleen from 74.5% to 21.2% of the children of the area. Incidence of malaria parasites in the blood has been reduced from 22% in May, 1949, to 1.3% in May, 1950. Meanwhile, in the surrounding unsprayed areas the percentages of enlarged spleen and malaria parasites in the blood of children tested have been increasing. In 1949 protection against malaria was provided by this team's operations to about 35,000 people. More than 22,500 separate rooms were sprayed. Dr. Gramiccia added that these encouraging results have had a profound effect on the population, who had taken a rather diffident and sometimes openly hostile attitude at the first. Now they not only are appreciative but earnestly request the continuation of the spraying and the extension of the programme to neighbouring regions.

CORTISONE (COMPOUND E)

SUMMARY OF ITS CLINICAL USES*

BY

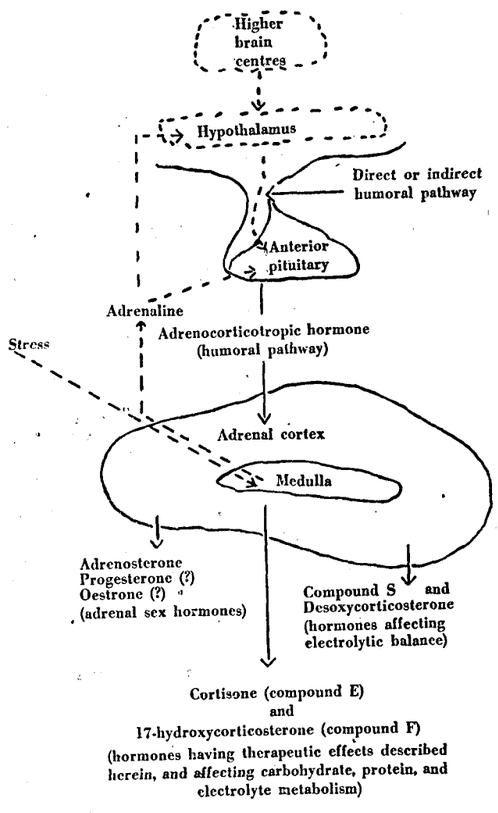
J. M. CARLISLE, M.D.

Medical Director, Merck and Co., Inc., Rahway, N.J., U.S.A.

Cortisone is one of the series of crystalline hormonal substances isolated from extracts of the adrenal cortex in the laboratory of Dr. E. C. Kendall, of the Mayo Foundation. This substance, originally named "compound E," was isolated from beef adrenal glands and described by Mason, Myers, and Kendall in 1936. It was also described independently by Reichstein as "substance FA," and by Wintersteiner and Pfiffner as "compound F."

Cortisone was first synthesized from a bile acid in 1946 by Dr. L. H. Sarett, of the Research Laboratories of Merck and Co., Inc. The availability of cortisone in sufficient quantities for clinical use was the result of a practical synthesis developed by the combined efforts of Dr. Kendall and his associates and of Dr. Max Tishler and his associates in the Merck Research Laboratories.

PITUITARY—ADRENAL RELATIONSHIPS



*A paper to be read at the First International Congress of Internal Medicine, Paris, September 11–14, 1950.

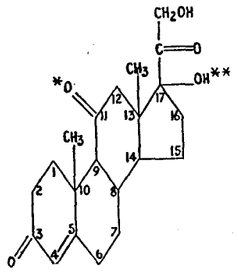
Theoretic Mechanism of Adrenal Secretion of Cortisone and Related Adrenal Steroids

The adrenal cortex upon stimulation elaborates (1) the group of hormones producing the therapeutic effects described herein and affecting carbohydrate, protein, and electrolyte metabolism, such as cortisone and compound F; (2) the group affecting electrolyte balance, such as compound S and desoxycorticosterone; and (3) the adrenal sex hormone adrenosterone, and possibly progesterone and oestrone. The present concept is that the secretion of cortical steroid hormones is mainly or entirely mediated through stimulation of the adrenal cortex by the adrenocorticotropic hormone of the anterior pituitary (see Diagram).

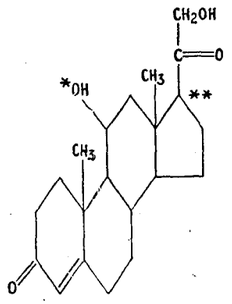
Specificity of the Chemical Structure of Cortisone

From the formula below it will be seen that cortisone has an oxygen atom at position 11* and a hydroxyl group (OH) at position 17**, and that these features differentiate it structurally from the earlier-named corticosterone.

Although the presence of an oxygen atom at position 11 and a hydroxyl group at position 17 are features which are vital to the biological activity of cortisone (and which have required much attention in the synthesis of the hormone),



Cortisone (Kendall's compound E). The chemical name, 17 - hydroxy - 11-dehydrocorticosterone, is based upon points of difference and similarity between the molecular structures of cortisone and corticosterone (Kendall's compound B).



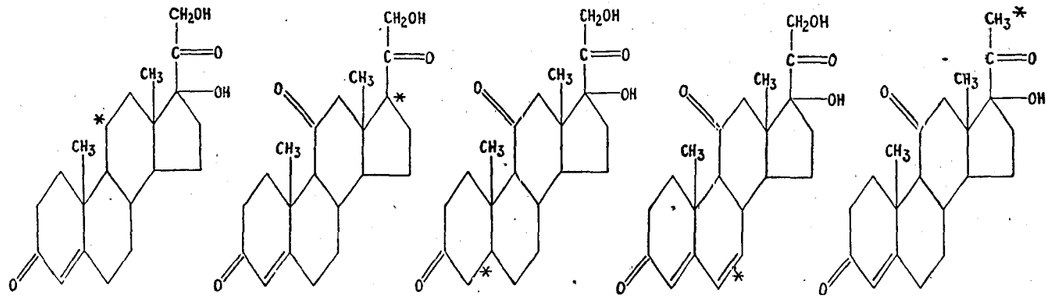
Corticosterone (Kendall's compound B)

it should also be noted that every other atom and configuration of the molecule probably is equally important. This is indicated by the fact that dozens of similar steroids have been prepared and tested for the antirheumatic and other therapeutic activity of cortisone, and that none possesses such activity (with the probable exception of compound F), although chemically each may differ very slightly from cortisone. Examples of a few of these "analogues" are given on the opposite page.

The list could be extended to include many more compounds, now numbering almost fifty, which have been synthesized and tested for cortisone-like activity. As each has been tested and negative results obtained, the remarkable specificity of the cortisone molecule has again been emphasized.

Metabolic Effects

Electrolyte balance is affected in varying degrees in different cases. Retention of sodium and water early in the course of treatment is often observed, especially when high dosage of cortisone has been employed, but is usually followed by spontaneous diuresis on continued



Reichstein's compound S (11-desoxy-17-hydroxycorticosterone, or "desoxycortisone"). *Molecule differs from cortisone only by the absence of an oxygen atom at position 11.

Kendall's compound A (11-dehydrocorticosterone). *Molecule differs from cortisone only by the absence of a hydroxyl group at position 17.

Dihydrocortisone. *Molecule differs from cortisone only by absence of a double bond at position 4, 5 (presence of an extra hydrogen atom).

6, 7 - Dehydrocortisone. *Molecule differs from cortisone only by presence of a double bond at position 6, 7 (absence of a hydrogen atom).

21 - Desoxycortisone. *Molecule differs from cortisone only by the absence of an oxygen atom at position 21.

administration of the hormone or after its discontinuation. In several instances, however, sodium and water retention has been so great as to require lowering the dosage or discontinuing administration of the drug because congestive heart failure with ascites or peripheral or pulmonary oedema developed. Sodium retention can be diminished or avoided by the restriction of sodium intake alone, or together with the use of diuretics during administration of the drug. High dosage of cortisone has caused increased urinary excretion of potassium, with metabolic alkalosis in some cases. In these patients potassium depletion resulting from such loss has produced symptoms of weakness, electrocardiographic changes characteristic of hypopotassaemia (such as lowering of T waves, and depression of the S-T segment and S-T junction), and hypotension. This development can be avoided by carefully following the CO_2-combining power, E.C.G., and chloride depletion. If any changes indicating alkalosis are noted, the dosage of cortisone should be reduced, or potassium administered concomitantly with the hormone. Also, it should be noted that in such cases the use of diuretics may provoke a further dangerous diuresis of potassium.

Carbohydrate metabolism may be affected also, in that blood-sugar levels may be increased and the response to insulin decreased. In patients with diabetes mellitus, insulin requirements are increased during administration of the hormone, but revert to their original levels soon after discontinuation of the drug.

Protein metabolism is affected in many patients, especially those receiving high dosage of cortisone. The continued administration of large doses usually produces a negative nitrogen balance, which may be overcome in certain instances by increased food intake. Where reversed albumin–globulin ratios are present, these tend to revert towards normal. Creatinuria is increased, uric acid excretion increased, and changes in the pattern of amino-acid excretion occur.

Studies in animals suggest that cortisone may inhibit the growth of granulation and fibrous tissues. Clinical studies also have provided evidence which suggests that the hormone may retard wound healing. This must be further evaluated, but these data should be considered when surgical procedures are contemplated in patients receiving cortisone, especially patients with ulcerated or inflamed lesions and those who show evidence of hypoproteinaemia, hypovitaminosis, and general malnutrition.

General Physiological or Hormonal Effects

Cortisone is a potent hormonal substance, and definite physiological effects are to be expected from its administration. With high or prolonged dosage, and in certain patients on the recommended dosage, undesired hormonal effects may occur. However, as with other hormones, such effects are reversible and disappear after administration of the substance is discontinued.

In some patients the drug has produced such evidences of hyperadrenalism as rounding of the face, mild hirsutism, acne, striae of the skin, and, in a few instances, amenorrhoea. All these phenomena disappeared after administration was discontinued.

In animal investigations, prolonged administration of large doses of cortisone may cause reduction in the size of the adrenal cortex. In man, muscular weakness and asthenia have been reported for brief periods after treatment was abruptly withdrawn. This suggests that a transient period of adrenal cortical insufficiency may exist when administration of the drug is stopped. In certain patients a temporary reduction of urinary corticoids and 17-ketosteroids is found; a temporary hypoglycaemia and suppression of eosinophil response occasionally occur.

Electroencephalogram.—In several patients an increase of approximately 10% in the frequency of alpha waves has been observed. This finding is said to indicate increased cerebral activity.

Other Physiological Effects

Cortisone has rarely caused a significant increase of blood pressure, but this possibility exists where sodium and water retention occurs. The resting blood pressure in patients with essential hypertension may be decreased. In some cases decrease in prothrombin time has been noted.

Certain mental effects have been reported. Definite improvement in the mental attitude of patients receiving this drug usually occurs, often with acceleration of the alpha waves of the electroencephalogram. In certain instances the increase in psychomotor activity has temporarily produced an exaggerated sense of well-being and, infrequently, a manic state. Conversely, mental depression has been reported in a few cases. Insomnia has been noted in some individuals. In rare instances pre-existent or latent mental derangement, such as schizophrenia, seems to have been intensified or precipitated. In such cases

premonitory symptoms of the psychotic reaction usually occur, such as pronounced insomnia and exaggerated swings of mood.

Clinical Effects in Rheumatoid Arthritis and its Variants

In rheumatoid arthritis and its variants, such as rheumatoid spondylitis (Marie–Strümpell disease), Still's disease, and psoriatic arthritis, the usual pattern of response is, first, diminution in subjective stiffness, usually within 24 to 48 hours, but sometimes within six hours after the initial dose (Table I) : in many cases this symptom is significantly

TABLE I.—*Response of Various Diseases to Cortisone*

Beneficial Effect Often Dramatic	Results Encouraging But Require Further Evaluation	Transient Beneficial Effects Observed	No Beneficial Effects Established
Rheumatoid arthritis	Various allergies: Hay-fever Angioneurotic oedema Drug sensitization Serum sickness	Acute leukaemia (lymphocytic or granulocytic)	Diabetes mellitus (increases insulin requirement)
Rheumatic fever	Acute gouty arthritis	Multiple myeloma	Myasthenia gravis
Rheumatoid spondylitis	Ulcerative colitis	Lymphosarcoma	Cushing's syndrome
Still's disease	Regional enteritis	Hodgkin's disease	Amyotrophic lateral sclerosis
Psoriatic arthritis	Nephrotic syndrome	Chronic lymphatic leukaemia	Multiple sclerosis
Lupus erythematosus (early)	Scleroderma (early)		Progressive muscular dystrophy
Addison's disease	Dermatomyositis		Progressive muscular atrophy
Asthma (status asthmaticus)	Psoriasis		Congestive heart failure (*may* be detrimental in some cases, but cases secondary to acute carditis may be benefited through effect of *cortisone on* inflammatory lesions)
Inflammatory eye diseases	Periarteritis nodosa (early)		Chronic myelogenous leukaemia
Exfoliative dermatitis	Pulmonary granulomatosis		Acute monocytic leukaemia
Pemphigus	Alcoholism (?)		Glomerulonephritis (exclusive of nephrotic syndrome)
Panhypopituitarism			Poliomyelitis
			Osteoporosis (may be detrimental?)

or completely relieved within a few days. Next, articular tenderness and pain on motion decrease. Finally, swellings of the joints diminish, sometimes fairly rapidly and completely, but occasionally more slowly and incompletely. In many patients mild soft-tissue deformities of the knees or elbows have disappeared within seven to ten days. An increase in muscle strength has been reported. The extent of return to normal has been limited, as must be expected, by the degree of permanent pathological change present.

The appetite usually improves rapidly, and many patients have described a loss of the feeling of malaise associated with the disease and have experienced a sense of well-being, occasionally within several hours after initial administration of the drug.

When cortisone is discontinued signs and symptoms may begin to reappear within 24 to 48 hours, becoming gradually worse during the following two to four weeks. The degree of relapse varies, and is apparently unrelated to the duration of treatment. In some individuals, however, the greater part of the remission of signs and symptoms achieved after use of the drug has persisted for as long as several weeks or months. If the drug is readministered when manifestations of the disease return, prompt remission is again induced.

Laboratory Findings

Erythrocyte Sedimentation Rate.—Elevated sedimentation rates are decreased, sometimes rapidly, during the administration of cortisone, usually becoming normal within 10 to 35 days. Occasionally, however, the rate does not return to normal, but is definitely reduced. In a few instances, persistently high sedimentation rates may be lowered by temporarily increasing the daily dose of the drug.

Haemoglobin.—Low haemoglobin values tend to increase when cortisone is administered. Increases of 2 g. within several weeks have been observed.

Erythrocytes.—Increases of as much as 1,000,000 red cells per c.mm. of blood have been observed in anaemic patients during cortisone therapy of two weeks' duration or longer.

Serum Protein.—Increased serum-globulin levels and low or reversed albumin–globulin ratios usually return towards normal, in most cases promptly, during treatment, but gradually revert to pretreatment levels when the drug is discontinued.

Arterial Synovial Biopsy.—Findings after several weeks of cortisone therapy included almost complete disappearance of lymphocytic reaction, improvement in appearance of collagen, and the presence of many fibroblasts in more adult form. Though not normal, the synoviae revealed definite evidence of healing.

17-Ketosteroids.—During administration of cortisone, urinary 17-ketosteroid values are initially reduced, but they usually rise again, and to a somewhat higher level. When large doses (e.g., 200 mg. daily) are employed the ketosteroids may remain slightly above the pretreatment level throughout the period of administration.

Corticosteroids.—The urinary concentrations of corticosteroids are initially increased by administration of cortisone and may reach a peak of excretion of about 5 mg. per 24 hours soon after treatment is started. The amount excreted then declines gradually to a fairly constant level, ranging from 1 to 2 mg. per 24 hours, on continued administration of the drug. On discontinuing cortisone therapy following prolonged treatment periods or after the injection of large doses of the drug, both 17-ketosteroid and corticosteroid excretion has been observed to diminish temporarily in certain patients.

Clinical Effects in Acute Rheumatic Fever

Within 24 hours after the initial injection of cortisone patients have usually described a sense of well-being and appeared alert instead of ill and "toxic." Temperatures that had been elevated usually became normal within one to four and a half days. Appetites have usually improved, with resultant gains, reaching 5 to 12 lb. (2.3 to 5.4 kg.) in 18 to 28 days in some cases.

Painful, swollen, and inflamed joints have in most instances become symptom-free after three and a half to six days of treatment with cortisone. In most of the patients with acute rheumatic fever improvement has been maintained for periods of three months or longer following treatment. Several patients with acute rheumatic fever who relapsed after the drug was discontinued responded promptly to another series of injections, and have remained apparently well since discontinuation of the drug a second time. While cortisone has demonstrated its value in curtailing the acute manifestations of rheumatic fever, long-term studies will be necessary to evaluate its effects on the development of cardiac lesions.

Effects on Cardiovascular System

Pulse Rate.—Tachycardia, when present, disappeared in three and a half to five days after treatment was started. Bradycardia, ranging from 44 to 60 beats a minute, accompanied the use of the drug in some cases. The bradycardia persisted while

the young adult patients were receiving 200 mg. a day of cortisone, but disappeared shortly after the dose was reduced to 100 mg. daily.

Blood Pressure.—Significant blood-pressure changes have been observed infrequently during or following treatment of acute rheumatic fever with cortisone.

Electrocardiographic Findings.—In patients with prolonged P-R intervals return to normal or nearly normal limits usually occurred within eight days after the beginning of treatment. Electrocardiograms, made daily, showed no evidence of toxic effects on the heart.

Laboratory Findings

Erythrocyte Sedimentation Rate.—Usually the elevated sedimentation rate became normal within 12 to 18 days after injection of cortisone was begun.

Haemoglobin.—Increase in haemoglobin value by as much as 2.4 g. occurred within three weeks in patients in whom the pretreatment levels were low.

Leucocyte Count.—No characteristic effect on the total number of circulating leucocytes was noted during administration of cortisone, despite rapid clinical improvement and reduction of the erythrocyte sedimentation rate.

Serum Proteins.—In almost every instance administration of cortisone caused a slight increase in the values for serum albumin and a reduction in the values for serum globulin.

Response in Other Diseases

Disseminated Lupus Erythematosus.—Cortisone has produced a temporary beneficial effect in most cases in which treatment was started in the early stages of the disease. Elevated temperatures and sedimentation rates have been lowered, joint symptoms improved, and the skin lesions in certain cases alleviated. The general condition of the patient also has been improved. These effects generally last from a few days to a few weeks, and even longer in some patients. Favourable response cannot be expected in late cases with advanced renal involvement, azotaemia, hypoproteinaemia, retinal haemorrhages, and cachexia. Because of the frequent involvement of the heart and kidneys in this disease, the physician should be particularly watchful for evidence of aggravation of salt and water retention and congestive heart failure in response to cortisone.

Bronchial Asthma.—Cortisone administered to patients in status asthmaticus has in most instances produced relief of the symptoms, and in certain patients has increased the vital capacity. The improved state has lasted from several weeks to several months in many of the cases.

Non-specific Iritis, Iridocyclitis, Uveitis, and Sympathetic Ophthalmia.—Striking improvement during the course of cortisone administration has been reported. Congestion has decreased and vision has improved to some extent. In some cases these benefits occur rapidly, but further investigation is necessary before any conclusions can be drawn concerning the efficacy of cortisone in the treatment of these conditions. Recent reports indicate that local ophthalmic instillation of cortisone (as a 1:4 dilution of the standard formulation in physiological saline solution) may also be effective. (Such instillation should be made at intervals of 30 to 60 minutes throughout the waking hours.)

Skin Conditions.—Cortisone has been tried in a variety of severe skin conditions, including pemphigus, angioneurotic oedema, atopic dermatitis, and exfoliative dermatitis, including cases secondary to drug reactions. In general, its use has resulted in improvement, with rapid subsidence of the inflammatory reaction.

Addison's Disease.—Cortisone has been highly effective in controlling Addison's disease, in conjunction with D.C.A. (desoxycorticosterone acetate) and/or supplementary sodium chloride (for special dosage see below).

Leukaemias and Lymphomas.—In some cases of acute leukaemia, especially in children, there is a temporary response to treatment with cortisone, but relapses are to be expected. Even in those cases in which there is an initial response, refractoriness to cortisone develops during repeated courses of the substance. Chronic lymphatic leukaemia, lymphosarcoma, and Hodgkin's disease also have shown transient involution of neoplastic masses. The peripheral blood picture of chronic lymphatic leukaemia apparently is not altered appreciably. Acute monocytic leukaemia and chronic myeloid leukaemia have shown no response to cortisone therapy in several cases treated.

Other Conditions.—Cortisone has been used in investigations of several other conditions, but the data are still very incomplete and inconclusive. From the information available at present, it appears that cortisone does not produce any significant benefit in chronic gout, myasthenia gravis, amyotrophic lateral sclerosis, or congestive heart failure. It has no appreciable effect on the late structural changes of the rheumatic diseases.

Dosage

With high or prolonged dosage, and in certain patients on the recommended dosage (see below), undesired hormonal effects may occur. The physician planning to use cortisone should have received instruction in its use and should familiarize himself with the published literature before attempting treatment.

The treatment should be given only to patients in hospitals which have adequate facilities operated by trained technicians and under the supervision of a qualified physician. Facilities should be available for electrocardiography and for routine blood determinations, such as blood sugar, carbon-dioxide-combining power, and, where possible, for blood electrolytes. Facilities for laboratory studies must be available during the entire course of treatment.

Although cortisone has now been used in over 3,000 individual cases, the duration of clinical study has been less than two years and only a small number of cases have been observed over this entire period. In no instance has continuous treatment been used for a longer period than eight months. Therefore it must be realized that recommendations are limited by the extent of this experience, and that optimal-dosage schedules are still tentative. The administration of cortisone must be carefully adjusted for each patient and regulated according to the effects observed. Failure to obtain an expected therapeutic response suggests, in the absence of any undesirable effects, the possible need for a temporary increase in dosage.

Dosage in Rheumatoid Arthritis

Initial Dosage.—When a maximal response to cortisone is desired in rheumatoid arthritis in adults, the following schedule is strongly recommended : 100 mg. every eight hours for three doses, then 100 mg. every 12 hours for two doses, followed by 100 mg. every 24 hours for 7 to 14 days (the last can be given as a single injection or as a divided dose of 50 mg. every 12 hours. In some cases it seems that the single injection is better). In all cases the injections should be made deeply into the gluteal muscles, at the outer upper quadrant of the buttock. The optimal dosage for children has not been established, but it seems to be more nearly proportional to the severity of the disease than to body size. A comparatively large dose, or the adult dose, may be necessary and is often well tolerated.

Subsequent Dosage.—When the desired response appears to have been obtained the dosage should be lowered gradually in a stepwise manner. The total daily dose should be reduced by 10 or 15 mg. at two- to three-day intervals until the total daily dose is 50 mg. The schedule may then be changed to 100 mg. every other day (or 100 mg. on Monday and Wednesday, and 100 or 200 mg. on Friday). If at any time during the change-over significant relapse occurs, 100 mg.-a-day dosage must be reverted to until the desired response again appears, before lowering the dosage.

Temporary Increases in Dosage.—If the expected response is not obtained within four to five days after initiating cortisone therapy according to the schedule suggested above, the dosage should be increased to 100 mg. every 12 hours for four doses and then again reduced to 100 mg. daily. If inadequate dosage is employed it is likely that the desired beneficial effect will not be obtained. It is essential for many patients that a temporary increase in dosage, as outlined above, be given in order to provide the greatest relief.

Rest Period.—A rest period of not less than three or four weeks should be allowed between courses of treatment with cortisone in order to permit recovery of adrenal activity. A "course" at full therapeutic dosage is generally considered to extend over a period of two to six weeks, and the total dosage per course should not exceed 3 to 4 g.

Dosage in Rheumatic Fever

Optimal dosage for treatment of rheumatic fever has not been established. In the adult cases treated thus far, 200 mg. of cortisone was injected intramuscularly daily for 10 to 19 days, and, following this, 100 mg. daily for 5 to 27 days.

It is suggested that, as a general practice, courses of treatment be extended over a period of 10 to 14 days, with rest periods of varying duration between the courses (see under "Dosage in Rheumatoid Arthritis"), but it is more important that the natural history of the disease be taken into account and that re-treatment be instituted as indicated by recurrence of signs and symptoms of reactivation of the disease, such as return of fever, increase of sedimentation rate, recurrence of arthralgia, and lengthening of the P-R interval.

Dosage in Other Diseases

For eye and skin conditions and the leukaemias and lymphomas the required dosage seems to be comparable to that outlined for rheumatoid arthritis. Somewhat larger doses may be required initially in bronchial asthma, but the duration of treatment necessary is usually not more than five to ten days. In Addison's disease 25 mg. daily, or less, may be adequate, but supplementary salt or desoxycorticosterone should be given concurrently, as indicated, to maintain normal values of blood electrolytes.

Special Precautions

It must be emphasized most strongly that cortisone is an agent with powerful biological actions. The patient receiving cortisone must be closely watched at all times for the development of unfavourable side-reactions. The most important precautions relative to these are :

1. *Evaluation of Relative Contraindications Before Using Cortisone.*—As in the case of other powerful therapeutic agents having potentially harmful effects, the physician must weigh the advantages of treatment with cortisone against the possible deleterious effects. This consideration is crucial where relative contraindications exist, such as diminished cardiac reserve or congestive heart failure, latent or overt psychotic tendencies, diabetes mellitus, and the debility accompanying advanced cachectic states, uraemia, and senescence.

2. *Restriction of Dietary Sodium Chloride.*—Salt and water retention is a common occurrence after several days of full cortisone dosage. Usually there is a gain of only a few pounds in weight and minimal dependent oedema. This may progress, however, and result in pronounced oedema, including pulmonary oedema, or cardiac enlargement and congestive failure, especially in patients with previously diminished cardiac reserve. Occasionally such symptoms may come on quite suddenly. There may be some elevation of arterial blood pressure. Measurement of fluid intake and output and daily weighing of the patient provide the best indices of fluid retention. When salt and fluid retention occurs the simplest treatment is the low-sodium diet. If sodium intake is kept below 1 g. daily for a few days it is usually possible to prevent or correct fluid retention. In some instances it may be necessary to decrease cortisone dosage or even discontinue it.

3. *Correction of Hypopotassaemia.*—When hypopotassaemia develops, supplementary administration of potassium chloride may be required. It is important to note carefully the discussion under "Metabolic Effects," relative to hypochloraemic-hypopotassaemic metabolic alkalosis.

4. *Control of Hyperglycaemia.*—When a patient with diabetes mellitus is treated for a concurrent disease amenable to cortisone the diabetic status must be followed and regulated with great care. It is usually possible to compensate for the anti-insulin effect of cortisone by administering larger doses of insulin—double the usual requirement may be needed. In treating non-diabetic individuals the physician should be aware of the possibility that cortisone may induce renal glycosuria or hyperglycaemia with glycosuria. In all such cases thus far reported these changes have disappeared soon after cortisone administration was discontinued.

5. *Detection of Early Psychic Disturbances.*—Although the usual psychic reaction to cortisone is a desirable increase in the sense of well-being, an occasional individual will develop pronounced psychic derangements, especially where high dosage has been used for protracted periods, but sometimes early during the course of therapy. These reactions include a wide array of phenomena ranging from pronounced euphoria to frank psychoses. Therefore, treatment should be continued with caution when early signs of such reactions appear. The premonitory symptoms are marked swings of mood, severe insomnia, bad dreams, and increased psychomotor activity.

6. *Supervision of Patient Following Cortisone Therapy.*—After discontinuation of cortisone supervision is essential, for this substance may continue to act for some time after the last injection, or there may be a sudden reappearance of severe manifestations of the disease for which the patient was treated. In a few cases following prolonged high dosage, evidence of a temporary hypo-adrenal state may be observed if treatment is withdrawn abruptly. Weakness and hypoglycaemia may occur, but return of adrenal function may be expected within two weeks.

Theories of the Mechanism of Action of Cortisone

It may be said at the outset that the fundamental nature of the action of cortisone against disease processes is unknown. During the past eighteen months, however, much valuable and intensive work has been directed towards the solution of this problem—a widespread research effort which may be expected to bring about a new concept of the nature of disease itself.

It seems likely that cortisone does not act therapeutically through a single circumscribed mechanism, but that this action must involve the many known physiological properties of the hormone as well as various undiscovered effects of this substance on the chemical processes of organs, tissues, and cells of the normal and the diseased organism. At the present time we have information indicating that (1) cortisone and/or compound F is involved in the metabolism of carbohydrate, protein, and fat; (2) it is necessary to the normal function of certain endocrine organs; (3) it exerts profound effects on neuromuscular metabolism; (4) it has distinct immunological effects; (5) it can bring about remarkable cytological changes; and (6) it is involved in several specific enzyme systems (see Table II).

It is for future research to determine which of these effects, or others, are fundamentally associated with the therapeutic activity of cortisone, and which ones are associated only coincidentally. The tendency to oversimplify the problem must be avoided, since it is clear that the hormone is implicated, directly or indirectly, in a large number of the physiochemical processes of the vertebrate organism.

Looking Ahead

The body of knowledge concerning the exact value of cortisone in the treatment of the variety of diseases discussed above is rapidly growing, as is the understanding of its pharmaco-physiological effects. Steadily increasing supplies of cortisone are becoming available, so that clinical and experimental studies are rapidly expanding in number and scope. So, too, the periods of observation on patients already treated are lengthening, and the results are becoming more measurable. Combined, these factors assure that a more exact appraisal of the effects of cortisone will shortly be possible.

TABLE II.—*Certain Known (or Probable) Effects of Cortisone*

Metabolic	Interendocrine	Neuromuscular	Immunological and Serological	Cytological	Enzymological
Increases gluconeogenesis	May either depress thyroid activity (probably via diminished pituitary production of thyrotropic hormone) or *increase sensitivity of tissues* peripherally to thyroid hormone	Restores capacity of muscle for work in adrenalectomized animals	Tends to bring about a restoration of normal A.-G. ratio in disease	Produces lymphopenia (some species) and eosinopenia in peripheral blood	Diminishes hyaluronidase activity
Lowers renal threshold for glucose	Increases insulin requirement. In individuals with normal pancreatic reserve *this requirement is* adequately met, but in latent or overt diabetes additional insulin must be administered	May cause increased activity in electroencephalogram (increase in frequency of alpha waves) or appearance of abnormal slow rhythms	Diminishes antibody response to typhoid antigen in rabbits	May increase tissue eosinophils and metaplasia of fibroblasts into eosinophils	Probably reduces blood glutathione
Opposes the action of insulin	Relative hypoglycaemia may occur after withdrawal of *cortisone*	May restore electroencephalographic pattern to normal in Addison's disease	Diminishes or abolishes tuberculin reaction	Inhibits fibroplasia	May be involved in enzyme systems concerned with pigmentation of skin
Increases mobilization and utilization of fat	Restores normal diuretic response to ingested water in Addison's disease	May induce euphoria and increased psychomotor *activity*	May prevent vascular lesions otherwise resulting from injection of D.C.A. (rats) or heterologous serum (rabbits)	Increases growth of macrophages in tissue culture	Increases arginase in liver and kidney of *mice*
Increases *protein* catabolism, urinary nitrogen, and urinary uric acid	May delay or inhibit menstruation, *probably* via depression of pituitary gonadotropic activity	May precipitate psychotic reaction (probably only in predisposed individuals)	*Prevents or reduces* tissue reaction to chemical irritants (guinea-pigs)	Stimulates reticulocyte production or release	Increases urinary excretion of urodepsin in patients with Addison's disease
Increases deposition of hepatic glycogen		May increase muscle strength (in rheumatoid arthritis) or may cause muscle weakness (probably only in cases of hypopotassaemia)	May inhibit formation of histamine	May bring about polycythaemia	
May bring about retention of sodium				May increase neutrophils in peripheral blood	
Increases urinary excretion of chloride and potassium				Causes involution of lymphoid tissue and of certain neoplastic tissues	
May increase calcium and phosphorus excretion					

A technical committee of the British Standards Institution has devised simple common names for certain pest-control products. A list of 25 names is being circulated for comment among Government departments, manufacturers, and scientific societies before final publication. In order to pre-empt the use of these names as proprietary names, the list has been lodged with, and approved by, H.M. Patent Office.

STREPTOMYCIN AND NEOMYCIN*

AN ANTIBIOTIC APPROACH TO TUBERCULOSIS

BY

SELMAN A. WAKSMAN, Ph.D.

(From the Department of Microbiology, Rutgers University, New Brunswick, N.J., U.S.A.)

"This attempt to place between the covers of a book the record of a drug discovered less than five years ago is a daring and unprecedented one. It suggests a wealth of knowledge, established despite the haste of its gathering. It is particularly daring in the instance of tuberculosis, a disease so chronic in its habit that phthisiologists rarely do more than describe its victims as 'apparently' cured, and so multiple in its manifestations that it required the discovery of the tubercle bacillus to unify its many forms beneath a single name."—Walker, Hinshaw, and Barnwell (Waksman, 1949).

Historical

The history of tuberculosis is as old as that of man himself. It was, however, the discovery of the causative agent of this disease, *Mycobacterium tuberculosis*, by Robert Koch that stimulated the search for "cures" of this "white plague" of man. Most of these, ranging from the tuberculin of Koch himself to the much publicized "gold cure" of recent years, led to serious disappointments. The antibiotics, or those compounds of microbial origin that have the capacity of inhibiting and even of destroying in very dilute solutions the growth of other microbes, especially the causative agents of disease, have given new hope for a final solution of this ancient disease. Although most of the antibiotics are not very effective against the acid-fast bacteria, a few have proved to be highly effective against the mycobacteria, including the tuberculosis organism. Side by side with the discovery of antimycobacterial agents of microbial origin, progress has also been made in the use of synthetic compounds which are non-toxic but still active enough to justify their use in chemotherapy.

*A paper to be read at the First International Congress of Internal Medicine, Paris, September 11–14, 1950

The utilization of micro-organisms as well as their products for the treatment of tuberculosis is not of recent origin. The first attempt at such treatment was made soon after the tuberculosis organism was isolated. Cantani tried in 1885 to utilize living saprophytic bacteria for combating tuberculosis; he was soon followed by Babes, who in 1888 used bacterial products. Later, Rappin and Vaudremer, in 1912–13, treated many patients with products of bacterial metabolism and with metabolic products and cell constituents of fungi, respectively. In general, the history of bacteriotherapy of tuberculosis is a long one (Waksman, 1947). Numerous investigators established beyond question that various saprophytic and pathogenic micro-organisms have the capacity to inhibit the growth of and even to destroy the *M. tuberculosis*. Further studies brought out the fact that this is due primarily to certain well-defined chemical compounds which these micro-organisms are able to produce when grown in artificial culture media and which are now known as antibiotics.

It has been definitely established that the ability to form antibiotics which are active upon the *M. tuberculosis* is widely distributed among various groups of micro-organisms. At least 16 products of fungi, 11 bacterial preparations, and 10 antibiotics of actinomycetes have been isolated and are now well recognized. They are listed in Table I. Most of these compounds or preparations proved

TABLE I.—*Production by Different Micro-organisms of Antibiotics Possessing Antituberculosis Properties*

Fungi	Actinomycetes	Bacteria
Aspergillic acid	Actinomycin	Ayfivin
Aspergillin	Anti-smegmatis factor	*Bacillin*
Biformin	Litmocidin	Endosubtilisin
Clitocybine	Mycomycin	Esperin
Diploicin	Neomycin	Eumycin
Emiatin	Nocardin	Gramicidin
Gliotoxin	Streptin	Licheniformin
Helvolic acid (fumigacin)	Streptothricin	Micrococcin
Javanicin	*Streptomycin*	Nisin
Lactaroviolin	Mannosidostreptomycin	Pyolypic acid
Lateritiin		Subtilin
Mycocidin		
Nebularin		
Polyporin		
Usnic acid		
Ustin		

to be, for one reason or another, quite unsuitable as chemotherapeutic agents. Some were too toxic, others were inactive or insufficiently active in the animal body. Some of them, however, gave definite promise of becoming important tools in combating tuberculosis. Most important of these proved to be streptomycin, an antibiotic produced by an actinomyces, *Streptomyces griseus*, which has already found extensive application in the therapy of tuberculosis.

Antimycobacterial Properties of Streptomycin

Streptomycin is highly active against various strains of *M. tuberculosis* (Waksman, 1949). The degree of sensitivity varies considerably, however, as shown in Table II. Of particular importance is the fact that upon contact with streptomycin, or upon continued administration of this drug to diseased persons, some of the strains tend to develop resistance to the antibiotic. This is shown in Table III, in which the sensitivity of different freshly

TABLE II.—*Comparative Effects of Neomycin and Streptomycin Upon the Growth of Different Mycobacteria (Waksman et al., 1949). Growth Inhibition in Units (for Neomycin) or in Micrograms (for Streptomycin) Per Millilitre of Broth After 14 Days' Incubation*

Organism	Neomycin	Streptomycin
M. avium	0·1–0·3	10·0
M. tuberculosis H37Rv	0·2–1·0	1·0–5·0
M. tuberculosis H37RvR*	0·2–1·0	5,000
Mycobacterium 607	0·1	0·2–0·4
Mycobacterium 607R*	0·25	300

*R = Streptomycin-resistant strain.

TABLE III.—*Comparative Effects of Streptomycin and Neomycin Upon Freshly Isolated Strains of M. tuberculosis (Waksman et al., 1949)*

Strain No.	Source of Culture	Amount of Antibiotic Required to Inhibit Growth in Liquid Medium	
		Streptomycin	Neomycin
		μg./ml.	units/ml.
100	Sinus left hip	1 to 5	<0·5
500	Sinus left flank	1 to 5	<0·5
575	Bladder	>100	<0·5
910	Gastric	1 to 5	<0·5
209	Sputum	1 to 5	<0·5
684	Urine	>100	<0·5

isolated strains of the pathogen to streptomycin, as compared with neomycin, is presented.

As is shown below, the search for a second antibiotic was stimulated by this limitation of streptomycin—namely, the rapidity with which bacteria develop resistance to it. Both the streptomycin-sensitive and streptomycin-resistant strains of different mycobacteria are sensitive to neomycin. This is true of saprophytic and pathogenic forms, whether the resistance is natural or is acquired by contact with streptomycin.

Search for New Agents

The discovery of streptomycin, and its extensive application in the treatment of various forms of tuberculosis, has aroused great interest on the part of bacteriologists, chemists, and clinicians, and has resulted in further extensive searches for new substances, microbial or synthetic in origin, which would overcome the limitations of streptomycin.

In the search for and selection of new antimicrobial agents, four postulates may be made (Waksman *et al.*, 1949):

1. These substances must be active, not only *in vitro* but also *in vivo*, against the specific micro-organisms. It is desirable that this activity be greater than that of other substances which are now recognized as useful or promising.

2. They must be active against those strains of the disease-producing micro-organisms which are not sensitive or which have become resistant to other chemotherapeutic agents.

3. They should not favour the development of resistance among sensitive bacteria; at least, the new agents should permit lesser emergence of such resistance than existing agents.

4. They should be of low toxicity to animals, or at least they should be no more toxic than agents now used in chemotherapy.

Many organisms have been tested for their capacity to produce such antibiotic agents. Various substances have been isolated in our laboratory since the isolation of streptomycin was reported in 1944, and their activity *in vitro* and *in vivo* has been determined. Of these, only one, neomycin, was found to satisfy the postulates. This conclusion was reached after extensive comparative studies of the effect of streptomycin and neomycin upon various bacteria. These included test-tube studies of both saprophytic and pathogenic mycobacteria and animal studies of both antibiotics against various Gram-positive and Gram-negative bacteria. These studies brought out the following facts:

1. Neomycin is more active than streptomycin against both the saprophytic *Mycobacterium* 607 and the human and animal pathogenic strains of *M. tuberculosis*.

2. Neomycin is as active against the streptomycin-resistant strains of the above organisms as against the sensitive ones.

3. Neomycin favours to a far less degree than does streptomycin the development of resistant strains of mycobacteria; it is true that on prolonged serial transfer of large numbers of cells a considerable increase in resistance may be obtained, but the rate of increase is much slower than in the case of streptomycin.

4. Neomycin is characterized by a relatively low toxicity in animals and has a high therapeutic index.

Before examining the limited experimental and clinical data now available for neomycin, it may be of interest to summarize briefly the very extensive literature on the effect of streptomycin upon tuberculosis. For a detailed review reference can be made to the various works dealing with this subject (Fanconi and Löffler, 1948; Florey *et al.*, 1949; Riggins and Hinshaw, 1949; Waksman, 1949).

Effect of Streptomycin in Experimental and Clinical Tuberculosis

In the first studies on the treatment of experimental tuberculous infections in guinea-pigs with streptomycin the results obtained were strikingly better than those previously reported with the use of various other chemotherapeutic agents. This is brought out in Fig. 1. Feldman and Hinshaw were soon able to state emphatically: "The evidence obtained from the many studies of the effect of streptomycin on the natural course of experimental tuberculosis in animals amply justifies the conclusion that this antibiotic is a highly potent antagonistic agent for tuberculous infections in animals produced by fully virulent tubercle bacilli of human or of bovine type."

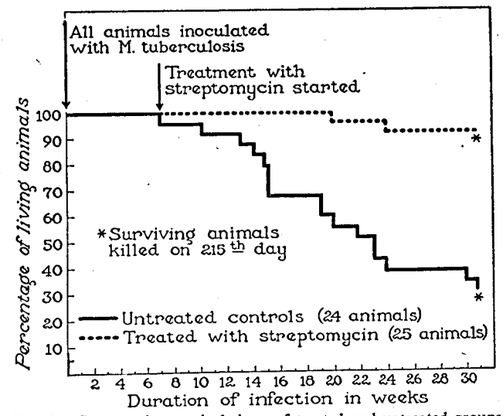


FIG. 1.—Comparative survival times of treated and untreated groups of guinea-pigs (from Feldman, Hinshaw, and Mann, 1945).

Clinical investigations soon followed (Hinshaw and Feldman, 1945; Hinshaw *et al.*, 1946a, 1946b). The first results obtained with streptomycin proved to be encouraging. It is now barely five years since the first clinical cases were reported and since the first attempt was made to manufacture streptomycin in sufficient amounts for large-scale clinical evaluation; a wealth of information which permits certain broad generalizations has already accumulated.

In general, the laboratory demonstrations of the effectiveness of streptomycin *in vitro*, followed by the experimental proof of its usefulness in experimental animals, were fully substantiated by numerous clinical investigations. The large-scale studies conducted in England by the Medical Research Council (1948), and in the United States by the Veterans Administration (Council on Pharmacy and Chemistry, 1950) and the American Trudeau Society (1950), produced adequate evidence that an agent for the treatment of tuberculosis was finally available. Although many hundreds of drugs were previously reported to control the tubercle bacillus in the culture tube, none were able to do so in the animal body. Many drugs that have been effective against the infection in animals were found to be impracticable against the same disease in man. In the case of streptomycin the analogy from laboratory to animal to man held well. It was only in the clinic, however, that investigators finally learned of the potentialities of streptomycin, on the one hand, and of its limitations and dangers on the other.

The clinical usefulness of streptomycin has been carefully summarized by Riggins and Hinshaw (1949) and by Walker, Hinshaw, and Barnwell (Waksman, 1949).

In submitting its report to the Council on Pharmacy and Chemistry (1950), the committee in charge of the work at the Veterans Administration emphasized the importance of combining surgical procedures with chemotherapy. The use of daily doses of 1 g. or less has decidedly reduced the incidence of toxic manifestations. The development of resistant micro-organisms was delayed, especially by the combined administration with para-aminosalicylic acid.

The American Trudeau Society Committee (1950) recommended for adults 1 g. of streptomycin, administered in a single dose intramuscularly, or 1 or 2 g. of dihydrostreptomycin in one or two injections. In miliary tuberculosis and tuberculous meningitis in adults, 2 or 3 g. a day, given intramuscularly in two or three doses of 1 g. each, was recommended. To overcome the emergence of streptomycin-resistant organisms, it has been recommended that streptomycin be administered at greater intervals, as 1 g. every third day or twice a week, or that its daily administration be combined with para-aminosalicylic acid.

It may be of interest to consider in somewhat greater detail certain special forms of tuberculosis.

Meningeal and Acute Miliary Tuberculosis

Since they were first recognized, these two types of tuberculosis have involved a mortality rate of 100%. The time between onset of disease and death was measured in weeks, especially in meningitis. These two forms provided, therefore, an ideal testing ground for the efficacy of streptomycin. It has fully justified itself. Its ability to suppress or destroy the tubercle bacillus was demonstrated. The effectiveness of streptomycin is now generally agreed on by investigators in the U.S.A., in England, and in other European countries. In one series of 100 patients with proved diagnoses, 24 were alive between 14 and 26 months after treatment had been instituted. These results are given in Table IV.

TABLE IV.—*Effect of Streptomycin on Acute Miliary and Meningeal Tuberculosis (From Walker, Hinshaw, and Barnwell—Waksman, 1949)*

Nature of Disease	No. of Patients	No. Living*	No. Dead After Start of Treatment in Months			
			0–1·5	1·5–6	>6	Total
Acute miliary ..	19	12	3	2	2	7
Meningeal	43	9	16	11	7	34
Miliary and meningeal	25	2	14	6	3	23
Meningeal developing during or after treatment for miliary ..	13	1	3	4	5	12
Total ..	100	24	36	23	17	76

* All patients still living 14 to 26 months after start of treatment.

Pulmonary Tuberculosis

Pulmonary tuberculosis is commonly considered, both in incidence and in the number of lives it takes, as one of the most serious forms. Since 1900 the mortality rate of tuberculosis has been reduced in the U.S.A. to 20% of its previous rate. In 1942, however, 52,000 deaths were still ascribed to tuberculosis, and of these 92% were due to pulmonary disease. The situation is worse in many European and Asiatic countries, particularly since the recent war. The prolongation of life in patients with meningeal and miliary tuberculosis was ample evidence that streptomycin had a definite effect on tuberculosis. The chronic nature of pulmonary tuberculosis suggests that years will pass before the effectiveness of streptomycin can be evaluated by its effect on the mortality rate.

In the relatively short period since its introduction, however, there has been substantial agreement among investigators that certain immediate results may be expected from its use. The question of toxicity and the development of bacterial resistance were the two controlling factors in establishing the most desirable duration of treatment. Originally a period of 120 days was selected. To lessen the incidence of resistance a decrease in duration of treatment has often been recommended. A reduction in efficacy did not seem to accompany a reduction in duration of treatment to 60 days. A further reduction to 42 days appeared to decrease the efficacy of streptomycin but certainly did not destroy it. The tendency over the last two years has been to reduce the daily dosage of streptomycin from 2 g. to 1 g. or even to 0.5 g. and to reduce the period of treatment from 120 days to 60 days or even less. The first is an attempt to avoid toxicity, and the second to reduce the incidence of resistance.

In a comprehensive study of the effectiveness of streptomycin in tuberculosis carried out under the auspices of the British Medical Research Council (1948), the conclusion was reached that the course of bilateral acute progressive disease can be halted by streptomycin therapy :

"Fifty-one per cent. of the streptomycin-treated patients showed considerable improvement radiologically when comparison was made with their chest radiographs taken on admission. That streptomycin was the agent responsible for this result is attested by the presence in this trial of the control group of patients, among whom considerable improvement was noted in only four (8%), and two of these four patients had improved only after collapse therapy. In other words, streptomycin therapy was effecting what the patient's tissues alone could not do—checking the spread of the tubercle bacillus in one of its most favourable *milieux*."

A summary of these results is presented in Tables V and VI.

TABLE V.—*Assessment of Radiological Appearance at Six Months as Compared with Appearance on Admission (Medical Research Council, 1948)*

Radiological Assessment	Streptomycin Group		Control Group	
	No. of Patients	%	No. of Patients	%
Considerable improvement ..	28	51	4	8
Moderate or slight improvement	10	18	13	25
No material change	2	4	3	6
Moderate or slight deterioration	5	9	12	23
Considerable deterioration ..	6	11	6	11
Deaths	4	7	14	27
Total	55	100	52	100

TABLE VI.—*Changes in the Radiological Picture (Medical Research Council, 1948)*

Radiological Assessment	Admission to End of 2nd Month		Admission to End of 4th Month		Admission to End of 6th Month	
	S	C	S	C	S	C
Total patients	55 (100%)	52 (100%)	55 (99%)	52 (99%)	55 (100%)	52 (100%)
Improvement:						
Considerable	8 (14%)	0	25 (45%)	0	28 (51%)	4 (8%)
Slight or mod.	34 (62%)	3 (6%)	18 (33%)	11 (21%)	10 (18%)	13 (25%)
No change ..	7 (13%)	27 (52%)	4 (7%)	9 (17%)	2 (4%)	3 (6%)
Deterioration:						
Slight or mod.	5 (9%)	14 (27%)	4 (7%)	14 (27%)	5 (9%)	12 (23%)
Considerable	1 (2%)	6 (11%)	4 (7%)	8 (15%)	6 (11%)	6 (11%)
Deaths ..	0	2 (4%)	0	10 (19%)	4 (7%)	14 (27%)

S = Streptomycin treated. C = Control.

Draining Cutaneous Sinuses and Fistulae

The ability of streptomycin to produce healing of tuberculous lesions of mucous and serous membranes, extending to lesions which involve the skin and its underlying tissues, was reported to be most remarkable. Prior to its use, cutaneous sinuses usually continued to drain for years. Their surgical treatment and closure were rarely possible. When treated with even small doses of streptomycin most sinuses were found to heal readily. The effect is so striking that it was not even considered necessary to have untreated controls. In the first clinical report of streptomycin therapy all sinuses in three patients healed during treatment. A much more extensive series of cases is summarized in Table VII.

TABLE VII.—*Effect of Streptomycin Upon 382 Patients with 687 Draining Cutaneous Sinuses and Fistulae (From Walker, Hinshaw, and Barnwell—Waksman, 1949)*

No. of Patients	Treatment: Streptomycin	Treatment: Days	No. of Sinuses and Fistulae	Observations at End of Treatment: Healed (Av. 8 wks.)	Imp.	No Change	Worse	Recurrence After Healing
126	1·8–2 g.	120	257	87·3%	7·8%	4·6%	0·3%	2%
229	1 g.	120	403	69·6%	23·5%	6·9%	0	2·5%
15	0·5 g.	120	15	60%	40%	0	0	0
12	0·2 g.	120	12	83%	17%	0	0	0

On the basis of extensive experience in the use of streptomycin in tuberculosis, Walker, Hinshaw, and Barnwell (Waksman, 1949) concluded :

"The introduction of streptomycin into clinical medicine has been peculiarly exciting to phthisiologists. Not only have they never had an 'antibiotic' which was helpful in the treatment of tuberculosis in man, they have never had a proved effective drug of any sort. So far as chemotherapy is concerned, not only was their situation comparable to that of the syphilologist prior to the discovery of penicillin, it was worse than his position before the appearance of Ehrlich and arsenic. Phthisiologists have been dependent on rest in bed, which finds its climax in the 'lung immobilizer,' and, more recently, on collapse therapy,

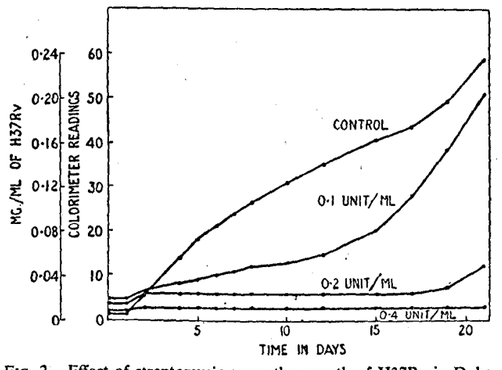


FIG. 2.—Effect of streptomycin upon the growth of H37Rv in Dubo medium (from Steenken and Wolinsky—Waksman, 1949).

which has become most definitive in the form of excisional surgery.

"Chemotherapy is a radical departure from tradition in tuberculosis, and on this account it might have been anticipated that a tuberculostatic drug would be slowly, perhaps inaccurately, evaluated. In the case of streptomycin, this would appear not to have occurred. Within three years after publication of the first clinical paper describing its use, it has been possible to write a chapter of the present sort. This relatively rapid evaluation of a new drug—rapid for tuberculosis if not for pneumococcic pneumonia—is partly the result of experience gained from the investigation of other drugs in other diseases. It is partly a result of the employment, here and in England, of co-operative methods of investigation which have yielded data, reasonably uniform, rapidly, and in large amount; methods which were used, perhaps for the first time, in the beautifully organized study on penicillin and syphilis which was initiated during the recent war."

Development of Resistance to Streptomycin

Attention has already been directed to the fact that among the most important problems involved in the use of streptomycin in tuberculosis is the development of resistance. This is brought out in a study of the effect of different concentrations of streptomycin upon the rate of growth of *M. tuberculosis* (Fig. 2). Steenken and Wolinsky (Waksman, 1949) emphasized that if the obstacle of streptomycin resistance could only be overcome the efficacy of the drug would be greatly increased. Whether by intermittent administration, or by combination of streptomycin with sulphones or para-aminosalicylic acid, or with some other tuberculostatic agent, it was found possible to delay the onset of streptomycin resistance. By shortening the course of therapy for pulmonary tuberculosis to four or six weeks the incidence of resistant strains is diminished. There is considerable variation in the development of drug-resistant strains in the study of a large group of patients. Those who have definite pulmonary cavitation are more likely to produce resistant cultures than are those without cavitation. Patients who start treatment with a high bacillary count in the sputum show a greater tendency to yield drug-resistant cultures during streptomycin therapy than those with few organisms in the sputum. *M. tuberculosis* lodged in the central nervous system becomes resistant less readily than it does in the lungs.

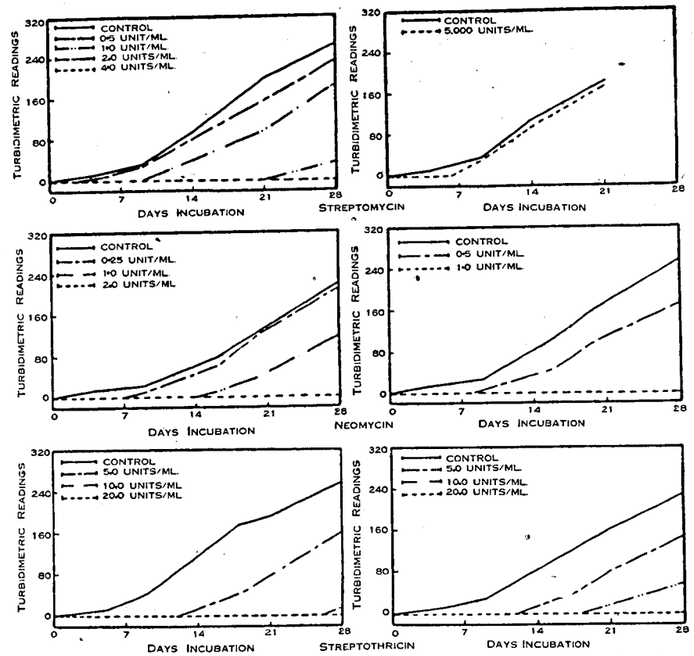


FIG. 4.—Inhibition of growth of streptomycin-sensitive (left) and streptomycin-resistant (right) strains of *M. tuberculosis* H37Rv by three basic antibiotics: upper, streptomycin; middle, neomycin; lower, streptothricin (from Waksman *et al.*, 1949).

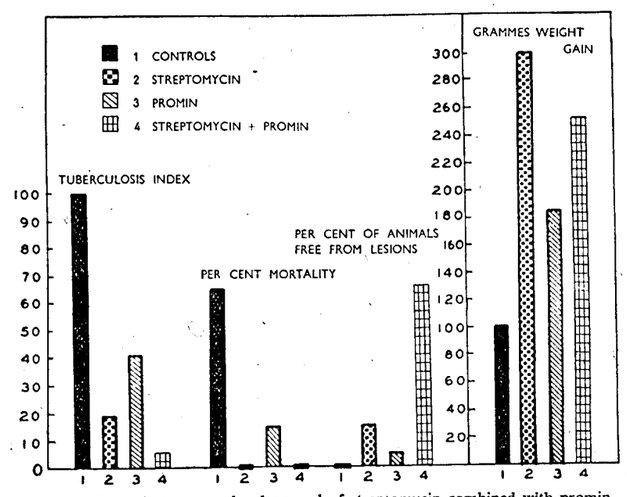


FIG. 3.—Effect of streptomycin alone and of streptomycin combined with promin upon experimental tuberculosis (from Smith and McClosky, 1945).

The possibility of utilizing a combination of two antimycobacterial agents appears, for the present at least, to provide an answer to the problem of development of resistance. This is illustrated in Fig. 3. Another answer may be found in the search for new antibiotics. That this may finally be accomplished is illustrated by the use of neomycin (Fig. 4).

Whether the final solution of the tuberculosis problem will be an antibiotic or a combination of two antibiotics administered together or alternately, such as streptomycin with neomycin, or of an antibiotic and a synthetic compound, only the future can tell. The main conclusion, however, can now be reached: the chemotherapy of tuberculosis is possible. We may only hope that in the near

future this dread disease, the "white plague" of mankind, will become but a memory in the history of man.

Potentialities of Neomycin

Information on the effect of neomycin in experimental and in clinical tuberculosis is still rather scanty. It is difficult to say what this antibiotic will do either in replacing or in supplementing streptomycin. The results presented here are based upon various published and unpublished reports of work done in a number of laboratories in the United States by G. L. Hobby, G. W. Rake, G. Duncan, O. Felsenfeld, and others.

Neomycin possesses a relatively low toxicity for experimental animals, the LD_0 for 20-g. mice being from 750 to 1,500 units. Daily injections of 1,200 to 2,000 units per mouse, administered subcutaneously in divided doses, produced no toxic manifestations. The drug is rapidly absorbed in the body and readily detected in the serum. It is rapidly excreted in the urine. It is highly active in experimental animals, daily dosages of 50 to 110 units per mouse being sufficient to suppress the tuberculous infections. It is just as active against streptomycin-resistant strains as against the sensitive strains.

With regard to the antituberculosis potential of neomycin, it is sufficient to say that in the animals infected with streptomycin-sensitive tubercle bacilli the results of neomycin therapy were, by and large, quite comparable to the results obtained with streptomycin.

One is impressed by the antituberculosis potential of neomycin in experimental tuberculosis against infections induced by either streptomycin-sensitive or streptomycin-resistant tubercle bacilli of the human type, as shown recently by Karlson, Gainer, and Feldman (1950). Until further pharmacological studies exonerate the drug of responsibility for direct or indirect damage to the kidneys, however, its use clinically must be approached with caution.

In human tuberculosis there is an immediate reaction consisting of lowering of the fever and a feeling of well-being. We have not seen toxic reactions with low doses. In two patients there was an increase of the N.P.N. and of the sedimentation rate, which disappeared when the drug was stopped. In some cases, however, definite evidence of a nephrotoxic and ototoxic action was reported.

The results recently published by Karlson, Gainer, and Feldman (1950) brought out the fact that neomycin is capable of producing a reversal of progressive tuberculosis in experimental animals. It is also effective against experimental infections due to streptomycin-resistant tubercle bacilli. A number of clinical cases, representing different forms of tuberculosis, are now being treated with neomycin, and it is expected that before very long a clear picture may be obtained of the potential place that this antibiotic may find in the treatment of tuberculosis. The possibility of combined action of neomycin and streptomycin or another antimicrobial agent is also receiving much consideration.

What of the Future?

The last decade has witnessed considerable progress in the chemotherapy of tuberculosis. From an unknown and questionable possibility, the treatment of this group of diseases by means of chemical agents has become a certainty. The introduction of antibiotics into the field of chemotherapy has opened new potentialities in the eradication of numerous infectious diseases, including tuberculosis. In the case of the latter, streptomycin pointed the way. Announced early in 1944, it has found immediate application in the treatment of various forms of tuberculosis. But streptomycin is not and must not be considered as a cure for tuberculosis.

It has its limitations. Most important of these is its toxic effect upon the eighth nerve and the development of resistance in the infecting agent upon prolonged treatment.

In the search for new antibiotics particular attention has been paid to agents that are more active than streptomycin, that are as active upon the streptomycin-resistant as upon the sensitive strains, and that allow, to a less extent than does streptomycin, the development of resistance. The discovery of neomycin pointed to the possibility of finding such antibiotics. Sooner or later other antibiotics will be found which are more effective than either and less toxic. The fact that in the various surveys on antibiotic production by micro-organisms the acid-fast bacteria are found to be among the most sensitive forms points to the possibility of the existence of such agents. Finding these is merely a matter of further search.

Further possibilities for improving the effect of streptomycin in tuberculosis are found in the combined use of two antibiotics or of an antibiotic and a synthetic compound. We can therefore look forward to a very bright future in the search for chemotherapeutic agents which will prove to be effective in the final eradication of tuberculosis.

REFERENCES

American Trudeau Society (1950). *Amer. Rev. Tuberc.*, **61**, 436.
Council on Pharmacy and Chemistry (1950). *J. Amer. med. Ass.*, **142**, 650.
Fanconi, G., and Löffler, W. (1948). *Streptomycin und Tuberkulose.* Benno Schwabe, Basel.
Feldman, W. H., Hinshaw, H. C., and Mann, F. C. (1945). *Amer. Rev. Tuberc.*, **52**, 269.
Florey, H. W., Chain, E., Heatley, N. G., Jennings, M. A., Sanders, A. G., Abraham, E. P., and Florey, M. E. (1949). *Antibiotics*, Vols. 1 and 2. Oxford University Press, London.
Hinshaw, H. C., and Feldman, W. H. (1945). *Proc. Mayo Clin.*, **20**, 313.
—— —— and Pfuetze, K. H. (1946a). *Amer. Rev. Tuberc.*, **54**, 191.
—— —— —— (1946b). *J. Amer. med. Ass.*, **132**, 778.
Karlson, A. G., Gainer, J. H., and Feldman, W. H. (1950). *Dis. Chest*, **17**, 493.
Medical Research Council (1948). *British Medical Journal*, **2**, 769.
Riggins, H. M., and Hinshaw, H. C. (1949). *Streptomycin and Dihydrostreptomycin in Tuberculosis.* National Tuberculosis Association.
Smith, M. I., and McClosky, W. T. (1945). *Publ. Hlth Rep., Wash.*, **60**, 1129.
Waksman, S. A. (1947). *J. Amer. med. Ass.*, **135**, 478.
—— (1949). *Streptomycin—Its Nature and Practical Application.* Williams and Wilkins Co., Baltimore, Maryland.
—— Hutchison, D., and Katz, E. (1949). *Amer. Rev. Tuberc.*, **60**, 78.

As the result of changes made in the National Hospital Service Reserve since recruiting first opened last autumn, the Ministry of Health has now sent an up-to-date outline of the scheme to all hospital authorities. It has come to the Ministry's notice that some of those who served at first-aid posts in the last war—and would be ready to do so again—have held back from joining the National Hospital Service Reserve because they are under the impression that there will be separate recruiting for first-aid-post personnel. This is not the case. Unlike the arrangements in the last war, the first-aid posts will in future be linked directly to hospitals; therefore personnel for all emergency nursing work, whether in hospital wards or first-aid posts, will be recruited and attached to the hospitals themselves. As far as possible those members joining the Reserve who express a preference to serve at first-aid posts will be earmarked for this kind of work. By the end of June membership of the Reserve had risen to 3,225, made up of 266 trained nurses and 2,959 auxiliaries. In supervising the organization of the Reserve, the Ministry has the guidance of a National Advisory Committee of sixteen members which includes representatives of the hospital authorities, St. John Ambulance Brigade, British Red Cross Society, Association of Hospital Matrons, Royal College of Nursing, and other bodies.

CHOICE OF SULPHONAMIDES FOR MIXTURE THERAPY*

BY

DAVID LEHR, M.D.

Associate Professor, Department of Medicine and Pharmacology, New York Medical College; Associate Attending Physician, Flower and Fifth Avenue Hospitals, New York City

Extensive experimental and clinical studies of the last five years have established the advantages of sulphonamide mixture therapy.[1-17]

In brief the rationale for the use of mixtures is as follows: The renal toxicity of most of the newer sulphonamides, if used singly, is due primarily to over-saturation of the tubular urine with a sparingly soluble sulphonamide and/or its metabolic product, resulting in the formation and deposition of drug crystals in the urinary pathways (crystalluria). This event may be followed by haematuria, oliguria, and complete renal shutdown. If instead of a single sulphonamide a combination of partial dosages of several therapeutically equivalent sulphonamides is employed, the danger of crystal formation in the kidney from the drugs comprising the mixture is significantly reduced. In fact, it will be only as great as if each compound had been administered alone and in the partial dosage contained in the mixture, since sulphonamides of different molecular structure, even if closely related, can be dissolved *simultaneously* to the full extent of their individual solubilities. At the same time full therapeutic potency is retained, since the antibacterial effect of such combinations is completely additive and may in many instances even show potentiation of action *in vitro* as well as at the bedside.[1 2 15]

From the standpoint of renal protection, combinations of substantially equal partial dosages of at least *three* sulphonamides were considered adequate in routine therapy in the absence of alkalization.[18] Some objection has been voiced against the use of mixed sulphonamides on theoretical grounds. It was intimated that the concomitant use of several drugs may lead to the simultaneous development of allergy against more than one component of the mixture.[19] Thus the incidence of allergic reactions might be increased and the possibility of "switching" a sensitized patient to another sulphonamide drug might be eliminated.

This thought was based on the concept that the incidence of sensitization to sulphonamides is largely independent of the dosage used. However, this point of view is not borne out by practical experience. Critical evaluation of the vast literature on sulphonamide therapy[12] demonstrated that, in the dosage range employed in human prophylaxis and therapy, the incidence of sensitization increases in direct proportion with the dosage. Table I shows that, for example, at an oral dosage of not more than 2 to 4 g. of sulphanilamide, sulphathiazole, or sulphadiazine in 24 hours, none of these drugs appeared to produce rash or fever in any significant percentage of cases, even if used for prolonged periods and repeatedly in the same individuals. The incidence of allergic reactions assumed significant proportions only when the daily dosage was increased to more than 4 g. and reached even higher percentages with full therapeutic amounts of 6 g. or more, provided medication was maintained for a minimum of three to five days. These observations indicate that the production of sensitization reactions is dependent upon the repeated presence of certain minimal tissue concentrations of a sulphonamide for a minimum period of several days.

TABLE I.—*Relation of Dosage to Incidence of Sulphonamide Allergy*

Drug	Daily Dosage (g.)	Days of Treatment	No. of Cases Treated	Incidence of Rash and Fever
Sulphanilamide ..	1–2	120–240	188	% 1·0
	1·5–4	7–21	1,687	0
	6–9	5–10	1,407	>10·0
	Routine therapy			7·2*
Sulphathiazole ..	2–4	3–15	3,584	0
	6	3–10	2,475	>6·4
	6–10	5–10	529	>10·0
	Routine therapy			11·2*
Sulphadiazine ..	1	12–90	664,840	<0·5
	2–4	3–20	18,185	0·07
	4–6	7–14	500	1·8
	6+	2–31	2,791	2·3
	Routine therapy			2·9*

* These figures are based on a comprehensive compilation of the incidence of rash and fever reported in the literature.

In most patients sensitization is specifically limited to the sulphonamide used. Hence the simultaneous administration of several sulphonamides in *partial* dosage may result in a reduced rather than an increased incidence of sensitization because mixtures permit "dilution" of individual drug concentrations below the level necessary for the production of allergy.

This concept appeared to be substantiated by our experience with more than 700 patients treated with combinations of two or three sulphonamides, including sulphadiazine, sulphamerazine, sulphapyrazine, sulphacetamide, and the "worst offender" sulphathiazole. The incidence of drug rash and fever at the full therapeutic dosage of 6 g. in 24 hours was impressively low and nowhere exceeded 2%.[12]

It has yet to be established whether closely related compounds such as isomers and homologues—e.g., sulphadiazine, sulphapyrazine, sulphamerazine, and sulphamezathine (sulphadimidine)—can be distinguished by the cells of the body as specific haptens. Should they prove indistinguishable, the danger of sensitization from their combined partial dosages could still not be greater than if the equal total amount of any one of these drugs had been employed. Hence no *increased* incidence of allergic reactions should result from any sulphonamide mixture, so long as individual drug concentrations in the tissues are kept well below the level usually necessary for the production of sensitization.

Theoretical Considerations

It seemed of interest to compare some properties of systemic sulphonamides which might help to determine their relative desirability as components of mixtures.

TABLE II.—*Relation of Solubility to Renal Complications*

Drug	Symbol	Solubility in Water 37° C.; pH 5·5 (Mg./100 ml.)		Blockage of Kidneys by Crystalline Deposits
		Free	N, Acetyl	
Sulphadiazine ..	SD	13	20	*Frequent*
Sulphamerazine ..	SMD	37	79	,,
Sulphamezathine	SMMD	75	115	Rare ,,
Sulphapyrazine ..	SPZ	5	5	Very frequent
Sulphathiazole ..	ST	98	7	,, ,,
Sulphacetamide ..	SAC	1,100	215	Not encountered
Sulphanilamide ..	SA	1,500	530	,, ,,

*This investigation has been made with the assistance of grants from the Committee on Therapeutic Research, Council on Pharmacy and Chemistry, American Medical Association, and the Schering Corporation, Bloomfield, N.J. A paper to be read at the first International Congress of Internal Medicine, Paris, September 11–14, 1950.

Table II represents an enumeration of systemic sulphonamides which deserve consideration for possible use as combinations. (The symbols for the different drugs shown here will be used in all subsequent graphs and tables.)

It is readily apparent that a definite relationship exists between the solubility of the sulphonamides and their acetylated metabolites and the frequency of renal complications. From this point of view sulphapyrazine would seem to be about the least desirable and sulphacetamide and sulphanilamide the most advantageous compounds. However, the high solubility of sulphanilamide is outweighed by its considerable overall toxicity. For this reason sulphanilamide was not used in our studies.

The behaviour of the other six drugs in the human body, as gleaned from the extensive literature on this subject, is illustrated in Table III. The desirable features of each

TABLE III.—*Comparison of the Behaviour of Six Sulphonamides in the Human Body*

Drug	Average Blood Levels* Free Sulphonamide Mg./100 ml.	% Plasma-bound	Diffusion into C.S.F. (% of Blood Level)	% Acetylated in the Body
SD	**6–15**	**17–58**	**50–75**	**20–40**
SMD ..	**10–20**	***39–84***	30–60	30–60
SMMD ..	**5–12**	***39–84***	30–60	***50–80***
SPZ	**5–12**	00–50	40–60	***50–85***
ST	**4–7**	***60–75***	***10***	**10–30**
SAC ..	**5–10**	**13–20**	**60–85**	**20–40**

* At a daily maintenance dose of 6 g. orally. Bold type = Advantages. Italic figures = Drawbacks.

drug are there stressed by bold print. Distinct drawbacks are indicated by italics. It can be seen that sulphadiazine is the least plasma-bound, best-diffusing, and least acetylated of the four "diazines." Hence, sulphadiazine rightfully maintains a therapeutic advantage over sulphamerazine and a definite superiority over sulphamezathine and sulphapyrazine. Sulphathiazole shares the disadvantage of excessive plasma-binding with the three last-named drugs and manifests in addition particularly poor diffusion into the cerebrospinal canal. Sulphacetamide, on the other hand, except for low blood levels due to rapid excretion, exceeds even the merits of sulphadiazine with regard to conjugation, diffusion, and plasma-binding.

No substantial differences seem to exist among systemic sulphonamides concerning their antibacterial spectrum. It should be remembered that various sulphonamides possessing a free para-amino group do not display appreciable differences in bacterial affinities. Molecular changes in the N_1 substituent serve to modify quantitative rather than qualitative antibacterial properties.[20]

In the animal experiment sulphathiazole proved the most toxic of the group, closely followed by sulphapyrazine, and then sulphadiazine and its two methyl homologues, which are about equally as toxic, whereas sulphacetamide is about five times less toxic than sulphadiazine.[21]

From a clinical point of view it can be assumed as established that, on the basis of their excellent clinical record, sulphadiazine and sulphamerazine qualify at present for first and second place respectively as components of any mixture. The other four compounds deserve attention as possible *additional* members of a combination.

Experimental Results

With this view in mind, I compared various triple mixtures with regard to antibacterial activity, toxicity, and therapeutic effectiveness in the experimental animal and in man. The majority of the mixtures contained both sulphadiazine and sulphamerazine as constant components, whereas the third component varied between sulphamezathine, sulphapyrazine, sulphathiazole, and sulphacetamide. Most experimental procedures used were closely similar to those outlined previously in detail.[2,7] For the sake of conciseness their description was eliminated from the present report.

No substantial differences were observed with any of the mixtures studied concerning *in vitro* antibacterial activity and efficacy against experimental infections of mice. On the whole the triple mixtures proved about equally as effective as sulphadiazine in identical total concentration or dosage.

Absorption, fate in the body, and excretion of these triple mixtures were investigated in rats, rabbits, and human beings. The results of representative experiments on tissue distribution in groups of albino rats are summarized in Figs. 1 and 2.

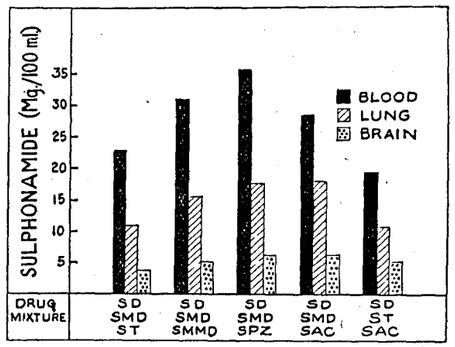


FIG. 1.—Concentrations of sulphonamide mixtures in tissues (single administration in albino rats).

Fig. 1 demonstrates the relationship of the drug concentrations in blood, lungs, and brain three hours after a single oral intubation of five triple mixtures (0.5 g./kg.). Although the sulphapyrazine and sulphamezathine combinations show higher blood levels, the sulphacetamide mixture, which is a close third in this respect, stands out as the one with excellent tissue distribution. In fact, the diffusion of this drug mixture into lungs and brain slightly surpasses that of the sulphapyrazine combination and is distinctly higher than that of the sulphamezathine or sulphathiazole mixture.

Similar results were achieved in 70 rabbits in studies of tissue distribution of sulphonamides from various routes of administration. In addition spinal fluid was obtained in these animals by occipital puncture, so that the blood–spinal-fluid ratio could be calculated. From the oral route of administration the diffusion of the sulphadiazine–sulphamerazine–sulphacetamide mixture through the haematocephalic barrier was as good as that of sulphadiazine, and the absolute concentration in the spinal fluid and blood even somewhat higher than that from sulphadiazine alone.

In the chronic study (Fig. 2), groups of rats were examined in a similar fashion after having been fed a standard diet containing 0.5% of four triple mixtures for 14 days. Here the mixture containing sulphamezathine as third component produced the lowest sulphonamide concentrations in lungs and brain, whereas there was no substantial difference between sulphathiazole, sulphapyrazine, and sulphacetamide in this respect. Since sulphathiazole

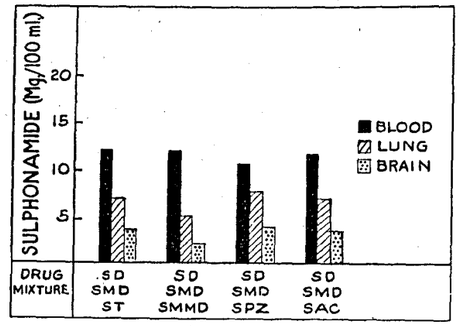


FIG. 2.—Concentrations of sulphonamide mixtures in tissues (chronic administration in albino rats).

has fallen into disfavour[22] and sulphapyrazine possesses a rather high experimental and clinical toxicity,[23] the mixture containing sulphacetamide appeared the most desirable composition for immediate clinical application.

This viewpoint was strengthened in numerous studies of absorption and excretion in 60 human subjects, using single and multiple dosages of separate and mixed sulphonamides. Tables IV and V represent a summary of all single-dose experiments with separate drugs and drug mixtures.

TABLE IV.—*Absorption and Excretion of Single Sulphonamides in Man**

Drug	Blood: Free Drug Mg./100 ml. 1 Hr.	4 Hrs.	8 Hrs.	24 Hrs.	Urine: Total Drug Excreted After 24 Hours Mg.	% of Dose
SD ..	1·8	8·0	7·2	3·7	2,223	55·5
SMD ..	3·0	9·8	9·0	4·7	1,077	26·9
SMMD	4·2	7·8	5·1	2·6	1,233	30·4
ST ..	3·9	6·5	5·0	1·0	2,869	71·7
SAC ..	6·2	6·8	4·5	1·4	2,801	71·0

* Each figure represents the mean of the values of 4 or more male test subjects. The dose was 4 g. sulphonamide orally.

Table IV illustrates on the left the blood levels achieved in groups of four male subjects with five single sulphonamides and on the right the total amount of drug excreted in 24 hours in mg. and as percentages of the 4-g. dose. It is apparent that sulphacetamide and sulphathiazole show the fastest absorption and most complete excretion, and that within the four-hour interval the blood levels of sulphacetamide are better than those of sulphathiazole and not far behind those of sulphamezathine. This is the more significant since sulphamezathine, like sulphamerazine, shows very incomplete urinary excretion, a fact which could be partially accounted for by their greater retention in the blood stream (plasma-binding) and partially by poorer absorption after oral administration. The percentage of acetylation was highest for sulphamethazine (68%), followed by sulphamerazine (46%), sulphadiazine (33%), sulphacetamide (30%), and sulphathiazole (21%). The behaviour of three triple mixtures under identical experimental conditions is depicted in Table V.

It is apparent that the replacement of sulphathiazole by sulphacetamide as the third component tends to raise blood levels slightly within the first four hours and to lower them accordingly thereafter. Sulphamezathine in the same position assists, as expected, in the prolonged maintenance of high levels and greatly retards urinary excretion. Conjugation of all three mixtures within the first 24 hours was

TABLE V.—*Absorption and Excretion of Sulphonamide Mixtures in Man**

Drug Mixture (Equal Parts)	Blood: Free Drug Mg./100 ml. 1 Hr.	4 Hrs.	8 Hrs.	24 Hrs.	Urine: Total Drug Excreted After 24 Hours Mg.	% of Dose
SD+SMD+ST	4·4	11·4	9·2	3·5	2,350	58·7
SD + SMD + SMMD ..	4·2	10·1	10·5	5·1	1,616	40·3
SD + SMD + SAC	6·3	9·2	7·1	3·2	2,431	60·7

* Each figure represents the mean of the values of 4 or more male test subjects. The dose was 4 g. sulphonamide orally.

around 30–40%, which was less than could be expected on the basis of mathematical computation using the figures of the single drugs. Since, in our hands, a combination of sulphadiazine–sulphamerazine–sulphathiazole had given excellent therapeutic results at the bedside, it was expected that the replacement of sulphathiazole by sulphacetamide would not interfere with the therapeutic efficiency of the triple mixture.

Clinical Application of Triple Mixtures

Clinical trials with a combination of equal partial amounts of sulphadiazine–sulphamerazine–sulphacetamide have been completed. A total of 170 unselected patients of all age groups with serious acute infections have undergone this therapy at the full routine dosage (in children: 0.15 to 0.2 g./kg. body weight daily; in adults: 3–4 g. initially, 4–6 g. daily thereafter; the lower maintenance dose of 4 g. daily proved adequate in most instances). Blood levels were excellent. They ranged as a rule between 10 and 25 mg. of free sulphonamide per 100 ml. Acetylation was low, rarely exceeding 20–25% in the blood and 40% in the urine. Although no alkalizing agents were used, crystalluria of a moderate degree was encountered in only 12 instances, as a rule in connexion with excessive urine concentrations of sulphonamide. There were two cases of drug rash and fever occurring on the tenth and the thirteenth day of therapy, respectively, and two instances of fever alone, possibly due to sulphonamide administration. One patient with acute tonsillitis had severe nausea and vomiting on the third day of drug administration, requiring interruption of therapy, and another patient with pneumonia developed a moderate degree of "cyanosis" apparently due to the drug. No other serious untoward reactions were observed.

Therapeutic results were highly satisfactory, with defervescence usually occurring within the first 24 to 48 hours. The series comprised 55 cases of bacterial pneumonia, 23 of shigellosis (*Shigella sonnei*), six of pyelitis, five of bacterial meningitis, one of penicillin-resistant pneumococcal bacteriaemia, and one of penicillin- and streptomycin-resistant staphylococcal septicaemia.

The experimental and clinical evaluation of other sulphonamide mixtures is continuing at present.

Summary

The simultaneous administration of several sulphonamides in *partial* dosage may result in a reduced rather than an increased incidence of sensitization, because mixtures permit "dilution" of individual drug concentrations below the level necessary for the production of allergy. Hence it is possible to enhance the renal protection afforded by sulphonamide mixtures by using additional components in proportionately smaller amounts, without the danger of increasing the incidence of allergic reactions.

Sulphadiazine and sulphamerazine qualify for first and second place, respectively, as mixture components. Sulphathiazole, sulphapyrazine, sulphamezathine, and sulphacetamide deserve attention as possible third and fourth members of a combination. Although sulphathiazole has fallen into disfavour in the U.S.A. because of its high clinical toxicity, mixtures containing this drug have shown a low overall toxicity. Sulphapyrazine, the most insoluble of these compounds, induces frequent renal and allergic reactions and therefore offers no advantages over sulphathiazole. Sulphamezathine has adequate solubility and low toxicity, but is subject to substantial conjugation and plasma-binding, which diminish its therapeutic efficiency. Sulphacetamide retains the high solubility of sulphanilamide and shares with the parent compound the improbability of renal concretion formation and the ready diffusibility into all tissues. In addition, it shows low figures for conjugation, plasma-binding, and sensitization.

The mixture sulphadiazine–sulphamerazine–sulphacetamide (equal amounts) revealed low toxicity in animals as well as excellent bacteriostatic activity *in vitro* and in experimental infections of mice. After oral administration, blood and spinal-fluid levels were similar to those from equal doses of sulphadiazine or sulphamerazine. Clinical trials of this mixture in 170 patients with acute systemic infections showed a high curative value and low toxicology.

REFERENCES

[1]Lehr, D. (1945). *Proc. Soc. exp. Biol., N.Y.*, **58**, 11.
[2]—— (1946). *J. Urol.*, **55**, 548.
[3]Frisk, A. R., Hagerman, G., Helander, S., and Sjögren, B. (1946). *Nord. Med.*, **29**, 639. Idem (1947). *British Medical Journal*, **1**, 7.
[4]Lehr, D., Slobody, L. B., and Greenberg, W. (1946). *J. Pediat.*, **29**, 275.
[5]Flippin, H. F., and Reinhold, J. G. (1946). *Ann. intern. Med.*, **25**, 433.
[6]Nilzen, A. (1946). *Svenska Läkartidn.*, **43**, 1816.
[7]Lehr, D. (1947). *Proc. Soc. exp. Biol., N.Y.*, **64**, 393.
[8]Snyder, L. J. (1947). *J. Lab. clin. Med.*, **32**, 1532.
[9]Lehr, D. (1947). *British Medical Journal*, **2**, 943.
[10]Sjögren, B., and Ortenblad, B. (1947). *Acta chem. scand.*, **1**, 605.
[11]Slobody, L., Lehr, D., and Willner, M. M. (1948). *Pediatrics*, **2**, 58.
[12]Lehr, D. (1948). *British Medical Journal*, **2**, 543.
[13]Oettinger, L., and Cronheim, G. (1948). *Amer. Practit., Phila.*, **2**, 526.
[14]Ledbetter, J. H., and Cronheim, G. E. (1948). *Amer. J. med. Sci.*, **216**, 27.
[15]Shore, P. D., Flippin, H. F., and Reinhold, J. G. (1949). Ibid., **218**, 80.
[16]Johnson, P. B. (1949). *Sth med. J.*, **42**, 761.
[17]Lehr, D. (1950). *N.Y. St. J. Med.*, **50**, 1361.
[18]—— (1949). *J. Amer. med. Ass.*, **139**, 398.
[19]Carrol, W. (1948). *Ann. intern. med.*, **29**, 533.
[20]Goldstein, A. (1949). *New Eng. J. Med.*, **240**, 98.
[21]Lehr, D. (1945). *J. Urol.*, **54**, 87.
[22]Council on Pharmacy and Chemistry (1949). *J. Amer. med. Ass.*, **141**, 264.
[23]Northey, E. H. (1948). *The Sulfonamides and Allied Compounds*, pp. 575, 577. Reinhold Publishing Corporation, New York.

Over 200 Scottish nurses had their names added to the *Register* of the General Nursing Council for Scotland on June 21. New rules made by the Council provide for the transfer of these nurses from the 1943 Nurses' List to the *Register* without application or payment of fee. This allows these nurses, who have hitherto been known as State-listed nurses, to be classified as State-registered in the branch of nursing in which they are qualified. It also grants them the right to vote in the forthcoming elections for the new General Nursing Council. The rules provide that persons who would have been eligible for admission to the 1943 list but who did not apply within the prescribed period may also be admitted to the *Register*. In their case, however, application for admission must be made to the registrar of the council.

MEDICAL TREATMENT OF HYDATID CYSTS OF LUNG*

BY

MARIANO R. CASTEX, M.D.

AND

EDUARDO L. CAPDEHOURAT, M.D.

Pulmonary hydatid cysts, apart from the rare cases which heal spontaneously after a single or repeated expectoration, are exclusively in the domain of surgery, varying only in the details of technique suited to each case.

Encouraged by the good results obtained in severe broncho-pulmonary suppurations, both localized and diffuse, by our method of transthoracic intrapulmonary injections of sulphonamides, antibiotics, and other drugs, we extended this treatment to suppurations due to the retention of hydatid membranes—that is, to suppurating cysts of the lung with incarcerated membranes. A few years later, in view of our favourable experience with infected cysts, we applied the same method of treatment to clean uninfected hydatid cysts.

Without exaggeration, and on the basis of our case records, we can now say that some cases can be treated medically. The importance and scope of this treatment remain to be established by further experience. Whilst the results in cases followed up have so far been successful, their number is too small to warrant definite conclusions. Nevertheless, we are optimistic, since we cannot believe that only the favourable cases came into our hands.

These cases fall into three categories : (1) suppurating pulmonary hydatid cysts, with retained membranes ; (2) ruptured pulmonary hydatid cysts, with loss of fluid content and persistence of the parasitic cavity, whether air-containing or not ; and (3) hyaline hydatid cysts—that is, closed and non-infected. We will outline the therapeutic procedures employed in each category, and give a single example of each kind to show the more salient clinical features.

Suppurating Pulmonary Hydatid Cysts, with Retained Membranes

These cases present two problems : broncho-pulmonary suppuration and the retention or incarceration of the parasitic membranes. The first problem is really a consequence of the second, since the membranes, except in rare instances of clean encystment or of calcification, behave as true foreign bodies, leading sooner or later to pus formation in the surrounding parenchyma.

We treat pulmonary suppuration locally by means of transthoracic injections of sulphonamides and antibiotics, choosing the drug according to the organism isolated, whenever possible, from the material aspirated, and adapting the dosage, interval of administration, etc., to the clinical and radiological progress of the patient.

The complete expulsion of the membranes, which is essential to end the suppuration, is achieved by a purely mechanical effect. The local congestion, partly hydrostatic and partly biochemical, created by the transthoracic injection provokes intense and repeated bouts of coughing, which directs the fluid current towards bronchi already dilated as a result of the suppuration. This flow carries along with it fragments of endocyst which have been

*A paper to be read at the First International Congress of Internal Medicine, Paris, September 11–14, 1950.

detached as much by the intense cough as by the proteolytic ferments of the pyaemic organisms. The insertion of the needle into the parenchyma, as well as the jet of solution, helps to break up the membrane and facilitate its expulsion. It is noteworthy that in most cases cyst remnants thus ejected were expelled during or shortly after injection ; this seems to establish a cause-and-effect relationship between the local influx of the drug and the expulsive action that follows it. In our cases the mechanical action achieved by the intrapulmonary injection has shown itself to be superior to bronchoscopic suction, which proved completely ineffective in all our cases, though performed by an experienced operator several times on one patient.

When all parasitic remains have been expelled and the broncho-pulmonary infection has died down, healing occurs rapidly ; this includes the whole bronchial tree draining the affected area, as demonstrated by clinical and radiographic examination. In some cases a slight increase in pleural opacity remains, with deformity of the diaphragm and obliteration of the costodiaphragmatic recess in the case of basal cysts, sequelae which do not affect the working capacity of the lung or the efficiency of the patient in carrying out normal activities.

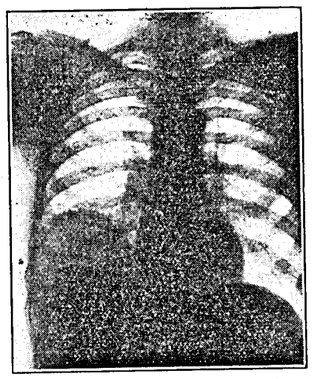


FIG. 1.—Case 1. The opaque cyst occupying the base of the right lung. A slight reaction is present.



FIG. 2.—Case 1. The cystic shadow is in the lowermost segment of the right lower lobe.

Case 1

A single labourer aged 41 was suffering from a suppurating hydatid cyst in the right lower lobe (Figs. 1 and 2). He was treated in the out-patient department and was thus able to remain on light work throughout treatment.

In view of the long history and the size and superficial location of the cyst, it was punctured at once at its most accessible point, which corresponded to the postero-inferior region of the lobe.

Hydatid ocentesis was carried out without the slightest inconvenience, immediate or remote. The first punctures yielded a small quantity of very thick pus and were then followed by 27 intrapulmonary injections. The first contained 200,000 units of crystalline sodium penicillin in 20 ml. of isotonic glucose saline ; most of the others contained 100,000 units in the same volume. Two injections consisted of an ampoule of "prontosil" mixed with an ampoule of "cibazol," and the last two injections consisted of 100,000 units of penicillin and an ampoule of cibazol and an ampoule of prontosil respectively. Treatment began on June 13, 1947, and ended on August 23 of that year, the intervals having varied from one to three days at the beginning and from four to twelve days towards the end. The cyst membrane was expelled in fragments during the course of the treatment. The good result obtained is clearly shown in Figs. 3 and 4.

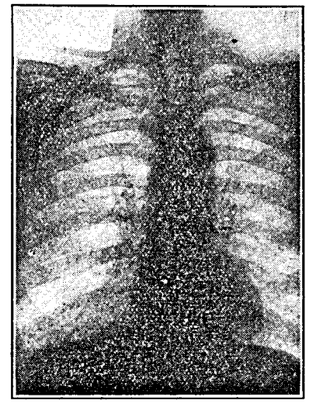


FIG. 3.—Case 1. Disappearance of the cystic shadow, and absence of any remnant of membrane.

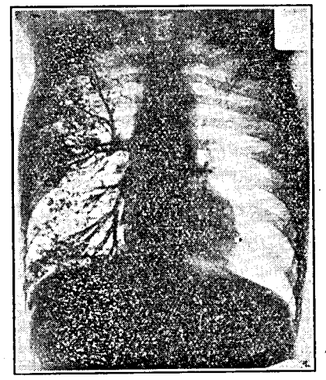


FIG. 4.—Case 1. Bronchogram showing the normal bronchial tree in the area previously occupied by the cyst.

Hydatid Cavities, Whether Air-containing or Not

In these cases, after rupture of some cysts, treatment is aimed essentially at removing the retained parasitic membrane which lines the cavity. This is achieved over a certain time, usually several months, by injection of digesting solutions containing hydrochloric acid and pepsin. Hydatid membrane, when exposed to these substances, becomes appreciably thinned and can then be coughed up without great efforts. This structural change is easily demonstrable by comparing the eliminated fragments with membrane which has not been exposed to digestive action. Patients show complete tolerance to the digestive solution, and this allows the frequent injections rendered necessary by the fact that the solution acts only for a short time because of rapid elimination, reabsorption, or both, and because of its dilution.

Case 2

A single labourer aged 34 had a ruptured hydatid cyst with air in the residual cavity situated in the left postero-inferior lobule. He was given intracystic injections of 10 ml. of a solution of pepsin in hydrochloric acid, the concentration of pepsin varying between 5 and 20%, and the HCl from 0.05 to 0.15%.

After 30 injections over a period of three months, and following complete expulsion of the parasitic membrane and consequent obliteration of the cavity, he was discharged healed. The digestive action had visibly affected the chitinous membrane, the expelled fragments being reduced to thin wafers which had lost their characteristic tendency to form cylinders. Erosion of the membrane facilitated its fragmentation and subsequent expectoration.

Hyaline Hydatid Cysts

These are referred to as clean, because they are closed and non-infected; they require a more complex treatment as follows: (1) Desensitization of the patient by injection in increasing doses of hydatid fluid and of its antigen, along the lines suggested by its discoverer, Dr. B. Calcagno. This is to prevent anaphylactic shock which, as is known, may be severe or even fatal. According to Calcagno this measure brings on death of the hydatid and so deprives it at the time of opening of its toxic properties on absorption of the hydatid fluid. (2) Fixation of the cyst to the chest wall, if this has not already occurred. This requires: (*a*) the induction of a pneumothorax; (*b*) irritation of the pleura by the use of substances such as hypertonic glucose or saline solutions, cibazol, 5% sodium morrhuate or ricinoleate urethane, etc., after previous injection of about 2 ml. of 0.5 to 2% procaine to allay pain and prevent reflex manifestations; (*c*) re-expansion of the lung; and (*d*) confirmation of pleural adhesion over the area by the failure of repeated attempts at fresh pneumothorax. (3) Puncture of the cyst, or hydatidocentesis. (4) Gentle aspiration of part of the hydatid fluid. (5) Chemical sterilization of the cyst by instilling some 10 to 20 ml. of 2% formalin and allowing it to stand for ten minutes. (6) Complete evacuation of the cyst.

There are now two alternative courses. One is similar to the treatment of a hydatid cavity and relies on the use of digesting substances. The other, which is much longer, is to await suppuration as a result of the retained membranes, or to induce it by such means as injection of terebene oil; induction of suppuration, however, is difficult to achieve because of the diffusion and absorption of the injected fluid. When suppuration is established, treatment is carried out as for the first category, in which infection pre-existed.

Expectoration of the intact membrane after emptying the cyst by puncture remains for us only a theoretical possibility, since we have never seen it happen. This could be explained by the disparity between the size of the membrane and that of the bronchial lumen, so that passage of the former is impossible even in the most severe bouts of coughing, whether or not induced by intrapulmonary transthoracic injection.

On the other hand, expectoration of the endocyst occurs reasonably easily and within a relatively short period after intrafocal medication when pulmonary suppuration is present, since the latter dilates the bronchial lumen at the same time as it fragments the parasitic membrane.

Case 3

A married woman aged 30 had a hydatid cyst in the left postero-inferior lobule. Pneumothorax was first induced, later followed by the intrapleural injection of 25 ml. of 50% glucose solution containing one ampoule of cibazol. Another sclerosing solution, "neo-varisclerin," was run in on three subsequent occasions, and the lung was then helped to re-expand by aspiration of the pneumothorax. All this took four months, during which time the patient was also undergoing desensitization with an antigen prepared by Dr. Pirosky, following Dr. Calcagno's method, according to whom this procedure should kill the cestode.

Failure to reinduce pneumothorax having demonstrated the pleural adhesion, the cyst was punctured without mishap. Then 20 ml. of fluid was drawn off and replaced by 10 ml. of 2% formol. Ten minutes later a similar amount was extracted and a further 10 ml. of 2% formalin was run in. As a final step, total evacuation of the cyst was attempted by carrying out injections into the cavity, some of penicillin and some of sulphonamides ("rubiazol" and prontosil), over a period of two months. After an interval of air-distension, the cyst collapsed and incarcerated the membrane.

Months later, since the patient had not managed to cough up the membrane, suppuration of the surrounding lung parenchyma was induced by the injection of terebene oil and the patient was temporarily discharged until the suppuration had become established some six months later. At this stage amounts of 20 to 40 ml. of physiological saline were injected into the area to act purely mechanically by causing coughing and subsequent expectoration. Five injections in six days were enough to achieve the complete expulsion of the parasitic membrane followed by the almost immediate subsidence of the pulmonary infection despite the fact that no active therapeutic substance had been used. This supported the belief that the pulmonary suppuration was caused mainly by the retained endocyst acting as a foreign body.

Conclusion

We consider that this method of bloodless treatment which we have devised is worthy of trial in strictly selected cases of hydatid cyst before deciding in favour of surgical intervention, which should remain a last resort.

The advantages of the method are: (1) It can be completely effective. (2) It does no injury to the body, whether locally or systemically. (3) It does not hinder the recovery of the affected broncho-pulmonary area. (4) It carries less risk than operative methods, which involve loss of blood and some mutilation. (5) It can be carried out on outpatients, to the advantage of either the State or the individual, who is spared the expense, and of the family, whose breadwinner can with care engage in some forms of light work without prejudicing his recovery. This double advantage of ambulant treatment would compensate for the longer time that is sometimes required for medical treatment as compared with surgical methods, particularly since the latter may also occasionally be prolonged by unfortunate complications. (6) It is no bar to subsequent operative treatment, which should be held in reserve in case of failure of this bloodless method.

RECENT ADVANCES IN OUR KNOWLEDGE OF THE MALARIA PARASITE*

BY

H. E. SHORTT, C.I.E., M.D., F.R.S.

Professor of Medical Protozoology, London School of Hygiene and Tropical Medicine

The demonstration by James and Tate (1938) of the essential part played by the exo-erythrocytic forms in the life cycle of *Plasmodium gallinaceum* started an intensive search for similar forms in the case of mammalian and human malaria parasites. The subsequent demonstration of the pre-erythrocytic forms of this parasite (Mudrow, 1940; Shortt, Menon, and Iyer, 1940; Huff and Coulston, 1944) intensified the search for similar pre-erythrocytic forms in simian and human malaria.

The investigation was taken up by malariologists in Europe, America, Asia, and Africa, and various findings were reported, none of which secured general recognition. A critical survey of these results was made by Angelini (1947), who came to the conclusion, subsequently justified, that none of the claims had been substantiated. This was the position when Fairley (1945, 1947) described the results of his classical experiments at Cairns with human volunteers infected with *P. vivax* and *P. falciparum* by the bites of

*To be read at the First International Congress of Internal Medicine, Paris, September 11-14, 1950.

infected mosquitoes. The results of these experiments, which cannot be described in detail, demonstrated the inescapable conclusion that during the incubation period of malaria after infection by mosquitoes the parasites which develop from the sporozoites must undergo some form of development, preliminary to invading the erythrocytes, in a secluded situation outside the circulating blood. This was a sure foundation on which to base the search for pre-erythrocytic forms.

The monkey parasite, *P. cynomolgi*, readily transmissible by *Anopheles maculipennis*, and closely resembling *P. vivax* of man, provided the most convenient material for study. All attempts, however, to demonstrate pre-erythrocytic forms proved abortive, and some observers cast doubts on their existence, while others considered that the methods being used in the search were faulty and that some new approach to the problem was indicated.

I had come to the conclusion, however, that the cause of failure by all workers, including myself, to demonstrate pre-erythrocytic forms of mammalian plasmodia was the use of inadequate numbers of infective mosquitoes in individual experiments. For this reason a crucial experiment was carried out in which 576 infected mosquitoes were fed upon a single rhesus monkey and the entire number of mosquitoes ground up and inoculated into the same animal.

Development of Pre-erythrocytic Forms

The monkey was killed seven days later and material from practically every type of tissue taken for study. The examination of this revealed, in the liver only, the long-sought pre-erythrocytic stage of a mammalian malaria parasite. Following this technique, it has been possible to demonstrate the development of these pre-erythrocytic forms from their early stages to maturity. The details of this development are as follows.

The earliest form so far found is a parasite seen four days after infection of the monkey by mosquitoes. It is situated inside a parenchyma cell of the liver, close to the nucleus. The original nucleus of the parasite has divided to produce 20 or more nuclei, so the parasite may now be called a schizont. From the fourth to the ninth day the parasite increases in size, while the nuclei multiply progressively until by the eighth or ninth day there are certainly over 1,000. The liver cell by this time is a mere bag containing the parasite, which may be 35 to 40 μ in diameter. The nucleus of the liver cell is pushed to the periphery of the body. The general shape of the schizont is ovoid, but lobose arms may be produced, probably due to unequal expansion in the direction of least resistance. In many cases vacuoles, single or multiple, appear in the body of the schizont.

There now follows condensation of the parasitic cytoplasm around the nuclei to form merozoites, which in a mature schizont number well over 1,000. Each is a small ovoid body about 1.1 μ in diameter with a single nucleus often eccentric in position. The containing cell membrane now ruptures and releases the merozoites into the surrounding tissues or into a blood sinusoid. Up to this point there has been no reaction on the part of the liver to the foreign body. On rupture of the latter, however, there is an immediate invasion of the area by phagocytic cells. The majority of the merozoites probably now invade erythrocytes to produce the blood infection, but many are engulfed by the phagocytes and destroyed.

Some of the merozoites almost certainly reinvade other parenchyma cells and recommence the cycle which has been described. This cycle can go on in the liver independently of the blood cycle, and is the probable cause of relapses in malaria. In proof of this a monkey which had been infected three and a half months previously, and in which the primary development from sporozoites must long have been completed, was examined. This monkey had shown no parasites in the peripheral blood for a month, and an early relapse was considered probable. On examination of the liver, exo-erythrocytic forms were found similar to those previously described.

The following interpretation of the cause of relapses is offered for consideration.

When an animal has been infected for some time it acquires an active immunity which is capable of destroying the merozoites produced either in the blood or by the liver schizonts when these enter the circulation, but the latter in their protected position in the parenchyma cells are unaffected. Therefore the merozoites released by the liver schizonts into the circulation are at once destroyed by the immune bodies, humoral or cellular or both, and so cannot attack the erythrocytes, while those which re-enter parenchyma cells are unaffected. If this immunity is lessened from any cause it is no longer effective in destroying the young merozoites escaping from the liver schizonts, and in consequence they succeed in invading the erythrocytes and so produce a parasitic relapse.

I shall now deal with pre-erythrocytic stages in human malaria.

Plasmodium vivax

In this case 2,010 mosquitoes infected with *P. vivax* were fed upon a human volunteer on two successive days. The volunteer was operated upon seven days later and a piece of liver removed. On examination this was found to contain schizonts of *P. vivax* very similar to those of *P. cynomolgi* found in the monkey. These schizonts measured up to 42 μ in diameter, and at 7 days old contained over 1,000 nuclei, so that the eventual number of merozoites produced was probably much greater. The description given of the schizonts of *P. cynomolgi* would apply generally to those of *P. vivax*. This experiment, where previously there had been doubts, proved conclusively the existence in vivax malaria of pre-erythrocytic forms, and there is no reason to doubt that here also there are later exo-erythrocytic forms which could produce relapses after recovery from the original attack of malaria.

Plasmodium falciparum

In this case there was no simian parasite readily available to guide one in devising experimental procedures, and so it was essential, from the beginning, to use a human volunteer in a transmission experiment.

A strain of *P. falciparum* was obtained from Rumania and used to infect *A. maculipennis* and *A. quadrimaculatus* mosquitoes. A total of 770 bites by heavily infected mosquitoes were inflicted on the human volunteer over a period of three successive days. Six days (140 hours) later a piece of liver was removed from the volunteer by open operation. If this should contain the expected pre-erythrocytic forms it would follow that the latter would be of three stages of development separated by 24-hour periods. On examining the biopsy specimen this prediction was proved to be correct and exo-erythrocytic stages were obtained of approximately six, five, and four days' development. Those of six days' development were fully developed schizonts with the merozoites already formed and ready to be released into the surrounding tissues. The forms of five and four days' development were schizonts, smaller in size and with the nuclei still in process of division preparatory to formation of merozoites. In the case of *P. falciparum* the fully developed schizonts were considerably larger than those of *P. cynomolgi*, measuring as they did 60 μ or more in diameter. They were less regular in shape than those of *P. cynomolgi* and tended to be multilobed. The merozoites were smaller and much more numerous.

Summary

It may be claimed that now, for the first time, unequivocal proof has been obtained that in simian and human malaria

pre-erythrocytic development of the parasites takes place in the parenchymal cells of the liver with the production of merozoites which invade the erythrocytes to establish the blood infection. At the same time strong evidence has been adduced to suggest that this developmental cycle in the liver persists after the establishment of the erythrocytic infection, may even exist without the latter, is relatively unaffected by the immunity response of the host, and is the probable source of relapses of the disease.

BIBLIOGRAPHY

Angelini, G. (1947). *Riv. Parasitt.*, **8**, 5.
Fairley, N. H. (1945). *Trans. R. Soc. trop. Med. Hyg.*, **38**, 311.
—— (1947). Ibid., **40**, 621.
Huff, C. G., and Coulston, F. (1944). *J. infect. Dis.*, **75**, 231.
James, S. P., and Tate, P. (1938). *Parasitology*, **30**, 128.
Mudrow, L. (1940). *Arch. Schiffs- u. Tropenhyg.*, **44**, 257.
Shortt, H. E., Fairley, N. H., Covell, G., Shute, P. G., and Garnham, P. C. C. (1949). *British Medical Journal*, **2**, 1006.
—— Garnham, P. C. C., Covell, G., and Shute, P. G. (1948). Ibid., **1**, 547.
—— Menon, K. P., and Iyer, P. V. S. (1940). *Indian J. med. Res.*, **28**, 273.

Medical Memoranda

Death from Atropine Poisoning

The following rare case is interesting enough to be placed on record.

CASE REPORT

A boy aged 2 years 9 months was brought to hospital on May 20, 1950, for the treatment of an alternating convergent squint which his mother had noticed five months previously. Atropine ointment 1% was prescribed and approximately 90 gr. (6 g.) was dispensed. The mother was given a glass rod with printed instructions about the method of administration.

The ointment was first used on May 23, when two applications were given, the first in the afternoon and the second in the evening. The mother stated that the application was made by first dipping the rod into the ointment, and that the amount applied was quite small. Next morning the child was not well and the parents called in their doctor, but a further application of the ointment was given. On the morning of May 25 the child had no breakfast, and at 9.15 a.m. he had a fit (tonic and clonic contractions) and was semiconscious afterwards. At 11 a.m. he had another fit, and was admitted to All Saints' Hospital, Chatham, at 2.20 p.m. under the care of Dr. Sadiq.

On admission his temperature was 97° F. (36.1° C.), pulse 120, and respirations 32. He was a well-nourished child. He had sordes on his lips; petechiae, mainly on the left side of the trunk; dilated pupils, not reacting to light; and slight opisthotonus. The cerebrospinal fluid was normal in every way. There was no growth of organisms from a throat swab. The white blood cells numbered 28,000 per c.mm. (polymorphs 72%, lymphocytes 23%, monocytes 5%). The blood sugar at 4 p.m. on the 25th was 30 mg. per 100 ml. Next day he had petechial haemorrhages on his neck, upper chest, elbows, and forearms, and a papular rash on his legs. His blood pressure was 130/60. His voice was hoarse; he cried without shedding tears and was restless. The blood urea was 60 mg. per 100 ml. He died at 9.45 p.m.

Post-mortem Examination.—This was carried out at 3.30 p.m. on May 27 by Dr. H. G. Close. The body was that of a well-nourished male child of stated age. The eyes were sunken and the pupils dilated. Bruises were found on the tip of the right iliac crest and below the left ankle. The air passages and lungs were dry. Several petechiae were present on the anterior aspect of the heart (weight 3 oz.—85 g.). There was a very small vegetation on the mitral valve. The thymus weighed 1 oz. (28 g.), the spleen 2 oz. (57 g.), and the lungs 9 oz. (255 g.). The liver (18 oz.—510 g.) was very pale, with several petechiae on the surface; microscopically, extensive fatty changes were seen. No gross abnormality was found in the kidneys (3 oz.—85 g.). The brain (44 oz.—1.25 kg.) was mushy, soft, and tore easily, and petechiae were present in the corpus callosum. The clinical story and post-mortem appearances are consistent with the diagnosis of atropine poisoning.

COMMENT

An analysis of the ointment showed that it contained 0.8% of atropine alkaloid, and the analyst stated that at least seven-eighths of the original quantity of the ointment dispensed was sent to him for analysis. Approximately ½ gr. (32 mg.) of ointment was picked up on the glass rod at each application. The total quantity administered, therefore, was approximately 3 gr. (0.2 g.), containing 1.6 mg. of alkaloid. The possibility that the child may have swallowed some of the ointment was considered, but almost all the ointment originally dispensed was accounted for.

Morton (1939) reported nine cases of atropine poisoning, two of which were fatal. In the first case six drops of 1% atropine solution were dropped into an injured eye, and after operation 1.5 g. of 1% atropine ointment was placed on the dressing next to the eye. Death occurred fourteen hours later. The total amount of atropine administered was 18.1 mg. In the second fatal case the pupils of both eyes were dilated with 1% atropine solution. Death occurred in under twenty-four hours and the total amount of atropine administered was 2 mg.

Hughes (1938) recorded a case, not fatal, in which 1% atropine ointment was smeared into both eyes twice daily for three days. On the third day the child was reported to be ill with a temperature, and the skin was flushed and very dry to the touch. Morphine and pilocarpine were given and recovery was uneventful.

My thanks are due to Dr. M. Sadiq for permission to publish this case and to Dr. H. G. Close for the pathological report.

W. E. HEATH, M.B., B.S., D.O.

REFERENCES

Hughes, C. A. (1938). *Trans. Ophthal. Soc. U.K.*, **58**, 444.
Morton, H. G. (1939). *J. Pediat.*, **14**, 755.

Neurological Complication After Combined Diphtheria and Pertussis Immunization

The occurrence of severe complications after an injection of pertussis vaccine is rare enough to merit record.

CASE REPORT

A girl aged 1 year was admitted to hospital on July 17, 1948, with left hemiplegia. She had been a healthy infant. There was no family or personal history of convulsions or allergy. Injections of diphtheria A.P.T. on May 9 and 19 had caused no apparent untoward effect. An injection of pertussis vaccine on June 17 similarly had caused no ill effect. On July 15 a mixture of alum-precipitated pertussis vaccine and diphtheria A.P.T. had been injected, and a few hours later she is said to have been quieter than usual, but by bedtime (about 17½ hours later) had become her usual self again. Early next morning she had been found in a fit with twitching of the face and both limbs on the left side, and 2½ gr. (0.16 g.) of phenobarbitone had been given. Shortly afterwards a state of semi-coma had ensued, lasting several hours, and later a left hemiplegia had developed.

On admission the child was very irritable, her temperature was 102° F. (38.9° C.). Physically she was well nourished. She had a left hemiplegia with little movement of the upper limb and none of the lower. The reflexes of the upper limb were absent, the knee-jerks were present and equal, but the left ankle-jerk was absent. The right plantar response was flexor but the left was indefinite. The abdominal reflexes were absent. There was no detectable involvement of the cranial nerves and the fundi oculorum were normal. The pyrexia subsided in two days.

On January 17 the spinal fluid was under normal pressure. It contained no excess of cells; 30 mg. of protein per 100 ml.; no excess of globulin; 730 mg. of chlorides per 100 ml. On January 20 a repeat tap showed that the fluid contained no excess of cells; 30 mg. of protein per 100 ml.; no excess of globulin; 720 mg. of chlorides per 100 ml.; 65 mg. of sugar. No organisms were grown. Queckenstedt's test was negative. The Wassermann reaction of the blood and spinal fluid was negative.

The hemiplegia improved rapidly, all the deep reflexes of the limbs and abdominal reflexes appearing within a week. The patient was discharged on July 31, a happy and lively baby with slight weakness of the affected limbs.

When seen again on August 5 there was no apparent weakness of the limbs. Her mother had noticed some clumsiness of the affected limbs in play, but considered that this was improving. There was no evidence of mental deficiency.

COMMENT

Anderson and Morris (1950) have reviewed the literature and reported a case which developed convulsions 36 hours after a first injection of combined diphtheria–pertussis antigen. Their case had had a previous history of convulsions.

The present case is of interest because no apparent ill-effects had been produced by previous injections of A.P.T. and alum-precipitated pertussis vaccine given singly; the convulsion followed the injection of a mixture of these two antigens, made by the same manufacturer. Sensitization as a result of the previous injections cannot be ruled out, but the frequency of allergic states and the rarity of serious neurological complications of this kind suggest that these reactions may have a genetic basis; a previous history of convulsions may therefore, pending further additions to our knowledge, be regarded as a contraindication to the use of pertussis antigens. It should not be forgotten that an attack of whooping-cough may cause encephalopathy with permanent residua, including mental changes (Levy and Perry, 1948).

J. VAHRMAN, M.B., B.S., C.P.H.,
Senior Registrar, Department of Infectious Diseases, Royal Free Hospital.

REFERENCES

Anderson, I. M., and Morris, D. (1950). *Lancet*, **1**, 537.
Levy, S., and Perry, H. A. (1948). *Amer. J. ment. Defic.*, **52**, 217.

An Emergency Leucotomy

Prefrontal leucotomy is now an established procedure in psychiatry. The indications for such an operation are usually regarded as certain forms of chronic mental illness which have not responded to more conservative methods. In the following case the operation may be correctly described as life-saving; and it would not be inaccurate to speak here of "an emergency leucotomy."

CASE REPORT

The patient, a woman aged 21, was admitted to hospital on August 6, 1947, with a provisional diagnosis of anorexia nervosa. She was the youngest child of a family of eight, whose father had committed suicide at the age of 54. Her childhood and adolescence had passed without revealing any abnormal personality traits. At 19 she became sensitive about her appearance and fastidious about her food, and developed the delusion that she was unable to swallow and that she might become "filled up with wind" and die. She would pretend to chew her food but secretly spit it out and hide it in odd corners. Her sleep was disturbed and she was losing weight. On admission her weight was 5 st. (31.8 kg.); two years previously it had been 7 st. (44.5 kg.). Apart from this peculiarity about eating, there were no other psychotic symptoms.

A course of modified insulin was given and strict hospital routine and observation were maintained. Her weight gradually returned to normal and she was discharged home on December 13 "happy, sociable, and eating and sleeping well."

After remaining well at home for four months her previous delusions and habits returned, and she was readmitted to hospital on June 30, 1948, in a dangerous state of emaciation. Her urine was loaded with acetone and her appearance was that of a concentration-camp victim. Her weight was 5 st. 5 lb. (34 kg.). She refused all food and required tube-feeding. Later, when her physical health was stronger, a course of E.C.T. was given. This treatment produced only very temporary remission, and within a few days of stopping it the refusal of food began again. Tube-feeding had to be resorted to. This was a painful procedure for all concerned, as the patient did all in her power to resist and to regurgitate the food. She made frequent promises to eat, but was a genius at deception. Food would be found hidden in the strangest places. She showed no insight into the danger she was in and could explain her refusal to eat only by saying "she came of a thin family."

A transorbital leucotomy was performed on December 6, 1948. This produced a temporary remission, but by March 13, 1949, she had returned to her previous state and tube-feeding had again to be resorted to.

It was at this stage that the emergency occurred. She developed a recurrent evening pyrexia. A radiograph of her chest showed "a cavity below the right clavicle with a little surrounding opacity, doubtless tuberculous." Her erythrocyte sedimentation rate at this date was 37 mm. in 1 hour. Further E.C.T. was now out of the question, and the prognosis was indeed grave. Her emaciated state and continued dependence on tube-feeding pointed to a fulminating phthisis soon ending the story.

A full leucotomy seemed now the only possible hope. This was performed on May 4. Convalescence was uneventful and she ate her food satisfactorily from that day forward. Before operation her weight was 5 st. 6 lb. (34.5 kg.) and a week after it was 5 st. 12 lb. (37.2 kg.). On June 27 it was 8 st. (50.8 kg.) and her erythrocyte sedimentation rate was 7 mm. in 1 hour.

In spite of the presence of a tuberculous cavity it was decided not to confine her to bed. The after-treatment of a leucotomized patient should be one of continued occupation, and this was considered a matter of priority in her case. Her activity was gradually increased and no rise of temperature was noticed. As the weeks passed her mental state improved concurrently with her physical condition. She became more interested in other people and in her own appearance, and her work at the occupational therapy class improved. On June 9 a further *x*-ray report read: "Cavity cleared below right clavicle and infection almost gone."

COMMENT

This case seems worthy of record for several reasons. (1) It raises an interesting point in psychiatric diagnosis. The initial symptoms were classically those of an anorexia nervosa, but the long duration of the illness, the temporary response to E.C.T., and the more permanent response to leucotomy suggest that basically the illness was schizophrenic. (2) It shows that when a transorbital leucotomy has proved a failure a full prefrontal operation may yet be a success. (3) The influence of the mental state on a patient suffering from phthisis is well known. In the above case a specifically psychiatric procedure and the ignoring of the physical disease during convalescence led to an eventual healing of a proved tubercular lesion—a healing as rapid as any collapse treatment would have produced.

My thanks are due to Dr. J. N. P. Moore, medical superintendent of St. Patrick's Hospital, Dublin, and to Professor A. McConnell and Mr. J. P. Lanigan, of the Neurosurgical Unit, St. Laurence's Hospital, Dublin, for their assistance with this case.

M. O'C. DRURY, M.D., D.P.M.,
Deputy Medical Superintendent, St. Patrick's Hospital, Dublin.

Reviews

POSTGRADUATE LECTURES

Postgraduate Obstetrics and Gynaecology. By F. J. Browne, M.D.(Aberd.), D.Sc., F.R.C.S.Ed., F.R.C.O.G. (Pp. 501; 107 figures. £2 10s., postage 1s. 6d. extra.) London: Butterworth and Co. 1950.

Professor F. J. Browne's energy and enthusiasm for teaching at all levels continue unbounded, to the admiration and envy of his friends and colleagues. Even since his nominal retirement a few years ago he has regularly conducted classes in advanced obstetrics and gynaecology for those seeking specialist rank and diplomas, helping by individual initiative to fill one of the gaps in the facilities for the training of such in this country.

The forty-five chapters in this book each represent the basis of one or other of his postgraduate lectures, selected to exclude so far as possible the material in his other book. They are mainly on those topics around which interest has centred in recent years, those which are likely "spots" for any higher examination, and those on which anyone engaged in practice or teaching may wish to have a clear and concise statement of the latest views. The outlook throughout is academic rather than practical, some of the chapters being good, some less good, but all useful. In his introduction Professor Browne writes: "The aim of a teacher should be, I think, to know the literature as far as he can, to filter it through his mind and give his conclusions, right or wrong." Not everyone will agree with this when the result is a predigested meal which satisfies rather than stimulates the appetite and deprives the student of the necessity to think and to browse among journals. Nevertheless, there is no doubt that postgraduate students will welcome it, and in doing so should beware lest it result in a uniformity in replies to examination questions. The examiners also can hardly fail to have read it, and, human nature being as it is, may grow weary of script after script containing thinly veiled chapter "X" of F. J. Browne.

T. N. A. JEFFCOATE.

CLASSIFICATION OF SHIGELLAE

On the Classification of the Shigella Types. With special reference to the Flexner Group. By Sten Madsen. (Pp. 122. No price.) Copenhagen: Ejnar Munksgaard. 1949.

Those bacteriologists working on the identification and the preparation of diagnostic sera for the investigation of organisms of the genus *Shigella* will be grateful to the author for collecting all the more important findings in his book. Madsen obained 230 strains of dysentery bacilli, mainly from British and American sources, but also from Denmark and other parts of the world, including strains used in earlier classifications. Using these, he confirms the use of the biochemical division into mannitol-fermenting and non-fermenting groups. The former group consists of *Sh. flexneri* types 1–6, *Sh. boydii* types 1–7, and *Sh. sonnei*; the latter of *Sh. shigae, Sh. schmitzii,* and *Sh. large-sachsii* types 1–5. He replaces with arabic the roman numerals commonly used in recent classifications. The organisms "alkalescens" and "dispar" are excluded from this genus on serological grounds, which suggest that they are more closely related to the genus *Escherichia.* Many observers will agree with this exclusion, since the organisms do not cause clinical dysentery. Details are given of both the typical and atypical biochemical reactions of all strains studied. In the chapter on serology the author describes the preparation of sera as well as his method of absorption used in the preparation of type-specific sera. His work on the Flexner group shows that he did not find one group antigen common to all types 1–6; in this respect his findings differ from those of some other investigators.

This monograph, the result of much careful work, is another step towards obtaining an internationally acceptable stable scheme for the classification of the shigella group. The descriptions of media, technique, and detailed laboratory findings will be of great assistance in the routine laboratory, but particularly in the specialized laboratory concerned with the full identification of strains.

JOAN TAYLOR.

THE STATISTICIAN'S JOB

Practical Statistics in Health and Medical Work. By Ruth Rice Puffer, Dr.P.H. (Pp. 238. £1 12s.) London: McGraw-Hill Publishing Co. 1950.

This book is an expansion of lectures given by the author to the School of Public Health of the University of Chile in 1946. The subject has been liberally illustrated with examples from the work of the Tennessee Department of Health, where Dr. Puffer has been Director of Statistical Service since 1933. Much of the advice she gives is no wishful idealism but the keynote of her work. She preaches what she practises—that careful planning is the key to the successful solution of any problem in field work, and that the statistician's job is to help design the experiment, not merely to analyse data for which he has not been responsible. She emphasizes that a knowledge of the field of study is more important than elaborate analysis, and that for many problems simple statistical techniques are sufficient.

The first four chapters of the book are on the general principles covering the uses of statistics in public health work, planning of studies, and presentation of data. Much of this could well be condensed, while Chapter 5, "Elementary Statistical Method," is at once too short for beginners and unnecessary for those with any previous knowledge. It is in the succeeding chapters, where she draws on her own experience, that the book is valuable. For the English reader the discussion of secondary attack rates, and the need for defining what Frost called the "index case," is useful. In two chapters she considers person-years as a measure of exposure to risk and life-table techniques in long-term and follow-up studies, uses which in the future will probably be of great importance. The sections on morbidity surveys in the U.S.A. make clear the distinction between prevalence and incidence data. A large part of the chapter on industrial mortality and morbidity is drawn from English data.

There are omissions, among the more important of which are a discussion of the uses and difficulties of sampling in field studies, but the student wishing to solve an epidemiological problem will find useful advice in this book.

J. KNOWELDEN.

OCCUPATIONAL THERAPY

Occupational Therapy; Principles and Practice. Edited by W. R. Dunton, jun., M.D., and S. Licht, M.D. (Pp. 321; 12 illustrations. £2 5s.) Oxford: Blackwell Scientific Publications.

Although occupational therapy has been in use as a form of hospital treatment for nearly forty years, particularly in mental hospitals and tuberculosis sanatoria, little was written on the subject before the second world war. It was then that the value of this type of therapy came to be more fully recognized and understood, not merely for its use in providing a pleasant diversion from brooding over disabilities and apprehensions, but as a positive means of restoring muscular tone, stimulating interest in creative work and providing recuperative activity for both body and mind.

This volume is the work of the associate editors of the useful bi-monthly journal *Occupational Therapy and Rehabilitation,* and, unlike previous treatises on the subject, is primarily intended for physicians. It has been written with the purpose of acquainting them with the varied conditions in which occupational therapy can make a direct contribution to ordinary medical and surgical treatment. That is why it probably includes many details of purely pathological and diagnostic interest which appear somewhat irrelevant in a book of this nature, and which tend to obscure the main object of the work.

Among interesting subjects discussed at length by expert contributors are the various purposes served by occupational therapy in the treatment of psychiatric disorders; kinesiology, and its value in selecting suitable handicrafts for weakened muscles; the place of drama therapy, and its psychotherapeutic function; and the type of occupational methods most suitable in the rehabilitation of cases of pulmonary tuberculosis, heart disease, and cerebral diplegia. Miss Lyttleton (a British occupational therapist) contributes a useful chapter on the treatment of amputees, with valuable hints on the right psychological approach.

The actual technique of occupational therapy is very scantily described, and there is but little reference to the details of application in traumatic and orthopaedic cases, or to the adaptation of machines in industry itself for the rehabilitation of injured workmen—such as is proving so fruitful a development of occupational therapy in Britain. The book will, however, give the general physician a wide view of the varied possibilities of this form of hospital treatment.

HAROLD BALME.

FOOT DISORDERS

The Practice of Chiropody. By Keith Campbell Jones. Foreword by Norman C. Lake, M.D., M.S., D.Sc., F.R.C.S. (Pp. 279; illustrated. £2 2s.) Sydney and London: Angus and Robertson, 48, Bloomsbury Street, W.C.1.

This is an excellent straightforward textbook for the student and practitioner of chiropody. The author is a past president and foundation member of the Australasian Guild of Chiropodists, and for many years has been recognized as one of the foremost teachers in his profession. His experience as editor of a journal devoted to chiropody has enabled him to present the material in a readable yet concise form.

He covers the subject comprehensively and discusses the various problems with admirable common sense. He gives in full the prescriptions of all therapeutic preparations in ordinary use, and includes a useful account of chiropodial physiotherapy. The chapters on the organization and conduct of a modern practice, on military chiropody, and on the problems of post-war chiropody are noteworthy. The only illustrations are of anatomical drawings of the leg and foot. These, though good in themselves, lose much of their value by being scattered haphazardly throughout the book. It is to be hoped that in future editions the illustrations will be grouped together in close relationship to the relevant text. The production is otherwise good, though the price seems rather high for a book so sparsely illustrated and printed on paper of only moderate quality.

J. C. ADAMS.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

The Physiological Basis of Medical Practice. By C. H. Best, C.B.E., M.A., M.D., D.Sc., F.R.S., F.R.C.P.Can., and N. B. Taylor, V.D., M.D., F.R.S.Can., F.R.C.S.Ed., F.R.C.P.Can., M.R.C.S., L.R.C.P. 5th ed. (Pp. 1,330. 84s.) London: Baillière, Tindall and Cox. 1950.

Worth and Chavasse's Squint: The Binocular Reflexes and the Treatment of Strabismus. By T. K. Lyle, C.B.E., M.A., M.D., M.Chir., M.R.C.P., F.R.C.S. 8th ed. (Pp. 319. 35s.) London: Baillière, Tindall and Cox. 1950.

Essays in Zen Buddhism (Second Series). By D. T. Suzuki, D.Litt. (Pp. 348. 15s.) London: Rider. 1950.

The Medical Annual, 1950. Edited by Sir H. Tidy, K.B.E., M.A., M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. (Pp. 448. 25s.) Bristol: John Wright. London: Simpkin Marshall. 1950.

Ionization Chambers and Counters. By D. H. Wilkinson, M.A., Ph.D. (Pp. 266. 25s.) Cambridge: University Press. 1950

Thorpe's Dictionary of Applied Chemistry. 4th ed. Vol. 10. (Pp. 913. 100s.) London: Longmans, Green. 1950.

Clinical Orthoptic Procedure. By W. Smith, O.D. (Pp. 393. 56s.) London: Henry Kimpton. 1950.

Collected Papers of the Mayo Clinic and the Mayo Foundation. Edited by R. M. Hewitt, B.A., M.A., M.D., and others. Vol. 41. (Pp. 820. 52s. 6d.) London: Saunders. 1950.

Parenthood. By C. M Owen, S.R.N. (Pp. 192. 7s. 6d.) London: William Heinemann. 1950.

A Doctor Remembers. By E. A. Barton. 2nd ed. (Pp. 288. 12s. 6d.) London: Seeley, Service. 1950.

Introduction to Motherhood. By G. D. Read, M.A., M.D. (Pp. 92. 6s.) London: William Heinemann. 1950.

A Measuring Diagram for Daylight Illumination. By P. J. Waldram, F.R.I.C.S. (Pp. 19. 5s.) London: Batsford. 1950.

Papers of the Michigan Academy of Science, Arts and Letters. Edited by E. S. McCartney and F. K. Sparrow. Vol. 34 (1948). (Pp. 355. 55s.) London: Geoffrey Cumberlege, Oxford University Press. 1950.

Ophthalmic Operations. By S. Philps, F.R.C.S. (Pp. 397. 50s.) London: Baillière, Tindall and Cox. 1950.

Help for Childless Couples. Marriage Guidance Booklets—No. 4. (Pp. 23. 6d.) London: National Marriage Guidance Council. 1950.

Williams Obstetrics. By N. J. Eastman. 10th ed. (Pp. 1,176. No price.) New York: Appleton-Century-Crofts. 1950.

Physician's Handbook. By M. A. Krupp, M.D., and others. 6th ed. (Pp. 380. $2.50.) Palo Alto, Cal.: University Medical Publishers. 1950.

German Aviation Medicine, World War 2. Vols. 1 and 2. Edited by the Surgeon-General, U.S. Air Force. (Pp. 1,302. $8.50 the set: in buckram $4.25.) Washington 25, D.C.: Department of the Air Force. 1950.

Spaltlampen-Mikroskopie des hinteren Augenabschnittes. By K. Hruby. (Pp. 164. M. 28.60.) Vienna and Innsbruck: Urban and Schwarzenberg. 1950.

Segment-Therapie. By M. Kibler. (Pp. 136. M. 9.50.) Stuttgart: Marquardt. 1950.

Leitfaden für Prostatiker. By J. Minder, M.D. (Pp. 68. M. 4.80.) Stuttgart: Georg Thieme. 1950.

Die Lunge des Kindes. By S. Engel. (Pp. 288. M. 29.70.) Stuttgart: Georg Thieme. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY SEPTEMBER 9 1950

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE

Two years ago a group of physicians met in Basle to found the International Society of Internal Medicine. The first Congress of the Society will be held in Paris next week under the presidency of Professor André Lemierre, and it is expected that between 1,000 and 1,500 delegates from all over the world will be present. It is unfortunate that there is no representative of the U.S.S.R. on the International Committee of the Society, the existence of which owes much to the inspiration of Professor A. Gigon, of Switzerland.

As the Congress has limited funds at its disposal those responsible for its organization asked certain internationally known periodicals to publish some of the principal contributions to be read next week. This task has been shared by the *Acta Medica Scandinavica*, the *Schweizerische Medizinische Wochenschrift*, the *Semaine des Hôpitaux*, and the *British Medical Journal*. In the opening pages of this week's issue are printed papers whose excellence is a testimony to the wisdom of those who, under the guidance of the Secretary-General of the Congress, Professor L. Justin-Besançon, of Paris, chose the subjects and speakers for next week's meeting. Copies of the journals participating in this novel method of publishing part of the proceedings of a congress will be in the hands of all those who attend it on Monday, September 11. This *Journal* welcomes the opportunity of making this small contribution to international medicine.

PERNICIOUS ANAEMIA AND THE INTRINSIC FACTOR

An important concomitant of two great chemical discoveries—the isolation[1] and synthesis of pteroylglutamic acid (folic acid) and the isolation[2] of vitamin B_{12}—is the evidence that these substances are factors essential not only for the maintenance of normal haematopoiesis but are also required for the growth of many kinds of living cells and organisms. In the study of pernicious anaemia, however, the nature of the gastric lesion still remains an unsolved problem. It is now apparent that pteroylglutamic acid is not the extrinsic factor of Castle. Though effective in securing normoblastic transformation of the megaloblastic marrow in pernicious anaemia, it does not halt the onset of subacute combined degeneration and may indeed precipitate it. There is some evidence that it may also fail to maintain adequate numbers of erythrocytes in the circulation. On the other hand, the effect of injections of vitamin B_{12} on both the haematopoietic and central nervous systems more closely resembles that of adequate parenteral liver therapy. Pteroylglutamic acid is as effective by the oral as by the parenteral route in procuring haematopoietic response, but vitamin B_{12} is very variable in its effects when given by mouth, and, at best, far larger doses are required than by injection to produce comparable results. All this recent work links up with the fundamental research of Castle and his co-workers on the intrinsic factor, for when vitamin B_{12} together with normal gastric juice is given to patients with pernicious anaemia the haematopoietic response is good.[3,4] In the opening pages of this issue Dr. Byron E. Hall describes experiments which shed light on the probable relationship of vitamin B_{12} to the intrinsic factor.

Both the nature and the mode of action of the intrinsic factor are mysterious. It has been established that in normal gastric juice it is heat labile, it is separable from pepsin, and it will not pass through semipermeable membranes. The effectiveness of dry preparations of hog stomach when given orally in pernicious anaemia may be explained by their content of both vitamin B_{12} and intrinsic factor.[5] Dr. Hall, collaborating with Dr. Bethell and his associates, has found that lyophilized extracts of gastric and duodenal mucosa of swine are particularly effective in promoting response to orally administered vitamin B_{12} in pernicious anaemia. Interaction between vitamin B_{12} and the intrinsic factor appears necessary for the absorption of the former from the human alimentary tract, but the nature of the reaction and its specificity and function are still under investigation. Some workers have suggested that the intrinsic factor has an enzymatic function, possibly acting on peptide linkages. Dr. Hall also supports the concept of an enzymatic action. Simple liberation of vitamin B_{12} from combined forms in the diet appears unlikely from the results obtained by giving the free vitamin and intrinsic factor preparations together by mouth. Although much is now known of the chemistry of the vitamin B_{12} molecule, including evidence for the presence of the

[1] Pfiffner, J. J., *et al.*, *Science*, 1943, **97**, 404.
[2] Smith, E. L., *Nature, Lond.*, 1948, **161**, 638.
[3] Berk, L., Castle, W. B., *et al.*, *New Engl. J. Med.*, 1948, **239**, 911.
[4] Hall, B. E., Morgan, E. H., and Campbell, D. C., *Proc. Mayo Clin.*, 1949, **24**, 99.
[5] Bethell, F. H., *et al.*, *Univ. Hosp. Bull. Ann Arbor*, 1949, **15**, 49.
[6] Brink, N. G., and Folkers, K., *J. Amer. chem. Soc.*, 1949, **71**, 2951.
[7] Beaven, G. R., *et al.*, *J. Pharm. Pharmacol.*, 1949, **1**, 957.
[8] *Proc. Soc. exp. Biol. Med.*, 1950, **73**, 15.
[9] *J. Amer. chem. Soc.*, 1949, **71**, 3858.
[10] Meyer, C. E., Eppstein, S. H., Bethell, F. H., and Hall, B. E., *Fed. Proc.*, 1950, **9**, 205.
[11] *British Medical Journal*, 1949, **2**, 731.
[12] *Blood*, 1949, **4**, 793 and 803.
[13] *J. Path. Bact.*, 1928, **31**, 557.

benziminazole nucleus,[6,7] there is no proof that any chemical modification is brought about by the intrinsic factor. The possibility of small structural changes not reflected by such physical properties as the absorption spectrum is admitted by Wolf and his colleagues,[8] but these workers also found no change in the microbiological activity of vitamin B_{12} for *L. lactis* Dorner when added to normal human gastric juice at *p*H 2, 3, and 7 and incubated for periods up to 22 hours at 28–30° C.

Evidence that "binding" of vitamin B_{12} occurs in certain conditions may have an important bearing on the problem of utilization. Ternberg and Eakin[9] have reported that the non-dialysable, heat-labile component of normal gastric juice unites with vitamin B_{12} and renders it non-available to such bacteria as *Bact. coli*, *L. lactis* Dorner, and *L. leichmannii*, and that heating liberates the microbiologically active vitamin B_{12} again from this complex. These authors have named the heat-labile component of the gastric juice "apoerythein." This is less abundant than normal in the gastric juice of patients with pernicious anaemia, and it is suggested that the substance is related to or identical with the intrinsic factor. Dr. Hall reports that the duodenal mucosal extracts of hogs which potentiated the absorption of vitamin B_{12} were also active in rendering vitamin B_{12} non-available to *L. leichmannii*. There is evidence that egg-white lysozyme will unite with vitamin B_{12} to form a complex non-available to *L. lactis* Dorner.[10] This complex is ineffective haematopoietically when given by mouth, and Dr. Hall has also discovered extracts of swine gastric mucosa with strong binding capacity for vitamin B_{12}, but not very effective clinically.

This evidence suggests that, although vitamin B_{12} may interact with several substances and lose microbiological activity, it is only after interaction with the intrinsic factor that increased absorption from the human alimentary tract takes place. How does this tally with the available evidence on the aetiology of pernicious anaemia? The simplest view is that grossly reduced production of intrinsic factor in pernicious anaemia is a consequence of atrophic gastritis and that vitamin B_{12} in food fails to be modified and absorbed. But the question of why absorption fails remains. The intrinsic factor may act in several ways—by aiding the passage of vitamin B_{12} through the intestinal mucosa, by protecting it from destruction within the lumen, or by preventing its assimilation by micro-organisms growing in the intestinal tract—but, as Dr. Hall points out, there is little direct evidence to support any of these theories. The possible role of micro-organisms in the development of the megaloblastic change in pernicious anaemia is interesting, in view of Frazer's[11] remarks about the importance of intestinal bacterial competition in the sprue syndrome and the work of Cameron, Watson, and Witts[12] on macrocytic anaemia occurring in association with anastomoses and strictures of the intestine. A similar anaemia can also be produced experimentally in rats. Davidson[13] showed, over 20 years ago, that the faecal population of micro-organisms may be abnormally large in pernicious anaemia. Gastric atrophy and failure of secretion may be the cause of this, so that the lack of intrinsic factor still remains the central problem. Whether the gastric atrophy is the primary lesion or only part of a widespread tissue defect, and the extent to which the process is genetically conditioned, are questions which cannot yet be answered with assurance.

KITCHEN HYGIENE

Over 6,000 cases of food-poisoning were notified last year, and no doubt a great many more went unrecorded. Slovenly handling of food is not only aesthetically unpleasant: it is a positive danger to health—the more so since eating in canteens and publicly owned restaurants became common. It is surprising that public opinion has not reacted more vigorously to some of the revelations about dirty food which have appeared in the newspapers, but the Ministry of Health and some local authorities are striving to bring the important points home to the professional food-handler and the housewife, and the Ministry of Food has sent to local authorities model by-laws[1] which will enable them to secure "the observance of sanitary and cleanly conditions and practices in connexion with the handling, wrapping, and delivery of food." At the British Food Fair which has been held at Olympia during the last fortnight the Ministry of Health's portable exhibition has been on view. This can be lent to local authorities to support their clean-food campaigns. At the same Fair the Central Council for Health Education convened a conference on the subject of food and drink infections, and it can only be hoped that as a result of all these efforts the public will demand that the high standard set by some food manufacturers and caterers will soon be followed by all.

It is impossible to lay down definite standards to which all kitchens must conform, for conditions differ greatly even among those preparing communal meals. The aim is to ensure that in the storage, preparation, and serving of food no deleterious bacteria are added and no opportunities are allowed for bacterial multiplication to occur. To secure this there must be a high standard of personal hygiene among the staff handling the food,

[1] Model Byelaws: Series 1, 1949, H.M.S.O., London.
[2] *Mon. Bull. Min. Hlth*, 1950, **9**, 22.
[3] Ibid., 1950, **9**, 38.
[4] *J. Hyg., Camb.*, 1947, **45**, 151.
[5] *Hygienic Food Handling*, published by Marks & Spencer, Ltd., 1949.
[6] *Med. Offr*, 1949, **82**, 257.

scrupulous cleanliness of kitchen and dining-room utensils, and adequate cold-storage space. Large numbers of organisms, including potential pathogens, have often been found in bacteriological investigations of kitchen utensils, and Frisby[2] has recently compared the results obtained when washing-up with soda and with a proprietary cleansing agent containing hypochlorite and a detergent. Sinks were redosed every 15 minutes and emptied and refilled every 30 minutes. With soda, bacterial plate counts per utensil were in the hundreds and occasionally in the thousands; bacteria in the washing-up water were uncountable even at a dilution of 10^{-4}; and the sinks even after cleaning yielded very high bacterial counts, faecal coli being among the organisms grown. The temperature of washing-up waters sampled at the height of the lunch-time rush in a busy canteen never exceeded 52° C. When the proprietary cleanser was used the bacterial count was usually below 100 per utensil, and some were sterile. The washing-up water and the sinks were almost sterile. Poor-quality cutlery deteriorated in the presence of hypochlorite and eventually had to be washed in the detergent only. Redosing with detergent had to be accurately timed: if the intervals rose to 20 minutes free chlorine disappeared from the water and the bactericidal power was lost. Higgins and Hobbs[3] inspected the kitchens of 30 catering establishments classified according to the washing and rinsing equipment provided, and investigated the number and type of bacteria remaining on utensils after washing. In one-sink kitchens high bacterial counts were obtained, but these were reduced if utensils were rinsed under running hot water and drained (not wiped) dry. The results obtained in two-sink kitchens (washing and rinsing) were only slightly better, probably owing to the low temperature of the rinse water. The third group—two sinks, one of which was "sterilizing," with the water thermostatically maintained at a constant temperature—was more satisfactory: plates washed by hand in water containing soap, soda, or synthetic detergent and chloramine compound were placed in metal racks and immersed for half a minute in the rinse water maintained at 170°–180° F. (76.6°–82.2° C.), and they were then stood in a hot-plate container without drying. Of articles washed in this way 63% attained the United States Public Health Service standard of fewer than 100 organisms per utensil, and intestinal and respiratory organisms were absent. In a fourth group of kitchens (with mechanical dish-washing machines) bacterial counts were much higher, probably due to lack of care in the supervision of the machine. Rinse waters were generally below the recommended temperature, necessitating hand drying, with the consequent addition of organisms from the cloth.

These investigations suggest that an efficient and simple method of cleansing tableware is washing with a detergent and rinsing at a temperature high enough to sterilize. This obviates the use of dish-cloths, for the utensils will dry in the air. Knox and Walker[4] investigated the washing and sterilization of food containers from a central kitchen supplying 3,000 meals a day, and they found that bacteriologically good results could be obtained with two sinks, one containing plenty of hot soapy water with soda and the other rinsing water at 80° C. After rinsing, the utensils dried in the air without the need for wiping. This method does not need much expert supervision and could be adopted by the least pretentious of feeding-places.

A more difficult problem is the personal hygiene of the food-handler. In larger kitchens, such as those of catering establishments and industrial works, with modern equipment and superintendents alive to the possibility of infection, personal cleanliness and a planned hygienic routine can be enforced and a high standard maintained. Such a routine has been well described in an excellent booklet published by one large company.[5] Food-handlers are medically examined before engagement and are periodically re-examined. Diarrhoea, severe colds, and septic skin infections must be reported, and the affected workers are temporarily withdrawn from their work. The harm which can be done by, say, a cook with a septic hand was well shown by Drs. E. L. M. Millar and M. Pownall in a paper which appeared in last week's *Journal*. It is much more difficult to maintain a high standard of personal hygiene in the small kitchens of private hotels, cafés, and snack-bars. The premises are often antiquated, with insufficient or no wash-basins and water-closets for the staff and equally unsatisfactory washing facilities for the dishes. The staff may be inadequate in number and poor in quality. No two premises are alike and no two sets of problems identical, and local authorities may find it good policy to appoint a keen sanitary inspector as food hygiene officer, with the sole task of improving standards of cleanliness. Such a person, with tact and patience, can suggest the most suitable methods for each kitchen, and by routine visits can keep alight any spark of enthusiasm that the staff may have shown. By regular sampling of utensils and washing-waters he can keep a check on method and supply a standard at which to aim. It is theoretically desirable that catarrhal and intestinal illness in food-handlers should be notified and that nasal and faecal specimens should be bacteriologically examined before the returned worker is allowed to handle food, but at present this is impracticable. A good sanitary inspector, however, can often obtain such specimens voluntarily. Bousfield[5] has suggested that, if we require food-handlers to have higher standards of personal hygiene, then the work of education must be started now in the schools. Perhaps it is too much to hope that education in the home could be equally effective.

NEOMYCIN

The list of antibiotics now known to have an action on the tubercle bacillus and presented by Dr. S. A. Waksman in a paper appearing in this issue is a formidable one: the majority are of course unsuitable for therapeutic use, usually on account of toxicity if for no other reason. It will not be forgotten in Paris, where Dr. Waksman is reading his paper at the First International Congress of Internal Medicine, that the first recorded use of a fungus product for treating tuberculosis was made in that city: Vaudremer treated 200 cases with an extract of *Aspergillus fumigatus* some 40 years ago. Waksman naturally deals mainly with streptomycin, not only giving a concise account of its remarkable achievements based on the well-known findings of American and British studies but emphasizing its two main drawbacks. These are the toxic effects of larger doses on the eighth nerve and the capacity of tubercle bacilli to acquire a high degree of resistance to the drug, which, once acquired, is permanent. These imperfections demand that if possible other antibiotics should be identified which can supplement its action or if necessary replace it, and it is suggested in this paper that such an antibiotic may have been found in neomycin.

The discovery of neomycin was announced by Waksman and Lechevalier[1] little more than a year ago. It is another product of the indefatigable search among the soil actinomycetes for useful producers of antibiotic substances—a search which has given us not only streptomycin but aureomycin, chloromycetin, and terramycin. Its source is *Streptomyces fradiae*, which is also reported by Swart, Romano, and Waksman[2] to form another substance, fradicin, which has no action on bacteria but is highly active against many species of fungi. Neomycin has a wide range of activity, most marked against Gram-negative bacilli and mycobacteriae. In the treatment of infections in mice due to the former, exemplified by *Salm. paratyphi B* and *Salm. pullorum*, Waksman and his colleagues[3] showed it to be more effective than streptomycin, and in another paper they have given particulars of its action on 52 species.[4] Organisms in the genera *Mycobacterium* and *Bacillus* and those of the enteric and dysentery groups are in general very susceptible, as are some other but not all species of Gram-negative bacilli: some streptococci, the pneumococcus, and *Cl. welchii* are much more resistant. Warth, Chandler, and Bliss[5] found it active *in vivo* as well as *in vitro* against *Bact. friedländeri* and *H. influenzae* and without effect on streptococcal and pneumococcal infections. They emphasize its high *in vitro* activity against both *Proteus* and *Pseudomonas* (presumably *Ps. pyocyanea*), characterizing it as the only substance known to them which attacks both of these organisms. This last interesting finding is to a large extent confirmed in the studies of Waisbren and Spink,[6] who nevertheless found that among their numerous strains some showed varying degrees of resistance.

This is the general picture of the potentialities of neomycin, but two important facts remain to be added which are of particular interest if it is to be used in the treatment of tuberculosis. One is that organisms which have become resistant to streptomycin remain sensitive to neomycin. Secondly, although some bacterial resistance to neomycin can be acquired, the process is a slow and gradual one. Waisbren and Spink have induced resistance to neomycin by the usual procedures and point out that it is of the "penicillin" and not the "streptomycin" type. Weiss and Waksman[7] also found that organisms rendered resistant to neomycin had an impaired vitality and growth rate and lost their resistance on transfer to normal medium. All these facts are encouraging, but it still appears uncertain whether neomycin will find a place in the treatment of tuberculosis or indeed of any other condition, because its toxicity has apparently yet to be fully ascertained. The only reports on this, so far as we are aware, refer to acute toxicity tests in mice: it seems that different batches have varied in their effects, some of the latter being lethal in lower doses than the original product.[4] These studies will have to be extended to other animals. Waksman mentions that the drug has actually been given to certain cases of human tuberculosis with good results, and with possible temporary toxic effects, presumably referable to the kidneys in two of the cases. Pending further information on this aspect of the action of neomycin its therapeutic usefulness must evidently remain *sub judice*.

1 *Science*, 1949, **109**, 305.
2 *Proc. Soc. exp. Biol., N.Y.*, 1950, **73**, 376.
3 *J. Bact.*, 1949, **58**, 229.
4 Waksman, S. A., Katz, E., and Lechevalier, H., *J. Lab. clin. Med.*, 1950, **36**, 93.
5 *Bull. Johns Hopk. Hosp.*, 1950, **86**, 169.
6 *Proc. Soc. exp. Biol., N.Y.*, 1950, **74**, 35.
7 *Proc. nat. Acad. Sci., Wash.*, 1950, **36**, 293.

ELECTRON STERILIZATION

The attraction of sterilizing food by electrons or *x* radiation is that penetration is virtually instantaneous up to the limit of depth which can be usefully reached. The possibilities have lately been examined at the Massachusetts Institute of Technology, and Brasch and Huber[1] have described a machine designed for practical use to which the name "capacitron" has been given. The proposed method is similar in conception to the *x*-ray treatment of cancer: the aim in each case is to render the cells irradiated incapable of division. With mammalian cells there is evidence that vulnerability is limited to the division process, and it is supposed that it is because of their greater rate of proliferation that cancer cells suffer the greater damage. With bacterial cells the evidence is that they can be rendered incapable of division at any time; and, provided that the initial count is not too high, it should be possible to achieve a 100% kill in a single short irradiation of high dosage. In their examination of the physical possibilities of this method Trump and Van de Graaff[2] pointed out that electron irradiation is much more efficient than the *x*-ray method. As against this, the penetration depth is less starting with electrons than starting with *x* rays: a fat herring might have to be irradiated from both sides for sterilization to be effective. Dunn and his colleagues[3] have studied the effects of electron sterilization on heat-resistant Gram-positive and Gram-negative bacteria, on

1 *Science*, 1947, **105**, 112.
2 *J. app. Phys.*, 1949, **19**, 599.
3 Ibid., 1949, **19**, 605.
4 *Nucleonics*, 1949, Vol. 5, No. 2, p. 50.

spore-forming and non-spore-forming bacteria, on moulds, and on some foods. Doses of 500,000 roentgens usually destroyed all non-spore-forming bacteria and 99.9% of the spore-formers, while 1,000,000 roentgens rendered apple juice 99.999% sterile. The effect is cumulative: each increment of dose destroys the same proportion of bacteria, and if the dose is big enough in relation to the initial bacterial count not a single cell will survive. In the equipment which has been developed at the Institute irradiation is with 3,000,000 volts electrons, and sterilization is effected in pulses of one-millionth-second duration produced at about one-second intervals. It could therefore be a moving-belt process, but careful design would be needed. Trump and Van de Graaff state that "high energy cathode rays and x rays offer a new and effective means of producing biological, bacteriological, and even chemical changes on a practical scale." Stern and his colleagues suggest on slender evidence that the changes in bacteria which render them incapable of division can be regarded as being of a different kind from the disruption of normal chemical molecules and that effects "on the taste, odour, and appearance" of food need not be feared. On the other hand, Dunn and his colleagues found that the colour of butter was progressively destroyed, and Goldblith and Proctor[4] have shown a reduction in riboflavin and carotene, which in the case of the latter amounted to an 80% loss under some conditions. These aspects of the matter are now being further investigated by the Department of Scientific and Industrial Research at the Low Temperature Research Station, Cambridge: they are the equivalent, in this new method of food treatment, to the effects of x radiation on normal cells in the treatment of cancer.

MEDICAL BIBLIOGRAPHY

The recent decision to discontinue the *Index Catalogue of the Library of the Surgeon-General's Office* (Army Medical Library, Washington) is a serious loss to medical bibliography. Since 1927 the *Index Catalogue* has been supplemented by the more up-to-date *Quarterly Cumulative Index Medicus*, published by the American Medical Association. In its early days the latter made available an author-subject index of books and papers within three months of their publication, but it has for some years become progressively more out of date, and at present is over eighteen months late. Nevertheless it has always been accurately and skilfully edited. During the last war the necessity for a really up-to-date index of medical literature resulted in the publication of the weekly *Current List of Medical Literature*, which, although more difficult to consult and less well produced, provided an index which could properly be called current. Responsibility for its production was soon taken over by the Army Medical Library. It has, however, slowly fallen behind, and in June there was a "back log" of about four months. The decease of the *Index Catalogue* and the lateness of the *Index Medicus* have led to the decision to improve the *Current List* and to publish it monthly.

The first issue of the *Current List* in its new form, dated July, 1950, has now reached this country. It is not yet as up to date as might be hoped; for example, the issues of the *British Medical Journal* and *Lancet* for April 15 appear in it, but no doubt it will eventually absorb the accumulation left by its weekly predecessor. It includes an alphabetical list of over 1,300 journals regularly indexed as received, a list of contents of each journal received during the month (arranged alphabetically by title of journal), and a combined author and subject index. Annual indexes will also be published. The July issue lists 2,992 items. All articles in a given journal are indexed, and titles of articles in foreign languages are followed by an English translation. New titles will be added gradually to the list of journals covered. The *Current List* will not displace the *Quarterly Cumulative Index Medicus*; it will provide a more up-to-date index of current medical literature, although it will not be quite so easy to use as the latter. It is reproduced by photo-offset; subscription outside the U.S.A. is $11.50 per annum. The number of journals indexed by the *Current List* will probably increase rapidly, and it should become one of the most important bibliographical aids in medicine. It might increase the usefulness of the publication if lists of medical books were included.

LINEAR ACCELERATORS

The Ministry of Health with the Department of Health for Scotland have recently placed orders for five new 4,000,000-volt "linear accelerators" for the treatment of malignant disease. One of these is going to Scotland, one to London, and three to the provinces as a first step in the equipment of some of the larger radiotherapy centres with high-voltage apparatus of British design, material, and craftsmanship. Since the war higher voltage apparatus has come steadily into wider use in radiotherapy departments all over the world, and the linear accelerator is one of the major British contributions to this advance. In 1945 experimental work at the Atomic Energy Research Establishment, Malvern, under Mr. D. W. Fry, led to the development of the apparatus which has now been ordered. The first 4,000,000-volt machine of this type was operated successfully in February, 1948. The apparatus employs high-power radio waves generated by magnetrons—the special valves which contributed so much to the pre-eminence of British radar during the war—to accelerate the electron stream until it acquires a velocity equivalent to that produced by a potential of 4,000,000 volts. It will be so mounted that the beam may be directed into the patient at any required angle, and it will have such a high output that the treatment of large numbers of patients will be practicable. Engineers, hospital physicists, and radiotherapists have successfully co-operated in designing this high-voltage apparatus expressly for clinical work. Much of the credit for the way in which advantage has been taken of the work done at Malvern must be given to the staff of the Medical Research Council's Radiotherapy Research Unit at Hammersmith Hospital. While these five linear accelerators are being built and installed a 10,000,000-volt linear accelerator has been constructed for research purposes. It was recently demonstrated to delegates attending the Sixth International Congress of Radiology, and will shortly be installed at Hammersmith Hospital.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CHEMOTHERAPY*—II. INDICATIONS FOR THE USE OF PENICILLIN

BY

LAWRENCE P. GARROD, M.D., F.R.C.P.

Bacteriologist, St. Bartholomew's Hospital; Professor of Bacteriology, University of London

The indication for using penicillin is not a disease, such as pneumonia or meningitis, but infection, wherever situated, by a sensitive micro-organism. This is now almost a truism, and since the advent of this and other forms of chemotherapy the profession as a whole has learned to think bacteriologically as it never did before. The laboratories are kept busy in providing the information on which rational treatment can be based. For this, it may be mentioned, they prefer a specimen obtained before treatment is begun; a short period of chemotherapy, even if not fully successful, can hopelessly obscure the picture. Naturally there are conditions, such as gonorrhoea and carbuncle, in which the bacteriological as well as the clinical diagnosis is self-evident, but even in some of these—and carbuncle is an example—it may be as well to confirm that the organism is normally penicillin-sensitive: staphylococci sometimes are not.

Sensitivity of Different Bacterial Species

In the past bacteria have been classed as either sensitive or resistant to penicillin. In fact, there is no such thing as complete resistance, but only a wide range of variation in sensitivity, the total compass of which is about 100,000-fold, and in the top ranges of this the bacteria and other organisms concerned are for practical purposes resistant, since the concentrations necessary to inhibit their growth cannot be attained anywhere in the body. At the other extreme are highly sensitive organisms, affected by concentrations easily attained throughout the body by giving moderate doses. Between these extremes there is a ladder of diminishing susceptibility with a species on almost every rung of it, and whether treatment will be of any value depends on how high a concentration can be attained at the site of infection. To maintain high concentrations throughout the body is difficult, arduous for the patient, and expensive; but to maintain them locally may be very much easier. In the central nervous system, and notably in the urinary tract, organisms which are outside the range of susceptibility for systemic effect may be successfully attacked.

If we retain the terms "sensitive" and "resistant" and make two categories of each according to their degree, some of the principal species can be classified as follows:

Fully sensitive (inhibited by 0.005–0.05 unit per ml.).—*Gonococcus; Meningococcus; Str. pyogenes; Str. viridans*†; *Pneumococcus*†; *Staph. aureus*†; *B. anthracis; Actinomyces israeli*†; *Treponema pallidum;* Vincent's organisms; *Erysipelothrix rhusiopathiae.*

Less sensitive (inhibited by 0.1–0.5 unit per ml.).—*Clostridia; C. diphtheriae; L. icterohaemorrhagiae.*

Moderately resistant (inhibited by 1–10 units per ml.).—*H. influenzae; Str. faecalis; Proteus vulgaris; Salm. typhi.*

Highly resistant (inhibited only by >50 units per ml.).—*Myco. tuberculosis; Shig. dysenteriae; Ps. pyocyanea; Bact. friedländeri;* most other Gram-negative bacilli; yeast-like and some other fungi; most viruses.

This list is far from complete, but the first category embraces the vast majority of infections for which penicillin is ordinarily used. It is noteworthy that four species in it have to be classed as variable, and in dealing with them it may be necessary to have a laboratory estimation made of the degree of sensitivity of the patient's own strain.

It is impossible within the compass of a short article to give an account, however brief, of all the possible uses of penicillin in different conditions. Many of these, however, if classified according to their causes, fall into only a few categories, in which the principles of treatment, if not its detail, are the same.

Haemolytic Streptococcal Infections

Streptococcus pyogenes of Lancefield's Group A is remarkably constant in its high degree of sensitivity to penicillin, which cannot be altered to any material degree by habituation either in the body or in the test-tube. Penicillin is therefore a dependable remedy for all infections caused by this organism, and the only serious question affecting its use concerns the merits of the sulphonamides as an alternative. Most strains are also fully sulphonamide-sensitive, and until the advent of penicillin we were perfectly satisfied with these drugs; indeed, they had brought about the greatest therapeutic revolution of modern times, and completely transformed the outlook in conditions which formerly had a high mortality. They are also cheap, easily administered, and reasonably free from risk, except in sensitized patients or those given very large doses.

Wound sepsis, acute throat infections, and puerperal fever, the three principal classes of infection which may be caused by haemolytic streptococci, can or could still be treated with sulphonamides with almost uniform success, although the response may initially be not quite so rapid as that to penicillin. Whether they should be is a matter of opinion, and involves considerations extraneous to the merits of the treatment, such as those of convenience and economy. It is perhaps reasonable to suggest that early and uncomplicated cases, at least of the first two of these classes, especially if undergoing treatment in their own homes, might be treated with sulphonamides only. Penicillin is always there in reserve should it prove to be needed. On the other hand, penicillin should be given from the first in severe wound infections, middle-ear disease, and puerperal fever, since here the inherent dangers are more immediate and less predictable, and a more rapidly acting and slightly more certain remedy is evidently called for.

Owing to its bactericidal action (that of the sulphonamides being merely bacteriostatic) penicillin is more capable of actually eliminating the organism as well as curing the disease. This is one reason for using it in scarlet fever, since it greatly shortens the period of infectivity: to ensure this effect treatment must be continued for seven days. It should not be forgotten that haemolytic streptococcal infection commonly complicates several other specific fevers, including severe diphtheria (for which large doses of penicillin are beneficial in any case) and smallpox.

*Part I appeared in the *Journal* of August 19, p. 453.
†Some strains may be less, or much less, sensitive.

Pneumococcal Infections

Pneumococci are usually fully sensitive to penicillin, but this species can acquire a moderate degree of resistance to the drug, and such strains are sometimes encountered. The same is true of their reaction to the sulphonamides. In general they are fully sensitive to the newer members of this series, but difficulties with resistant strains began to be encountered in the latter part of what may be called the sulphonamide era (1935–45); how often they occur now is unknown. There is this difference, that whereas the dose of penicillin can be multiplied twentyfold if necessary to meet this difficulty, that of a sulphonamide cannot.

The choice between the old and new treatments for the principal disease concerned here, pneumonia, must again remain a matter of opinion. It may perhaps be made on similar lines; that is to say, a mild case with otherwise favourable features may justifiably be given a sulphonamide only, whereas the patient whose condition justifies any serious anxiety should be given penicillin or both. Whenever possible the sputum should be examined, since in bronchopneumonia (and even in rare cases of lobar pneumonia) the infection may not be pneumococcal, and one of the newer antibiotics may be the only useful specific—e.g., streptomycin for *H. influenzae* or *Bact. friedländeri*. There is only one drug effective in all forms of pneumonia, virus as well as bacterial, and unfortunately we cannot afford in this country to give it to every case: this is "aureomycin."

Staphylococcal Infections

The position here is different in two ways: sulphonamides are relatively ineffective, and yet by a strange misfortune this is the one common sensitive species which sometimes possesses a high degree of resistance to penicillin. Staphylococci can in fact be rendered enormously resistant in the test-tube, but this change has nothing to do with the natural resistance which is now presenting a serious therapeutic problem: this has a different mechanism, and there is almost no doubt that selection and not habituation is the cause of its increasing prevalence. The general use of penicillin is steadily eliminating staphylococci sensitive to its action, while those naturally resistant to it survive and spread. At present the proportion of all staphylococcal infections which are due to these resistant strains appears to be only about 5% in the general population, but it often exceeds 50% in institutions such as hospitals and maternity homes: here cross-infection and the nasal carrier-state in nurses enable a resistant strain to become endemic.

There is ample proof that the degree of this natural resistance varies widely in different strains, and unfortunately its degree cannot easily be estimated. There is no general agreement on whether it can be overcome by greatly increased dosage; the truth almost certainly is that it sometimes can and sometimes cannot, depending on the degree of resistance. When it cannot, the best alternative is again aureomycin.

But for this qualification, which recent developments have made necessary, it could well be said that penicillin is more of a godsend for staphylococcal infections than for any other. It is invaluable in osteomyelitis, although here, as in any other lesion causing necrosis or suppuration, it does not remove the need for surgery. It is required for carbuncle, and may be used also in severe furunculosis and in staphylococcal infections of wounds, of the air passages, and of the urinary tract. Either applied locally or, if necessary, given parenterally, it is useful for all skin conditions of which staphylococci are the cause (sycosis, pemphigus, impetigo, blepharitis), and to some extent for any in which these organisms are important secondary invaders.

It is now advisable to consider infection in a few special situations, for which the method of treatment may be different.

The Circulatory System

Endocarditis.—It need scarcely be said that septicaemia of whatever origin, due to any sensitive organism, is the strongest possible indication for penicillin treatment. Equally so is endocarditis, whether acute or in the subacute form also known as endocarditis lenta. The treatment of endocarditis, particularly of the latter type, calls for more vigorous and sustained efforts with penicillin than any other disease. The latest conclusion reached from its study in this country is that a daily dose of two million units is advisable, and that treatment should be continued for at least six weeks. This dose should be so subdivided as to maintain a continuous effect. Among factors affecting the prognosis are the stage of the disease at which treatment is begun. Early recognition is thus vital, with repeated blood cultures for confirmation. Another is the degree of sensitivity of the organism. This is variable in *Str. viridans* and uniformly low in *Str. faecalis* and *Haemophilus parainfluenzae*, which are less common causes of the infection. Some cases will therefore require either very large doses of penicillin, perhaps reinforced with caronamide, or another antibiotic or combination of two, such as penicillin with streptomycin.

The Central Nervous System

Meningitis.—The only form of purulent meningitis which it is still advisable to treat with sulphonamides alone is meningococcal. When streptococci, pneumococci, or staphylococci are concerned penicillin must be used, and because comparatively little reaches the cerebrospinal fluid from the blood, intrathecal injection is necessary. The concentrations which can so be maintained in the cerebrospinal fluid are such that even less sensitive organisms can be attacked in this situation. These include *H. influenzae*, although streptomycin is to be preferred for this infection. Penicillin should be given intramuscularly as well as intrathecally, and when the organism concerned is also sulphonamide-sensitive one of the more potent sulphonamides which attains a good concentration in the cerebrospinal fluid—sulphadiazine being probably the best—should be given in addition.

Urinary-tract Infections

When penicillin is administered by injection some is destroyed in the body, but almost the whole of the remainder, amounting to 60% or more, is excreted in the urine. Thus if a patient is given 250,000 units a day and his urinary output is 1,500 ml., its penicillin content will be 100 units per ml., a far higher concentration than that attained in the blood or tissues. This means that infections of the urinary tract caused even by bacteria in what has been termed earlier the "moderately resistant" class may be successfully treated. The principal species, with the concentrations usually required to inhibit their growth, are:

Staphylococcus aureus and *albus* ...	0.02 unit per ml.
Streptococcus faecalis	2 units per ml.
Proteus vulgaris	8 units per ml.

Even some strains of *Bact. coli* are sensitive to about 25 units, although others are more resistant. *Bact. aerogenes, Ps. pyocyanea,* and various paracolon bacilli are highly resistant, and penicillin is useless for them. Penicillin can thus be used for some urinary-tract infections, but only with any expectation of success if the nature of the infection is known and comes within no more unfavourable category than the "moderately resistant." Large doses are not necessary, but they should be given at least four times a day unless in a slowly absorbed form. No attempt need be made to alter the reaction of the urine, but output may with advantage be diminished by restricting fluid intake.

Prophylactic Use

The use of penicillin to prevent infection in very varied circumstances has become common, and a few personal opinions on some of these types of use may perhaps be expressed.

At least three seem fully justified. One is the prevention of infection in extensive and grossly contaminated recent wounds. The effect of the intramuscular penicillin given to casualties with the more dangerous types of wound during the attack on Normandy in 1944 astonished and delighted everyone who saw these men, and there is no doubt that this example should be copied in dealing with all wounds involving serious danger from sepsis generally and gas gangrene in particular. Another imperative indication is dental extraction or tonsillectomy in a rheumatic subject, or indeed in anyone in whom the temporary bacteriaemia now known to be produced by these operations is likely to have any consequences. A third is prolonged labour with much manual interference, or any other circumstances particularly tending to infection of the placental site.

It is more doubtful whether penicillin should be used as a preventive of infection during the course of what should be a clean operation, or of post-operative chest complications. This sort of use is often unnecessary, wasteful, and not always successful, since infections, particularly of the chest, do occur in spite of it, and are then usually due to penicillin-resistant bacteria. It can be said even more emphatically that penicillin given alone is not a reliable preventive of infection in connexion with operations on the urinary tract. The majority of the Gram-negative bacilli apt to cause this are not merely resistant to penicillin: they appear to thrive on it. This is not simply a figure of speech: there are good reasons for believing that *Ps. pyocyanea,* for instance, is actually stimulated by penicillin, and it is not very uncommon for a urinary-tract infection to be produced by this organism *de novo* in a patient having a long course of penicillin treatment, for no other apparent reason than that the drug is being given. If penicillin is considered necessary to prevent tissue sepsis due to cocci, then a sulphonamide should be added to give wider cover for the urinary tract itself.

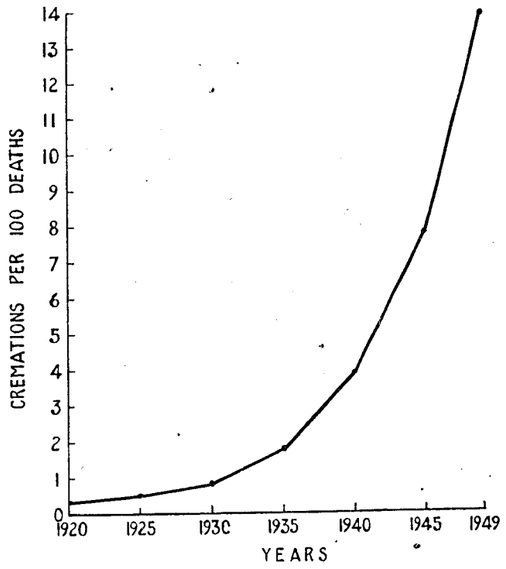
Reference to the list of the principal sensitive bacteria will serve as a reminder that penicillin can be used in a number of other diseases, for which there is no space for further discussion. On the other hand, it is without action in many other infections, and some of these are susceptible to the newer antibiotics, which are the subject of two articles to follow.

Impact, a quarterly bulletin issued by Unesco, gives reports of addresses and notes on books mainly on the theme of the impact of science on society. The first issue, which is dated April–June, 1950, includes a short introduction on the main theme, to which is attached a bibliography with notes on the books listed. The bulletin is obtainable for 3s. a year from the Unesco Sales Service, Unesco House, 19, Avenue Kléber, Paris, 16e.

CREMATION

COMMITTEE AND CRANK

Disposal of the dead by cremation has become increasingly popular in the last thirty years. According to a recent report of the Cremation Committee[1] there were 1,796 cremations in 1920 and 79,607 in 1949. The following graph shows the number of cremations per 100 deaths in England, Wales, and Scotland in certain years from 1920 to 1949.



The committee was appointed in 1947 to review the regulations made under the Cremation Act of 1902, and to make recommendations. Its members were: Mr. H. A. Strutt (chairman) and Mr. R. S. Wells, of the Home Office, Mr. R. Howat, of the Department of Health for Scotland, Mr. J. M. Ross, of the General Register Office, and Mr. H. F. Summers, of the Ministry of Health.

Medical Certification

The regulations were framed primarily to prevent cremation being used to destroy evidence of crime. The normal medical attendant of the deceased gives a detailed certificate leading up to the opinion that there is no reason to suspect that death was due to other than natural causes (Form B); and an independent medical practitioner gives a shorter confirmatory certificate (Form C). Alternatively, a medical certificate (Form D) may be given by a pathologist who has conducted a necropsy on the case, or by the coroner (Form E). Authority to cremate is given by the medical referee (Form F).

The committee's main recommendations on medical certification are as follows:

The certificate in Form B should require further and more explicit details: (*a*) Where the medical attendant has consulted the coroner, the fact and the result should be stated on the form. (*b*) It should be stated whether or not a post-mortem examination has been made, and, if so, by whom it was made, and the result. (*c*) Particulars should be given of the date of any operation during the final illness or within a year before death. (*d*) The present question No. 13 should make it clear that the reference here is to private nursing. (*e*) The medical attendant giving the certificate should furnish his

[1] Report of the Interdepartmental Committee Appointed by the Secretary of State for the Home Department, 1950. (H.M.S.O., 9d.)
[2] *British Medical Journal*, 1880, **2**, 461.
[3] Ibid., p. 794.
[4] Ibid., 1884, **1**, 123.
[5] Ibid., p. 515.
[6] Ibid., p. 624.

address and telephone number. (*f*) Dual questions should be set forth as separate questions.

The requirement that Form B must be completed by a medical attendant who attended the deceased during his last illness should be varied to permit certification by the doctor "to the best of his knowledge and belief" if he had visited the deceased within 14 days prior to death.

The requirement that the medical practitioner completing Form B must certify definitely the cause of death before cremation may take place should be modified to permit the confirming doctor to authorize cremation where there is no reason to think that death resulted from other than natural causes.

The confirmatory certificate should be retained and serve the dual purpose of confirming the certificate B and authorizing cremation, combining the present functions of Forms C and F.

This combined certificate should be given by the medical officer of health of the county or county borough in which the death occurred, the M.O.H. of a county to have power to delegate in appropriate cases to M.O.H.s of county districts. The medical officer of health should be assisted by a panel of medical practitioners chosen by the local authority.

In the case of a death in a hospital which is not referable to the coroner, the medical superintendent or his deputy should give the combined confirmatory certificate and authority to cremate.

In any case in which there may be conflict of medical opinion as to the cause of death, but in which there is no reason to suppose that the death may have been due to poison, to violence, to any illegal operation or to privation or neglect, the confirming doctor should be empowered to authorize the cremation without requiring any further examination of the body.

Any suspicious case should be reported to the coroner by the doctor giving the confirmatory certificate. If the coroner is satisfied that an inquest or post-mortem examination of the body is unnecessary, he should have power to authorize the cremation to take place. He would do this on Form E. The coroner should be empowered to authorize cremation on Form E in any case of accidental death, without waiting for the termination of the inquest.

In every case in which a coroner issues a certificate on Form E, that document should be the authority to cremate. Where the coroner, after being consulted by the doctor who gives the confirmatory certificate in Form C, does not think it necessary to hold an inquest or to make a post-mortem examination, the doctor who gives the certificate should authorize the cremation to take place. A note should be made on Form C by that doctor that the coroner has been consulted.

The Confirmatory Certificate

Some witnesses before the committee recommended abolition of the confirmatory certificate. Among the reasons for this suggestion were that the certificate was given in a perfunctory manner because the certifying doctor would not be disposed to act inquisitorially in respect of the medical man who gave Form B, and some fatal poisons might escape detection from a superficial examination of the body.

The B.M.A. in its evidence strongly opposed abolition of the confirmatory certificate, which it considered was a public duty that the medical profession should be required to take seriously. The Association emphasized that to place the onus on a medical referee alone would be to burden him with undue responsibility, and would lead inevitably to unnecessary distress to the relatives when he exercised his discretion to direct pathological examinations. The requirement that two medical certificates should be completed by medical practitioners unrelated to one another, either professionally or in law, was considered to be sound and in the public interest.

The committee also makes a number of recommendations to regulate the procedure at crematoria and to ensure that the staff should be suitable.

Sanitary Advantages

An early advocate of cremation in this country was Sir Henry Thompson, a well-known surgeon, who was one of the joint founders of the Cremation Society in 1874, among the other founders being Mr. (later Sir) Spencer Wells and Dr. Ernest Hart, editor of this *Journal*. At the B.M.A. Annual Meeting in 1880 Spencer Wells[3] read a paper on cremation in the Section of Public Health, his theme being that "the sanitary advantages over burial in coffins or in wicker baskets are undeniable and very great." He referred to Darwin's observation that earthworms bring soil to the surface from a considerable depth. He then pointed out that Pasteur had shown how the earth mould brought up by worms in fields where cattle had been buried after dying of "charbon," or splenic fever, contained "the specific germs which propagate the disease." The same germs had been found in the intestines of the worms.

As a result of this paper over 120 members of the B.M.A. sent a memorial[3] to the Home Secretary saying that "we disapprove of the present custom of burying the dead and . . . until some better mode is devised we desire to promote that usually known as cremation."

Four years later public interest was excited by the actions of a surgeon, Mr. William Price, living in Glamorganshire, an eccentric character who claimed that he was a descendant of the ancient Druids.[4] One night "attention was directed to a large fire in the grounds adjoining his house; and he was found to be in the act of cremating, in a barrel containing paraffin oil, the body of the illegitimate child of his housekeeper. He was chanting the supposed Druidical incantations over the body; and threatened to shoot anyone who interfered with him." But he was seized by a constable and conveyed to the police station. The housekeeper was later locked up because she refused to give evidence as to maternity at the inquest. Mr. Price admitted that he was the father of the child, and said that it had died of convulsions. The mother afterwards corroborated Mr. Price's evidence, and was released from custody, a verdict of death from natural causes being returned at the inquest. The body was returned to Mr. Price, who undertook that it would be interred in the ordinary way.

Mr. Price was then charged with misdemeanour, but was acquitted at the Glamorganshire Assizes by Mr. Justice Stephen and a jury, a decision which this *Journal*[5] "hailed with great satisfaction," remarking "that clean ashes are surely less repulsive to contemplate than mouldering carcasses." Mr. Price, unrepentant after all, soon accomplished his object. The body was cremated[6] on a pile consisting of three hurdles, half a ton of coal, and pair of large iron grates, Mr. Price chanting "an ancient sacred song in the presence of a number of spectators."

A Bill to regularize cremation was introduced into Parliament the same year, 1884, but was rejected, and it was not until 1902 that an Act was passed prescribing the conditions under which cremation should take place.

WORLD FEDERATION FOR MENTAL HEALTH

[FROM A CORRESPONDENT IN PARIS]

Psychiatrists, psychologists, sociologists, and psychiatric social workers from 25 countries assembled in Paris from August 31 to September 7 for the third annual meeting of the World Federation for Mental Health. The World Federation "stemmed"—to use a word which is at present in favour in this field—from the memorable London Congress on Mental Health two years ago, and its establishment and survival in face of obvious difficulties, especially financial ones, are due above all else to the driving force of its director, Dr. J. R. Rees.

The Paris meeting, which was held under the presidency of Professor WILLIAM LINE, of Toronto, was on four topics—namely, mental health in education, from the pre-school child to the education of teachers and medical men; occupational and industrial mental health; mental health of transplanted and homeless persons; and leadership and authority in local communities.

Collaboration with W.H.O.

An official welcome was given to the Federation by representatives of the French Ministries of National Education, Labour, and Public Health, and by Professor P. Heuyer and Dr. Xavier Abeley on behalf of French psychologists. Dr. G. R. HARGREAVES, chief of the Mental Health Section of W.H.O., spoke on collaboration between the Federation and his organization, pointing out that governmental and non-governmental agencies were complementary, not overlapping. He answered those who objected that W.H.O., like other instruments of the United Nations, moved slowly. He asked whether it moved more slowly than their own Governments. The time had come to shift the inquiry into the efficiency and speed of the machinery from the international centres at Geneva or elsewhere to the national components. He quoted his chief, Dr. Brock Chisholm, as stating that perhaps the success of W.H.O. should be judged not by the amount of money which it could persuade its member Governments to spend in the international field, but by the amount which it could persuade them to spend on health in their own countries.

In his presidential address to the World Federation, Professor LINE made the point that the man in the street had confidence in the leadership of medicine so far as his physical needs were concerned, and was content that medicine should advise public-health departments in the interests of his own physical and environmental well-being. He had in fact handed over his responsibility in this respect to professional medicine, and medicine was worthy of the trust. But the man in the street must be made to realize that in the field of mental health, involving the effectiveness with which he could live with other people and with himself, he could not afford to delegate his responsibility. This was something that could not be turned over to the expert because it concerned personality development, character formation, and social adaptation, which last was expressed in that loosely used word "democracy."

The Language of Science and of Industry

The discussion on mental health in industry was opened by Dr. R. F. TREDGOLD, who made the point that it was not so much more knowledge on this subject which was required, as the better application of the knowledge already existing. He also said that the results of scientific research were quite frequently made public in a manner as remote as possible from the understanding of the industrialist, who was expected to approve them and incorporate them in his organization. The language of science was as far apart from that of industry as English was from French—indeed, it was farther apart, because when the industrialist came upon scientific language (which he was apt to call "jargon") his inhibitions were at once aroused, and he tried not to understand it, whereas the Englishman, faced with a presentation in French, regarded it as a challenge and did his best to understand it. The psychiatrist, said Dr. Tredgold, should be aware of the suspicion and uncertainty with which the industrialist regarded him. A frank statement of his aims, qualifications, and practices was at least the first step towards a better understanding.

He reminded the assembly of three cross-currents which were now operating: (1) while all were agreed that prevention was better than cure, preventive work was less attractive to the student and to the practitioner; (2) the advance of psychiatric treatment during the last 20 years, and perhaps the next 10, might gradually result in a diminution of the "chronic" population of mental hospitals, and thus release many psychiatrists for fields of work outside the hospitals; (3) in spite of what he had already said about the latent antagonism of the industrialist, it already seemed to be accepted by industrialists, who had the reputation of being hard-headed business people, that in financial terms the value of such mental-health services as had been planned and put into operation in industry had been worthy of their support.

Displaced Persons

The subject of the mental health of homeless and "transplanted" persons was developed by Professor JOHN COHEN, professor of psychology in the Hebrew University, Jerusalem. Human transplantation, he said, was as old as Adam. In fact, Adam was the first transplanted person, and perhaps his transplantation to a less comfortable environment might account for the delinquency of one of his offspring, who slew his brother. Moreover, displaced persons were not only groups vaguely thought of as moving about rather aimlessly in distant parts of the world, but were in our own community—the child taken from home to hospital, the old person removed from domestic independence to a home for the aged, the conscript entering the Army. What was new in the situation, he said, was not the phenomenon itself but the deliberate attempt or intention to reduce its hardship and to dovetail the life of the newcomer into that of the receiving community. The integration was always going on, and there were indices by which its process could be measured—the comparative literacy of the immigrants and the native groups, the extent of inter-marriage, the vital and morbid statistics of each, and the comparative industrial productivity.

One aspect of the problem of integration was the elimination of tensions. Tension, said Professor Cohen, was a central concept in psychology. It was a pity that it had been rather isolated from other concepts such as frustration and conflict, for all three cohered in the same framework. Each type of frustration or conflict produced a different kind of tension, and an analysis of these different forms of tension, above all in the social sphere, should be attempted.

One of the reports presented to the meeting concerned the results of an inquiry into training facilities in psychiatry and allied mental-health disciplines. Replies so far have been received from no more than a dozen countries, not including Great Britain. The replying country in which there is the most abundant provision is the United States. At the present time the approximate annual output of trained psychiatrists from training institutions in the U.S.A. is 500. It is estimated that approximately that number of medical graduates complete each year a comprehensive systematic training course in psychiatry covering a period of three years. There are 253 hospitals, institutions, and other training centres in the U.S.A. which are recognized by the medical profession as providing acceptable training. Three-year advanced training courses are provided by 10 approved psycho-analytic institutes, and an average of 21 psycho-analysts complete this training annually.

Nova et Vetera

GIORDANO BRUNO AND THE CIRCULAR MOTION OF THE BLOOD

So far, Giordano Bruno (1548–1600), the philosopher of pantheism and martyr of science, does not seem to have been cited in connexion with the discovery of blood circulation. I have no intention of claiming a share in this discovery for Bruno. I wish, however, to put on record several passages in which Bruno emphasizes the "circular" pattern of the motion of the blood. He says: "The spiritual life-force is effused from the heart into the whole of the body and (flows back) from the latter to the heart, as it were from the centre to the periphery and from the periphery to the centre, following the pattern of a circle. . . . The material part of all these spirits is a fluid which cannot move on its own account, but by means of its innate spirit. Hence there is no circular or sphaerical motion outside the body, for the *blood, which in the animal moves in a circle* in order to distribute its motor, the spirit, lies immovable outside the body, is inert and decays, no longer deserving the name of blood" (*De Rerum Principiis*. 1590. A certainly genuine though posthumous treatise from the "Noroff Collection," edited by F. Tocco and H. Vitelli. Opp. Latina. Florence, 1891, p. 521.).

He also says that "in us the blood and other fluids are being *moved continually and very rapidly in a circle*, flow and flow back, are diffused from the centre into the extreme periphery and from there return to the centre—a movement for which the followers of Aristotle give far-fetched and confused reasons such as an instinct of nature, the necessity of fate, the providence of God, etc." (The italics are mine.)

There are also allusions to the circular motion of the blood in two of his better-known treatises (*De Immenso*, VI, 8; *De Monade*, 1591, p. 23). The ideological background to this is (*a*) his most probable acquaintance with Caesalpino, the well-known Aristotelian philosopher, naturalist, and precursor of Harvey, the first to use the term "circulatio" (1571), and (*b*) Bruno's belief in the perfection of the circle as the fundamental symbol of all life and action in the cosmos (*De Triplici Minimo*, I, 3; *De Monade*, I, 2). The above passages from Bruno show that Caesalpino's idea of "circulatio" was alive in a general philosophical form towards the end of the sixteenth century.

WALTER PAGEL.

Correspondence

The Difficulty in Medical Education

SIR,—Your educational number was highly entertaining, but the contributors do not appear to have grasped the real difficulty in medical education, which is that people cannot avoid preaching what they practise. The preclinical teacher practises medicine as a branch of inductive science, the hospital consultant practises it as a specialty, and the whole-time clinical professor, restricted to a small unit, practises it as a means to clinical research. None of these practices has much relevance to general practice. The ideal medical school would be different from either a university or a key hospital; I often think it would come better outside and after the university. So long as we go on expecting to prepare students for general practice in institutions which have a different frame of reference we shall continue to be dissatisfied with the results.—I am, etc.,

Oxford. L. J. WITTS.

Training for General Practice

SIR,—In his article, "A G.P. on his Clinical Training," Dr. Donald Johnson writes (*Journal*, August 26, p. 493) of his hospital education in preparation for general practice as having been "wholly bad." He is writing of 25 years ago when he spent two years and six months as a medical student at St. Bartholomew's Hospital. As I am no longer a member of the teaching staff of that hospital, I may perhaps be allowed, without prejudice, to explain to Dr. Johnson how it is that he has become a competent general practitioner in spite of (because of) Bart's. The same post which brought me the *Journal* with his article in it brought me a brochure about the Paget Club, which is one of our institutions at St. Bartholomew's. This brochure opened with the words: "Sir James Paget, 'Nothing appears more certain than that the personal character, the very nature, the will, of each student had far greater force in determining his career than any helps or hindrances whatever'—('What Becomes of Medical Students,' *St. Bartholomew's Hospital Reports*, 1869, 5, 242.)"

St. Bartholomew's Hospital, with its tradition, atmosphere, teachers, nurses, porters, and students, strengthened Mr. Johnson's character and will. *We made the man* and he became a good doctor, partly because we made him, or we left him, hungry for knowledge. He tells us how, after leaving the hospital, he gained valuable clinical experience in the Metropolitan Hospital, Kingsland Road, how he learnt about the treatment of minor complaints from the experienced G.P. from whom he bought his practice, and about skin diseases from his dispenser. His article is that of a man with strong convictions; it is boldly critical, and he tells us that he is a pretty good doctor ("reasonably competent," he says). He is in fact a good Bart's product, and it is doubtful if he would have turned out any better if he had done his clinical training in a tip-top spoon-feeding unit.—I am, etc.,

London, W.1. GEOFFREY EVANS.

SIR,—Despite the publication of enlightened protests, such as that of Dr. Donald Johnson (August 26, p. 493), against the process of standing six months in a theatre catching glimpses of specialized surgical operations or of parking one's posterior on the patient's bed-locker during interminable ward rounds, students still come to be qualified without an adequate idea of how to work in general practice.

It is refreshing to read in an article by Professor W. Hobson and Dr. J. Pemberton in the *Lancet* this week (August 26, p. 324) that at Sheffield:

> "In the final three months of his curriculum each student will be attached to a general practitioner for a fortnight. He will attend the morning surgery and accompany the general practitioner on his daily round. In this way he will see for himself the opportunities open to the doctor for practising social medicine in the community."

These fortunate students should be able to see many other sides of medicine, and particularly those which are neglected in their hospital experience. May I repeat what I said at the meeting of members of the Royal College of Physicians at which Dr. Lawrence spoke? If I had a child who was taking up medicine I should make sure that he or she had at least three months' "apprenticeship" to a good general practitioner. Thinking it over, I am inclined to suggest six months; one period of three months before going to walk the wards and another after that, but before taking finals. Could not this sort of apprenticeship be made compulsory and interchangeable with six months of the new compulsory intern year?

Finally I still have a dream, which is unlikely to come true, of a general practitioner being allowed to attend all lectures and ward rounds where students are instructed, and his being given five minutes at the end to tell them how much they may forget. (Perhaps five minutes would not suffice.) This is obviously impracticable, but might not each teacher carry in his mind a similar imaginary counsellor to stop him from wasting the students' time?—I am, etc.,

Bristol. HUGH R. E. WALLIS.

SIR,—Heavier bludgeons than mine will, I feel sure, be swung at Dr. D. McI. Johnson (*Journal*, August 26, p. 493). I feel compelled, however, to make a pass at him myself. He has put himself, it is true, in a strong strategic position; anyone who blames himself and not his teachers for what he failed to learn 25 or more years ago can easily be disposed of as self-righteous. May I suggest that Dr. Johnson explains nearly the whole of his let-down by Bart's in the words "somewhat unwilling but not entirely uninterested"?—I am, etc.,

Potters Bar. W. E. HAYES.

SIR,—I have read with much interest Dr. Donald Johnson's article in the *Journal* (August 26, p. 493).

I had no idea that, 25 years ago, the clinical teaching at St. Bartholomew's was so primitive. At Edinburgh—but that was 50 years ago—we had the most excellent clinical teaching, which covered the needs of the embryo G.P. or specialist. Ward rounds (I do not remember tired legs); side-room talks; out-patients; evening tutorials; anaesthetic giving, with the not uncommon sequel of instruction in artificial respiration—all gave us the chance of assimilating what was to be of future use: "You mustn't mind seeing these cases frequently. You'll see lots in G.P." (Cotterill). "Handle the patient's body as if it were your own" (Chienne). "This is the sort of puzzle you'll meet in practice" (Bramwell). And so on.

The defects in my methods, which may be so obvious to my colleagues, I can fairly put down, with the modesty so characteristic of the southern Scot, to my own lack of attention, or of the ability to absorb. The material was presented well; it was up to me to digest it. Two or three years later I adopted what I think should be a universal practice (even for medical scientists—it will broaden their minds). I went as assistant to a first-class G.P. In a small country town on the Scottish borders Dr. David Huskie gave me the chance—may I have taken at least some of it—of learning how to approach patients, how to bear adversity, how to give the gentle answer, to see and how to treat the minor and chronic ailments which are inevitably not seen in hospital, how to shoulder responsibility.

I agree wholeheartedly with Dr. Johnson in his condemnation of systematic lectures, a complete waste of time in that we wrote instead of listening, and I thank him for spurring me on to pay a belated tribute to my old hospital and my old chief.—I am, etc.,

Glamorgan. A. W. B. LOUDON.

SIR,—Dr. D. McI. Johnson's diatribe against the clinical teaching he received at Bart's (*Journal*, August 26, p. 493) should, of course, have the heading "Stinking Fish."

As one who must have been a contemporary of Dr. Johnson may I say: (1) I thought then, and still do, 22 years afterwards, that I was made to learn many things that have been no use to me since. (2) This does not alter the fact that the picture he draws of the futility of Bart's teaching then is grossly exaggerated. (3) There must be many old Bart's men who are eternally grateful for the teaching of men like Horder, Gow, Vick, Rawlings, Patterson Ross, Kenneth Walker, Roxborough, Girling Ball, Wilfred Shaw, Langford Moore, and a host of other grand teachers too numerous to mention. (4) Dr. Johnson blames his teaching for not foreseeing early death after a hemiplegia. Why? The best bedside clinician cannot always foretell the outcome of these cases. (5) He complains that he could only write two prescriptions. Why? Had he never read and resorted to the Bart's Pharmacopoeia, or was this included in what he, in his wisdom, "ruthlessly eliminated" from his programme? (6) He could not give "even a hypodermic injection." Why? I seem to remember we all had ample opportunity to learn this simple job. (7) He knew nothing about rashes, infectious or non-infectious. Did he never attend Skins or Fevers? What was he doing all the time? And the final absurdity—of which we have heard *ad nauseam* from other sources—"Society, shocked at the incompetence and inexperience of newly qualified doctors . . ." Let us have evidence of the proof of this statement. What "Society," or branch or faction of it? What "incompetence" has been a nine days' wonder?

I am old-fashioned enough, Sir, to believe in loyalty. Loyalty to one's team, one's crowd, one's Alma Mater. And I for one will always be glad and proud and happy that I went to Bart's and that I have tried to live up to, and profit by, all that Bart's has taught me.—I am, etc.,

Aylesbury. W. A. BELLAMY.

SIR,—I take a hasty pen to protest how very different from the curriculum described by Dr. D. McI. Johnson (August 26, p. 493) was the teaching at Guy's about fifteen years earlier. On reaching the clinical stage a student became a ward-clerk. A firm, maximum six, had about seventy beds between them, and certain hours, extensible to taste, in the "Front Surgery." The clerks were immediately responsible for case-history of all admitted cases, with all signs and symptoms they could detect. Later the registrar took the firm round, with criticism and coaching; and when the consultant had made one more round there would not be very much unelicited about these cases, especially as questions were searching and treatment and progress had to be meticulously noted. There was much rivalry between firms, and efficiency was checked by interim examination.

Work in Casualty or "sorting" department was under supervision by dressers and house-surgeons, and all the way up the scale there was an admirable blend of responsibility with guidance. We were not forced into P.-M. room or museum, but the wisest spent many hours there. For those aspiring to house appointments there was a ward called "Clinical," where one had one's own beds and had first choice of all cases admitted to the hospital.

As regards special departments, we were encouraged to believe that the G.P. was the backbone of the profession, and should know enough of all branches to do some good and no harm. Skin Out-patients in particular was always crowded, and thought to be about the best value per man-hour to be obtained. There was always so much of interest going on in the hospital, including "culture," that there was little temptation to seek it elsewhere; nor, considering all there was to learn in a brief four years, did the less brainy of us find much time to do so, after taking a fair share of athletics.

A graduate trained only in a general hospital must inevitably lack much knowledge of minor ailments and chronics, but how better gain the lacking experience than by six months as assistant to an "old-timer"?

Dr. Donald Johnson seems to have found standing round beds a trial; but we were all young once, and a posse (or is it a fleet?) of bath-chairs would be somewhat of a traffic problem.—I am, etc.,

Kington-on-Arrow, Herefordshire. G. W. DRYLAND.

SIR,—I have only just read Dr. J. H. S. Hopkins's article on Bornholm disease (May 27, p. 1230). It is an extremely common condition. Practitioners should try to get all their cases of this and of atypical pneumonia as fully investigated as laboratory facilities allow. It is a "pushover" as a subject for an M.D. thesis. My experience has been that physical signs are usually present, but I have made embarrassing misdiagnoses.

Early descriptions of outbreaks in nursing staff and failure to instruct students about the disease are related phenomena and the usual hallmarks of impending dissemination of knowledge of common, interesting, and overlooked diseases. All students are well instructed in the pathology, aetiology, and differential diagnosis of the rarer, progressive, serious, and fatal illnesses. These are also in the books, where you can look them up if you did not attend ward rounds. Teachers neglect the common ones because they know nothing about them. Their only contact with everyday disease is in themselves and nursing staff. (Note the reluctance with which some consultants approach the sick nurse or student.) Serious disease eliminated, analytical thought and further investigation are abandoned. For this there is some slight excuse. However, they fail to teach the management of cases. Hence modern insistence on a doctor doing a few house jobs. If he does them in a municipal or non-teaching hospital an intelligent man soon picks up a working knowledge of medicine.

I qualified without having been shown any of the common infectious fevers except chicken-pox. Fortunately I had had the others, but this experience is not universal. However, if I saw a case of aortic stenosis I knew the patient was usually a man; and that a child with chorea is usually a girl (this is more useful).

Any general practitioner of sound intelligence who analyses his cases carefully will cut clean through the mass of inexperienced consultants to the top, as witness Mackenzie—provided he advertises by writing. If he does not do this he is merely a miser deriving pleasure from his hoard of superior knowledge.—I am, etc.,

Co. Derry. D. HAMILTON, Capt., R.A.M.C.

Psychology as Science

SIR,—Dr. F. M. R. Walshe, in his Linacre Lecture (*Journal*, August 12, p. 379), has paid me the compliment of referring to a work which I wrote a quarter of a century ago. In the naturally brief summary which he sets out I do not feel that he has given a correct picture of the position which I adopted in that book, and I am therefore seeking this opportunity to make my position clearer.

He accuses me of claiming that psychological medicine has established itself as a discipline within the field of the natural sciences, that the data of the psychologist in medicine are strictly comparable in character to those of natural science, that—as a scientific concept must be capable of verification by repeated reference to experience and experiment—I clearly believe this postulate to be fulfilled in psychological medicine. There are other accusations which I will refer to later, but may I in the first place be allowed to plead not guilty to these preliminary charges, basing my defence entirely on the statements made in the book in question? To begin with, I did not claim that psychological medicine had established itself as a discipline within the field of the natural sciences. On the contrary, the whole aim of the book was to examine whether and how far psychological medicine could claim a place within the field of *Science*. Science is not here equated with "natural science," and Dr. Walshe would obviously agree with me in this respect, as he uses the term "historical science." The meaning which I attached to "science" was the employment of the method of science as defined by Karl Pearson—viz., a procedure involving three successive steps. First, the observation of phenomena; secondly, the orderly arrangement and classification of the facts which have been observed; and, thirdly, the finding of "laws" which will serve to explain those facts, and enable one to predict and control the occurrence of future phenomena of the same order. The object of my book was, as I have said, to examine to what extent the development of psychological medicine had followed this road. While I found that it had done so in certain respects and at certain stages of its growth, in other respects and particularly in some of its later stages I emphatically stated that the canons of scientific validity were not satisfied. I described my final position with regard to these

later developments as one of "benevolent scepticism." I share the substantive with Dr. Walshe, though hardly the adjective.

Next, so far from claiming that the data of the psychologist are strictly comparable to those of natural science, I have expressly set out their weakness in this respect. Except for the facts of introspection all other psychological facts are inferences, in that they are inferred from behaviour and speech. I quoted Drever's remark that this peculiarity was an inherent weakness, and one which dooms psychology always to occupy an invidious position in the scientific hierarchy. I added that, owing to the nature of its material, psychology can give only an imperfect response to the demand for objective verification which science insistently makes. Nevertheless I did not, and do not, think that this weakness is sufficient to remove psychology altogether from the employment of the method of science. Often the gap that separates the "psychological fact," which forms the material to which psychology applies the method, from the directly observed fact—e.g., speech—is so small that it may safely be neglected. After all, inferences of this degree are commonly accepted in medicine. If a patient tells me that a spot is tender, I include the tenderness without protest among observed facts, though it is actually an inference. I do claim that, by following the method of science, psychological medicine has in its development arrived at conceptions which serve to explain and control our experience to a degree which no other mode of attack has succeeded in achieving. I may cite here the work of Janet on hysteria, which cast a new light on a field illuminated before only by the completely sterile concept of "functional nervous disorder" bequeathed by our neurologist ancestors. Moreover, this work was to a reasonable extent capable of being checked by experience and experiment. I would also add the conception of "purpose" in disorder, which we certainly owe to Freud's earlier work. This conception enabled us to understand the genesis of the psychoneuroses of the first world war, and moreover the knowledge so gained enabled practical and effective steps to be taken in controlling and reducing similar manifestations in the second world war. It is perfectly true, therefore, that in my book I claimed that psychological medicine had, by employing the method of science, succeeded in making considerable advances. But, in estimating that success, the gap between the actual observed fact and the psychological fact behind it must be carefully watched, and the possibility of distortion between the two borne constantly in mind. In the later work of the Freudian school I felt that the gap had been too wide, and I therefore was not prepared to accept it as conforming to the postulates of scientific method.

I may remark here that the context of Dr. Walshe's lecture makes it plain that he is identifying psychological medicine with the doctrines of the orthodox psycho-analytic school. He pays no attention to the very considerable work which has been and is being accomplished altogether outside that school. This point does not directly concern me, however, except in so far as Dr. Walshe has by implication included me with those accepting the Freudian claims.

One further accusation of Dr. Walshe must be mentioned. Commenting on my remark that the introduction of "purpose" removes psychology from the mechanistic sciences, but not from the whole field of science, he says, "Here Hart seems almost trembling on the brink of awareness that psychology does not belong to natural sciences. However, he goes on to place it with biology. Yet the word 'purpose' is not unequivocal, for teleology in biology is not the 'purpose' that determines human action. Such are the pitfalls of linguistics." I understand this quip to mean that I have unwarrantably identified "purpose" in psychology with teleology in biology. If I had done so I should not describe my transgression as having anything to do with linguistics, but should term it a gross confusion of thought. But I perpetrated no such error. The gist of the whole passage in question is as follows. There are two concepts of causality: (1) An unconditional sequence; *a* is inevitably followed by *b*. (2) Not merely inevitable succession but a relation of identity between cause and effect. The effect is regarded as the cause in a new form. In this sense causation is an equation, and a reversible equation. It is the sense in which causality is understood in the mechanistic sciences, and obviously psychology cannot be brought under it, for sequences in which "purpose" is playing a part are clearly not reversible. But this irreversibility does not exclude psychology from the first concept of causality. If it were insisted that the method of science requires the concept of causality in the second sense, biology and even physiology would have also to be excluded, not because teleology and "purpose" are identical, but because both necessarily involve irreversible sequences. They are analogous in this attribute of irreversibility, but that is all.

In my book I pointed out that I held no brief for regarding the method of science as a unique mode of approach to the problems of psychology, and was quite prepared to employ any other method which should prove to be more effective. Dr. Walshe now puts forward the method of historical science as the only sound alternative. He does not give any concrete example of the use of this alternative in the problems of psychological medicine, and we could of course hardly ask for this in the scope of a single lecture, though I hope he will give us further indications of his proposals in this respect. But I must confess that I feel considerable apprehension over his comparison of the historical method of approach with the taking of a clinical history. In the latter, as he rightly says, "From its items we select, discard, and assemble in the light of our previous experience; and the final product of our activity is the sublimation of a certain kind of evidence from one source and of a critical study of it from another," and later he speaks of the ideal medical psychologist dealing with the mental activities he is examining "by rethinking or reliving these activities in his mind, and in the context of his own knowledge." The possible action of bias and distortion here is so great that my feeling of helpless scepticism, in face of the labyrinth of conflicting speculations and methods which Dr. Walshe so eloquently describes, is far from being assuaged. It is very doubtful whether the clinical history obtained by Dr. Walshe in a given case would be identical with that obtained by an enthusiastic psycho-analyst in the same case. I would point out that the advance in historical method which has taken place in the last century is largely due to a better estimation of the part played by bias and emotional distortion in presenting alleged factual records, and this has been achieved by the application of psychology to historical method, rather than vice versa. Some of this knowledge, indeed, has been attained by the use of investigation and experiment—e.g., by Stern and the Breslau school—which needs no apology on the score of scientific method.

Finally I would say that one of the lessons of history is that systems of thought and belief are destroyed, not by attacking them, but either by a process of internal decay or by the appearance of another and more satisfying system which gradually undermines it. I would be content to leave the developments which Dr. Walshe anathematizes to the first process, in the hope that a considerable sediment of solid stuff would be left. But if Dr. Walshe can really provide the second alternative it is cordially to be welcomed. For my own part I felt when I wrote the book, and still feel, that psychology will get along better by pushing the method of science, albeit in an imperfect form, as far as it will prove reasonably sound and effective, than by any other method as yet available.—I am, etc.,

Eastbourne. BERNARD HART.

SIR,—In his most interesting Linacre Lecture (August 12, p. 379) Dr. F. M. R. Walshe writes: "Of its possible relation to historical science we find no word in the superabundant writings on psychological medicine" (p. 382). May I be allowed to point out that in the preface to the fifth edition (1944) of my *Psychology and Psychotherapy* I wrote:

"Psychology as a science is based on the category of historical causation, and the rules of diagnosis and prognosis in medical psychology are based on patients' medical histories supplemented by the results of deep mental analysis. It is instructive to re-read Immanuel Kant's *Kritik der reinen Vernunft* from the standpoint of modern historical science. Events do indeed follow one another 'according to a rule' (*nach einer Regel*), but deeper connexions of meaning have to be unravelled before the true 'rule' becomes apparent."

As one listens to a patient during a course of prolonged and deep mental analysis, one is impressed by the importance of "choice" and "decision" at critical moments of his life, and one sees his life unfolding as an evolutionary process and not as a mere mechanical sequence of events. My experience in the consulting-room, in association with my training as a philosopher, has convinced me that individual mental life is a historical process, and that the mental sciences (*Geisteswissenschaften*) reach their fullest development along the lines of historical explanation. But this, of course, leaves scope for many other legitimate (though more abstract) points of view from which to develop the science of psychology.—I am, etc.,

London, W.1. WILLIAM BROWN.

SIR,—Dr. F. M. R. Walshe's Linacre Lecture (August 12, p. 379) contains much wisdom, and many, including myself, will agree with most of what he says. It is a pity, however, that in such a thoughtful lecture he should have embarked upon the subject of methodology in psychiatry with so little circumspection. In the course of his argument he upbraids medical psychologists for their blindness in claiming to use the scientific method of natural science. He exonerates those "sage medical psychologists" who, using physical methods, know them to be empirical. He does not, by the way, specify which physical methods. Apparently he is thinking mainly of leucotomy. All other psychiatrists, in their anxiety to be "scientific," are thought to be actuated by unconscious yearnings to acquire some sort of academic prestige within the world of ordered knowledge. He anticipates that his remarks will set off rhetorical land-mines, but, undismayed, he proceeds upon his hazardous way. The expectation of rhetorical land-mines will hardly be realized. Dr. Walshe is not opening up new ground. It is true that the Goulstonian Lecturer of 1926 supported the claim that psychiatry was within the ambit of natural science and used its method. But other psychiatrists disputed this claim, as they had done earlier. Dr. Walshe is apparently unaware of their contributions upon this somewhat ancient theme.

Some psychiatrists—by no means all—have clear ideas upon the subject of methodology, and their number is not limited to those who employ physical methods—in his use of this term. Dr. Walshe may be glad to know that within psychiatry itself there are those (for example, certain psychotherapists) who have repudiated the claim that the only acceptable method in psychiatric practice is that of the natural sciences.—I am, etc.,

London, W.1. E. A. BENNET.

Inflammability of Ethyl Chloride

SIR,—Having read the instructive article on "Poisoning due to Inhalation of Methyl Bromide," by Drs. A. C. MacDonald, I. C. Monro, and G. I. Scott, in the *Journal* of August 19 (p. 441), I feel that their remark, "Like chloroform, ethyl chloride, and carbon tetrachloride it is not inflammable," should not pass without comment. Ethyl chloride is, surely, highly inflammable, burning, in fact, with a greenish flame. When mixed with 5–15% of air, it is actually explosive (*B.P.C.*, 1949). Few anaesthetists would feel justified in using "open E.C." in the presence of the diathermy, and disaster might result if one attempted to put out a fire with a bottle of ethyl chloride.—I am, etc.,

London, S.E.1. T. H. S. BURNS.

SIR,—Drs. MacDonald, Monro, and Scott state in their article on methyl bromide poisoning in your issue of August 19 (p. 441) that ethyl chloride is not inflammable. A surgeon who was about to remove a wart from my abdomen by means of cautery and local anaesthesia, with ethyl chloride spray as the anaesthetic, was also of this opinion. I can assure Drs. MacDonald, Monro, and Scott, with considerable warmth, that ethyl chloride is very much inflammable. The wart was undoubtedly removed, but the surgeon and I spent a very exhilarating few seconds extinguishing the resulting conflagration on my abdomen.

Fluid ethyl chloride can easily be ignited by the pea flame of a bunsen, but not, I believe, by a dull red fire. It was the latter fact that had led to my surgeon's belief.—I am, etc.,

Liverpool. H. E. VICKERS.

An Interesting Advertisement

SIR,—The grave shortage of psychiatric social workers is now well known, and makes discussions of improved mental health services, both preventive and therapeutic, largely academic. All with knowledge of the problem are agreed that the present salary scale is inadequate for workers who bear considerable responsibilities, and whose training lasts at least three years. That it is wholly out of relation to current rates is illustrated by a recent county council advertisement for mental health workers which reads as follows:

". . . Preference will be given to duly qualified Psychiatric Social Workers or candidates with a Diploma or Certificate in Social Science, and if so qualified the salary will be £370 by £20 to £530 per annum, commencing according to experience. For unqualified persons the salary would be £480 by £15 to £525 per annum."

This means that the unqualified start at £110 per annum higher than the qualified. Is it surprising that for several years past insufficient suitable candidates have come forward to fill training vacancies?—We are, etc.,

London, W.1. JOHN D. SUTHERLAND.
JOHN BOWLBY.

Chlorinated Swimming-pools and Poliomyelitis

SIR,—In recent announcements concerning poliomyelitis it has been stated that in certain places the swimming-pools were to be closed. This seems prudent. I have only three or four times swum in such places, but on each occasion I was immediately aware of an intense nasal irritation set up by the chlorinated water. Since then I have always believed that this is probably one important factor which encourages the spread of poliomyelitis, owing, I think, to the chlorine being ineffective as an agent for the destruction of the virus, but being present in quite sufficient concentration to disturb the normal resistance of the nasal mucosa and thus lay open an easy portal of entry, through the cribriform plate of the ethmoid and elsewhere, through the mucosa. Non-chlorinated water may be unpleasant to bathe in, but it is not necessarily dangerous.

I well remember the Merton Street Bath at Oxford. This was reserved for members of the University for bathing and for water-polo matches, but we boys of Magdalen College schools were allowed to use it, and we went there every evening in the summer when we were not swimming in the Cherwell. In Eights Week the bath was crammed with those who, having run and sweated on the tow-path, wished to cool down before going into Hall. There were no showers for a preliminary rinse; everybody just pulled off his zephyr and shorts and went in. The content of bacteria and other low forms of life must have been prodigious, for the water was only changed two or three times in the term of eight weeks, the signal for this being the impossibility of seeing the bottom—an event which occurred quite suddenly and was due, I suppose, to the rapid growth of some mould. Admittedly, poliomyelitis was uncommon in those days. None the less, it is of interest that, despite the filth of the water—of which, of course, we took no heed—I do not remember any case of otitis media among us, and the school was then a small one. During my five years as a schoolboy I am certain there was never a case of mastoid suppuration, nor, so far as I am aware, was there any unusual incidence of serious nasal or eye disease.

The nose is designed to probe into strange places and to be assailed in a variety of ways, but it will look after itself. I think it is fair to say that to wash it out with the attractive-looking water of a chlorinated swimming-pool is to invite disaster.—I am, etc.,

London, W.1. R. OGIER WARD.

The Internal Spermatic Fascia

SIR,—I would like to make some comments on Mr. C. Brun's article (August 19, p. 443). First, I think he will agree that (1) a stretched internal ring means a prolapsed cord and a defective muscular (valvular) mechanism; (2) there is no new surgical procedure which will completely restore a defective muscle action; (3) sutures in fascia, such as the transversalis fascia, cannot be regarded as a preventive against further stretching. Secondly, I cannot help feeling that if he agrees that the essential weakness of any well-developed inguinal hernia lies in the posterior wall of the canal, then buttressing of this wall by obliteration of the gap between the inner part of the

conjoined tendon and the inguinal ligament should be continued laterally, using either continuous or interrupted sutures. In this way the size of the internal ring is constricted until the new posterior wall fits snugly up to the forefinger, pressing the cord and ring outwards and backwards. Thirdly, I see no point in visually defining the internal ring in indirect herniae, as it can be palpated so much more easily, and there is no real hindrance to the action of displacing the cord outwards by finger pressure. The sutures used in the outer part of the new posterior wall should of course pick up the stretched fibres of the internal ring, in passing from the internal oblique muscle to the inguinal ligament.—I am, etc.,

Peterborough. D. W. BRACEY.

Domiciliary Treatment of Tuberculosis

SIR,—I feel I must express my sympathy for the patients who, under Dr. Crosbie Walsh's care (*Journal*, August 26, p. 525), are presumably denied the benefits of attending the local chest clinic. For his information and that of any other practitioners who may feel that they should "by-pass the tuberculosis officer," it may perhaps be well to enumerate a short selection of the services provided at chest clinics.

These include:

(1) Assessment of the significance of radiological appearances by the comparison of comparable films by physicians continuously confronted with the hazards and difficulties of this aspect of diagnosis.
(2) Advice given by physicians and health visitors versed in the special problems associated with these long-term cases.
(3) Arrangements for prompt financial assistance as afforded by the present scale of Government allowances.
(4) Arrangement of home-helps, boarding-out of children, special schools, recommendations for suitable jobs, and a hundred other vital forms of social assistance.
(5) Examination of contacts—primarily a radiological technique.
(6) Recommendation for sanatorium, surgical treatment, etc., which must in the vast majority of cases be done through these clinics.
(7) The controlled maintenance of adequate collapse therapy.

It is difficult to see how Dr. Crosbie Walsh can claim to provide a comparable form of assistance to his patients in these matters, quite apart from being able to assess the indications for streptomycin, etc., the hazards of which are being continuously stressed.[1,2]

In our area, in which we enjoy a full degree of co-operation with general practitioners,[3] we still get at least one new case a month in which valuable weeks or months have been wasted by trying to arrive at a diagnosis without reference to the chest clinic.

Finally, as the question of co-operation between general practitioner and chest clinic has been raised, may I put in a plea for careful history-taking, with special reference to time factors, in all cases who attend the doctor's surgery with a condition which might prove to be pulmonary tuberculosis? The history is the important factor in the early diagnosis of pulmonary tuberculosis, and the practitioner gets this first.—I am, etc.,

Hounslow. B. MEYER.

REFERENCES

1 *British Medical Journal*, 1949, **1**, 280.
2 McCoy, Herbert L., *Amer. Rev. Tuberc.*, 1950, **62**, 223.
3 Heller, R., *Tubercle, Lond.*, 1949, **30**, 204.

SIR,—The last thing I desire is for this correspondence to degenerate into a war between tuberculosis officers on the one hand and general practitioners on the other, because I have always believed that we must work together. However, I feel that the letter from Dr. R. Crosbie Walsh (August 26, p. 525) calls for comment.

I desire that every tuberculous patient should have the skilled treatment necessary in his particular case. I do believe that a tuberculosis officer who keeps himself up-to-date by working in close co-operation with the tuberculosis hospital and thoracic surgery centre is better qualified to assess cases for chemotherapy than a general practitioner. The analogy made between tuberculous cases suitable for streptomycin and puerperal sepsis cases requiring penicillin does not stand scrutiny. We all know that puerperal sepsis cases require penicillin, but on the other hand all cases of tuberculosis are not suitable for streptomycin. Furthermore, Dr. Walsh must have little idea of the respective functions of a medical officer of health and a tuberculosis officer if he does not know that the former is an administrator, not concerned with treatment, whereas the latter is a clinician.

I agree that it is the responsibility of the general practitioner to treat his tuberculous patients as well as others, but I think that treatment should be discussed with the tuberculosis officer, who should know what the future plan of treatment is likely to be and whether the suggested treatment will be beneficial or otherwise. Dr. Walsh appears to have been most unfortunate in his dealings with his local tuberculosis clinic, for I am sure that most tuberculosis officers, overworked though many of them are, are only too pleased to discuss their cases personally with the general practitioner if this be desired, and I think they all try to keep him informed by letter of any changes in *x*-ray or other findings.

The limited facilities placed at our disposal in the past by some local authorities may have caused some tuberculosis officers to be less helpful to the general practitioner than they might have been. It is to be hoped that all chest clinics will soon be adequately equipped and staffed to deal properly with the tuberculous population of their areas.—I am, etc.,

Liverpool, 18. WILLIAM D. GRAY.

SIR,—With great surprise I read Dr. Walsh's reply and criticism (*Journal*, August 26, p. 525). Dr. Walsh most likely has been very lucky to get a "teaching hospital chest physician" to deal with his difficult cases arising out of the antibiotic treatment of tuberculosis. It would be a really sad day when we see the general practitioners, who are the main pillars of an efficient medical service, by-passing any branches of specialized medicine. But I want to ask him a few questions.

What procedure does a provincial doctor take when requiring institutional treatment for tuberculous patients? What percentage of his open tuberculous patients have been admitted to teaching hospitals? (We ought to remember there is only one Brompton Hospital in the whole country.) I am only very new in the tuberculosis service of the country, but my short experience shows that in dealing with tuberculosis, which not only requires curative treatment but entails massive social and economic adjustments, proper co-operation between general practitioners, chest physicians, and tuberculosis officers must be maintained on the highest level.—I am, etc.,

Manchester, 13. S. S. CHATTERJEE.

The Case for Abortion

SIR,—It will surely be the general view among your readers that Mr. Albert Davis and yourself have done a considerable service in publishing his "Report on 2,665 Cases of Abortion" (*Journal*, July 15). The report is defined as intended "to determine the relative merits of active and passive treatment in cases of incomplete abortion," and within these terms adds considerably to our knowledge. One cannot help feeling, however, that the material provided among the incidental findings raises farther-reaching questions. I trust a comment may be permitted along these lines.

Of the cases generally (the great majority of which were those of attempted illegal abortion among married women) it was noted that in almost 1 in 10 there was a history of previous abortion. Also, that the abortions had been induced either medicinally or by douching. These facts lead to two conclusions: (1) that women in the relatively favourable state of legal marriage had been brought by unwanted pregnancy to such mental distress that in 253 cases they were willing to attempt abortion again, *after having had the experience*, which argues a certain desperation; (2) that these women must already have been in a very poor state of physical health if "female pills," purgatives, or douches could produce effect. Upon the healthy system they are quite ineffective; but for which fact very many people living to-day would not have entered this world.

If it is a fact that psychological health affects physical health, if to endure humiliation, pain, and danger of death rather than

fulfil a natural function implies some degree of psychological sickness, then there must be a case for close consideration of psychological and environmental factors as they affect health when the decision for or against the termination of a pregnancy is made. This decision should be neither in the hands of the mother, who cannot see beyond her immediate situation or understand all the factors involved, nor in the hands of the gynaecological specialist, who cannot be expected to be fully informed regarding psychological and environmental factors and their probable results, nor in the hands of the psychological practitioner alone, since he needs friendly conference with both the gynaecological specialist and most particularly with the general practitioner, the key-man immediately in touch with the personality and background of the patient.

Mr. Davis gives, as a permissible indication for termination of pregnancy, "*gross* physical disease." This requires elaboration. What, in fact, is "gross" physical disease? Has the mother to have both feet in the grave before relief is afforded her? Mr. Davis states: "The indications were those usually accepted as necessary for therapeutic induction, with the possible exception of pulmonary tuberculosis, *but the difficulty of obtaining suitable sanatorium accommodation for these patients is usually an overriding factor*" (my italics).

This in fact means that in such circumstances environmental factors—indeed, economic factors—were taken into account, in so far as they would in all likelihood eventually render the mother unfit to give birth. Upon this basis, is it unreasonable to conclude that, where environmental factors will cause such tremendous stress as to affect mental health to the extent of rendering a mother unfit to give birth, relief should also be indicated? Yet Mr. Davis notes, "Several patients with temporary mental instability were referred by psychiatrists, but this was invariably transient, the result of unwanted pregnancy, and interruption was refused."

This must inevitably prompt the question whether the after-histories of such patients are available over a long period of years. In the experience of every psychological practitioner (not merely in theory) it is found that temporary mental instability never results only from an immediate stress. The unwanted pregnancy is not the cause of the temporary mental instability, it is only the precipitating factor. The original cause usually lies many years back. Since the true cause of the mental instability remains untouched, let a new stress arise years later (and in the case of the unmarried mother in poor circumstances, how many chances there are that this will happen), and the mental instability will be back again *in more acute form*. Unless a secure and not greatly troubled future can be guaranteed for the woman suffering temporary mental instability as the result of an unwanted pregnancy, or unless a cure is effected by prolonged analytical treatment, then she is almost bound to relapse at the next practical crisis of her life, and her child, too, will suffer. Therefore psychological treatment should always be given as the natural accompaniment of refusal of termination.

When a woman is found to be suffering from temporary mental instability, precipitated by unwanted pregnancy, the psychiatric practitioner must (with the aid of the family doctor) endeavour to assess the environmental factors, together, of course, with those "inner" factors upon which the pregnancy has, from the practical viewpoint, acted only as the precipitating agent. These may include the unmarried status of the mother, the overburdened lot of the mother of several children, extreme poverty, lack of housing accommodation, unhappy marriage, and so on. No one of these things could by itself ever be accepted as an indication for termination. They may, however, singly or in combination, constitute that final stress which (added to other "inner" factors) might push a woman over the edge of sanity.

For a married woman who has already been through the ghastly experience to attempt second (and even more) abortions argues *ipso facto* a degree of mental instability for the time being (and of latent instability which may be permanent) sufficient to justify examination of her case.

Mr. Davis notes (and the experience of most of us, as well as the statistical evidence, will confirm) that "the complication rate is much higher in illegitimate abortions. In the present series of 315 unmarried women severe complications—gross haemorrhage, virulent infection, pelvic abscess, etc.—were present in 43 (14%) of the cases, while the corresponding figure for the 2,350 married patients was only 6%. . . . The most likely explanation lies in a combination of several factors—the inexperience of these girls, their isolation, and the desperate nature of their predicament." Here, if more is needed, is sure confirmation of the fact that mental factors exert deep influence upon physical health.

It is not, again, suggested that the fact that a girl is unmarried is *in itself* an indication for termination, or should ever be so; or that the decision should lie in her own hands. The proposal is rather that, when the decision is taken by gynaecological specialist, psychiatrist, and family doctor in consultation, the greater actual physical and mental risks run by the unmarried mother should be borne in mind—in precisely the same way that the risks run by the unhospitalized phthisic expectant mother are borne in mind by Mr. Davis.

The note that only 1% of the cases mentioned in the report were instances of therapeutic abortion leads one to wonder whether there is not some connexion between this figure and the far greater (and frightening) figure of 90% of cases considered to have been improperly induced. This appalling figure should make us begin to realize the nature of our individual responsibility when we refused consideration to such a request. Surely of those 2,400 cases there must have been a number of individual instances where there were in fact legal grounds for termination?

If not only the frequency of abortion and the state of physical health of individual patients in these cases, but also some details of their background, could be obtained, a great new light would be thrown upon this whole subject. The following heads would cover some of the most pertinent points: the precise reason driving the mother to the desperate expedient of illegal abortion; existing number of children; relationship between husband and wife (or between unmarried girl and her parents, and the man responsible); and family income and accommodation. No doubt more could be added.

I myself hope one day to publish the results of cases (of a different section of society from that of Mr. Davis's series) considered on psychological grounds; a certain number where the pregnancies were terminated and a larger number where the patient was made to understand the rightness of continuing to full term.—I am, etc.,

London, W.1. EUSTACE CHESSER.

Abortion

SIR,—There is a good deal to criticize in Albert Davis's article on abortion in the *Journal* (July 15, p. 123). May I consider a few points?

Under "Civil State" he writes, "Of the 2,665 women, 2,350 were married, 303 were single, and 12 widows. This is in accord with McIlroy's (1929) report that abortion is most frequent in the married." Must he not also consider the relative frequency of married, single, and widowed women in the general population?

I am quite incapable of believing that of 2,665 patients only 13 had a retroverted uterus. I suggest with some confidence that many of the case-papers lacked a specific note on the position of the uterus and that there must have been far more in retroversion. Mr. Davis writes: "In nine cases the patient had aborted incompletely before admission. The uterus was replaced in the remainder, but in only one case was this *successful in producing continuation of the pregnancy*" (italics mine). I believe that if you wish a patient with a retroverted uterus to miscarry, the simplest plan is to manipulate her uterus into anteversion.

As there were four cases of impaction and only two of retention of urine, I should be interested to know what Mr. Davis means by impaction of a retroverted uterus without retention: it is not a condition with which I am familiar.

I am completely floored by the logic of the last two lines of this paragraph on retroversion. The fact that of 13 patients admitted for abortion 9 were incomplete on admission, and 3 more aborted after the uterus was manipulated, does not prove

to anybody "the difficulty of preserving such pregnancies": it proves nothing. Every gynaecologist of experience has seen many patients with a retroverted uterus who have threatened to abort and then gone on to term.

Under "peritonitis" on page 128 one successful hysterectomy leads him to conclude that "there is a definite though necessarily limited indication for its use in post-abortal peritonitis." The conclusion may possibly be right, but it is not justified by the evidence given.—I am, etc.,

Leeds, 2. ANDREW M. CLAYE.

Haemorrhage from Peptic Ulcer

SIR,—Sir Robert Hutchison's suggestion that "every peptic ulcer once established as chronic be operated on in the cold" (August 19, p. 459) is utopian rather than practical and fails to take into account several obvious difficulties:

(*a*) A local practitioner discussing the incidence of peptic ulcer stated that he had in his practice approximately 100 patients "of duodenal type," of whom not an inconsiderable number would merit surgical consideration. The North-eastern Region (Scotland) area serves a population of roughly 400,000, which by simple computation would yield some 16,000 duodenal dyspeptics. Assuming that only 1 in 20 be "definitely established as chronic"—and such assumption cannot be an overestimation—the waiting-list for gastrectomy would be 800.

(*b*) The practising surgeon and physician must have encountered perforations and haematemeses which occur unheralded in a clinically silent duodenum. Thus, even although the established chronics have been dealt with, a fruitful source of perforation and haematemesis remains.

(*c*) Since 1945 the number of beds available for general surgery has decreased by virtue of the demands of thoracic, neurosurgical, and vascular clinics. The National Health Service too, far from increasing the accommodation, has meant a reduction in the number of available beds in this area.

Hence, in this area at least, in which Drs. Needham and McConachie (July 15, p. 133) have compiled their recent statistics, any attempt to forestall perforation and haematemesis by mass surgery on the established chronic ulcer would inevitably fail.—I am, etc.,

Aberdeen. W. MICHIE.

SIR,—Having been brought up since childhood to respect the name and opinions of Sir Robert Hutchison I was delighted to read his letter under the above heading in the *Journal* of August 19 (p. 459) expressing so succinctly the beliefs of many surgeons. Twenty-five years ago gastro-jejunostomy held sway in the treatment of even the most unsuitable types of peptic ulcer, and the mortality of gastrectomy was forbiddingly high except in the hands of one or two pioneer experts. In recent years surgeons working on the unpromising material provided by the failures of medical treatment, the half-starved, the exsanguinated, and the chronically enfeebled have succeeded in restoring a large proportion of patients to a decent level of digestive and general good health with a small operative mortality. Nevertheless, we are still not having ulcer dyspeptics referred for surgical treatment until disaster is at hand or has actually occurred. There then ensues a period fraught with anxiety and alarm for the patient, the relatives, and all concerned; during these hours the question of an emergency operation must be considered, continuous transfusion and constant nursing vigil add to the strain on all until, only too often, the dismal revelations of the post-mortem room humiliate us with the information that the patient must have been living with the threat of a lethal haemorrhage from a chronic peptic ulcer for many years. Few would question the advisability of operating on an inguinal hernia before strangulation occurs; why then should the profession accept the risks of haemorrhage, perforation, or malignant change in a chronic peptic ulcer with equanimity?

In conclusion I would strongly endorse Sir Robert Hutchison's appeal not only as a measure that will save the patient chronic invalidism and a constant threat of sudden death, but as a measure that will save the hospital service hundreds of beds, the nursing profession untold hard work, and the transfusion service gallons of blood.—I am, etc.,

Weymouth D. J. ROSS STEEN.

Extreme Hyperpyrexia with Recovery

SIR,—I would bring the following case to your notice as illustrating the tenacity of life among the Chinese.

The patient, a rather emaciated Chinese aged 67, came under my care complaining of right-sided abdominal pain and constipation of four days' duration. He had not vomited, and there was no history of preceding dyspepsia or jaundice, or of previous attacks. On examination his condition was good (pulse 100, temperature 98° F. (36.7° C.)). The whole of the right side of the abdomen was rigid, and he placed the site of maximum pain and tenderness just to the right of his umbilicus. The conjunctivae were pale, and the patient was anaemic. A diagnosis of acute cholecystitis, ? acute appendicitis, was made.

The abdomen was opened through a right paramedian incision and the gall-bladder found to be acutely inflamed and full of small stones. The sounder courses of closure or cholecystostomy were discarded, and cholecystectomy was embarked upon; this was accomplished with some difficulty and the loss of a modicum of blood by the patient. On leaving the theatre his condition was still fairly good, the pulse being 130 but of good volume. One and a half pints (840 ml.) of saline was given intravenously during the next three hours.

After this time it was decided to give him blood, and one pint (560 ml.) Group B was obtained from a donor and cross-matched. After half a pint had been given at about 20 drops per minute the patient began to have rigors. The transfusion was stopped, but the rigors continued and became worse. After half an hour his temperature had risen to 107° F. (41.7° C.) and his pulse to 150, being barely perceptible. Nikethamide 1 ml. was given and cold sponging commenced. During the next half-hour the patient became worse. The pulse could not be felt anywhere, the breathing was shallow and laboured, and the limbs cold and wet. The axillary temperature rose to approximately 112.5° F. (44.7° C.). (The thermometer scale stopped at 110 degrees, but by producing the marking it appeared that the reading lay midway between 112 and 113. This was checked by three readings in the next five minutes.) Quinine 15 gr. (1 mg.) was given intravenously together with a further 1 ml. of nikethamide, which was continued hourly. The cold sponging was continued. The patient now appeared moribund. However, an hour later he improved slightly, the pulse being just perceptible (150), and the temperature 101° F. (38.3° C.). The improvement continued, and by the next morning he was conscious and taking fluids by mouth, with a pulse of 120 of fair volume and temperature of 100.5° F. (38° C.). His subsequent convalescence was uneventful. For three days his temperature remained about 100° F., after which it became normal. He began to sit up on the fifth day and to walk about on the tenth. It would seem that he has suffered no permanent harm from his pyrexia.

I am at a loss to account for his somewhat alarming rise in temperature. The strife and bloodshed occurring in this particular part of the Empire necessitate frequent massive blood transfusions, but we are not accustomed to meet with such reactions. The grouping and cross-matching were properly carried out and the apparatus was clean and sterile. The patient showed no evidence of chronic malaria.

I am grateful for permission to publish this case.—I am, etc.,

Malaya. J. T. ROWLING, Lieut., R.A.M.C.

Sulphonamide Therapy

SIR,—Professor D. M. Dunlop (August 12, p. 408) made no mention of sulphanilamide, of which I happen to have a stock in tablet, powder, and cream form. Nor did he mention the application of sulphonamides in the treatment of burns. Could he, moreover, express opinion as to the value, if any, of a couple of doses (2 g. each) of, say, sulphanilamide as a prophylaxis of gonorrhoea on "the morning after"? Such information would be much appreciated.—I am, etc.,

H.M.T.S. "Monarch" J. L. BARFORD, Ship Surgeon.

Poliomyelitis and Inoculations

SIR,—The incidence of muscular paralysis, confined to the inoculated limbs, which is described in Dr. J. Newcombe's letter (*Journal*, August 12, p. 416) is a classic example of the type of case which still startles medical opinion. Such cases, however, offer a good opportunity for an analysis, because here we are at least dealing with some known factors, similar to those we encounter with the inoculation of vaccines, or antibiotics, or sera. But so far the factor of an adjuvant, apart from the needle, has not been taken into consideration, whether it is the micro-organisms present in the vaccine or the micro-organisms causing infection. This factor of infection, for which Dr. Newcombe injected penicillin, was completely ignored as an additional causative agent, although the febrile reaction and boil formation were due to some of the staphylococcal series.

Trauma can always be regarded as a precipitating factor for an entry of the virus, since it exposes the muscle motor-end plates to an open attack at the myo-neural junctions. In the case of the neurotropic virus, such an entry is a prerequisite for it to be able to exert its pathogenic activities.

But there are also chemical changes taking place as a result of trauma: muscle tissue is hydrolysed, in consequence of which there will be released a series of enzymes, like myosin ATP-ase, carboxylase, phosphatases, and also adenosine compounds like ATP, ADP, or creatine phosphate. Also we find liberated a series of ions, such as Ca, Mg, K, P, and organic acids, resulting in a gross shift of the *p*H and ionic balance. Micro-organisms contain large amounts of nucleic acids in combination with proteins. When infection as well as trauma is present some of the micro-organisms will die or be disintegrated under the influence of antibiotics and their nucleoproteins released into inflammatory tissue, still physiologically active. The best comparison one can offer is with Griffith's discovery of the transformation of one type of pneumococcus into another type by bringing into contact, *in vivo* or *in vitro*, the living form "R" variant of the type to be transformed with the heat-killed form "S." Avery and McCarty and MacLeod isolated this transforming agent, which is a sodium-desoxyribonucleic acid.

I quite agree that these are complex factors, but without an understanding of the biochemical principles involved the problem of poliomyelitis can hardly be solved.—I am, etc.,

Hayes, Kent. L. RETI.

But Was it Poliomyelitis?

SIR,—Last year when I was in Brigg (Lincs) I had some cases of children febrile and perhaps dragging a leg or not using an arm which seemed painful if moved. I used to give 1 mega unit of penicillin. This—or perhaps three subsequent doses of ½ mega unit daily—cleared the condition.

It may have been mild poliomyelitis: I did not diagnose it at the time, being satisfied if the child was well again, and all the cases were well with this treatment. Therefore I think penicillin in huge doses given *early* in any febrile condition in any district where poliomyelitis is known to be is justified. No time should be lost awaiting results of swabs.—I am, etc.,

Keighley. FLORENCE M. E. DAVIES.

Treatment of Acute Yellow Atrophy

SIR,—On p. 214 of the *Journal* (July 22) an account is given of the meeting of the North of England Obstetrical and Gynaecological Society held at Newcastle-upon-Tyne on Friday, June 2, 1950. I gather that you have been given an incorrect description of the infusion I used for treatment of yellow atrophy of the liver. The quantity of nicotinamide should be 150 mg. and the infusion should also contain potassium chloride. It is correct to state that three pints of the infusion are given daily, but this is followed, not by a pint of saline, but by a pint of plasma to which vitamins have been added. The treatment is actually more complicated than would be inferred from reading the report and is given in detail in the paper which is awaiting publication in your *Journal*.

At the meeting, Mr. Stabler made it very clear that he was showing these cases solely because of their obstetric interest, and that they were included in a series of five cases to be reported upon by myself.—I am, etc.,

Newcastle-upon-Tyne. A. L. LATNER.

Osteoarthritis

SIR,—Some of the detail in Dr. C. W. Buckley's Refresher Course paper (June 17, p. 1415) is a strong stimulus to criticism.

Trauma can hardly be an important cause of osteoarthritis, as the condition is common in persons whose occupation is of a sedentary nature. It also occurs in persons who have abstained from exertion as far as possible throughout their lives on account of cardiac lesions or other reasons. The effect of injuries on joints is well known and often loosely termed "osteoarthritis," but the condition is not the same. Massage is recommended to relieve muscle spasm. Surely the existence of such an unusual feature as muscle spasm calls for a review of the diagnosis? If surgery is left till pain is severe and deformity serious the results are certainly likely to be disappointing, and if as stated the patient remains in hospital in splints for a long period failure is almost certain.

Osteoarthritis of the hip is more commonly bilateral than unilateral, though commonly symptoms commence first on one side. The alternatives to cup arthroplasty of the hip-joint—namely, arthrodesis and osteotomy—are not mentioned, and manipulation under anaesthesia, which is a popular method of treatment of osteoarthritic joints and spondylitis, is not discussed.

Patients are justified in objecting to wearing callipers or Marsh knee cages. If they need them they could probably be served better by surgery.

—I am, etc.,

Melbourne, Australia. FRANKLYN STONHAM.

Penicillin and the Skin

SIR,—Professor L. P. Garrod in his article on "Administration of Penicillin" (*Journal*, August 19, p. 453) states that it has "all the properties of an ideal antiseptic . . . without doing the slightest harm to tissue." During the war, however, as well as later, I have had the opportunity to observe that skin-grafts to which penicillin had been applied disappeared rapidly and with distressing regularity. I have seen ulcers of many months' standing. Soon after the appearance of a small lesion the patient had been applying penicillin ointment for several weeks and months. Remembering the resorption of skin-grafts, I ordered the discontinuation of the ointment. The ulcers disappeared under a dry dressing within a few days.—I am, etc.,

London, S.W.3. E. F. BLUMBERG.

Strangulated Hernia in Infants

SIR,—On December 23, 1949, a 21-day-old African male was admitted to hospital at 7.30 p.m. suffering from a strangulated right inguinal hernia. This had occurred the previous night, about 20 hours earlier. The bowels had not been open for 24 hours, and the abdomen was slightly distended. The child had vomited six times and there was a tense irreducible swelling in the right inguinal region. The temperature was 98° F. (36.7° C.) and the pulse rate 142.

No anaesthetic was used for the operation: the child was crucified on splints, and the anaesthetist who was standing by kept the child quiet by letting it suck his little finger. At operation there was a loop of small intestine in the sac, in good condition. The inguinal ring was then enlarged, and attempts were made to replace the gut. Owing to straining, this was very difficult, as the intestines were constantly being forced out. It was finally accomplished at the end of 45 minutes. While the incised ring was being repaired there was a flood of urine all over the field of operation. The source of the puncture in the bladder could not be traced, so the area of leakage was oversewn. The inner surfaces of the sac were sewn together, and the wound closed. As the operation had now taken 60 minutes, the skin was closed with a continuous suture to save time.

There was no post-operative leakage of urine from the wound, but it broke down on the fifth day, partly as the result of the mother enthusiastically bathing the child and pulling off the "elastoplast" dressing. The skin suture came away with the dressing. The gaping skin wound was treated with eusol, and healed at the end of 26 days.

Immediately following operation the temperature rose to 101° F. (38.3° C.) and the pulse increased to 160, but the temperature had returned to normal next day and thereafter never rose above 98.6° F. (37° C.). Post-operative treatment consisted of penicillin 25,000 units three-hourly for six doses, and pot. brom. 1 gr. (65 mg.) p.r.n. The child continued to suckle normally, and put on weight. He was discharged well on the twenty-sixth day, and returned home eight miles by canoe, the way he had come.

Three months previously an African baby of 9 months was admitted with a tense right scrotal swelling of three days' duration, a distended abdomen, and vomiting. The temperature was 102° F. (38.9° C.) and the pulse rate 154. An operation was performed under general anaesthetic. There was an excess of fluid in the sac, and the loop of the small intestine was very

congested, but viable. The ring was incised and the intestine replaced. The ring was repaired and the neck of the sac closed. A drainage tube was placed in the scrotum. Post-operative treatment was penicillin 100,000 units, followed by the treatment as above. The temperature and pulse were normal by the third day. The child suffered no inconvenience, and was discharged cured on the thirteenth day.

I am grateful to the Director of Medical Services, Gold Coast, for permission to publish this report.—I am, etc.,

Gold Coast. M. P. BROWNE.

Damage to the Antrum During Dental Extraction

SIR,—The maxillary antrum is vulnerable during extraction of a lone premolar or molar tooth with alveolar atrophy around it. The danger is not at all obvious to the inexperienced. First, the tooth may shoot up into the antrum. In such case a snare is a suitable instrument with which to effect delivery. Secondly, part of the antral floor may come away with the tooth, leaving a permanent oro-antral fistula. Thirdly, an ill-advised plastic operation has the effect that, when the patient eats, saliva drips from the nose. (Such fistulae have been established deliberately in the treatment of atrophic rhinitis.) There is a better method of closing an oro-antral fistula of this kind. A palatal flap based upon the posterior palatine foramen is reflected under a longitudinal bridge of palatal tissue and sutured to the buccal margin of the fistula. This is in accordance with the soundest principles and practice of reparative surgery, and may therefore be relied upon to put matters right again.—I am, etc.,

Huddersfield. W. O. LODGE.

Minority Crusade

SIR,—Tuberculosis is very much in the news, and this is all to the good, provided it leads on to effective measures to combat the disease. We, the undersigned, fear, however, that the calls being made for a crusade against tuberculosis may result in a big expenditure of public money without any worth-while improvement in the position. Our fear is based on two considerations: (1) no known antibiotic or therapeutic agent of low toxicity is highly effective against tuberculosis, and (2) the profession as a whole closes its eyes to what is probably the main cause of our failure to get rid of tuberculosis—namely, our failure to get rid of tobacco.

In a high proportion of cases—about 60%, we estimate—pulmonary tuberculosis is complicated by tobacco smoking (tobacco smoking is a drug addiction, a specific disease). Tobacco smoking violates almost every principle in the treatment of pulmonary tuberculosis—fresh air, immobilization of diseased lung (smoking gives rise to coughing, the activity which above all others disturbs healing and starts off haemorrhages; it also spreads infection), comfortable economic circumstances (smoking is expensive and leaves less money for food, housing, leisure, etc.), and good nutrition (almost everyone who gives up smoking puts on weight, often measurable in stones rather than pounds in a few months, and this is done without resting or "stuffing" in a sanatorium; the increase in weight is accompanied as a rule by increase in well-being). Can it therefore be doubted that smoking aggravates the course of pulmonary tuberculosis in a degree dependent in the main on the consumption of tobacco and the type of smoking? The importance of this lies in the fact that tobacco smoking, unlike pulmonary tuberculosis, is readily preventable and curable. It is no more difficult to prevent than opium smoking.

The principal obstacle in the way of preventing and curing tobacco smoking is, in our view, its prevalence among medical men and women. Nicotinism in common with other drug addictions is characterized by subtle psychopathological changes. Addicts of tobacco (and of other drugs) are deluded as a rule about matters concerning their drug; about, for example, its virtual harmlessness and the reality and importance of the contribution it makes to their happiness. So fixed oftentimes are these delusions that many addicts (including medical addicts) are quite inaccessible to logic on the subject and merely project on to those who seek to undeceive them their own unconscious disturbance of judgment, dubbing them cranks or fanatics. Even those who say they are convinced about the harmfulness of tobacco smoking are often unable or unwilling to express this conviction in their actions.

Although getting rid of tobacco would not completely solve the tuberculosis problem it would be a rational and, in our view, an important step in the right direction. The harm caused by tobacco smoking is by no means confined to its effects on pulmonary tuberculosis, and we are of the opinion that the upheaval that would be caused to our economy and mode of life by abolishing tobacco smoking would be a small price to pay for the substantial gain in the health and economy of the country that would quickly result.—We are, etc.,

Wallasey. LENNOX JOHNSTON.
F. C. MORGAN.

Johann Mikulicz-Radecki

SIR,—Sir Gordon Gordon-Taylor's tribute to the memory of Mikulicz-Radecki, "the great German [*sic*] surgeon," at the 67th Congress of the Deutsche Gesellschaft für Chirurgie (*Journal*, July 8, p. 103) prompts me to sketch briefly the life of this eminent Pole. His father Andrzej, born in Sniatyn (Poland) in 1806, came from an ancient noble family of Polish patriots which goes back to the fourteenth century. Their ancestral castle Radek (from which the name is derived) is at Osmiany. One of his ancestors was a member of the Polish royal household. Another distinguished himself so much in the battle against the Turks that the King of Poland added the cross and half-moon to the family coat of arms. In 1792 the Austrians seized the family properties of all Polish patriots, and Mikulicz's grandfather lost everything.

Mikulicz had a hard life as a student. He had to make his own way by giving piano lessons and teaching languages. After graduating in 1875 he was admitted to Billroth's clinic as *Operationzöglinge* (voluntary worker), and after the publication of his paper on rhinoscleroma he was quickly promoted. He became *Privatdozent* in 1880. Having achieved this title Mikulicz had automatically to leave the faculty. This was followed by the most tragic period of his life. The brilliant young surgeon was without a workshop, and there was no hope that as a Pole he would ever get one in Austria. Things were no better when he was ordered by the Habsburg authorities to remove the Polish eagle from his coat of arms. For two years he was at the Polyclinic, and during this time he had not done a single major operation. One can imagine his state of mind when he had to turn to general practice to support his wife and child. His Polish colleagues could not see such a talent wasted, and they invited him to take charge of what was left of the Jagiellonian surgical clinic in Cracow.

One can imagine with what joy Mikulicz received this invitation. The university clinic consisted of a few rooms on the second floor, sixteen beds in all, primitive conditions, and no funds for improvement. Obviously the Habsburgs could see no advantage in spending money on a Polish university. Mikulicz put all his zeal and energy into his work. This was the only place where he could work and show the Teutonic world what he was capable of. He lectured—in Polish, of course—and, surrounded by the love and esteem of both colleagues and students, he achieved miracles in this poor little "clinic" (a useful reminder to modern surgeons who would consider work inconceivable without teams, units, and vast "labs.").

Mikulicz was at Cracow from 1882 to 1887. As Sir Gordon relates, he was the first to operate successfully for gastric haemorrhage. This took place at Cracow in 1885, and the same year saw the publication of this case. His greatest surgical pioneer work was done during his stay at Cracow. This included lateral pharyngotomy for resection of malignant pharyngeal tumours (*Gazeta Lekarska*, 1883), osteoplastic resection of foot (*Przeglad Lekarski*, 1882), plastic nose surgery (1884), thyroidectomy (1886), surgical treatment of suppurative sinusitis (*Pamietnik Lekarski*, 1882), treatment of gangrene, intestinal resection, myomectomy, etc. While at Cracow Mikulicz published over forty original papers. By 1887 he had made famous both Cracow University and himself.

When the chair at Graz became vacant everybody thought he would get it. But he was a Pole and the place went to Wolfler. However, in 1887 he was offered the chair at Königsberg. He accepted with mixed feelings, for he was sorry to leave his Polish colleagues who had helped him so much in his hour of need. It is safe to say that without their help a great surgical genius would have been lost to the world. When Mikulicz became the recognized leader of world surgery and international honours were showered on him the Austrians felt it incumbent on them to do something also. When Mikulicz was approached on behalf of the Emperor he asked for only one honour—permission to reinstate the Polish eagle in his coat of arms. This was granted by decree in 1899.

I am relating these few historical details to show how inaccurate Sir Gordon Gordon-Taylor is when he calls Mikulicz "the great German surgeon." He may have his own views on Mikulicz's nationality, but when speaking on behalf of the Royal Society of Medicine and the Royal College of Surgeons these facts should not be overlooked. It is again becoming fashionable to flatter the Germans, but must it be done by removing Mikulicz from the ranks of great Poles and turning him into a German?—I am, etc.,

London, W.1. S. GALEWSKI.

POINTS FROM LETTERS

Clinical Impression versus Cold Science

Colonel W. H. CRICHTON writes: I do not presume to dispute the findings of the Medical Research Council or of Lorriman and Martin on their carefully conducted trials of antihistaminics in the common cold (*Journal*, August 19, p. 425). I do, however, feel that my own personal experience with this type of treatment which led me to arrive at a very different conclusion should be placed on record. I should explain that I am prone to get "colds in the head" about two or three times in a year, usually in spring and autumn with the change of the weather, but at other times as well if indiscreet with coverings, especially after exercise. On April 24 this year I was due to proceed to Eastbourne to attend the Congress of the R.S.I. On the 23rd at midday I was conscious of a roughness of the throat and a slight fullness in the head. By the afternoon I had begun to sneeze. By evening the symptoms of a cold in the head were clearly established. I went to bed early (9 p.m.) with a hot drink and 10 gr. aspirin—my usual remedies. The next morning (April 24) the symptoms were worse: shattering and more frequent sneezes, profuse watery discharge from the nose, eyes suffused, headache, general malaise. I took 10 gr. aspirin and stayed in bed, cancelling my departure for Eastbourne and cursing my luck at missing the congress, as my colds usually last at least a week to 10 days once they are established. For this reason I was tempted to try treatment by "anthisan," and in the late afternoon I took a tablet of 0.1 g. The effect produced was that of drowsiness and slight dizziness. I slept soundly. The following morning (25th) to my delight I was obviously much better: nose practically dry, no sneezes, general malaise gone. I stayed in bed and had a second tablet of anthisan. The effect was the same as before and I slept soundly again till lunch-time. By afternoon all symptoms had disappeared and I made arrangements to proceed to the congress the following morning, but I stayed indoors (not in bed), as the weather was exceptionally bad, with snow storms. The following morning I left for Eastbourne in the most inclement weather but feeling perfectly fit and *without* the usual aftermath of a persistent purulent nasal discharge. I had no recurrence and no unpleasant sequelae. The duration of my cold before the exhibition of anthisan was 24 hours approximately, and the symptoms were by then fully established in spite of my staying in bed and taking aspirin. A complete cure was effected with two tablets of anthisan within a further 24 hours. So impressed have I been with my own cure that I have recommended it strongly to others similarly affected since then, but I have found it necessary to insist that it is useless to expect any good results *unless the patient is prepared to go to bed* for at least 24-36 hours (maximum 48 hours). If this condition is fulfilled I am confident that a complete cure can be effected in every case.

Dr. A. J. AMBROSE (Beckenham) writes: I am not satisfied that the Research Council are 100% correct. Whereas before taking "benadryl" I was troubled with frequent colds which persisted for weeks, now, since taking at most five capsules of benadryl, my colds are of minor degree. In my own family, I found that one child responds dramatically to benadryl and two children do not. Perhaps the true summing-up would be that some people do respond and others do not. And I notice the trials the Research Council made were not with benadryl, as originally advocated by Captain Brewster.

An Adjustable Bed for Patients at Home

Mr. T. M. PROUDFOOT writes: The bed which your correspondent Dr. T. H. Gillison saw in Skye (August 26, p. 530) is a model which was manufactured about 20 years ago, and my firm, John Bell and Croyden, had exhibited such a bed in the surgical section of their business in Wigmore Street. About this time the London Clinic was being equipped, and two or three of this particular bedstead were supplied for use in the Clinic. If I recall correctly, the bedstead was manufactured in Liverpool and distributed by Messrs. Alexander and Fowler, Pembroke Place, in that city, and Mr. J. D. Gray of that firm could probably give further information.

Obituary

SIR REGINALD ST. JOHNSTON, K.C.M.G., M.R.C.S.

Sir Reginald St. Johnston, formerly Governor of the Leeward Islands, died at Eastbourne on August 29 at the age of 78.

St. Johnston was the son of a doctor, and after leaving Cheltenham College he studied medicine at Edinburgh and Birmingham. He qualified in 1905, and became house-surgeon at the Dudley Hospital. After holding clinical assistantships at St. Peter's Hospital and the Hospital for Women, he was appointed assistant medical superintendent of Lewisham Infirmary in 1907. Shortly afterwards, however, he went to Fiji and worked as a general practitioner. Almost immediately he accepted an appointment under the Government of the Colony, and, finding a useful career open to him, he obtained leave to study law and was duly called to the Bar.

During the first world war St. Johnston was at first in Fiji, but he was seconded for war service in France, where he did much medical work, both practical and administrative. He was eventually attached to the War Office for special duty and was given the rank of lieutenant-colonel. At the end of the war he served for a short period as Acting Governor of the Falkland Islands, and was then appointed in 1920 as Colonial Secretary of the Leeward Islands. On a number of occasions in the next few years he acted as Administrator of Antigua, of Dominica, and of St. Kitts and Nevis. He was made Governor of the Leeward Islands in 1929. From then until 1936, when he retired, he did much to improve social conditions in the Islands. He was created C.M.G. in 1923 and promoted to K.C.M.G. in 1931. He was the author of a number of books, including *Dream Faces, The Leeward Islands, South Sea Reminiscences, From a Colonial Governor's Notebook*, and *Strange Places and Strange Peoples*.

A. D. MACPHERSON, M.B.

Dr. Angus Duncan Macpherson, assistant medical secretary of the British Medical Association from 1904 to 1935, died in London on September 3 at the age of 79. He studied medicine at Edinburgh, Dublin, and King's College, London, and he graduated M.B., C.M. (Edinburgh) in 1897. He entered the service of the British Medical Association in 1904, when the medical secretariat in the old building in the Strand was beginning to take shape under the new constitution. During the thirty-one years Macpherson worked for the Association he gained a detailed knowledge of constitutional procedure, and this knowledge he put to good effect as secretary to the Organization Committee. He was responsible each year for the production of the B.M.A.'s annual handbook, at first called *Handbook for Recently Qualified Medical Practitioners* and later renamed *Medical Practitioners' Handbook*, and it was due to his efforts that this booklet became such an invaluable aid to the general practitioner. Many correspondents and visitors at B.M.A. headquarters will remember Macpherson's invariable courtesy and helpfulness. The sturdiness of his character was exemplified by the fact that at the age of 70, during the worst period of the last war, he took a post as a ship surgeon in the Merchant Navy.

We are indebted to Dr. Alfred Cox for the following appreciation: By the death of Angus Macpherson the Association loses a former veteran of its staff who devoted to its service the best years of his life. He was little known to most members of the Association, for the work in which

he was chiefly engaged did not take him to the Representative Meeting nor indeed much into committees.

When I joined the staff in 1908 as deputy medical secretary I found Macpherson there as the only medical assistant to Dr. (later Sir) James Smith Whitaker. But for his comparative youth and lack of experience in the then burning question of contract practice it is probable that he might have been promoted to the position I then took. He continued till he retired in 1935, having found his *métier* in work which, though little attractive to most of us, he thoroughly enjoyed. He loved the detail connected with the drafting and revision of articles and by-laws and regulations. He was the soul of accuracy and could always be relied on.

I saw him but rarely after his retirement. For a time he engaged in general practice in Chelsea, and then went on several voyages as ship surgeon. A few weeks ago I heard he was very ill and went to see him. He was suffering from malignant disease of the prostate, and I found him a mere shadow of his former self. He was obviously near his end, but I never met anybody who faced death with greater equanimity. He made no complaints and was still full of interest in the work of the Association. On this he was a mine of information, and I regret that he never committed it to writing, for his term of service covered a period of great importance.

All of us who knew anything of his domestic circumstances admired him for his striking devotion to his wife and two sisters, who lived with him. Our sympathy goes out to those he has left behind, and his memory will live with us as a good man and loyal colleague.

Dr. MATTHEW BURROW RAY, for many years senior physician to the British Red Cross Clinic for Rheumatism, died in London on July 5 at the age of 80. He studied medicine at Edinburgh University, and graduated M.B., C.M. in 1893, proceeding M.D. in the same year. He was admitted M.R.C.P.(London) in 1934. Before the first world war he held a number of appointments, and at one time he was pathologist and assistant medical officer at the West Riding Mental Hospital, assistant surgeon to the Eston Hospital, and honorary surgeon to the Harrogate Infirmary. He was a past president of the Harrogate Medical Society. He served as a colonel with the R.A.M.C. in the 1914–18 war, being A.D.M.S. of his division, the 47th (2nd London), T.A. He was awarded the D.S.O. in 1917. After the war he and the late Dr. Fortescue Fox were instrumental in establishing with the British Red Cross Society the well-known clinic which is now the Arthur Stanley Institute for Rheumatic Diseases at the Middlesex Hospital. He was the first chairman of the honorary medical committee of the Clinic, and in recognition of his services the British Red Cross Society decided that he should remain a member of the active staff as long as he wished. In fact he worked at the Clinic until it was taken over by the National Health Service and absorbed into the near-by Middlesex Hospital in 1948. He continued to act as physician and director of the department of physiotherapy at the St. Marylebone and Westminster General Dispensary. Dr. Ray was a great expert on hydrotherapy, and his knowledge of the spas of Europe was in a class by itself. He was an active and useful member of the British Medical Association, being chairman of the Marylebone Division in 1934–5. He was a representative of the Division at several Annual Meetings, and for two years he was also an officer of the Section of Physical Medicine. He served on a number of committees connected with his specialty, and he was at one time honorary treasurer of the British Association of Physical Medicine. In 1930 he gave a Chadwick lecture on "The Treatment of Rheumatism," and among his publications were books entitled *Rheumatism in General Practice* and *Hydrotherapy and Climatotherapy*. Dr. Ray was a sound clinician, a physician of the old school in the best sense. His character was exemplified by his devotion to his work and his patients. He obtained great satisfaction from his two creative hobbies—painting and carpentry. He is survived by his widow, to whom the sympathy of his friends, colleagues, and patients will be extended.

Dr. ALEXANDER CHRISTIE REID died suddenly while on holiday in Edinburgh on August 20 at the age of 76. He was educated at Aberdeen University, taking the degrees of M.A. and B.Sc. before entering on his medical studies. He graduated M.B. in 1902 and proceeded M.D. with honours in 1905. In 1913 he took the Oxford Diploma in Ophthalmology. For nearly 40 years he was honorary surgeon to the Nottingham and Midland Eye Infirmary, and for many years was consultant ophthalmic surgeon to the Kesteven county council and the Mansfield and Worksop Hospitals. He retired from active consulting practice four years ago, and for his distinguished service was appointed consulting surgeon to the Nottingham and Midland Eye Infirmary. During the 1914–18 war he served as a captain in the R.A.M.C. Dr. Reid made a study of miners' nystagmus, and to gain first-hand knowledge of working conditions went down the pit on many occasions. He always brought a clear, analytical mind to bear on any difficult problem. Apart from his professional work his interests were wide and varied. Dr. Reid will be remembered with affection and admiration by all who knew him.—G. G.-N.

Dr. FRANCIS JAMES STRONG HEANEY died at his home outside Chester on August 26 at the age of 76. He was educated at Dundask School, and later was a Stewart medical scholar at Trinity College, Dublin, where he qualified in 1901. In 1902 he proceeded M.D., and in the same year became a Fellow of the Royal College of Surgeons of Ireland. From 1907 he was a member of the Liverpool Medical Institution, where he held many offices. He was president of the Lancashire and Cheshire Branch of the B.M.A. in 1923–4, and chairman of the Liverpool Division in 1926–7. He served on the Council in 1921–4 and as a representative in the R.B. in 1920–2 and again in 1924. He also served on the Journal Committee for a year in 1921–2. Among other committees on which he served was the English and Welsh Consultants and Specialists Group Committee, 1934–40. For a number of years he was president of the Liverpool Hospital Staffs Association, and in this capacity gave his services ungrudgingly for the establishment of good professional relationships. During the war of 1914–18 Strong Heaney, who retired with the rank of Surgeon Captain, R.N.V.R., served in the R.N. hospital ships *Plassy* and *Asmirias*, and he always retained his interest in the Service. In 1919 Heaney was appointed to the Stanley Hospital at Liverpool and remained on the teaching staff of the medical school until 1946, having worked untiringly through the heavy raids which made such demands upon the hospitals in the war years. He also held appointments in Ormskirk, at the Providence Hospital, St. Helens, and in the Radium Institute. His many friends will remember Frank Strong Heaney for his great courage in tackling the difficult operative problems of cancer in the early days, for his enormous energy, and for his unfailing, cheerful, and purposeful kindliness. He was a splendid spokesman and advocate who was always loyal to his ideals, who faithfully represented the views of his colleagues, and who was logical, lucid, and determined, but pleasant and tactful withal.—C. A. W.

Dr. W. A. MILLIGAN died at his home in London on August 25 at the age of 78. He was one of the best-known medical practitioners of Mayfair and had practised there for close on fifty years. Wyndham Anstruther Milligan was the fourth son of a family of 11 children, his father being Dr. William Milligan, professor of Biblical criticism in the University of Aberdeen. His brother William became a distinguished ear, nose, and throat surgeon in Manchester. Milligan was educated in that famous seminary "The Gym," founded by the Rev. Dr. Anderson, and at Aberdeen University. He graduated M.B., C.M. in 1895, and proceeded M.D. in 1906. He became a Fellow of the Royal College of Surgeons of Edinburgh in 1899. His sincerity, mental alertness, and directness of manner could not conceal the warm-hearted soul within. His large clientele of patients of all types had complete trust in his judgment and his diagnosis. Though busily engaged in practice, he extended his medical interests by becoming physician to the Margaret Street Hospital for Diseases of the Chest. Many patients still remember with gratitude his skill in diagnosis and his deep personal interest in their welfare. His wide view of general practice and his desire to keep himself efficient led him to become honorary gynaecologist to the Farringdon Dispensary and district surgeon to the City of London Lying-in Hospital. His special gynaecological experience merited his appointment in 1931 to a post of high responsibility as medical inspector in nullity cases coming before the High Court of Justice. He succeeded the late Dr. Gilbert Orme as chairman of the Westminster and Holborn Division of the B.M.A. in 1945. There was no more loyal or steadfast member, and none more patient or impartial ever presided over the meetings of the Division, which passed a special resolution to enable his colleagues to re-elect him unanimously as chairman for the fourth year. All his professional life he cherished a lasting affection for the Aberdeen University Club in London. He had been joint honorary secretary for many years and later vice-president, and on the death of Lord Meston in 1948 the club elected him president, a well-deserved honour. Although he was approaching his seventieth year, the second world war found him, as always, ready for whatever task might fall to him. He spent long and strenuous hours in the Home Guard, and was always on call to attend air-raid casualties at the first-aid post in Berkeley Square. The loss of his son, a naval surgeon, torpedoed in the Atlantic, caused him deep grief. During the half-century he worked in Mayfair he saw a great many changes in that area of London, but all these he viewed with equanimity, for his strong sense of service and duty never wavered. He remained at work until a few weeks ago, detaching himself with stoic calm from his own anxieties while sharing the cares of others. Dr. Milligan had been a widower for 30 years. He is survived by three sons and one daughter.

Medico-Legal

DEATH AFTER NEW DRUG

An inquest was held in June on a woman aged 67 who died after being treated with G.T.41, a drug that was being tried in the treatment of cancer. The coroner recorded a verdict of death from misadventure.[1] The woman was first admitted to hospital in July, 1945, and a radical mastectomy was performed for carcinoma of the right breast. Secondary deposits were present in the axillary nodes and surrounding tissues, and a full course of radiotherapy was given.

G.T.41 is a dimesyloxyalkane, its formula being $CH_3OSO_2(CH_2)_4SO_2OCH_3$. Though the drug is not a nitrogen mustard, its action is similar. The substance is one of a long series of nitrogen mustards and related compounds the biological properties of which have been the subject of experiment for several years. G.T.41 and other associated substances have from time to time been selected for clinical trial by oral administration in cases of advanced malignant disease, since they have an inhibitory action on the growth of certain tumours. The inhibition is not exerted against the malignant cells specifically, and various normal tissues are also affected. One of the most sensitive of these is the bone marrow. While the effect on the bone marrow can normally be controlled, in the present case agranulocytosis developed, though no other toxic side-effects had been observed during administration. The case suggests that G.T.41 is peculiar in its effects as compared with related substances which have been used clinically. It may be abnormally accumulated in the tissues, or its effects may be much less reversible than is usually the case. Its further clinical trial has been suspended.

[1] *Birmingham Post*, June 30.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on July 29 the following degrees were conferred:

D.M.—R. T. C. Pratt.

M.CH.—P. A. L. Roberts.

B.M.—W. G. Dewhurst, W. F. P. Gammie, H. Yellowlees, J. L. Godden, J. M. D. Hooper, R. S. Walsh, L. Robertson, J. G. Danaher, B. N. McQuade, R. A. Riseley-Prichard, J. H. Wilson, C. S. Pitcher, P. H. Watkins, F. B. E. Kampfner, G. E. Rousseaux, Ursula F. Rowlatt, Myrtle J. Raynor.

UNIVERSITY OF CAMBRIDGE

The following medical degrees were conferred on August 5:

M.D.—*J. R. Handforth, A. J. Rook, J. G. Benstead, G. F. Roberts.

M.B., B.CHIR.—*H. de Glanville, *J. M. Hodson, M. J. D. Newman, *K. W. Gray, *R. P. Holmes, *M. Binnie, *P. R. Gittins, *J. R. Gough, *M. J. Peel, *J. B. Spargo, *R. Thomas, *P. O. Williams, *D. R. Sweetnam, *H. B. Eckstein, *J. S. McCormick, *T. B. Scott, J. W. B. Dalgleish, *H. F. Juckes, P. G. A. Irvine, *D. R. Bowsher, *J. M. Brown, *D. Butcher, *G. E. Heald, *T. M. Howell, *K. Last, *R. D. Montgomery, *R. H. Oram, *S. T. Pickles, *R. B. Prowse, *C. R. Robinson, J. L. Milligan, B. J. Muir, A. C. Townsend, *J. E. Dalby, *M. L. E. Espir, *J. N. Redfern, *P. R. V. Tomson, D. R. Pugh, J. H. Ross, *H. H. Broadhead, *G. N. St. J. Penney, J. S. W. Chambers, *C. R. Leeson, *T. S. Leeson, *A. G. Wallace, *P. Ll. Williams, K. E. Halnan, H. M. Michaelson, *P. G. I. Stovin, *S. E. Trickey, *M. S. Aldridge, *M. G. Rinsler, *A. C. Chovil, *T. D. W. Davies, *W. J. Wigfield, *J. P. Williams, A. D. Muirhead, *P. B. Brown, *Verity G. Wills, Frances E. Kirk, Dora W. Lemmon, Joan K. Perkins, Alison M. Richardson, *Mrs. Elizabeth R. Taylor, Mrs. Mary E. Kendrew, Mrs. Jane Lodwick, *E. Marley.

M.B.—*G. A. Mandow.

*By proxy.

UNIVERSITY OF LONDON

The following have been appointed, or nominated for appointment or reappointment, as representatives of the University on the governing bodies indicated in parentheses: Sir Archibald Gray (Bedford College); Sir Archibald Gray and Mr. J. B. Hunter (British Postgraduate Medical Federation); Mr. P. H. Mitchiner and Sir James Paterson Ross (Guy's Hospital Medical School); Professor L. P. Garrod (St. Mary's Hospital Medical School, Inoculation Committee, Wright-Fleming Institute); Dr. Ruth E. Proctor (Battersea Training College of Domestic Science).

The Municipal Borough of Luton has been added to the list of areas approved by the University for the purpose of instruction in public health administration for the Academic Postgraduate Diploma in Public Health.

The examination for the Postgraduate Diploma in Psychological Medicine (University Extension and Tutorial Classes Council) will be held for the last time in March–April, 1952. An Academic Postgraduate Diploma in Psychological Medicine has been instituted, the regulations for which may be obtained on application to the Academic Registrar, University of London, Senate House, London, W.C.1.

UNIVERSITY OF BIRMINGHAM

The opening ceremony of the new session of the Faculty of Medicine will take place in the Nurses' Recreation Hall, Nuffield House, Queen Elizabeth Hospital, Birmingham, on Tuesday, October 3, at 3 p.m., when Viscount Addison will distribute the prizes awarded for the session 1949–50 and will deliver an address to students.

UNIVERSITY OF BRISTOL

G. F. M. Hall has been approved at the examination for the degree of M.D.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England held on August 3, with the President, Sir Cecil Wakeley, in the chair, the Honorary Medal of the College was awarded to Lord Webb-Johnson in recognition of his many generous acts and

continued labours in the interests of the College throughout the eight years of his presidency.

The Gilbert Blane Medal was presented to Surgeon Commander E. B. Martin, R.N., for his research on naval aviation medicine.

A resolution of condolence was passed on the death of Mr. E. Cranmer Hughes, past member of the Court of Examiners.

Professor B. W. Windeyer was appointed a Hunterian Professor for 1951, for a lecture on "The Place of Radiotherapy in the Treatment of Malignant Disease."

Mr. R. J. Last, F.R.C.S., was appointed Professor of Applied Anatomy in the College.

Mr. L. E. C. Norbury was again nominated as the representative of the College on the Advisory Board on Nursing Education.

The Hallett Prize was awarded jointly to Tara Chandra (Lucknow University) and Malik Shaukat Hasan (Punjab University).

Diplomas of Fellowship were granted to R. H. Cram and O. V. Jooma.

Diplomas of Membership were granted to K. M. McFadyean and to the other 107 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of August 5 (p. 373) as recipients of the diploma of L.R.C.P.

Diplomas in Public Health and in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians of London, to the successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of August 5 (p. 373).

Diplomas in Ophthalmology were granted, jointly with the Royal College of Physicians of London, to R. St. H. Warren and to the 21 other successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of August 5 (p. 373).

The following hospitals were recognized under paragraph 23 of the F.R.C.S. regulations: Bury General Hospital (*junior registrar* for general surgery; junior registrar for orthopaedics; resident casualty officer; two house-surgeons (all for six months)). Coventry and Warwickshire Hospital (additional recognition of registrar and house-surgeon for otolaryngology). Hexham General Hospital (surgical registrar (*for twelve months*); first and second house-surgeons (general); orthopaedic registrar; and orthopaedic house-surgeon (all for six months)). *Lister Hospital, Hitchin (surgical* registrar (for twelve months); senior and junior house-surgeons (for six months)). Whipps Cross Hospital (three house-surgeons (for six months); house-surgeon to orthopaedic department (for six months)). Northampton General Hospital (registrar and house-surgeon for otolaryngology). Manfield Orthopaedic Hospital, Northampton (senior and junior orthopaedic registrars (for six months)). Rush Green Hospital, Romford (*senior and surgical* registrars (each for twelve months); and house-surgeon (for six months)). North Staffordshire Royal Infirmary (two house-surgeons; orthopaedic house-surgeon; ophthalmological and ear, nose, and throat house-surgeons; senior surgical registrar; assistant resident surgical officer; registrars in ophthalmology, orthopaedics, and ear, nose, and throat; junior orthopaedic registrar (all for six months only)). Sunderland Royal Infirmary (*senior surgical registrar; second* surgical registrar; registrar to ear, nose, and throat department; registrar to casualty department; registrar to orthopaedic department). Maelor General Hospital, Wrexham (two registrars and two house-surgeons (for six months only)). City General Hospital, York (two house-surgeons; orthopaedic registrar and orthopaedic house-surgeon (all for six months)).

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.S.Glas.: G. E. Aitken, Eleanor K. Althorp, R. F. Armstrong, J. G. Bhatt, A. F. Bushby, A. J. Cameron, J. Clougherty, A. P. Davidson, Elspeth G. Davie, Joy L. Di Marco, Audrey E. Evans, Margaret R. Farrell, T. A. Frewin, Eileen M. Gorman, Monica C. Grant, P. J. Halket, Mary T. Hill, G. E. Horseman, C. R. Hosein, J. D. Hughes, D. M. Johnstone, I. Kantor, H. L. Kinman, A. W. Laughland, Winifred A. Lloyd, I. N. H. Luck, C. N. McFarlane, G. C. McGlone, Margaret McKenzie, W. K. MacLean, J. F. Maguire, H. R. W. Miller, R. J. Misthry, G. T. D. Murray, Pauline A. Nock, Jean Poole, Hannah L. Pluss, J. B. M. Porter, Dorothy H. E. Ramsay, M. Raphael, Joan C. C. Reeves, Patricia M. Scanlan, Beatrice M. Sinclair, T. Slutsky, R. Sorkine, J. G. E. Smith, Margaret I. A. Smith, R. H. Thorp, G. A. Walters, A. White, A. C. Yelland.

UNIVERSITY OF MICHIGAN

In June the degree of Master of Public Health was conferred on Kenneth I. E. Macleod, M.B., Ch.B.

No. 33

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 19.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	21	2	33	2	3	22	2	7	3	1
Deaths	—	—	—				—	—		
Diphtheria	31	—	15	1	4	59	8	23	1	6
Deaths	—	—	—	—	—	2	—	—	—	1
Dysentery	141	13	99	2	—	35	4	83	—	1
Deaths		—			—					—
Encephalitis, acute	13	1	—	1	—	3	—	1	—	—
Deaths		—		—			—			
Erysipelas			14	6	2			16	6	1
Deaths							—			
Infective enteritis or diarrhoea under 2 years					11					
Deaths	10		4	4	1	19	—	4	6	6
Measles*	5,529	362	79	85	22	2,120	158	57	96	37
Deaths†			—	—	—			—	—	—
Ophthalmia neonatorum	35	9	11		—	47	1	17	—	—
Deaths										
Paratyphoid fever	9	—	1 (B)		—	30	1	3 (B)	8 (B)	—
Deaths	—		—		—	—		—		—
Pneumonia, influenzal	233	8	1		2	245	13	2	2	6
Deaths (from influenza)‡	3	—	—	1	—	6	—	—	—	—
Pneumonia, primary			98	¶				127	20	
Deaths	76	9		2	9	103	11		4	8
Poliomyelitis, acute	550	38	65	8	18	295	35	14	1	2
Deaths§	26	2		1		14	2			
Puerperal fever		—	3				—	5		
Deaths										
Puerperal pyrexia‖	80	8	7	1	—	80	6	5	—	1
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	614	26	94	36	39	678	47	136	61	43
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	9	—	—	1	—	6	3	1	2	1
Deaths	—	—	—		—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,939	336	220	61	33	1,637	82	41	118	82
Deaths	1	1	—	1	—	4	1	1	1	—
Deaths (0–1 year)	196	23	17	20	6	220	29	27	14	19
Deaths (excluding still-births)	3,886	577	481	166	101	3,910	635	513	167	108
Annual death rate (per 1,000 persons living)			9·7					10·3	10·3	
Live births	7,061	1150	821	323	209	7,087	1099	831	400	247
Annual rate per 1,000 persons living			16·5					16·7	24·8	
Stillbirths	179	15	20			188	29	21		
Rate per 1,000 total births (including stillborn)			24					25		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended August 26 were: paralytic, 369 (375); non-paralytic, 220 (175); total, 589 (550). The figures for the previous week are in parentheses. A decrease in paralytic cases of 6 was offset by an increase in the non-paralytic of 45, with a total increase for the week of 39 cases. A satisfactory feature is the increased percentage of non-paralytic cases from 32% in the preceding week to 37% in the week under review.

The main increases in total notifications occurred in the following county areas:

	Week Ended August 19	Week Ended August 26	Increase
Durham	9	31	22
Lancashire	29	44	15
Gloucester	26	38	12
Leicester	8	18	10
Yorks (E.R.)	1	11	10
Surrey	9	18	9
Dorset	6	13	7

Significant decreases occurred as follows:

	Week Ended August 19	Week Ended August 26	Decrease
Isle of Wight	19	6	13
Worcester	26	15	11
Warwickshire	47	39	8
Kent	17	9	8
Yorks (N.R.)	45	38	7

The following county areas have notified no cases in the period of three weeks up to August 26: Cambridge, Suffolk West, Cardigan, Radnor. In the same period the following notified one case only: Isle of Ely, Huntingdon, Soke of Peterborough, Anglesey, Brecknock.

The uncorrected notifications for the week in 1947, 1948, and 1949 corresponding to that under review were 676, 77, and 280 respectively.

Discussion of Table

In *England and Wales* decreases in the numbers of notifications were recorded for measles 891, scarlet fever 81, dysentery 70, acute pneumonia 23, diphtheria 18, while increases were reported for whooping-cough 517 and acute poliomyelitis 158.

The largest falls in the incidence of measles were Yorkshire West Riding 161, London 112, Hertfordshire 95. A small fall in the number of notifications of scarlet fever was reported from most areas. The notifications of diphtheria were the smallest ever recorded and were 8 below the previous lowest level of eight weeks ago. The chief feature of the returns of diphtheria during the week was a fall of 5 in London. The largest rises in the incidence of whooping-cough were London 83 and Middlesex 71.

The number of notifications of dysentery was the smallest for 36 weeks. A new outbreak involving 20 persons was reported during the week from Kent, Broadstairs and St. Peters U.D. The other large returns of dysentery were Lancashire 36 (Preston C.B. 9); Yorkshire West Riding 12; Durham 13.

The notifications of acute poliomyelitis were 158 more than in the previous week. The paralytic cases rose by 100 and the non-paralytic by 58. The largest returns during the week were Warwickshire 47 (Birmingham C.B. 24, Sutton Coldfield M.B. 6, Coventry C.B. 4, Meriden R.D. 4); Yorkshire West Riding 45 (Leeds C.B. 12, Wakefield C.B. 7, Bradford C.B. 4, Hemsworth R.D. 4); London 38 (Woolwich 7, Lewisham 6; the remaining cases were notified from 15 boroughs); Lancashire 29 (Liverpool C.B. 10, Manchester C.B. 5, Salford C.B. 5); Lincolnshire 28 (East Kesteven R.D. 10); Gloucestershire 26 (Bristol C.B. 18); Staffordshire 26 (Sedgley U.D. 4); Worcestershire 26 (Dudley C.B. 9, Worcester C.B. 8); Middlesex 23 (Hayes and Harlington U.D. 4); Essex 23 (Barking M.B. 4); Isle of Wight 19 (11 in Rural District); Kent 17; Northumberland 17 (Newcastle-upon-Tyne C.B. 9); Yorkshire North Riding 15 (Middlesbrough C.B. 4, Flaxton R.D. 4); Devonshire 14.

In *Scotland* decreases were recorded in the number of notifications of whooping-cough 36, measles 11, and rises were reported for dysentery 19, cerebrospinal fever 14. The chief centres of dysentery were Glasgow 60, Stirling county 10, and Edinburgh 8. The largest returns of acute poliomyelitis were Glasgow 22, Fife county 11, Dundee 4, Kirkcaldy 4.

In *Eire* a fall in the number of notifications was recorded for measles 64, scarlet fever 13, diarrhoea and enteritis 6. In Dublin C.B. the notifications of measles fell by 42, but a rise of 11 occurred in the notifications of whooping-cough.

In *Northern Ireland* a decline in incidence was recorded for measles 32 and scarlet fever 9, while a rise of 12 was reported for whooping-cough. The trends of these diseases were similar throughout the country. The chief returns for acute poliomyelitis were Down county 6, Belfast C.B. 5, and Antrim county 3.

Week Ending August 26

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 635, whooping-cough 3,725, diphtheria 41, measles 4,277, acute pneumonia 177, acute poliomyelitis 589, dysentery 137, paratyphoid fever 10, typhoid fever 11.

Medical News

The Boston Medical Library

On October 18 the Boston Medical Library will celebrate the seventy-fifth anniversary of its foundation. Two ground-floor rooms were opened as a library on Hamilton Place, for the use of Boston physicians, on Monday, October 18, 1875, with James Read Chadwick as librarian, E. H. Brigham as assistant librarian in charge, and Oliver Wendell Holmes as president of the new association. The present building was occupied in 1900. Long associated with the library is *The New England Journal of Medicine*, formerly the *Boston Medical and Surgical Journal*, and, more recently, the *Journal of Bone and Joint Surgery*. The Massachusetts Medical Society is housed in the present building and this year has acquired the adjacent property as a permanent home. To mark its birthday, the library will hold "open house" on October 18 with a scientific session and a dinner.

Alfred Adler Medical Society

The Alfred Adler Medical Society has been formed, and the following officers appointed: Professor Alexander Kennedy (president), Professor W. C. W. Nixon (vice-president), Dr. James Moore (chairman of council), Dr. E. N. Snowden and Dr. R. Strom-Olsen (vice-chairmen), Dr. A. R. Redfern (honorary secretary), and Dr. Donald Blair (honorary treasurer). The first meeting will be held at 8 p.m. on September 14 at 11, Chandos Street, London, W.C.2, when Dr. James Moore will deliver the inaugural address on "The Meaning of this Society."

Dominion Travelling Fellowships

The Nuffield Foundation is extending its scheme for Dominion travelling fellowships to Ceylon, India, and Pakistan. It already operates for Australia, Canada, South Africa, and New Zealand. The object of the fellowships is to advance the interests of the new Dominions and to strengthen their academic ties with the United Kingdom. Men and women graduates of outstanding ability and some postgraduate experience from the Dominions will gain further experience in Britain. The Nuffield Foundation will appoint Fellows on the recommendation of an advisory committee in each Dominion, the fellowship lasting one year and being valued at between £770 and £890. Travelling expenses will also be paid, as well as those of the Fellow's wife if he is married at the time of application. One fellowship in medicine will be awarded in Ceylon, and two in India. Three fellowships, the subjects for which are not yet chosen, will be awarded in Pakistan.

Touring U.S.A.

Professor W. C. W. Nixon, of University College Hospital, is leaving for a three-months tour of obstetric centres in the U.S.A., and on October 27 will give the DeLee Lecture at the Chicago Lying-in Hospital on "Uterine Action—Normal and Abnormal." The tour is sponsored by the Rockefeller Foundation.

COMING EVENTS

Society of Chemical Industry

A joint meeting of the Edinburgh Section and the Fine Chemicals Group of the Society of Chemical Industry will be held at Edinburgh on October 6–7. On October 6 Mr. F. Bergel, Ph.D., will speak at 10 a.m. on "The Biological and Therapeutic Significance of Organic Phosphates Occurring in Nature"; and on October 7 Professor G. F. Marrian, F.R.S., will deliver the third Lister Lecture on "The Adrenocortical Hormones." Particulars may be obtained from Mr. G. W. Walker, F.R.I.C., c/o T. and H. Smith, Ltd., Wheatfield Road, Edinburgh, 11.

Institute of Dermatology

The Institute of Dermatology will begin its winter course of lectures on October 3 at St. John's Hospital for Diseases of the Skin, Lisle Street, Leicester Square, London, W.C. The course will include special lecture demonstrations on medical mycology and a number of lectures on various branches of pathology relating to diseases of the skin.

Institute of Ophthalmology

The academic year 1950–1 of the Institute of Ophthalmology (University of London), (Judd Street, London, W.C.) will be inaugurated on Wednesday, October 4, at 4.30 p.m., with an address by Dr. W. Russell Brain, President of the Royal College of Physicians of London. The annual dinner of the institute will be held at Claridges Hotel, Brook Street, London, W., at 7.30 p.m. the same day. Past students of the institute and of Moorfields Westminster and Central Eye Hospital are invited to both these functions. Tickets for the annual dinner are 25s. each and may be obtained on application to the secretary of the institute at the above address.

Health of the Tuberculous

The Welfare Group of the Lambeth Civic Society will hold a conference on tuberculosis on September 30 at 3–9 p.m. Local organizations have been invited to discuss what can be done to help sufferers from tuberculosis. Anyone interested in the subject is invited, and should communicate with the secretary, Mr. J. S. Marrin, Welfare Group, Lambeth Civic Society, Lambeth Town Hall, Brixton Hill, London, S.W.2.

William Meredith Fletcher Shaw Memorial Lecture

Professor A. Leyland Robinson, emeritus professor of obstetrics and gynaecology in the University of Liverpool, will deliver the William Meredith Fletcher Shaw Memorial Lecture before the Royal College of Obstetricians and Gynaecologists, 58, Queen Anne Street, London, W., on Friday, September 29, at 2.30 p.m. His subject is "The Evolution of the Gynaecologist," and all medical practitioners who are interested are invited to attend. Admission is by ticket only, allotted in order of application, obtainable from the secretary of the college at the above address.

SOCIETIES AND LECTURES

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

Tuesday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, September 12, 4.30 p.m., *"Sensitivity in Disease,"* by Professor J. H. Biggart.

Thursday

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, Cavendish Square, London, W., September 14, 8 p.m., *"The Meaning of This Society,"* Inaugural Address by the Chairman, Dr. James Moore.

LONDON COUNTY MEDICAL SOCIETY.—At St. Stephen's Hospital, Fulham Road, Chelsea, S.W., September 14, 3 p.m., clinical meeting.

APPOINTMENTS

Drs. F. A. Ibiam, O.B.E., and K. A. Abayomi have been reappointed Members of the Executive Council of Nigeria.

DAVIES, DONALD MAITLAND, M.D., M.R.C.P., Consultant Physician, Bury and Rossendale Group of Hospitals.

FLEMING, CHARLES, M.B., Ch.B., D.P.H., Medical Officer of Health for Rugeley Urban and Tutbury Rural Districts.

HUDSON, JOHN HARRAL, M.B., Ch.B., D.T.M.&H., D.P.H., additional post of Acting Part-time Medical Officer of Health, Borough of Dartford.

JARMAN, THOMAS FRANCIS, M.D., Consultant Chest Physician and Director of Mass Radiography, Wales, under Welsh Regional Hospital Board.

LIVERPOOL REGIONAL HOSPITAL BOARD.—The following senior medical staff appointments are announced: *Consultant Physician to Clatterbridge General Hospital*, F. J. Zacharias, M.D., M.R.C.P. *Consultant Orthopaedic Surgeon to Walton Hospital*, J. H. Redding, F.R.C.S.Ed. *Consultant Paediatrician to certain hospitals in Liverpool*, Anne E. McCandless, M.D., M.R.C.P. *Assistant Venereologist (whole-time) with duties at V.D. clinics in Liverpool*, P. Morgan, M.D. *Assistant Venereologist (whole-time) with duties at V.D. clinics in Birkenhead, Wallasey, and Liverpool*, T. Lyall, M.B., Ch.B. *Tuberculosis Medical Officer (whole-time) for North Liverpool area*, A. D. M. Hamilton, M.B., B.Ch., D.P.H. *Tuberculosis Medical Officer (whole-time) for Ormskirk area*, R. S. Nicholson, M.R.C.S., L.R.C.P.

LORANT, STEPHEN, M.D., Consultant Pathologist, Rochdale Group of Hospitals.

MITCHELL-HEGGS, FRANCIS S., M.B., F.R.C.S., F.R.C.S.Ed., Consultant Surgeon to Bury and Rossendale Group of Hospitals, Manchester Regional Hospital Board.

POWELL, K. J., M.B., B.S., D.A., Consultant Anaesthetist in the Exeter Clinical Area, South-western Regional Hospital Board.

REEVES, ANTHONY JOSEPH, M.D., D.P.H., County Medical Officer, Offaly, Eire.

ROBERTSON, GEORGE STUART, M.D., Chief Assistant School Medical Officer, Liverpool.

UNGLEY, GORDON, V.R.D., M.D., F.R.C.S., Consultant Surgeon to Lambeth Hospital, Brook Drive, London, S.E.

WILLIAMS, J. R. D., M.B., B.S., D.P.H., Assistant Venereologist at Ipswich, Bury St. Edmunds, and Lowestoft, East Anglian Regional Hospital Board.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bremner.—On August 22, 1950, at Newcastle-upon-Tyne, to Mary Bremner (formerly Cammock), M.B., Ch.B., and Alan E. Bremner, F.R.C.S.Ed., a son.

Murray.—On August 27, 1950, to Ailsa (formerly Tully), wife of Dr. Laurence H. Murray, Park Way, Rickmansworth, Herts, a son.

Perkins.—On August 4, 1950, at Stamford Hospital, Lincs, to Royce (formerly Thompson), wife of Squadron Leader I. M. Perkins, M.R.C.S., L.R.C.P., R.A.F., a daughter—Alison Villiers.

Tatlow.—On August 21, 1950, at Bristol, to Anne, wife of Dr. W. F. T. Tatlow, M.D., M.R.C.P., a son—John William Tissington.

Thomas.—On August 10, 1950, at 27, Welbeck Street, London, W., to Judith, wife of Trevor Meyrick Thomas, M.Chir., F.R.C.S., The Tudors, Farnborough, Kent, a son.

Watson.—On August 18, 1950, at Harrogate General Hospital, to Peggy (formerly Lowis), wife of Dr. J. E. Watson, 6, St. Roberts Road, Knaresborough, Yorks, a son.

Weiner.—On August 27, 1950, at the Radcliffe Infirmary, Oxford, to Marjorie (formerly Daw), wife of Dr. J. S. Weiner, a son.

Wilkie.—On August 12, 1950, at the Jessop Hospital, Sheffield, to Noreen (formerly Keer) and Dr. D. J. K. Wilkie, a daughter—Rosemary Elizabeth.

DEATHS

Agnew.—On August 30, 1950, at 44, Eastern Avenue, Reading, Berks, Henry Murray Agnew, L.R.C.P., L.R.C.S., D.P.H.

Badger.—On August 29, 1950, at his home, Guildford, Walter Spencer Badger, M.B., Ch.B., D.P.H., aged 78.

Boyd.—On August 17, 1950, at Gloucester, the result of an accident, Ringland Gilmore Boyd, M.C., M.B., B.Ch., aged 33.

Bushe.—On August 19, 1950, at Winchester, Charles Kendal Bushe, O.B.E., M.D., Surgeon Rear-Admiral, R.N., retired.

Cobbledick.—On August 20, 1950, at Coulsdon, Surrey, Arthur Stanbury Cobbledick, M.D., of London and Trevone, Cornwall, aged 79.

Crooks.—On August 31, 1950, at the General Hospital, Nottingham, Frederick Crooks, M.Ch., F.R.C.S.Ed., of 6, The Ropewalk, Nottingham, aged 63.

Dilling.—On August 18, 1950, at Thwaite, Coniston, Lancs, Walter James Dilling, M.B., Ch.B., aged 64.

Eccles.—On August 29, 1950, at Bon Accord, New Herrington, Co. Durham, Herbert Anderson Eccles, T.D., M.B., Ch.B.

Graham-Smith.—On August 30, 1950, at Forvie, Cambridge, George Stuart Graham-Smith M.D., F.R.S., aged 75.

Heaney.—On August 26 1950, at Chester, Francis James Strong Heaney, M.D., F.R.C.S.I., of 68, Rodney Street, Liverpool.

Hillier.—On August 18, 1950, at Birmingham, William Thomas Hillier, M.R.C.S., L.R.C.P., D.P.H., aged 74.

Low.—On August 24, 1950, at Calverley Lodge, Tunbridge Wells, Percy Charles Low, M.B., B.Ch., aged 88.

Milligan.—On August 25, 1950, at 9, North Audley Street, London, W., Wyndham Anstruther Milligan, M.D., F.R.C.S.Ed., aged 78.

Purser.—On August 22, 1950, at 55, Wimborne Road, Bournemouth, Robert Williamson Kinross Purser, M.R.C.S., L.R.C.P., M.R.C.O.G., aged 57.

Reid.—On August 19, 1950, at Edinburgh, Alexander Christie Reid, M.D., D.O., of 16, Pelham Road, Nottingham, aged 73.

Richardson.—On August 24, 1950, at Worthing Hospital, Horace Richardson, M.R.C.S., L.R.C.P.

Slade.—On August 16, 1950, at the Middlesex Hospital, Florence Slade, M.D., M.R.C.P., of 26, Church Row, Hampstead, London, N.W.

Strathearn.—On August 14, 1950, at his home, The Manor House, Verwood, Wimborne Minster Dorset, Sir John Calderwood Strathearn, C.B.E., M.D., F.R.C.S.Ed., Lieutenant-Colonel, R.A.M.C. (T.F.), retired, aged 71.

Twort.—On August 21, 1950, at Hammersmith Hospital, Charles Claud Twort, M.D., of "Romans," Roman Road, Southwick, Sussex.

Watt.—On July 24, 1950, Robert Watt, M.B., B.Ch., of 62, Crumlin Road, Belfast, aged 88.

Any Questions?

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

Judging a Baby Show

Q.—*What points should I consider in judging a baby show? Granted that most of the babies are healthy, well nourished, and of normal weight, what other factors should I take into consideration?*

A.—This empirical art, productive of fierce maternal jealousies, requires an estimate of intelligence, social behaviour, physical state, beauty of appearance, and maternal care. On the whole the qualities which give aesthetic appeal go together with good health, and a largely subjective judgment is likely to be of most value. The features which make a fine baby and which can be assessed rapidly include brain, muscle, bone, and skin. Intelligence shows in an alert appearance and appropriate motor behaviour for age (any standard textbook on children will give a scale sufficiently simple and comprehensive for the purpose) and can be estimated quite well with a little practice; quiet and friendly behaviour will give evidence of social adaptation. Muscular development and tone can be tested simply and quickly. Bone structure can be seen best in legs and skull; generous allowance must be made for apparent bowing of the legs of plump babies. The skin provides essential evidence. The texture of a really healthy child's skin is unmistakable, and the presence of sun tan is at any rate evidence of sensible care. Scurf on the scalp and pustules on the face are misfortunes at least partly preventable by adequate use of soap and water. The hair is a further index of care: good condition is not to be achieved by five minutes' work before the show. Clothing deserves attention; it should be suitable and not excessive. The judge will probably find himself excluding a few babies by his olfactory sense, for the well-treated baby is a far more pleasant-smelling object than his less lucky neighbour, who tends to smell stale in spite of any amount of last-minute washing. Finally, it is probably fair to give a considerable number of marks for a pleasant, though not necessarily beautiful, face.

Family History

Q.—*Teachers and textbooks often assert the usefulness in diagnosis, treatment, and prognosis of the patient's family history. In so far as "usefulness" means practical benefit to the patient, is this assertion well founded? If so, in what kinds of case, and how does the benefit arise? Where can I find a critical analysis of the evidence purporting to establish such benefit in any fairly common condition?*

A.—There can be few physicians who would be prepared to jettison inquiry into the family history and to accept the patient as an isolated individual without antecedents, collaterals, or descendants. Nevertheless the questioner must not be disappointed if the "practical benefit" which results from such information is of a less obvious character than that which follows the drainage of an abscess. Perhaps its most easily appreciable value lies in those diseases of which the familial incidence is so high that the diagnosis is in serious doubt if relatives are not affected. Huntingdon's chorea, haemophilia, certain of the myopathies, acholuric jaundice, and the cerebellar ataxias provide examples. In many other disorders, of which essential hypertension, diabetes mellitus, peptic ulcer, pernicious anaemia, migraine, diseases of the gall-bladder, and the allergic states are instances, a family history is common; here diagnosis does not depend on this knowledge, but an indication of the prognosis may often be obtained. This is well shown by those families in which several members die of cerebral haemorrhage about the same age. Again, the prognosis of mental disorder, and in particular of depression, can be accurately assessed only in the light of the family history.

More important, if less easy to expound, is the part played by the family history in revealing to the physician the character and personality of his patient. No individual exists and develops in isolation; his parents and siblings in his early years, his wife and children in later years, people his environment, form his character, implant his habits, and shape his personality. It is a commonplace that the only son of a divorced couple will react to the stresses and strains of life differently from a member of a large and happy family. Without knowledge of the family history the doctor may be able to attach a suitable nosological label, but he will certainly have less insight into the man consulting him. His failure to seek this knowledge will deprive the patient of the "practical benefit" of advice founded on complete diagnosis, a term which Galen defined as "the thorough comprehension of things present."

Radium for Uterine Cancer

Q.—*Can you give me the latest figures for the five- and ten-year cure rates for carcinoma of the body of the uterus treated by radium? Is the modern tendency to treat this condition by radium in all cases, irrespective of the patient's fitness for operation?*

A.—The figures published in the 1948 report from Stockholm of the Radiumhemmet show that, of 264 cases treated during the years 1934–8, 171 (65%) were symptom-free after five years and 124 (47%) were symptom-free after ten years (Table XII, p. 114). The results are calculated by the method used in the League of Nations reports estimating the relative cure rate for cases of carcinoma of the cervix; they also take into account the patients operated upon after failure of radiological treatment. The series comprises all except the frankly untreatable cases, and therefore includes many cases inoperable at the time of institution of treatment by radium. The method used is the packing of the uterine cavity with many small sources of radium, the time being decided from the number of such sources and depending therefore on the size of the cavity, according to the method described by Heyman and published in the *British Journal of Radiology* (1947, **20**, 85). There are probably no better figures for a truly comparable series, and a study of the table referred to, which covers 980 cases from 1914 to 1943, indicates that since this method of treatment has been started the results have improved significantly. The general procedure in most countries is to operate on all operable cases, although a rational consideration of the evidence would suggest that treatment on the lines adopted in Stockholm will produce better results.

Chronic Synovitis of the Knee

Q.—*What is the modern treatment for chronic synovitis of the knee? Treatment has to be undertaken in an African village hospital where there are no facilities for laboratory investigations. I have tried repeated aspirations with replacement by penicillin, normal saline, and so forth, without success. The fluid continues to be yellowish and mucilaginous, and a course of N.A.B. injections has not been helpful.*

A.—The treatment of chronic swellings of the knee depends upon their cause. In general, the causes can be grouped into three classes: mechanical, inflammatory, and neoplastic. A fair idea of the group into which a particular case falls may be gained from a careful consideration of the history (noting particularly the circumstances of the onset, details of any injury, progress, etc.) and a full clinical examination. Swelling due to thickening of the synovial membrane, especially when associated with a local increase of temperature and limitation of all movements, suggests an inflammatory lesion (low-grade non-specific infection, tuberculosis, and rheumatoid arthritis are the commonest causes). Initial treatment should be by rest. On the other hand a recurrent effusion, varying in degree and unaccompanied by synovial thickening, suggests a mechanical cause (in a young adult a torn cartilage or loose body is usually responsible; in older patients the cause is almost always osteoarthritis). Treatment here is directed towards remedying the mechanical defect when possible, and this is followed by intensive muscle exercises. There are many cases, however, in which the diagnosis cannot be established without facilities for *x*-ray and laboratory

investigations, and if these are not available the problem becomes difficult. In such circumstances, if it is impracticable to transfer the patient to a centre where appropriate facilities are available, treatment should err on the side of caution. Thus in the case mentioned—though a definite opinion cannot be given because of the lack of information about the age of the patient, presence or absence of synovial thickening, local increase of temperature, movements, etc.—caution would suggest that the lesion be regarded as inflammatory and that treatment should be by resting the knee in a plaster case, from groin to ankle, for an initial period of at least six to eight weeks. Subsequently, if improvement in the local condition is apparent, a clinical trial out of plaster, with intensive quadriceps redevelopment exercises, should be advised; but should further signs of inflammatory reaction occur further rest may be required. In each individual case the programme to be adopted depends so much upon the clinical state and progress of the condition that it is not possible, in a short answer, to lay down any more definite plan of treatment.

Peribuccal Pigmentation

Q.—*A girl of 16, otherwise healthy, complains of brown pigmentation on either side of the upper lip. There is also some pigmentation of the brow. I should be grateful for suggestions about treating or bleaching the affected areas.*

A.—This peribuccal pigmentation, described by Brocq, is very common and certainly indicates some little derangement of endocrine function at puberty. This usually corrects itself, and active treatment may be unwise unless there is some other indication such as dysmenorrhoea. Small doses of oestrogens given for two or three weeks, starting with the first day of the period, may then be helpful. There is often waxing and waning of the pigmentation with each period. No attempts at removing or bleaching the pigmentation should be made. They are likely to damage the skin and are unnecessary, since the condition will clear.

Breast-feeding and Immunity

Q.—*Is there any evidence that breast-feeding produces any protection in the child from infectious diseases, particularly exanthemata, and, if so, in what way is this effected?*

A.—Passive transfer of antibody from mother to offspring occurs almost entirely via the placenta in the human species, whereas in the ruminants ingestion of the colostrum is the most important means of protection. Hence confusion often arises about the protection against infectious disease afforded by breast-feeding. There is no evidence that breast-fed babies are better protected against the exanthemata than are artificially fed infants; instead the degree and duration of immunity are closely correlated with the amount of antibody—e.g., diphtheria antitoxin—transferred from mother to foetus by way of the placenta. The relative immunity of the breast-fed baby to infantile enteritis is most probably due to factors other than the transfer of antibody.

Stilboestrol and Cancer of the Breast

Q.—*A woman aged 28 has obtained great relief from a prostrating dysmenorrhoea by the use of stilboestrol. The dose used two years ago was 1 mg. t.d.s. for the first fourteen days of the cycle. She now takes less than half that dose, with adequate relief. The patient's grandmother, mother, and maternal aunt have all had cancer of the breast. Is there any good reason to believe that stilboestrol might further predispose her to this condition? Apart from the stilboestrol, what are the risks of her contracting carcinoma of the breast, and at what age should one be particularly on the alert? Are there any recent advances in early diagnosis or prevention?*

A.—There is a strong family predisposition to cancer of the breast in this case, but it is impossible to assess the risk of this patient developing the disease; it would appear to be greater than for a woman without her antecedents. Although the disease can occur at a younger age, special attention should be given from 35 years onwards. As to early diagnosis, the outstanding sign is a lump in the breast, and it would be a wise precaution if the patient were examined at intervals of, say, six months. She should also feel her breasts from time to time and report immediately any lump which may be present. As to the prevention of cancer of the breast, women should avoid wearing brassieres which are unduly tight; uniform, even pressure should be applied to the breasts. It is wise to keep under observation a breast which is the site of an old abscess. After lactation the breasts should be emptied of all residual milk so that this is not allowed to stagnate. A blood-stained discharge from the nipple requires treatment, and special supervision should be given to patients who develop periductal fibrosis, cysts, and other forms of chronic mastitis. In view of the strong familial tendency to cancer of the breast it would seem that the taking of stilboestrol is inadvisable in this case, especially for so long. Could not the cause of the dysmenorrhoea be found and the appropriate treatment given? In any case, it would be wise to discontinue the use of stilboestrol.

NOTES AND COMMENTS

Corrections

Through an oversight, for which we must apologize, we included no summary of Professor V. F. Lambert's paper in our report (August 5, p. 356) of the meeting of the combined Sections of Oto-Rhino-Laryngology and Radiology at the Annual Meeting of the B.M.A. in Liverpool on July 20. Professor Lambert reviewed a series of 62 cases treated at the Manchester Christie Cancer Hospital and Holt Radium Institute since 1932 by means of the Finzi-Harmer radium technique, after fenestration of the thyroid cartilage. In the properly selected cases this treatment yielded a cure rate of 83%, a figure which included deaths from intercurrent disease as well. In the patients who died within the first three years the larynx was never well after the treatment. The cases in which the best results were obtained were those in which the growth was in the middle third of the cord. Anterior spread should not rule out treatment, but posterior spread was a definite contraindication to this type of therapy. The voice in all successfully treated cases was very good. Professor Lambert also reviewed his experience in the use of contact x-ray therapy for malignant growths limited to one side of the larynx according to the technique which he and T. A. Watson described in April, 1942. In a series of 53 cases, only 22 could be regarded as cured. In addition to the high percentage of failures morbidity was high, and consequently this method of treatment had now been abandoned. In the subsequent discussion Professor Lambert, who admitted that his views might not be shared by many of his surgical and radiological colleagues, also expressed the view that hyperkeratosis of the vocal cord should be regarded as a pre-malignant condition which should be treated by some form of irradiation therapy, even in the absence of clinical or microscopical evidence of malignant change. Once the condition crossed the narrow dividing line between the precancerous and the cancerous stage it tended to spread with great rapidity.

Professor E. W. Anderson, of the Department of Psychiatry, the Royal Infirmary, Manchester, has written to point out that we were wrong in stating in the *Journal* of August 26 (p. 516) that the training course in psychiatry at Manchester University is for one year. The course for the D.P.M. at this university now covers eight university terms.

Under the title "Professional Training of Army Medical Officers" (August 26, p. 517) we erroneously said that two revision courses in surgery a year are held at Westminster Hospital Medical School for senior officers of the Millbank College. In fact, officers attending the Senior Officers Postgraduate Course attend at the Westminster Hospital for clinical tuition in medicine and surgery during the second part of the course.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 16 1950

CONGENITAL HEART DISEASE*

A REVIEW OF ITS CLINICAL ASPECTS IN THE LIGHT OF EXPERIENCE GAINED BY MEANS OF MODERN TECHNIQUES

BY

PAUL WOOD, O.B.E., M.D., F.R.C.P.

Director of the Institute of Cardiology (National Heart Hospital); Physician in Charge of the Cardiac Department, Brompton Hospital

[WITH SPECIAL PLATE]

PART I

In the past the chief contributions to the better understanding of congenital heart disease have been based on necropsy studies, particularly those by Peacock (1866), Keith (1909), and Maud Abbott (1928). More recently, Brown (1939) and Helen Taussig (1947) have presented us with important monographs from a more practical angle, but even these have depended on the correlation of clinical and post-mortem findings. In some respects all these works have necessarily been influenced by the selected nature of the material, and have tended to create a number of false impressions. For example, of Abbott's 1,000 cases there were 37 with three-chambered hearts, 81 with partial or complete transposition of the great vessels, 40 with pulmonary atresia, 21 with persistent truncus, and 16 with tricuspid atresia (total 195); against 33 with atrial septal defect (A.S.D.), 55 with uncomplicated ventricular septal defects (V.S.D.), 105 with uncomplicated patent ductus, 9 with simple pulmonary stenosis, and about 71 with Fallot's tetralogy (total 273), giving a ratio of the rare to the common types of 2:3. Again, in 1947 Helen Taussig stated that she had never had an opportunity of studying a single case of pure pulmonary stenosis. The suggestion that V.S.D. accounts for 35–40% of all congenital hearts seen in school-children (Perry, 1931; Muir and Brown, 1934) is also unacceptable.

In recent years, modern techniques have made it possible to prove the precise nature and physiological effects of 90% of all congenital cardiac anomalies during life. In the light of this rapidly acquired knowledge of dynamic processes, many physical signs have acquired a new significance and their proper interpretation has so greatly improved bedside diagnosis that the special investigations responsible for their discovery have already become superfluous in many cases. The time is ripe, therefore, for a review of the whole subject of congenital heart disease from a more functional standpoint, to present a fresh account of these physical signs, to offer a more practical and physiological classification of the common or well-recognized anomalies, and incidentally to give a truer picture of their clinical incidence. By implication, stillborn infants and those dying shortly after birth have been excluded from the study.

Material.—Observations are based on 233 cases of supposed congenital heart disease examined personally by me during the last two and a half years at the National Heart Hospital, Hammersmith and Brompton Hospitals, in private practice, and at the Rheumatic Fever Centre, Taplow. Of these, 152 were catheterized, and in 42 angiocardiograms were taken. Further confirmation of the diagnosis was obtained at operation in 44 cases and at necropsy in 20.

Techniques

1. Cardiac Catheterization

American nylon catheters and saline manometers were used throughout, as described by McMichael and Sharpey-Schafer (1944). Mean pressures are expressed in millimetres of mercury above the sternal angle with the patient horizontal. Blood gas analysis was carried out by trained technicians using Haldane's or van Slyke's apparatus. The catheter was inserted into a median antecubital vein in all cases but one, in which the external jugular had to be used. Failure to enter the superior vena cava was always due to inexperience and could usually be overcome by asking the patient to breathe deeply or by causing an anaesthetized patient to cough or gasp; changing the position of the head, arm, or body was usually a waste of time. Occasionally it was necessary to change the catheter or to use the other arm. The services of an anaesthetist are required for children under 7 or 8 years old. Dr. B. G. Lucas, at the Heart Hospital, has usually given rectal thiopentone with intravenous supplements.

Venospasm is a reflection on the skill of the operator, and never occurs if the skin is properly anaesthetized, if all traces of disinfectant are washed off the catheter before use, and if the catheter is not too large for the vein. It has caused no embarrassment in the last 100 cases.

Air embolism is avoided by keeping the hilt of the catheter below right auricular level when sampling. It has not occurred in this series.

Thrombo-embolism, paradoxical or pulmonary, is avoided by giving 50 mg. of heparin to the patient, by adding a smaller quantity to the saline reservoir, and by taking care to keep blood out of the catheter, especially when entering a high-pressure chamber and after sampling. It has not been encountered in this series.

*St. Cyres Lecture delivered on June 13 at the Royal Society of Medicine under the auspices of the National Heart Hospital.

Rigors are due to pyrogens in a previously used catheter. They do not occur if catheters are thoroughly washed out and subsequently cleaned by running hydrogen peroxide through the lumen until bubbles cease.

Ventricular fibrillation developed in two patients, and proved fatal in one of them (a severe case of atrial septal defect with gross cardiac enlargement and congestive heart failure). Since then all cases have received quinidine (5–10 gr.—0.32–0.65 g.) half an hour beforehand.

Subsequent infection, such as thrombophlebitis, pulmonary or cerebral abscess, septicaemia, and bacterial endocarditis, should not occur with aseptic technique, but all our cases have been given penicillin for 48 hours after the procedure, as a precaution. No such infection has yet arisen.

X-ray overdosage has been avoided by limiting the screening time to 30 minutes at 1 mA, 20 minutes at 2 mA, and 15 minutes at 3 mA. The operator wears a lead apron and does not regularly perform more than two catheterizations a week.

Failures.—Of 152 cases of suspected congenital heart disease an attempt was made to catheterize the pulmonary artery in 129, and was successful in 110 (85%). This figure includes failures due to inability to enter the right ventricle. The latter was entered in 135 out of 146 attempts (92%). There was only one failure to catheterize the right auricle in the 152 cases. Many of the failures occurred in difficult cyanosed cases, including six with tricuspid atresia and at least one with pulmonary atresia. In acyanotic cases, including simple pulmonary stenosis, the right ventricle was catheterized in 98%, and the pulmonary artery in 91%. In Fallot's tetralogy the pulmonary artery was entered in 15 out of 21 cases. The high incidence of successful catheterization is attributed to the development of what we have called "the coil technique." Instead of attempting to pass the catheter direct into the right ventricle, its tip is first rotated outwards against the lateral wall of the right auricle; a half-loop is easily formed in this situation, and when this is rotated medially the upwardly directed tip passes straight towards the pulmonary artery after slipping through the tricuspid valve.

2. Angiocardiography

I am indebted to Dr. Maurice McGregor, of Johannesburg, for personally constructing the angiocardiograph now used at the Brompton Hospital, and for helping to develop the technique. Copies or slightly modified copies of his model are used at the Hammersmith and the Heart Hospitals. Angiocardiograms have been carried out mostly by the cardiological registrars at these hospitals, particularly by Dr. J. B. Lowe at Brompton and at the Heart Hospital, and by Dr. E. Petrie at Hammersmith. Technical details have been described elsewhere. There were no fatalities.

Incidence

The series was closed at the 233rd case, for by then the nature of the congenital anomaly was virtually certain in 200. Of the residue, 13 proved to have normal hearts, 4 had rheumatic aortic and/or mitral valve disease, 6 had idiopathic pulmonary hypertension, and 10 eluded analysis.

The incidence of the various forms of congenital heart disease encountered is given in Table I. It is believed that weighting in favour of those lesions amenable to surgical repair is slight, because the clinics at which most of the cases were seen did not have a surgical flavour or unduly close surgical link. It is concluded that the commonest forms of congenital heart disease are Fallot's tetralogy (18%) and atrial septal defect (17%); followed closely by patent ductus (14.5%), ventricular septal defect (12%), and simple pulmonary stenosis (11.5%); whilst coarctation of the aorta comes next (8%). Together these six conditions accounted for 81% of the total.

TABLE I.—*Incidence of Chief Anomalies*

Total No. of cases investigated		233
Rheumatic A.S.; M.I.; or A.I.+M.S.		4
Proved normal		13
Primary pulmonary hypertension		6
Nature still obscure		10
True congenital heart disease		200
	No.	%
Acyanotic		
Coarctation of the aorta	16	8
Aortic or subaortic stenosis	6	3
Simple pulmonary stenosis (4 with V.S.D.)	23	11·5
Atrial septal defect	35	17·5
Ventricular septal defect (excluding 4 with pulmonary stenosis)	24	12
Patent ductus arteriosus	29	14·5
Cyanotic		
Fallot's tetralogy (including 3 with pulmonary atresia)	36	18
Pulmonary stenosis with reversed interatrial shunt	5	2·5
Tricuspid atresia	6	3
Eisenmenger's complex	2	1
Transposition of the great vessels	2	1
Others	16	8
Total	200	100

Clinical Features

In attempting to make a bedside diagnosis of the precise nature of any case of suspected congenital heart disease, due consideration should be given to 10 major items, all of which have multiple facets.

1. Other Congenital Stigmata

Mongolism and arachnodactyly are well-recognized associations, but in their complete form are uncommon. Partial arachnodactyly, especially high arched palate and pigeon chest, however, is common. Brown also stresses accessory nipples. When the diagnosis rests between normality, congenital heart disease, or acquired heart disease, any such stigmata favour a congenital anomaly.

2. Effort Intolerance

Breathlessness may be divided into four grades: (1) slight—the patient attempts to compete with his fellows, but is always at a disadvantage; (ii) moderate—he is obviously breathless on effort, but can walk several miles; (iii) severe—he can walk only several hundred yards, certainly not more than a mile; and (iv) gross—incapacitated and cannot walk 100 yards.

Squatting (Taussig, 1947) should always be noted. It is especially common in Fallot's tetralogy, but not limited to it. It occurred in practically every cyanotic form of congenital heart disease in this series, but whereas it was recorded in two-thirds of those with Fallot's tetralogy, it was mentioned in only one-quarter of the others. It was noted only once in an acyanotic case (severe pulmonary stenosis).

Angina pectoris and syncope were rare, but occurred occasionally in severe pulmonary stenosis with or without reversed interatrial shunt. Angina occurred in three of the six cases with idiopathic pulmonary hypertension, and syncope in one of them.

Palpitations had a nuisance value in several severe cases of patent ductus, and in a few advanced cases of atrial or ventricular septal defect.

3. Cyanosis

It is usual to grade the intensity of cyanosis and clubbing so that some idea of their degree may be recorded. Central cyanosis is best seen on warm surfaces such as the conjunctivae, the inner side of the lips, the palate, and the tongue. Peripheral cyanosis may occur on exposed surfaces which may be cold, such as the nose, ears, face, outer side of the lips, and hands. The distinction is very important. Clubbing always means central cyanosis when other causes can be excluded.

Polycythaemia is also recorded under this heading, and usually implies central cyanosis; but it sometimes helps to compensate for an extremely low cardiac output.

Central cyanosis in congenital heart disease means a veno-arterial shunt. It may occur, however, in the late stages of primary pulmonary hypertension, and of course in anoxic cor pulmonale.

4. Pulse

A small pulse is characteristic of all the severe cyanotic and severe acyanotic forms of congenital heart disease except patent ductus, aorto-pulmonary septal defect, and perforated aortic sinus, when it is water-hammer in quality. It is normal in mild cases in both groups. In the absence of aortic incompetence Corrigan's sign provides valuable evidence in favour of patent ductus or its near relatives. Both water-hammer pulse and Corrigan's sign were present in 18 out of 22 such cases in which they were looked for.

Hypertension is limited to coarctation of the aorta, and then, of course, it can be detected only in the upper extremities. The blood pressure was normal in all other conditions except the ductus group, although the pulse pressure was small in the most severe cases. In the ductus group the diastolic pressure was significantly reduced in the majority.

5. Jugular Venous Pressure

The general level of the jugular venous pressure was usually normal, excluding cases of heart failure; but it tended to be within the upper limits of normal or even slightly raised in the group with arteriovenous shunt and in cases of simple pulmonary stenosis or idiopathic pulmonary hypertension. It was slightly raised in 4 out of 28 cases of Fallot's tetralogy.

Giant *a* waves were conspicuous in the neck in the most severe cases of simple pulmonary stenosis with or without reversed interatrial shunt. These were easily recognized and distinguished from the well-known venous pulse of tricuspid incompetence by their presystolic timing, by their abrupt and collapsing quality (venous Corrigan), and by the fact that they represented a pressure far above that of the *c* and *v* waves. In two cases they were transmitted to the liver. Giant *a* waves may also be seen in acquired tricuspid stenosis and severe primary or secondary pulmonary hypertension, but rarely in other conditions. They resemble in quality, but not in timing, the cannon waves of heart-block. They are not seen in uncomplicated A.S.D., V.S.D., patent ductus, aortic stenosis, or mitral incompetence.

6. Pulsation

The quality of the cardiac impulse is very important. It may be described as normal (gentle left ventricular thrust), heaving (from a hypertrophied left ventricle), hyperdynamic (a quick tumultuous thrust), or tapping. It is believed that the tapping cardiac impulse represents absence of pulsation at the apex beat associated with an easily palpable first heart sound. This may result from clockwise rotation or from enlargement of the right ventricle, usually both. It is characteristic of A.S.D., Fallot's tetralogy, and severe pulmonary stenosis. A hyperdynamic left ventricular thrust is characteristic of patent ductus and V.S.D. Occasionally a tumultuous cardiac impulse is due to a grossly hyperkinetic right ventricle in A.S.D. (Roesler, 1934).

When the left ventricle is enlarged the normal precordial systolic retraction tends to be exaggerated. When the right ventricle is enlarged there is a diffuse lift in the third and fourth spaces between the sternum and the nipple line. This lifting outflow tract or conus is very rarely recorded in hospital notes, yet it is highly important, and is probably the best clinical evidence available of an enlarged right ventricle.

Systolic pulsation in the second left space offers good evidence of a dilated pulmonary artery, and is a most helpful and reliable physical sign. It was recorded positively in 7 out of 25 cases of A.S.D. in this series, but negatively only twice, and was never seen in any form of pulmonary stenosis. Occasionally, however, it may be due to a large aorta, as in pulmonary atresia, or to a persistent truncus.

7. Murmurs and Thrills

The significance of the site, intensity, and conduction of most murmurs and thrills is well recognized and needs little comment. But more attention should be paid to functional murmurs; particularly to the Graham Steell murmur of pulmonary incompetence, which was heard in 13 out of 25 cases of A.S.D. in this series, and which always indicates a dilated pulmonary artery; and to the mitral diastolic murmur that denotes a torrential mitral blood flow—this was heard in 16 out of 18 cases with either a large patent ductus or a large V.S.D. There can be no doubt that it is functional, for it disappears immediately the ductus is ligated. Phonocardiograms show that it follows the third heart sound at the mitral area and is indistinguishable in timing, quality, intensity, and duration from the mitral diastolic murmur associated with mitral valvulitis.

8. Second Heart Sound

It is nearly always possible to distinguish two components of the second heart sound in normal children and in most healthy adults who are neither emphysematous nor overweight, particularly during inspiration. In other words, the second heart sound is normally split. The first component represents aortic valve closure, the second pulmonary valve closure. The second heart sound is usually single in the neck, at the aortic area, and at the cardiac apex—at these sites only the aortic element is normally heard. At the pulmonary area both elements are heard, and the loudest is usually the aortic. Phonocardiograms taken by Dr. Aubrey Leatham confirm the clinical view that the pulmonary valve normally closes after the aortic. The significance of this fact will not be overlooked, for it offers a bedside method of detecting pulmonary hypertension, pulmonary hypotension, and right bundle-branch block (or its functional equivalent).

Thus in primary or secondary pulmonary hypertension the second element of a normally split second heart sound is usually obviously accentuated; in Fallot's tetralogy the second sound at the pulmonary area is always single and usually loud—it is the aortic sound that is heard and the vessel is not covered by the pulmonary artery; in severe simple pulmonary stenosis the pulmonary element is also absent, but may be present in mild cases; in A.S.D. with functional right branch block or its electrocardiographic equivalent, and a grossly overfilled right ventricle, the second heart sound is widely split and the second or pulmonary element is but little accentuated. No sign will repay closer study than the second heart sound at the pulmonary area. It is believed that Helen Taussig (1947) was the first to point out the value of hearing a split second sound, stating that it offered clear evidence of the existence of both great vessels.

9. The Electrocardiogram

The important findings in congenital heart disease include the P pulmonale, evidence of left or right ventricular preponderance, and appearances resembling partial or complete right bundle-branch block. The P pulmonale is common, and therefore not very helpful, in all cyanosed cases, but in acyanotic cases it usually means pulmonary stenosis or severe pulmonary hypertension. It is never conspicuous in uncomplicated A.S.D., V.S.D., or patent ductus.

The electrocardiogram is the most reliable clinical means of deciding which ventricle is predominant, and the point is of the utmost importance in differential diagnosis. Details cannot be discussed here.

Partial or complete right bundle-branch block occurs in 95% of all cases of A.S.D., the clinical diagnosis of which is almost untenable in its absence.

10. X-ray Appearances

The most valuable recent addition to well-known radiological signs is perhaps the recognition of overfilled or underfilled peripheral pulmonary arteries. Pulmonary plethora (Plate, Fig. 1) occurs in A.S.D., V.S.D., patent ductus, and transposition of the great vessels; pulmonary ischaemia (Fig. 2) in all cyanotic cases with veno-arterial shunt, including Eisenmenger's syndrome. The difference is very obvious and does not necessarily bear any relation to the size of the pulmonary artery itself or to its main left and right branches; thus dilatation of the pulmonary artery itself without pulmonary plethora occurs in pulmonary valve stenosis, pulmonary hypertension, and

Eisenmenger's complex; on the other hand, diminutive main pulmonary arteries occur only when the pulmonary blood flow is reduced.

Another point of great importance is the quality of pulmonary artery pulsation: whether it is abrupt and collapsing as in A.S.D. and pulmonary incompetence, or whether it is relatively slow-rising and sustained as in pulmonary stenosis (Wells, 1950).

Coarctation of the Aorta

Of the 16 cases in the series 8 were male and 8 female. Their ages ranged from 5 to 47. The findings were characteristic, and there is very little to add to the well-known clinical picture.

Patent ductus was associated in one, V.S.D. in two, and aortic stenosis in one (possibly two). The coarctation was of the usual adult type in all of these.

A mitral diastolic murmur was heard in no fewer than 9 of the 16 cases. There was a ready explanation for it in five (ductus, 1; V.S.D., 2; calcific mitral stenosis, 1; and active rheumatic carditis, 1). But there was no explanation for it in the other four; there was no rheumatic history, and the murmur disappeared after surgical repair in one of them. The contrary evidence that an unexplained mitral diastolic murmur may persist after successful surgical repair is still lacking. According to Brown, cases of coarctation of the aorta, like cases of A.S.D., are peculiarly apt to develop rheumatic mitral valvulitis in childhood, and at present there is no better explanation to offer.

A radiological sign that too often escapes notice is the double aortic knuckle (Fig. 3) described by Bramwell (1947) and others. This at once distinguishes coarctation from obstruction lower down.

Retrograde aortography was carried out on three cases, but the results were little better than those obtained by the intravenous route, and the procedure is probably more dangerous. Good aortograms are essential, however, so that cases which are anatomically unsuitable for repair need not be subjected to thoracotomy.

The mortality rate for Crafoord's operation is now 10–16% (Gross, 1949; Shapiro, 1949).

Patent Ductus Arteriosus

There were 29 cases of patent ductus in the series—21 female and 8 male. Only one was seriously incapacitated, but five others had moderate breathlessness and complained of palpitations.

Of the physical signs, Corrigan pulsation in the neck, a water-hammer pulse, a normal venous pressure and pulse, a thrusting hyperdynamic left ventricular cardiac impulse, a high continuous murmur in the first and second left intercostal spaces, a normally split (when not obscured) second heart sound at the base, often with some accentuation of the pulmonary element, and a functional mitral diastolic murmur were the most important. The electrocardiogram showed normal P waves, a varying degree of left ventricular preponderance, and no bundle-branch block. S waves were always dominant in Lead V_1, and a small secondary R wave was seen only once; but the main R wave in this lead was sometimes notched, and S was occasionally slurred. The most severe cases showed T-wave inversion in left ventricular surface leads or their equivalents, and one patient had auricular fibrillation, which reverted to normal rhythm after ligation of the ductus. Skiagrams usually revealed left ventricular enlargement, pulmonary plethora, and a varying degree of dilatation of the pulmonary artery.

The mildest cases showed no abnormality apart from the Gibson murmur. Nine out of ten severe cases had a functional mitral diastolic murmur which disappeared immediately the ductus was ligated. Two patients did not have a continuous murmur at any time, and in two others the murmur was atypical and was thought by some observers to be absent in one of them and discontinuous in the other. The two without the classical murmur were the most severe in the series. Both were proved by cardiac catheterization and subsequent ligation of the ductus. Four acyanotic patients with continuous murmurs did not have a patent ductus. Two had aorto-pulmonary septal defects, and two had a perforation of the aortic sinus—one into the pulmonary artery and one into the right ventricle. Several other continuous murmurs were heard in acyanotic patients during the two-and-a-half-year period under review, but have been excluded from the series. Some represented a venous hum and were louder in the neck. One was due to a needle causing an aorto-pulmonary fistula; another was caused by an arteriovenous aneurysm in the lung. No case of coronary arteriovenous aneurysm was encountered.

The venous hum is accentuated when the patient sits up and may be abolished by compressing the jugular vein at the root of the neck. Continuous murmurs due to aorto-pulmonary septal defects or to a perforated aortic sinus tend to be loudest a little lower than the classic ductus murmur; they are also extremely coarse and accompanied by a gross thrill. Both cases of perforated aortic sinus in this series developed during or after an attack of bacterial endocarditis.

Arteriovenous aneurysm of the lung usually causes cyanosis; if not, it may yet be recognized by means of pulmonary angiocardiography and by finding a lowered arterial oxygen saturation. Coronary arteriovenous aneurysm should show an unusually high oxygen content in samples obtained from the coronary sinus.

Cardiac catheterization was undertaken in 13 cases. Mean pressures in the pulmonary artery were normal in four and raised, often considerably, in nine (Table II).

TABLE II.—*Patent Ductus*

Case No.	Age	Mean Pressure (mm. Hg)		% O_2 Saturation		Ratio of Pul. to Systemic Flow	Approx. Pul. Resistance $\left(\frac{\text{P.A. Pressure}}{\text{Pul. Flow.}}\right)$
		R.V.	P.A.	S.V.C., R.A., and R.V.	P.A.		
1 H	6	18	32	63	83	3:1	2·0
2 H	9	12	17	65	80	2:1	1·7
3 67	18	16	24	53	75	2·5:1	2·0
4 69	8	30	52	68	81	2:1	5·0*
5 74	9	7	7	69	81	2:1	0·7d
6 76	35	19	40	52	85	6·5:1	1·25d
7 87	9	33	48	69	87	3·7:1	2·5
8 125	32	9	13	72	80	1·7:1	1·4
9 126	8	24	37	62	73	1·5:1	5·0*
10 143	23	30	65	69	86	2:1	6·0*
11 116	5	27	47	65	87	3·5:1	2·8
12 5B	4	10	13	69	86	2·7:1	1·0 d
13 7B	13	8	12	67	83	2·2:1	1·0 d

* Increased resistance. d = Diminished resistance.

There was some relationship between the height of the pressure and the size of the shunt, but it was not close. The peripheral resistance in the lungs was variable: it was reduced in four, normal in six, and raised in three. When it was low a relatively large shunt was associated with a relatively low mean pressure in the pulmonary artery; when it was high a relatively small shunt was associated with a high pressure in the pulmonary artery. Only when the peripheral resistance was normal was the pressure proportional to the shunt (Fig. A). This, of course, is obvious and may be calculated by the formula B.P. = T.P.R. × C.O., which applied here becomes: pulmonary artery pressure = pulmonary peripheral resistance × pulmonary blood flow.

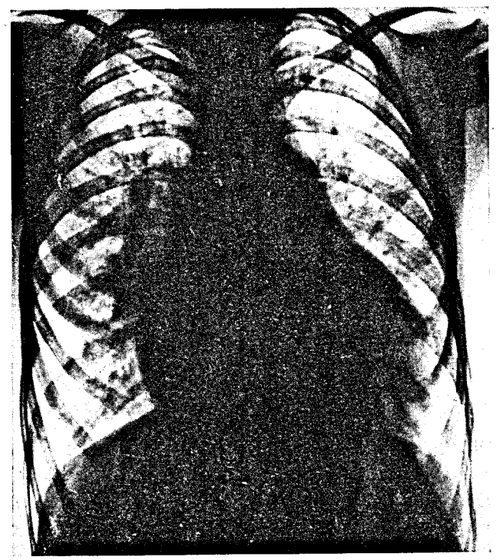


FIG. 1.—Pulmonary plethora in a case of V.S.D.

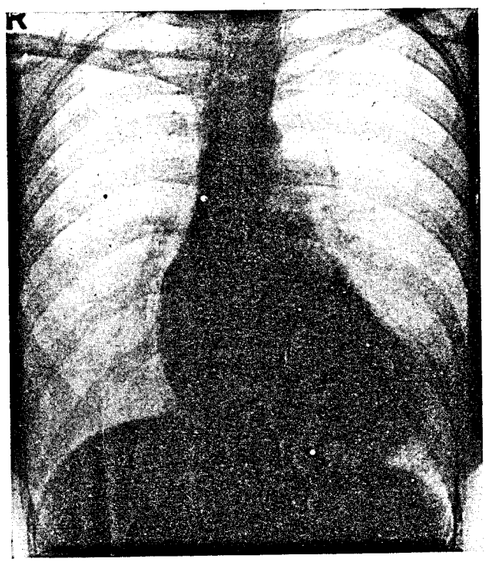


FIG. 2.—Pulmonary ischaemia in a case of Fallot's tetralogy.

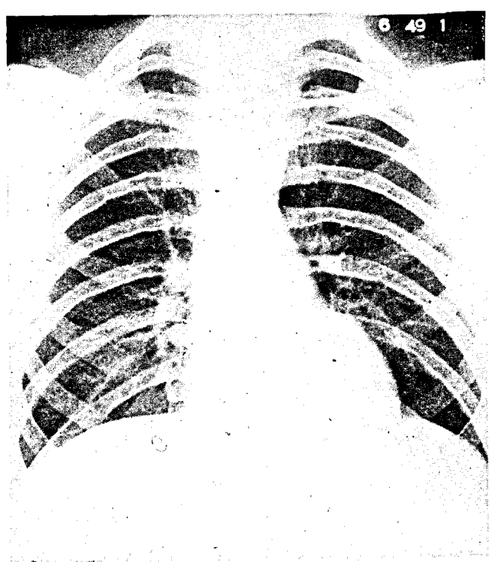


FIG. 3.—Coarctation of the aorta showing a double aortic knuckle.

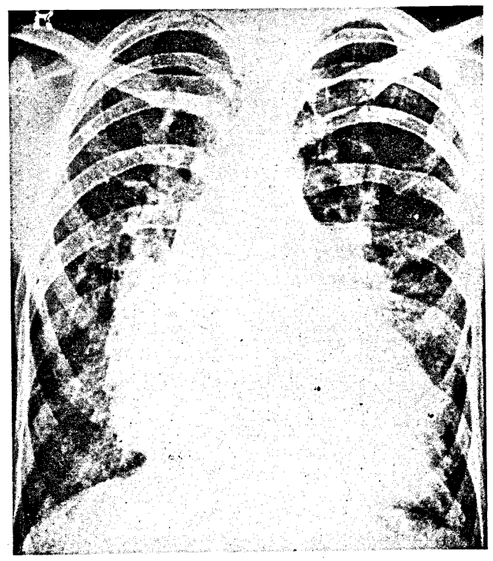


FIG. 4.—*X*-ray appearances in V.S.D., showing pulmonary plethora and left ventricular enlargement.

GEORGE LUMB: DIFFUSE EOSINOPHILIC ARTERITIS

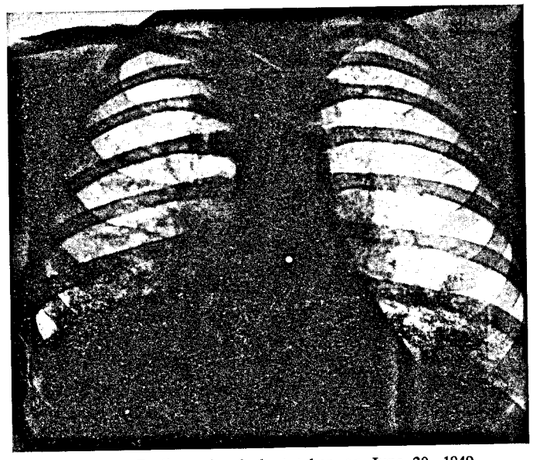


FIG. 1.—Radiograph of chest taken on June 20, 1949.



FIG. 2.—Lung. Fibrosis, giant-cell formation, and eosinophilic infiltration.



FIG. 3.—Lung. Necrosis and eosinophilic infiltration of the wall of a vessel. (× 150.)

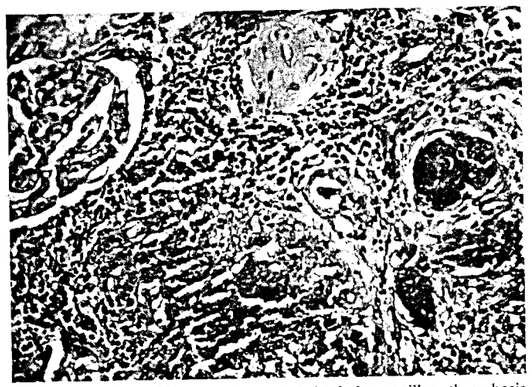


FIG. 5.—Kidney. Necrosis of convoluted tubules, capillary thrombosis in a glomerulus, and eosinophilic infiltration of the interstitial tissue. (× 150.)

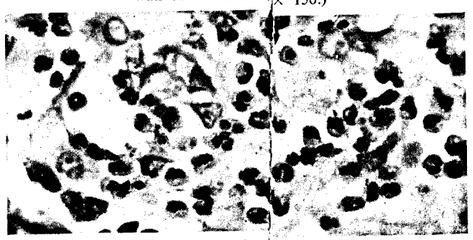


FIG. 4.—Heart. High-power view of eosinophils. (× 240.)

L. J. MAHONEY AND H. J. BARRIE: ADRENAL INSUFFICIENCY AFTER SURAMIN

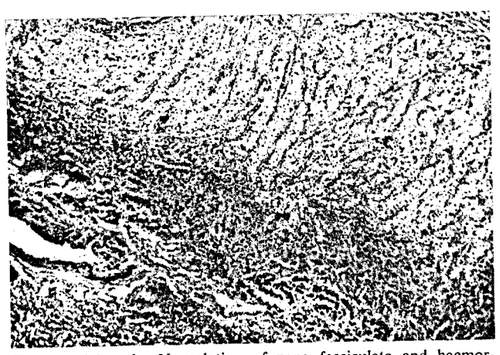


FIG. 1.—Adrenal. Vacuolation of zona fasciculata and haemorrhagic necrosis of zona reticularis. H. and E. (×45.)

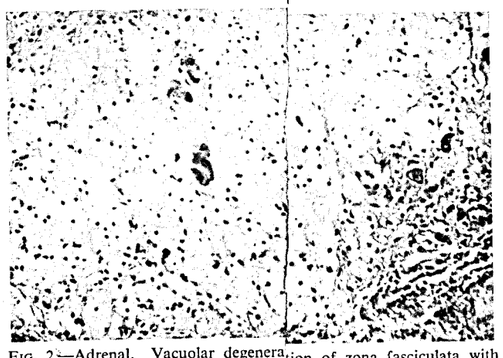


FIG. 2.—Adrenal. Vacuolar degeneration of zona fasciculata with isolated islands of autolysing cells. H. and E. (× 115.)

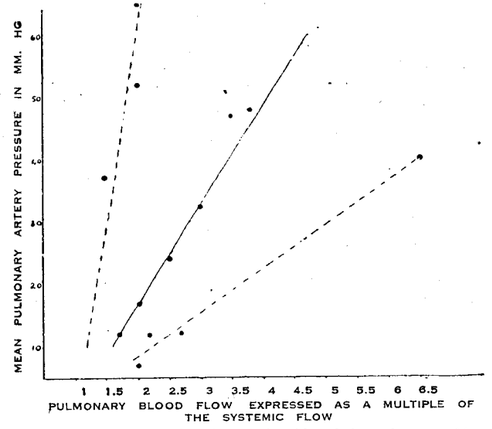


FIG. A.—Graph illustrating the relationship of the pulmonary blood flow to the pulmonary artery pressure in patent ductus.

To the three patients with true pulmonary hypertension mentioned (aged 8, 8, and 23) must be added a fourth (a girl of 12) who was catheterized only a year after successful ligation. Her mean pulmonary artery pressure was then 33 mm. Hg. above the sternal angle. The prognosis of these cases should be guarded, for the hypertension may be irreversible; on the other hand, before ligation a moderate increase of peripheral pulmonary resistance may be beneficial, for it reduces the size of the shunt and the work of the left ventricle. By far the worst case (a woman of 35) in this series had a low normal resistance. Another point that emerges is that three of those with true pulmonary hypertension were younger than the average of those without, which was 14.

It is clear that the duration of the shunt does not determine whether the peripheral resistance rises or not, but some other factor. Should the resistance rise precipitously, reversal of the shunt is theoretically possible, and this might occur in childhood. The point will be discussed again in relation to Eisenmenger's complex.

The pulmonary blood flow was usually two to four times the systemic flow—that is, about 10–20 litres a minute. The whole of the extra work entailed in pumping the shunted blood falls on the left ventricle. The systemic flow (and therefore the right ventricular output) was usually a high normal (5–6 litres a minute).

Differential Diagnosis

1. *Aorto-pulmonary Septal Defect or Perforation of an Aortic Sinus into the Pulmonary Artery.*—Apart from the fact that the thrill and murmur are especially coarse and loud, respectively, and tend to be maximal in the third rather than the second intercostal space, there is nothing to distinguish this condition from patent ductus. Cardiac catheterization revealed the same kind and degree of shunt in three cases studied, and angiocardiography has not helped. If the onset of the thrill and murmur can be dated to an attack of bacterial endocarditis, however, a perforated aortic sinus may be diagnosed with confidence.

2. *Perforated Aortic Sinus into the Right Ventricle.*—Only one case was encountered. The clinical findings were similar to those of patent ductus, but the continuous thrill and murmur were distinctly lower, being maximal in the fourth space. Cardiac catheterization proved that the shunt was from the aorta to the right ventricle, pressures and samples being similar to those found in cases of V.S.D.

3. *Other Causes of a Continuous Murmur.*—These include a jugular venous hum, and arteriovenous aneurysm of the lung or of coronary, intercostal, or internal mammary vessels. These have already been discussed.

4. *Rheumatic Aortic Incompetence and Mitral Stenosis.*—The combination of a water-hammer pulse, systolic and diastolic murmurs at the base, left ventricular enlargement, and a mitral diastolic murmur with or without slight enlargement of the left auricle may occur in rheumatic heart disease or patent ductus, and the distinction between the two occasionally presents difficulty: this is when opinion differs about whether the basal murmur is to-and-fro or continuous, or when a continuous murmur is missing in a case of patent ductus with pulmonary incompetence. The presence or absence of a rheumatic history or of other rheumatic manifestations and of radiological evidence of pulmonary plethora should prevent error. If there is still doubt, cardiac catheterization should be performed.

5. Ventricular septal defect with aortic incompetence gives rise to a water-hammer pulse, a systolic and diastolic basal murmur, left ventricular enlargement, a functional mitral diastolic murmur, and pulmonary plethora. The differential diagnosis rests entirely on the site and timing of the thrill and murmur, and if these should be atypical serious error resulting in ill-advised thoracotomy may result. Moreover, cardiac catheterization in V.S.D. occasionally yields data compatible with patent ductus plus pulmonary incompetence.

Treatment

Surgical ligation is advised in all severe cases of patent ductus, and in all infected cases after preliminary penicillin treatment. As the operative mortality is still 2–3%, mild uncomplicated cases should be left alone. Whether moderate cases are ligated or not often depends on the attitude of the parents or patient; on the whole they are probably best ligated.

Ventricular Septal Defect

There were 24 cases with uncomplicated V.S.D.—11 male and 13 female. Their ages ranged between 3 and 55, 15 of them being children under 12 years old, 5 adolescent, and 4 adult. The majority were symptom-free, but five could not compete physically with their fellows, and one (aged 5) had congestive failure.

The important physical signs included a small or normal peripheral pulse, a normal jugular venous pressure without a conspicuous *a* wave, a thrusting hyperdynamic left ventricular type of cardiac impulse, a lifting right ventricular outflow tract and pulsating pulmonary artery, a Roger murmur and thrill, a normally split second heart sound at the pulmonary area (if not obscured by the murmur) with accentuation of the pulmonary element, and a functional mitral diastolic murmur.

Mild cases showed little but the Roger murmur and thrill. The least common sign in the more severe cases was detectable pulsation of the pulmonary artery.

A thrill accompanied the Roger murmur in every case. It was maximal in the fourth or third and fourth intercostal spaces in all but three, when it was maximal in the second (two) or second and third (one) spaces. In two patients it was unusually far to the left towards the apex beat and could have been mitral in origin. A mitral diastolic murmur was distinct in 10 out of 12 relatively severe cases, and was heard by some observers (but not by

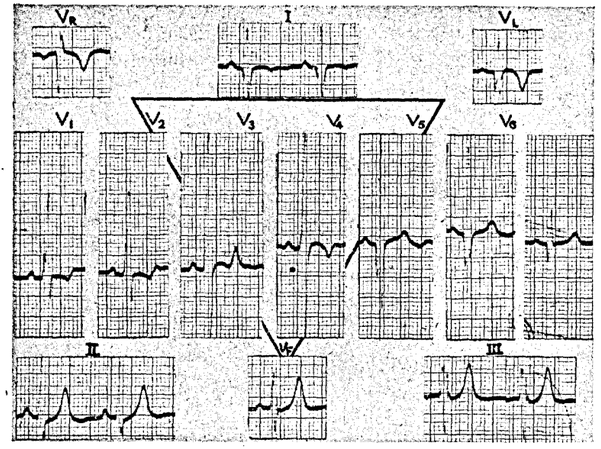


FIG. B.—Electrocardiogram in a case of V.S.D. showing large Q waves, tall R waves, and inverted U waves in left ventricular surface leads; and tall secondary R waves and inverted T waves in right ventricular surface leads.

me) in one of the other two. It was also heard in two relatively mild cases. A Graham Steell murmur from functional pulmonary incompetence was heard in four patients, and what was believed to be an aortic diastolic murmur in a fifth.

The electrocardiogram showed normal P waves, and QRS complexes that sometimes resembled the appearances in A.S.D. and sometimes those of patent ductus, but which as a rule lay somewhere between the two. Thus there might be prominent Q waves, tall R waves, and inverted U waves in left ventricular surface leads (Fig. B), and yet V_1 might show a well-formed secondary R wave. Partial right bundle-branch block, indistinguishable from that in A.S.D., was seen in three cases. In mild "maladie de Roger" the electrocardiogram was normal.

X-ray appearances were indistinguishable from those of patent ductus. Pulmonary plethora and left ventricular enlargement were very conspicuous in the more severe cases (Fig. 4).

By all standards at least 13 of the 24 cases were severe. Only four showed nothing but the characteristic Roger thrill and murmur.

Cardiac catheterization was undertaken in 16 cases. The mean pulmonary artery pressure was raised considerably in six, slightly in four, and was normal in six (Table III). As with patent ductus, the height of the pressure did not parallel the size of the shunt at all closely but depended on the pulmonary peripheral resistance: this was increased in four cases, decreased in four, and normal in eight. The patient with the largest shunt had a low resistance, and three of the four patients with high pressures had only average shunts (Fig. C). The pulmonary blood flow was usually at least double the systemic flow, being of the order of 10–15 litres a minute, but in four mild cases it was only about one and a half times the systemic flow. The contention that very mild cases of "maladie de Roger" may not be detectable by the method of cardiac catheterization is difficult to dispute in the absence of necropsies, but seems improbable.

Angiocardiography was carried out in the patient with the highest pulmonary artery pressure to see if transient reversal of the shunt could be demonstrated. The mean pulmonary artery pressure was 95 mm. Hg, and the systemic blood pressure 160/100 mm. Hg, there being associated coarctation of the aorta. No reversal of shunt could be seen in the angiocardiogram. Nevertheless reversal of the shunt is likely to occur in rare cases that develop an extremely high pulmonary resistance (see under Eisenmenger's syndrome).

TABLE III.—*Ventricular Septal Defect*

Case No.	Age	Mean Pressure (mm. Hg) R.V.	Mean Pressure (mm. Hg) P.A.	% O_2 Saturation R.A.	% O_2 Saturation Low R.V.	% O_2 Saturation High R.V.	% O_2 Saturation P.A.	Ratio of Pul. to Systemic Flow	Pul. Resistance (P.A. Pressure / Pul. Flow)
1 36	19	11	13	56	70	75	75	2:1	1·3
2 51	55	18	18	58	—	75	71	1·7:1	1·8
3 56	6	54	95	49	63	63	83	3·5:1	5·4*
4 T	27	29	—	59	81	—	—	3:1	(?3)
5 85	15	13	18	70	83	86	82	2:1	1·8
6 94	11	43	73	72	86	82	81	1·9:1	7*
7 102	24	24	42	56	82	84	85	4·3:1	2
8 139	7	9	10	72	78	81	81	2:1	1d
9 145	8	9	11	76	75	83	82	1·4:1	1·5
10 160	6	12	18	73	85	82	84	1·7:1	2
11 166	6	6	7	73	82	82	83	2:1	7d
12 167	28	12	14	64	81	81	83	2·5:1	1d
13 161	11	8	12	74	73	72	78	1·3:1	1·5
14 7B	15	34	71	69	81	—	81	2:1	7*
15 163	3	9	11	66	—	77	77	1·6:1	1d
16 169	6	37	61	68	86	86	83	2·5:1	5*

* Increased pulmonary resistance. d = Diminished pulmonary resistance.

Differential Diagnosis

The clinical diagnosis of V.S.D. by specialist physicians was often incorrect, and many cases of V.S.D. had been diagnosed otherwise. Thus, of 33 cases proved by means of cardiac catheterization, 17 had been diagnosed as uncomplicated V.S.D.

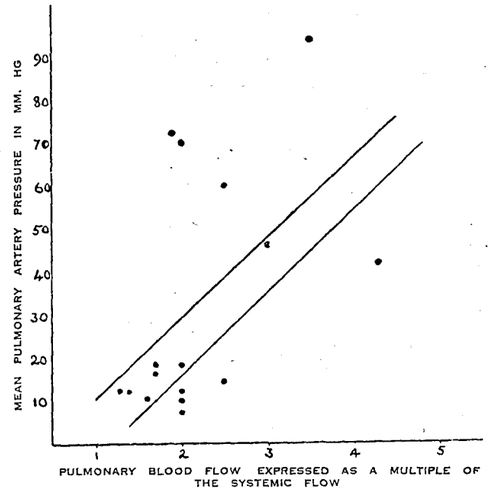


FIG. C.—Graph showing the relationship of the pulmonary blood flow to the pulmonary artery pressure in V.S.D.

in error, 7 with V.S.D. had been diagnosed otherwise, and 9 were correctly diagnosed as having V.S.D. The chief sources of confusion in suggested mild cases were innocent left parasternal murmur, simple pulmonary stenosis, subaortic stenosis, and organic mitral incompetence; and in cases with pulmonary plethora, patent ductus, and A.S.D.

If there is no thrill, a left parasternal murmur unaccompanied by any of the clinical features of V.S.D. mentioned above should be regarded as innocent.

Simple pulmonary valvular stenosis can usually be distinguished by the higher position of the thrill and murmur, by the softness of the pulmonary element of the second heart sound (if it can be heard at all), by the tapping cardiac impulse, and by dilatation of the pulmonary artery in the absence of pulmonary plethora. Subvalvular stenosis is more difficult, because turbulence may then be lower and the pulmonary artery may not be dilated; but the second heart sound and the quality of the cardiac impulse should prevent mistakes. Severe pulmonary stenosis is easily distinguished by the electrocardiogram. Mild subaortic stenosis may be clinically indistinguishable from the "maladie de Roger" if the murmur and thrill are low; if the left ventricle is enlarged, however, absence of other evidence of V.S.D. strongly favours subaortic stenosis.

Organic mitral incompetence with left ventricular enlargement, a mitral diastolic murmur, and a systolic thrill and murmur rather centrally placed may deceive the most experienced; but skiagrams should reveal the tell-tale systolic expansion of the left auricle if there is mitral incompetence, and pulmonary plethora if there is V.S.D.

Patent ductus without a Gibson murmur should be recognized by the peripheral pulse. Confusion is scarcely possible unless V.S.D. is complicated by aortic incompetence; and if systolic turbulence then happens to be high, real difficulty may be encountered. Clinical or electrocardiographic evidence of right ventricular dilatation (as well as left) favours V.S.D.

Afrial septal defect with a relatively low systolic thrill and murmur, and with a hyperdynamic right ventricle forming the apex beat, may closely simulate V.S.D. But the second heart sound is much more widely split in A.S.D., and the pulmonary element is not accentuated. Moreover, the Roesler type of thrusting cardiac impulse is much less common in A.S.D. than was at one time thought: in clinical diagnosis few mistakes will be made if a left ventricular type of cardiac impulse is accepted at its face value.

Terminology

It is suggested that the term "maladie de Roger," if retained at all, should be applied only to mild cases showing nothing more than the Roger murmur and thrill. The majority of cases of V.S.D. present a very different picture from that described by Roger himself and from all textbook descriptions of the "maladie de Roger." Nor is Taussig's classification of high and low defects acceptable. She regards cases with pulmonary plethora and dilated pulmonary arteries as examples of high V.S.D., the left ventricle pumping much blood almost direct into the pulmonary artery. She thinks that trivial shunts mean low V.S.D. This is incorrect. Selzer (1949) has already reviewed the literature from the pathological point of view and shown that only 10% of all cases of uncomplicated V.S.D. have low defects in the muscular septum and that these present no distinctive clinical features. In the present series cardiac catheterization has shown that high and low right ventricular samples are similar to one another and to samples from the pulmonary artery in nearly all instances (Table III); only in the mildest case was there any significant difference, and then the lowest sample was the least saturated.

(The conclusion of the paper will appear next week, with a full list of references.)

A circular from the Ministry of Health to local health authorities points out that many soldiers discharged from the Army on psychiatric grounds need social rather than medical aftercare. A special procedure has therefore been devised for these people as an experiment for one year. Army Form D.487, with which medical officers of health are familiar, will be marked "psychiatric aftercare" and sent to the M.O.H. of the area where the soldier will live. The local health authority should arrange for an initial visit to be paid to the ex-soldier by a social worker soon after the form is received. The authority may then arrange for aftercare services to be provided.

DIFFUSE EOSINOPHILIC ARTERITIS

BY

GEORGE LUMB, M.D.

Honorary Consultant Pathologist, Westminster Hospital; Senior Lecturer in Pathology, Westminster Medical School

[WITH SPECIAL PLATE]

During the past years considerable interest has centred on the problems of tissue changes in conditions of allergic origin, and an increasing quantity of evidence has been collected demonstrating that certain abnormalities, such as vascular proliferative lesions, focal necrosis, and tissue oedema, are to be found in a variety of apparently different diseases linked only by the probability of their having an allergic background.

Essentially similar changes have been found in cases of rheumatic polyarthritis and polyarteritis nodosa (Bergstrand, 1946), whilst evidence of associated allergic skin phenomena have been demonstrated in these conditions; and the association of polyarthritis with clear-cut cases of polyarteritis nodosa is not unknown (Herlitz, 1930–1; Friedberg and Gross, 1934). Further, Rich and Gregory (1943) have shown that the lung lesions in rheumatic pneumonia are essentially similar to those found in cases in which hypersensitivity to sulphonamide drugs exists. There is also certain evidence (Salvesen, 1938; Ehrström, 1941) that glomerulo-nephritis—also considered to be of allergic origin—may, more often than was first supposed, be an associated factor in cases of rheumatism.

More recently, examples of vascular and tissue changes of a similar type, occurring particularly in the lungs, have been described in cases of asthma, and Wilson and Alexander (1945) have shown that 18% of their cases of polyarteritis nodosa had an associated bronchial asthma.

A group of cases has therefore emerged which, although presenting widely differing clinical pictures, has in common the possibility of a similar type of aetiology—namely, an allergic manifestation. Experimental proof of such a theory is so far lacking, and the threads of evidence which do exist are disappointingly inconclusive. Evidence of similar or related morbid anatomical and histological changes in the tissues of patients suffering from this group of diseases provides another method of approach to this problem which has been followed principally by Bergstrand. Opportunities for post-mortem examination have been scanty, for diseases of the asthma group are of relatively benign type, and it is considered justifiable to place on record a further case in which necropsy was performed and full clinical details are available, in order to add to the few examples of this type already in the literature.

Case Report

A married woman aged 33, with one healthy child aged 3, first consulted her doctor in the autumn of 1948 complaining of a cough which had been present for nine months. Previously she had been healthy, with no personal or family history of any complaint of an allergic nature. She gave a history of frequent streaking of blood in the sputum, and for two months she had suffered from dysphagia and hoarseness associated with a swelling of the thyroid gland, together with some increase of nervousness and irritability. She was admitted to hospital on October 10, 1948.

A blood count showed: Hb, 82%; red cells, 4,570,300; white cells, 7,400 (23% eosinophils). Sputum examined for tubercle bacilli was negative on three occasions, but 9% of the total number of nucleated cells were eosinophils. A radiograph of

the chest revealed no abnormalities. It was considered that a non-toxic goitre was causing some non-specific laryngitis which by this time had disappeared. Whilst in hospital the patient had a low-level pyrexia, which settled, and she was discharged improved on November 11.

Within a week of her leaving hospital laryngitis returned, and she was readmitted on December 29. The thyroid enlargement had increased and was giving rise to definite respiratory obstruction and dysphagia. Additional symptoms of swelling of the eyelids and oedema of the dorsum of the hands, together with chemosis of the conjunctivae, had manifested themselves. She was again running a low-grade pyrexia. The white cells numbered 13,200 (19% eosinophils). Subtotal thyroidectomy was performed on February 1, 1949, and histological examination showed no signs of toxicity. The patient was discharged improved after operation, but in April and again in June required hospital treatment on account of dyspnoea, dysphagia, and swelling of the eyelids. Each time a blood count was performed eosinophilia was revealed. On April 5 a radiograph of the chest showed for the first time abnormal irregular shadows in both lower zones, which had increased in size and distribution by June 20 (Plate, Fig. 1).

In view of her increasing dyspnoea at this time she was recommended for early admission to Westminster Hospital, where she arrived in the early evening of July 1 dyspnoeic but

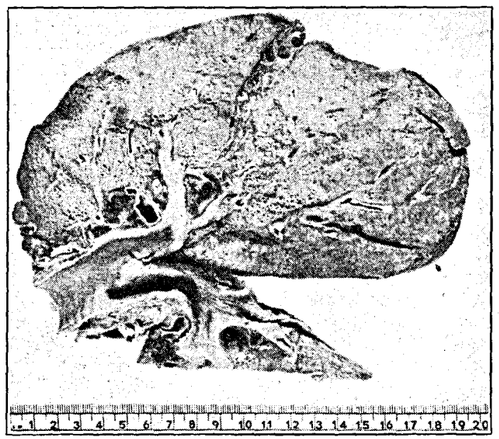


FIG. A.—Cut surface of lung, showing diffuse patchy consolidation.

not unduly distressed. She ate a reasonable dinner soon after admission, but three hours later became extremely distressed with inspiratory and expiratory stridor. Direct laryngoscopy revealed no obstruction and she finally lapsed into a coma and died 12 hours after admission.

Post-mortem Examination

This was performed three and a half hours after death. The body was that of a young woman in a good state of general nutrition. A well-healed scar at the site of thyroidectomy was seen in the neck. There was some oedema of the face, more marked on the right side than on the left, and considerable swelling of the right lacrimal gland caused prominence of the right eyelid.

Respiratory System.—The pharynx and larynx were filled with thick sticky mucopus, and the walls of the pharynx, larynx, trachea, and main bronchi were thickened and intensely oedematous. The mucous surface was flattened and very pale. The vocal cords were normal, and there was no abnormality in relation to either recurrent laryngeal nerve. Both pleurae showed easily broken-down adhesions, more marked on the right side, and at the right base a small collection of serous fluid was found. Both lungs were heavy and had an irregular shotty feel on palpation. Examination of the cut surface proved this to be due to very widespread irregular patches of consolidation of greyish yellow colour, involving the vast majority of the lung substance, with small intervening areas of compensatory emphysema (Fig. A).

Heart.—No abnormalities of valves or coronary vessels were found, and the musculature appeared normal on naked-eye examination, with the exception of one small area at the base of the left ventricle anteriorly, where it was very soft and yellowish in colour.

Spleen.—This was normal in size. The cut surface was rather pale and fatty, showing numerous scattered areas of greyish yellow infiltration varying in size from a pinhead to 0.5 cm. in diameter.

Kidneys.—These were normal in size, but scattered through the cortex were numerous yellowish areas of infiltration similar to those seen in the spleen and liver.

Thyroid.—A small remnant remained on the right side which was normal in appearance.

Lymphatic System.—Numerous enlarged lymph nodes were found in the neck, mediastinum, and para-aortic regions. The nodes were rubbery and discrete, and on the cut surface some of them had a yellowish appearance similar to the nodules in the liver, spleen, and kidneys.

The cause of death was considered to be acute respiratory obstruction associated with extensive bilateral pulmonary consolidation. The possibility of some bacterial infection of the lungs leading to a septicaemia was considered, but cultures taken from the blood, lungs, and the nodules in the spleen and kidneys were all sterile, and material injected into guinea-pigs and hamsters caused no abnormalities in these animals.

Microscopical Features

Lungs.—The normal architecture was replaced by a diffuse fibrous process showing irregular collagen bands and inflammatory cells, including numerous eosinophils, a few plasma cells, and some multinucleate giant cells (Fig. 2). Frequently the collagen strands were seen to be split up by oedema, and areas of hyaline degeneration were seen which failed to take up the aniline blue by Mallory's method or even to retain the first dye—in this case azocarmine. This collagen change has been described particularly in the so-called "Frühinfiltrat" of rheumatic pneumonia. Foci of necrosis were frequent and were invariably surrounded by a dense infiltration of eosinophils. Where an alveolar network remained signs of compensatory emphysema were seen. The bronchi were everywhere grossly thickened by oedema and infiltrated by eosinophils. The arterioles showed considerable intimal proliferation with thrombosis; necrosis of the wall with eosinophilic infiltration of the type found in polyarteritis nodosa was often seen (Fig. 3). Hyaline degenerative masses in the walls of the arterioles were a frequent finding.

Heart.—The myocardium showed a generalized degeneration of muscle fibres and these were widely separated by oedema and an infiltration of eosinophils. In the yellow area noted macroscopically focal necrosis with intense eosinophilic infiltration had occurred (Fig. 4).

Spleen.—There was a diffuse infiltration of eosinophils throughout the organ, and in the macroscopic yellowish areas focal necroses packed with eosinophils were seen. The majority of arterioles showed intimal proliferation.

Liver.—Accumulations of eosinophils were found around many portal tracts, and isolated cells of this type were found lying free in the sinusoids. No areas of necrosis were seen.

Kidneys.—Both had focal necrotic areas scattered in the cortex, where a few convoluted tubules had been destroyed and accumulations of eosinophils existed. Glomeruli were for the most part normal, but occasional capillary thrombi were seen (Fig. 5). The arterioles showed intimal proliferation and occasional thromboses, but no vascular necrosis was found.

Lymph Nodes.—The three lymph nodes examined revealed sinus catarrh with numerous eosinophils.

Lacrimal Gland.—This showed oedema and considerable infiltration by eosinophils.

Discussion

To summarize, one may say that here was a woman with no relevant family or past history, who had complained of cough for 18 months, and who gave a nine-months history of associated dyspnoea and dysphagia. Partial thyroidectomy had been performed five months before death, with apparent temporary relief. The first sign which might have led to the suspicion of an allergic background was the eosinophilia discovered nine months before death. The first time any specific lesion was found in the lungs was two and a half months before death, whilst the oedema of the face and hands began six months before death. The only attack which might have been called asthmatic was the terminal one during which the patient died.

The morbid anatomical and histological changes, however, seem to be identical with cases described by a number of authors under various titles, notably, Meyer-Dörken (1934), Harkavy (1943), Bayley *et al.* (1945), Bergstrand (1946), Smith (1948), and others. The generalized lesions found in the above case may be said to fall under three headings—namely, intimal proliferation, necrosis, and thrombosis of small vessels; focal necroses; and tissue oedema and eosinophilia.

The most striking lesions were the vascular changes in small arteries and the eosinophilia, which was constant in the peripheral blood throughout the course of the disease and was such a pronounced feature of the histological picture. For this reason in discussing this case I have decided to use the non-specific term diffuse eosinophilic arteritis rather than attempt to make any particular diagnosis.

In studying this case it is at once apparent that there are certain similarities to a number of other conditions. Thus the vascular changes are almost identical with those seen in polyarteritis nodosa. The focal necroses which have not been described in this latter condition are common, however, in other conditions in which hypersensitivity plays a part, as, for instance, after the use of sulphonamide drugs (Lederer and Rosenblatt, 1942). In this connexion it is interesting to note that, despite the patient's pyrexia, no drug of this group was at any time administered. The lung fibrosis is reminiscent of rheumatic pneumonia, and the eosinophilia and oedema are common findings of allergic phenomena.

It is difficult to escape the conclusion that the changes described both in this case and in the literature represent not a particular disease syndrome but a non-specific tissue reaction of allergic type which may vary from the benign lesions of the so-called Loeffler's syndrome (von Meyenberg, 1942) to lethal conditions such as the one described here. Examples of intermediate pathology may be quoted from the numerous varieties and gradations of polyarteritis nodosa.

In the cases of rheumatism, hypersensitivity to sulphonamide drugs, and nephritis many data exist concerning the exact precipitating factors, whereas in conditions such as polyarteritis nodosa no such evidence is yet forthcoming.

The above record is therefore presented as one of violent allergic reaction to some unknown precipitating stimulus, with widespread lesions of a type seen in a number of other conditions, and which it is perhaps justifiable to regard as representing part of the general pathology of the allergic state.

My grateful thanks are due to Professor R. J. V. Pulvertaft for help with this paper, to Dr. W. E. Lloyd for making the case notes available, and to Dr. Peter Hansell, of Westminster Hospital Photographic Department, for the illustrations.

REFERENCES

Bayley, E. C., Lindberg, D. O. N., and Baggenstoss, A. H. (1945). *Arch. Path.*, **40**, 376.
Bergstrand, H. (1946). *J. Path. Bact.*, **58**, 399.
Ehrström, M. C. (1941). *Acta med. scand.*, **106**, 182.
Friedberg, C. K., and Gross, L. (1934). *Arch. intern. Med.*, **54**, 170.
Harkavy, J. (1943). *J. Allergy*, **14**, 507.
Herlitz, G. (1930–1). *Acta paediatr., Stockh.*, **10**, 105.
Lederer, M., and Rosenblatt, P. (1942). *J. Amer. med. Ass.*, **119**, 8.
Meyer-Dörken, G. (1934). *Virchows Arch.* **292**, 374.
Rich, A. R., and Gregory, J. E. (1943). *Bull. Johns Hopk. Hosp.*, **73**, 465.
Salvesen, H. A. (1938). *Acta med. scand.*, **96**, 304.
Smith, J. F. (1948). *J. Path. Bact.*, **60**, 489.
von Meyenberg, H. (1942). *Schweiz. med. Wschr.*, **72**, 809.
Wilson, K. S., and Alexander, H. L. (1945). *J. Lab. clin. Med.*, **30**, 195.

OBSERVATIONS ON SYMPTOMATOLOGY AND TREATMENT OF CERVICAL EROSION

BY

JEAN R. W. ROSS, M.B., Ch.B., B.Sc.

(From the Gynaecological Department, Royal Salop Infirmary, Shrewsbury)

The large number of cases of cervical erosion seen in this out-patient department has focused attention on that condition, which was present in 36% of all the cases seen there from April, 1947, to June, 1949—some 870 cases of erosion in all. This prevalence may be due in part to the lack of post-natal care in the surrounding districts, though Fulkerson (1926), in his study of all cases attending the gynaecological department of the Cornell University Medical School, found that the incidence of cervicitis with erosion was 33%.

All patients were subjected to speculum examination of the cervix, and diagnosis was by direct observation either of an erosion or, in a few cases, of Nabothian follicles associated with a mucopurulent discharge from the external os.

The diversity of symptoms presented when cervical erosion was the only lesion found became evident. These symptoms have been analysed in 128 cases out of the 870 treated. The remaining cases of erosion have been set aside because they were associated with other conditions which clouded the issue, or because follow-up was impossible. In all other respects these 128 cases are unselected.

The symptoms of which the patients complained, and the numbers cured by healing of the erosion, are presented. The patients were examined six weeks after treatment, and were followed up for a period of from six months to two years, in order to observe the permanency of cure and to eliminate any purely psychological effect of treatment.

The treatment employed was thermo-cauterization of the cervix, using the electric cautery. The results of treatment in the 128 cases are analysed, and, in addition, the complications which occurred after cauterization in the 870 cases treated are reviewed.

Symptomatology

The symptoms observed in the 128 patients (summarized in Table I) were, in order of frequency, as follows.

Leucorrhoea.—As is generally recognized (Young, 1930; and others), the cardinal symptom was leucorrhoea. The discharge was typically not more than moderately profuse, mucoid, and white or yellowish in colour. No fewer than 102 (80%) complained of leucorrhoea, and 92 (90%) of these were cured as a result of treatment. Of the remainder four were found to have persistent or recurrent erosion,

TABLE I.—*Symptoms Present in 128 Cases of Cervical Erosion*

Symptom	No. of Cases	Percentage Incidence	Percentage Cured
Leucorrhoea	102	80	90
Backache	75	59	60
Abdominal pain	75	59	56
Frequency of micturition	32	25	75
Menorrhagia	24	19	67
Pruritus vulvae	15	12	100
Dysmenorrhoea	14	11	71
Dyspareunia	11	9	73
Cervical haemorrhage	11	9	100
Sterility	9	7	33
Sense of pelvic weakness	3	2	67

two had trichomonas vaginitis which had not been present at the time of treatment, and in four cases no abnormal discharge could be found on examination.

Backache.—Of the 75 (59%) patients who complained of backache 45 (60%) were cured by cauterization of the cervix, and were still cured when seen six months to two years later. The backache associated with cervical erosion was typically of a constant aching character and was felt in the lumbo-sacral region. It is not claimed that the majority of cases of backache in women are due to cervical erosion. Barns (1948) has stressed the importance of causes other than lesions of the pelvic viscera. Yet the fact that 60% of the women in this series who had cervical erosion and complained of backache were permanently cured by treatment of the cervix demands careful consideration. This is at variance with the views of many writers such as Fulkerson (1926) and Wilfred Shaw (1948), but Young (1930) states that a low backache is not infrequently associated with cervicitis. It is submitted that cervical erosion can by no means be ignored as a cause of this common symptom.

Abdominal Pain.—Of the 75 (59%) patients who complained of abdominal pain 42 (56%) were permanently cured by cauterization of the cervix. The pain in these 42 cases is thought to have been due to the erosion; it was localized in the right iliac fossa in 11 cases and in the left iliac fossa in 4, and was more generalized in the lower abdomen in 24. The pain was of two types—either dull, aching, and constant, or acute and lancinating. The importance of cervical erosion as a cause of troublesome and sometimes severe abdominal pain must be stressed. In this series 56% of patients with erosion and complaining of abdominal pain were permanently cured by treatment of the cervical lesion. Six patients had already undergone abdominal operations without relief, and were subsequently cured by simple cauterization of the cervix. The following two cases illustrate this point.

Case 1.—A married woman aged 34, with one child aged 7, complained of attacks of pain in the right iliac fossa for one year, and of leucorrhoea. An emergency appendicectomy had been performed four months previously. The removed appendix was normal. The pain continued. On examination she was found to have a cervical erosion, which was cauterized. After six weeks the cervix was healed and the patient was symptom-free. Two years later the cervix was healthy and there was no abdominal pain and no discharge.

Case 2.—A married woman aged 44 complained of dragging lower abdominal pain, with intermittent acute exacerbations, since the birth of her only child 18 years before. Three years after delivery a pelvic floor repair had been carried out, followed two years later by subtotal hysterectomy, appendicectomy, and right oophorectomy. There was no relief from the abdominal pain. On examination a marked chronic cervicitis with an erosion and numerous Nabothian follicles was found. The cervix was cauterized. Six weeks later the cervix had healed and the patient was symptom-free. After one year the pain had not recurred, and the patient felt better than for nearly twenty years.

These facts will be sufficient to emphasize the association of abdominal pain with cervical erosion. It is suggested, therefore, that before any operation is performed on a patient complaining of abdominal pain of no clear origin, and particularly if such pain is associated with a vaginal discharge, the cervix should be examined and cervical erosion excluded.

Frequency of Micturition.—Of the 32 (25%) patients who complained of day-and-night frequency 24 (75%) were cured by cauterization of the cervix, with no other treatment. Unfortunately, microscopical and bacteriological examination of a catheter specimen of urine was carried out in only 16 of the 32 cases: only one showed evidence of infection, the organism being *Bact. coli.* Of the remaining 15 cases of frequency known to be unassociated with infection 14 were cured by cauterization of the cervix. This supports the hypothesis that cervical erosion often causes a trigonitis, in which no organism can be recovered from the urine, and is in agreement with the observations of Vassallo (1936). The one case of infection is of interest, as it illustrates how cervicitis can be an aetiological factor in the production of recurrent cystitis (Winsbury-White, 1933). In the case under review, in which there had been numerous attacks of recurrent cystitis, the condition has remained entirely cured for two years, following a single course of sulphonamide therapy and healing of the cervical erosion.

Menorrhagia.—There were 24 (19%) patients who complained of an excessive menstrual loss—that is, the loss was more than their normal or their periods had become more frequent. No treatment other than cauterization of the cervix was employed, and as a result no fewer than 16 (67%) were cured. Details of these cases in which the periods returned to normal after cauterization are given in Table II. It would appear, therefore, that menorrhagia

TABLE II.—*Details of 16 Cases of Menorrhagia Cured by Cauterization of Cervix*

Age of Patient	Menstrual Cycle in Days		Remarks
	Before Cauterization of Erosion	After Cauterization of Erosion	
33	5–6/21. Profuse loss	3/24–26. Average loss	
35	9–10/28. Profuse loss	6–7/28. Average loss	
27	5/14–20	5/26	
44	7/14	7/28–49	Probably climacteric
22	7/26. Profuse loss	6/26. Average loss	
43	5/14–21. Moderate loss	5/28. Average loss	Child 3½ years
48	7/21. Very profuse	3/21. Average loss	
34	3–10/14–28.	3/28	
25	12/28. Profuse loss	7/28. Average loss	Child 11 months
36	5–6/14–28	5/24–28	
41	7/28. Very profuse loss	7/28. Average loss	
26	5/21. Profuse loss	4/26. Average loss	Child 19 months
24	7/28. Very profuse loss	7/28. Loss much less; now average	
17	7/14. Profuse loss	7/28–34. Average loss	
28	10/21	4/28. Average loss	
30	8/28. Profuse loss	7/28. Average loss	

is in some cases associated with cervical erosion. This fact has been noted also by Young (1930), Ground (1936), and Joubert (1946).

Pruritus Vulvae.—Fifteen patients (12%) complained of pruritus vulvae; no demonstrable cause, other than a cervical erosion, was found. All were cured by cauterization of the cervix. This eliminated the cervical discharge, which was probably the cause of the pruritus. These findings differ from those of Jeffcoate (1949).

Dysmenorrhoea.—Fourteen patients (11%) complained of dysmenorrhoea. Ten (71%) were relieved of the symptom by cauterization of the cervix. The dysmenorrhoea

was of the spasmodic type in nine, six being cured by treatment of the cervix. It was of the congestive type in five, four being cured by cervical cauterization. It seems possible that cauterization may cure spasmodic dysmenorrhoea in some cases by interfering with the sympathetic innervation of the cervix in a manner similar to that following cervical dilatation.

Dyspareunia.—Of the 11 (9%) patients who complained of deep dyspareunia 8 (73%) were cured by cauterization of the cervix. In none of these was the dyspareunia associated with any other obvious clinical cause. It has been noted that, in some cases in which there is cervical erosion, movement of the cervix during vaginal examination causes pain, and it is therefore not surprising that these patients complain of dyspareunia.

Cervical Haemorrhage.—There were 11 (9%) cases of bleeding from the cervix. Seven complained of intermenstrual bleeding and two had a post-coital loss. In addition, two patients complained of post-menopausal bleeding for which curettage of the uterus showed no cause. The bleeding, which was from the "eroded" area of the cervix, was cured in every case by treatment of the cervix.

Sterility.—Nine patients (7%) complained of sterility. Three of these, of whom one was a 1-para and two were nulliparous, conceived six, five, and one month after cauterization respectively. Cervical erosion is a recognized cause of subfertility, and these figures, though small, bear this out.

Sense of Pelvic Weakness.—Three patients, in whom no prolapse was demonstrable, complained of a sense of pelvic weakness simulating prolapse. This was entirely eliminated in two of the cases by cauterization of the cervix.

Comment on Symptomatology

Of the 128 cases of erosion, 19 (15%) were "congenital" in origin—that is, occurred in patients who had never been pregnant. A separate analysis of the symptoms in these 19 cases revealed no noticeable difference in the symptomatology.

In addition, many of the patients complained of general fatigue and listlessness, and experienced an improvement in their general health after the cervix had been treated. Many and varied symptoms not localized to the pelvis have been attributed to cervicitis by some writers (Derow, 1940; and others), and Young (1930) and others stress the role of cervicitis as a focus of infection in the aetiology of systemic disease. No instance was observed in this series.

An attempt to analyse these general symptoms has not been made, but it may be fairly stated that the local symptoms already discussed may in themselves be sufficiently worrying to the patient to make her feel a great deal better when they have been cleared up.

Treatment

Treatment consisted of cauterization of the cervix with the electric thermo-cautery. This was done in the out-patient department, except when the hymen was intact, the erosion was very large, or an anaesthetic was required for some other reason. Cauterization was not carried out during pregnancy, and six weeks were allowed to elapse after delivery before an erosion was cauterized. The technique was to expose the cervix with a speculum and to cauterize the cervical canal as the first step, without preliminary dilatation. The area of the erosion was then cauterized in lines radiating from the external os.

This procedure caused little distress in the majority of cases. It is noteworthy that during the cauterization most patients experienced aching lower-abdominal pain, in many instances similar to that of which they had previously complained.

The patients were instructed to douche twice daily with a dilute "milton" solution and to avoid coitus for six weeks. Each was given a printed slip warning her to expect a temporary worsening of such symptoms as backache, lower abdominal pain, and vaginal discharge, and to be prepared for some bleeding at the time of the separation of the slough, eight to ten days later.

All patients reported after six weeks, and if the cervix had not healed the treatment was repeated.

Results

In 109 cases the cervix was healed six weeks after the first treatment. A further 17 were healed after two treatments, and in one case three treatments were carried out before healing occurred. In the remaining case the cervix failed to heal after being cauterized three times. This cervix was subsequently amputated, but microscopical examination revealed no pathological change other than chronic cervicitis with erosion. Simple cauterization of the cervix therefore resulted in healing in 99.2% of cases.

Recurrence Rate.—When the patients were followed up six months to two years after treatment 6 of the 128 cases (4.7%) were found to have a cervical erosion, with a recurrence of symptoms. These cervices were known to have been healed six weeks after cauterization. None of the patients had been pregnant in the interim. They were therefore cases of recurrent erosion, representing a failure of treatment in 4.7% of cases and necessitating recauterization. This was carried out, and in four of the six cases the cervix was healed six weeks later. The remaining two cases were not followed up.

Complications

The complications which have been described after cauterization of the cervix are haemorrhage, pelvic infection, and atresia or stenosis of the cervical canal (Dell, 1938; Henkin, 1937; and others).

Of the 870 cases of erosion cauterized, six (0.7%) developed complications. There were two cases of haemorrhage, two cases of pelvic infection, and two cases of atresia of the cervical canal. No complications occurred in the 128 cases already analysed above.

Haemorrhage

Only two patients experienced bleeding severe enough for admission to hospital. That it was not serious even in these cases is shown by the fact that in each instance it was readily controlled by rest, sedatives, and hot douches.

Of the 128 cases analysed 47 (37%) experienced bleeding after treatment—in 42 the bleeding was slight, and in 5 it was "like a very profuse period" and the patients had to rest in bed at home for 24 to 48 hours. The occurrence and severity of haemorrhage in these cases bore no relation to the phase of the menstrual cycle in which cauterization had been carried out. This is at variance with the opinion of Maryan (1943).

Pelvic Infection

There was one case of pelvic cellulitis and one case of an acute exacerbation of a chronic salpingitis following cauterization. The two case histories are given below.

Case 3.—A nullipara aged 32 complained of constant lower-abdominal pain and of leucorrhoea for one year. There was

no history suggestive of abortion or salpingitis; the appendix had been removed. On examination the only gynaecological abnormality found was a cervical erosion. This was cauterized. Five weeks later the patient came to hospital complaining of increasing lower-abdominal pain since the cauterization, and of feeling "ill and feverish." She was flushed, her temperature was 99.8° F. (37.7° C.), and her pulse rate 96 a minute. There was tenderness but little guarding in the right lower abdomen. On vaginal examination the cervix was found to be healed. A tender, firm, ill-defined mass was palpable in the right fornix. On rectal examination the right utero-sacral ligament was found to be indurated, thickened, and very tender. A diagnosis of pelvic cellulitis was made. A five-day course of penicillin and sulphatriad, followed by short-wave pelvic diathermy, was given. The temperature and the pain subsided rapidly, though the induration in the right utero-sacral ligament persisted for some weeks. Three months later the patient was symptom-free and no sign of the cellulitis remained.

Case 4.—A 5-para aged 36 complained of a dragging pain in the left iliac fossa and of a profuse yellow vaginal discharge for eight years, since the birth of her last child. She also had menorrhagia. She was said to have had an attack of acute salpingitis two weeks before. On examination her general condition was satisfactory. Pelvic examination revealed an enlarged and tender left tube and a cervical erosion. The erosion was cauterized. A week later she complained of severe pain in the left iliac fossa and a profuse blood-stained discharge. Her temperature was 101° F. (38.3° C.). The lower abdomen was tender, particularly in the left iliac fossa. Vaginal examination revealed an acutely tender swelling, with pulsation, in the left fornix. Acute salpingitis was diagnosed and a course of penicillin and sulphatriad was begun. Next day her condition had deteriorated, and laparotomy was performed. The peritoneal cavity contained thin offensive pus, from which anaerobic streptococci were later isolated. A small necrotic left pyosalpinx was found, surrounded by adhesions. The abdomen was closed, with drainage. Convalescence was stormy for two weeks, but the patient made a satisfactory recovery.

This danger of an acute exacerbation of a chronic salpingitis after cauterization of the cervix has been pointed out by Cannell and Douglass (1935), Dell (1938), and others and is again emphasized.

Stenosis

Two cases of haematometrium occurred; these were caused by occlusion of the external os by scar tissue.

Case 5.—A 2-para aged 36 complained of abdominal pain and discomfort, and of amenorrhoea, since cauterization of the cervix in the out-patient department ten weeks before. On examination under anaesthesia the external os was found to be occluded by a thin layer of fibrous tissue, and after the passage of a sound a small quantity of dark-red blood escaped. The patient subsequently remained well.

Case 6.—A 2-para aged 56 complained of post-menopausal bleeding and of soreness of the vulva. On examination a mild degree of prolapse, kraurosis vulvae, and a cervical erosion was found. In December, 1948, dilatation and curettage, biopsy of the cervix, and cauterization of the cervical erosion were carried out under general anaesthesia. The subsequent histological examination of the curettings showed no malignant change in the endometrium, and biopsy of the cervix confirmed the diagnosis of cervicitis with erosion. Ethinyl oestradiol was prescribed on account of the kraurosis vulvae. In February, 1949, there was no further bleeding and the patient was symptom-free.

In June, 1949, six months after cauterization, she complained of lower-abdominal discomfort and of a sense of pelvic weakness. On bimanual examination the uterus was found to be bulky. When the cervix was drawn down to test the degree of uterine prolapse an adhesion over the external os gave way and a large quantity of dark-red blood escaped from the cavity of the uterus. Subsequently a vaginal hysterectomy with pelvic repair was performed on account of the concealed post-menopausal bleeding associated with prolapse. No evidence of malignancy was found in sections prepared from the uterus. The patient made an uneventful recovery.

First-stage dystocia is said to result occasionally from rigidity of the cervix due to scarring after extensive cauterization. Seven patients in the series of 128 cases were confined from 10 to 17 months after cauterization, and each had a normal first stage of labour. There is therefore no evidence in this series of dystocia following cauterization of the cervix.

Conclusions

Cervical erosion is a common and incapacitating lesion, and its clinical manifestations are not sufficiently recognized. This lack of appreciation of the symptoms of cervical erosion leads to the failure to look for, find, and treat the cause of many gynaecological complaints, thus in many instances condemning the patients to chronic ill-health as a result of such symptoms as leucorrhoea, backache, abdominal pain, and dysuria.

Worse still is the case of the patient who is subjected to some unnecessary operation on a mistaken diagnosis, when abdominal pain is the presenting symptom and the presence of a cervical erosion is overlooked.

The teaching so commonly heard that pain felt in the lower abdomen in one or other iliac fossa is ovarian in origin is, in my submission, unsound. Much more often such pain is due to cervical erosion, and the cervix should be inspected in such cases. Indeed, it should be inspected in all cases presenting the symptoms which have been discussed.

The treatment of cervical erosion by cauterization of the cervix in the out-patient department, without anaesthesia and without preliminary dilatation of the cervix, was in most cases found to be very satisfactory. Of 128 cases treated by cauterization, 99.2% were cured, with a recurrence rate of only 4.7%.

Serious complications after this treatment were few, and occurred in only 0.7% of a series of 870 cases. Although mild secondary haemorrhage from the cauterized area was relatively common, it was exceptional for the bleeding to be severe enough to necessitate the admission of the patient to hospital. Haematometrium and pelvic cellulitis may occasionally occur. In my opinion, if the cervix is cauterized in the presence of chronic pelvic infection, such as a chronic salpingitis, there is a very considerable risk of a severe acute exacerbation.

My thanks are due to Mr. Vivian Barnett for permission to use his cases, and for his kind help and encouragement in the preparation of this paper; to the nursing staff; and to Mrs. Ecclestone and other members of the secretarial staff of the Royal Salop Infirmary who helped with the follow-up of the patients.

REFERENCES

Barns, H. H. F. (1948). *Practitioner*, **160**, 68.
Cannell, D., and Douglass, M. (1935). *Amer. J. Obstet. Gynec.*, **30**, 376.
Dell, J. M. (1938). *J. Florida med. Ass.*, **25**, 237.
Derow, D. (1940). *Arch. phys. Therap.*, **21**, 154.
Fulkerson, L. L. (1926). *Amer. J. Obstet. Gynec.*, **12**, 374.
Ground, W. E. (1936). *Arch. phys. Therap.*, **17**, 520.
Henkin, A. L. (1937). *Amer. J. Obstet. Gynec.*, **33**, 520.
Jeffcoate, T. N. A. (1949). *British Medical Journal*, **2**, 1196.
Joubert, J. D. (1946). *Sth Afr. med. J.*, **20**, 632.
Maryan, H. O. (1943). *Med. Clin. N. Amer.*, **27**, 99.
Shaw, W. (1948). *Textbook of Gynaecology*, 5th ed., p. 382. Churchill, London.
Vassallo, S. M. (1936). *Urol. cutan. Rev.*, **40**, 315.
Winsbury-White, H. P. (1933). *Brit. J. Urol.*, **5**, 249.
Young, J. (1930). *British Medical Journal*, **1**, 577.

GASTRIC ULCER OCCURRING AFTER VAGOTOMY

BY

D. M. MORRISSEY, M.Ch., F.R.C.S.

(From the Department of Surgery, Queen Elizabeth Hospital, Birmingham)

Increasing experience of the late results of vagotomy for duodenal ulcer has shown that the percentage of patients thus treated who are not relieved of their ulcer distress may be as high as 25% (Orr and Johnson, 1949) even though there is a satisfactory reduction in the free gastric acid level. Other authors, reviewing their results after shorter periods, report more favourable figures (Moore, 1947, 1948; Cameron *et al.*, 1949; Healy and Sauer, 1949) Search of the literature for the causes of unfavourable results has revealed only two records of the occurrence of gastric ulceration after successful vagotomy for duodenal ulcer. Orr and Johnson (1949) report one such case in their series of 71 cases, and Dragstedt *et al.* (1949) record two examples of this complication in their series of 197 cases of duodenal ulcer treated by vagotomy alone.

The complication is therefore rare, but is important because of the malignant potentiality of gastric ulcers and because such ulcers are sometimes remarkably painless after vagotomy (Kugel and Janzen, 1949). For this reason it is felt that the following two case reports will be of interest, as they provide further evidence of the inefficacy of vagal section in interrupting the normal course of simple gastric ulceration. These cases come from a series of 79 cases of duodenal ulcer treated by vagotomy alone at the Queen Elizabeth Hospital, Birmingham. Over fourteen months have elapsed since the most recent of these cases was operated upon, and every case has been followed up at six- and twelve-monthly intervals with barium-meal examinations and an insulin test.

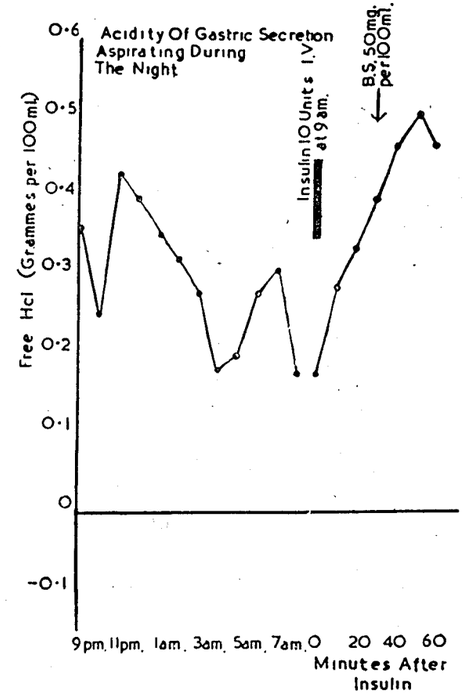


FIG. 1.—Case 1 (April 10, 1948). Night gastric secretion and insulin test before vagotomy.

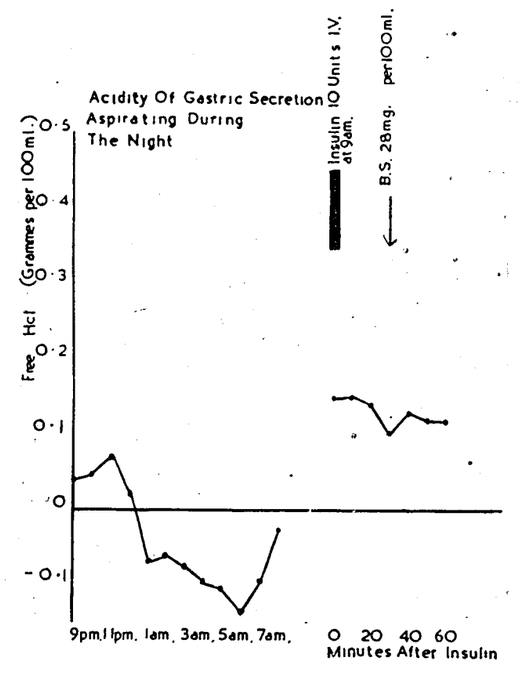


FIG. 2.—Case 1 (October 11, 1948). Night gastric secretion and insulin test six months after vagotomy.

Case 1

A wood machinist aged 40 was seen in the out-patient department in March, 1948, complaining of symptoms of duodenal ulcer of 13 years' duration. From 1935 to 1938 his periods of pain lasted approximately one week, with intervals of freedom up to three months. From 1939 onwards his symptoms were more persistent and were associated with vomiting. Barium-meal examination in 1944 revealed a duodenal ulcer, and from that time he followed a careful dietary regime which controlled his symptoms so that he was able to continue at work. During May, 1946, the ulcer perforated. After operation he was symptom-free for seven months. From January, 1947, his symptoms were more or less continuous. There was no haematemesis or melaena.

Examination revealed a well-built man, weighing 142 lb. (64.4 kg.) and 5 ft. 9 in. (175 cm.) in height, with an abdominal scar from his previous operation. Except for tenderness on palpation of the epigastrium, physical examination revealed no further abnormality. The relevant points from his laboratory investigations and *x*-ray examination were as follows:

Barium meal and screening: duodenal deformity present; stomach emptying in four hours. Radiograph of chest was normal. Blood count: red cells, 5–6 millions per c.mm.; Hb, 15.7 g.%; C.I., 1.01; white cells, 5,700 per c.mm. A fractional test meal revealed the following: fasting juice 29 ml.; no mucus in any specimen; bile in the 2¼-hour specimen; maximum acidity in 1¼-hour specimen (0.22 g. of free HCl per 100 ml.); residual juice 2 ml. The histamine test showed maximum acidity in a 30-minute specimen (0.42 g. of free HCl per 100 ml.). The night fasting gastric secretion (maximum acidity 0.43 g. of free HCl per 100 ml.) and the insulin test are graphically presented in Fig. 1.

On consideration of these findings the case was thought suitable for treatment by vagotomy, but it was felt that, even though there was no evidence of pyloric narrowing, the site of the previous perforation should be inspected.

On April 15, 1948, under general anaesthesia, the left side of the chest was opened after excision of a segment of the eighth rib. Through a 4-in. (10-cm.) incision in the diaphragm, forward from the region of the oesophageal hiatus, the stomach was carefully inspected and the patency of the pyloric canal and duodenum confirmed by palpation. A duodenal ulcer was present, but there was no evidence of gastric ulcer. The diaphragmatic incision was closed and vagal section carried out in the usual manner with resection of 2-in. (5-cm.) segments of the nerves.

Convalescence was uneventful, the patient being discharged on the 11th day. His weight on leaving hospital was 138 lb. (62.6 kg.). By the third month following his operation he was perfectly well, had resumed work, and had gained 14 lb. (6.4 kg.) in weight to 152 lb. (68.9 kg.). On October 1 he complained of epigastric pain after food, relieved by vomiting, and volunteered the information that these fresh symptoms were quite unlike his previous ones. He began to lose weight, and when readmitted to hospital on October 15 he weighed 136 lb. (61.7 kg.). The insulin test was repeated (Fig. 2), and barium-meal examination now showed a gastric ulcer about the middle of the lesser curve, with no delay in stomach-emptying. The duodenal cap was deformed but not tender. His symptoms were not controlled by diet and alkalis, and four weeks later a partial gastrectomy was performed.

At operation the gastric ulcer was readily identified about midway along the lesser curve, as was the scar of the old duodenal ulcer, which appeared to be healed. Examination of the stomach afterwards showed a peptic ulcer about ½ in. (1.2 cm.) in diameter, with yellow necrotic base, penetrating deeply into the stomach wall. Histological section revealed a complete breach of muscular coat and replacement by fibrous tissue without evidence of malignancy. The patient's convalescence was again satisfactory, and he remained symptom-free 21 months later.

Case 2

A man aged 45 had had epigastric pain after meals for 12 years, with periods of freedom from symptoms up to two months. He had been treated by six weeks' rest in bed and dietary measures on two occasions, but pain recurred on resuming full work. There had been no haematemesis or melaena. Examination showed a well-nourished man of 5 ft. 7 in. (170 cm.) in height, weighing 129 lb. (58.5 kg.). Physical examination was entirely negative.



FIG. 3.—Case 2. Photograph of stomach showing two gastric ulcers.

Fractional test meal: "high normal" acid curve with a large volume of resting juice (194 ml.) containing charcoal. Blood count: red cells, 5,090,000 per c.mm.; Hb, 14.1 g.%. A barium meal showed deformity of the duodenal cap, thought to be due to chronic ulceration.

On February 11, 1949, laparotomy was carried out by Mr. B. N. Brooke. A chronic duodenal ulcer was seen on the anterior wall of the first part of the duodenum with some scarring, but no appreciable stenosis and no evidence of gastric ulcer. In view of this he considered that vagal section was justifiable, and this was effected below the diaphragm.

The patient's immediate convalescence was uneventful, and he was discharged from hospital 12 days later. Three months after the operation he was still symptom-free, had gained 17 lb. (7.7 kg.) in weight, and had resumed his normal occupation of grocer. He was enthusiastic about his progress and was now able to eat a variety of foods which he had not been able to do for many years. He was seen again on July 13, 1949, when he complained of foul eructations and occasional attacks of diarrhoea, but no postprandial pain or discomfort. On August 25 he had a sudden severe haematemesis (he alleged that he vomited about three pints (1.7 litres) of blood-stained fluid), followed by repeated tarry stools.

On admission to hospital next day his red blood cells numbered 2,300,000 per c.mm. and haemoglobin was 44%. He was given a slow transfusion of two pints (1.14 litres) of blood, and after a temporary rise his blood count and haemoglobin began to drop steadily. The stools still contained altered blood on the tenth day after admission. In view of the continued bleeding a further transfusion was given and a partial gastrectomy was performed on September 6 by Mr. Brooke. On this occasion the old duodenal ulcer appeared to have healed, but there were now two small but deep gastric erosions about 3 in. (7.5 cm.) from the pylorus on the lesser curvature. Histological examination of the ulcers revealed a complete breach of the muscle coat and fibrous tissue formation at their bases (Fig. 3). The patient's convalescence was again uneventful. He was discharged from hospital 12 days after operation with a blood count of 4,900,000 red cells per c.mm. and 98% haemoglobin. He has remained symptom-free up to the present time (July, 1950).

Comment on the Cases

Post-operative insulin test results are not available in Case 2, as the patient was admitted to hospital with haematemesis within the six-months period, but the direct evidence of healing of his duodenal ulcer with the entire relief of symptoms while on a full mixed diet probably indicates that complete vagal section was achieved. The result of the insulin test six-months post-operatively in Case 1 is considered to be compatible with complete vagal section, as there was no rise of the acid level following an induced hypoglycaemia of 28 mg. per 100 ml. The view that the gastric ulcer developed after the vagotomy is based on the *x*-ray evidence and examination at the time of operation, which of necessity, by reason of the approach used, involved manual retraction of the lesser curve.

Discussion

The addition of these two cases to those already reported gives an incidence of 5 in 347 cases of complete vagotomy for duodenal ulcer. Many of the other causes of unfavourable results, such as recurrence and non-healing of the duodenal ulcer, may be explained on the grounds of incomplete nerve section, but such tests as we possess—the insulin test, lowering of gastric acidity, clinical and radiological healing of the original ulcer—indicate that in these cases the vagal section was complete. Dragstedt thought that gastric stasis may have been a causal factor, as he has not had this complication in any of 262 cases of duodenal ulcer treated by vagotomy and gastroenterostomy; and Orr and Johnson found gastric retention in their case, which also presented with painless haematemesis. There was evidence of gastric retention in my Case 2, but barium-meal examination of Case 1 at the time of onset of ulcer symptoms did not reveal any delay in gastric emptying.

It is difficult to reconcile the occurrence of gastric ulcer after successful vagotomy with current views on the pathogenesis of the condition. There is after vagotomy a lowering of the gastric acid level and particularly of the volume and degree of acidity of the night acid secretion. This problem might be solved if an unequivocal test of complete vagal section were available; and the observations of Brooke (1949) with regard to the insulin test are supported by the findings of Walters and Brownson (1948) and Walters *et al.* (1949) that in their series the clinical results in those cases showing a negative post-operative insulin test were similar to those showing a positive response. Without therefore being able to say that vagotomy has any causal relationship to the gastric ulcers in the cases described above, it does seem that the lowering of acidity brought about by vagal section affords no protection against ulceration developing. Further confirmation is forthcoming from the report of Nuboer (1949), who has described the occurrence of gastric ulceration in some of his cases following resection of the oesophagus for malignant disease, when the vagi were necessarily completely divided.

These two cases are obvious failures following vagotomy in the treatment of duodenal ulcer. The Birmingham series referred to above contains cases which have had other undesirable sequelae of the operation: these will be recorded when the series is fully analysed.

Summary

In a series of 79 cases of duodenal ulcer, two cases developed gastric ulcer following successful vagal section. These two cases are described.

The view is expressed that vagotomy is unsuitable as a treatment of gastric ulceration and confers no protection against the development of a gastric ulcer.

In both cases the gastric ulcers developed within six months of the vagal section.

I am indebted to Mr. B. N. Brooke for permission to publish Case 2, and to Professor F. A. R. Stammers for his guidance and help in the preparation of this paper.

REFERENCES

Brooke, B. N. (1949). *Lancet*, **2**, 1167.
Cameron, D. A., Burt, C. W., and Tuttle, W. M. (1949). *J. Mich. med. Soc.*, **48**, 301.
Dragstedt, L. R., Camp, E. H., and Fritz, J. M. (1949). *Ann. Surg.*, **130**, 843.
Healy, M. J., jun., and Sauer, P. K. (1949). *Bull. N.Y. Acad. Med.*, **25**, 449.
Kugel, A. I., and Janzen, J. (1949). *Gastroenterology*, **12**, 993.
Moore, F. D. (1947). *Arch. Surg., Chicago*, **55**, 164.
—— (1948). *Gastroenterology*, **11**, 442.
Nuboer, J. F. (1949). *Acta gastro.-ent. belg.*, **12**, 380.
Orr, I. M., and Johnson, H. D. (1949). *British Medical Journal*, **2**, 1316.
Walters, W., and Brownson, B. C. (1948). *Bull. Chic. med. Soc.*, **51**, 135.
—— —— and Phillips, S. K. (1949). *Kentucky med. J.*, **47**, 254.

According to a press report the New York Academy of Medicine has arranged a series of "refresher" lectures for doctors in New York which will be given over the radio. Believed to be the first of its kind, the series is designed to bring the latest scientific developments in medicine to doctors who are unable to attend medical conventions, who have no hospital connexions, or who are too busy to read through the medical journals. The one-hour programmes, to be broadcast every Thursday evening, will actually be transcriptions of papers delivered at the Academy's regular Friday afternoon lectures. A test broadcast last April on A.C.T.H. and cortisone received such wide response that planning went ahead for the series. The New York radio authorities are now planning to start a similar series of "refresher" lectures for lawyers and are hoping to expand the idea to other professions.

EPIDEMIC OF BENIGN DRY PLEURISY

BY

D. G. H. SYLVESTER, M.B.

Medical Superintendent, St. Mary's Hospital, Paddington, W.2

(From the Student Health Service)

Since Sylvest's original monograph on Bornholm disease, or epidemic myalgia, was published in 1933, a similar condition has been described in countries as widely separated as Scandinavia, India, and the United States. A diagnosis of benign dry pleurisy has been made in cases with associated pleural friction.

In this country epidemics have been sporadic in appearance and often confined to localized communities such as schools (Attlee *et al.*, 1924; Carter, 1933), children's hospitals and convalescent homes (Lloyd, 1924; Williamson, 1924), or to single households (Howard, 1938), while Pickles (1933, 1939, 1948) has described several outbreaks in village communities in Yorkshire.

Scadding (1946) reviewed the literature on Bornholm disease and described a series of similar cases observed among soldiers in the Middle East. These were characterized by a high incidence of pleural friction (55% of 20 cases), and he consequently named them benign dry pleurisy.

This paper records an epidemic of benign dry pleurisy occurring in two households in the Bayswater district of London during September and October, 1949. Eleven cases in all were encountered, two of which were observed during the course of their illnesses.

Case 4

A healthy medical student aged 22 became ill on October 4: he complained of severe pain in both upper quadrants of the abdomen, which was lancinating and worse on coughing or deep breathing. It radiated first to the right, then to the left shoulder, and was accompanied by headache and sweating.

When first seen on October 5 his breathing was shallow and painful and his temperature 100.8° F. (38.2° C.), but, apart from upper abdominal tenderness, there were no abnormal physical signs. In view of the position and radiation of the pain, the absence of cough or abdominal rigidity, and his clean tongue, a tentative diagnosis of diaphragmatic pleurisy was made.

On October 6 his temperature had risen to 101° F. (38.3° C.) and his respirations were 40 a minute. The pain and tenderness were now localized in the region of the left costal margin. A chest radiograph showed no abnormality at the left base; there was, however, a slight but definite decrease in translucency at the right base, together with slight elevation of the right half of the diaphragm. The total leucocytes were 8,000—polymorphs 6,000 (75%), lymphocytes 1,600 (20%), monocytes 400 (5%).

On October 7 there was a pleural rub in the right axilla which persisted for three days. His E.S.R. (Westergren) was 18 mm. in one hour and the Mantoux reaction was positive to 1 in 1,000 tuberculin. The diaphragm moved normally on screening. Recovery was rapid; by October 11 he was free of symptoms and there was no relapse. A radiograph of the chest taken on November 16 showed no residual shadowing.

Case 10

On October 22, eighteen days after the above patient had fallen ill, a second medical student, aged 26, was seized with pleuritic pain in the right shoulder which wakened him in the night and which spread to the right upper abdomen when he got out of bed. The pain was worse on lying down and prevented him from lying on the affected side. His temperature was 99° F. (37.2° C.) and there were no abnormal physical signs. On October 23 the pain had spread to the left shoulder and

right lower chest, there was right upper abdominal tenderness, and a pleural rub which persisted for twenty-four hours was heard below the right nipple. By the 24th he was free of symptoms. The total leucocyte count was 7,000—polymorphs 4,340 (62%), eosinophils 770 (11%), basophils 70 (1%), lymphocytes 1,540 (22%), monocytes 280 (4%). The E.S.R. (Westergren) was 4 mm./hour. A chest radiograph, however, was normal.

The second patient stated that other residents at his lodgings had also suffered from similar symptoms. When they were interviewed it was evident from the typical history given in nine cases that there had been an epidemic of benign dry pleurisy similar to that described by Scadding (1946).

All the cases occurred in two lodging-houses under common ownership in adjacent streets in Bayswater. The patients were healthy adults between the ages of 19 and 28, in the proportion of nine males to two females. The onset of the epidemic was dated to September 28, when, in House A, the manageress, aged 24, wakened with pain under both costal margins. Four days later (October 2) her sister, living in House B, fell ill with similar symptoms. Seven further cases were identified in House A and two in House B. They are listed in Table I.

TABLE I

House A (16 Residents)				House B (20 Residents)			
Case No.	Age	Date of Onset	Occupation	Case No.	Age	Date of Onset	Occupation
1	24	Sept. 28	Manageress	2	19	Oct. 2	Music student
3	22	Oct. 3	Medical student	4	22	,, 4	Medical student
5	24	,, 5	Pharmacist	6	26	,, 6	Art student
7	21	,, 9	Medical student				
8	28	,, 19	Student				
9	21	,, 21	Medical student				
10	26	,, 22	,, ,,				
11	20	,, 24	,, ,,				

Summary of the Eleven Cases

Prodromal Symptoms.—One case only had catarrh preceding the attack of pain; there were no cases with sore throat (as have been reported by Attlee *et al.*, 1924). The onset was sudden in all cases, with pain as the presenting symptom. The pain was always suggestive of pleurisy and was worse on lying down. Unlike the pain of pleurisy associated with pneumonia or tuberculosis, it was worse when lying on the affected side, possibly because immobility of the intercostals in this position caused increased movement of the diaphragm. The situation of the pain at onset was right-sided in 9 of the 11 cases, and is set down in Table II. The position of the pain and its reference to

TABLE II.—*Situation of Pain at Onset*

	No. of Cases
Right shoulder	3
Upper abdomen	3
Under right costal margin	2
In right arm and under right costal margin	1
In right chest and right shoulder	3

the shoulders suggests its origin in the diaphragm, and it is interesting that in Case 7, whose pain was in the right subcostal region, referred pain in the right shoulder was produced by pressure below the right ribs.

The average length of illness was three to four days, the minimum being two and the maximum seven days, and no relapses occurred. Pleural friction was heard in the two cases seen during the illness. It was of short duration and unilateral in both cases.

Radiographic and Blood Examinations.—Leucocyte counts were normal in both cases treated in hospital; the E.S.R. was normal in Case 10 (4 mm./hour) and raised in Case 4 (18 mm./hour). In previous series, chest radiographs have been normal and the diaphragm has moved normally on screening. In one of the two cases radiographed in the present epidemic abnormal findings were present. On the second day of illness Case 4 had a slight but definite decrease in translucency at the right base, which was more marked on the fourth day and was associated with slight elevation of the right half of the diaphragm. These *x*-ray changes were minimal but definite, and were possibly caused by pleural oedema.

Differential Diagnosis.—Finn (1947), in Boston, writing of a large series of cases, reports confusion with pneumonia, glandular fever, influenza, "non-paralytic poliomyelitis," lymphocytic chorio-meningitis, hepatitis, and acute abdominal emergencies. Pickles (1933) has emphasized that faulty diagnosis from the acute abdomen may lead to needless laparotomy. The pleural friction heard in the two cases here described clearly indicated the source of the pain.

Complications.—Pericarditis and orchitis have been quoted by Finn *et al.* (1949) in Boston and by Jamieson and Prinsley (1947) in Aden, while McConnell (1945), in Pennsylvania, recorded a high incidence of neurological symptoms (68% of 16 cases). There were no complications in this series.

Epidemiological Aspects

Seasonal Incidence.—The disease seems to be most prevalent in the summer and early autumn, when these cases occurred, resembling poliomyelitis in this respect. It is of interest that three cases of paralytic poliomyelitis and one of polio-encephalitis occurred among the hospital staff during the same period as the cases of epidemic pleurisy.

The incubation period is quoted by Finn (1947) as 8–10 days. In this epidemic it would appear to lie between 2 and 19 days. The cases occurred in two groups at intervals of ten days, the first group including occupants of both houses.

Case 2 may have been infected from her sister (Case 1), or both may have derived their infection from a common unidentified source. If Case 4 was infected from one of the preceding cases this could only have been from Case 2, making the minimum incubation period two days. The longest possible incubation period in these cases is provided by Case 11, who returned from holiday on October 5 and developed symptoms on the 24th (19 days).

The second group, Cases 8 to 11, consists of students who returned to London from holiday on October 5. Two of them, Cases 10 and 11, returned to share adjacent rooms with Cases 3 and 7 respectively, Case 3 being in bed with the disease at the time. Their accommodation on and after October 5 is shown in Table III.

TABLE III.—*Occupants of Adjacent Rooms in House A on October 5*

	Case	Onset of Symptoms
Room 1	3	October 3
	10	,, 22
Room 2	7	,, 9
	11	,, 24

Cases 10 and 11 returned from holiday on October 5. Prior to October 5, Room 1 was occupied by Cases 3 and 7, Room 2 being let to temporary visitors.

Causative Agent

Attempts to isolate any infective agent have met with little success. Small (1924) suggested a plasmodium; other workers have failed to isolate any bacteriological agent; nor has any virus been isolated from stools or nasal washings. Henle (quoted by Finn *et al.*, 1949), in complement-fixation tests for the viruses of influenza and chorio-meningitis, had negative results.

The absence of any other infective agent and the nature of the outbreaks suggest a virus as the probable cause. In the present series complement-fixation tests for the Coxsackie 2 strain of virus were kindly performed by Dr. G. M. Findlay in March, 1950 (five months after the last recorded case). Sera from five cases were tested, and the results are listed in Table IV. Three cases were strongly positive and two faintly positive; two normal students taken as controls were negative.

TABLE IV.—*Result of Complement-fixation Tests*

Serum	Antigen		
	Coxsackie 1	Coxsackie 2	Normal Mouse
Case 4	—	+ 1 in 5	—
Case 7	—	+ 1 in 20	—
Case 9	—	+ 1 in 20	—
Case 10	—	+ 1 in 20	—
Case 11	—	+ 1 in 5	—
Control I	—	—	—
Control II	—	—	—

This virus, which is transmissible only through newborn mice, was originally isolated by Dalldorf and Sickles (1948) and later by Melnick *et al.* (1949) from the faeces of cases of "non-paralytic poliomyelitis" in the United States. In mice the infection involves skeletal muscles, producing severe myositis and paralysis, while the central nervous system is unaffected. Death commonly occurs within twenty-four hours of the onset of paralysis.

Transmission

The exact mode of transmission is unknown. Melnick *et al.* (1949) isolated the Coxsackie strains from sewage and from flies in areas where epidemics of "non-paralytic poliomyelitis" occurred.

It is interesting that the first case in the present series was the cook for the whole of House A, in which seven further cases occurred, and that Case 2, the first in House B, assisted her parents in preparing food for this household. While this strongly suggests an alimentary spread at the onset of the epidemic, later cases may have arisen from droplet infection owing to the close proximity of their living quarters. On inquiry, however, no cases could be traced outside the two households among their day-to-day contacts at work.

Coincident with the epidemic, one sporadic case was also seen during the illness. A transitory bilateral pleural rub was present and the complement-fixation reaction to the Coxsackie 2 strain was strongly positive (1 in 20). This case also had a minimal unilateral pleuritic reaction on *x*-ray examination which did not persist.

Summary

An explosive outbreak of benign dry pleurisy is reported in two near-by households under common ownership. Two cases are described in detail.

The epidemiological aspects of the outbreak are discussed.

Five months after the illness the sera from five cases were shown by Dr. G. M. Findlay to give positive complement-fixation reactions to the Coxsackie 2 strain of virus as compared with negative results in two normal controls.

It is suggested that, in view of the seasonal incidence and the possible relationship to "non-paralytic poliomyelitis," the mode of spread may be similar to that of poliomyelitis itself and is possibly alimentary.

I wish to thank Dr. G. M. Findlay for his advice and for performing the serological tests, and Professor R. Cruickshank and Dr. T. A. Kemp, physician in charge of the Student Health Service, St. Mary's Hospital, for their guidance and helpful criticism.

REFERENCES

Attlee, W., Amsler, A. M., and Beaumont, D. C. (1924). *Lancet*, **2**, 492.
Carter, A. H. (1933). *British Medical Journal*, **2**, 1186.
Dalldorf, G., and Sickles, G. M. (1948). *Science*, **108**, 61.
Finn, J. J. (1947). *New Engl. J. Med.*, **237**, 621.
—— Weller, T. H., and Morgan, H. R. (1949). *Arch. intern. Med.*, **83**, 305.
Howard, C. R. G. (1938). *British Medical Journal*, **2**, 1203.
Jamieson, W. M., and Prinsley, D. M. (1947). Ibid., **2**, 47.
Lloyd, E. I. (1924). *Lancet*, **2**, 272.
McConnell, J. (1945). *Amer. J. med. Sci.*, **209**, 41.
Melnick, J. L., Shaw, E. W., and Curnen, E. C. (1949). *Proc. Soc. exp. Biol., N.Y.*, **71**, 344.
Pickles, W. N. (1933). *British Medical Journal*, **2**, 817.
—— (1939). *Epidemiology in Country Practice*. Wright, Bristol.
—— (1948). *Lancet*, **1**, 201.
Scadding, J. G. (1946). Ibid., **1**, 763.
Small, J. C. (1924). *Amer. J. med. Sci.*, **168**, 570.
Sylvest, E. (1933). *Den Bornholmske Syge: Myalgia Epidemica*. Levin and Munksgaard, Copenhagen. English translation, *Epidemic Myalgia*, 1934. London.
Williamson, B. (1924). *Lancet*, **2**, 64.

ADRENAL INSUFFICIENCY AFTER SURAMIN TREATMENT OF PEMPHIGUS

BY

L. J. MAHONEY, B.A., M.D.

AND

H. J. BARRIE, B.M., B.Ch.

(From the Department of Pathology, University of Toronto, Toronto, Canada)

[WITH SPECIAL PLATE]

Suramin ("germanin") has been used for the treatment of pemphigus since 1931. It is a carbamide of a complex salt of trisulphonic acid, is also known as "naphuride" and "Bayer 205," and was originally introduced for the treatment of trypanosomiasis. It is known to have toxic effects on the renal tubules and haemopoietic system. Wells *et al.* (1937) have shown that when given to guinea-pigs in amounts comparable with human doses it causes damage to the renal tubules and adrenal cortex, but the full picture of so-called adrenal atrophy was not achieved in their experiments. Two cases of acute adrenal insufficiency following suramin treatment have been reported (Wells *et al.*, 1937; Tomlinson and Cameron, 1938), but any conclusion that these adrenal changes were solely due to the drug is confused by the fact that many of the features of pemphigus, especially in acute cases, strongly resemble those of adrenal insufficiency and are sometimes improved by the administration of cortical extracts.

Furthermore, Goldzieher (1945) has shown that signs of severe organic damage may be found in the adrenal cortex in deaths from pemphigus. None of the six cases he studied had received suramin,* and he regarded their lesions as terminal secondary processes such as occur in other severe debilitating diseases.

The paradox is a familiar pharmaceutical one—that a drug which mimics the effects of a disease should be beneficial for it—and perhaps the problem is one of correct dosage for the individual.

Wells *et al.* state that none of the persons who have been followed up for some time after suramin therapy for trypanosomiasis have shown any delayed symptoms attributable to adrenal insufficiency. We are therefore in somewhat

*Personal communication.

the same position as we once were with agranulocytosis and sulphonamide therapy. From consideration of only a few cases it is hard to be certain whether the disease or the drug plays the dominant part in producing the lesion. It seems to us likely that in the case of suramin it is a summation effect. We think that this further experience with suramin should therefore be reported. No further comment is necessary.

Case Report

A 37-year-old woman of Scottish-Canadian ancestry was perfectly well until seven months before death, when, in the second month of pregnancy, she developed typical lesions of pemphigus. During the next four months two courses of suramin were started but were stopped after one injection (0.25 g.) because of the development of fever. Three months before death she was delivered of a normal seven-months male infant by elective caesarean section and two weeks later developed rapid mood swings, hallucinations, and delusions, and was admitted to hospital.

Examination revealed a dehydrated, confused, belligerent, agitated, and hallucinated woman whose skin was covered with lesions in all stages of healing, varying from patches of erythema to bullae measuring 2 in. (5 cm.) in diameter. Her temperature varied from 99 to 100° F. (37.2 to 37.8° C.). Her blood pressure was 108/60. The haemoglobin was 70% and the leucocytes numbered 16,000 per c.mm. The urine contained many white cells but no albumin, and cultured *Bact. coli*. Her N.P.N. was 27 mg. per 100 ml.

She was treated with electric shock, and a third course of suramin was completed five weeks before death (1 g. every two days for ten doses), with definite improvement in her mental condition and her skin lesions. No albumin appeared in the urine immediately after the course of suramin. Because of a falling haemoglobin 500 ml. of whole blood was given. At this time she developed an upper respiratory infection which persisted. Two weeks before death abnormal pigmentation of her skin and buccal mucous membrane was noticed, and over a period of a few days she developed anorexia, nausea, and vomiting, and her temperature rose suddenly to 104° F. (40° C.), her pulse to 130, her respirations to 30, and her blood pressure fell to 60/46. Her urine now contained 1+ albumin and her blood chlorides were 489 mg. per 100 ml.

Because of the signs of adrenal insufficiency 10 ml. of "cortin" was given every four hours, at first intravenously and then intramuscularly, together with a continuous intravenous infusion of 5% glucose in normal saline and 100,000 units of penicillin intramuscularly twice a day. The nausea and vomiting decreased, her blood pressure remained around 90/50, and her temperature varied from 99 to 100° F. with occasional elevations up to 102° F. (38.9° C.). Her serum chloride level remained around 540 mg. per 100 ml.

Five days before death her temperature rose to 105° F. (40.6° C.) and then fell to normal, and, though her blood pressure was 100/50 and she appeared to be getting no worse, she died suddenly in the middle of the night.

Necropsy Findings

At necropsy typical Addisonian pigmentation of the buccal mucous membrane and skin was found, and large branny brown macules were scattered over the trunk and extremities.

The heart was soft and flabby; the spleen (470 g.) and liver (2,200 g.) were enlarged and both were congested. Several of the abdominal lymph nodes were enlarged and firm. The adrenals were thin, weighed 10 g. combined, and on cut section all laminae were narrow. The lipoid zone was even and contained lipoid which varied slightly in brightness. It was separated from the grey medulla by a vivid, sharply demarcated reddish black stripe which was much darker than the usual pigment zone.

There was moderate oedema of the brain (1,420 g.), with some herniation of the hippocampal unci and cerebellar tonsils, and moderate compression of the ventricles. All other organs appeared normal.

Microscopical Examination

Fragmentation of the myocardium, congestion of the liver and spleen, and oedema of the abdominal lymph nodes were found, but nothing else of importance except in the adrenals and thyroid.

Adrenals.—Sections of each adrenal were alike. The capsule and its blood vessels appeared normal. The most obvious change was a band of extreme congestion and haemorrhage occupying the inner half of the cortex (Plate, Fig. 1). In it could be seen isolated ghosts of pigmented cells. Peripherally there were radial bars of dilated sinusoids traversing the rest of the cortex, but the capillaries of the medulla were only slightly dilated and then only at the line of junction with the cortex. Because of the variable arrangement of the laminae in the centre of the adrenal it was difficult to be certain that none of the medullary cells were necrotic; most of them showed no evidence of it but were rather widely separated by oedema. In the outer half of the cortex the sinusoids could be recognized, and the spaces between were occupied by vacuoles separated by thin wisps of cytoplasm. Sometimes one could be certain that these vacuoles were in cells and sometimes it was difficult to be sure. At rare intervals there were cells without lipoid occurring singly and in clumps, and many of these showed an acute autolytic form of necrosis and the adjoining sinusoids were enormously dilated (Fig. 2). In frozen sections the vacuoles were found to contain abundant lipoid, most of which was doubly refractile. In summary, there was complete necrosis of the zona reticularis, and vacuolar degeneration and patchy necrosis of the remainder of the cortex.

Thyroid.—The thyroid acini were small, lined by flattened epithelium, and contained little but rather darkly staining colloid. There were many bands in which the acini had atrophied and had been replaced by lymphoid tissue.

Summary

A case is reported of a woman of 37 who developed pemphigus in pregnancy and died of acute adrenal necrosis five weeks after finishing a course of suramin therapy.

We would like to thank Dr. W. Garbe for permission to publish this case.

REFERENCES

Goldzieher, J. W. (1945). *Arch. Derm. Syph., Chicago*, **51**, 369.
Tomlinson, C. C., and Cameron, O. J. (1938). Ibid., **38**, 555.
Wells, H. G., *et al.* (1937). *J. Amer. med. Ass.*, **109**, 490.

A professional conference organized by the Royal College of Nursing and attended by some hundreds of nurses was held in London on June 28 to discuss the educational scope and potentialities of the Nurses Act, 1949. Miss Ethel Strudwick presided, and the principal address was given by Miss Enid Russell Smith, Under Secretary, Ministry of Health. Miss Russell Smith said that the Act provided for the first time for the financing of nurse training separately from the finances of the hospital. It ensured that the money for such training would not be diverted to any other object. The General Nursing Council had been reconstituted and strengthened, educationally and financially, to enable it to carry out its new function. There had previously been a two-tier system, consisting of the General Nursing Council and some 600 training schools; this was bound to be inflexible. Under the Act there would be an intermediate tier of 14 area management committees, each with responsibility for about 40 training schools. Miss Joan B. Price, sister-tutor at the Sheffield Hospitals School of Nursing, said that this school was an educational establishment for four hospitals with 1,200 beds, meeting the educational needs of 500 to 600 nurses. It was financially and administratively independent of the group of hospitals with which it was associated. The teaching staff were appointed by the school itself. There was a most valuable connexion with the medical faculty of the university. Student nurses attended the university and used the lecture theatre, and university lecturers visited the school.

THE INDICATIONS FOR GLOBIN INSULIN

BY

DAVID W. PUGH, D.S.C., M.D., M.R.C.P.

Physician, Bath Clinical Area; Late Senior Registrar, the London Hospital

When globin insulin was introduced over six years ago it was hoped that a single daily injection of this type of insulin would control most diabetics. Mosenthal (1944) reported on a series of 50 ambulant diabetics treated with globin insulin (G.I.) and showed that as a rule G.I. produces a fall in blood sugar within two hours of injection. This effect is intermediate between that of soluble insulin (S.I.) and zinc protamine insulin (Z.P.I.). The action lasts for 12 to 16 hours and sometimes 24 hours, depending on the size of dose and other factors.

Eaton (1944) reported on a series of 41 diabetics treated with G.I. who had failed to do well on other types of insulin. He showed that a combination of Z.P.I. and S.I. produces a lower fasting blood sugar than G.I., but that in suitable cases G.I. gave results more nearly physiological than did any other single type of insulin, and that its action closely resembled that of mixed doses of Z.P.I. and S.I. containing over 50% of the latter.

These favourable reports encouraged other clinicians to use G.I. Wauchope (1948) reported enthusiastically on a series of 366 diabetics treated with G.I. as out-patients thus: "All types of patient do as well on a single dose of globin insulin each day as on other kinds of insulin, singly or in combination." This has not been quite the experience at the diabetic clinics of the London Hospital, and I was prompted, therefore, to review the records of diabetic patients who had been treated with G.I. since its introduction in 1943. In that year a large number of patients attending the London Hospital were changed from a twice-daily dose of S.I., or a single combined dose of S.I. and Z.P.I., to a single daily dose of G.I. This dose was usually two-thirds of the previous total dose of other insulins. In addition, a small number of new diabetics were treated with G.I. from the start. Out of a total of approximately 1,800 diabetics treated between 1943 and 1948, 360 were given G.I. In 55 of these, control of the diabetes proved unsatisfactory, so that a change to some other kind of insulin had to be made.

It is of interest to note at this point that during the same period over 750 patients were being maintained satisfactorily on a twice-daily dose of S.I. or a combined daily dose of Z.P.I. and S.I.

The methods of control were those in general use at diabetic clinics. Some patients attended weekly or fortnightly, others at monthly or three-monthly intervals. The urine examined was the early morning specimen, unless otherwise stated, using Benedict's reagent. Control was mainly by the result of urine examination, blood sugars being estimated in difficult cases. The diet employed during the period was the calorie-control type of Crooke and Scott (1943); usually of 2,000 calorie value, but higher in adolescent subjects and lower in the overweight and more elderly.

Of the 305 cases successfully treated by G.I. the majority were elderly patients with diabetes of no more than moderate severity. Only 36 (12%) were under 40 years of age, and 79% received a single daily dose of G.I. of less than 40 units. Thus the cases successfully treated by G.I. were usually not severe and they belonged to the older age groups. Such cases are usually easy to control on any regime.

Of the 55 cases who failed on G.I., 22 were males and 33 females. The majority were young (18 were below the age of 40—i.e., 35%). The 55 cases were made up of (*a*) 17 new diabetics who began treatment on G.I.; and (*b*) 38 old diabetics who had previously been treated with either twice-daily S.I. or a once-daily injection of Z.P.I. and S.I. Of this latter group all except one were receiving more than 30 units of insulin per day.

The patient who is poorly controlled on G.I. often shows a characteristic picture. He is usually under middle age, and his diabetes is of moderate or greater severity. He complains of nocturnal thirst and polyuria, and an early morning specimen of urine will show heavy glycosuria (more than 2% sugar, Benedict's test brick red precipitate). There is usually steady loss of weight (7 patients lost over a stone (6.3 kg.) in weight, and 13 patients over 10 lb. (4.5 kg.) in weight, in periods varying from three to nine months). Female patients complain of troublesome pruritus vulvae. If the dose of G.I. is increased to overcome these symptoms midday reactions usually occur, as happened in 18 of these cases.

The reactions tended to occur about four to six hours after taking the insulin. Ten patients suffered reactions at midday, eight in the late morning, and two in the late afternoon. Those patients who had experienced reactions from S.I. or Z.P.I. usually complained that G.I. produced more severe reactions. The feature that particularly worries the patient is the suddenness of the reaction. Patients on a single daily morning dose of G.I. should therefore have their main meal of the day at midday.

I believe that this combination of nocturnal thirst and polyuria, with midday or afternoon reactions if the dose of insulin is increased, along with heavy morning glycosuria, loss of weight, and pruritus vulvae in women, constitutes a clinical picture which might be called the "failed-globin syndrome," and it is not uncommon when globin insulin is used in unsuitable cases. When it appears, a different insulin arrangement is obviously necessary. This may be either a twice-daily dose of S.I., or often more conveniently a combined daily morning dose of Z.P.I. and S.I.

As would be expected, if a patient continues with a heavy glycosuria, the risk of ketosis is increased. Ten of these patients had episodes of ketosis while taking G.I. Since changing back to S.I. twice daily or S.I. and Z.P.I. there has been only one incident of ketosis, in a patient with cellulitis of the leg, among the 55 cases.

All of the 55 patients have subsequently been adequately controlled on a twice-daily dose of S.I. or on a combination of Z.P.I. and S.I. Over 80% of them have now been under observation for a further two years. The glycosuria has been stemmed, with gain in weight and relief from nocturnal thirst and polyuria. The troublesome nocturnal pruritus vulvae has disappeared in nine out of ten women affected.

Conclusions

(1) Globin insulin is often successful in the treatment of diabetes of older persons when the total daily dose of insulin does not exceed 40 units.

(2) Young and severe diabetics, when treated with a single daily injection of globin insulin, may show heavy morning glycosuria and suffer from nocturnal polyuria, thirst, and loss of weight.

(3) An increase in the dose of globin insulin in such patients usually produces midday reactions without relief of these symptoms.

(4) Such patients can be better controlled by a twice-daily dose of soluble insulin, or a combination of soluble insulin and zinc protamine insulin.

It is a pleasure to acknowledge the help and criticism of Dr. R. R. Bomford and Professor Clifford Wilson in preparing these notes, and the permission to use the case histories of their patients.

REFERENCES

Crooke, A. C., and Scott, E. (1943). *British Medical Journal*, **1**, 64.
Eaton, J. C. (1944). *Lancet*, **2**, 269.
Mosenthal, H. O. (1944). *J. Amer. med. Ass.*, **125**, 483.
Wauchope, G. M. (1948). *British Medical Journal*, **2**, 191.

SOME ASPECTS OF SCHISTOSOMA MANSONI INFECTION

BY

DAWOOD MUSTAFA, D.K.S.M.

Medical Registrar, Khartum Civil Hospital

Extensive subperitoneal miliary infiltration of the small intestine by *Schistosoma mansoni* and enlargement and heavy invasion of the mesenteric and retroperitoneal lymph nodes by ova of the same schistosome are rare enough to warrant being recorded. The post-mortem findings of three cases are therefore given.

Case Reports

Case 1. "Miliary Schistosomiasis" of Subserous Surface of Small Intestine.—A man aged 35 was admitted to hospital on September 14, 1949, with acute dysenteric symptoms. *Sch. mansoni* ova were found in his stools. He died five days later. On post-mortem examination the outer surface of the whole length of the small intestine was found to be studded with tiny nodules which were macroscopically indistinguishable from miliary tubercles. Only a few such tubercle-like lesions were seen on the surface of the lowermost portion of the large bowel. The mesenteric and retroperitoneal lymph nodes were moderately but universally enlarged. Some were haemorrhagic. The outer surface of most of the large bowel as well as the parietal peritoneum were devoid of nodules. The inner lining of the small intestine was congested and showed some minute submucous haemorrhages, but no ulceration or overgrowth. Ulcers and polypoid growths were, however, seen on the mucous surface of the whole length of the large bowel. The liver was cirrhotic. Scrapings from the miliary nodules on the surface of the small intestine revealed large numbers of ova of *Sch. mansoni*, while digested sections (with sodium hydroxide) of the mesenteric and retroperitoneal lymph nodes were simply clumps of such ova. They were negative for tuberculosis.

Case 2. Heavy Adult Infection; Enlargement and Heavy Invasion of Mesenteric and Retroperitoneal Lymph Nodes by Ova.—A man aged 30 was admitted on September 11, 1949, with acute watery diarrhoea. On admission he was extremely toxic, dehydrated, and anaemic. Stools were positive for *Sch. mansoni* ova. He died ten days later. At necropsy a very heavy adult infection of the portal vein and of its intrahepatic tributaries was found. Most were present in the portal vein. The cut surface of the liver, which was soft and dark red, showed many adult worms as well as ova. The mesenteric and retroperitoneal lymph glands were all enlarged and were teeming with ova. The transverse and descending colon showed extensive submucous polypoid growths and ulcers.

Case 3. Minimal Intestinal Lesions; Enlargement of Mesenteric Lymph Nodes.—A man aged about 40 was admitted on August 8, 1949, for fever. He had no intestinal symptoms or signs on admission. Blood culture was positive for *Salmonella paratyphi A*. He went downhill and became more and more toxic and anaemic. A terminal diarrhoea developed and he died on September 26. Stool examination was negative for schistosoma ova. On post-mortem examination the mesenteric lymph nodes were slightly enlarged. Sections showed the presence of many ova. The mucous membrane of the small intestine was slightly congested, while that of the large bowel was a trifle thickened. There were no overgrowths or ulcers. The liver was slightly enlarged but otherwise normal.

Comments

The points of interest in these cases are:—Case 1: the miliary lesions, their simulation of miliary tuberculosis, and the heavy infection of the mesenteric and retroperitoneal lymph nodes. Case 2: the heavy adult infection of the portal system and enlargement of the lymph nodes. Case 3: the paucity of intestinal lesions while the lymph-node infection was the predominant feature.

Subserous miliary schistosomal infiltration of the small intestine is an abnormal feature in *Sch. mansoni* infection, which could easily have been mistaken for miliary tuberculosis, while enlargement of the mesenteric and retroperitoneal lymph nodes is rare. Small-intestinal and lymph-node lesions are, however, the usual findings in Asiatic schistosomiasis.

The most interesting feature of these cases is therefore that their pathology resembles in some respects that of *Sch. japonicum* infection.

In *Sch. mansoni* infection the organs and tissues most seriously involved are the colon and rectum, though eggs carried in the mesenteric current into the portal vessels may filter out in the liver and lead to cirrhosis.

The essential difference in *Sch. japonicum* infection is the location of the adult worms and the discharge of ova primarily in the mesenteric vessels draining the small intestine. Thus the organs and tissues most seriously involved are jejunum, ileum, appendix, and mesentery. But the relatively short distance for transportation of eggs in the mesenteric current into the intrahepatic portion of the portal vessels and the large numbers of eggs discharged by *Sch. japonicum* females combine to set up periportal fibrosis and other visceral lesions—for example, lymph nodes—as more important in this disease than intestinal lesions.

It is stated that the same schistosome may present different pathological features in different parts of the world. It may therefore be that lymph-node involvement is not an uncommon feature in Sudan schistosomiasis (*mansoni*). Many post-mortem examinations are required to prove this.

I am indebted to the Director of Health Services for permission to publish these cases, and to Dr. R. Kirk, assistant director of research, for his kind criticism and comments.

A report on the British Legion Village covering the years 1947–9 has recently been issued. It pays tribute to the work of Professor F. R. G. Heaf, consulting physician to the Village, whose methods are used in the training schemes. Over 10,000 tuberculous ex-Service men and women of the 1914–18 war have benefited from the services provided by the Village, and many of the second world war are now doing so. The hospital section of the Village has been transferred to the Ministry of Health, but the settlement will still be considered as a unit. Throughout the organization national scales of salaries and wages are paid, and men undertaking full hours of occupational therapy receive increases in wages in accordance with their technical skill. This arrangement benefits morale, since the disabled men know that they are working under conditions like those of their fellows in the outside world.

Medical Memoranda

Uterine Sepsis from Unabsorbable Sutures

The following case report may be of interest to those obstetricians who still advocate the use of unabsorbable ligatures for sewing up the uterine wound after caesarean section.

CASE REPORT

A woman aged 44 was admitted to the Royal Masonic Hospital on August 8, 1949, complaining of irregular uterine bleeding and a purulent vaginal discharge. The average duration of her menstrual period was 7 to 14 days, and the cycle was irregular. The loss was variable, but enough to cause a moderate anaemia. In 1938 an artificial menopause had been induced with radium, but her periods had returned after three months' amenorrhoea and had continued since. She had had two children, aged 19 and 13 years, both delivered by caesarean section. The Fallopian tubes had been tied at the second operation.



Uterus with abscess, showing old caesarean suture.

As this was a case of persistent irregular haemorrhage after radium it was considered advisable to perform a total hysterectomy, and this was undertaken on September 5. The uterus was found to be densely adherent to the anterior abdominal wall by a broad adhesion about 1 in. (2.5 cm.) in diameter. This was dissected away from the anterior abdominal wall and a small abscess, containing frank pus and several long strands of silk ligature, was opened in the middle of the adhesion. The abscess connected with the cavity of the uterus and there was a nest of silk sutures in the abscess.

On section, the myometrium showed considerable fibrosis, possibly the result of the radium menopause. The wound was closed, with drainage to the extraperitoneal space, and the patient had a smooth convalescence. The accompanying illustration shows the uterus with adhesions cut away and a probe passing down the abscess cavity into the uterine cavity. The thick plaited strands of silk are clearly visible, and one or two strands have been removed to show that they are no more absorbed than on the day when they were inserted. The cause of the bleeding and discharge was a stitch abscess in the endometrium.

Most gynaecologists condemn the use of unabsorbable ligatures in the uterus, but a few still advocate the practice. This case is perhaps instructive in showing that such sutures are never absorbed and may give rise to serious mischief—in this case over 13 years after their insertion. I would further submit that nylon used for suturing the uterine incision after caesarean section may well give similar trouble in the future. Though not ideal, catgut is the best suture material to use in the uterus.

JOHN HOWKINS, M.D., M.S., F.R.C.S., F.R.C.O.G.,
Assistant Obstetrical and Gynaecological Surgeon,
St. Bartholomew's Hospital.

Volvulus of Transverse Colon Complicating Labour

The following case is reported because of its rarity and also because it brought to mind that host of differential diagnoses of collapse occurring during labour and in the immediate period post-partum.

CASE REPORT

A woman aged 22, in her third pregnancy, was admitted at term with abdominal pain and nausea on the evening of May 12, 1949. Her past general and obstetric history was normal. She was believed to be in labour. Her blood pressure was 160/110, pulse rate 130, and temperature 97.8° F. (36.55° C.); the urine contained a heavy cloud of albumin. The foetus was presenting by the vertex, and the head was engaged. The foetal heart rate was 84, and the rhythm was irregular.

As she was thought to be in the pre-eclamptic state, treatment was carried out in the routine manner. Six hours after admission an asphyxiated female infant, weighing 7 lb. 9 oz. (3.4 kg.), was delivered spontaneously and survived after resuscitative treatment. The mother collapsed and was treated for obstetric shock. Moderate abdominal distension and generalized tenderness was then discovered. She vomited during the night, and eight hours after the birth her blood pressure was 70/50 and her pulse rate 156.

Gastric suction was begun and intravenous fluids were administered. She had received an enema shortly before admission, but since then had passed neither faeces nor flatus. Her condition did not deteriorate further. Two days after the child was born a lump could be felt in the abdomen above and to the right of the umbilicus. The abdomen was tender, and the fundus of the uterus was felt 3 in. (7.5 cm.) above the symphysis pubis, 1½ in. (3.75 cm.) from the lower border of the tumour.

Four and a half days after the onset of abdominal symptoms laparotomy was performed by Mr. Keith Vartan under general anaesthesia. The lump was found to be distended transverse colon: the mesocolon was longer than normal, and the ascending colon was freely movable. A volvulus had occurred, involving the upper half of the ascending colon and the proximal two-thirds of the transverse colon. It was thought that the mesentery had become untwisted to some extent spontaneously, and nothing was done by the surgeon, apart from completing the untwisting. The other abdominal viscera were examined and found to be normal. The patient was discharged with her baby on June 8, 28 days after admission.

COMMENT

Involvement of the ascending and transverse colon is rare in volvulus occurring during pregnancy. All authors consider the condition from the point of view of intestinal obstruction and discuss the maturity of pregnancy at which such obstruction is most common. Lambert (1931) found the greatest number of cases of volvulus at term or during labour. Kohn *et al.* (1944) also found the last trimester to be the most common time, but remark the strangeness of its occurrence at a time when the abdomen is so distended by the pregnant uterus that torsion of abdominal contents would seem most difficult. On the other hand, it is easy to see the strength of the theoretical argument of Spence (1937) that immediately after delivery there is such a great alteration in the position of the alimentary tract that it is a wonder volvulus is not more common at that time.

The case reported was characterized by three features: (1) the extreme degree of peripheral vascular failure complicating labour and the immediate period post-partum; (2) the dominance of this feature over all other signs and symptoms, and (3) the spontaneous partial resolution of the pathological condition. For, indeed, vomiting as a symptom

was not such as seriously to lead to the suspicion of alimentary obstruction, and constipation was minimal. The enema return was satisfactory and the post-partum abdominal distension was not significantly greater than that occasionally seen after uncomplicated childbirth. Finally, the patient was undoubtedly suffering from pre-eclampsia.

I wish to thank Mr. Keith Vartan, medical director of the British Hospital for Mothers and Babies, London, S.E.18, for permission to publish this report and for his encouragement and suggestions.

ARCHIE G. MURRAY, M.B., B.S., D.R.C.O.G.

REFERENCES

Kohn, S. G., Briele, H. A., and Douglass, L. H. (1944). *Amer. J. Obstet. Gynec.*, **48**, 398.
Lambert, A. C. (1931). *Thèse Paris*, No. 417.
Spence, J. H. (1937). *British Medical Journal*, **2**, 1169.

Massive Lipoid Deposit in Atrophied Muscle

The following case is of interest not only on account of its rarity but because of the increasing importance which is being attached to the role of the fat-storage depots in diabetes mellitus.

CASE REPORT

A married woman, aged 46, with eight children, gave a history that in 1932 she had developed a severe cold and sore throat, and that four days later weakness of the left ankle had ensued which spread upwards until, in three days, the entire limb was paralysed. The leg then became painful, and despite rest in bed the pain involved the whole leg from the buttock down to the foot. The pain gradually decreased over the succeeding nine months, during which time she remained in bed. As the pain decreased the wasting of the leg and buttock became progressively worse. On gradually resuming activity she regained considerable use in the leg, though movements at the ankle were impossible. This improvement continued, without any treatment, for the next 16 years. In March, 1948, the left calf began to swell, at first mainly at night, but later it remained permanently swollen and slightly tender. The patient did not consider the condition a great disability and she had had three children since its onset in 1932.

On examination she was seen to be a short, very stout woman, rather pallid, with sparse hair and eyebrows. She walked with a stick, dragging the left leg, but was not greatly handicapped. All muscles of the left thigh and buttock were grossly wasted, being 3 in. (7.5 cm.) less than the right in circumference; the calf appeared hypertrophied, the tissues being firm, tender, and measuring 1½ in. (3.7 cm.) more than the right. Power was grossly diminished on the left, being fair at the hip and poor at the knee; the movements of dorsiflexion and plantar flexion of the foot were very small. The tendon reflexes were totally abolished in both limbs, except for the right knee-jerk, which was just detectable. No other abnormality was discovered.

On admission to hospital she was found also to be suffering from diabetes mellitus. Electrical reactions for the muscles of the left leg gave no response either to faradic or to galvanic stimulation. A biopsy of the left calf (by Mr. J. M. Sanderson) showed that the superficial tissues were normal, but the "muscle" was seen to be totally replaced by soft, yellowish white fatty tissue with occasional more resistant areas suggestive of fibrous remnants of muscle bundles. Dr. W. St. C. Symmers, reporting on the microscopical appearances, stated that the muscle was replaced by mature adipose tissue in which small blood vessels and nerve bundles were scattered. Occasional distorted skeletal muscle fibres remained, and small groups of what appeared to be sarcolemmal cells.

COMMENT

The neurological disorder which precipitated the extreme wasting of this patient's leg in 1932 can now be diagnosed only by presumption, but it seems to have been an infective condition of the nervous system, such as an acute poliomyelitis or polyradiculitis, a theory which finds some support in the absence of reflexes in the other limb and their gross diminution elsewhere. Nor can the duration of the diabetes be estimated, as the patient had no symptoms whatsoever: however, glycosuria had not been noted at the out-patient department four months before admission.

It has been known for many years that fatty infiltration precedes and accompanies the atrophy of muscle fibres following lesions of the anterior horn cells such as occur in poliomyelitis (Vulpian, 1870), but excessive deposition of fat to the extent of limb hypertrophy has not been recorded as a sequel to this disease. The outstanding condition in which fatty replacement of muscle fibres occurs is, of course, the pseudohypertrophic muscular dystrophy, but the clinical and histological features of this case were entirely different.

Complete fatty replacement of the soleus of one limb, discovered at post-mortem, was described by Barnes (1932) in a member of a family showing a hereditary myopathy. Weaver and Maun (1942) described a case in which, during post-mortem dissection, the gastrocnemius and soleus on one side were found to have been completely replaced by fat. This was unsuspected during life. Both these patients died of cardiac disease with oedema of the extremities, and it is interesting to note that my patient stated that the swelling of the calf at first came on only towards the end of the day, suggesting that a peripheral oedema, not uncommon after poliomyelitis, may have preceded the permanent deposition of fat.

The other feature of this patient's condition—the diabetes—is also interesting, for in the knowledge that fat deposits in internal organs are commonly associated with diabetes (Goldzieher, 1927), and that high lipaemia is a phenomenon of the severe disease, it is tempting to associate the two conditions in this case.

I wish to thank Professor P. C. P. Cloake for permission to publish this case and for invaluable criticism.

EDWIN R. BICKERSTAFF, M.D., M.R.C.P.,
Senior Registrar, Neurological Unit,
United Birmingham Hospitals.

REFERENCES

Barnes, S. (1932). *Brain*, **55**, 1.
Goldzieher, M. (1927). *Virchows Arch.*, **263**, 769.
Vulpian, A. (1870). *Arch. Physiol. norm. path.*, **3**, 316.
Weaver, H. M., and Maun, M. E. (1942). *J. Mich. med. Soc.*, **41**, 1060.

Nearly 15% of the Fijian population is affected by filariasis, according to a report just issued by the Filariasis Control Division in Suva, Fiji, after a five-year investigation. Blood samples were taken from 61,967 Fijians, or nearly 81% of the inhabitants of 1,150 villages. Results showed that 14.84% of those tested had microfilaria in the blood stream. In males the percentage was 18.23; in females 11.37. The difference may be due to the fact that the clothing worn by men leaves more of the body exposed to mosquito bites. Filariasis is carried in Fiji by a species of mosquito which bites during the day-time. It shelters in long grass or bush, and its flight range is limited to a maximum of 150 yards. The control methods, therefore, are to destroy all possible breeding-places, clear villages of all possible shelter, and then clear all bush in a belt 100 yards wide round each village. These methods are simple, but they require continuous community team-work among the villagers, which is not always easy to obtain. Next year the Filariasis Control Division will make blood tests in selected areas where the control methods have been in force for five years, with the object of finding out how effective this control has been. It is also intended to experiment with other methods of control, including the mass use of the drug "hetrazan," the spraying of villages with D.D.T., and a combination of these with the existing method.

Reviews

X-RAY DIAGNOSIS

A Textbook of X-ray Diagnosis. By British authors. Volumes 3 and 4. Second edition. Edited by S. Cochrane Shanks, M.D., and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E. (Volume 3, pp. 830; 694 illustrations. £3 10s. Volume 4, pp. 592; 553 illustrations. £3.) London: H. K. Lewis and Co. 1950.

The immense advances made by medical science in the last 30 years are such that only by team work can their fruits be fully gathered. In no branches is this more certain than in radiology and surgery, and it is only by the close co-ordination of the surgeon and the radiologist that either can succeed. The modern radiologist must have a full appreciation of the problems confronting the surgeon and of the attempts which he makes at their solution, while the surgeon must understand fully the assistance which the radiologist can afford him and the great advances which his art has made. It is one of the most remarkable features of these volumes that these axioms have been fully grasped; as a result they may be read with equal pleasure and profit by either the radiologist or the surgeon.

Throughout the work another principle of the greatest value has been followed. In each section a short though precise anatomical description has been given, illustrated by radiographs of normal anatomy, of the region concerned. It is only after this substantial foundation that abnormalities are described, with illustrations so clear that no doubt can arise about their nature. Moreover, in every case a brief account is given of the surgical procedures required, and the picture is completed by *x*-ray photographs which show the results achieved.

Volume 3 covers a wide field; it includes discussion of the whole alimentary tract, the abdomen, the urinary tract, and obstetrics and gynaecology. Most of the account of the alimentary tract is by Cochrane Shanks, and it is a masterly achievement. The normal stomach and the abnormal conditions which may occur are illustrated by admirable radiographs, and the same course is followed with great skill in the case of the duodenum. This is followed by one of the most important chapters in the volume, describing and illustrating the results of the various surgical procedures which have been adopted. We cannot imagine any account which could be read with more interest by an abdominal surgeon, or one from which he would derive information of greater value. The chapter on the diaphragm is indeed a great achievement, for it gives a complete epitome of what is known on this difficult subject. The developmental anatomy is briefly but accurately described and is so admirably illustrated by diagrams and radiographs that it can be clearly understood. The whole article attains a high scientific level, and the research involved is indicated by the complete bibliography which is attached.

The biliary tract is discussed by Peter Kerley and illustrated by superb examples of radiography. The precise information given on how these are obtained will be welcomed by every worker in this field. Kemp Harper contributes an article on the liver, spleen, and pancreas, with excellent illustrations of the difficult problems involved.

The urinary tract is discussed by Cochrane Shanks and Johnstone and reaches the same high level as the rest of the volume. The account of the precise details of the various procedures required for the successful performance of urography, which is followed by a discussion of the difficulties, will be of value to surgeons as well as radiologists, and both will envy the superb results which are here so admirably illustrated.

The great advances of radiology in obstetrics during the last 20 years are admirably described by Rohan Williams. He gives a clear and fascinating account of a field of research which must have an important influence on the future of the art of obstetrics and assist in its further advance as an exact science. The difficult subject of *x*-ray pelvimetry is made clear by excellent diagrams, while perfect radiographs, some demonstrating the placental site and some showing the actual process of labour, suggest the possibilities of the future.

Volume 4 is on the bones and joints and follows the lines we have already indicated. The many and perfect radiographs show clearly every abnormality, whether from injury or disease, with which the surgeon is likely to meet. Two articles, however, call for special mention. The first is by Baker on the general pathology of bone. He not only gives a clear description of the normal growth and structure of bone but describes with equal clarity the complex processes by which bone is absorbed and replaced. The second is an article by Hunter and Jupe on the constitutional diseases of bones and joints. They describe fully the disturbances of growth, nutrition, metabolism, and of the endocrine glands, giving a clear account of a most complex and important subject. Both articles are on a high scientific level and elucidate many problems in connexion with the skeletal system. Their inclusion in this volume adds greatly to its value.

The editors and the many contributors to these volumes are to be congratulated on a really superb achievement.

HENRY SOUTTAR.

POCKET-BOOK OF OSTEOLOGY

Osteology for Dissectors. A Tutorial Pocketbook. By Robert King Howat, M.B., C.M.(Glas.), F.R.C.S.(Eng.), F.R.F.P.&S.(Glas.). (Pp. 292; 46 illustrations. 15s.) London: Henry Kimpton. 1950.

This booklet is described as "an attempt to meet a desire for notes on osteology that can be used conveniently in the dissecting room as well as at home." It is doubtful whether such a desire really exists or, if it does, to what extent the present work will meet it. Mr. Howat's book, both in style and in content, is essentially a rough compilation of tutorial notes. In notes of this short compass there must inevitably be a number of omissions, many of which have been judiciously made. One would have thought, however, in view of the emphasis placed on the clinical applications of anatomy, that the nucleus pulposus might at least have been mentioned in describing the articulations between the vertebral bodies.

There is room for considerable improvement in the diagrams. Most teachers of anatomy endeavour to simplify their diagrams so that they may be the more readily understood and learnt by students, and within limits it is a matter of personal taste how far such simplification should proceed. It is astonishing how informative the simplest of line diagrams can be, but the diagram must bear a reasonable resemblance to the original. Some of the diagrams in the present work have been over-schematized to the point of being misleading or unrecognizable—for example, Figs. 1, 3, and 26. It is perhaps only fair to add that Mr. Howat does not stand alone in this respect, and that the practice of making anatomical diagrams too diagrammatic has grown increasingly in recent years.

J. M. YOFFEY.

THE SENSITIVE NOSE

The Nose: An Experimental Study of Reactions Within the Nose in Human Subjects During Varying Life Experiences. By T. H. Holmes, M.D., and others. (Pp. 154; 37 figures. 32s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

In this carefully documented book the authors correlate the effects of environment and social factors with the reaction of the nasal mucous membrane. Rhinologists have long realized that sneezing, nasal engorgement, and excessive secretion, three factors in the entity known as vasomotor rhinitis or spasmodic rhinorrhoea, while often a response to a specific irritant, are nearly always associated with an unstable emotional background.

In this work the facts are established beyond dispute by a meticulous clinical examination of the nasal mucosa carried out concomitantly with an analysis of mental conflicts in a wide variety of people. While in many people placed in situations of conflict there is but little change in the nasal mucosa, it is convincingly established that in the susceptible the same emotional situations tend to give rise to the same physical reactions over and over again; and in unresolved and chronic cases these reactions may become an irreversible pathological state. The same team of research workers performed a similar survey on the effects of emotional disturbances on gastric mucosa, and in one case with a large gastric fistula it was possible to correlate the nasal reactions also. The findings were significantly parallel.

It is suggested that the occlusion of the nasal passages which occurs is a manifestation of a desire to shut out noxious or harmful influences and its relationship to such varying conditions as "specific threats to respiratory apparatus; general threats to bodily integrity; home environment; relations to siblings; fear, anger, hostility, and resentment; sexual function, menstruation, and pregnancy." While it is not implied that all nasal disease stems from difficulties in interpersonal and social adjustment, nevertheless they occupy a position of importance and may modify the course of morbid processes.

No suggestions are made about treatment, but the conclusion is inescapable that the salvation of many must depend, if not on psychiatry, at least on the good offices of social welfare workers. This is a good piece of work which greatly needed to be done.

F. C. W. CAPPS.

MEDICINE IN GERMANY

Lehrbuch der Inneren Medizin. By H. Assmann and others. Edited by H. Schwiegk and A. Jores. Volumes I and II. (Pp. 1,984; illustrated. No price.) Berlin: Springer. 1949.

The new edition of this textbook has an interest transcending that of its intrinsic merits, for it is one of the first works of its kind to be published in post-war Germany. Thus it gives the reader a conspectus of authoritative German teaching which has been denied to him since 1939. In this respect the opening section, in which Professor Siebeck discusses such general notions as the aim of medicine, the nature of ill-health, and diagnosis, is of particular value. These topics are not mentioned in textbooks in the English language, and the problems they raise are unsuspected by many students.

Thereafter the book follows conventional systematic lines. It is remarkable both for the detail and for the wide range covered by its various contributors. The general discussions of such matters as infection, fever, immunity, and epidemiology by Professor Doerr are particularly noteworthy. The differences from comparable English textbooks are chiefly those of emphasis. Some of these may be traced to difficulty of supply; for instance, in the section on the general treatment of infective diseases, the antibiotics, of which only penicillin and streptomycin are mentioned, are accorded less space than the sulphonamides. In considering heart disease the approach remains that of the morbid anatomist, and the importance of aetiology is disregarded. Electrocardiography is treated superficially, and only limb leads are mentioned. No attempt is made to assess the value of streptomycin in pulmonary tuberculosis, although all other aspects of this disease are most adequately considered. Of the other sections, that by Professor Heilmeyer on blood diseases requires mention for its special excellence.

Such criticisms are only of minutiae. In the present edition this well-known textbook fully maintains its reputation and bears witness to the international character of latter-day medical practice. It can be warmly recommended to the English reader.

R. BODLEY SCOTT.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Techniques in British Surgery. Edited by R. Maingot, F.R.C.S. (Pp. 733. 75s.) London: Saunders. 1950.

Plastic and Reconstructive Surgery. By F. Smith, M.D., F.A.C.S. (Pp. 895. 75s.) London: Saunders. 1950.

Faith Healing and Healing Methods Founded Thereon. By M. Shipsey, M.B., B.Ch. (Pp. 123. 10s. 6d.) Birmingham: Michael Shipsey. 1950.

Tuberculosis Control in a British Colony. By V. Hetreed, M.B., B.S. (Pp. 50. 7s. 6d.) London: National Association for the Prevention of Tuberculosis. 1950.

The Four Pillars of Wisdom. By Sir Sheldon F. Dudley, K.C.B., F.R.S. (Pp. 246. 8s. 6d.) London: Watts and Company. 1950.

Emergencies of Childhood. By R. Gamlin, M.A., M.B., B.Ch., M.R.C.S., L.R.C.P., M.H., D.P.H. (Pp. 64. 6s.) London: James Nisbet. 1950.

The Psychology of Inteligence. By J. Piaget, D.Sc. (Pp. 182. 15s.) London: Routledge and Kegan Paul. 1950.

A Textbook of Gynecology. By A. H. Curtis, M.D., and J. W. Huffman, M.D. 6th ed. (Pp. 799. 50s.) London and Philadelphia: W. B. Saunders Company. 1950.

Medical Diagnosis: Applied Physical Diagnosis. Edited by R. L. Pullen, M.D., F.A.C.P. 2nd ed. (Pp 1,119. 63s.) London and Philadelphia: W. B. Saunders Company. 1950.

Les Frottis Vaginaux et Cervicaux. By J. P. Pundel. (Pp. 350. 2,000 francs.) Paris: Masson. 1950.

Thérapeutiques Cardiologiques Internationales. By C. Lian. (Pp. 167. No price.) Paris: L'Expansion Scientifique Française. 1950.

Werdnig-Hoffmann's Infantile Progressive Muscular Atrophy By S. Brandt. (Pp. 328. 20 Danish kronen.) Copenhagen: Ejnar Munksgaard. 1950.

Grundriss der chemischen Physiologie. By F. N. Schulz. (Pp. 234. M. 7.50.) Jena: Gustav Fischer. 1950.

Wesen und Herkunft endogener Pigmente. By B. Oebike. (Pp. 92. M. 10.80.) Jena: Gustav Fischer. 1950.

Grundsätzliches zur Diabetestherapie. By F. Bertram. (Pp. 40. M. 1.) Stuttgart: Georg Thieme. 1950.

Lehrbuch der Röntgendiagnostik. By H. R. Schinz and others 5th ed. (Pp. 878. M. 70.) Stuttgart: Georg Thieme. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY SEPTEMBER 16 1950

A SECRET REMEDY FOR CANCER

A weekly with a large popular circulation, *Picture Post*, has recently thought fit to champion a cancer treatment practised by a Mr. D. Rees Evans and to demand a full official trial, which they say has hitherto been refused. In furtherance of this aim they have circulated to certain scientific bodies a record containing case histories and experiments on which their claim is based, together with some account of the treatment. The evidence in favour of the treatment has been compiled by Mr. D. W. Morley, a biologist with no medical training, who has previously done research on the habits of ants and has been for some months a scientific journalist. Rees Evans, "having no scientific training himself . . . was unable to undertake any research on his own behalf. Such research has now at last been undertaken in the U.S.A." Sixteen cases of cancer were made available to him for treatment in the Presbyterian Hospital, Newark, N.J. According to Mr. Morley, Mr. Evans went to the U.S.A. "to obtain the test of his methods of treatment which he had failed to get in Britain. . . ." And Mr. Morley, in the record referred to, stresses the American work "because it is the most detailed, both in records of treatment and methods of diagnosis." Mr. Morley, acting as a sort of scientific compère for Mr. Evans, evidently sets great store by the American experiment: "discussion of the English cases is of necessity less detailed . . . [partly] because in many of the cases the diagnosis is less certain." The Presbyterian Hospital is officially recognized by the American College of Surgeons and by the Council on Medical Education and Hospitals. It is evidently, as our friends in the U.S.A. say, in "good standing." To learn if any further light could be thrown on Mr. Evans and his treatment we asked for information and received this cable in reply from the "Tumor Therapy Committee" which sponsored the investigation (periods inserted):

> "Work entirely experimental. No definitive results obtained. Evans statement unwarranted and unauthorized. No results to be published. Would disavow all unproven claims by Evans."

The Tumor Therapy Committee evidently refused to go any further with the trial of Mr. Evans's treatment unless he agreed to divulge the composition of his drug or drugs to the Food and Drug Investigation and to one or more members of the committee "so that clinical evaluation of Mr. Rees Evans's preparations and method of treatment can be carried out ethically in accordance with the usual procedures of the leading scientific and medical societies of this country. . . ." Mr. Evans, it appears, thereupon returned to England—and to *Picture Post*, which took upon itself to present to the British public evidence on his behalf, resorting to the startling device of beginning its article on the cover of the magazine.

No doubt the exponents of Mr. Evans's treatment are acting in all sincerity. No doubt the Editor of *Picture Post* sees himself as the champion of the unorthodox and as a bold innovator in the history of scientific journalism. No doubt it would be only human on his part to appreciate the publicity value for his magazine of this strange incursion into the complicated and baffling nature of the treatment of a disease which claims an ever-increasing number of victims in an ageing population. No doubt, too, unfortunately, the hopes of many sufferers will be tragically raised that here at last is something which will cure cancer. It is true the caution is uttered that "this is not . . . a general 'cancer cure.' This is a treatment which—we claim—has achieved success over a period of years in certain cancer cases, when carried out by a particular person." But the untutored reader will be heavily influenced by the peculiar evidence of the photographs. In treating in this manner such a difficult question *Picture Post* has done a grave disservice to science and to the British public.

What is the evidence thus presented in all the glare of modern journalistic presentation? Mr. Evans, in investigating whose work *Picture Post* "has spent thousands of pounds," went to the U.S.A. in November, 1949, and returned in May, 1950. During this time he treated sixteen cases of cancer. Of these sixteen patients four died, and three others were regarded as unsatisfactory for other reasons. It is claimed that the remaining nine "were completely cured," but one of these was "believed" to have developed metastases since the completion of the treatment and is dead—according to Mr. Morley from pneumonia. A second cable from the Tumor Committee in America informs us that another patient for whom partial success in treatment is claimed is now dying; also that no biopsies were obtained in three patients said to be cured, though it is claimed in the *Picture Post* records that biopsy was obtained in two of these. Much is made in this magazine of the so-called cure obtained in the case of Rousch (spelt Rauch on the same page). The cable from America informs us that "Rausch skin cancer now requires surgery kidney mass": is this the same mass described in *Picture Post* as "white kidney stones"?

It is difficult to understand how Mr. Morley can state on one page of *Picture Post* that "nine cases were completely cured," and on the opposite page write this: "As these cases in America were treated within the past twelve months it cannot be established that they will not suffer from a return of the disease." In the light of this second, and accurate, statement the first is dangerous nonsense.

Mr. Evans inherited his therapeutic armamentarium from his uncle and father, David and John Evans. In 1907 another journalist, Mr. W. T. Stead, took up the cudgels on behalf of what was known as the Cardigan Cancer Cure and against the medical profession. The pretentiousness of these claims was exposed in these columns at that time.[1] A year later, in 1908, Mr. Lynn Thomas described a case of cancer of the breast "cured" by Mr. John Evans, who had then come under his, Mr. Lynn Thomas's, care.[2] Mr. Thomas published photographs which showed extensive scar tissue at the site of the right breast, with cancerous ulceration. Another photograph showed the breast at the time of treatment by Mr. Evans—the surface converted into a mass of dark, necrotic tissue. This bears a very close resemblance to one of the photographs in *Picture Post* of a treated cancerous breast. Analysis of the necrotic tissue and of the fluid used by the Evans brothers in 1908 showed the presence of a high percentage of zinc chloride. The caustic effect of this has been exploited in many "cancer cures," often in the form of pastes. Mr. Rees Evans claims to have improved on his father's remedies, but the *Picture Post* photographs strongly suggest that whatever is applied destroys the skin and the breast tissue immediately under it. As Mr. Evans has so far refused to disclose the constituents of his remedies, it would be legitimate to suppose that its principal ingredient is zinc chloride—the favourite prescription of many self-dubbed cancer-curers of the past and present in Mr. Evans's father's remedy. But information in the second cable from the Tumor Therapy Committee suggests there may be something else as well. We give the information as received (periods inserted).

> "Patients exhibited effects colchicine. Although nature drug not known pharmacologist chemists agree possibly some form colchicine orally. Mixture colchicine plant material plus acid possibly tannic to skin. Several patients exhibited gastrointestinal symptoms cerebral disorientation convulsions local muscular spasms and severe pain."

Mr. Evans had the opportunity of submitting his treatment to authoritative investigation in 1923, when he appeared before a Ministry of Health Cancer Committee. He refused to disclose the nature of his remedy. He refuses in 1950 to reveal his secrets to the U.S.A. Food and Drug Administration.

Advertising of cancer cures is now illegal, but are the articles in the last two issues of *Picture Post* very different in effect from an elaborate form of advertisement for a secret remedy and Mr. Rees Evans?

We can but repeat what was written in these columns in 1908: "'Cancer curing' is to our mind the most execrable of all forms of quackery, for, in addition to the bitterness of disappointed hope, it inflicts an incalculable amount of unnecessary suffering."

[1] *British Medical Journal*, March 23, 1907.
[2] Ibid., December 5, 1908.

POLIOMYELITIS AND THE COMMUNITY

The risk of contracting poliomyelitis in its paralytic form is, even in a sharp epidemic, far less than it is popularly imagined to be. The publicity given to an outbreak is useful in at least one way, for it leads the doctor to consider poliomyelitis as a possible diagnosis even if the symptoms are not typical. The greatest contribution which the doctor in practice can make to the prevention of paralysis in the individual is to diagnose the disease early and secure rest for the patient. A reminder of the diagnostic signs and symptoms was given by Dr. W. H. Kelleher in a recent Refresher Course article.[1] After the diagnosis of poliomyelitis has been made in a member of a family or community the doctor is often asked for advice on problems which arise. He will probably find it difficult to answer some of these questions because of the lack of precise information about how the disease spreads, and it is worth recalling the facts which are known about its epidemiology.

Poliomyelitis is caused by one of a group of viruses, and infection is mainly spread from person to person. Occasionally the patient is known to have been in contact with another patient who developed paralysis, and the time from the known contact to the onset of symptoms is usually between 7 and 14 days, though it may be shorter or longer. Sometimes the contact has been with a person who had only a mild illness with no signs of involvement of the central nervous system, but more frequently the source of infection is a healthy person who has been in contact with a case or who has visited an area in which cases were occurring. In such instances the line of spread of infection can be seen, but in many others no such direct or indirect contact can be established. It sometimes appears that there has been indirect contact with two or more carriers intervening between cases, as when the fathers of two patients meet at work or brothers or sisters from two affected families attend the same class in school. Evidence of person-to-person spread is also provided by the frequent observation that cases occur successively in different parts of a town or village and show a centrifugal or radial spread from the first focus. Even these indications of the line of spread of infection are sometimes lacking, and it may be necessary to postulate a number of initial foci and a whole series of carriers between cases in order to justify the concept of person-to-person transmission. Virus studies have shown that the infection tends to be widely distributed, for many of those in close contact with patients excrete the virus in their stools, as do a smaller number who have been in more casual contact and a few who have had no known contact with a case. Epidemiological studies have often shown a patchy distribution of foci of high incidence with areas of diminishing incidence surrounding them, and scattered, apparently sporadic, cases in the rest of the area.

[1] *British Medical Journal*, 1950, **2**, 570.

Outbreaks of poliomyelitis are usually fairly abrupt in onset: the majority of cases in a village or in part of a town where the incidence is high occur within four to six weeks. The spread of infection through the community is therefore quite rapid, and this also suggests a widespread carrier epidemic, since careful investigations as a rule yield no evidence of spread by mass contamination of food or drink. Spread by flies has been shown experimentally to be possible and may sometimes be the mode of infection, but person-to-person spread appears to be more important. The way in which infection is transferred has been the subject of debate between those who emphasize the importance of the presence of virus in the throat of carriers and of patients for a few days before and after the onset of symptoms and those who are impressed by the frequency with which the virus can be recovered from the stools of patients at the time of onset of illness and for four or more weeks afterwards. The conclusion to be drawn is that both pharyngeal secretions and faeces may be the source of infection, and that hands contaminated from either source may transmit infection either directly or indirectly. In a household where a case of poliomyelitis occurs it is therefore wise to assume that the other members, particularly children, are excreting the virus in their stools and to point out the need for careful personal hygiene. Some school medical officers recommend exclusion of brothers and sisters of a patient from a day school for three weeks, and "home and garden quarantine," or some approximation to it, of these children and of any pre-school children in the family may be advised. These precautions diminish the danger of spread from some sources of infection and are probably welcomed by other parents, but it is only in the early stages of an outbreak, before the virus is widespread, that they can appreciably diminish the total risk of infection in the community. No restrictions are usually placed on the adult members of a family in which a case of poliomyelitis occurs, except when a medical officer of health has to guard against special dangers in the case of food-handlers and those whose occupation brings them into close contact with children. Quarantine may be advised for children outside the family who have been in close contact with the patient at the time of onset of illness, but the activities of other casual contacts of a case are not restricted. During an epidemic it is sound practice to discourage gatherings of people (particularly of children) who do not normally meet, but there should be a bias in favour of allowing the normal activities of the community to continue.

Closure of day schools or day nurseries is called for only if it is clear that spread of infection is still occurring by contact of children who come from widely separated homes and so would not meet if they did not come to school. It is sometimes wiser, even in such circumstances, to keep the children in school rather than to free them to play with other younger children in or near their homes. The opening of day schools has been postponed where cases have been occurring at the end of the holidays and where the mixing in school of children from affected and unaffected areas seems likely to lead to further dissemination of infection. In a boarding school parents are usually notified if a single case of paralytic poliomyelitis occurs, and school life continues with precautions to prevent the spread of infection and to bring under medical observation any case of suspicious illness. When several cases occur the alarm of the school authorities and the anxiety of the parents may lead to school closure, especially if many parents decide to withdraw their children. Dispersal is of course attended by the risk of disseminating the infection in the homes to which the pupils go, and it disrupts the term's work. It is seldom possible to be confident that dispersal is justified on the grounds that it diminishes the risk of paralysis to individuals.

WIDENING HORIZONS OF MEDICINE

The unification of ideas has been long pursued, yet with an elusive quality shown in side-steps to diversity whenever the framework provided has seemed too rigid. One such unification was in the Middle Ages, when empire and papacy stood as twin symbols which between them covered all human activity. The barriers were broken at the Renaissance, if not before; and men such as Linacre for medicine, Newton (on his own pinnacle) for physics, and Boyle for chemistry set out in their own times and ways to follow their separate roads, freed in

varying degree from preconception but with a lack of specialization which now would seem surprising. Specialization has grown since and abundantly. Yet in an age in which the holder of a chair of anatomy can express embarrassment at being called upon to speak in a physiology lecture theatre there is also evident a contrary tendency towards unification which, being based on knowledge rather than preconception, may prove more enduring than its predecessors. Professor J. Z. Young[1] can see similarities between the operation of memory in brains and calculating machines, and draw surprise from neither physicist nor physiologist at a meeting of the Royal Society—unless that his own researches should have so far made progress. Equally it was possible for Sir Harold Hartley, a physical chemist by training, in his Presidential Address to the British Association[2] on the broad theme of energy and man's use of it, to glance in passing at the human machine and note that "life is dynamic, and the slender thread on which it hangs is that ceaseless flow of energy." With the same broad approach the difference between the rusting of iron and the resistance of the living organism to decay is that the one is not dynamic and the other is. The one sinks to the lowest energy level, sooner or later, with the remorselessness of the Greek Fates; the other is held above it like "a ball of celluloid poised on a jet of water," keeping its place and spin so long as energy is supplied to maintain it.

That this dependence on energy expenditure for maintenance is no fanciful generalization was illustrated in the section of physiology, also at the British Association, when Dr. R. B. Fisher discussed the lining layer of the intestinal mucosa as "the one barrier across which all ingested foodstuffs must pass before they enter the body fluids." The relevance of this contribution is that the mucosa is seemingly no inert membrane across which this or that material may pass, as in the classical demonstration of osmotic pressure—with water finding its way from a weaker solution to a stronger as of its own volition. The operation of the mucosal layer seems rather to be that of a chemical pump, with the energy for its working supplied by its own quick metabolism. Glucose can pass from lumen to tissue fluid against the gradient of concentration: so to an engineer might a wheel coast uphill impossibly, unless energy were provided to counter the gradient. So, too, do water and probably fat pass the mucosal boundary. With protein, the supreme necessity, it seems "eminently reasonable" that the first step in protein absorption should be the synthesis of mucosal protein, and the second the breakdown of this, with the breakdown products passing into the tissue fluids. Here, surely, is the pump that lifts the water over the hill, to run under gravity in the succeeding stage—as planned on transatlantic scale through the operation of the Grand Coulée Dam in the U.S.A.

So the horizons of medicine are widening, as from this or that vantage-point—hillock, perhaps, rather than hill—the surrounding territory can be surveyed. Another such has been quoted lately by Professor W. T. Astbury[3] from the knowledge, given largely by his own researches, of the structures characteristic of long-chain molecules. To see a resemblance between material of human weaving and the cell wall of an alga, viewed at 10,000 magnification, might at one time have seemed fanciful only—a resemblance no more illuminating than the microscopist's trick which transforms a sheet of reasonably smooth metal into a corrugated and jagged landscape. But if the underlying architecture is found to be common, if the strands of the algal weave are of the same kind as the component fibres of rayon thread, if the comparison can fairly be extended to range from natural proteins to synthetic plastics—then the laugh is with the *x*-ray physicist and electron microscopist, for Professor Astbury is both, and not with those who would see no more in such a resemblance than a conjuring trick of magnification. "In its material aspect," Astbury states, "life is more than anything else a manifestation of the physics and chemistry of chain molecules." It is a necessary reservation that by "material" is meant "structural" and all that structure implies, including the ability to change from one variant to another and back again, as was first shown by Astbury for wool fibres.

For the energetics of living organisms it is necessary to turn to those sciences which deal with energy considerations, as Sir Harold Hartley has graphically illustrated. To illuminate mechanisms it may be helpful in some connexions to look, with Professor Young, at the devices of the electronic engineer, although with the biologist's reservation that no calculating machine has yet been designed which is self-modifying in the light of experience. The principle remains good—that with the growth of knowledge in one field it becomes possible to see valid resemblances with events in others. In the two last of these examples the resemblance is experimental and liable to modification or qualification from further knowledge. In Sir Harold's it is fundamental, provided that the same answer as his is given to a question asked by Gilbert Lewis—whether in living organisms Nature obeyed her laws of energy. "This we may never know for certain, but the presumption is—she does." So when the mucosal layer of the intestine is found to act as a chemical pump, when the same deduction is reported, as lately by Dent and others,[4] of the role of the placenta in foetal nutrition, the response of the biochemist is to look with renewed interest for the mechanisms by which energy is made available—and the celluloid ball balanced, spinning, on the water-jet.

[1] *British Medical Journal*, 1950, **2**, 94.
[2] *Nature, Lond.*, 1950, **166**, 368.
[3] *Times Survey of the Progress of Science*, August, 1950, p. 3.
[4] *Biochem. J.*, 1950, **47**, 223.

SWEAT AND ADRENAL FUNCTION

During recent years advances in clinical endocrinology have been due largely to the development of more accurate methods for determining the activity of the patient's endocrine glands. Often only indirect methods are available—for example, the metabolism of radioactive iodine as an index of thyroid function—but in some instances the amount of hormone secreted by a particular gland can be measured by chemical or biological methods. The adrenal cortex secretes three main types of hormone, which are classified according to their chief physiological effect. Steroids with sex hormone activity can be measured by estimating the urinary excretion of 17-ketosteroids in the case of androgenic substances, and of oestrogens in the case of oestrogenic substances. Steroids which affect protein and carbohydrate metabolism can be measured by estimating the urinary excretion of 11-oxysteroids. An indirect method of assessing 11-oxysteroid production is to measure the fall in circulating eosinophils which normally occurs when the adrenal is stimulated by a test dose of A.C.T.H. or adrenaline. Other more indirect evidence of oxysteroid production may be obtained from the glucose- and the insulin-tolerance tests. The third main type of steroid secreted by the adrenal cortex is concerned with sodium, potassium, and chloride metabolism. An example of this type is the synthetically prepared desoxycorticosterone (D.C.A.). There is little evidence that this particular steroid is actually formed by the adrenal, but hormones which exert their main effect on electrolyte metabolism are often called the D.C.A.-like, desoxy-like, salt-active, or salt-retaining corticosteroids. At the present time no satisfactory chemical or biological method has been devised for measuring the urinary excretion of desoxy-like steroids. It is well known that many of the manifestations of Addison's disease are due to a deficiency of this type of hormone. The tests of Power and his colleagues[1-3] are used to reveal adrenal hypofunction, but they are influenced by a deficiency of other substances besides the D.C.A.-like hormone.

During the last few years Conn and his colleagues have reported a number of observations which suggest that the concentration of salt in the sweat bears a close relationship to the desoxy-like steroid production of the adrenals.[4 5] While studying the electrolyte metabolism of men subjected to humid heat, Conn confirmed previous findings that the concentration of salt in the sweat was reduced. Thus a man excreting 8 litres of sweat a day would lose 32 g. of salt before acclimatization, whereas he lost only 10–13 g. when fully acclimatized. This 60–70% reduction in salt loss from the skin was associated at first with a parallel conservation of salt by the kidneys; but the renal retention of salt was not sustained, whereas the excretion from the skin continued at a low level for as long as the subject remained in the heat. It seemed probable that this salt-conserving phenomenon was due to increased formation of D.C.A.-like hormone. The process of acclimatization was also associated with a negative nitrogen balance which persisted for 2–4 weeks and was independent of the nitrogen intake. This could be attributed to increased secretion of 11-oxysteroids. Thus Conn proposed that increased adrenal activity, as shown by a greater secretion of desoxy-like and 11-oxysteroids, was part of the process of acclimatization, and that the adrenals were stimulated by increased secretion of A.C.T.H. from the pituitary. He was able to show that injections of A.C.T.H. caused similar metabolic changes to those observed during acclimatization—namely, a reduction in the salt content of the sweat and a negative nitrogen balance. Injections of D.C.A. also reduced the salt content of the sweat, but as would be expected there was no disturbance of nitrogen metabolism.[6 7]

Conn then turned to pathological conditions in which there was a disturbance of adrenal function.[8] In Addison's disease the salt content of the sweat was greatly increased above the values found in normal subjects. Two patients with chronic adrenal insufficiency had 105 milliequivalents of chloride per litre of sweat, whereas the range in controls was 15–60 mEq. per litre. Treatment with D.C.A. reduced the salt loss nearly to normal. In three patients with panhypopituitarism the values were 70–75 mEq. per litre, indicating a deficiency of D.C.A.-like steroids not as great as in Addison's disease. In patients with Cushing's syndrome, whether associated with adrenal carcinoma or hyperplasia, increased steroid production was shown by a marked reduction in the salt content of the sweat. These studies indicate that the salt content of sweat collected under standard conditions may prove a reliable index of endogenous salt-active corticosteroid production. Unfortunately the collection of samples of sweat under conditions in which the body is exposed for two hours to a temperature of 95° F. (35° C.) and a relative humidity of 90% is not a practical proposition. Perhaps the originators of this sweat test will be able to evolve a method more suitable for use in the clinical laboratory.

[1] Robinson, F. J., Power, M. H., and Kepler, E. J., *Proc. Mayo Clin.*, 1941, **16**, 577.
[2] Levy, M. S., Power, M. H., and Kepler, E. J., *J. clin. Endocrinol.*, 1946, **6**, 607.
[3] Cutler, H. H., Power, M. H., and Wilder, R. M., *J. Amer. med. Ass.*, 1938, **111**, 117.
[4] *J. clin. Endocrinol.*, 1950, **10**, 12.
[5] *J. clin. Invest.*, 1948, **27**, 529.
[6] Ibid., 1946, **25**, 912.
[7] *Advances in Internal Medicine*, 1949, London, vol. 3, p. 373.
[8] *Arch. Intern. Med.*, 1949, **83**, 416.

ELECTROENCEPHALOGRAPHIC CONTROL OF ANAESTHESIA

The effect of anaesthetic drugs on the output of electrical energy by the brain cortex has been studied by Bickford[1] in the laboratory of electroencephalography at the Mayo Foundation. He found a constant relationship between the depth of anaesthesia and the output of electrical energy, and was able to devise an apparatus for the automatic electroencephalographic control of dosage in general anaesthesia. The fluctuating brain potentials are amplified and made to charge a condenser, the rate of charge being proportional to the number and amplitude of the waves in a given time. At a predetermined voltage the condenser discharges, actuating a relay which pushes forward by a small amount the plunger of a syringe delivering thiopentone or any other anaesthetic agent into the patient's vein or into a vaporizer. The rate of injection is therefore dependent on the amount of cerebral electrical activity, and anaesthesia can be steadily maintained at a depth which may be varied by controlling the gain of the amplifier.

The device has been used for barbiturate and ether anaesthesia in the rabbit, cat, and monkey and also in man.

[1] *Electroenceph. clin. Neurophysiol.*, 1950, **2**, 93.

Anaesthesia has been maintained automatically in animals "on many occasions . . . for periods as long as two or three days without any readjustment of the circuit controls." Bickford stated that a modified version of the apparatus adapted for the prolonged administration of ether to human patients has been used successfully in the operating theatre, and he proposes to publish later a full description of the technique.

SYPHILIS AND YAWS IN HAITI

Haiti, or Hispaniola as it was formerly known, looms large in the history of syphilis, for it was to or from this island, or perhaps both, that Christopher Columbus and his men conveyed syphilis on their return to Spain at the end of the fifteenth century. Both syphilis and gonorrhoea are common among the Haitians, affecting perhaps 25% of the population, but it is yaws—a para-venereal disease closely akin to syphilis, which is said to have an incidence of 85% among all the inhabitants and 75% among children under 15 years of age—which causes the greatest amount of disability; this it does by attacking mainly the skin and bones. An ambitious scheme to eradicate all three diseases from the island is under way, sponsored by the World Health Organization and the United Nations International Children's Emergency Fund.[1] Fortunately penicillin is effective against all these diseases, so that theoretically it should be possible to eliminate them within the two years allotted. There are, however, several practical difficulties: the cost will be high, but Unicef is putting up 320,000 dollars for the purchase of supplies and the Haitian government will provide 290,000 dollars a year for running expenses. The area to be covered is large—10,714 square miles—and many of the 3½ million inhabitants live in out-of-the-way places, some of which doctors will be able to reach only by travelling on foot or horseback. It may be difficult to impress the more backward and illiterate inhabitants with the objects of the campaign, but the help of local newspapers, police, and priests is being sought, and it is believed that the population will co-operate, particularly when they see the almost magical results of treatment. For administrative purposes the island will be divided into geographical areas, and 10 mobile treatment units, consisting of teams of four travelling in "jeeps," will each be allotted an area. The physicians will mostly come from other countries, since there are only about 300 medical practitioners on the island, and only 26 to look after the rural population of 2½ millions,[2] but the auxiliary staff will mainly be Haitians. The campaign will be carried out in three stages: mass diagnosis and treatment; establishment of permanent treatment dispensaries at strategic points from which mobile squads will work so as to reach all areas; and the organization of a system of case-finding and home-treatment. The proposal is to give two doses of penicillin separated by an interval of 10 or 12 hours. Whether this will bring about biological cure in anything approaching 100% of cases remains to be seen, but it should at least render patients non-contagious.

The undertaking is an immense one, probably the largest anti-venereal-disease campaign ever launched. The results may be expected to be good, but history has few if any records of a widespread disease being completely eradicated by treatment alone. Nevertheless, this project offers a valuable opportunity to study a disease such as yaws, about which so little is known. Specimens of the causative organism are to be sent to Professor T. B. Turner at the Johns Hopkins Hospital at Baltimore, so that the relationship between *Treponema pertenue* and *Treponema pallidum*—the causative organisms of yaws and syphilis respectively—can be examined. Hitherto these two organisms have been morphologically indistinguishable, but it may be that their immunological reactions differ. Perhaps an answer will at last be found to the question, "Are yaws and syphilis two diseases or one?"

[1] Guthe, T., *J. Soc. Hyg.*, 1950, **36**, 6.
[2] *Chron. World Hlth Org.*, 1950, **4**, 87.

THE DOCTOR AS A PUBLIC SPEAKER

One accomplishment which the prospective doctor should seek after, and which need not add to the burden of the curriculum, is the ability to speak in public—to give clear and succinct expression to his ideas in a company of his fellows. He will probably find it easiest to acquire this ability in a debating society or similar body, for it is more a matter of cultivation than of natural endowment. The level of public speaking in the medical profession is lower than in the professions of law and teaching and in the Church and the Civil Service. It is below the level which used to obtain in medical societies, whose old members, accustomed as they were to deliberate speech, with a slight polish on it, would be aghast at the slovenliness prevailing to-day. There are outstanding exceptions, but in general the standard of speaking in medical assemblies—scientific, business, or social—has deteriorated. Discussions are casual and conversational, speech is slipshod, articulation is disregarded. It is a refreshment to find a speaker who has not only something to say but a way of saying it, a sense of phrase and structure, with sentences that do not lose their way in parenthesis.

In Plutarch's *Lives* it is told of Demosthenes that he claimed he was a good member of the democratic State because he always came prepared to the rostrum; he held that such preparation was a mark of respect to the people he addressed. The medical profession does not need a Demosthenes; but some preparation before speaking, some attention to form, is, after all, a courtesy to the audience, as well as a way of impressing the speaker's ideas not only upon others but upon his own mind. This is not the unimportant frill that some may suppose. The doctor, especially in a small community, will probably be called upon to take a lead in public affairs, which will bring him occasionally to the platform. He may also be expected to take a part in the meetings of his profession, and the ability to put his points so that they can be comprehended by the slower-witted and the partially deaf will be a recommendation. From time to time he will go into the witness-box, and in court a habit of clear statement will serve him well. It is the young doctors and research workers, full of knowledge of their subject, who should be particularly on guard against incoherence. Some of the older men, brought up in a different tradition, are less prone to be glib and diffuse—both more audible and more comprehensible. Their example is one which the eager young speaker should follow.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CHEMOTHERAPY—III. STREPTOMYCIN

BY

LAWRENCE P. GARROD, M.D., F.R.C.P

Bacteriologist, St. Bartholomew's Hospital; Professor of Bacteriology, University of London

Streptomycin was the first successful product of the world-wide search for further antibiotics with chemotherapeutic powers following the demonstration of these properties in penicillin. It is formed by a soil fungus, *Streptomyces griseus*, and is of more complex chemical structure than penicillin. It is basic in nature, and the compounds which have been used in therapeutics are the hydrochloride, sulphate, and calcium chloride complex. More recently a slightly modified form, dihydrostreptomycin, has been introduced, for which it is claimed that toxic effects are less often produced when administration has to be prolonged.

Administration

When streptomycin is given by mouth its behaviour is entirely different from that of penicillin: it is not destroyed, but neither is it absorbed. Hence this route is indicated only in order to produce an effect in the intestinal tract itself. To obtain a systemic effect, streptomycin must be given, like penicillin, by intramuscular injection. Absorption after injection is somewhat slower, as also is excretion: following a single full dose—for example, of 1 g.—the drug can be detected in the blood for eight hours or more. It reaches all important areas in the body except the cerebrospinal fluid; like penicillin, it has to be injected intrathecally for the treatment of meningitis. It is excreted by the kidney, and thus attains a high concentration in the urine.

Dosage varies within much narrower limits than that of penicillin, because streptomycin is by no means free from toxicity. A daily dose of 4 g. has rarely been exceeded, and for long-continued treatment it is now more commonly 1 g. How many doses are given daily depends on the condition being treated. Tuberculosis is a special case, since a single daily dose (or injections at even longer intervals than one day) is used in treating this disease. On the other hand, the short-term treatment of an acute infection is usually accomplished by giving two, three, or four daily doses. It cannot be said that the best system for this kind of purpose has yet been defined by any deliberate comparison.

Mode of Action

Streptomycin is actively bactericidal. There is no optimum concentration for this effect, as with penicillin: the higher the concentration, the more rapidly are bacteria killed. The equivalent of that attainable in the urine will in a nutritive medium *in vitro* markedly reduce a susceptible bacterial population in a few minutes and extinguish it within an hour. The lower concentrations reached in the blood and tissues cannot act so rapidly, but there is no reason to assume any qualitative difference in the effects produced there.

If this were all that need be said about the action of streptomycin on bacteria, it would be a most remarkable drug and much more regularly successful than in fact it actually is. Its disadvantage is that bacteria can acquire a high degree of resistance to it with extraordinary rapidity. This is of such a degree that further treatment is futile, and it has often been observed within 24 hours of the beginning of treatment, though its appearance may be delayed rather longer than this. The change is also permanent. It follows that in many cases only a single course of treatment can be given: either this succeeds, the infection being totally eradicated, or further treatment is precluded by acquired bacterial resistance. This is sometimes accompanied by "dependence"—the existence in the bacterial population of some cells which actually utilize streptomycin as a nutrient and cannot grow without it.

A sensible conclusion from these facts would seem to be that treatment should be brief and vigorous, allowing the least possible opportunity for bacterial recovery. This policy would require that the drug concentration in the blood and tissues be well maintained, and thus would call for frequent administration.

The time needed for tubercle bacilli to acquire resistance corresponds with their much slower growth, and is at least five weeks. Systems of dosage different from those applicable in other conditions have been found advisable for treating tuberculosis.

Toxic Effects

In patients with impaired renal function, streptomycin may accumulate in the body and has occasionally thus caused death. The only serious common toxic effect is on the eighth nerve, vestibular disturbances (vertigo and incoordination) being produced first, and deafness in more severe cases. Either effect may be permanent, but some degree of recovery occurs in more mildly affected patients.

These changes are never produced by any ordinary doses given only for a short period, such as a week. They are the product of long-term treatment, and their frequency and severity are then directly proportional to the dose: if this does not exceed 20 mg. per kg. daily no permanent damage will result. Intrathecal injections are particularly apt to have these effects. It is claimed for dihydrostreptomycin that it is much less apt to produce them, but this claim has not been fully borne out in recent experience.

Indications

Penicillin being the perfect chemotherapeutic agent, there is no need for any other except in infections insensitive to it. There are unfortunately many such, but each new discovery is effective against some of them. Streptomycin began this process by subtracting from the list infections due to the tubercle bacillus and to a number of Gram-negative bacilli. A satisfactory table of species classified according to their sensitivity to streptomycin cannot be prepared because strain variation in sensitivity is so marked. It must suffice to say that *Mycobacterium tuberculosis*, unless it has had previous contact with streptomycin, is uniformly and highly sensitive, being inhibited by not more than 0.2 μg. per ml.; that almost all species of Gram-negative bacilli are also sensitive, but to concentrations varying from as little as 0.1 to as much as 25 μg. per ml. or more; and that most penicillin-sensitive organisms, such as streptococci and staphylococci, are usually also sensitive to streptomycin, though to a less degree.

The main clinical indications for streptomycin are therefore tuberculosis, various infections due to Gram-negative

bacilli, and occasionally coccal infections if they are abnormally penicillin-resistant. The latter are usually much better controlled by "aureomycin," if this is obtainable.

Tuberculosis

This is no place to discuss in detail the indications for streptomycin in various forms of this disease or the systems of dosage advisable. At the risk of seeming to belittle the functions of general practice, it has to be said that the decision to undertake this treatment is one in which the expert should usually have a say, while the conduct of the treatment itself may be difficult outside a hospital or sanatorium.

Streptomycin is of course imperatively indicated in otherwise fatal forms of the disease—in miliary tuberculosis and meningitis. It has been strikingly successful in rapidly extending lung infections and in ulcerative tracheobronchitis. Its place in the treatment of more chronic disease, whether of the lung or elsewhere, is much more dependent on the features of the individual case and on the possibilities of combined surgical treatment.

Tubercle bacilli cannot be successfully attacked either in a cavity in the lung or in a large caseous focus in, for example, the kidney. There is thus no prospect of eliminating the infection in patients with such lesions. The only effect will be to limit extension while treatment continues, and to deal with bacilli in smaller and more accessible foci. This may be valuable if surgery is undertaken at the same time, and particularly if it is necessary in order to render surgery feasible. On the other hand, to rely solely on streptomycin in a case of chronic pulmonary tuberculosis with cavitation is expecting altogether too much of the drug, and will rarely produce any ultimate benefit.

Indiscriminate treatment may be positively harmful, not only to the patient but to others, because its effect is usually to make the bacillus resistant to the drug. This means that streptomycin will be useless in any subsequent acute exacerbation, and in treating the disease in anyone else who may acquire it from this patient. The danger of breeding and spreading streptomycin-resistant strains of tubercle bacilli is a very real one, and disastrous instances of its results have already been seen in the U.S.A. American studies have made it clear that cavitation is a major factor in promoting acquired bacillary resistance in treated patients. Fortunately combined treatment with *p*-aminosalicylic acid (given orally at the rate of 12 g. daily) diminishes the frequency of acquired resistance as well as reinforcing the action of streptomycin on the tubercle bacillus.

Plague and Tularaemia

It may be that in years to come these will be the only diseases for which streptomycin is used. Both are derived from wild-animal reservoirs in which the micro-organism has no chance of acquiring resistance to the drug, and in both it is strikingly successful. In pneumonic as well as bubonic plague streptomycin has been found curative, and in tularaemia, even in its more severe forms, all reports are agreed that the effect is immediate and invariable. These are in fact the two specific diseases in which the drug has had its greatest success, and we should not forget that there are some parts of the world in which to possess an effective treatment for plague constitutes a therapeutic advance of the first order.

Septicaemia

The forms of septicaemia in which streptomycin is principally indicated are those due to Gram-negative bacilli of coliform type—usually *Bacterium coli* itself, *Proteus vulgaris*, or *Pseudomonas pyocyanea*—and seen as complications of severe urinary-tract infection, middle-ear disease, wound sepsis, and lesions of the intestinal tract. It is important to determine the sensitivity of the organism to the drug, since if this is subnormal another antibiotic such as "chloromycetin" may be indicated. Full and frequent doses (1 g. three or four times a day) are required until the generalized infection has been overcome.

Meningitis

There are several kinds of meningitis in which Gram-negative bacilli are concerned for which streptomycin is strongly indicated. One is the spontaneous form occurring in young infants and due to *Bact. coli* or sometimes to a species of *Salmonella*. In *Haemophilus influenzae* meningitis, usually seen at a later stage of infancy, streptomycin should also be used, but sulphadiazine and immune serum may be advisable in addition. Thirdly, *Ps. pyocyanea, Proteus vulgaris*, or other coliform bacilli may cause meningitis complicating trauma or otitis media, or resulting from contamination of materials used in operative procedures on the central nervous system; the meningitis which has unfortunately followed spinal anaesthesia or even simple lumbar puncture is an example.

Streptomycin should be given intrathecally as well as intramuscularly: the full daily dose by this route is 100 mg. for an adult. Here again not only the initial but subsequent tests of sensitivity (if cultures continue to yield growth) should be carried out, and one of the newer antibiotics substituted if resistance develops.

Urinary-tract Infections

Streptomycin is the most potent of all urinary antiseptics, with a wide range of activity. Properly used, it will often succeed, even in long-standing infections, when everything else has failed. There are three main conditions which must be satisfied in order to ensure a good prospect of success. First, any underlying predisposing cause must if possible be removed; in the presence of obstruction or calculi only temporary benefit, if any, can be expected.

Secondly, it must be determined by cultivation of a properly collected fresh specimen of urine and by sensitivity tests of the organisms found that streptomycin is the right drug to use. If a staphylococcus, a streptococcus, or even *Proteus vulgaris* is found, penicillin is likely to be preferable. On the other hand, *Bact. coli, Bact. aerogenes, Ps. pyocyanea*, and various paracolon bacilli, which should normally be more or less sensitive to streptomycin, are nowadays sometimes found to be completely resistant. This is often the consequence of previous treatment, but is now beginning to be seen in patients who have never had the drug, and must therefore be attributed to the dissemination of resistant strains from other treated persons, a development which has long been foreseen and which must tend steadily to restrict the field of usefulness of streptomycin.

When treatment has been decided on, the third condition to secure is alkalinity of the urine, since the drug possesses little activity in an acid medium. Unless the infection is due to a urea-fermenting organism, when of course the urine will be persistently alkaline owing to the formation of ammonia, it may be necessary to give 2 g. of sodium bicarbonate four times a day for one or two days before this condition is secured. The specimen tested should be that passed on waking in the morning, and not until this is at least neutral to litmus, if not frankly alkaline, should

streptomycin be given. The object is then to maintain a high concentration in the urine for the short period required to sterilize it, and theoretically three or more doses daily are advisable: two have been used with success, but one only is inadequate. A dose of 0.5 g. three times a day or of 1 g. twice a day will usually suffice, though more vigorous treatment is safer and can do no harm in the short period necessary.

Sterility in successful cases is achieved in less than 24 hours, and it is useless to continue for more than three days: to what extent the period of treatment can be shortened further without risk of failure is not yet known, but in my own experience patients have been cured of long-standing infections by only three and four 0.5-g. doses. If the organism persists it will usually be found to have acquired a high degree of resistance, precluding any further treatment with this drug.

Intestinal Infections

Streptomycin given by mouth—for example, in 1-g. doses four times a day—is of value in bacillary dysentery and in acute salmonella enteritis, although, unfortunately, it does not seem to diminish the liability to subsequent persistence of a carrier state. Its usefulness in infantile gastro-enteritis is a subject of dispute, possibly because there are varieties of this condition, some of its imperfectly known causes being streptomycin-sensitive and others not. Despite its *in vitro* activity against *Salmonella typhi*, the drug is practically useless in enteric fever, for reasons which are still obscure. It may be used either alone or together with sulphasuxidine to disinfect the bowel preparatory to operations on the colon: administration should not be begun more than two days before operation, since otherwise resistance may have been acquired before this takes place.

It may be added here that streptomycin and other antibiotics have been successfully used in peritonitis. It is exceedingly difficult on the available evidence to decide what their effect is, and which is likely to be most useful in any given case, but owing to its wider range of activity, including many intestinal species (with the notable exception of the clostridia), streptomycin is at least theoretically preferable to penicillin.

Lung Infections

A strong indication for streptomycin has been pneumonia due to *Bact. friedländeri* or *H. influenzae*. How far it should be replaced by the newer antibiotics for this purpose is not yet clear. More chronic lung and bronchial infections due to these and similar organisms may also be treated, but the benefit is likely to be only temporary if there are underlying structural changes, as in bronchiectasis. The value of the drug in whooping-cough is doubtful.

Local Application

Like penicillin, streptomycin can also be applied locally in a number of ways. It has been administered by inhalation for infections of the bronchial tree. It can be employed in the same way as penicillin for infections of the conjunctiva, cornea, and the interior of the eye itself. The instillation of a solution is useful in the treatment of otitis externa and otitis media when Gram-negative bacilli such as *Proteus vulgaris* and *Ps. pyocyanea* are concerned. The same organisms can rapidly be eliminated from superficial wounds, burns, and such lesions as varicose ulcers by spraying a solution or the application of dressings wet with it, if these operations and the general aseptic management of the case are conducted with care and skill.

Only a short period of application should be necessary for such purposes. It has to be remembered that repeated contact with streptomycin over a period of some weeks leads to sensitization. This has been seen frequently in nurses handling the drug, who develop erythematous and oedematous lesions of the face and hands. It should be possible by careful technique to avoid such contact in making up and administering doses, but once the condition is established there is no remedy but avoidance of any further dealings with the drug.

INTERNATIONAL SOCIETY OF HAEMATOLOGY

MEETING IN CAMBRIDGE

The third congress of the International Society of Haematology was held in Cambridge under the presidency of Sir Lionel Whitby from August 21 to 26. Some 500 delegates attended from many parts of the world, and nearly 200 papers were read during the conference, grouped under the four headings, anaemia, leukaemia, problems of coagulation, and immunohaematology.

The social events included a reception by the president on Monday, August 21, and the society's dinner on Wednesday, August 23, at which it was announced that Dr. A. Pavlovsky, of Argentina, would be president for the next congress. A reception was also held by the vice-chancellor in Pembroke College on Tuesday, August 22, and garden parties were given by Captain R. G. Briscoe, Lord Lieutenant of the county, at Longstowe Hall, and by Sir Lionel Whitby in the grounds of Downing College.

A number of delegates showed scientific exhibits, and several commercial firms displayed products of interest to haematologists. Films were shown and a demonstration of colour television microscopy was given by Messrs. W. G. Pye and Co., Ltd.

Anaemia

The first meeting on this subject was devoted to therapy, and Dr. E. LESTER SMITH (England) opened with a paper describing the isolation and properties of vitamin B_{12}. The effect of its oral administration in pernicious anaemia in the absence of known sources of intrinsic factor was then discussed by Dr. E. H. MORGAN *et al.* (U.S.A.), and Dr. GRACE GOLDSMITH (U.S.A.) described the effects of vitamin B_{12} given orally and parenterally and of a concentrate of intrinsic factor in macrocytic anaemia. Other contributions concerned the therapeutic effect of vitamin B_{12} obtained from a variety of new sources, the use of the vitamin in the treatment of tropical macrocytic anaemia, and the effect of cobalt therapy in various anaemias. A further session on pernicious anaemia and vitamin B_{12} was opened by Dr. O. P. JONES (U.S.A.), who described the action of anti-anaemic substances on embryonic prehepatic erythropoiesis. Dr. G. LARSEN (Norway), describing the pathogenesis of the macrocyte, pointed out that even in adequately treated pernicious anaemia macrocytes occur in the peripheral blood. These cells have a normal mean corpuscular volume, but their thickness is about half normal. Their life-span is about 40 to 60 days, and they are more resistant than normal cells to hypotonic saline. Experiments were described which suggested that there may be alterations in the haemoglobin of these macrocytes, with a failure of normal haemoglobin maturation. Drs. J. MOSBECH and A. VIDEBAEK (Denmark) presented the results of an investigation, with adequate controls, into the prognosis in 301 cases of pernicious anaemia (see *Journal*, August 12, p. 390). Further papers and discussions centred on the question of whether vitamin B_{12} alone was a fully adequate haemotherapeutic agent in pernicious anaemia. Experimental work on the megaloblast problem and the maturation of erythroblasts was discussed by Drs. G. ASTALDI (Italy), D. DANTCHEV (Bulgaria), and P. COLOMBO (Italy).

On August 25 a session was devoted to nutritional factors in anaemia when Dr. C. R. DAS GUPTA (India) discussed the aetiology of nutritional macrocytic anaemia. Drs. V. RAMALINGASWAMI and H. M. SINCLAIR (England) spoke on the aetiology and pathogenesis of polycythaemia in pyridoxin deficiency in the rat, and Dr. J. F. RINEHART *et al.* (U.S.A.) gave an account of experimental pyridoxin deficiency in the rhesus monkey. The action of folic acid, liver extracts, vitamin B_{12}, and other substances with anti-anaemic properties were described by Drs. A. ASCHKENASY (France), L. TENTORI and G. VIVALDI (Italy), O. CARERE-COMES (Italy), and G. SOTGIU and C. CACCIARI (Italy). Drs. A. R. AXELROD and L. BERMAN (U.S.A.) presented their findings in the bone marrow in hypo- and hyperthyroidism. The incidence of lymphocytes in bone marrow in hyperthyroidism may reach levels comparable to chronic lymphatic leukaemia with no peripheral lymphocytosis.

A session on haemoglobin metabolism was opened by Drs. C. V. MOORE and R. DUBACH (U.S.A.), who discussed radioactive iron studies in the understanding of iron metabolism. Further papers were devoted to the action of vitamin B_{12}, folic acid, and liver extracts on the synthesis of protoporphyrins (Dr. A. GAJDOS, France), the role of nuclear functions in the synthesis of ribose-nucleic acid and the formation of haemoglobin in erythroblasts (Dr. I. G. GUZMAN, Mexico), the metabolism of haemoglobin, porphyrin, and bile pigment (Dr. I. M. LONDON, U.S.A.), the interrelationship of red cell stroma and haemoglobin production in the normal and anaemic-hypoproteinaemic dog (Dr. G. H. TISHKOFF *et al.*, U.S.A.), and the fate of transfused red cells tagged with radioactive iron (Dr. L. E. HUMMEL *et al.*, U.S.A.).

An interesting session on hypersplenism was opened by Drs. T. S. EVANS and C. A. DOAN (U.S.A.), who described haemolytic crises of acquired hypersplenism in the course of giant follicle lymphoma. The secondarily enlarged spleen which may develop during the course of this normally long and rather benign disease can and should be removed by splenectomy. The results of splenectomy in cases of leukaemia with haemolytic anaemia were described by Drs. P. S. HAGEN and C. J. WATSON (U.S.A.), who demonstrated the very considerable fall in transfusion requirements in such patients after splenectomy.

Further excellent papers from Sweden, Denmark, Holland, Greece, and Austria demonstrated the very widespread interest in the problem of hypersplenism.

Dr. W. DAMESHEK (U.S.A.) gave the first paper in a session devoted to haemolytic anaemia. He analysed the possible mechanism of auto-immunization in acquired haemolytic anaemia and discussed the rationale of therapy with A.C.T.H. and splenectomy. Further contributions dealt with the role of the spleen in familial spherocytosis (Dr. C. A. A. SCHRUMPF, Norway), photo-electric study of permeability and lysis of red blood corpuscles in anaemia (Dr. P. MOSER, Germany), and Rh antibodies in haemolytic anaemia (Dr. E. WITEBSKY, U.S.A.). The pathogenesis of the haemolytic crisis and the effect of dicoumarol on the course of the disease were discussed by Dr. W. H. CROSBY *et al.* (U.S.A.).

Leukaemia

Leukaemia due to benzine, one of the rare human leukaemias of which the cause is known, was the subject of papers by Dr. J. BERNARD (France) and by Dr. L. BRAIER (Argentina). The cytology of acute leukaemias, unusual types of leukaemia in children, the possibility of a virus in the aetiology with some supporting experimental work, and the significance of leukaemic plasma in cytogenesis were also discussed. During the next session, devoted to leukaemia and related diseases, Drs. SHIMKIN and S. R. METTIER (U.S.A.) analysed the mortality and longevity statistics for myelocytic leukaemia. Dr. M. MORRISON *et al.* (U.S.A.) described a rare type of leukaemia showing dwarf cells, and Drs. G. DI GUGLIELMO and E. STORTI (Italy) presented some interesting observations on erythromyelosis in the fowl and man. Dr. S. MOESCHLIN (Switzerland), who was convinced of the neoplastic nature of Hodgkin cells, advised that this condition should be regarded as a malignant tumour and recommended radical excision of affected lymph glands.

The first of two sessions on treatment dealt mainly with the use of A.C.T.H. and cortisone therapy. Papers were read by Drs. J. M. STICKNEY *et al.* (U.S.A.), R. H. SAUNDERS *et al.* (U.S.A.), and A. VIDEBAEK (Denmark). These authors, and those who took part in the discussion, agreed that, while striking haematological remissions could be produced in many cases of lymphatic leukaemia, the improvement was transitory and often accompanied by a distressing type of obesity. The principles which should govern titrated, regularly spaced radioactive phosphorus, or spray x-ray therapy, were dealt with by Dr. E. E. OSGOOD (U.S.A.), and Dr. P. BJERRE-HANSEN (Denmark) described his clinical experience with urethane.

The second session was opened by Dr. F. H. BETHELL *et al.* (U.S.A.), who discussed the metabolism of folic acid in leukaemic patients. Aminopterin in the treatment of leukaemia (Dr. J. INNES, Scotland), urethane in the treatment of multiple myeloma (Drs. W. C. MOLONEY and W. J. HARRINGTON (U.S.A.), and clinical and experimental observations on the action of urethane (Dr. C. MALAGUZZI-VALERI, Italy) were also discussed. Dr. A. PAVLOVSKY and Dr. G. C. VILASECA (Argentina) recorded their results in acute leukaemia with radioactive phosphorus, and Dr. H. R. BIERMAN *et al.* (U.S.A.) described the disappearance of leukaemic cells transfused into non-leukaemic recipients. The treatment of acute leukaemia with blood transfusion and antibiotics was the subject of a paper by Dr. L. M. MEYER (U.S.A.).

A session on aetiology was opened by Dr. J. HOOGSTRATEN (Canada), who compared the characteristics of leukaemia and neoplasia and concluded that the neoplastic nature of leukaemia must be regarded with some scepticism. Dr. J. C. WHITE *et al.* (England) presented the results of quantitative studies on the content of nucleic acid in normal leukaemic cells from blood and bone marrow. There was a tendency towards high ribose, nucleic acid, phosphorus values in leukaemia where primitive cells predominate. The cytochemistry of leukaemia (Dr. W. LAVES, Germany), the cytochemistry of leukaemic chromosomes (Dr. E. E. POLLI, Italy), and the significance of pathological polyploidy in leukaemia (Dr. E. UNDRITZ, Switzerland) were also discussed.

A session on experimental observations was opened by Dr. J. BICHEL (Denmark), who described tissue culture of leukaemic cells. The effects of folic acid antagonists on leukaemic and blood-forming cells were dealt with by Dr. U. HAENEL (Switzerland) and Dr. W. JACOBSON (England). Dr. P. BASTRUP-MADSEN (Denmark) discussed the action of adenine antagonists on living cells *in vitro*. Dr. A. FIESCHI (Italy) described his tissue culture experiments with leukaemic cells, and Dr. R. H. GIRDWOOD (Scotland) presented evidence that 4-amino-pteroylglutamic acid had an action other than that of a folic acid antagonist.

In a session on special types of leukaemia a case of acute erythraemic myelosis was discussed by Dr. E. NEUMARK (England), and several other papers were read on erythroleukaemia, plasma cell leukaemia, histoleukaemia, and the relationship between lymphatic leukaemia and lymphosarcoma.

Problems of Coagulation

The first session here was opened by Dr. F. J. LEIBETSEDER (Austria), who discussed the effect of adrenaline and dihydroergotamine on the first stage of coagulation. Drs. R. BREDA and R. BERNARDI (Italy) described a condition present in two brothers belonging to a family affected with hereditary haemorrhagic telangiectasia who showed a prolongation of prothrombin time. Experiments conducted with plasma from these cases suggested the possibility of an anti-prothrombin-conversion factor. Drs. K. N. KAULLA (Switzerland) and V. D. BORI (Italy) described the coumarin treatment of experimental thrombosis. The correlation between deficiencies or increases of blood-clotting factors and dysproteinaemias was described by Dr. P. DE NICOLA (Italy). The clinical and haematological problem of thrombophilia (Drs. A. MARMONT and A. PALMIERI, Italy), the present status of the thrombopathies (Dr. N. QUATTRIN, Italy), and a case of haemophilia-like disease due to the presence of circulating anticoagulants (Drs. M. CRISALLI and G. COTELLESSA, Italy) were the subjects of further papers presented.

A session was devoted to the role of the liver, and papers were read by Dr. CROSBY for Dr. M. STEFANINI (U.S.A.) on the haemorrhagic diathesis of liver dysfunction; by Drs. P. NOLF and M. ADANT (Belgium) on the function of the liver in blood coagulation; by Dr. W. RIEBEN (Switzerland) on the coagulo-hepatogram, which presented a measurement of acglobulin, prothrombin, and natural plasma-antithrombin, all predominantly formed in the liver, and Dr. P. MENEGHINI (Italy), who discussed the occurrence and significance of mast cells in haemorrhagic conditions.

A stimulating session on physiology was opened by Dr. P. A. OWREN (Norway). He discussed the prothrombin-activating complex and its clinical significance, and introduced new terminology for various coagulation factors. Other papers in this session were read by Dr. W. H. SEEGERS (U.S.A.) on "Studies on Purified Prothrombin," Dr. K. JACOBSON (Sweden) on "Plasminogen," Drs. P. CAZEL and IZARN (France) on "Rapid Neutralization of Thrombin after Coagulation," and Dr. L. LORAND (England) on "Contributions to the Fibrinogen-Fibrin Problem."

A session devoted to haemophilia was opened by Drs. R. G. MACFARLANE and R. BIGGS (England), who described studies on the coagulation of haemophilic blood. Their experience suggested that the abnormally slow speed of thrombin formation in haemophilic blood may be due to its insensitivity to added thromboplastin. Several further papers were read on experimental and clinical observations in haemophilia in man and dog.

During a session on purpura several papers were read on the cytology, physiology, and pathology of platelets and factors involved in capillary function. An interesting communication by Dr. E. L. LOZNER *et al.* (U.S.A.) concerned the endocrine aspect of thrombocytopenic purpura, and the evidence presented strongly suggested that oestrogenic substances were concerned with the development of this disease in adults.

A later discussion on anticoagulants concerned principally the mode of action of dicoumarol, water-soluble polyamino acids, and heparin.

Immuno-haematology

In the first meeting devoted to immunology papers were read by Dr. L. BERMAN *et al.* (U.S.A.) on the so-called "Lupus Erythematosus Inclusion Phenomenon," and by Drs. A. D. CAJANO and C. MAUREA (Italy) on anti-cellular and anti-organ sera. The latter authors immunized rabbits against guinea-pig leucocytes, bone marrow, and spleen, and were able to show that the antisera obtained had not only species-specificity but also organ-specificity.

The present position of blood groups was reviewed briefly by Dr. J. VAN LOGHEM (Holland). Drs. M. CUTBUSH and P. L. MOLLISON (England) gave an account of the Duffy blood-group system. Dr. A. E. MOURANT (England) described the distribution of blood groups in relation to transfusion organization, and Dr. G. FULTON ROBERTS (England) discussed the prozone inhibition which some anti-globulin sera show when tested against weakly sensitized cells.

The next session was opened by Dr. A. S. WIENER (U.S.A.), who described with illustrative cases the medico-legal application of the rhesus blood types. Dr. P. LEVINE (U.S.A.) summarized the position of the Kell–Cellano system of blood factors, and Drs. R. R. RACE and R. SANGER (England) described a blood lacking any detectable representative of the C and E series of allelomorphic antigens. This case represents a probable deletion in a human Rh chromosome and supports the separability of the C, E, and D genes. A notable paper was presented by Dr. S. FILITTI-WURMSER *et al.* (France) on the differentiation of "A" blood groups by their agglutinins.

Dr. L. E. YOUNG *et al.* (U.S.A.) gave a paper on erythrocyte-iso-antibody reaction in dogs, and further papers were presented on an experimental haemolytic syndrome by Drs. T. FORMAGGIO and PIOVELLA (Italy) and Dr. D. H. HEARD (England). Dr. R. CEPPELLINI (Italy) discussed the Rh antigen E^u, Dr. F. STRATTON (England) the D^u group of Rh, and Drs. S. D. LAWLER and R. R. RACE (England) the quantitative aspects of Rh antigens.

The final session began with a communication from Dr. P. VOGEL (U.S.A.) on technical considerations and results in replacement transfusion in infants, and Dr. T. J. GREENWALT (U.S.A.), Dr. W. C. MOLONEY (U.S.A.), and Dr. L. J. UNGER (U.S.A.) presented papers on various aspects of treatment and prevention of Rh sensitization. An interesting paper by Dr. J. V. DACIE (England) described the presence of non-specific incomplete "cold" antibodies in most normal sera. These incomplete antibodies differ in some ways from other types of antibodies such as anti-Rh, and might be a source of confusion in carrying out tests for "warm" antibodies, particularly in cases of acquired haemolytic anaemia.

MEDICAL PHOTOGRAPHY AT THE ROYAL PHOTOGRAPHIC SOCIETY

The photographs of medical interest at the 95th Annual Exhibition of the Royal Photographic Society at Prince's Gate are provided by comparatively few exhibitors. A possible explanation is the counter-attraction of the International Exhibition of Medical Photography which the Society sponsored earlier in the year and which was shown at the house of the Medical Society of London. This exhibition has also been seen at the Congress of Radiology and is due in Manchester in October. In the present exhibition all branches of photography are covered, and the medical prints must be comprehensible to the non-medical visitor assisted by no more extensive notes than can appear on the mounts.

The University of Zürich eye clinic has provided three mounts which are of fine quality, their pattern alone having a great appeal. The photomacrograph of the ciliary body will delight the ophthalmologist and the anatomist. The eye is always a popular subject, and Manchester Royal Infirmary shows an interesting traumatic arteriovenous aneurysm of the choroid. Other exhibits from this department are noticeable for clarity of detail; a composite mount of osteochondritis dissecans using radiographs and operation photographs may be cited also as a workmanlike piece of applied photography—it could not fail to be valuable to the teacher.

Pathological preparations are usually well represented. The sole example this year is from St. James's Hospital, Leeds, and shows a concurrent ulcer and remote carcinoma in a single specimen of stomach. The standard of pathological specimen photography, not only in Britain but generally, is surprisingly low when the large output is considered. This print is not of the quality we have come to associate with this department; it has probably been hung more on account of its rarity than its quality, for there is no doubt that it is flat, even making allowances for fixed material. The texture in the ulna exposed by a third-degree burn, from the same hospital, is nearer to their customary standard.

Medical photomicrography is provided by the radiotherapists. The Cambridge entry, optical sectioning of the unstained nucleus by ultra-violet light, is of excellent quality and exemplifies a valuable technique. Mr. Mitchell is to be congratulated on this mount. The Chester Beattie Institute shows several fine examples of mitotic figures in stained material.

There is a small group of transparencies, the majority in colour and all good. (Colour prints are still not within practical bounds for a busy hospital department.) St. James's shows stages in fasciectomy for Dupuytren's contracture. From Newcastle come two dental subjects; that of attrition of the upper incisors makes good use of a mirror to record the lingual aspect of the teeth. Manchester makes an interesting point with a pair of slides demonstrating the "mitral flush." One is an accurate "ektachrome" colour transparency, the other a black-and-white slide made on orthochromatic film. The latter shows not only the distribution of the flush but some freckles also, which are

barely noticeable in colour. This pair may provide some comfort to those who are prevented by budgets and lack of dollars from having all the colour they would like. The monochrome version, if the clinician or teacher will take the trouble to learn its interpretation, may well be equally useful at a fraction of the cost.

BRITISH ASSOCIATION MEETING

MATTERS OF MEDICAL INTEREST

The 112th annual meeting of the British Association for the Advancement of Science was held at Birmingham from August 30 to September 6. It was the most largely attended meeting outside London since the Association's jubilee year meeting, held at Manchester in 1887.

The presidential address, on "Man's Use of Energy," was given by Sir HAROLD HARTLEY, F.R.S., chairman of the Fourth World Power Conference, held lately in London. He ended his address with a strong plea for a survey, in respect of each country, of its natural resources, human geography, economic structure, and capacity to produce and consume: for only if the resources and potentialities of each country were known could the "natural wealth of the world, distributed in such an accidental way," be used to the best advantage.

Muscle Movements

The Section of Physiology, under the presidency of Professor R. J. BROCKLEHURST (Bristol), began its meetings with a discussion on muscle movements. This was introduced by Mr. W. GISSANE (Birmingham). His approach was that there was much to be learnt from the detailed study of the anatomical problems confronting the orthopaedic surgeon. This was illustrated by an account of recent research in the University of California on the movement of the limb bones during walking, in relation to artificial limbs.

Twelve medical students allowed pins, several inches long, to be inserted into the pelvis, femur, and tibia in order to serve as indicators of rotatory movements. The movements of the pins in normal walking were then recorded by film cameras in front view and from the side. The results showed that transverse rotations or angular displacements are more important in walking than has been previously accepted in Great Britain, and that function is intimately co-ordinated between muscles and joint ligaments.

Mr. Gissane also discussed the use of skin grafts in the treatment of extended burns; for full restoration of function it was necessary that the healing of the grafts should be complete within about 30 days—possibly due to the thickening of exposed fascial planes over longer periods.

Dr. H. D. DARCUS (M.R.C. Unit for Research on Climate and Working Efficiency, Oxford) described a dynamometer for the study of isometric muscular contraction in man. A twisting movement imparted to the dynamometer by the hand causes deformation of a tempered steel bar, the extent of which is measured with electrical strain gauges. The position of the subject can be varied with respect to the machine, and by a suitable choice of positions the performance of a single muscle can be studied. For example, it is possible to show that the biceps muscle is incapable of effective contraction between full pronation and about the mid-range of the movement, the supinator muscle being then effective. Other factors which may affect the result are training, muscular fatigue, and the variation in will shown by all subjects to exert the greatest force possible.

Mr. W. F. FLOYD (Middlesex Hospital), in a joint contribution with Dr. P. H. S. SILVER, showed oscillograms in which the degree of electrical activity in six muscles was simultaneously displayed for a variety of postures and movements. The act of standing requires little activity, and in most subjects a position of practically zero activity can be found. This is in contrast with commonly expressed views based on earlier observations on "four-footed and decerebrate cats," the relevance of which to an intact human subject might well be doubted. In standing with the eyes closed, corrective activity is increased, suggesting that the eye is an important agent in maintaining the upright position. In bending there is a critical point beyond which activity of the spinal muscles is inhibited, and this may have a bearing on the occurrence of slipped disks when a heavy weight is lifted with the spine bent. In sitting, the forward-slumped position makes a smaller demand on activity than postures conventionally regarded as more correct.

Dr. L. GUTTMAN (Spinal Injuries Centre, Stoke Mandeville) illustrated with films the teaching of "trick movements" to paraplegics with the object of obtaining maximum function from available muscles. "If a paralysed man can tilt his pelvis," he stated, "then he can walk." In reply to a question, Dr. Guttman said that much could be done even 8–11 years after injury. It was suggested that to the conventional anatomy of muscular movement there would have to be added a second anatomy based on the abnormal development and use of muscles which can be acquired.

Two papers bearing on the chemical basis of muscular contraction were presented at a later session held jointly with the Section of Chemistry. In the first, Dr. S. V. PERRY (School of Biochemistry, Cambridge) reported the shortening of myofibrils, isolated from rabbit skeletal muscle, in the presence of low concentrations of adenosine triphosphate. In the second, Dr. J. R. BENDALL (Low Temperature Research Station, Cambridge) described experiments on the shortening of muscle during rigor mortis—when work can be done by muscles in lifting a load. There is good correlation in time between shortening and the breakdown of adenosine triphosphate. This correlation holds good with a variety of prior treatments—for example, in muscles which have been fatigued or depleted of glycogen by starvation, in muscles well provided with glycogen at death, and in muscles from animals paralysed with myanesin or narcotized with "dial."

Functions of the Skin in Vertebrates

A joint meeting on the functions of the skin in vertebrates was held between the Sections of Physiology and Zoology. This was opened by Professor P. B. MEDAWAR (Birmingham), and consisted rather of a series of isolated contributions than of a discussion in the normal sense.

Professor Medawar reviewed research, largely in his own department, on the anatomical basis of skin pigmentation. Whereas the epidermis of the mammal is usually figured in textbooks as if all its cells belonged to a single division lineage, that of the Malpighian cell, there are in reality cells of a second and quite distinct lineage—dendritic cells. Their branches intertwine with the Malpighian cells and at their ends are button-like terminations or cups. Whatever other function these cells may have, they "are the sole origin and seat of the pigmentary function in mammalian skin," the melanin which they form being caused to enter the cytoplasm of neighbouring cells. The difference between negro skin and white is not in the number, shape, size, or distribution of dendritic cells, but in their physiological activity.

Dr. J. D. FINDLAY (Hannah Dairy Research Institute, Ayr) described experiments with Mr. W. R. BEAKLEY on the differences between Ayrshire and zebu (tropical adapted) cattle in relation to skin function and heat dissipation. Their conclusion is that neither of these breeds sweats, but that cooling in zebu cattle is facilitated by the large dewlap, in which there is a capillary network about ten times as great as in Ayrshire cattle.

Dr. W. S. BULLOUGH (Sheffield) spoke on skin replacement. Close observation shows that the cells of the epidermis divide according to set patterns and rhythms which vary from place to place across the surface of the body, the normal pattern being destroyed only in regions of inflammation or wounding. Epidermal replacement occurs mainly during sleep, and glycogen is normally the critical substance limiting replacement, but oestrogen has a positive activity of its own. The physiology of epidermal cell division, Dr. Bullough stated, is important not only for its own sake but in relation to the mechanics of growth and development, wound healing, and possibly cancer—the incidence of which may be related to the rates of cell division, normal and abnormal, in the various tissues of the body.

Dr. J. S. WEINER (Oxford) described the experimental methods of sweat collection developed in the Climatic Research Unit at Oxford, and discussed the influence of skin temperature and other factors on variations in sweat composition. Professor J. D. BOYD (London Hospital Medical College) demonstrated with slides the effects of fungal infection associated with excessive sweating and the patterns of denervation resulting from neuromuscular surgery.

Hormones of the Digestive Tract

The presidential address of the Section of Physiology was given by Professor R. J. BROCKLEHURST (Bristol) on "Hormones of the Digestive Tract." His review covered work in this field from the time of Pavlov onwards and cannot be adequately summarized. It will be published in full in the October issue of *The Advancement of Science*. The distinctions were emphasized that, whereas the salivary glands are stimulated solely by their nerve supply, the stomach is stimulated by both nerves and hormones, and the intestine and its glands probably by hormonal mechanisms alone. Perhaps the most striking feature of these humoral mechanisms is that "there is nothing which corresponds with a co-ordinating centre for them; each mechanism is brought into play, when it is needed, by a particular event in the sequence of digestive process. So far as we know at present, they are found only in connexion with the stomach, the small intestine, and its associated glands." The investigation of the cells in which the hormones originate has barely commenced.

Professor A. A. HARPER (King's College, Newcastle-upon-Tyne) then described a modification of the secretin test. The modification consists in giving an intravenous injection of pancreozymin 30 minutes after the injection of secretin. This is followed by an increase in the output of amylase, lipase, and trypsin in the duodenal samples, as well as by further changes. The modified secretin-pancreozymin test thus gives additional information about the ability of the pancreas to secrete enzymes.

The activities of the intestinal mucosa were discussed by Dr. R. B. FISHER (Oxford). Its lining layer is of particular interest as the one barrier across which all ingested foodstuffs must pass before they enter the body fluids, and it is becoming increasingly clear that the majority of exchanges between the body and the intestinal lumen depend on the performance of work by the mucosal layer. Transfer, in other words, is not passive, but involves physiological activity in this layer. Glucose, for example, passes from lumen to tissue fluid even when the initial concentration is the same on each side. There is evidence also for the active transport of water across the intestinal mucosa, and strong indications that fat and the products of protein digestion are also actively transported. From previous work on the oxygen consumption of isolated intestines, it appears that the metabolic rate of the small intestine is very high; and the rate of cell division is so rapid (Leblond and Stevens) as to suggest complete replacement every 36 hours. Corresponding with this rapid growth process, a high rate of turn-over would be expected of mucosal protein. There have been no studies as yet of the incorporation of labelled amino-acids into the mucosa alone, but it has been shown by this method that the turn-over of proteins in the intestinal wall as a whole is higher than in any other tissue in the body. Together with evidence suggesting that the whole cytoplasmic protein of the body acts as a protein store, "it seems eminently reasonable" that the first step in protein absorption is the synthesis of mucosal protein, and the second its breakdown, with the products of breakdown passing into the tissue fluids.

Nerve Fibres

A group of papers on "The Nerve Fibre" was introduced by Professor J. D. BOYD (London Hospital Medical College), who reviewed the anatomy and histochemistry of vertebrate peripheral nerve fibres and their sheaths. He drew attention to the problems of remote control by the cell nucleus, of tracing the fibrils of the axon back to the cytoplasm of the cell body, where they divide on either side of the nucleus, of the origin of the myelin sheath as between nerve cell and Schwann cells, and of the doubtful validity of any hard-and-fast distinction between myelinated and non-myelinated fibres.

Dr. A. L. HODGKIN (Physiological Laboratory, Cambridge) summarized recent work at Cambridge relating nerve conduction on the one hand with changes in electrical potential as between the inside and outside of a fibre, and on the other with the permeability of the fibre to sodium and potassium ions. The two effects are complementary. In the resting nerve, the outside of the fibre is 50–100 millivolts positive with respect to the inside, and the membrane is selectively permeable to potassium. On activation, conditions are reversed: the outside of the fibre is now 30–50 millivolts negative, and the membrane is selectively permeable to sodium. The potential difference is reversed by the entry of sodium into the fibre, and restored by the exit of potassium. On the other hand, the permeability change is itself initiated by electrical stimulation. The progression of activity along the nerve is interpreted as being due to the cancellation of the external negative charge at the point of activity by the positive charge of adjoining sections of fibre; and the effect of the myelin sheath, interrupted at the nodes of Ranvier, is to increase the distance over which cancellation takes place, so speeding conduction along the fibre. Repeated stimulation increases the sodium content of the axon and reduces its potassium content, and time is necessary for these changes to be reversed.

Dr. B. KATZ (University College, London), who was unable to be present, was to have put forward the view that an electrical change must be produced in a sense organ before messages can travel along the appropriate sensory fibres; and that this is so whether the initial stimulus is light, sound, mechanical pressure, or a chemical substance.

Dr. F. K. SANDERS (Oxford) described experiments on the migration of virus particles along nerve fibres, and the multiplication of the virus. He has worked with the spontaneous encephalomyelitis virus of mice (mostly with the "severe" strain, G.D.VII). This is not closely related to the virus of poliomyelitis, but its behaviour is similar to that of the poliomyelitis virus in monkeys and possibly in man. The virus particles travel at 0.5 mm. per hour (compared with the 2.5 mm. per hour reported for poliomyelitis in monkeys). If inoculated into tongue muscle, the virus particles are first detectable in the first group of nerve cells serving the tongue at about 20 hours from inoculation. Between 30 and 60 hours, virtually no virus can be demonstrated in these cells, which may mean that the virus has been "dis-assembled" in some way so that it is no longer infective. Yet from 60 hours onwards there is very rapid increase, and at 100 hours more than one million times as much virus can be recovered from these cells alone as was originally inoculated. The attainment of maximum virus concentration closely coincides with, or perhaps precedes, the onset of tongue paralysis.

Psychology

The presidential address to the Section of Psychology was given by Professor J. C. FLUGEL (University College, London). In a discussion of "Human Affairs and the Psychological Point of View," he suggested that there was room for a closer psychological approach to economics (e.g., on the motivation of spending and saving). He referred to the conflict between the legal and the moral points of view resulting from the increasing penetration of the psychologist into the field of delinquency, and to the further conflict raised by the application of psychological approach to the investigation of the religious attitude. The most urgent need was perhaps for the greater adoption of the psychological point of view in the field of politics, with which existing "social psychology" had little contact.

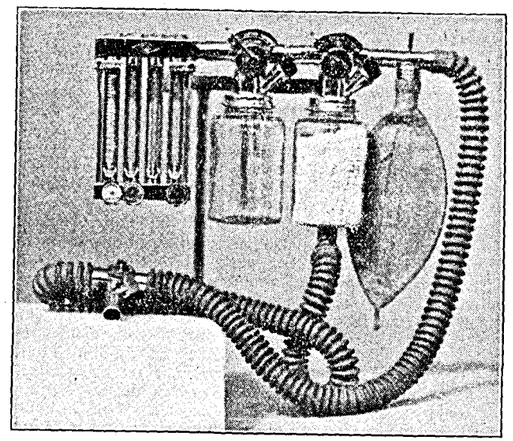
Professor C. W. VALENTINE (Birmingham) suggested that the tendency to explain every problem child in terms merely of environmental factors had gone too far, and that "even in America" a back-swing had now begun. Mr. P. SMITH (late principal assistant organizer, City of Birmingham Education

Committee) reviewed experience of 25 years of research on vocational guidance in schools; the most important single conclusion being perhaps that "vocational guidance cannot easily, and indeed should not, be separated from educational guidance."

Preparations and Appliances

NOVEL MODIFICATION OF BOYLE'S ANAESTHETIC APPARATUS

Dr. W. B. PRIMROSE, senior anaesthetist, Glasgow Royal Infirmary, writes: The conventional gas–oxygen anaesthetic apparatus installed in most hospitals now consists of a sight-feed unit for the gases, followed in series by a chloroform bottle, ether bottle, and breathing-bag with tubular connexion to the patient, all parts being under the control of valves. This arrangement does not permit the use of carbon dioxide absorption: for this a special absorbing unit of elaborate design and make is required which is fed with gases from the machine through a tubular connexion. The accompanying photograph



shows the manner in which a simple absorbing unit can be incorporated with the anaesthetic apparatus, rendering any elaborate means for CO_2 absorption unnecessary.

The alterations required are very simple, and the arrangement depends upon the fact that neither chloroform nor "trilene" should be used with an absorber. This means that the chloroform bottle is removed. Its place is given to the ether bottle, which remains an essential component of the system. The header to which the ether bottle was previously attached has its immersion tubular parts removed by unscrewing them in the case of the bakelite mount: the plunger rod is, however, left in place. The exit orifice of the header through which the vapour normally passes to the patient is carefully enlarged to 7/16 in. (1.1 cm.). In the case of the all-metal mount, nothing is removed. The exit aperture is again enlarged to a corresponding degree, both on the bottle side and also on the breathing-bag side of the barrel valve. This is done with the turning lever at the full "on" position, and in such a way that the valve closes completely at the "off" position.

The absorber consists of an ether bottle which has a hole drilled in the bottom to take the British metal-tube fitting. This is fixed by screw collars with rubbers to protect the glass and to give gas-tightness. To this fitting is attached the expiratory tube from the face-piece mount. The absorber, filled with 1 lb. (454 g.) of soda-lime granules, screws into place in the usual way. The circuit is completed by the inspiratory tube which passes from the breathing-bag to the face-piece.

The face-piece mount, to which the hoses are attached, consists of a Barth three-way valve with an adjustable expiratory valve suitably fixed to it. This very light and convenient valve provides all requirements for breathing. Air can be breathed. The "no valves" position with the expiratory valve provides the ordinary gas–oxygen–ether (or other) anaesthesia. In this position the absorber is shut off at the face-piece in addition to its being cut out at the header valve when in the "off" position. The "valves" position provides circuit breathing through the absorber, which must also be "on" at the header valve.

In circuit breathing the rubber flap valves are kept moist unless they are allowed to get dry from periods of inaction. It is generally known that rubber will not distort for a long time if kept damp and cool. The valves should, of course, be changed at intervals of from three to six months, and, provided this precaution is observed, there should be no leakage.

If it is desired to use trilene or chloroform the absorber is removed and the fittings for the chloroform bottle are replaced in the case of the bakelite mount. The expiratory tube can be detached from the Barth valve, when the apparatus becomes as originally arranged. Confusion or accident from decomposition of these drugs cannot take place.

The advantages of this simple modification are considerable. The changes themselves are easily carried out and there is no essential interference with existing parts. The absorber can be changed in a few seconds, during the operation if necessary, as the only screw to be manipulated is that of the bottle—about one and a quarter turns. The original Boyle machine with absorber is now self-contained and eminently portable.

The method of single-phase absorption has been found quite satisfactory in anaesthetic work over the past 12 years. In the past 20 years I have tried circuit and to-and-fro breathing in both liquid and solid absorbents, and find that expiratory absorption is as good as any.

I am indebted to Messrs. Vicarey, Davidson and Co., 162, Bath Street, Glasgow, C.2, for carrying out my instructions in producing this modification.

According to a report from the Director of Medical Services, Uganda, the incidence of yaws has been exceptionally high for many years among the 266,000 inhabitants of Lango District, where the number of sufferers seeking treatment was never sufficiently great to reduce the reservoir of infection. Consultations were held in 1948 between the African local authorities and medical department representatives, as a result of which it was decided to embark upon an intensive campaign. The whole population has now been examined, and some 22,000 infectious cases were treated with arsenicals and bismuth during the last sixteen months. The district was divided into sectors, which were covered methodically by teams of trained African staff under a European medical officer responsible for organization and supervision. The results of the campaign appear to be excellent. A follow-up scheme in progress aims at the elimination of infections which were not detected during the campaign. One of the most difficult problems facing the public health workers of colonial territories is to find means of arousing popular interest in simple sanitary matters, any attempt to impose new habits by edict being of no avail. With this in mind a mass health education scheme was started early this year in one of the most densely populated areas between Kampala and Jinja. The scheme was designed to draw attention to the transmission of intestinal bacteria and worms. Lectures, demonstrations, and discussions were held, and films, photographs, and slogans were displayed. Chiefs and other African officials from all over the country attended the course, which lasted a week. The whole "school" was then moved to each county subcentre for a week, where many local people came to see what was happening, stayed to ask questions, and often lent a willing hand in the construction of latrines and the protection of water supplies. There were signs that those who attended the "schools" were beginning to show interest in the reduction of intestinal infections.

Correspondence

Psychology as Science

SIR,—It is good, even at the cost of an expressed difference of opinion by an old pupil in whose psychiatric education he can never have taken great pride of achievement, to have stimulated the return of Dr. Bernard Hart (September 9, p. 623) to a scene in which he has been so distinguished a figure, and his letter must increase our regret that his wisdom and experience do not more often find public expression in a field of medicine where they were never more needed than to-day. Nevertheless, I believe that there is a greater measure of agreement between us than of difference, though I still must feel that the inferences I drew from his lecture are valid and necessary. He allows that psychopathology comes only in part, and then imperfectly, within the discipline of science. But since Dr. Hart accepts Karl Pearson's postulates, this element of science can only be natural science, for the postulates are not applicable to a science of history. Indeed, we may doubt whether Pearson would accede to the notion that there could be a historical "science." It is for this reason that I felt I had to equate Dr. Hart's use of the term "science" with "natural science." Further, if the intrusion of "purpose" in psychopathology requires this to be placed within the fold of biology, then this "purpose" can only be teleology. Yet surely it is not teleology that he had in mind. Thus I conclude that there is involved in his thesis the error of using one term in two senses in one argument.

Dr. Hart now believes that false systems of thought should be allowed to die of natural decay while we passively await their replacement by sounder systems. If a purely philosophic system were in question, this view would have the sanction of history, though even the ghosts of dead philosophic systems still haunt us. But psychological medicine is more than a system, if less than a philosophy. It is also a methodology, indeed a number of methodologies, and these have the widest effects upon the community. They influence thought and practice in every field of medicine. Views about them, of varying degrees of naivety, are put abroad by politicians, journalists, and novelists, and now by the terms of the Criminal Justice Act of 1948 the State has made the psychiatrist an official participant in the administration of the law, and in a manner which gives him a dangerous latitude in his treatment of certain offenders before the courts who are certifiable neither as mental defectives nor as persons of unsound mind. In these circumstances we cannot stand silently by while unsound systems and methods of medicine die tediously of natural decay, doing perhaps an infinity of harm in the process.

In the past literature has owed an immeasurable debt to literary criticism. Is it to be assumed that the science and arts of medicine do not need, and should not receive, the same kind of salutary corrective? If Dr. Hart had really thought this he would never have given us his critical and stimulating Goulstonian lectures, which still contain valuable lessons and great delight for all who read them.—I am, etc.,

London, W.1. F. M. R. WALSHE.

Training for General Practice

SIR,—The consensus of opinion in your recent educational number was that medical education was barking up the wrong tree in that it produces ill-developed polyvalent quasi-specialists instead of general practitioners. As your contributors pointed out, the course for a medical student as at present designed pays but the scantiest attention to the needs of the general practitioner. Therapeutics are rather frowned upon by physicians when teaching students. I well remember one of my chiefs answering a question on the treatment of a case by saying, "Learn the signs and symptoms now: therapeutics will come later." That eventual time did not come until I had left my hospital and, away from the guiding hands of sister and dispenser, I was faced with the difficult problems of medicine in a Families Welfare Centre in the Army. No time now to sneak away and look up a textbook of therapeutics. Only time to write a prescription and hope it was the correct line of therapy and that its ingredients would be palatable and compatible.

Paediatrics, now forming a large part of my practice, was taught by six weeks' children's clerking combined, if I remember correctly, with venereal diseases, but it was August and the chief was away on his summer holiday.

As a student I just achieved my 25 midwifery cases, and if I had not had the privilege of being resident accoucheur after qualifying I should soon have become one of those who were recently described in your columns as wildly wielding the forceps. Skins, fevers, minor orthopaedics, and oto-rhino-laryngology are all now painful exercises in temporizing while I have time to ask somebody's opinion or read it up.

Not only are the wrong things taught to students but the methods employed are inefficient. Despite all the evidence of special methods of teaching presented in your pages, I am not convinced that they will ever replace some of the traditional methods. I was surprised that no one called for an extension of ward teaching, and in fact the general impression was that this method was disparaged by your reformers. Ward teaching has always been one of the prides of the English medical schools. It is still paid great lip service by our teachers, and many complain that they do not see the students in the wards as much as in the old days. The reason for this is not far to seek. When I held my clinical appointments in 1945 I had from eight to ten cases to look after at any one time. When I came on the house in 1948 I found that the clerks and dressers were lucky if they had three or four cases, and I know of some students who from no fault of their own had never seen a case of acute appendicitis when they qualified. In the same period the introductory course had been extended from three weeks to three months, the teaching in psychology and psychiatry had increased, and now it is rumoured that the students are soon to be taught French and German. Surely the time is out of joint. Yet one of the solutions has been so often hinted at. I remember a friend who in desperation before finals was able to spend an afternoon in a cardiac ward of a municipal hospital. There he discovered that there was a difference between early and mid-diastolic and pre-systolic murmurs and that the third and fourth heart sounds really existed. Here is one efficient way to train the primary instruments of the doctor—his eyes, ears, and fingers.

But even when the student has gained a knowledge of the well-known and well-defined textbook illnesses and has qualified, it will be many years before he becomes proficient in that most difficult of all specialties, general practice.—I am, etc.,

Farnborough. J. D. BURY.

SIR,—May a practitioner 40 years qualified venture some comments on the article by a general practitioner (August 26, p. 493) on his medical education 25 years ago? Inevitably these comments must be reminiscent and egotistical, but I am glad to say that they are of a purport relating to my own day quite contrary to the somewhat disgruntled carping with which your younger contributor refers to his. Perhaps because I lacked his more enviable background of University culture and came straight from a rather spartan northern public school, and also, no doubt, because a medical career was my own avid choice and not a parental *Diktat*, I entered the busy world of the London Hospital and its college in 1905, and remained there as a student and resident until 1912 with unalloyed enthusiasm and satisfaction. With a bare minimum of cash, an old football injury limiting games, and a "cribriform" type of memory, it was possibly for my good that hard work was imposed upon me; but I still remember with respect and gratitude all my teachers, and their inculcation of principles and practice which have remained throughout the years as an inspiration and guidance for the work of each day. The emphasis was always upon the practical, and was focused on

the patient, his history and physical examination. The ancillary methods of clinical pathology were—and properly so to my archaic mind, *pace* the strictures of a research scholar of much erudition and less horse-sense on the imperfections of British general practice—relegated to the pathological laboratory as the only environment in which they could attain a true accuracy.

Many of my teachers are gathered to their fathers. Some happily remain, but all my generation and later ones who came under the influence of Arthur Keith, Leonard Hill, William Bulloch, Hubert Turnbull, Robert Hutchison, Henry Head, James Sherren, Russell Howard, and James Walton and their contemporaries must remember them with respect, gratitude, and affection. The hospital itself was a world teeming with the activity of all sorts and conditions of humanity, of all races, creeds, trades, and temperaments. Apart from formal teaching there were unceasing opportunities for increasing knowledge of men and things by continuous intercourse and contact with keen and often brilliant minds among teachers, residents, students, and laymen alike, whilst an ever changing pageant of clinical material unfolded itself before the inquiring eye.

Medical education was in those days much simpler, to-day it is no doubt much better, but I would aver that in my day at "The London" it was a vital and invigorating discipline.—I am, etc.,

Minehead. H. B. WALKER.

The Importance of Preventive Medicine

SIR,—Last year I commented on the section on public health services in your educational number. Your contributor then said that prospects in public health had never been better. Many of us considered this to be wishful thinking, and the pitiful contribution in this year's educational number shows how right we were. The disquieting drop in the numbers taking the D.P.H. course is confirmation if any were needed.

Financial prospects apart, what is wrong with public health, or, as I prefer to call it, preventive medicine? The preventive specialist used to have his roots in hospital and domiciliary medicine, and one of his main contacts with the public through them. The National Health Service Acts have cut these roots. Owing to financial stringency no new ones have grown, and the result is that the preventive specialist has had his potentiality for good very severely restricted. Prior to July 5, 1948, approximately two hospital beds out of three in Scotland were provided by the local authorities. The extent of the restriction will thus be seen by reference to the following table taken from the national estimates:

National Health Service Estimates Scotland 1950-1 and 1949-50

	1950–1	1949–50
	£	£
Hospital and specialist services ..	31,986,000	28,761,000
General medical services	16,402,000	17,449,000
Local authority services	1,350,000	1,100,000
All other services	1,516,000	1,668,300
Totals	£51,254,000	£48,978,300

In other words, one-fortieth of the expenditure under the Scottish National Health Service Act is directed towards the prevention of illness and preservation of health. That is what is wrong with public health.

Dr. Frank Gray's presidential address (*Supplement*, August 12, p. 85) indicates part of the way. He says that the hospital is antagonistic to preventive medicine, and that the way of salvation for the general practitioner lies in interesting himself in the trivialities with a view to the prevention of serious illness. I heartily agree. The general practitioner is in a position to do more for the nation's health than anyone else. There has sometimes in the past been antagonism between him and the local health department. Provided that he realizes that the local health department has much help to offer him, and he to offer to the department, there is no need for any antagonism.

The local authority clinic did great service in the days when every visit to the private doctor cost money. Now that the general practitioner's surgery is a "free for all" in more ways than one, the general practitioner should welcome the opportunity to see pre-school children on his list, at the clinic, for a fee. Similarly he should be prepared to act as medical officer to a school, to get to know the pupils and the relationship between their health and their educational progress. Before undertaking such duties, however, he should have training and experience which as a rule are not his. There is much in the D.P.H. course that could and should be included in that for the undergraduate, and there is much specialist training in the latter which should be jettisoned. The discipline of applied physiology and applied bacteriology, the latter leading on to epidemiology, is in my view vital. And, above all, the introduction to preventive medicine should be made no later than that to curative medicine.

So much for the general practitioner's approach to and place in public health. What now of that of the trained preventive specialist? Hitherto he has, as a rule, been drawn to public health at an early stage in his postgraduate career. Perhaps this has had something to do with the antagonisms previously mentioned. I do not think that recruitment from the ranks of general practitioners could be improved on. And incidentally I consider that this applies to clinical specialism as well as preventive. Satisfactory work in the child welfare, school health, and epidemiological branches should count towards a specialist diploma in preventive medicine. This should preferably be granted by a national college or faculty of preventive medicine and replace the existing statutory D.P.H.

Finally, a new local health authority must be set up, under which the general practitioner, preventive expert, and clinical specialist all play their part in the health team. General practitioners will form the forward line, leading the attack, preventive specialists will be the half-backs, and clinic specialists the backs and goal-keeper to cover up when play goes against the attackers. This local health authority must have all the functions, health and welfare, of the existing local health authority. It must take over the functions of the local executive council, and of the local hospital management committee. It must have the closest possible liaison with the National Assistance Board and the Ministry of National Insurance. By this means alone, full inter-service co-operation, can the full potential for health of all parties be developed and the National Health Service be made to pay dividends instead of swallowing money in its present prodigal way.—I am, etc.,

Elgin. I. C. MONRO.

Mechanical Aids to Instruction

SIR,—The excellent article on this by Drs. R. Ollerenshaw and P. Hansell (*Journal*, August 26, p. 488) serves to stress the importance of these aids, which was very obvious at a recent large international congress where the failure of many speakers to make proper use of the diascope and epidiascope was a cause of great discomfort to the audiences. After attempting to see and read wholly illegible matter projected by epidiascope, one came to the conclusion that societies should prohibit the use of this form of projection until speakers learned to use it properly. Even lantern slides were often of very poor quality, or overcrowded with figures.

On one point one cannot agree with Ollerenshaw and Hansell. They say, in speaking of lantern slides, "Script is always more legible when projected as a white image on a black field than in the more usual black and white." I have always found that staring at a black screen with white script has a curiously irritating effect, and that one soon tires. Other members of the audience usually agree that this is an unsatisfactory form of projection. When this form has been used, one has usually blamed the speaker for showing negatives and being too lazy or too parsimonious to have proper positives prepared. The subject appears to be worth investigating from the physiological and psychological aspects.—I am, etc.,

Edmonton, N.18. A. B. ANDERSON.

Traumatic Neurosis and Electro-shock

SIR,—It must be so rarely that electro-shock treatment administered in this country meets with misadventure that it may be of interest to mention a case in which it led to a severe traumatic neurosis—the most severe case of conversion hysteria I have met with, even in the psychotherapy of two world wars.

She was a patient of 34 who had been paralysed for twelve years in both legs, was emaciated, 5 st. (32 kg.) in weight, would not and could not eat, and had such severe headaches and noises in the head that she could not read, nor listen to the radio, nor meet visitors. The headaches took the form of pressure in the cranium and a "cracking" and "grating" in the occiput, as of a fracture. The noises were described as "Morse sounds" of someone constantly crying, interspersed with someone screaming. She also heard voices in German saying, "Won't eat! I can't go on," etc. These noises and voices were so loud and insistent that she projected them and thought they came from someone crying in an adjoining room or in the street, and often asked that they should be stopped. It is not surprising that on several occasions she attempted suicide, and that her condition was falsely diagnosed as schizophrenia. She also suffered from "fits," and was on occasion found on the floor in the morning unable to move because of her paralysis. These fits were diagnosed as epileptic, and she was given "epanutin" for several years.

She was treated psychologically by the abreaction method (reliving the experiences, releasing the repressed emotion, and readjustment to the situation), and the causes of her symptoms were revealed. It transpired that the cracking and grating sensations in the occiput and the headaches originated in a car accident in which she was thrown on the back of her head on the hard road and suffered "concussion." This accident does not concern us except that it was for the results of this accident that she was first treated medically in Germany and then sent to a psycho-analyst, obviously of the cruder type, whose insistence that she was sexually in love with her father and that she must fall in love with him, the analyst, before she could get better so distracted her that she became much worse and had to be sent to a mental hospital, was diagnosed as schizophrenic, and there received electroplexy in 1938.

This apparatus seems to have been of the somewhat primitive type, and she was warned that on no account must she let the electrode slip. Three or four times the administration was satisfactory, but on the occasion in question, just before the shock was given, she felt the electrodes slipping. She was filled with horror, and yet dared not move to stop it in case it made things worse. The shock was administered, the instruments were smashed, the doctor and nurse also received shocks, and the patient experienced a terrific blow on the head followed by the convulsion, during which, as it transpired, she was quite conscious. But she developed an amnesia for the whole experience. Her symptoms originated from this dissociation; they were in fact a revival of what she had experienced but repressed and forgotten. The so-called "epileptic" fits were a reproduction in detail of the convulsion itself, the "Morse noises" were of her own crying when in the dissociated state of shock, interspersed by a scream when she moved and felt a severe pain in her back, presumably from a compressed fracture. The voices she heard were her own voice saying, "I can't go on," etc., when in the dissociated state. The paralysis was partly due to the previous car accident (for after that she suffered from periods of paralysis) but finally and persistently from the electro-shock. There were of course predisposing causes going back to childhood, as we always find even in traumatic cases, but they do not concern us here.

By the recovery of all these experiences all her symptoms have one by one disappeared as they were analysed, and she has now made an almost complete recovery—she has had no fits for some months, no headaches, and the noises have gone. She is now able to walk on the level, though not yet upstairs without help owing to the disuse of her limbs for 12 years, is eating heartily, and has nearly doubled her weight.

This case supports the view of Janet, Freud, and others that it is not the physical shock alone but the psychic shock, in this case the conscious horror of the experience, which produces the traumatic neurosis. This explains why it is that patients undergoing electro-shock do not always suffer from traumatic neurosis. If traumatic neurosis were the result of physical shock as some maintain (as in the case of shell shock), electro-shock treatment should always end in neurosis. This patient had had three or four previous doses of shock treatment without any effect, bad or good, although the shock was sufficient to make her unconscious. In this last instance she was conscious of the horrifying experience although it was dissociated. This case also reveals the interesting fact that projected voices, although regarded as real by the patient, may be due not to paranoia or schizophrenia but entirely to psychological dissociation.—I am, etc.,

London, N.W.1 J. A. HADFIELD.

Poliomyelitis

SIR,—In the excellent refresher course article on poliomyelitis by Dr. Howlett Kelleher in the *Journal* (September 2, p. 570) very little mention is made of the infectivity of the disease. No advice is given to the G.P. on isolation of contacts, nor of any necessary disinfection of rooms, clothing, etc. These are questions always asked by relatives, and a clear guide to the practitioner would be, I am sure, very generally welcomed. Recently, while doing a locum, I have had a case brought to the surgery, and felt it my duty to close the rooms until they were disinfected by the health authority. Was this necessary? I am, etc.,

Hambrook, Bristol. G. S. KEELING.

*** Some of the points raised here are discussed in a leading article this week. For advice on disinfection in individual cases, medical officers of health should be consulted.—ED., *B.M.J.*

Haematemesis from Leeches

SIR,—The following case was recorded in April, 1950, at a camp for Arab refugees situated in the Jordan valley. It compares with an anecdote about Rhazes (Ar-Razi), the renowned Arabian physician who lived from A.D. 850 to 923, and bears out the aphorism of Rokitansky: "Those about to study medicine, and the younger physicians, should light their torches at the fires of the ancients."

Case Report.—An Arab boy, 7 years old, was brought to the camp clinic by his father, who complained that the boy had vomited blood three times during the preceding two days, but was otherwise quite well, without any pain or nose-bleeding, and, apart from measles and ascariasis, had had no previous illness. The boy vomited shortly after his arrival: the vomitus was not large in quantity and contained fresh blood, together with typical "coffee grounds," mucus, and food residue. On examination the boy was seen to be pale, but of good physique. He was intelligent and co-operative. There was no conjunctival or mucosal pallor, and no signs of dried blood on the external nares. The teeth were in good condition, but the gums were hypertrophic and bled easily (a very common condition among these children). Tongue and fauces were normal, but a small black object was momentarily visible behind the uvula. On further examination with a mirror this proved to be the tail of a large horse-leech, which was firmly attached to the posterior wall of the naso-pharynx. Traction on the leech with forceps failed to remove it, owing to its properties of tenacity and elasticity. With a view to local anaesthesia the throat was then sprayed with 5% cocaine hydrochloride; fortunately this had the additional effect of partially paralysing the leech so that it became easily detachable, and it was removed and identified as a specimen of *Limnatis nilotica*. Needless to say, the vomiting of blood did not recur.

The following anecdote is quoted by Professor E. G. Browne in his FitzPatrick Lectures on Arabian Medicine. It appears in the works of several Arab writers, particularly Qadi Abu Ali at-Tanukhi, whose account is particularly valuable, as he was almost a contemporary of Rhazes.

A young man who had recently travelled from Bagdad was troubled by the vomiting of blood, and he went to visit the famous physician. After careful examination, however, he was unable to explain the cause of his symptoms. The patient was in despair, believing that where Rhazes had failed none other could succeed. The physician, touched by his distress as much as by his faith, then proceeded to question him carefully as to the water he had drunk on his journey, and ascertained that in some cases it had been drawn from stagnant pools. "When I come to-morrow," said he to the patient, "I will treat you and not leave you until you are cured, on condition that you will order your servants to obey me in all that I command them concerning thee." The patient gave his required promise and Rhazes returned the next day with two vessels filled with a water-weed, which he ordered the patient to swallow. The patient, having swallowed a considerable quantity, declared himself unable to take any more, whereupon the physician ordered the servants to hold him on his back on the ground and open his mouth, into which he continued to cram more and more of the nauseous substance until

vomiting ensued. Examination of the vomit revealed a leech, which was the source of the trouble and with the expulsion of which the patient regained his health.

Two further cases of leech infestation were seen during a period of eight months in Transjordan. In one case the creature was attached to the epiglottis, in the second case it was in the pharynx. In neither of these cases was haematemesis the presenting symptom. Such leech infestation is not uncommon in tropical and sub-tropical areas. Manson-Bahr and Stitt, for instance, both describe horse-leeches as being liable to occur in this situation, but the usual presenting features are said to be epistaxis and persistent headache.

It is debatable whether Rhazes had made the diagnosis, and it seems possible that his therapy was based on the magical law of similarity (homoeopathic magic), which is still prevalent at the present day in Arab folk medicine. Muhammad 'Awfi, however, writing in the thirteenth century, gives Rhazes credit for the diagnosis and states that the leech when swallowed in the drinking-water had attached itself to the mouth of the patient's stomach and there remained until induced to transfer itself to the more congenial water-weed.—I am, etc.,

A. CAMERON,
Lately with British Red Cross Commission, Jordan.

Guildford.

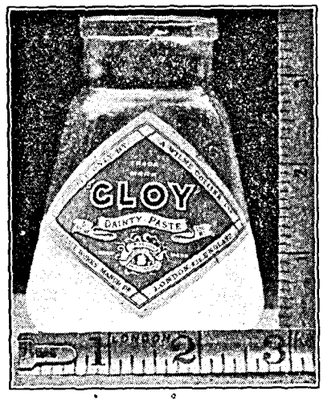
REFERENCES

Browne, E. G., *Arabian Medicine*, 1921, p. 74.
Manson-Bahr, Sir Philip, *Manson's Tropical Diseases*, 1941, p. 855.
Stitt, E. R., *Tropical Diseases*, 1929, p. 593.

An Unusual Foreign Body in the Rectum

SIR,—Although medical literature contains a long list of reports of foreign bodies in the rectum, I consider the following case of sufficient rarity and interest to add to the already formidable list.

A married professional photographer, aged 48, stated that, while reducing his piles following defaecation, he slipped and fell and became unconscious. On recovering he had agonizing rectal pain and then noted the absence of a paste pot which had been standing on the lavatory floor. After feeling the paste pot in his rectum he got on his motor-cycle and rode eight miles to his doctor and a further three miles to hospital. On admission he was in considerable pain, but regarded his accident with a certain amount of humour.



On rectal examination, about ½ in. (1.3 cm.) above the deep sphincter the bottom of a large bottle could be felt, but it was impossible to get beyond it. The sphincters and mucous membrane were grossly dilated and oedematous, but not lacerated. Under general anaesthesia the bottle was found impacted between the bodies of the ischium laterally, the pubis anteriorly, and the lower end of the sacrum posteriorly. A finger could be passed beyond the rim of the bottle on the postero-lateral quadrant, but it could not be moved in any direction. Attempts were made to extract it with various forceps, but without success. A laparotomy was carried out through a left lower paramedian incision, and again it was found impossible to push the bottle out of the rectum from above. The rectum was opened, but the bottle could not be got up out of the pelvis.

It was finally found necessary to break the bottle in the rectum with a hammer and chisel before removing it in pieces. This resulted in some laceration of the rectal mucous membrane, which was repaired. The opening in the bowel was closed and a left inguinal colostomy performed. The pelvis was drained with corrugated rubber and the wound closed in layers.

During the post-operative period he developed some proctitis and a small faecal fistula along the drain (from the pelvis). Sphincter exercises were begun after ten days. The fistula closed and he was discharged from hospital in four weeks. He was readmitted after two months for closure of his colostomy. His sphincter tone and rectal mucous membrane were then normal and he was discharged with a normally functioning bowel.

He has kindly photographed an identical bottle with measurements.

I am indebted to Mr. F. H. Scotson, consulting surgeon, under whose care this case was, for giving me permission to publish.

—I am, etc.,

Manchester, 8. J. B. PRENDIVILLE.

Erythroblastosis Foetalis Following ABO Incompatibility

SIR,—We wish to report an interesting case referred to us by Mr. Rutherford Morison, of Harrogate.

A primipara, aged 28, was admitted to a maternity home on April 4, 1950, being then 26 weeks pregnant (B.P. 180/120, albumin ++). The uterus was much larger than normal for dates. A radiograph of the abdomen showed a single foetus presenting as a breech with extended legs and confirming the age as 26 weeks. No foetal abnormality was seen. On Wednesday, April 5, 1950, her membranes were ruptured and several pints of bright yellow liquor were withdrawn. After being in labour for about 36 hours she was fully dilated but without progress for over two hours. An abdominal palpation, even allowing for the amount of liquor withdrawn from the uterus, gave the age as 34–36 weeks. The foetus and the placenta were removed per vaginam only with the greatest difficulty. The foetus was so oedematous as to be the equivalent more or less of a full-term foetus. Ascites was so marked that the abdomen of the child had to be punctured before it could be delivered. The placenta was mushy and came away piecemeal, in spite of which the amount of post-partum haemorrhage was minimal. There was a second-degree tear. A post-mortem examination was made on the child on April 7, 1950, at the National Blood Transfusion Service Depot, Leeds.

The whole foetus was very oedematous but not macerated. All subcutaneous tissues were waterlogged—the scalp floating on the skull. The brain was oedematous but otherwise normal. The dorsal spine and one thigh had been fractured at delivery. The skin was pale and very slightly jaundiced. At examination there was almost no blood in the child at all. The liver was enlarged, and grossly and visibly degenerated. All other organs appeared normal. These macroscopic appearances suggested haemolytic disease of the newborn in the form of hydrops foetalis.

A piece of the liver was sent to the Pathology Department at Leeds University for histology, which reported:

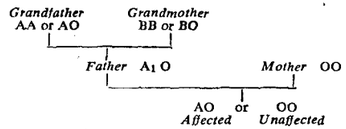
"The sections of this liver show most extensive extra-medullary haemopoiesis, the majority of the sinusoids containing primitive (marrow) forms of blood cells. There is also a marked degree of haemosiderosis, the iron-staining pigment being dispersed in fine granules within the liver parenchymatous cells. The liver cells show a degree of cloudy swelling but no advanced degeneration. There is no cirrhosis and nothing to suggest congenital lues. The histological appearances are without doubt those of erythroblastosis foetalis."

Meanwhile samples of the mother's blood showed her to be Group O Rhesus-positive, genotype R_1R_1 (CDe/CDe). A Kahn test had proved negative. Setting up the mother's serum against a panel of known Group O cells showed that there were no rhesus antibodies of any kind present about this time—i.e., April 10, 1950. The husband's blood was taken and found to be Group A rhesus negative (r r, cde/cde).

As the serological findings conflicted with all other evidence, further samples of the mother's blood were examined on May 12, and with the following result as regards the alpha titre. It was found that the mother's serum haemolysed the father's red cells to a titre of 1 in 4 and afterwards agglutinated them to a titre of 1 in 16,384 in saline and 1 in 128,000 in albumin. An indirect Race-Coombs test showed a titre similar to the albumin result.

As the child had been born dead no blood was taken from it, but it was presumed to have been Group A (from the father). ABO incompatibility seemed a certainty as the cause of foetal death. It seems possible that the high alpha titre was in part naturally occurring, as the mother gave no history of previous pregnancy in any form, nor of any previous transfusions or injections of blood at any time. A further sample of the mother's blood was taken on May 27, 1950. This showed no change in the alpha titre.

The parents were anxious about the prognosis. Accordingly, in order to find out whether the father was heterozygous, blood samples were taken from the father's parents. Grandmother, Group B; grandfather, Group A. It was calculated as under that each pregnancy produced a 50/50 chance of the infant being affected—and probably dying *in utero*.



Further estimations of the mother's alpha titre will be made.—We are, etc.,

National Blood Transfusion Service, Leeds.

R. T. D. FRANKLIN.
P. NEWSTEAD.
M. PASHLEY.
R. B. ROY.

Myeloid Leukaemia and Pregnancy

SIR,—In order to add to the list one more instance of chronic myeloid leukaemia associated with pregnancy, I record the case of a woman who, some fifteen years ago, was admitted in the early days of the puerperium to the Crewe Memorial Hospital as suffering from puerperal sepsis.

She was pyrexial, had localized infection of the breast, vulva, and skin, a large spleen, and cardiac murmurs. Before the blood film was seen, the likely diagnosis seemed to be bacterial endocarditis. Dr. W. H. Grace, of Chester, kindly examined the film and found it to be typical of myeloid leukaemia, from which disease the patient eventually died. In spite of the fact that the leukaemia, which must have been present during the pregnancy, was not treated at that time, I cannot recall any abnormality of the infant. The woman was admitted for a time to the Royal Infirmary at Chester, where I am sure any investigator will find more adequate details than my memory can supply.—I am, etc.,

High Wycombe. G. S. W. EVANS.

Danger of Mixed Anaesthetics

SIR,—It would seem, from a study of some recent articles on anaesthesia and from conversations with colleagues, that the practice of mixing thiopentone and a relaxant in the same syringe prior to administering them as an anaesthetic is becoming widespread. As almost the sole advantage of this technique is its convenience to the anaesthetist, I should like to present the arguments which operate against it. When any drug is exhibited the safest possible method should be used, and only techniques which allow the operator to judge the signs of possible overdosage, and to take steps to prevent it, are admissible. Dr. T. C. Gray and others, whose experience of relaxants is greatest, stress the necessity of a test dose, and while as yet the percentage of subjects sensitive to relaxants is not known, the literature already contains records of deaths which have occurred when this precaution was neglected, to say nothing of other cases which have survived only after prolonged and energetic resuscitation.

When the thiopentone-relaxant mixture is used, the test dose is rarely given, and if given loses most of its value, because, since the cardinal sign of overdosage of either thiopentone or curare is apnoea, each may mask the effect of the other to such an extent that it is impossible to judge the effect of either drug on the patient with any accuracy. Under such conditions overdosage becomes fatally easy. In addition, users of a thiopentone-relaxant mixture are, in effect, acting on the belief that there is an exact thiopentone-relaxant equivalent—e.g., 15 mg. D-tubocurarine chloride ≡ 0.5 g. thiopentone. This is simply not true, as users of these drugs can testify, and the fact that on a number of occasions such a mixture has been successfully used cannot be accepted as upholding that belief, for if the exceptions are as rare as even one in two hundred cases, these should be sufficient to rule it out.

It is suggested that when it is intended to use a relaxant with thiopentone, or indeed any other anaesthetic agent, the greatest margin of safety is obtained only if (*a*) a test dose of relaxant is invariably given, since at worst no harm is done, and at best, where the patient is sensitive, valuable information is obtained, and (*b*) the full dose of relaxant is administered separately and after the anaesthetic agent, so that the anaesthetist can judge the effect of each on the patient.

Anaesthetists have been called—among other things—"the guardians of sleep." If they use techniques other than the safest, surely their proud motto "In somno securitas" can be called in question and yet another question posed in its place: "Quis custodiet ipsos custodes?"—I am, etc.,

London, W.12. J. ANSTRUTHER SMITH.

Collapse During Spinal Analgesia

SIR,—I read the letter from Drs. E. H. Winterbottom and J. W. Dundee in your issue of August 26 (p. 527) with great interest. The last paragraph, however, gives me cause for thought and great difference of opinion. I agree that there was much argument against the use of spinal analgesia in this case, but why, if general anaesthesia were chosen as an alternative, should it be assumed to be necessary to intubate and use intratracheal methods? Auricular fibrillation could just as easily have been initiated by intubation, as they say, and I can see no reason for thus complicating a general anaesthetic in a case for relief of urinary obstruction.—I am, etc.,

Orpington. ERIC A. SCOTT.

Methyl Bromide Poisoning

SIR,—The case of methyl bromide poisoning reported by Drs. A. C. MacDonald, I. C. Monro, and G. I. Scott (*Journal*, August 19, p. 441) prompts me to record the case of a man who was in my care last year.

The patient was a "spiv" who stole some 200 R.A.F. methyl bromide fire extinguishers from a storage depot. While unloading these from his lorry one went off in his face and he felt temporarily overcome by the fumes. Between two and three hours later he felt his hands shake and then collapsed quite suddenly. He was admitted to a hospital, where he was unconscious for four days. The cause of his collapse was only discovered following police investigations.

After four weeks he was discharged from hospital but complained of weakness and jumping in his arms and legs. Ten weeks later, as there were no discoverable organic causes for his symptoms, he was referred to a psychiatric out-patient clinic, where I first saw him, and he was later in my care in a neurosis unit for some weeks. The symptoms were of a hysterical nature and were susceptible to suggestion, but at first it was necessary to persuade the man to face the police charge that was awaiting him. In court the Recorder said that the patient had already suffered enough, and he was put on probation. Following a slight relapse in his weakness he then improved with superficial psychotherapy and was soon fit for work.

An interesting feature of the case was that while in hospital for treatment of the neurosis he had a typical grand mal seizure. This was witnessed by an experienced male nurse who has observed many epileptics, and I have no doubt that it was a genuine epileptiform convulsion. There was no history of any previous attack (even during the acute stage of the methyl bromide poisoning), and unfortunately the patient took his discharge soon after this so that further observation was denied us.

My attempts at follow-up of this patient have been unsuccessful, but over a year after leaving hospital he was seen by a nurse who had known him in hospital, and he appeared to be maintaining normal health.—I am, etc.,

Co. Durham. JOHN A. EWING.

Pyloric Stenosis in a Premature Infant

SIR,—Congenital pyloric stenosis is regarded as a well-defined entity and has been widely reviewed in the literature. The following case report is of interest chiefly because the patient was a premature infant presenting the classical signs of congenital pyloric stenosis.

In 1925 Weeks and Brooks reported a premature infant with pyloric stenosis weighing 4 lb. (1.8 kg.) at operation. Gallagher, in 1937, reported a case of pyloric stenosis occurring in a coloured female infant which weighed 3 lb. 8¾ oz. (1.6 kg.) at birth. The mother was delivered by caesarean section because of nephritic toxaemia. In this case the infant did well until the 28th day, when vomiting commenced and typical signs of pyloric stenosis were noted. A Ramstedt operation was performed, but the wound did not heal by first intention and resuturing was necessary. Vickers and Conrad

(1940) also reported a case of an infant weighing 4 lb. at birth. Signs and symptoms of pyloric stenosis developed when the infant was one month old. The infant weighed only 3 lb. 12 oz. (1.7 kg.) at operation, which was successfully performed. The wound broke down on the 10th day after operation, but final recovery was complete.

Case Report.—An apparently healthy female infant was born at Staincliffe General Hospital, Dewsbury, on November 24, 1949. The mother had had three previous pregnancies, two of which had resulted in premature births and one in a miscarriage. There was no history of pyloric stenosis in the two living children. With the present pregnancy there was evidence of toxaemia, but delivery was spontaneous and normal. At birth the infant weighed 4 lb. 6 oz. (1.9 kg.) and had a crown-heel measurement of 17 in. (42 cm.). The mother's menstrual history was vague, but it was estimated that the infant was born at about the 36th week of gestation. The infant did well until the 15th day, when she began to regurgitate feeds. Gradually the vomiting became more copious and forceful, and stools became infrequent and dry. She was hungry for her feeds but began to lose weight. On the 19th day a definite abdominal mass with the characteristics of a pyloric tumour was felt, and weak peristaltic waves were visible. A diagnosis of congenital pyloric stenosis was made, and "eumydrin" was given before each subsequent feed. However, she did not improve and vomiting persisted.

On the 21st day a Ramstedt operation was performed. At this time the infant weighed 4 lb. 1 oz. The operation was performed under local analgesia, and a well-marked hypertrophy of the pylorus was found. No particular difficulty was encountered at the operation. Recovery was uneventful and the wound healed well by first intention. She was discharged from the hospital 3½ weeks after operation, when she weighed 6 lb. 13¼ oz. (3.1 kg.).

—We are, etc.,

CYRIL JOSEPHS.
R. W. HENDRY.

Dewsbury.

REFERENCES

Gallagher, John T. F., *Ann. Surg.*, 1937, **106**, 299.
Vickers, H. D., and Conrad, J. W., *Amer. J. Surg.*, 1940, **49**, 508.
Weeks, A., and Brooks, L., *Calif. west. Med.*, 1925, **23**, 65.

The Training of Pathologists

SIR,—It was with considerable interest that I read of the recommendations of the committee set up by the Royal College of Physicians "to inquire into the training and recognition of medical specialists in pathology, and to make recommendations concerning this branch of medical practice in the future" (August 26, p. 515). Having been actively engaged in the teaching of pathology for almost twenty years I write to point out a condition which should apply to all pathologists-in-training.

I consider it imperative that the fundamental principles of pathology should be assimilated and inculcated correctly, systematically, and thoroughly from the very outset, and not left, as is implied in the annotation on the report, until the third, fourth, or fifth year when the trainee is in a university or associated department and free from routine responsibilities. As a consequence, the recommended generous provision of posts in hospital laboratories, and in the departments of clinical pathology of universities and teaching hospitals, must be such as to permit candidates specially selected for training to be free or relatively free from routine responsibilities in the first or first and second years of training. This would enable all trainees systematically to acquire considerable competence and experience of laboratory methods in each of the four divisions of pathology within a two-year period, and at the same time to make some study of the four subjects in selected and supervised reading. By this means candidates would receive a good grounding in pathology and be the better able to profit from the three succeeding years of study in which a selected subject or one of special interest could form the basis of individual investigation and study suitable for presentation as the thesis for a higher degree.

This point is stressed because, unless first- and second-year trainees are appointed *supernumerary* to departmental establishment in hospital laboratories selected for training, those in training would be employed mainly or wholly in repetitive routine work and would learn little of the fundamentals of their subject and perhaps only a limited repertory of technical methods. As a corollary, it is important that the medical staff of departments of pathology selected for teaching, in hospitals other than teaching hospitals, should be adequate to allow the senior members time in which to teach all juniors systematically. Such an arrangement would, in the end, more than justify the expense of the salaries paid out for little immediate return, other than, say, resident alternate night duty required of trainees.

When, in the future, conditions become more stabilized it should be possible for the university departments of pathology to be responsible for the initial period of postgraduate training and provide, in a two-year course, a curriculum similar to that at present followed for one year at the Postgraduate School for the Diploma in Clinical Pathology (University of London). The additional year would permit of methods being learned less hurriedly and practised more frequently, and at the same time allow of related systematic reading. Such university postgraduate courses in pathology for all trainees should not be regarded as the ideal and the unattainable, but rather as the best and essentially economic means of providing well-trained pathologists in this country.—I am, etc.,

J. F. HEGGIE.

London, N.18.

Vaccination and Inoculation Certificates

SIR,—In your issue of July 22, p. 215, you publish a letter from Sir Philip Manson-Bahr referring to the inconvenience caused by regulations regarding vaccination and inoculations. This draws attention to an important international matter at present being studied by the World Health Organization. It is proposed next year to replace the various present international sanitary conventions with new international health regulations. An opportunity is thus given to place medical supervision of international trade and travel on a more scientific basis and so reduce the present too frequent obstruction it offers to free international movement. In this respect, however, the draft of the new regulations already circulated to governments for comment is not reassuring. If these regulations are adopted they will still provide nervous or officious health authorities with ample scope for demanding excessive immunization certificates, medical examination, and isolation of passengers and crews, and the holding of ships, aircraft, and land transport, all in the name of disease prevention. It is not possible in a letter to indicate how doubtful many such quarantine barrier methods are as a means of preventing the introduction of disease. My own opinion is that there is scarcely any measure of the quarantine barrier type which is practical or justifies the serious obstruction given to international trade and travel. I have given this view in an article in the *Journal* (1948), **1**, 1092, from which I should like to quote the summary:

Much medical interference in world traffic still exists in spite of the advance in international sanitary legislation. This partly arises out of the increasing demand for travellers to hold vaccination certificates and to submit to medical examinations, and partly to medical interference with shipping and aircraft. Arguments are put forward [in the paper] suggesting that such restrictive quarantine medical practice is of limited value and is dangerous in creating a false sense of security. It cannot guarantee exclusion of infection and is no protection against the recrudescence of endemic disease. It leads to the neglect of more valuable internal measures for improving medical organization and sanitary conditions. It also contributes to inter-territorial friction.

There is thus a need for the international sanitary conventions now being revised to reduce "police" measures, to emphasize national self-reliance and responsibility, and to clear the way for better national health services and world transport less shackled with medical restrictions.

—I am, etc.,

H. S. GEAR.

Capetown.

A Dromedary has One Hump

SIR,—I should like to ask if any reader of the *Journal* can explain the employment of the dromedary to describe the temperature chart in anterior poliomyelitis? Dr. W. Howlett Kelleher in his authoritative article (September 2, p. 571) follows current textbooks in making it appear that the term is intended to describe a two-humped chart.—I am, etc.,

BRIAN WEBBER.

Broadstairs.

Lung Cancer and Petrol Lighters

SIR,—If the use of petrol lighters is to be considered as a possible cause of lung cancer, as suggested by your correspondent Dr. R. W. Ironside (August 26, p. 529), what about paraffin-impregnated matches?—I am, etc.,

B. R. SANDIFORD.

Birmingham, 3.

Obituary

HERBERT MORLEY FLETCHER, M.D., F.R.C.P.

Dr. Morley Fletcher, consulting physician to St. Bartholomew's Hospital, died at his Sussex home on September 9, in his eighty-sixth year. Although he had lived for years in retirement in the Sussex village of Petworth, Dr. Morley Fletcher will be remembered not only by a host of his Harley Street neighbours and others but by a large number of young and middle-aged members of the medical profession who worked under him as clinical clerks and house-physicians or met him in the examination-room. He was examiner in medicine for Cambridge, Durham, Manchester, Sheffield, and Glasgow Universities, Queen's University, Belfast, and the National University of Ireland, also for the Conjoint Board and the Society of Apothecaries, so that a large proportion of entrants into medicine must have been examined by him. He had the gift of rapidly assessing the quality of an individual and measuring his attainments, and was never misled by pretentiousness or superficial brilliance.



Herbert Morley Fletcher was born in 1864 at Huyton, in Lancashire, the son of Alfred Evans Fletcher and Sarah, daughter of Richard Morley, of Leeds. His younger brother was Sir Walter Morley Fletcher, the first secretary to the Medical Research Council, who died in 1933. Herbert was sent to Mill Hill School, and then to Trinity College, Cambridge, where he took his B.A. in 1887. At Cambridge, like his brother, he shone not only in natural science but also as an athlete. He was elected president of the Cambridge University Athletic Club in 1888, and to a good age he was adept in many kinds of outdoor sport. Few men have kept their youthful appearance and carriage so long after middle life. He received his medical training at St. Bartholomew's, qualifying in 1890, and proceeding M.D.Cantab. in 1893. He completed his studies at Freiburg and Vienna.

Morley Fletcher's reputation as a consultant in general medicine, and especially in children's diseases, quickly grew. In 1904 he was appointed to the staff of his old hospital, St. Bartholomew's, of which in due time he became senior physician and on his retirement in 1929 consulting physician. He was also vice-president of the Medical College. Other hospitals with which he was associated were the East London Hospital for Children, Queen Charlotte's, the Alexandra Hospital for Diseases of the Hip, the Florence Nightingale Hospital, the Infants' Hospital, and the Bushey Heath, Hertford County, and Royal Buckinghamshire Hospitals. He was also a member of the consulting staff of the Convalescent Home for Officers at Osborne, Isle of Wight, honorary physician to the Metropolitan Convalescent Institution, and a member of the Medical Consultative Board of the Navy. In the war of 1914–18 he served as major, R.A.M.C.(T.). In 1933 he was appointed by the Government a member of the Advisory Committee concerned with the administration of the Cruelty to Animals Act.

He was a prominent figure in the Royal College of Physicians of London, becoming eventually Senior Censor. He took the Membership of the College in 1891 and was elected a Fellow in 1900. At one time he was president of the Section of Medicine of the Royal Society of Medicine and at another president of the Section of Diseases of Children. He had also been president of the British Paediatric Association and honorary secretary of the Association of Physicians. The Royal Australasian College of Surgeons made him an Honorary Fellow, and in 1937 Queen's University, Belfast, conferred on him the honorary degree of LL.D. The Marquess of Londonderry, Chancellor of the University, in bestowing the degree, described him as having one of the most acutely critical minds in medicine. "His detection of error is exercised not only on scientific hypotheses but also on conjectures contained in the type of monographs whose utility is most doubted by their authors." This ceremony took place during the British Medical Association meeting at Belfast, where Dr. Morley Fletcher was president of the Section of Diseases of Children. In 1894 he published a translation of C. van Kahlden's *Method of Pathological Histology*. He contributed the article on biliary cirrhosis in Allbutt and Rolleston's *System of Medicine* and on diseases of the peritoneum, liver, and pancreas in Garrod, Batten, and Thursfield's *Diseases of Children*. He was a frequent contributor to the *Practitioner*, and his writings were authoritative and widely quoted.

He was twice married: first to Ethel Frances, who died in 1918, daughter of the late Joseph Crossley, of Halifax, by whom he had two sons and three daughters; one of his daughters of this marriage is the wife of Mr. H. U. Willink, K.C. His second marriage was to Mary Christina, sister of Mr. H. U. Willink, by whom he had two daughters.

A former house-physician writes: "Morley," as we always called him, gave one the impression of being a bit aloof. But to become his house-physician was to become his friend and colleague. It was only after one had left Bart's that one realized how tolerant he had been to youthful arrogance. He treated his house-physicians as equals who were sharing with him the common task of looking after the sick. "It might be worth while trying such-and-such a drug," was his method of instruction: you received the instruction in the form of a consultation, and this was enormously encouraging.

Morley Fletcher was a sound clinician of the older school. He kept himself up to date with recent advances in medicine without ever surrendering his judgment of a case to the compilers of reports on special investigations. He was always courteous and urbane, and to be on "Morley's" firm as clerk and house-physician was a very happy experience. That very remarkable figure in charge of his male ward, Sister Hope (Miss Powell), used to say: "One can get very cross with Dr. Fletcher, but as soon as he smiles you are disarmed at once." One amusing characteristic of him was that once he had made up his mind that certain of your experiences had followed a certain pattern it was difficult to convince him of error in one or two particulars: he held fast to his own version.

About a year ago he said he thought he had shrunk a bit, but he still held his slim, trim figure as erect as ever. Morley Fletcher was a connoisseur in those things that make for the fuller life. To all who knew him well he was a lovable person, and they will hold his memory in great affection.

Dr. ERNEST VILLIERS HUNTER, of the Church Missionary Society, Uganda, died suddenly on July 29 at Nairobi aged 73 years. As a young man he worked as a missionary in India, but after a time he decided to become a doctor, and he qualified in Ceylon in 1903. After qualifying he held a number of medical posts, being at one time in charge of a leper colony in India. At the beginning of the first world war he joined the R.A.M.C. and was posted to Gibraltar. On demobilization he took up general practice in Worcestershire, but two years later he responded to an appeal from the Church Missionary Society for a doctor to work in Uganda. For some years he worked at Ngora, where he founded and built the Freda Carr Hospital. In 1939 he took charge of the Mengo Hospital. During the difficult war years his gifts of resource and practical common sense were of great service to Mengo. He did much to modernize and improve the hospital. On his retirement in 1942 his services to the Protectorate were marked by the award of the O.B.E. He continued to serve the Church Missionary Society in an advisory capacity up to the time of his death. Dr. Hunter was a man who was valued and respected by a wide circle of friends of all races. As a doctor he showed great shrewdness, wisdom, and skill. He was eminently a practical man and could turn his hand to many things. His deeply rooted Christian faith was the mainspring of his entire life and character. The last year of his life was clouded by the death of his wife, who had been so closely united with him in all his aims and activities, and also by the loss of his only son. His own death came at a time when he felt that his life's work was done, and he was buried, as he would have wished, in African soil.—W. R. B.

Dr. JOHN VINCENT BATES, of West Malling, Kent, died suddenly on August 14 at the age of 58, while attending a meeting at the West Kent General Hospital. Dr. Bates was educated at Highgate School, Pembroke College, Cambridge, where he was a scholar and where he obtained first-class honours in the Natural Sciences Tripos in 1913, and University College Hospital, where he gained the Goldsmid Exhibition. He qualified in 1915 and at once joined the R.A.M.C., serving in France with a battalion of the Black Watch. At the Battle of the Somme, in 1916, he was awarded the Military Cross. He served in France until he was wounded in 1917, when he was posted to the Military Heart Hospital at Colchester. On demobilization he took the M.A. and M.B. and B.Ch. degrees of Cambridge University, and subsequently became house-physician at University College Hospital and house-surgeon at the Leicester Royal Infirmary, finally entering general practice as partner in a large practice at West Malling. In this practice he was medical superintendent of the Malling Isolation Hospital and medical officer to the Aylesford Paper Mills and Holoplast, Ltd., and was the well-loved friend and adviser of a large number of patients, who will mourn his passing. Shortly after coming to West Malling he was gazetted to the 131st (H.C.) Field Ambulance and eventually commanded the unit, retiring with the rank of brevet-colonel. Dr. Bates was a member of the B.M.A. since 1919, was chairman of the Maidstone Division from 1944 to 1947, and was Representative of the Division at the A.R.M. in Cambridge in 1948. He was a member of the Kent and Canterbury Local Medical Committee and of the management committee of the Mid-Kent group of hospitals. He leaves a widow and two sons, both of whom have followed him in the profession of medicine. The sympathy of a large circle of friends and colleagues will go out to his family.

Dr. BERTRAM HENRY BARTON died on August 16 after a long illness at the age of 67 years. He was educated at Chatham House, Ramsgate, and in medicine at St. Bartholomew's Hospital, where he qualified in 1906. He graduated M.B. in 1908 and proceeded M.D. in 1910. After holding house appointments at the Seamen's Hospital, Greenwich, the Royal Hospital, Portsmouth, and the Hospital for Sick Children, Great Ormond Street, he became a general practitioner in Harrow, where he worked until his retirement about three years ago. During the first world war he was in the R.A.M.C., serving in France with front-line troops for a long period. He was awarded the M.C. for his outstanding work in a field-dressing station. As a general practitioner he was much beloved by his patients and held in great esteem by his brother practitioners. He was on the staff of Harrow Hospital for many years as a general practitioner and gave much of his time to giving anaesthetics there. During the second world war he did E.M.S. work at the same hospital. He was a keen member of the B.M.A. from 1910, and chairman of the Harrow Division in 1926–7. In 1941 he represented Harrow at the Annual Representative Meeting in London. By his death the district of Harrow has lost one of its most loyal and devoted general practitioners, for he was a man who devoted his time and attention whole-heartedly to his profession.—H. E. T.

Mr. EDWARD GILLESPIE, for many years a member of the surgical staff of the Prince of Wales General Hospital, Tottenham, died at Bishop's Stortford on August 22. He studied medicine at Glasgow and graduated M.B., Ch.B. in 1900. After working as a house-surgeon at the Western Infirmary he left Glasgow and held a number of hospital posts while studying surgery. He was admitted F.R.C.S.(England) in 1907. Gillespie became surgical registrar at the Prince of Wales Hospital after working there as a house-surgeon. Before long he was elected an assistant surgeon, and thereafter he rose steadily until he became senior and, comparatively recently, consulting surgeon of the much enlarged hospital. He also soon came to be associated with the Enfield Cottage Hospital, which later became the enlarged Enfield War Memorial Hospital. During the first world war he held a number of surgical posts in France and in England: two of the most important were at Tréport and at the Tooting Orthopaedic Hospital. At the beginning of the second world war he joined the E.M.S. and was appointed to the Haymeads Emergency Hospital at Bishop's Stortford. He retired shortly after the end of the war, but continued to live at Bishop's Stortford.

Dr. C. F. Hadfield writes: The announcement of the death of Edward Gillespie may well have escaped the notice of the many hundreds of patients alive to-day who owe their existence to his skill and care. Perhaps the fact that I knew and worked with him for more than forty years may be deemed a valid excuse for attempting an appreciation of a man whom I, with no small experience, regard as one of the most able and skilful surgeons whom it has been my privilege to assist. While studying in Glasgow he came much under the influence of Sir William Macewen. Although anything but a hero-worshipper, and in fact apt to be somewhat censorious of the work of himself and others, he was never tired of praising the abilities of that great surgeon and admitting his indebtedness to his teaching. How exactly he became house-surgeon at the Prince of Wales Hospital, which was to take such a large part in his subsequent life, I do not know, but when I first met him in 1908 he was already surgical registrar there and working under, among others, that fine old type of general-practitioner surgeon, Mr. Hooper May. For very many years quite a proportion of Gillespie's private and hospital work was connected with Enfield, and he became the trusted adviser in more than surgical matters to many of the general practitioners of that neighbourhood. During this period he did not only the routine surgical work of the Enfield Cottage Hospital but also all the emergency operations, and he never seemed to resent the innumerable night calls there from the West End. Another of his appointments was that of surgeon to the Tottenham Hotspur Football Club. In this I was usually associated with him, and I should hesitate to say how many potential football teams we dealt with. I again had the privilege of working in close co-operation with him at the Haymeads Emergency Hospital. At first the staff was a rather shifting one of younger surgeons, some of whom perhaps did not quite understand why their senior should be a surgeon whose name they scarcely knew. It was, however, interesting and even amusing to those of us who knew him to notice how rapidly and without any effort on his part they came to seek his advice and to acknowledge his superior judgment and skill. He quickly attained an outstanding position not only in the hospital but in the surrounding neighbourhood for his surgical skill, his wisdom, and the trust he inspired. It is in fact at the special request of a number of his Haymeads colleagues that I have attempted to write this brief appreciation. During the war years his work at the hospital was twice seriously interrupted by severe attacks of coronary thrombosis, but after each of these he returned to his work with unimpaired abilities and continued to perform gastrectomies and other severe operations with unaltered success. Although a diligent student and critic of surgical literature, he himself wrote little and seldom took active part in formal discussions, though in private consultations his opinions were decided and trenchantly expressed. He was a keen sportsman and in younger days played much tennis. He was fond of golf, and, though never of the first class, he could up to the last usually give points to most of his house-surgeons and colleagues. Though his friends who remain will miss him sadly, we can rejoice that he was spared any long and tedious period of slowly diminishing physical and intellectual activity.

Dr. JAMES FRANCIS BLACKETT, for twenty-five years medical officer of health of the city of Bath, died at his home on August 30 after a brief illness at the age of 69 years. Though on the retired list, he was happily active up to the end, just having returned from doing relief duty for an old friend who had been on holiday. A student of the Bristol Medical School, he graduated M.B., B.S.(London) in 1906, proceeding to the M.D. in 1909. Two years later he also obtained the M.D. of Bristol University. James Blackett was an able student, obtaining the Lady Haberfield and the Clarke and Sanders Scholarships, as well as the committee gold medal of the Bristol Medical School. After a period as house-physician at the Bristol General Hospital he went into general practice for a few years. During the first world war he served as a captain in the R.A.M.C. In 1917 he turned to the public health field, and after obtaining the D.P.H. at Bristol he became assistant medical officer of health in the borough of Swansea. In January, 1920, he was appointed medical officer of health and school medical officer of his native city of Bath, a post which he held until his retirement in 1945. During his term of office Blackett was a pioneer in the development of the health services, being closely associated with the reconstruction of the City Isolation Hospital, the building of the Bath and Wessex Children's Orthopaedic Hospital, and Winsley Sanatorium. For thirty years he was honorary treasurer of the West of England Branch of the Society of Medical Officers of Health, and he was an active member of the B.M.A., representing the Bath Division at the annual meeting in 1923, and serving as chairman of the Division in 1930–1. Few people were privileged to know Blackett intimately, but those who did found in him a loyal friend and interesting companion. Studious and retiring by nature, he had a great interest in many subjects, apart from his chosen profession. Archaeology was a particular hobby, and at week-ends he was frequently to be seen cycling through the byways of Somerset in search of fresh knowledge. After his retirement he was able to enjoy his hobbies to a greater extent, travelling further afield on the Continent. His brain was as active and eager as ever, much of his time being devoted to recording the history of the development of public health services in Bath during the last fifty years. Happily he was able to complete this work, and in 1949 the University of Bristol awarded him the degree of M.A. for his thesis on this subject. Blackett was one of those who possessed in high degree the qualities of loyalty, thoroughness, and integrity—qualities which are so needed in public life to-day. He will be sorely missed by those of his staff to whom he also accorded the privilege of friendship. His wife died in 1941, but he leaves a son and daughter, to whom the sympathies of his friends and colleagues are extended.—B. A. A. W.

The Ministry of Health announces that gifts of blood to hospitals in England and Wales through the National Blood Transfusion Service totalled 125,956 during the first three months of this year—the highest number since the war. Over 23,600 more donors joined the Service in the quarter, bringing the total strength up to 377,704. Another 220,000 donors are needed to keep ahead of the steadily increasing demands of hospitals and to reduce calls on the individual donor.

Medico-Legal

NATIONALIZATION AND CHARITY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Another Chancery case recently gave the court an opportunity further to trace the dividing line between charities and State-owned institutions under the National Health Service, and to define the effects of the new legislation on bodies that have hitherto been governed by the principles of equity relating to charitable trusts. It decided that teaching hospitals are still charities and therefore suitable objects of bounty; and also that the Royal College of Surgeons is a charity.

The late Lady Bland-Sutton bequeathed funds to the National Provincial Bank, as executor and trustee of her will, to be applied as follows. The Royal College of Surgeons was to have £300 a year, free of tax, to maintain a Bland-Sutton Research Scholarship in its Bernhard Baron Laboratories, and the residue was to go each year to the Middlesex Hospital for the maintenance and benefit of the Bland-Sutton Institute of Pathology already in existence. But she attached a condition to this gift. If ever the institute should cease to be carried on as a pathological research institution, or if its name should be changed, or if the Middlesex Hospital should become nationalized or by any means pass into public ownership, or if the bank should become unable lawfully to apply the income for those purposes, then it was to transfer the capital and income of the endowment fund to the Royal College of Surgeons absolutely for the College's general purposes. In 1943, when her will was proved, the fund amounted to some £23,000, and down to July 5, 1948, when the National Health Service Act came into force, it was duly applied according to her will. After that date, however, the bank felt doubt concerning the effect of the Act, started to accumulate the income other than that required for the scholarship, and moved the court to determine whether the gift to the College was valid.[1]

Two important points arose for decision: whether the Middlesex Hospital had become nationalized and passed into public ownership, and whether the Royal College of Surgeons was a charity. On the first point, Mr. Justice Danckwerts stressed that the Middlesex is a teaching hospital for the purposes of the Act, and that when the Act came into force the Bland-Sutton Institute of Pathology was part of a medical school. By Section 6 of the Act all the premises and movable property of the hospital were transferred to the Minister of Health free of any trust; but by Section 7 all endowments of a teaching hospital were transferred to the board of governors constituted under the Act, and by Section 8 (1), where a medical or dental school is associated with a hospital which is transferred to the Minister under Section 6, property held solely for the purposes of that school is not affected, and those purposes are not to be deemed to be purposes of the hospital.

This provision seemed to the judge to take the property held for the purposes of the medical school of the hospital, including the Bland-Sutton Institute of Pathology, out of the provisions of the Act transferring property of hospitals to the Minister. By Section 8 (2) the property of a medical school of the University of London is transferred to the school's governing body. By the scheme submitted by the old council of the medical school and approved by the university, the council became incorporated and the property vested in it. The judge took the view that the governing body and the property had neither been nationalized nor passed into public ownership; the Bland-Sutton Institute of Pathology and its work continued in existence, though administered by a differently constituted body, and the bank might lawfully apply the income of the endowment fund for the purposes of the institute.

This ruling disposed of any right of the Royal College of Surgeons to the residue, but before giving it the court went deeply into the question of the legal standing of the College.

---

[1] *Re* Bland-Sutton's Will Trusts. 1950, 2 All E.R. 466.
[2] *Re* Royal College of Surgeons of England. 1899, 1 Q.B. 871.
[3] Customs and Inland Revenue Act, 1885, s. 11.

The right of the College depended on whether it is a charity at law, and a major obstacle to this view was a previous decision of the Court of Appeal in an unsuccessful claim by the College to be exempted from the tax on corporate and unincorporated bodies.[2,3] The argument before the court on that occasion had proceeded entirely on the question whether the property or income of the College was appropriated and applied solely for the promotion of science; and the court held that this condition was not satisfied.[4] Its reason was that the College had two main objects: promotion of the science of surgery, and promotion and encouragement of the practice of surgery and the interests of those practising or about to practise it; and the second of these objects disqualified it for exemption. The Chancery judge, however, now held that, in considering whether a particular society is a charity for the purposes of a gift in a will, the test is whether the objects of the society are really charitable, notwithstanding that their carrying out might incidentally produce benefits to its members. The motives of the members of a society on joining it are not material. Counsel for the College urged that the art and science of surgery are essentially a practical art and science, and cannot be promoted without practice and experience, which can be carried out only by means of a competent body of practitioners whose labours are intrinsically directed towards the cure or alleviation of the ills of mankind. The judge found great force in that argument, and considered himself free to hold that the real object of the College was the promotion and encouragement of the art and science of surgery and not the interests of surgeons. The earlier decision did not prevent him from so doing, as it concerned a particular statute and was directed to different considerations. This present judgment, though it did not help the College in its immediate object of securing the Bland-Sutton residue, may prove of great help on some future occasion.

Universities and Colleges

UNIVERSITY OF EDINBURGH

The Faculty of Medicine of the University of Edinburgh has announced the following Macarthur postgraduate lectures to be delivered by Mr. Norman C. Tanner, F.R.C.S., Senior Surgeon, St. James's Hospital, Balham, S.W., in the Surgery Lecture Theatre, University New Buildings, Edinburgh, at 5 p.m. on each day: Monday, October 9, "The Indications for Surgery in Peptic Ulcer"; Tuesday, October 10, "Operative Methods in the Treatment of Peptic Ulcer"; Wednesday, October 11, "Treatment of the Complications of Peptic Ulcer." Dr. Philip S. Hench, Mayo Clinic, Rochester, Minnesota, U.S.A., will deliver a Macarthur postgraduate lecture on Friday, October 13, at 5 p.m., in the Anatomy Lecture Theatre, University New Buildings, Edinburgh. His subject is, "The Present Status of Cortisone and A.C.T.H. in General Medicine." Senior students and graduates in medicine are cordially invited to attend these lectures.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting the Royal Faculty of Physicians and Surgeons of Glasgow held on September 4, with the Visitor, Mr. Walter W. Galbraith, in the chair, the following were admitted Fellows of Faculty *qua* Physician: J. Colvin, R. J. Cuthbert, J. C. C. Kelly, R. J. McWilliam, S. S. Meighan, jun., J. McC. Murdoch, G. B. Shaw.

SOCIETY OF APOTHECARIES OF LONDON

Dr. Frank Howitt has been elected Master of the society and Dr. G. Roche Lynch and Sir Wilson Jameson Wardens. Sir Cecil Wakeley has been reappointed as the society's representative on the British Postgraduate Medical Federation for a further year.

The diploma of Mastery of Midwifery has been conferred upon Dr. Hugh F. Powell, *honoris causa*.

The following have been granted the diploma of L.M.S.S.A. upon examination: P. A. Van Der Merwe, A. H. R. Hewett-Clarke, W. B. Wright, P. E. E. Kann, M. K. Mangan, M. el K. A. Tarshouby, L. Tippett, C. E. Law, A. J. Rowe, W. C. Snoek, H. C. Killey, N. L. Rowe, D. G. Bluett, D. L. Hadley, T. G. Scott, R. A. Davidson, W. H. Bexon, A. Gordon, P. H. I. Parsons, B. Kay, R. N. Pearson, J. M. Hayman, G. T. Gould, R. E. Hazell.

No. 34

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	18	3	16		1	18	2	16	2	—
Deaths		—	—				—	—		
Diphtheria	41	3	21	2	2	52	6	25	—	3
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	137	7	86		—	90	10	68	1	—
Deaths		—			—				—	—
Encephalitis, acute	3	2	—	—	—	2	—	—	—	—
Deaths		—					—			
Erysipelas			20	4	4			17	8	5
Deaths							—			
Infective enteritis or diarrhoea under 2 years	11		3	23	8	28	2	3	74	—
Deaths				2	—				9	
Measles*	4,277	316	79	64	26	1,778	120	75	68	41
Deaths†			—	—	—		—	—	—	—
Ophthalmia neonatorum	34	2	6		—	38	2	8	—	—
Deaths										
Paratyphoid fever	10	1	3 (B)		—	25	3	—	7 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	177	10	—	2	2	222	9	—	—	12
Deaths (from influenza)‡	1	1	—	1	—	3	—	1	1	—
Pneumonia, primary			98	¶				74	19	
Deaths	121	24		2	7	122	20		3	7
Poliomyelitis, acute	589	42	86	5	18	280	34	9	—	1
Deaths§	40	2		—		20	4			
Puerperal fever		—	6				—	5		
Deaths										
Puerperal pyrexia‖	85	10	7	1	—	91	7	9	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	635	50	137	27	37	718	53	131	40	59
Deaths†			—	—	—		—	—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	11	3	3	—	1	10	1	1	4	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,725	354	238	80	31	1,671	79	66	69	72
Deaths	6	2	—	—	—	3	1	—	—	—
Deaths (0–1 year)	165	24	29	13	3	260	35	32	30	11
Deaths (excluding stillbirths)	3,968	615	484	134		4,054	648	517	144	88
Annual death rate (per 1,000 persons living)			9·7		99			10·4	8·9	
Live births	6,681	1090	844	433		7,297	1143	866	410	227
Annual rate per 1,000 persons living			17·0		20			17·4	25·4	
Stillbirths	180	22	24			189	14	33		
Rate per 1,000 total births (including stillborn)			28					37		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending September 2 were: paralytic, 302 (369); non-paralytic, 189 (220); total, 491 (589). The figures for the previous week are shown in parentheses. The total decrease compared with the preceding week was 98, of which 67 were paralytic and 31 non-paralytic. Non-paralytic cases in the week under review comprised 38.5% of the total. The uncorrected notifications for the corresponding week in 1947, 1948, and 1949 were 657, 73, and 308 respectively.

The only counties showing more than average increases for the week under review were Kent and the West Riding of Yorkshire—10 and 7 respectively more than in the preceding week. Material decreases in notifications occurred in London 12, Kesteven (Lincs) 15, Middlesex 7, Surrey 14, Warwick 9, Worcester 7, and East Riding of Yorkshire 7.

The following county areas have notified no cases in the four weeks up to September 2—Cambridge, Suffolk West, Cardigan, and Radnor. In the same period the following contributed 1 case only: Isle of Ely, Soke of Peterborough, and Anglesey.

Discussion of Table

In *England and Wales* a decrease occurred in the number of notifications of measles 1,252, whooping-cough 214, and acute pneumonia 56, while a rise was reported for acute poliomyelitis 39, scarlet fever 21, and diphtheria 10.

A further large fall occurred in the incidence of measles, and the number of notifications are now less than one-half what they were six weeks ago. The largest declines during the week were in Lancashire 219, Lincolnshire 185, Middlesex 84, and Yorkshire West Riding 81. The largest fluctuations in the local trends of whooping-cough were a rise of 38 in Hertfordshire and a fall of 38 in Southampton. The only variation of any size in the incidence of scarlet fever was a rise of 24 in the number of cases notified in London. The chief features of the local returns of diphtheria were rises of 3 in London and Kent.

The largest returns of dysentery were from Lancashire 36 (Southport C.B. 11, Oldham C.B. 8); Yorkshire West Riding 19 (Bradford C.B. 10); Durham 15; and Leicestershire 14 (Leicester C.B. 13).

The main centres of acute poliomyelitis were Lancashire 44 (Liverpool C.B. 11, Manchester C.B. 14); London 42 (Hackney 5, Islington 4, Lewisham 4, St. Pancras 4); Warwickshire 39 (Birmingham C.B. 22, Coventry C.B. 5, Sutton Coldfield M.B. 4); Gloucestershire 38 (Bristol C.B. 24, Sodbury R.D. 4); Yorkshire West Riding 38 (Leeds C.B. 8, Bradford C.B. 6, Sheffield C.B. 5); Lincolnshire 32 (East Kesteven R.D. 18); Durham 31 (Hebburn U.D. 5, Boldon U.D. 4, Stockton-on-Tees M.B. 4); Middlesex 24; Staffordshire 21 (Lichfield R.D. 4); Essex 19 (Romford M.B. 4); Kent 9 (Bromley M.B. 4); Leicestershire 18 (Leicester C.B. 15); Northumberland 18 (Newcastle-upon-Tyne C.B. 7); Glamorganshire 15 (Cardiff C.B. 4); Worcestershire 15 (Dudley C.B. 4, Bromsgrove R.D. 4); Sussex 13 (Brighton C.B. 4); Dorset 13; Yorkshire East Riding 11 (Kingston-upon-Hull C.B. 6); Devonshire 10; Yorkshire North Riding 10 (Middlesbrough C.B. 5); and Norfolk 10.

In *Scotland* increases were recorded in the number of notifications of scarlet fever 43, acute poliomyelitis 21, and whooping-cough 18, and decreases were reported for cerebrospinal fever 17, and dysentery 13. A rise in the incidence of scarlet fever occurred in most areas. The chief centres of acute poliomyelitis were Glasgow 20, Dundee 9, Fife county 7, Lanark county 7, Ayr county 6, Aberdeen county 4, and Greenock 4. The largest returns of dysentery were from Glasgow 45, Edinburgh 14, and Dundee 8.

In *Eire* the notifications of measles were 21 fewer than in the preceding week, while the notifications of whooping-cough were 19 above the previous week's total. A fall of 18 in the notifications of scarlet fever occurred in Dublin C.B., while a rise of 11 occurred in the remainder of the country.

In *Northern Ireland* the trends of infectious diseases remained practically constant. The largest returns of acute poliomyelitis were from Down county 8, Antrim county 6, and Belfast C.B. 4.

Week Ending September 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 715, whooping-cough 3,671, diphtheria 51, measles 3,413, acute pneumonia 235, acute poliomyelitis 491, dysentery 156, paratyphoid fever 6, and typhoid fever 7.

Medical News

Lecturing in North America

Sir Geoffrey Jefferson, C.B.E., F.R.S., Professor of Neurosurgery at Manchester University, will be making a lecture tour in North America next month. He will be giving the Sommer Memorial Lectures at Portland, Oreg., October 3–5; the Opening Address to the California Academy of Medicine, San Francisco, October 14; the Balfour Lecture, Toronto University, October 18; and the Martin Lecture to the American College of Surgeons, Boston, October 23.

Medical Studentship in Experimental Psychology

The Medical Research Council invites applications from men or women recently qualified in medicine and with one or two years' experience in hospital appointments for a studentship for training in methods of experimental psychology. The studentship will be tenable at the Psychological Laboratory, University of Cambridge, for a period of not less than one year. It will carry a stipend at the rate of £500 per annum (not expected to be liable to income tax); tuition fees and laboratory expenses will be met in addition. The award will be made with a view to future opportunities for research in medical problems of psychology, but no promise of employment after the expiry of the studentship can be given. The selection will be made as soon as possible after October 1, and applications should be lodged before then with the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1 (Telephone: Whitehall 4884), from whom forms for the purpose can be obtained.

British Epilepsy Association

At a meeting held on September 5 at Mansion House, Portland Place, London, W.1, it was decided to form a society known as the British Epilepsy Association, with the objects of bringing before the public the special needs of epileptics and of promoting their welfare generally. Lady Cynthia Colville was elected chairman, Miss Irene Gairdner honorary secretary, and a provisional council was formed. At a Press conference Lady Colville said that the association, which had the support of the medical profession, would carry out educational and propaganda campaigns to create a proper understanding of epilepsy.

Animal Experiments

The Fight Against Disease, which since 1921 has been the official organ of the Research Defence Society, has been renamed *Conquest*. Since the war only two issues per annum have been published; it is intended to publish *Conquest* quarterly, or even bi-monthly, and to include in it authoritative papers demonstrating important advances in prophylaxis, diagnosis and treatment, the relief of pain, and the prolongation of life which have resulted from experiments on animals. The first number of *Conquest* includes a brief history of the society and a statement of its aims and objects.

Dutch Medical Journals

Acta Brevia Neerlandica, which since 1931 has published Dutch contributions to physiology, pharmacology, and microbiology, is to combine with *Archives Néerlandaises de Physiologie de l'Homme et des Animaux* to form a new quarterly entitled *Acta Physiologica et Pharmacologica Neerlandica*. Papers in the new journal will appear in English, French, or German.

To Visit Greece

Mr. St. J. D. Buxton is visiting Greece for the third time on the invitation of the Greek Recovery Programme Committee from September 17 to October 5 to advise on rehabilitation of the wounded and sick and on the development of a national service for the care of cripples.

Wills

Mr. Thomas A. Hindmarsh, of Newcastle-upon-Tyne, left £59,950; Dr. Edmund R. Boyd, of Blythe Bridge, Staffs, £15,430; Dr. Edward Somerset, of Newbury, Berks, £17,464; Dr. Theodore H. Waller, of Bedford, formerly head surgeon of Chelmsford Hospital, £12,339; and Dr. J. K. Cumming, senior consultant surgeon to the Royal Infirmary, Blackburn, and senior consultant surgeon to the Blackburn District Hospitals Group, £9,207.

COMING EVENTS

Royal Free Hospital School of Medicine

The inaugural address at the opening of the 1950–1 session of the Royal Free Hospital School of Medicine will be delivered by Professor Lillian M. Penson, Vice-Chancellor of the University of London, at B.M.A. House, Tavistock Square, London, W.C., on Friday, September 29, at 3 p.m.

King's College Hospital Medical School

Sir Lionel Whitby, Regius Professor of Physic in the University of Cambridge, will deliver the inaugural address at the opening of the 1950–1 session of King's College Hospital Medical School at the school, Denmark Hill, London, S.E., on Friday, September 29, at 2.30 for 3 p.m.

Contraceptive Technique

A lecture and demonstration (on living models) on contraceptive technique will be given by Dr. Marie C. Stopes at the Mothers' Clinic, 108, Whitfield Street, London, W., on Thursday, October 5, at 2.30 p.m. Tickets must be obtained in advance, as space is limited.

St. Thomas's Hospital Dinner

The St. Thomas's Hospital Old Students' Dinner will be held at Claridge's Hotel, Brook Street, London, W., on Friday, October 20, at 7 for 7.30 p.m., when the chair will be taken by Mr. J. P. Hedley. The price of the dinner, exclusive of drinks, is 30s. Dress, dinner jackets. Tickets may be obtained from the honorary secretaries, St. Thomas's Hospital, S.E.1.

SOCIETIES AND LECTURES

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

Wednesday

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—September 20, 3 p.m., "*Modern Anaesthesia in France and its Developments Related to Cardiac Surgery*," Bengué Memorial Award Lecture by Dr. Nadia du Bouchet (Paris).

Thursday

CHADWICK TRUST.—At St. Mary's Hospital Medical School, Norfolk Place, Praed Street, Paddington, London, W., September 21, 4.30 p.m., "*The Public Health Aspects of Venereal Disease Control*," Malcolm Morris Memorial Lecture by Professor J. Earle Moore, M.D. (Johns Hopkins University).

ROYAL SANITARY INSTITUTE.—At Winter Gardens, Malvern, September 21, 10 a.m., papers: "*Water Supplies—An Unusual Case of Copper Poisoning*," by Dr. A. J. B. Griffin; "*Malvern Miscellany*," by Mr. C. C. Judson, B.Sc. Afternoon: visits will be made.

Friday

BIOCHEMICAL SOCIETY.—At Derby Hall, University of Liverpool, N. Mossley Hill Road, Liverpool, 18, September 22, 11 a.m., 289th meeting. Symposium: "*The Biochemistry of Fish*."

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W.—September 22, 8 p.m., general meeting. "*The Treponemal Immobilization Test in Relation to Biologic False Positive Tests for Syphilis*," by Professor J. Earle Moore, M.D. (Johns Hopkins University). A discussion will follow.

APPOINTMENTS

ANNING, STEPHEN TOWERS, M.D., M.R.C.P., Assistant Dermatologist (Consultant), the General Infirmary at Leeds.

BREMNER, ALAN E., M.B., Ch.B., F.R.C.S.Ed., Associate Orthopaedic Surgeon, Royal Victoria Infirmary, Newcastle-upon-Tyne, and Consultant Orthopaedic Surgeon to Gateshead Group of Hospitals.

COLLINS, MICHAEL JOSEPH, M.B., B.Ch., D.P.H., Medical Officer of Health, Hucknall Urban District, and Assistant County Medical Officer, Nottinghamshire County Council.

COOK, J. B., M.D., M.R.C.P., Senior Registrar, Neurological Department, the General Infirmary at Leeds.

CRAMOND, JAMES, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, Borough of Barking, Essex.

EUSTACE, ANTHONY, M.B., B.Ch., D.P.H., County Medical Officer of Health, Donegal, Eire.

KORVIN, H. G., F.R.C.S., Orthopaedic Surgeon to Mayesbrook School Clinic and Newbury Hall Clinic, Ilford, Essex.

POWELL, K. J., M.B., B.S., D.A., Consultant Anaesthetist, Exeter Clinical Area.

PRICHARD, JOHN STOBO, *M.C.*, M.B., B.Chir., M.R.C.P., Neurologist, Hospital for Sick Children, Toronto, Canada.

ROBINSON, MARGARET M. F., M.D., D.P.H., Assistant Medical Officer of Health for Maternity and Child Welfare, Derby.

SMITH, GEORGE W., M.R.C.S., L.R.C.P., House-surgeon, St. Helier Hospital, Carshalton, Surrey.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—*Consulting Obstetrician and Gynaecologist in North Gloucestershire Clinical Area*, S. A. Bond, M.B., Ch.B., F.R.C.S., M.R.C.O.G.; *Consulting Radiologist in South Somerset Clinical Area*, D. R. F. Bertram, M.B., B.S., D.M.R.

STEPHEN, J. D., M.B., Ch.B., Pathologist, Regina General Hospital, Regina, Saskatchewan, Canada.

TATTERSALL, WILLIAM H., M.D., Consultant Chest Physician to the Bournemouth Area, South-west Metropolitan Regional Hospital Board.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Fergusson.—On August 27, 1950, at 9, Grosvenor Street, Edinburgh, to Elizabeth (formerly Brouton), wife of Dr. R. S. C. Fergusson, a son.

Shield.—On August 21, 1950, at Lyndhurst, Hants, to Margie (formerly Wood), wife of James B. Shield, F.R.C.S.Ed., a daughter—Pamela Joan.

MARRIAGES

Blend—Imerdauer.—On September 5, 1950, in London, David Blend, M.B., B.S., to Martha Imerdauer.

Donaldson—Wilson.—On September 2, 1950, at Jesmond Parish Church, Newcastle-upon-Tyne, Dr. Richard Gordon Donaldson to Dr. Ann Kenya Wilson.

Tompkins—McCoshim.—On August 28, 1950, in Glasgow, Arthur B. Tompkins, M.B., D.C.H., to Sheena E. McCoshim, M.B., Ch.B.

DEATHS

Cochrane.—On May 25, 1950, Stanley Cochrane, L.R.C.P.&S.Ed., L.R.F.P.S. Glas., of Mitcham, Victoria, Australia.

Ferguson.—On September 7, 1950, at a nursing-home, Edinburgh, Peter Joseph Henry Ferguson, M.B., C.M., of 4, Oxford Terrace, Edinburgh, late of 9, Windsor Street, Edinburgh.

Fletcher.—On September 9, 1950, at Burton Corner, Petworth, Sussex, Herbert Morley Fletcher, M.D., LL.D.(Hon.), F.R.C.P., aged 85.

Gillespie.—On August 22, 1950, at 29, Hockerill Street, Bishop's Stortford, Herts, Edward Gillespie, M.B., F.R.C.S., late of Weymouth Street, London, W.

Gunson.—On June 6, 1950, in Australia, Edward Burton Gunson, M.D., F.R.C.P.

Henry.—On July 13, 1950, Claude Dawson Henry, M.D., of Lower Hutt, New Zealand.

Hudson.—On August 26, 1950, at 6, Castleview Road, Rochester, Kent, Osborne Henderson Hudson, M.R.C.S., L.R.C.P., aged 90.

Kirkpatrick.—On August 19, 1950, William Alexander Kirkpatrick, M.B., B.S., of Skelton-in-Cleveland, Saltburn, Yorks, aged 47.

Kirwan.—On August 29, 1950, at a Croydon nursing-home, John Francis Kirwan, M.B., B.Ch., aged 50.

Lyons.—On September 1, 1950, the result of an accident, Harold Michael Lyons, M.R.C.S., L.R.C.P., of Bishop's Corner, The Bishop's Avenue, London, N., late of Didsbury, Manchester.

Milton.—On August 29, 1950, at Passey's House, Eltham, London, S.E., Edward Farminer Milton, M.D., aged 68.

Murison.—On September 8, 1950, at 4, Olden Lane, Purley, Arthur Alexander Murison, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., late of City Chambers, Glasgow.

Palmer.—On September 2, 1950, at Nottingham, Charles James Palmer, L.S.A., J.P., of Longdale Lane, Linby, Notts, formerly of Mansfield Woodhouse, Notts, aged 81.

Pim.—On August 24, 1950, at Holcombe, Bath, William Ferguson Pim, M.D., formerly of Foxrock, Dublin, aged 83.

Pott.—On September 7, 1950, at Upham, Hants, Francis Henry Pott, M.R.C.S., L.R.C.P., of 81, Cornwall Gardens, London, S.W., aged 89.

Rivaz.—On September 3, 1950, Percy Montgomery Rivaz, M.D., Surgeon Captain, R.N., Ret., of 23, Vanbrugh Park, Blackheath, London, S.E.

St. Johnston.—On August 29, at an Eastbourne nursing-home, Sir Thomas Reginald St. Johnston, K.C.M.G., M.R.C.S., L.R.C.P., late Governor of the Leeward Islands.

Tucker.—On September 2, 1950, at St. Helier Hospital, Carshalton, William Marwood Tucker, B.M., B.Ch., of Gisborne, New Zealand, aged 33.

Wight.—On August 26, 1950, at Wangford, Beccles, Suffolk, Cecil Harold Wight, *M.C.*, M.R.C.S., L.R.C.P.

Wolff.—On August 28, 1950, at Bears House, Hingham, Norwich, Ernest Douglas Wolff, M.R.C.S., L.R.C.P.

Woodcock.—On September 5, 1950, at 23, Burton Crescent, Headingley, Leeds, Herbert de Carle Woodcock, M.D., F.R.C.P.Ed., D.P.H., aged 89.

Any Questions?

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

Varicose Vein Injections

Q.—*Can you tell me something of the nature and frequency of unpleasant sequelae resulting from the injection of sclerosing agents into varicose veins—assuming that the technique has been properly carried out? One is struck by the contrast between the great care and forethought we give to antecubital venous injections and the comparative recklessness we show when we are injecting sclerosing agents into the varicose veins of our patients. Ought we not, for example, to test a patient's urine before we subject him to the somewhat hazardous business of "intravenous phenol therapy"? Do soaps injected intravenously become hydrolysed, and, if so, is there not a potential danger of oleic or morrhuic acids so formed giving rise to oil embolism?*

A.—Unpleasant sequelae occur after the injection of varicose veins in a small number of cases, and the ideal sclerosing agent is yet to be found. Prevention of complications is assisted by avoiding injections in cases of previous severe spontaneous thrombophlebitis, ischaemic conditions of the leg, gross secondary skin changes, and in patients who are not ambulant. A very severe local reaction may lead to an injection ulcer and cause sufficient pain to keep the patient still during the following day, thus encouraging the spread of thrombosis to the deep veins. Sudden collapse following the injection and delayed urticaria are severe enough complications to warrant the cautious use of sclerosing agents, particularly sodium morrhuate and monoethanolamine at the first session. Haematuria and pulmonary embolism are very rare complications. The safest substance to use is probably 30% saline, but it is extremely painful when injected in quantities sufficient to produce good thrombosis, and general anaesthesia is usually necessary. Monoethanolamine is used in many clinics, but very rarely an attack of urticaria is encountered with this synthetic soap, which is included in the *British Pharmacopoeia*. Sodium morrhuate has fallen into disrepute following frequent reports of reactions after its use. There is some experimental evidence (*Proc. R. Soc. Med.*, 1948, **41**, 631) that not more than 2 ml. of sclerosing agent should be injected into a varicose vein at a time, owing to possible damage to the valves in the deep veins. With the patient lying down, 2 ml. of radio-opaque solution has been shown to stay in the superficial veins until the leg is exercised, when it is rapidly dispersed in the general circulation and diluted so much that no distant effects are produced.

Sterilization of the Male

Q.—*Would you kindly let me know the immediate, permanent, and any late effects of sterilization of a healthy male aged 30 by vasotomy? Under effects I include those on libido, sexual functions, mentality, physical organs, and any other known changes. Is vasotomy 100% certain, if carefully performed, to prevent any danger of insemination?*

A.—Vasotomy has no ill-effects of any kind, either immediate or remote. Occasionally there is a little temporary swelling and discomfort for 48 hours after the operation, but even this is unusual. Libido is not affected. A few patients notice that the amount of fluid ejaculated is a little less than previously, but this does not spoil their pleasure, which is more likely to be enhanced by the elimination of all anxiety on the score of a possible conception. Atrophy never follows, and there is no increased risk of developing a testicular neoplasm. The operation is sometimes carried out as a rejuvenating measure (Steinach's operation), so it is not likely to precipitate premature old age. If the operation is properly carried out and the possibility of recanalization guarded against it is 100% successful, but contraceptive measures must be continued until the spermatozoa beyond the ligated and divided vasa have been eliminated: half a dozen ejaculations should be sufficient to secure this, but it is safer to examine the semen microscopically and to be certain that it contains no spermatozoa before discarding these measures.

Ankylosing Spondylitis

Q.—*What are the causes of ankylosing spondylitis? On what points does the diagnosis rest and what is the treatment? Is it possible that the condition could result from, or be aggravated by, any of the well-known tropical diseases? Could living conditions in a country such as Iraq have any special bearing on it?*

A.—The cause of ankylosing spondylitis is unknown. It is considered by some to have an infective origin, but no specific infective agent has been proved. Others have suspected an endocrine basis, but again there is little evidence to support the hypothesis. The relationship between ankylosing spondylitis and rheumatoid arthritis is also uncertain.

The diagnosis is made from a consideration of the clinical, radiological, and serological findings. Clinically, the disease begins typically in young (17–30) male adults. There is deep pain first localized across the sacro-iliac area, later spreading upwards towards the lumbar and dorsal spine. At the same time there is increasing stiffness of the spine. In progressive cases the cervical spine and sometimes the hips are involved. In the typical established case the main features found on examination are gross rigidity of the spine (often excepting the upper cervical region) and markedly diminished chest expansion on respiration (often as little as half an inch). Radiologically the first changes (always bilateral) are seen in the sacro-iliac joints. There is loss of the sharp outline of the joint margins, which have a fuzzy appearance. Later, bony ankylosis of the joints occurs. As the disease progresses changes of a similar nature are seen in the lumbar, dorsal, and often in the cervical spine. There is destruction and obliteration of the facet joints and bridging of the vertebral bodies by ossification of the longitudinal ligaments. In cases with hip involvement there is progressive narrowing and, later, bony ankylosis of one or both joints. It is important to note that the stiffness of the spine, as observed clinically, is in advance of the radiological changes; thus a large part of the spine may be almost completely rigid when the radiological changes are confined to the sacro-iliac joints. The blood sedimentation rate is much raised during the active stage of the disease.

Treatment may be considered under four headings: relief of symptoms and arrest of the disease; prevention of deformity; maintenance of maximum function; and reconstructive or corrective operations in the late stage. Deep *x*-ray therapy is the most effective method of relieving the symptoms, and it is thought that it often leads to arrest or delays the progress of the disease. The marked tendency to flexion deformity of the spine is prevented mainly by sleeping on a hard flat mattress in the supine position, with not more than one pillow. Flexion deformity is almost inevitable if the patient sleeps on his side with spine, hips, and knees flexed. Occasionally, in the active stage, a plaster bed is advisable. Maintenance of maximum function depends upon adequate supervision by a physiotherapist to ensure that all movable joints are used to the full extent and that the muscles controlling them retain their full power. Special exercises for this purpose are advisable. In the later stages, if marked crippling or deformity has occurred, certain reconstructive operations may be advisable. The most useful are arthroplasty of the hip (for pain or ankylosis) and corrective osteotomy of the spine (for fixed flexion deformity).

Since the cause of ankylosing spondylitis is unknown it is difficult to say with certainty whether its incidence or course is likely to be influenced by living conditions or disease in other countries. Though some observers gained the impression during the war that ankylosing spondylitis did seem to occur unusually frequently in troops stationed overseas, the writer knows of no statistical evidence to support the impression.

Vaccination Failing to Take

Q.—*I should be glad of your advice concerning a child, now aged 2, who has been five times vaccinated, with negative results, by three different doctors. On the last occasion special lymph was obtained in view of the four previous failures. Bearing in mind the letter by Colonel W. Strelley Martin in the "Journal" of May 13 (p. 1142), can you suggest any further measures? Is intradermal injection of lymph ever employed in resistant cases? The child's father has lived in the East and has a friend with a similar history of unsuccessful vaccination in infancy; he subsequently developed severe smallpox.*

A.—It is most unusual to find a young child completely refractory to primary vaccination. It is not stated at what age the unsuccessful attempts were made in this case, but if they were done in the first few months of life it is possible that the infant still had enough antibody by passive transfer from the mother to interfere with a successful vaccination, particularly if the mother had been vaccinated within a year or two of the child's birth. A further attempt at vaccination should be made now with vaccine lymph used as soon as possible after it is received, since vaccine quickly loses potency if not kept in the refrigerator. Intradermal injection is not likely to be more effective than inoculation by scarification or multiple pressure. The suggestion that the British vaccine lymph used in the Middle East during the late war was ineffective was thoroughly investigated and refuted by an expert committee.

Lichen Planus

Q.—*What is the modern treatment for lichen planus? A male patient aged 55 has had this condition for two years. He has a rash on the glans and the body of the penis, with mucous patches in the mouth. He has been treated with various salicylate creams and bismuth injections weekly. Arsenic causes a severe skin irritation.*

A.—No specific cause for lichen planus has been demonstrated, though a great deal of work has been done on the influence of constitutional and psychological disturbances and on the part played by drugs in precipitating this disorder. These factors are probably of major importance and should receive due attention and treatment. There is no specific remedy, and none of the modern drugs has shown any particular merit in treatment. Rest and holidays are important; the old-fashioned treatment with mercury as liquor hydrarg. perchlor. dr. 1 (3.5 ml.) t.d.s., or by weekly injections of mercuric salicyl arsonate gr. ½ to gr. 1 (32–65 mg.) intramuscularly to a total of gr. 6, may help in some cases. In this particular patient arsenic appears to be contraindicated. *X*-ray therapy directed over the enlargements of the spinal cord, as suggested by Pautrier or as modified by Hellier (*Brit. J. Derm. Syph.*, 1943, **55**, 11), is sometimes effective. Painting with thorium X has been advocated by some authorities, as has the administration of calciferol in large doses, but none of these remedies is significantly successful. Rest and attention to psychological factors seem to be of much more importance.

Rectal Thiopentone

Q.—*I see in the "Journal" of July 1 (p. 21) an article on rectal thiopentone for minor surgery. Would this be a safe method of giving an anaesthetic for minor surgery in one's consulting-room—for circumcisions, for example—if one has a colleague available to control the anaesthetic and apparatus for administering oxygen in an emergency?*

A.—With the dose usually advised—e.g., 1 g. per 50 lb. (22.5 kg.) body weight—rectal thiopentone cannot be relied upon to produce anaesthesia of sufficient depth and duration for an operation like circumcision. Lorber (*British Medical Journal*, July 1, 1950, p. 21) pointed out that the child might even react to a stimulus like lumbar puncture and that local anaesthesia would be necessary if any incision of the skin was to be made. He also mentioned that the child is only relaxed in the absence of painful stimuli. Rectal thiopentone is an excellent method of inducing sleep in children prior to general anaesthesia. The rather prolonged recovery time, which may last for one to three hours, probably precludes the use of this method, even as sedative, in a consulting-room, unless there are facilities for watching the child throughout the recovery period. A more satisfactory technique for anaesthesia for circumcision in these circumstances would be a small dose of pentobarbital sodium given well ahead of the operation, followed by ethyl chloride and open drop ether as the main anaesthetic.

Trichlorethylene for Dental Operations

Q.—*Is trichlorethylene useful for anaesthesia for dental extractions? If so, how should it be administered? Are there any special intranasal techniques?*

A.—Trichlorethylene is a very useful supplement when dealing in the dental chair with robust patients who are difficult to anaesthetize with nitrous oxide alone. Any simple vaporizer, such as Marrett's bottle, Rowbotham's chloroform bottle, or any ether bottle, is plugged into the apparatus between the nitrous oxide cylinders and the patient. The merest trace of trichlorethylene will smooth out an otherwise difficult anaesthetic. If more than this trace is used the patient may feel "heavy" for some little time after the extraction. No alteration in the usual methods of nasal administration of gas and oxygen is necessary when trichlorethylene is added as a supplement. Trichlorethylene provides excellent general analgesia for cavity preparations, and details of two methods will be found in *Recent Advances in Anaesthesia* (L. Hewer, 6th ed., London, 1949, p. 259).

Antihistaminic Drugs and Diabetes

Q.—*A diabetic patient on large doses of insulin is sensitive to bee-stings, which provoke an alarming reaction. Is there any contraindication to the administration of antihistaminic drugs in such a case?*

A.—"Benadryl" would probably cause a small increase in the insulin requirements, but this would be very small in comparison with the increase in insulin requirements which occurs as a result of severe reaction due to bee-stings. It is certainly worth while trying whether the benadryl or other antihistaminic drug will prevent local reaction, since the diabetic condition would then be much less upset.

Duodenal Ulcer, Obesity, and Hypertension

Q.—*Would you suggest a suitable reducing diet for an obese hypertensive patient who is suffering from an active duodenal ulcer? He has had one bout of bleeding about a year ago.*

A.—It is difficult to devise a diet for the synchronous treatment of peptic ulceration and obesity. It is not clear from the question whether the patient is at present in bed undergoing intensive medical treatment for the former; if so, the obesity should be disregarded and every effort made to induce the ulcer to heal. For this purpose the usual regime of multiple meals should be prescribed, but the quantities reduced to lower the daily intake of calories to 1,200. Aluminium hydroxide should be given after each meal and at night; olive oil and other fats should be avoided. If the ulcer heals satisfactorily an ordinary reducing diet should be taken with plenty of aluminium hydroxide to control gastric activity. It is obviously ill-advised to try to reduce the patient's weight and to heal his duodenal ulcer at the same time.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 23 1950

PHARMACOLOGICAL ACTION OF ANTIHISTAMINE COMPOUNDS*

BY

J. H. BURN, M.D., F.R.S.

Professor of Pharmacology, University of Oxford

We owe the development of a specialized group of compounds known as "antihistamine compounds" to the Swiss pharmacologist Daniel Bovet, who worked in the Institut Pasteur in Paris. Although he recorded preliminary observations in 1937, his first full paper was published in 1944 (Bovet, 1944). There are three highly active substances present in the body—adrenaline, acetylcholine, and histamine—and antagonists to the first two of these have long been known. Some of the ergot alkaloids and synthetic compounds such as "priscol" are anti-adrenaline compounds, while atropine and synthetic compounds like "trasentin" are anti-acetylcholine compounds. Bovet's contribution was to devise tests by which antihistamine compounds could be recognized, and to foresee that the more highly active substances would have a clinical application in allergic states like hay-fever and urticaria.

The pharmacological work which has been carried out on antihistamine compounds in the last few years has shown that these are not highly specialized substances with unusual properties as has been commonly believed, but that they share properties with well-known drugs like atropine, procaine, quinidine, and pethidine, and that these substances in their turn can exert an antihistamine action. I propose to describe briefly how this work has developed and its practical consequences, and to suggest the basis which underlies the results.

In 1945 Dr. G. S. Dawes was working in my laboratory to find substitutes for quinidine, and made the important observation that several substances having a quinidine action on cardiac muscle were also local anaesthetics (Dawes, 1946). Thus cocaine, procaine, and amethocaine were among these substances. This observation recalled the fact that quinine and quinidine are both local anaesthetics, and thus it appeared there was a close relation between power to prolong the refractory period of cardiac muscle and local anaesthetic action. This was not all. Dawes then observed that various substances used as spasmolytics to relax smooth muscle, such as atropine, papaverine, trasentin, and "syntropan," also had a quinidine-like action on the heart. All these substances were also known to have local anaesthetic action. Finally, he examined the analgesic substance pethidine, and found that it exerted a quinidine-like action on the heart and possessed a local anaesthetic action. Thus Dawes's work suggested that the power of lengthening the refractory period, local anaesthetic action, spasmolytic action, and analgesic action were related to one another in many compounds.

*Read in opening a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Liverpool, 1950.

Anthisan and Histostab

In 1946 we obtained a specimen of the antihistamine substance "neoantergan," as Bovet called it, or "anthisan," and it occurred to me that we should examine it to see if it fell in the category of these substances. Would it have a quinidine-like action, prolonging the refractory period of cardiac muscle? My colleagues Dews and Graham (1946) found that it did; indeed, they found that neoantergan was twice as active as quinidine. Would it have a local anaesthetic action like procaine? It was found that it had this action also, being three times as effective as procaine when injected into the skin of a guinea-pig. Would it have an analgesic action like pethidine? It was found that it possessed not only an analgesic action but a general narcotic action, though the dose required was as large as 100 mg./kg. Thus its analgesic action was weak, for pethidine produced analgesia in a dose of 5 mg./kg. We were thus able to demonstrate that neoantergan was not only an antihistamine substance, but that it possessed properties in common with quinidine, procaine, atropine, papaverine, and also pethidine.

An extension of this investigation to other antihistamine substances was later carried out by my colleague Dutta (1949b). He compared "histostab" (also known as "antistin") and "benadryl" with procaine as local anaesthetics, and found that histostab was 2.3 times and benadryl 3.2 times as potent as procaine. He compared the same substances with quinidine for power to prolong the refractory period of the auricle, and found that each was about twice as active as quinidine. He showed that, like procaine and quinidine, histostab and benadryl reduced the action of acetylcholine on the heart and on skeletal muscle, both in the frog and in the rat. He showed a similarity of action on the perfused superior cervical ganglion.

The observations thus made have greatly clarified one aspect of drug action, since they have shown that many substances used for quite different purposes in medicine and hitherto thought to have quite dissimilar modes of action have many common properties, and that among these substances are the antihistamine compounds.

Side-actions of Antihistamine Compounds

The first practical consequence of this conclusion so far as antihistamine compounds are concerned is that it is clear that they will all cause side-actions. Since benadryl, for example, has properties in common with atropine, we must expect that benadryl will cause some dryness of the mouth. Since benadryl has properties in common with the analgesic pethidine, we must expect that benadryl will cause some degree of central depression and mental confusion.

What applies to benadryl must apply to a greater or less extent to all the other antihistamine compounds, and none will be free from side-effects in sensitive persons.

The second practical consequence of this conclusion is that antihistamine compounds will have many other actions than those in which they obviously antagonize histamine.

I have pointed out that they resemble atropine, but since they combine a power to dry up secretions with central depression it would be more correct to say they resemble atropine's near relation hyoscine. It can therefore be said at once that antihistamine compounds should be of value in sea-sickness, as during the war hyoscine was demonstrated to be the best available remedy for that condition. The substance of which benadryl is the hydrochloride when united to chlorotheophylline is known as " dramamine," and that has been shown to be effective in all forms of travel sickness, sickness due to pregnancy, sickness following irradiation, and sickness after operation on the labyrinth. What we do not know at the present time is whether dramamine is better than hyoscine, and whether its side-effects, when taken over a period of days, are more or less severe. The point is important, because dramamine is very much more expensive than hyoscine. The only comparison so far made is that by Chinn and Oberst (1950), which indicates that hyoscine is more effective in controlling air-sickness. Another consequence of the resemblance of antihistamine compounds to atropine and hyoscine is that they are useful in Parkinsonism, in which they relax the spasm of skeletal muscles.

The action of antihistamine substances in aborting the common cold if given early enough has been believed to indicate that the initial phase of the cold is an allergic reaction due to histamine. It is, however, possible that this is also an atropine-like action, for atropine appears to abort some cases of common cold when given early.

I have pointed out that the antihistamine compounds resemble quinidine and quinine in their action in prolonging the refractory period of heart muscle. There is no doubt that benadryl, anthisan, antistin, and other compounds could be used to restore a normal rhythm in patients with auricular fibrillation. So far as I am aware this has not been tried, but it is a reasonable deduction from the pharmacological evidence that the trial would be successful. They have, however, been used in a condition which can be regarded as similar, which arises in skeletal muscle. That is to say, they have been used in myotonia, a disease in which the contraction of the muscle is prolonged, so that in shaking hands, for example, there is much delay in releasing the grasp. There is an abnormal stream of impulses from the motor end-plate which maintains the contraction unduly. The usual treatment is to give quinine, which is thought to act as it acts in auricular fibrillation, by prolonging the refractory period, and so renders the stream of impulses ineffective. My former colleague Dr. Lawrence Bussell (1949) has described the relief of the symptoms of myotonia with benadryl and also with anthisan, thus providing clinical evidence of their similarity to quinine.

If the antihistamine compounds resemble in their properties substances like atropine, pethidine, procaine, and quinine, then, conversely, these latter substances should exert an antihistaminic action. My colleague Dutta (1949a) has shown that they have such an action when tested on the guinea-pig for their power to depress the bronchoconstrictor action of histamine. He found that atropine and pethidine had more than one-tenth the activity of histostab or benadryl; procaine and quinidine were much less active, having only 1/100 and 1/400 of the potency of histostab. The observations bring to mind the recent use of intravenous procaine for the release of bronchial spasm in man. They suggest that intravenous pethidine would be much more effective than intravenous procaine. Procaine is, however, a safe substance for intravenous use, since it is rapidly destroyed in the body, *p*-aminobenzoic acid and diethylaminoethanol being formed by cleavage; larger amounts are, however, required than would be required of a substance like pethidine.

The Properties of Acetylcholine

What is the explanation of the similarity of the properties of so many medicaments? Dawes furnished a hint to explain the similarity between quinidine, procaine, and quinine, for he pointed out that in all forms of muscle—skeletal, cardiac, and smooth—they were antagonists of acetylcholine, and their common properties might depend on this antagonism. Elio then examined a series of other substances which had a quinidine-like action, and found that they too antagonized the action of acetylcholine on different forms of muscle, including the muscle of the blood vessels. Stephenson (1948) added to the list the alkaloid conessine and its isomers; they acted like quinidine on the heart, were local anaesthetics, and antagonized the action of acetylcholine in all forms of muscle. Dutta and I (1948) then showed that a selection of these substances which included atropine, benadryl, pethidine, procaine, and quinidine, when examined on the blood vessels of the rabbit ear, inhibited the action not only of acetylcholine but of adrenaline and of histamine as well.

We are so accustomed to look upon acetylcholine and adrenaline as antagonists and of histamine and adrenaline as antagonists that it is difficult to think of these three as related substances linked to one another in their actions. But as long ago as 1930 Dale and Gaddum (1930) showed that in denervated skeletal muscle the action of acetylcholine could be either potentiated or inhibited by the action of adrenaline. It is this kind of relation which now appears to exist in many tissues of the body.

There is evidence that in the heart, in the intestine and other smooth muscle organs, and in the central nervous system the synthesis of acetylcholine proceeds continually and may be responsible for the activity of the organ. Thus in the auricles of the heart the synthesis seems to be responsible for maintaining the rhythmic contractions. There is evidence of a similar synthesis in blood vessels, where it may be responsible for vascular tone. We commonly think of vascular tone as due to nervous impulses, forgetting that, though tone is lost when the nerves are cut, it is rapidly regained in a few days, although the nerves degenerate. It may be that the acetylcholine synthesis is the basis of the normal function in all these tissues, and that the effect of the acetylcholine so produced is modified, being either potentiated or inhibited, by histamine and adrenaline, which may also be synthesized, or possibly are liberated by the nerves.

Thus the conception forms in our minds of acetylcholine, adrenaline, and histamine acting as local hormones and governing tissue activity in many organs. We then begin to see why substances such as anthisan, which inhibit one of them, in some degree inhibit all of them, and why such substances have many properties. They may prolong the refractory period of the heart muscle, neutralize the action of histamine in the nasal mucous membrane and in the skin, and exert a depressant action on the vestibular apparatus in the central nervous system. For in all these and other functions substances like anthisan, procaine, and quinidine are inhibiting the effect of the local hormones.

Summary

Many substances used medicinally as local anaesthetics, as analgesics, and as spasmolytics have common properties, among which is included the ability to act like quinidine on the heart. Antihistamine compounds also belong to this large group of drugs. The side-effects they produce are therefore to be expected. They can also be used for other purposes—as local anaesthetics, as quinidine substitutes for fibrillation, as quinine substitutes for myotonia, for travel sickness, and to relieve pain. Similarly, local anaesthetics such as procaine, or analgesics such as pethidine, have an antihistamine action which is considerable.

The basis of these common properties is that the substances which possess them depress the effects of acetylcholine, histamine, and adrenaline; these substances control activity locally in many tissues.

REFERENCES

Bovet, D. (1944). *Ann. pharm. franç.*, Suppl. 4.
Bussell, L. (1949). *British Medical Journal*, **2**, 1206.
Chinn, H. I., and Oberst, F. W. (1950). *Proc. Soc. exp. Biol. N.Y.*, **73**, 218.
Dale, H. H., and Gaddum, J. H. (1930). *J. Physiol.*, **70**, 109.
Dawes, G. S. (1946). *Brit. J. Pharmacol.*, **1**, 90.
Dews, P. B., and Graham, J. D. P. (1946). Ibid., **1**, 278.
Dutta, N. K. (1949a). Ibid., **4**, 197.
—— (1949b). Ibid., **4**, 281.
—— and Burn, J. H. (1948). Ibid., **3**, 354.
Stephenson, R. P. (1948). Ibid., **3**, 237.

CONGENITAL HEART DISEASE*

A REVIEW OF ITS CLINICAL ASPECTS IN THE LIGHT OF EXPERIENCE GAINED BY MEANS OF MODERN TECHNIQUES

BY

PAUL WOOD, O.B.E., M.D., F.R.C.P.

Director of the Institute of Cardiology (National Heart Hospital); Physician in Charge of the Cardiac Department, Brompton Hospital

[WITH SPECIAL PLATE]

PART II

Atrial Septal Defect

There were 35 cases of A.S.D.—12 male and 23 female. Their ages ranged from 5 to 61, eight being under 14, six being adolescent, and 21 adult. There were no symptoms in 20, and only slight breathlessness or difficulty in keeping up with others in 10. Of the remaining five, two had Lutembacher's syndrome and were in congestive failure; one had severe hypertension resulting from polycystic kidneys, and two had considerable limitation of cardiac reserve. Only one had haemoptysis.

The physical signs included a small or normal pulse, a normal or high normal jugular venous pressure without exaggeration of the *a* wave, a tapping cardiac impulse, a lifting right ventricular outflow tract, visible or palpable pulsation of the pulmonary artery, a pulmonary systolic murmur with or without thrill, a pulmonary diastolic murmur, and wide splitting of the second heart sound at the pulmonary area without accentuation of the pulmonary element.

A thrusting hyperdynamic cardiac impulse, as described by Roesler (1934), simulating the left ventricular thrust of patent ductus or V.S.D., was felt in five cases and was attributed to a grossly overfilled right ventricle forming the apex beat of the heart. A lifting right ventricular outflow tract or palpable right ventricular conus could be appreciated in the third and fourth intercostal spaces to the left of the sternum in most cases, and explained the precordial bulge of the chest wall that might be seen in this situation. Visible or palpable pulsation of the pulmonary artery in the second left space was also common; but neither this nor the palpable conus was well documented. Precise figures for their incidence are therefore not given.

Although the systolic murmur was classed as pulmonary, being usually best heard in the second space, it was maximal in the third space in six instances. It was accompanied by a thrill, usually rather faint, in nine. In four cases there was a loud mitral systolic murmur and in eight a mitral diastolic murmur; but only two of these had other evidence of Lutembacher's syndrome. Nevertheless, all mitral murmurs in A.S.D. were attributed to mitral valve disease, presumably rheumatic.

Functional pulmonary incompetence occurred in half the cases. In respect of the size of the shunt there was no difference between those with a Graham Steell murmur and those without.

Noticeable splitting of the second heart sound was characteristic and was heard in practically all cases. The split was usually distinctly wider in A.S.D. than in normal controls, but there was some overlap between the two. The intensity of the pulmonary element was commonly normal, not accentuated. The wide split was attributed to right bundle-branch block or to delay in the emptying-time of a grossly overfilled right ventricle.

The electrocardiogram showed the pattern of partial or well-developed right bundle-branch block in all but two cases, and the S wave in Lead V_1 was never conspicuous (under 5 mm.). The secondary R wave in Leads V_1 or V_2 was rarely very tall. The only case that showed a really high R wave had a considerable degree of pulmonary hypertension.

Skiagrams revealed right ventricular enlargement, dilatation of the pulmonary artery, and pulmonary plethora in varying degree in all cases, as described by Roesler (1934) and by Bedford, Papp, and Parkinson (1941). Skiagrams in the antero-posterior view were often difficult to distinguish from those of V.S.D. or patent ductus; but in the second oblique position the chamber responsible for the enlargement could usually be recognized.

Cardiac catheterization was undertaken in 25 cases (Table IV). The mean pulmonary artery pressure was

TABLE IV.—*Atrial Septal Defect*

Case No.	Age	Mean Pul. Art. Pressure (mm. Hg)	O_2 Saturation			Ratio of Pul. to Systemic Flow	Pul. Resistance $\left(\frac{\text{P.A. Pressure}}{\text{Pul. Flow}}\right)$
			S.V.C.	R.A.	P.A. R.V.		
1 H	16	13	70	83	85	2·5:1	1·1d
3 I	24	18	68	80	81	2·5:1	1·4
4 9	36	12	58	80	81	2·7:1	0·9d
5 11	16	8	63	82	81	2·5:1	0·6d
6 24	51	16	59	81	82	3:1	1·0d
8 44	14	13	62	—	76	1·8:1	1·5
10 47	6	10	64	78	83	2·5:1	0·8d
11 63	12	17	67	76	78	1·6:1	2·0
12 78	35	6	71	81	82	1·8:1	0·7d
13 79	12	64	52	70	68	1·6:1	8·0*
14 95	18	13	62	85	85	3·2:1	0·9d
15 97	16	14	68	86	90	4:1	0·7d
16 109	14	7	71	81	89	3·5:1	0·4d
17 111	5	10	69	85	85	3:1	0·7d
18 118	29	6	65	88	90	4·5:1	0·3d
19 148	53	12	67	82	82	2·3:1	1·0d
20 149	5	13	69	86	87	4:1	0·7d
21 150	30	6	71	88	88	3·2:1	0·4d
23 159	21	18	63	81	84	3·3:1	1·4
25 162	18	13	73	82	85	2:1	1·3

* Increased pulmonary resistance. d = Diminished pulmonary resistance.
(No attempt to enter the pulmonary artery was made in 5 cases; these have been omitted from the Table).

*Conclusion of the St. Cyres Lecture delivered on June 13 at the Royal Society of Medicine under the auspices of the National Heart Hospital. Part I appeared in last week's issue.

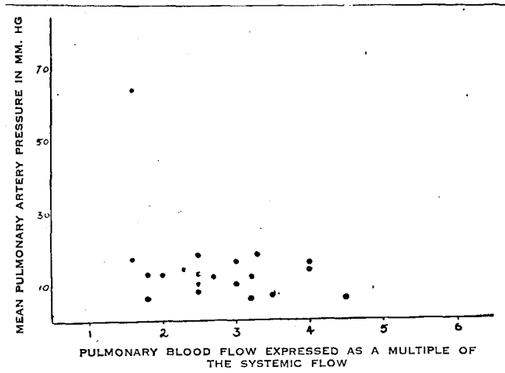


FIG. D.—Graph showing the relationship of the pulmonary blood flow to the pulmonary artery pressure in A.S.D

usually normal or nearly so, and the peripheral resistance in the lungs was usually diminished (Fig. D). This explains why the right auricular pressure does not rise, why the clinical and electrocardiographic signs point to right ventricular dilatation rather than hypertrophy, and why the pulmonary element of the second heart sound is not accentuated.

The pulmonary blood flow was two to three times the systemic flow in 10—that is, about 10 to 15 litres a minute. In five cases it was a little less, and in eight cases more.

Reversal of the shunt was not demonstrated in any case in this series. But the stage was set for such a development in two patients. One of these had considerable pulmonary hypertension for no known reason, and one had slight pulmonary hypertension associated with severe emphysema. Two other cases, not included in this study, came to necropsy with central cyanosis and lowered arterial oxygen saturation. Both had reversed interatrial shunt resulting from the effects of pulmonary hypertension associated with emphysema in one case and with cystic disease of the lungs in the other. It is believed that reversal of the shunt in A.S.D. is rare in uncomplicated cases, even when the heart fails; it is suggested that an increased peripheral resistance in the lungs is more likely to be responsible, and that this is an accidental association, not even an indirect consequence of the shunt. Such pulmonary hypertension may operate not only by raising the right auricular pressure but also by lowering the left (see under Eisenmenger's syndrome).

Differential Diagnosis

Pulmonary hypertension, especially when complicated by pulmonary incompetence, is too often confused with A.S.D., and with too little reason. There are many points of difference. In pulmonary hypertension the jugular venous pressure tends to be raised and the *a* wave may be conspicuous; the second heart sound is split, but not widely so, and the pulmonary element is grossly accentuated; the electrocardiogram usually shows a prominent P pulmonale and tall R waves in Lead V_1 without widening or much notching; skiagrams do not show pulmonary plethora, but merely dilatation of the pulmonary artery and its two main branches. Again, cyanosis always favours cor pulmonale, and, even if a reversed interatrial shunt is responsible for it, cor pulmonale is still likely to be present, as explained above.

The distinction between A.S.D. and V.S.D. has already been discussed.

Idiopathic dilatation of the pulmonary artery, with pulmonary incompetence causing dilatation of the right ventricle and the electrocardiographic pattern of right bundle-branch block, may cause real difficulty; but pulmonary plethora is absent.

Simple mild pulmonary stenosis with dilatation of the pulmonary artery, normal but well-filled pulmonary vessels, and noticeable splitting of the second heart sound is often confused with A.S.D. But these mild cases are usually associated with a normal left ventricular cardiac impulse and with a normal electrocardiogram. Moreover, the pulmonary artery is always impalpable.

Finally, a normal heart with clockwise rotation (due perhaps to slight scoliosis), unusual prominence of the pulmonary artery, a functional pulmonary systolic murmur, noticeable splitting of the second heart sound, a rather tapping type of cardiac impulse (left ventricle displaced posteriorly), a secondary R wave in Lead V_1, and well-filled pulmonary vessels may resemble mild A.S.D. very closely. The clinical diagnosis depends chiefly on the degree of the changes enumerated. There are very few cases of A.S.D. that are mild enough not to show something beyond the range of normal variation.

Pulmonary Stenosis

No form of congenital heart disease has caused so much confusion and muddled thinking as pulmonary stenosis. First, apart from Fallot's tetralogy, it was considered rare (Abbott, 1932; Taussig, 1947); more recently it has been realized that it is not so rare (Currens, Kinney, and White, 1945; Allanby and Campbell, 1949), and in fact it is common. Secondly, the presence or absence of cyanosis, whether it is peripheral or central, and what determines it still need clarification. Thirdly, certain titles used in modern papers to describe various forms of pulmonary stenosis, while obviously acceptable at their face value, are not acceptable when used to define recognizable clinical entities: thus Selzer *et al.* (1949) used the title "the syndrome of pulmonary stenosis with patent foramen ovale" to describe cyanosed cases of pulmonary stenosis with reversed interatrial shunt; and Allanby and Campbell (1949) used the title "congenital pulmonary stenosis with closed ventricular septum" to describe, apparently, any form of pulmonary stenosis that was not Fallot's tetralogy. As is shown later, neither of these descriptive titles covers the facts that they are meant to convey. Fourthly, no satisfactory description of the clinical features of pulmonary stenosis has yet been published.

There were 61 cases of pulmonary stenosis in this series (excluding pulmonary atresia), of which 23 could be classed as "simple," 5 as pulmonary stenosis with reversed interatrial shunt, and 33 as Fallot's tetralogy. Several different types of "simple" stenosis were encountered, depending on: (1) the state of the pulmonary artery—whether aneurysmal, dilated, normal, or small; (2) whether the stenosis was valvular or subvalvular; (3) whether the stenosis was mild or severe; (4) whether the ventricular septum was closed or patent; and (5) whether the auricular septum was closed or patent.

These variables are not academic, but have a profound practical influence on the clinical features of the condition. To avoid too much repetition the classical picture of severe valvular stenosis with closed septa will be described first, and then the effect of each of the variations on this picture can be discussed.

Simple Pulmonary Valvular Stenosis (Severe) with Closed Septa

Five cases were studied. They were characterized by many constant features.

1. Cyanosis, when present, was peripheral. When the cardiac output was low, cyanosis might be increased by compensatory polycythaemia, and the facies was sometimes bloated.

2. Breathlessness developed in childhood or adolescence, and was progressive. Angina pectoris and syncope occurred in one.

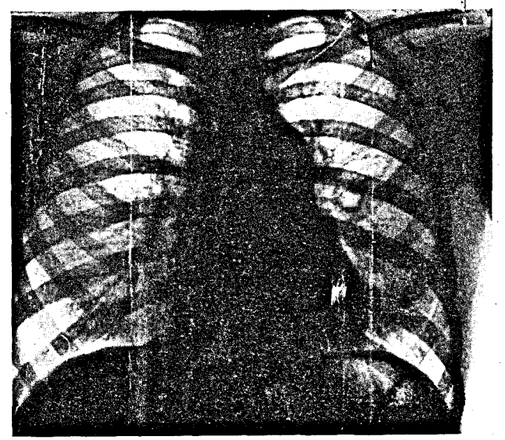


FIG. 5.—Skiagram in a case of moderately severe pulmonary stenosis.

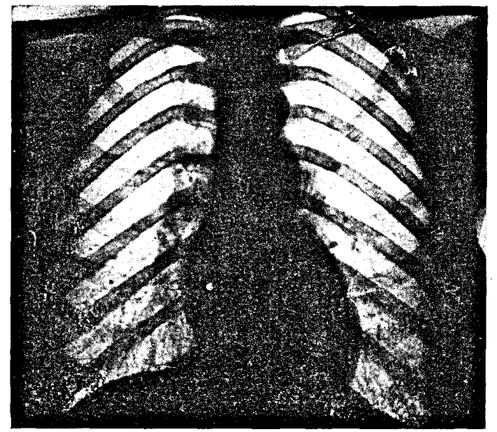


FIG. 6.—Skiagram in a case of mild pulmonary stenosis.

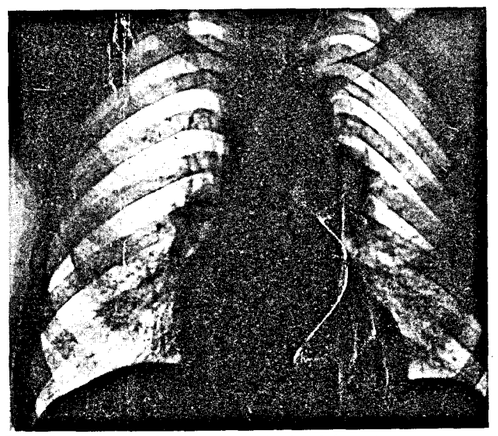


FIG. 7.—Aneurysmal dilatation of the left pulmonary artery associated with pulmonary stenosis.



FIG. 8.—Angiocardiogram of the same case as Fig. 7 (second oblique position).

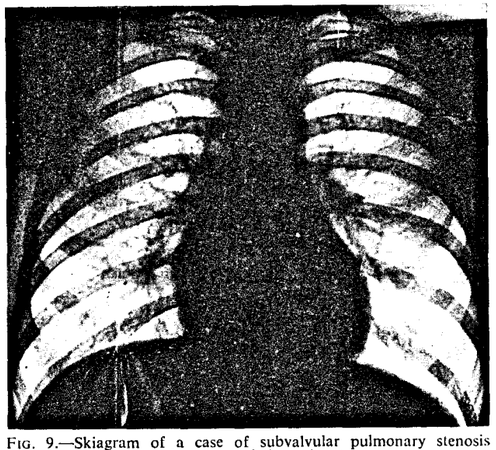


FIG. 9.—Skiagram of a case of subvalvular pulmonary stenosis showing no dilatation of the pulmonary artery.

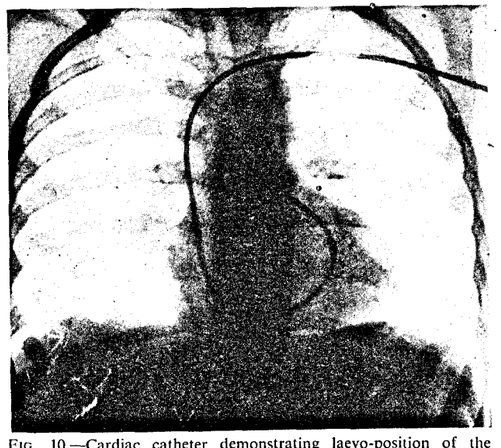


FIG. 10.—Cardiac catheter demonstrating laevo-position of the pulmonary artery in a case of Fallot's tetralogy.

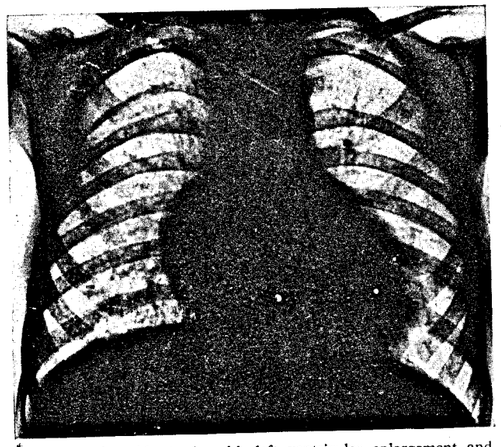


FIG. 11.—Tricuspid atresia with left ventricular enlargement and bronchial vessels supplying the lungs.

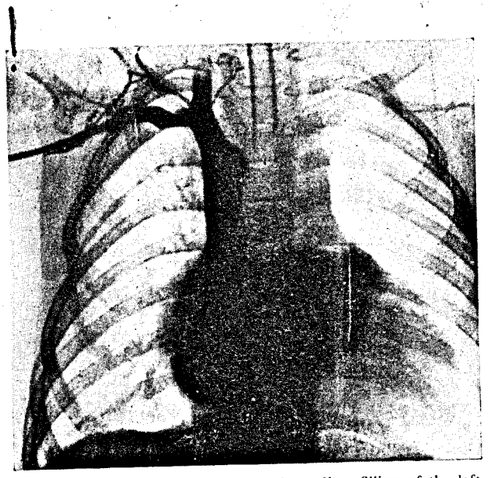


FIG. 12.—Angiocardiogram showing immediate filling of the left auricle in a case of tricuspid atresia (note L.A. appendix).

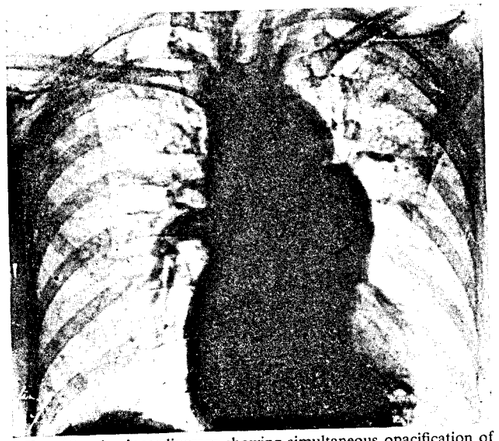


FIG. 13.—Angiocardiogram showing simultaneous opacification of the aorta and pulmonary artery in a case of pulmonary hypertension with reversed aorto-pulmonary shunt due to patent ductus.



FIG. 14.—Angiocardiogram showing simultaneous opacification of the aorta and pulmonary artery in a case of true Eisenmenger's complex.

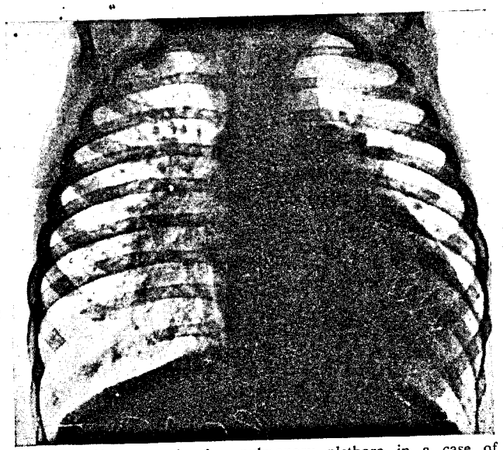


FIG. 15.—Skiagram showing pulmonary plethora in a case of transposition of the great vessels.

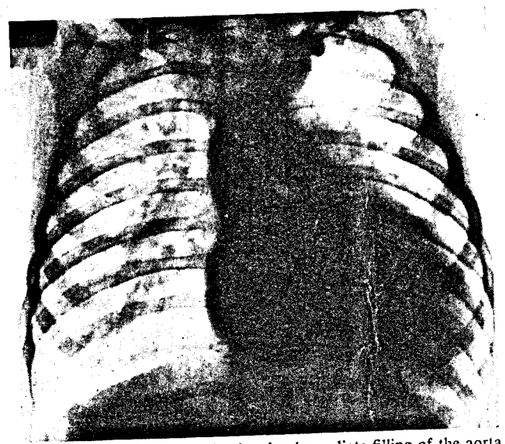


FIG. 16.—Angiocardiogram showing immediate filling of the aorta from the right ventricle in a case of transposition of the great vessels.

Death from congestive failure is expected in all of these before long, unless pulmonary valvulotomy saves them.

3. The pulse was small or on the small side of normal.

4. The jugular venous pressure was usually raised, and in at least two cases giant *a* waves were seen in the neck. This presystolic venous pulse was most conspicuous, towered above the *c* and *v* waves, was abrupt and collapsing in quality, so that it came to be called a "venous Corrigan," and was transmitted to the liver.

5. The cardiac impulse was tapping, the right ventricular outflow tract lifting, and the pulmonary artery pulse invisible and impalpable.

6. All had a high systolic murmur and thrill maximal in the second or second and third left spaces.

7. The second heart sound was invariably single at the pulmonary area.

8. The electrocardiogram showed prominent sharp P waves and strong right ventricular preponderance without right bundle-branch block. The R waves were very tall and the T waves were sharply inverted in right ventricular surface leads or their equivalents (Fig. E). The U waves were also inverted in these leads in some of the cases.

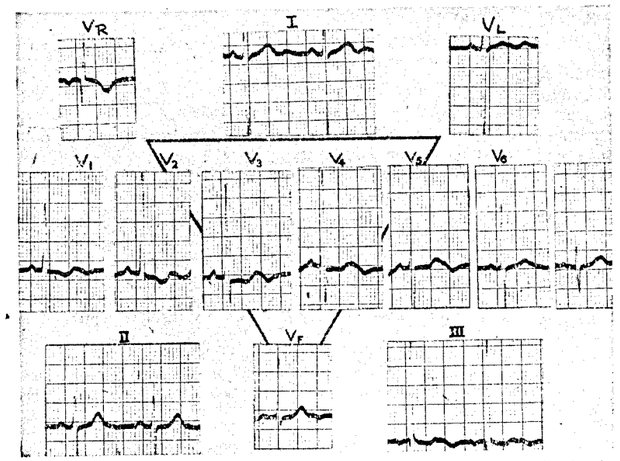


FIG. E.—Electrocardiogram in a case of severe pulmonary stenosis showing almost monophasic R waves, inverted T waves, and inverted U waves in right ventricular surface leads.

9. Skiagrams showed enlargement of the right ventricle, often considerable, and dilatation of the pulmonary artery. The peripheral vascular shadows were normal or rather light (Plate, Fig. 5).

Cardiac catheterization revealed an extremely high mean pressure in the right ventricle (over 35 mm. Hg), and a low pressure in the pulmonary artery (under 8 mm. Hg). Samples from the pulmonary artery, right ventricle, right auricle, and superior vena cava were similar.

Penetration of the pulmonary artery may be dangerous in this condition, for if the catheter blocks the pulmonary valve there is no other way for the blood to escape.

Severe Pulmonary Stenosis with Reversed Interatrial Shunt

Five cases were studied in this series. Three were cyanosed from birth. This is inevitable in the most severe cases, because the low left auricular pressure and raised right auricular pressure must keep the foramen ovale open. But cyanosis certainly increased in childhood or adolescence, and was markedly accentuated by effort. Angina pectoris and syncope occurred in one case. The onset of cyanosis may have been delayed in the other two, as described by Allanby and Campbell (1949). Such cases are presumably not quite so severe at birth but tighten up later. When this occurs reversed interatrial shunt can develop only if the foramen ovale happens to be patent—that is, in about a quarter of the cases.

The physical signs were similar to those of severe stenosis without shunt, with the addition of cyanosis, clubbing, and polycythaemia.

Skiagrams always showed diminished pulmonary vascular markings beyond the dilated pulmonary artery.

Cardiac catheterization (in three cases) revealed extremely high mean pressures in the right ventricle (over 45 mm. Hg) and low pressures in the pulmonary artery (below 5 mm. Hg). Pulmonary venous samples were normal; samples from the left auricle, left ventricle, and femoral artery were similar, and contained a large proportion of venous blood shunted from the right auricle. In a typical case the systemic blood flow was 4.3 litres a minute, and the pulmonary flow 1.4 litres a minute; the shunt was therefore 2.9 litres a minute.

Angiocardiography shows immediate filling of both auricles and simultaneous opacification of both ventricles and of the aorta and pulmonary artery.

Differential Diagnosis.—Severe pulmonary stenosis without cyanosis is difficult to confuse with any other condition. Pulmonary stenosis with reversed interatrial shunt may be distinguished from Fallot's tetralogy by the history, by greater cardiac enlargement, and by the presence of a dilated pulmonary artery. A low murmur or absence of a thrill favours Fallot's tetralogy. Doubt may be resolved by means of cardiac catheterization or angiocardiography.

Treatment—Pulmonary valvulotomy (Brock, 1948) is the treatment of choice for all severe cases of pulmonary stenosis with or without reversed interatrial shunt.

Mild Valvular Stenosis with Closed Septa

Seven cases were investigated, and these differed radically in nearly all respects from the severe type. (1) None had peripheral cyanosis; indeed, they all looked healthy. (ii) There were no symptoms; one patient was an athlete. (iii) The pulse was normal. (iv) The venous pressure was normal, and large *a* waves were not seen. (v) The cardiac impulse was usually a normal gentle left ventricular thrust, and there was little evidence of right ventricular enlargement. (vi) All had a high pulmonary systolic thrill and murmur. (vii) The second heart sound was usually split in the normal fashion, the pulmonary element being soft or of average intensity. (viii) The electrocardiogram showed normal P waves and virtually normal QRS complexes, although the R wave in Lead V_1 was a little high in three of them. (ix) Skiagrams showed no cardiac enlargement, a dilated pulmonary artery, and normal peripheral vascular markings (Fig. 6).

Cardiac catheterization revealed a normal mean pulmonary artery pressure (over 8 mm. Hg) and moderate elevation of the right ventricular pressure (15–30 mm. Hg). Samples from the pulmonary artery were similar to those from the right ventricle, right auricle, and S.V.C., and were normally unsaturated.

Similar mild cases have been described by Mannheimer *et al.* (1949), at Stockholm, and by Dexter *et al.* (1950).

The differential diagnosis is from the normal heart with prominent pulmonary artery and functional pulmonary systolic murmur, from mild atrial septal defect, and from the "maladie de Roger."

No treatment is required.

Pulmonary Stenosis with Aneurysmal Dilatation of the Pulmonary Artery

Only one such case was seen. The clinical features were those of mild pulmonary stenosis, and the *x*-ray appearances (Fig. 7) were a surprise. The mean pressure in the pulmonary artery was 11 mm. Hg, in the right ventricle 22 mm. Hg. Angiocardiography confirmed the nature of the hilar shadows (Fig. 8).

Idiopathic dilatation of the pulmonary artery without pulmonary stenosis (Greene *et al.*, 1949) may be complicated by pulmonary incompetence, enlargement of the right ventricle, and right bundle-branch block. Two such cases were encountered in this series. In both, the pulmonary artery and right ventricular pressures were normal.

Subvalvular Stenosis

In two cases simple pulmonary stenosis appeared to be subvalvular on cardiac catheterization and angiocardiography. Both were characterized by absence of the common post-stenotic dilatation of the pulmonary artery (Fig. 9) and by a relatively low systolic thrill and murmur which were readily appreciated in the third left space. Otherwise the findings were the same as for valvular stenosis. They happened to be moderately severe (P.A.P. 11 and 8; R.V.P. 44 and 31 mm. Hg respectively). When mild, these cases may easily be mistaken for the "maladie de Roger," or for subaortic stenosis.

Since completing this series a third case has been seen, in which a separate infundibular chamber was demonstrated.

Pulmonary Stenosis with V.S.D. (or A.S.D.)

Four such cases were revealed as a result of cardiac catheterization. Two had been diagnosed as pulmonary stenosis, and two as "maladie de Roger."

The stenosis was valvular in all four. It was severe in one (P.A.P. 5; R.V.P. 37 mm. Hg), moderate in two (P.A.P. 17 and 32; R.V.P. 40 and 40 mm. Hg respectively), and mild in one (P.A.P. 10; R.V.P. 16). Despite the stenosis the pulmonary blood flow was at least twice the systemic flow in two of the cases.

Clinical diagnosis may be puzzling, for the signs of pulmonary stenosis and V.S.D. may be combined. As a rule, however, one or the other dominates the picture and determines the course. The association is important for several reasons: (1) it shows that the notation "pulmonary stenosis with closed ventricular septum" cannot be used clinically to distinguish "simple" pulmonary stenosis from Fallot's tetralogy, because the presence or absence of V.S.D. may be impossible to determine clinically, and may not interfere with the clinical features or course of the pulmonary stenosis; (2) it offers further evidence of the clinical confusion between mild pulmonary stenosis and the "maladie de Roger"; and (3) it is probable that similar cases occur in which the stenosis is very tight—reversal of the shunt might then occur and the case would come to resemble Fallot's tetralogy (but without a riding aorta).

Since completing the series a similar type of case was investigated, but the left-to-right shunt proved to be interatrial and resulted from A.S.D. The stenosis was mild (P.A.P. 8; R.V.P. 31; infundibulum 18 mm. Hg). Left auricular samples were 93% saturated, and the pulmonary blood flow was twice the systemic flow. Considerable pulmonary plethora was present radiologically.

Pulmonary Stenosis with Patent Foramen Ovale

That this is not synonymous with pulmonary stenosis with reversed interatrial shunt is obvious, and if there is no cyanosis the presence of patent foramen ovale is unsuspected. Unlike pulmonary stenosis with A.S.D., there is no left-to-right interatrial shunt.

One such acyanotic case was discovered in this series. This was that of a girl of 14 without symptoms and with typical signs of moderate pulmonary valve stenosis. The catheter slipped through a patent foramen ovale, and left auricular samples were 96% saturated with oxygen. The mean right auricular pressure was 4 cm. of saline, the left 5.5 cm. The pulmonary artery pressure was 8 mm. Hg, and the R.V. pressure was 32 mm. She is clearly liable to develop a reversed interatrial shunt if the situation deteriorates.

Patent foramen ovale in mild pulmonary stenosis should remain functionless indefinitely.

Fallot's Tetralogy

There were 33 cases of Fallot's tetralogy and 3 of pulmonary atresia (Fallot type) in the series. The clinical features are too well known to justify more than a few minor comments:

1. The jugular venous pressure was very rarely raised, and no case was seen in failure. Accentuation of the *a* wave was uncommon and never great.

2. The systolic murmur was maximal high in the second space in one-third of the cases, and low in the third or third and fourth spaces in the remainder. A thrill was present in half of them, and was as frequently high as low.

3. The second heart sound was invariably single, and usually rather loud. This is attributed to absence of the pulmonary element and to the proximity of the root of the aorta to the anterior chest wall.

4. A continuous murmur was heard in three out of four cases of pulmonary atresia in the series, but not in Fallot's tetralogy. Necropsy in three of these cases showed that the murmur depended upon a broncho-pulmonary anastomosis at a fairly high arterial level, not upon a patent ductus. Since these figures were completed two more cyanotic cases with continuous murmurs have been examined and diagnosed as atresia partly because of these murmurs. Cardiac catheterization was not, therefore, undertaken, and angiocardiography proved that both diagnoses were correct. The murmur was left-sided in two of these cases, mainly right-sided in two, and bilateral in one. Clinically it is impossible to distinguish pulmonary atresia from a persistent truncus arteriosus unless well-formed pulmonary arteries arise from the root of the aorta, or unless the latter is obviously much enlarged. Angiocardiograms are also similar in all other respects.

5. Cardiac catheterization was carried out in 21 cases of Fallot's tetralogy. The mean pulmonary artery pressure was under 8 mm. Hg (−1 to +7) in all but one of 15 cases in which that vessel was entered. The right ventricular pressure ranged from 22 to 55 mm. Hg, and was commonly around 40. Samples from the P.A., R.V., R.A., and S.V.C. were usually very unsaturated and were similar in all but two cases: in those two the pulmonary artery samples were less unsaturated. No explanation for this can yet be offered.

6. The catheter was passed through a patent foramen ovale in two cases. It was interesting to be able to demonstrate the absence of reversed interatrial shunt in both instances, the left auricular pressure being higher than the right, and left auricular samples being normally saturated with oxygen; and this despite mean right ventricular pressures of 44 and 37 mm. Hg and a pulmonary artery pressure of 6 mm. in one of them. It seems that the right ventricle is able to accommodate itself to work against the systemic blood pressure without difficulty, and does not suffer from the extremely high pressure generated on effort in cases of pure pulmonary stenosis. This also suggests that reversed interatrial shunt depends more upon elevation of the right auricular pressure than upon the lowering of the left.

7. Both during cardiac catheterization and on inspecting the angiocardiograms, laevo-position of the pulmonary artery was often noticed. This was usually more convincing than dextroposition of the aorta (Fig. 10).

Tricuspid Atresia

This is the only cyanotic form of congenital heart disease with a diminished pulmonary blood flow associated with left ventricular enlargement and a rudimentary right ventricle. The cardiac impulse, *x*-ray appearances (Fig. 11), and electrocardiogram (Fig. F) usually make

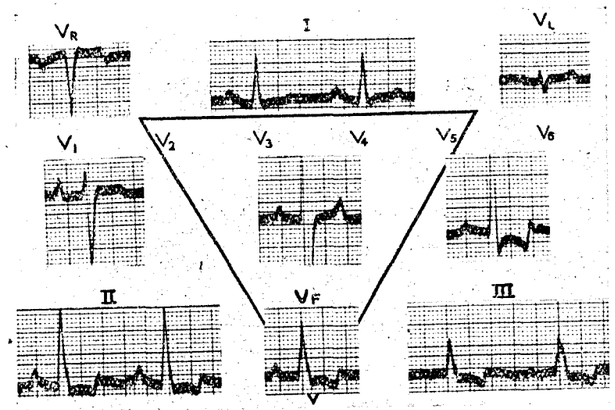


FIG. F.—Electrocardiogram of a case of tricuspid atresia showing the "P mitrale," and left ventricular preponderance (vertical heart).

the diagnosis easy. If not, angiocardiography provides convincing evidence (Fig. 12).

Cardiac catheterization is unsatisfactory, because failure to enter the right ventricle may be due to technical difficulty and cannot be attributed to tricuspid atresia with any surety. However, a reversed interatrial shunt can be demonstrated, and under the clinical circumstances this confirms the diagnosis.

Eisenmenger's Complex

The majority of cases in which a diagnosis of Eisenmenger's complex was suggested turned out otherwise; only three were finally accepted after full physiological and angiocardiographic studies, and subsequent necropsy disproved one of them.

The Eisenmenger's syndrome consists of central cyanosis, tapping cardiac impulse, lifting conus, visible and palpable pulsation of the pulmonary artery, a systolic murmur and thrill in the third left space, normal splitting of the second heart sound with accentuation of the pulmonary element, an electrocardiogram showing right ventricular preponderance, and *x*-ray appearances characterized by right ventricular enlargement, dilatation of the pulmonary artery and its two main branches, and poorly marked peripheral vascular shadows.

Cardiac catheterization reveals a raised pressure in the pulmonary artery and right ventricle, a similar degree of unsaturation in samples from the pulmonary artery, right ventricle, right auricle, and S.V.C., and normally saturated samples from the pulmonary veins and left auricle (if obtained through a patent foramen ovale). The arterial oxygen saturation is reduced.

Angiocardiography shows simultaneous opacification of the aorta and pulmonary artery from the right ventricle, no dye entering the left auricle initially.

Differential Diagnosis

Clinically, advanced idiopathic pulmonary hypertension may closely resemble Eisenmenger's syndrome at any age, differences being largely a matter of degree. Thus there is usually less cyanosis, and the small pulse and cold extremities suggest that some of it is peripheral; breathlessness is more severe, and there may be angina or syncope; the jugular venous pressure is higher and the *a* wave more conspicuous; there is no thrill at the base, and if there is a murmur it is unimpressive; the electrocardiogram nearly always shows a conspicuous P pulmonale and stronger right ventricular preponderance; and the heart looks larger radiologically. Physiological studies reveal higher pressures in the pulmonary artery and right ventricle, and pulmonary venous samples (if they can be obtained) show the same degree of unsaturation as arterial samples. No shunt can be seen in the angiocardiogram.

Idiopathic pulmonary hypertension with reversed interatrial, interventricular, or aorto-pulmonary shunt is the usual explanation for most cases of "proved" Eisenmenger's syndrome. The clinical features resemble those of pure idiopathic pulmonary hypertension as described above; but cyanosis and clubbing are more conspicuous, and the angiocardiogram shows simultaneous opacification of the aorta and pulmonary artery.

The absence of a thrill and murmur favours reversed interatrial or aorto-pulmonary shunt, and both cardiac catheterization and angiocardiography should demonstrate an interatrial shunt; but reversed interventricular shunt is clinically Eisenmenger's syndrome itself. At necropsy, however, the aorta is not overriding.

One of the accepted cases of Eisenmenger's syndrome included in this series (Fig. 13) proved to be pulmonary hypertension with reversed aorto-pulmonary shunt through a patent ductus. This case is being reported in detail by Dr. Maurice Campbell.

The question is constantly being asked whether there is really any such thing as Eisenmenger's complex; whether it is possible to be sure of an overriding aorta at necropsy when the pulmonary outflow tract is normal. One case in the series seems to provide a positive answer to this question.

This was that of a girl aged 7, with considerable effort dyspnoea, squatting, moderate cyanosis and clubbing, slight polycythaemia, a normal rather than small arterial pulse, a normal venous pressure and pulse, a tapping cardiac impulse, lifting conus and visible pulmonary artery pulsation, a systolic murmur and thrill in the third left space, and a normally well-split second heart sound with accentuation of the pulmonary element. Her electrocardiogram showed normal P waves and slight to moderate right ventricular preponderance. Skiagrams showed no obvious enlargement of the heart, but the pulmonary artery was dilated and the peripheral vascular shadows diminished. On cardiac catheterization the pressure was 39 mm.

Hg in the pulmonary artery, 19 in the right ventricle, and +2 in the right auricle, samples from these positions being the same (66–69% saturated). The arterial sample was 71% saturated. Angiocardiography showed simultaneous opacification of the aorta and pulmonary artery without early filling of the left auricle (Fig. 14).

It is clear in this case that the pressures are not high enough to warrant a diagnosis of pulmonary hypertension with reversed interventricular or aorto-pulmonary shunt, and an overriding aorta must be postulated.

Transposition

Two patients with transposition were investigated, girls aged 3 and 12. The clinical diagnosis is usually easy, and depends on the recognition of pulmonary plethora in an obviously cyanotic case (Fig. 15). The rest of the findings closely resemble those of Eisenmenger's complex.

The catheter was passed down the aorta as well as into the pulmonary artery in both cases studied. The mean right ventricular pressure was of course high, 31 and 41 mm. Hg; the pulmonary artery pressure 11 and 64 respectively (aortic 74 and 69). Samples from the pulmonary artery were considerably more saturated with oxygen than samples from the aorta, and this proved the diagnosis. Venous blood entered the lungs from the right ventricle via a ventricular septal defect in both cases, and pulmonary venous blood escaped from the semi-closed pulmonary circuit via an atrial septal defect in the first case and presumably via bronchial and azygos veins in the second. The pulmonary blood flow was greatly increased, being three times the systemic flow in both patients. Angiocardiography also confirmed the diagnosis (Fig. 16).

The elder girl with atrial septal defect was less cyanosed and less breathless than the other; indeed, she was remarkably well. The creation of an artificial atrial septal defect or of a pulmonary-azygos venous anastomosis would seem to be justified.

Classification

In the light of these findings a new clinical classification of congenital heart disease is offered (Table V).

TABLE V.—*Classification of Congenital Heart Disease*

No Shunt		
General	Left-sided	Right-sided
Dextrocardia Idiopathic hypertrophy Von Gierke's disease Heart-block Familial cardiomegaly	Coarctation of the aorta Right-sided aortic arch Complete or incomplete aortic rings Bicuspid aortic valve (or supernumerary cusps) Aortic or subaortic stenosis Left coronary artery arising from pulmonary artery	Idiopathic dilatation of the pulmonary artery Simple pulmonary stenosis (with or without patent F.O.). Ebstein's disease

With Shunt	
Acyanotic Left-to-right Shunt (Pulmonary Plethora)	Cyanotic Right-to-left Shunt
Left ventricular enlargement: Patent ductus Ventricular septal defect (with or without mild pulmonary stenosis) Perforated aortic sinus into P.A. or R.V. (or R.A.) *Right ventricular enlargement:* Atrial septal defect (with or without mild pulmonary stenosis). Anomalous pulmonary veins joining S.V.C. or R.A.	*Diminished pulmonary blood flow:* Low P.A. pressure: 1. Left ventricular enlargement: Tricuspid atresia 2. Right ventricular hypertrophy: Fallot's tetralogy Pulmonary atresia (Fallot type) Persistent truncus Pulmonary stenosis with reversed interatrial shunt High P.A. pressure: Eisenmenger's complex Pulmonary hypertension with reversed aorto-pulmonary, interventricular, or interatrial shunt *Pulmonary plethora:* Transposition

Summary and Conclusions

A fresh account of congenital heart disease is presented in the light of a series of 200 cases proved by means of cardiac catheterization, angiocardiography, thoracotomy, or necropsy.

The technical difficulties of cardiac catheterization are discussed.

The clinical incidence of the more common or well-recognized anomalies is given.

The physical signs of congenital heart disease are reviewed and revalued. Particular attention has been paid to the jugular pulse, the cardiac impulse, the right ventricular outflow tract, functional mitral and pulmonary diastolic murmurs, and the second heart sound.

New facts concerning most forms of congenital heart disease are presented.

The left-to-right shunts with pulmonary plethora usually have a normal or low pulmonary resistance. When the pulmonary resistance is high the shunt is diminished and is in danger of being reversed; an acquired Eisenmenger's syndrome results. This pulmonary hypertension does not depend on the duration of the shunt, but on some inherent predetermined factor, and operates early.

It is suggested that the term "maladie de Roger" should be limited in its meaning, and should be used only to describe uncommon cases of V.S.D. characterized by nothing more than a Roger thrill and murmur. The majority of cases of V.S.D. present a very different picture.

Many types of pulmonary stenosis are described, the chief of which are: (1) severe pulmonary stenosis (usually valvular) with closed septa; (2) severe pulmonary stenosis (usually valvular) with reversed interatrial (or interventricular) shunt; (3) mild pulmonary stenosis (valvular or infundibular) with or without functionless patent foramen ovale; and (4) pulmonary stenosis with left-to-right shunt through an associated V.S.D. or A.S.D. Pulmonary stenosis with late reversed interventricular shunt was not encountered with certainty, but must occur; it would closely resemble Fallot's tetralogy, but there would be no overriding aorta.

Eisenmenger's complex should be diagnosed under appropriate clinical circumstances only when the pulmonary artery pressure is not high enough to cause reversed aorto-pulmonary, interventricular, or interatrial shunt, through a patent ductus, V.S.D., or A.S.D. Pulmonary hypertension with reversed aorto-pulmonary, interventricular, or interatrial shunt might be called acquired Eisenmenger's syndrome, because it is clinically indistinguishable from Eisenmenger's complex.

A new classification of congenital heart disease is offered.

I wish to thank my colleagues on the staff of the National Heart Hospital for allowing me to investigate some of their cases and to make use of material so obtained. I also wish to thank Mr. Latham, our senior technician, for carrying out the blood-gas analysis.

REFERENCES

Abbott, M. E. (1928). *Amer. Heart J.*, **3**, 392.
—— (1932). *Nelson Loose-leaf Medicine*, **4**, 207.
Allanby, K. D., and Campbell, M. (1949). *Guy's Hosp. Rep.*, **98**, 18.
Bedford, D. E., Papp, C., and Parkinson, J. (1941). *Brit. Heart J.*, **3**, 37.
Bramwell, C. (1947). Ibid., **9**, 100.
Brock, R. C. (1948). *British Medical Journal*, **1**, 1121.
Brown, J. W. (1939). *Congenital Heart Disease*. Bale, London.
Currens, J. H., Kinney, T. D., and White, P. D. (1945). *Amer. Heart J.*, **30**, 491.
Dexter, L., *et al.* (1950). *Circulation*, **1**, 267.
Greene, D. G., *et al.* (1949). *Amer. J. Med.*, **6**, 24.
Gross, R. E. (1949). *J. Amer. med. Ass.*, **139**, 285.
Keith, A. (1909). *Lancet*, **2**, 359.
McMichael, J., and Sharpey-Schafer, E. P. (1944). *Brit. Heart J.* **6**, 33.
Mannheimer, E., *et al.* (1949). *Acta paediatr., Stockh.*, **38**, 484.
Muir, D. C., and Brown, J. W. (1934). *Arch. Dis. Childh.*, **9**, 27.
Peacock, T. B. (1866). *On Malformations of the Human Heart* 2nd ed. Churchill, London.
Perry, C. B. (1931). *Bristol med.-chir. J.*, **48**, 41.
Roesler, H. (1934). *Arch. intern. Med.*, **54**, 339.
Selzer, A. (1949). Ibid., **84**, 798.
—— *et al.* (1949). *Amer. J. Med.*, **6**, 3.
Shapiro, M. J. (1949). *Amer. Heart J.*, **37**, 1045.
Taussig, H. B. (1947). *Congenital Malformations of the Heart* Commonwealth Fund, New York.
Wells, B. G. (1950). In press.

THE CARE OF THE CHRONIC SICK—V*

(INVESTIGATION OF 393 PATIENTS SEEKING ADMISSION TO A HOSPITAL FOR THE CHRONIC SICK)

BY

C. R. LOWE, M.D., D.P.H.

Lecturer in Public Health, Department of Social Medicine, University of Birmingham

In an investigation of patients in the largest hospital for the chronic sick in the Birmingham region the problem of disposal was considered against the background of recent legislation (Lowe and McKeown, 1949; McKeown and Lowe, 1950). When the need for frequent medical attention and for skilled nursing were used as criteria of suitability for hospital admission it was evident that about three-fifths of the patients could be cared for outside hospital if essential complementary facilities (domestic service, simple nursing, and occasional medical attention) were made available. It was recognized, however, that results based on the present hospital population were unacceptable as an accurate guide to future policy, and this inquiry was undertaken in an attempt to correct the previous estimates. It was hoped that examination of the medical condition and social circumstances of patients seeking admission to hospital would indicate (*a*) the proportions of applicants for whom regional hospital boards and local authorities are respectively responsible, and (*b*) the additional facilities required to meet the obligations of local authorities.

The data were recorded by investigation of all new patients for whom admission to Dudley Road Infirmary† was sought between October 10 and December 22, 1949. Details of social and domestic circumstances were recorded in the home by an almoner within twenty-four hours of the request for admission; medical data were recorded by one of five consultants after examination of the patient either at home or shortly after admission to hospital. With the full social and medical data before him, the consultant in each case finally made a decision in respect of disposal.

During the period of the inquiry there were 393 applications for admission. Thirty-two patients refused to enter the infirmary, still associated in their minds with the nineteenth-century workhouse, and relatives eventually made alternative arrangements for them. Twenty patients died at home before they could be examined, and six were admitted to general hospitals. The analysis which follows is based on the remaining 335 patients (161 men and 174 women) for whom the requisite examinations were completed.

Disposal of the Chronic Sick

Table I gives the disposal suggested for the 335 patients seeking hospital admission. Criteria used were those previously applied to the hospital population at Dudley Road Infirmary.

(*a*) General hospital (40%). Patients who needed skilled nursing and/or medical attention once a week or more frequently. These patients were acutely ill or needed hospital investigation, or were in the terminal stages of malignant disease.

*This research was assisted by a grant from the Birmingham University Students' Social Services Fund.

Parts I, II, and IV appeared in the *British Journal of Social Medicine* for July, 1949, and April and July, 1950, and Part III in the *British Medical Journal* of February 11, 1950.

†Formerly called Western Road Infirmary.

TABLE I.—*Suggested Disposal of 335 Patients Seeking Admission to a Hospital for the Chronic Sick*

	Regional Hospital Board		Local Authority		Total
	(*a*) General Hospital	(*b*) Mental Institution	(*c*) Long-stay Annexe	(*d*) Own Home	
Males ..	74 (46·0%)	11 (6·8%)	48 (29·8%)	28 (17·4%)	161 (100%)
Females ..	62 (35·6%)	23 (13·2%)	31 (17·8%)	58 (33·4%)	174 (100%)
Total ..	136 (40·6%)	34 (10·1%)	79 (23·6%)	86 (25·7%)	335 (100%)

(*b*) Mental institution (10%). Patients who needed personal supervision because of their abnormal mental state.

(*c*) Long-stay annexe (24%). Patients not requiring skilled nursing or weekly medical attention who could not be kept in their own homes.

(*d*) Own home (26%). Patients who could be cared for at home.

As stated above, patients were allocated to the four groups by one of five consultants. To check the consistency of standards the data in each case were later examined by one of the physicians who had not seen the patient, and a second opinion was given in respect of disposal without knowledge of the earlier decision. There was almost complete agreement about patients considered suitable for (*a*) general hospital or (*b*) mental institution, but there were substantial differences of opinion about the division of the remainder between (*c*) long-stay annexe and (*d*) their own home. Table I is based on the first decision—that is, upon the view of the consultant who examined the patient. It may be noted that the differences, though important in relation to the work of local authorities, do not affect the main conclusion, which is that regional hospital boards and local authorities are each responsible for about half the chronic sick for whom admission to hospital is requested.

Patients assigned to each of the four classes are considered separately and in more detail below.

(a) General Hospital

Before accepting the conclusion that some of the chronic sick should be cared for in general hospitals, hospital authorities will no doubt want to be satisfied, first, about the kind of attention needed, and, secondly, that the numbers are such that the responsibility can be discharged without serious embarrassment to their traditional work. Table II classifies the 136 "hospital" patients according to the nature of their requirements: 53% were acutely ill, 29% required investigation as in-patients, and 18% were in the terminal stages of malignant disease.

TABLE II.—*Classification of Patients Suitable for General Hospital*

Diagnosis	Males	Females	Total
Acute illness	43	29	72 (52·9%)
Cerebral thrombosis	9	13	
Cardiac failure	19	5	
Bronchopneumonia	11	2	
Other conditions*	4	9	
Needing investigation	19	20	39 (28·7%)
For carcinoma	9	10	
For other reasons†	10	10	
Terminal stages of malignant disease	12	13	25 (18·4%)
Totals	74	62	136 (100%)

* Acute illness, other conditions: unexplained acute illness (2 cases), acute enteritis (2 cases), leg gangrene, empyema, uraemia, ischio-rectal abscess, acute glaucoma, recent fracture of spine, recent fracture of femur, suppurative parotitis, acute myeloid leukaemia.

† Needing investigation, other reasons: fractured spine, tuberculosis, peripheral neuritis, cerebral syphilis, steatorrhoea, leg ulcer, pleural effusion, etc.

These patients clearly require attention best provided in a general hospital. Acute illness in the elderly patient has of course distinctive features which have made general hospitals reluctant to accept this commitment; for example, 40% of the 136 patients were incontinent. But the fact that incontinence will sometimes respond to treatment is an additional consideration in favour of their admission. The data suggests that numbers will not be formidable if alternative arrangements can be made for the remaining 60% of the patients (considered not to require care in a general hospital), as well as for the swift transfer of patients who neither die nor recover.

(b) Mental Institution

One-tenth of all applications were in respect of patients in need of constant supervision because of their mental condition, and Table III classifies them according to the

TABLE III.—*Classification of Patients Suitable for a Mental Institution*

Diagnosis	Males	Females	Total
Senile dementia (no other pathology)	10	18	28 (82·4%)
Old hemiplegia	1	2	3 (8·8%)
Psychosis	—	2	2 (5·9%)
Other	—	1*	1 (2·9%)
Total	11	23	34 (100%)

* A woman of 82 with a fungating carcinoma of breast and no evidence of secondaries.

diagnosis. Two patients, both women, were psychotics, but most (82%) were demented senile patients for whom no more specific diagnosis was made. More than half of these old people were both bedfast and incontinent; they are typical of the class of patient which places the heaviest nursing burden on existing hospitals for the chronic sick.

A recent Ministry of Health circular to hospital boards (R.H.B. (50) 26) considers some of the difficulties of caring for the aged who are mentally infirm. It suggests that large general hospitals should provide short-stay units for diagnosis and short-term treatment; after a period a few patients may be well enough to return home, a few more may require certification, but most will need alternative accommodation. For these the circular suggests long-stay annexes associated with mental hospitals, with hospitals for the chronic sick, or with general hospitals. The suggestion that these annexes should be within the grounds of mental hospitals is unlikely to be attractive to patients or their relatives, but wherever they are sited the problem of staffing will be formidable, since the care of the aged who are also mentally infirm is among the least attractive of medical and nursing commitments.

(c) Long-stay Annexe

About one-quarter of the cases were considered suitable for admission to a long-stay annexe. Because of their social circumstances these patients could not be kept at home, yet their medical and nursing requirements were not such as would justify admission to a general hospital.

TABLE IV.—*Classification of Patients Suitable for a Long-stay Annexe*

	Males	Females	Total
"Senility" (no pathology)	14	10	24 (30·4%)
Cardiac conditions	13	4	17 (21·5%)
Carcinoma	10	2	12 (15·2%)
Old cerebral thrombosis	6	4	10 (12·6%)
Other conditions*	5	11	16 (20·3%)
Total	48	31	79 (100%)

* Other conditions: 8 with disease of C.N.S. (post-encephalitic Parkinsonism, paralysis agitans, motor neurone disease, disseminated sclerosis, Huntington's chorea); 6 with advanced arthritis; 2 with old fracture of femur.

Table IV classifies them according to their medical condition, and it may be noted that about one-third had no pathological lesion and suffered merely from infirmity associated with advanced age. A few patients had incurable malignant disease, and the remainder were partially incapacitated by other illnesses.

Two questions arise in relation to the suggested disposal. The first is whether the nursing requirements constitute a sufficient reason for admission to hospital. The information in Table V underlines this question, for it shows that

TABLE V.—*Mobility and Continence of Patients Suitable for a Long-stay Annexe*

	Bedfast	Sitting Out of Bed	Ambulant	Total
Continent	26 (32·9%)	12 (15·2%)	18 (22·8%)	56 (70·9%)
Incontinent	17 (21·5%)	2 (2·5%)	4 (5·1%)	23 (29·1%)
Total	43 (54·4%)	14 (17·7%)	22 (27·9%)	79 (100%)

54% were bedfast and 29% incontinent. Clearly such patients need more attention than can be offered in the typical municipal home for the aged; equally clearly they do not belong in the wards of a general hospital.

The second question is whether any of the 79 patients in this group could be cared for at home. This was out of the question in the case of 23 patients who had no home and were living in lodgings, municipal homes, or common lodging houses; in the remaining 56 cases the decision rested on the judgment of the consultant that personal circumstances prohibited home care, even assuming the availability of complementary services.

(d) Own Home

As shown in Table I, roughly one-quarter of all requests for admission were in respect of patients considered suitable for care at home, and Table VI gives particulars of

TABLE VI.—*Classification of Patients Suitable for Care at Home*

	Males	Females	Total
"Senility"	5	20	25 (29·1%)
Cardiac conditions	6	8	14 (16·3%)
Old cerebral thrombosis	8	9	17 (19·8%)
Carcinoma	3	6	9 (10·4%)
Other conditions*	6	15	21 (24·4%)
Total	28	58	86 (100%)

* Other conditions: 10 with advanced disease of C.N.S. (post-encephalitic Parkinsonism, paralysis agitans, disseminated sclerosis, motor neurone disease, unexplained paraplegia); 5 with diabetes; 2 with terminal illness (too ill to move); 4 others—*suprapubic cystotomy*, varicose ulcer, bronchopneumonia (recovering), dermatitis herpetiformis.

their medical condition. From a medical point of view this group is very similar to the previous one, and, since the two have been separated solely on consideration of personal circumstances, it is necessary to examine specific requirements in detail. Information of this kind is provided in Table VII, which gives particulars of the medical, nursing, and domestic assistance needed by these patients.

They need little medical attention: a few (7%) require visiting more than once a week, but the majority (61%) could be supervised by visits once a fortnight, or less often. It seems reasonable, therefore, to suggest that these services are within the compass of the general practitioner.

Skilled nursing is required by 16%, simple nursing by 41%, and no nursing by 43%. It may be recalled that in our investigation of chronic sick in hospital all patients needing skilled nursing were assigned to the hospital group. This was in fact the only reasonable decision where the

TABLE VII.—*Services Required by Patients Suitable for Care at Home*

Medical Supervision

	Daily	More than Once a Week	Weekly	Fortnightly	Monthly	Total
Males	—	1	10	14	3	28
Females	3	2	18	21	14	58
Total	3 (3·5%)	3 (3·5%)	28 (32·5%)	35 (40·7%)	17 (19·8%)	86 (100%)

Nursing

	Skilled Nursing Required		Simple Nursing Required (Daily)	No Nursing Required	Total
	Daily	Twice Weekly			
Males	3	1	8	16	28
Females	9	1	27	21	58
Total	12 (14·0%)	2 (2·3%)	35 (40·7%)	37 (43·0%)	86 (100%)

Domestic Help

	All Day	Half-day	2–3 Times Weekly	Not Required	Total
Males	4	3	15	6	28
Females	11	20	15	12	58
Total	15 (17·4%)	23 (26·8%)	30 (34·9%)	18 (20·9%)	86 (100%)

examination was conducted in hospital without detailed knowledge of domestic circumstances, but in the present inquiry, in which most patients were seen at home, it was permissible to be somewhat more flexible. Of the 14 patients who required skilled nursing, six were diabetics having daily insulin injections, five needed care of pressure sores or of varicose ulcers, four were acutely ill, and one required daily attention to a suprapubic cystotomy. It was considered practicable to provide these services through the home nursing service of the local authority. Simple nursing (for 35 patients) comprised washing, dressing, feeding, lifting in and out of bed, with, in the case of bedfast patients, attention to bowels and bladder and prevention of pressure sores. In cases which required no nursing (37 patients), requests for hospital admission were entirely determined by domestic circumstances.

Table VII also indicates that most patients (79%) need some kind of domestic assistance, although only a few (17%) require continuous help. These requirements could be met in part through local provision of hot meals and a laundry service. The investigation exposed deficiencies in such essentials as beds and bed-linen; 22 homes had no bed suitable for an invalid. In 12 cases difficulties were financial in origin, and supplementary funds from the National Assistance Board would have made it possible for the household to deal with its own problem.

Personal Circumstances

Since social circumstances of the chronic sick have a considerable bearing on the question of disposal, information in respect of the patients examined may be considered briefly. Of patients in Dudley Road Infirmary 92% were 60 and over; 88% of the applicants for admission were 60 and over, and 68% were 70 and over (Table VIII). About one-quarter of these old people were living alone or in lodgings, municipal homes, and common lodging houses (Table IX), and additional domiciliary services are therefore unlikely to meet their difficulties.

To maintain a reasonable standard of home care for an invalid a bath and an adequate supply of hot water are essential. Less than one-fifth of the houses visited attained

TABLE VIII.—*Age and Sex Distribution of Patients Investigated*

Age:	30–39	40–49	50–59	60–69	70–79	80–89	90 and Over	Total
Males	—	8 (5·0%)	12 (7·4%)	38 (23·6%)	66 (41·0%)	37 (23·0%)	—	161 (100%)
Females	2 (1·2%)	7 (4·0%)	10 (5·8%)	31 (17·8%)	89 (51·1%)	30 (17·2%)	5 (2·9%)	174 (100%)
Total	2 (0·6%)	15 (4·5%)	22 (6·5%)	69 (20·6%)	155 (46·3%)	67 (20·0%)	5 (1·5%)	335 (100%)

TABLE IX.—*Domestic Circumstances and Marital Status*

	Living in Own House				Living as Guest of Member(s) of Family	Living in Lodgings, Municipal Home, or Common Lodging House	Total
	Alone	With Spouse Only	With Lodgers	With Member(s) of Family			
Single	3 (7·9%)	—	3 (7·9%)	6 (15·8%)	12 (31·6%)	14 (36·8%)	38 (100%)
Married	2* (1·8%)	56 (49·1%)	4 (3·5%)	46 (40·3%)	6 (5·3%)	—	114 (100%)
Widow(er), divorced, or separated	34 (18·6%)	—	21 (11·5%)	53 (28·9%)	39 (21·3%)	36† (19·7%)	183 (100%)
Total	39 (11·7%)	56 (16·7%)	28 (8·4%)	105 (31·3%)	57 (17·0%)	50 (14·9%)	335 (100%)

* Two women with husbands in mental hospitals.
† Includes one widow admitted to the infirmary from the streets; she had been evicted from her lodgings.

TABLE X.—*Water Supply*

Bath		No Bath		Total
Hot-water System	No Hot-water System	Indoor Water Supply	Outdoor Water Supply Only	
60 (19·6%)	24* (7·8%)	201 (65·7%)	21 (6·9%)	306† (100%)

* Bath but no hot-water system (bath filled from cooker or fire).
† Excludes 29 patients—28 in municipal homes and common lodging houses, 1 no home (admitted from streets).

this standard (Table X), and in many cases (29%) outdoor sanitation was shared with neighbours.

It is difficult to appreciate the degree of squalor and misery that these figures represent, and indeed some of the living conditions were almost unbelievably bad. They indicate that the social problem created by the increasing number of chronic sick extends beyond the difficulty of providing adequate medical and nursing services. If the rising demand for hospital accommodation is to be stemmed, a steady improvement in national housing standards is as important as the provision by local authorities of specific services.

Discussion

The data examined suggest that regional hospital boards and local authorities are responsible for about equal numbers of patients applying for admission to hospitals for the chronic sick. This conclusion rests on two assumptions: (*a*) that regional hospital boards accept only patients who need hospital care or who require supervision because of their abnormal mental state; and (*b*) that local authorities provide for all other patients in their homes or in long-stay annexes.

Since the allocation of responsibility for the long-stay annexe to local authorities may provoke differences of opinion it is necessary to be clear about the kind of patient suggested for admission. About one-quarter of the patients examined required only simple nursing and domestic service, but because of social circumstances could not be cared for at home. They cannot be admitted to the typical municipal home for the aged, which does not provide simple nursing, nor do they need the skilled attention which justifies hospital admission. If hospitals for the chronic

sick continue in their present form, such patients will of course be admitted to them; but if patients are to enter hospital only when they require skilled attention, some alternative to the general hospital or municipal home will be needed. The long-stay annexe is the alternative suggested, and it will be necessary to assign responsibility for it either to regional hospital boards or to local authorities. It is here placed under local authorities only because this seems consistent with Section 21 of the National Assistance Act. A different decision would of course alter the proportions indicated above, and would assign to regional hospital boards three-quarters of the patients applying for admission to hospital.

Summary

The personal circumstances of 393 patients seeking admission to a hospital for the chronic sick were investigated by a social worker; 335 of these were examined by a consultant who considered the problem of disposal in the light of social circumstances and medical requirements. Cases were recommended for care as follows: (*a*) In a general hospital (40%): patients who needed skilled nursing and/or medical attention once a week or more frequently. (*b*) In a mental institution (10%): patients who needed personal supervision because of their abnormal mental state. (*c*) In a long-stay annexe (24%): patients not requiring skilled nursing or weekly medical attention who could not be kept in their own homes. (*d*) At home (26%): patients who could be cared for at home.

If local authorities provide the long-stay annexe they will be responsible for about one-half the patients seeking admission to hospital; if they do not, they will be responsible for about one-quarter—that is, only for patients who could remain at home. According to this decision regional hospital boards must accept one-half or three-quarters respectively in the two cases.

The maintenance of one-quarter of the patients in their own homes requires the provision of domiciliary medical and nursing services, and of a more complete domestic service than is now available.

I am very glad to acknowledge my indebtedness to the five physicians who provided the clinical records: Drs. G. Hearn, F. G. Marson, K. May, L. Nagley, and Professor A. P. Thomson (who suggested the investigation); and to Mrs. E. M. Sagrott, who did most of the work of the social survey with help from the almoners of the Birmingham United Hospitals.

REFERENCES

Lowe, C. R., and McKeown, T. (1949). *Brit. J. soc. Med.*, **3**, 110.
McKeown, T., and Lowe, C. R. (1950). *British Medical Journal*, **1**, 323.

The Brussels Treaty Public Health Committee, set up in application of Article II of the Treaty, as a part of the efforts to be made by the five signatory powers—Belgium, France, Luxembourg, Netherlands, and the United Kingdom—to raise the standard of living of their peoples, held its sixth session in Edinburgh on September 7, 8, and 9, 1950, under the chairmanship of Sir Andrew Davidson, Chief Medical Officer of the Department of Health for Scotland. The committee began the study of the protection of the civil population from the health point of view in time of emergency. In the matter of the health control of sea traffic the committee decided to recommend the five Governments to introduce, from March 1, 1951, onwards, a uniform system which will enable the five countries to be treated as one single territory in this respect, as has been achieved under the uniform system for control of air traffic which has been in operation since February 1, 1950. The committee took note of the very useful results obtained from the visits of health personnel organized in 1949–50, during which period 40 doctors and specialists from the five countries travelled in the other Brussels Treaty countries to learn about current methods as well as the general administrative structure of public health services in those countries.

RADIOLOGICAL AND PATHOLOGICAL CORRELATION OF MILIARY TUBERCULOSIS OF LUNGS IN CHILDREN

WITH SPECIAL REFERENCE TO CHOROIDAL TUBERCLES

BY

J. L. EMERY, M.D., D.C.H.
Pathologist, Children's Hospital, Sheffield

AND

J. LORBER, M.B., M.R.C.P.
Lecturer in Child Health, University of Sheffield

Since the description of the radiological appearance of the lungs in miliary tuberculosis by Klieneberger (1908), Otten (1908), and Presuhn (1908), the diagnosis of this condition during life has become almost exclusively based on radiological findings. As early as 1911 Assmann (1911b) regarded the diagnosis of miliary tuberculosis as a triumph of *x*-ray examination. Most reference books offer no alternative method of diagnosis, and the impression gained is that this method is generally satisfactory. Nevertheless, some books recognize that the disease may be present for weeks before the typical snow-storm appearance develops, and that sometimes there is no radiological evidence of the disease at all (Amberson, 1947; Hill, 1948; Kayne *et al.*, 1948; Nelson, 1948). Similar views are expressed by Axén (1941), Davis (1942), Gratzek (1941), and Rigler (1949). The literature refers to many unexpected necropsy findings of miliary tuberculosis where previous radiographs of the chest were negative (e.g., Baggenstoss *et al.*, 1947; Lincoln, 1947; Löffler and Piotti, 1948; Rigler, 1949; Rubie and Mohun, 1949).

Three previous papers concerning the pathological and radiological correlation of miliary tuberculosis have been noted (Bronson *et al.*, 1934; Steiner, 1937; Chapman and Whorton, 1946). A fourth study correlated clinical and pathological findings, without specifying radiographs as the method of clinical diagnosis (Lewison *et al.*, 1931). These four studies deal almost exclusively with adult material (Table I).

TABLE I.—*Pathological and Radiological Correlation of Miliary Tuberculosis (Previous Work)*

Author	Total Positive at Necropsy	Diagnosed by Radiographs
Bronson *et al.* (1934)	9	5 (56%)
Steiner (1937)	46	22 (48%)
Chapman and Whorton (1946)	63	16 (25%)
		Diagnosed in Life
Lewison *et al.* (1931)	96	75* (78%)

* 9 further cases diagnosed in life did not have miliary tuberculosis at necropsy.

Specific treatment is now available for miliary tuberculosis. The earlier treatment is instituted the better are the results, and early diagnosis is therefore essential. This study is an attempt to investigate the accuracy and speed of the present methods of diagnosis.

Material and Methods

In a consecutive series of necropsies between January, 1947, and August, 1949, the pathological diagnosis of miliary tuberculosis was established in 52 children under 14. Tuberculous meningitis was present in all but two cases. During the same period 11 children died of tuberculous meningitis, but necropsy did not reveal miliary tuberculosis. Radiographs of the chest taken within a fortnight of death were available for examination in all cases.

Interpretation of Radiographs

When a discrepancy between the radiological and post-mortem findings became apparent it was decided to obtain a wider opinion on the *x*-ray appearances. Accordingly the films were referred to an independent panel of two radiologists and two paediatricians.

The assessors were informed that all these deaths were from tuberculosis and were asked to make a radiological diagnosis of the presence, doubtful presence, or absence of miliary tuberculosis. The usual marks of identification had been removed from the films and each assessor was unaware of the others' diagnoses. The reports of the four assessors were analysed, along with those of Dr. Lodge (consultant radiologist to the hospital) and one of us (J. L.). The majority vote was accepted as the diagnosis. Eleven cases came to necropsy after the survey of the assessors was completed. The findings of the assessors, however, had been so consistent that it was regarded as justifiable to take the report of Dr. Lodge and one of us (J. L.) and include the eleven cases in the series. In the analysis of the results four radiologically doubtful cases will be included with those reported as negative, because many children with similar radiographs prove never to have miliary tuberculosis.

Ophthalmoscopy

In all but four children the fundus oculi had been examined for the presence of choroidal tubercles. The examination was carried out by the technique of Illingworth and Wright (1948) in the earlier cases, and under rectal thiopentone anaesthesia later (Lorber, 1950).

Morbid Anatomy of the Lungs (J. L. E.)

Before opening the chest the trachea was clamped in order to minimize collapse of the lungs. Blocks for histological examination were taken from at least one lobe of the lung quite separate from the one containing the primary focus. In many cases the blocks were taken from all lobes.

The criteria for diagnosis of miliary tuberculosis were either (*a*) the presence of macroscopic miliary tubercles throughout the lung at necropsy, or (*b*) the presence of miliary tubercles in sections taken from lobes of the lung not containing the site of primary focus.

The identification of miliary tubercles on histological examination was not difficult, except in some cases in which differentiation was required between small lymph follicles near bronchioles and early tubercles. The identity of a tubercle was not accepted unless it was typical, contained well-developed epithelial-cell foci and areas of necrosis, or was shown to contain acid-fast bacilli.

In several instances miliary tubercles had been found within the lobe containing the primary focus, but were absent in the block from a distal part of the lung. These were excluded from the cases reported here.

The diameters of the tubercles were measured from their extreme edges, using the microscope stage scale. The tubercles were classified according to the size of their majority into three groups: (*a*) less than 0.5 mm., (*b*) 0.5–1 mm., and (*c*) over 1 mm. in diameter. They were also classified according to their type into primarily cellular, necrotic, or fibrous groups. An estimate was made of the concentration of tubercles seen in the pleura and in the cut surface of the lobes and of the numbers of tubercles present per square centimetre of section.

Results

In 12 of the 52 cases miliary tuberculosis was diagnosed radiologically on the last film taken before death. Choroidal tubercles were seen in 10 of the 11 cases examined. At necropsy all showed macroscopic miliary tubercles of the lung, numbering 5 to 20 per cm.², and on histological examination all the tubercles were over 0.5 mm. in diameter, half being over 1 mm.

In the remaining 40 cases miliary tuberculosis was not diagnosed on the last radiograph taken before death. In six cases miliary tuberculosis was diagnosed radiologically at an earlier stage of the disease, but owing to streptomycin therapy was no longer apparent on the final examination. At necropsy macroscopic miliary tuberculosis was present in all of them. In five of these six cases choroidal tubercles had been found. It will be noted, therefore, that of the 17 patients examined in the radiologically positive group 15 had choroidal tubercles.

In 34 children there was never radiological evidence of miliary tuberculosis, yet at necropsy this was seen macroscopically in 23 and microscopically in the remaining 11. Choroidal tubercles were present in 10 of 31 examined—a significantly lower proportion than in those with radiological evidence of miliary tuberculosis. The miliary tubercles in this series varied in number from 1 to 6 per cm.² of section and the majority were 0.5 mm. or less in diameter.

It will be seen, therefore, that miliary tuberculosis was diagnosed radiologically in only 18 of 52 cases established at necropsy. Choroidal tubercles were seen in life in 25 of 48 children examined. Using both methods of diagnosis, 28 of 52 cases were diagnosed correctly during life. These results are summarized in Tables II and III.

TABLE II.—*Pathological and Radiological Correlation of Miliary Tuberculosis (Present Study)*

	No. of Cases	Positive Macroscopically at Necropsy	Positive Microscopically Only
Radiologically positive	12	12	0
Radiologically positive on admission only, not in last radiograph before death	6	6	0
Radiologically negative or doubtful	34	23	11
Total	52	41	11

TABLE III.—*Correlation of Choroidal Tubercles with Miliary Tuberculosis*

	No.	Choroidal Tubercles Present
Radiologically positive at any time	17	15
Radiologically negative or doubtful	31	10
Total cases	48	25 (52%)
Cases dying of tuberculosis without miliary disease	11	0

Discussion

The factors rendering miliary tubercle in the lungs visible on radiographs have been the subject of many experiments and observations. In the opinion of many, the number and size of the tubercles are the major factors responsible (Ott, 1930; Dale, 1932; Rigler, 1949). Achelis and Nunokawa (1910), Ott (1930), and Schinz *et al.* (1939) thought that the appearance is due to superimposition of the shadows cast by many tubercles in the same line of the Roentgen rays, but according to others (Assmann, 1911a; Haudek, 1911; von Dehn and Weinschenk, 1924) the picture obtained represents the individual tubercles lying nearest to the film. Assmann (1911a) *x*-rayed narrow slices

of lung tissue with miliary tuberculosis and these films gave similar appearances to those of the whole lung.

Steiner (1937) held that the histological nature of lesions was more important than their size and number. In his series of 46 cases, the 16 in which epithelioid tubercles without caseation predominated showed no radiological abnormalities. Where, however, central caseation predominated in the tubercles, these produced the characteristic radiological appearance regardless of the size and number of the lesions. Blacklock (1932) divided miliary tubercles into acute and subacute types according to their histological structure, and pointed out that it was the larger subacute type of lesion which gave the typical snowstorm appearance, while the smaller acute lesions may not show at all, unless particularly abundant.

An attempt was made in this study to correlate the histological structure of the tubercles with the radiological diagnosis. No direct relationship was found. Our findings confirm the views of the previous writers that size and numbers matter most. The radiographs were positive when the majority of the tubercles were over 1 mm. in diameter and their number was 5 to 20 per cm.^{2} In the *x*-ray-negative group the tubercles were mostly under 0.5 mm. wide and their numbers ranged from 1 to 6 per cm.^{2}

The frequency with which miliary tuberculosis could not be diagnosed by radiographs in this series is in substantial agreement with the findings of Bronson *et al.* (1934), Steiner (1937), and Chapman and Whorton (1946) (Table I). It must, however, be pointed out that all patients with negative radiographs in this series died of coexistent meningitis. It is therefore possible that if untreated cases survived longer the lesions might have become visible radiologically. It is clear that when miliary tuberculosis can be diagnosed radiologically the disease is already in an advanced stage. For early diagnosis, therefore, other methods are required.

The thorough examination of the fundus oculi is one such method. In this series it gave positive evidence in 25 of 48 cases. Of the clinico-pathological studies mentioned, only Chapman and Whorton (1946) refer to the help that choroidal tubercles may give in the diagnosis, but these were seen in only one of their 63 cases. The incidence of choroidal tubercles in miliary tuberculosis, however, has been discussed by several writers and full references were given by Illingworth and Wright (1948). They found choroidal tubercles in 60% of 42 cases. Choroidal tubercles appear early in the disease, being found at the first or second examination. The same finding also holds true for the 12 positive cases in this series, which were not included in those discussed by Illingworth and Wright. Furthermore, choroidal tubercles at the first examination are often in a stage of development which is thought to denote that they must have been present for at least several weeks. Consequently these cases could have been diagnosed by ophthalmoscopy at an earlier stage of the disease.

Choroidal tubercles were not seen in tuberculous meningitis in which miliary tuberculosis was subsequently excluded by histological examination. This experience agrees with that of Bernard *et al.* (1949), who never found choroidal tubercles in adults suffering from tuberculous meningitis and where miliary tuberculosis was not present at the same time. In a very exceptional case choroidal tubercles may be found in primary tuberculosis, but, as the few children in whom this was observed are still alive, miliary tuberculosis cannot definitely be excluded. Therefore it may be assumed that, if a child's clinical condition is suggestive of miliary tuberculosis, the presence of early choroidal tubercles proves the diagnosis, irrespective of *x*-ray findings or a normal cerebrospinal fluid.

Using the combination of the two most widely accepted methods of diagnosis of miliary tuberculosis, only 27 of 48 cases were diagnosed in life, or little over half the total. This observation suggests that more sensitive methods of diagnosis are required. We have no personal experience with bone-marrow biopsy. This method has been used (Schleicher, 1946) but must be regarded as being in an experimental stage.

Summary

The accuracy and speed of the present methods of diagnosis of miliary tuberculosis in life were analysed. The material consisted of 52 consecutive children with histologically proved miliary tuberculosis of the lung.

Radiographs of the chest taken within 14 days of death were available in all cases. The fundus oculi was examined for choroidal tubercles in 48 children.

Eighteen, or only about one-third of the cases, were diagnosed by *x*-ray examination by a panel of experts. In 25 of 48 cases choroidal tubercles were seen. Altogether 28 of 52 cases were diagnosed in life.

Histological observations suggested that the number and the size of tubercles were the major factors in the production of the diagnostic *x*-ray appearances.

The tubercles were more numerous and larger in the 18 *x*-ray-positive than in the 34 *x*-ray-negative cases. Choroidal tubercles were present in a significantly higher proportion in the former (15 of 17) than in the latter (10 of 31).

Clinical features consistent with miliary tuberculosis and the presence of early choroidal tubercles establish the diagnosis irrespective of the radiological findings.

The present methods of diagnosis of miliary tuberculosis are not sensitive enough.

Our thanks are due to the four assessors: Dr. J. L. Grout, Dr. J. Wilkie, Professor R. S. Illingworth, and Dr. S. A. Doxiadis for their help and interest; to Professor R. S. Illingworth and Dr. T. Colver for permission to study their cases; and to Dr. T. Lodge for his reports on the radiographs.

REFERENCES

Achelis, W., and Nunokawa (1910). *Münch. med. Wschr.*, **57**, 187.
Amberson, J. B. (1947). In Cecil's *Textbook of Medicine*, 7th ed., p. 324. Saunders, Philadelphia.
Assmann, H. (1911a). *Ver. Dtsch. RöntgenGes.*, **7**, 49.
—— (1911b). *Fortschr. Röntgenstr.*, **18**, 27.
Axén, O. (1941). *Acta radiol.*, **22**, 547.
Baggenstoss, A. H., Feldman, W. H., and Hinshaw, H. C. (1947). *Amer. Rev. Tuberc.*, **55**, 54.
Bernard, E., Kreis, B., Lotte, A., Paley, P. Y., Mantoux, G. (1949). *Sem. Hôp. Paris*, **25**, 2087.
Blacklock, J. W. S. (1932). *Spec. Rep. Ser. Med. Res. Coun.*, No. 172, p. 67. London.
Bronson, M. L., Zimmerman, H. M., and Powers, G. F. (1934). *Amer. J. Dis. Child.*, **47**, 104.
Chapman, C. B., and Whorton, C. M. (1946). *New Engl. J. Med.*, **235**, 239.
Dale, T. (1932). *Acta radiol.*, Suppl. 16, p. 1.
Davis, K. S. (1942). *Nav. med. Bull., Wash.*, **40**, 304.
Dehn, O. von, and Weinschenk, M. (1924). *Fortschr. Röntgenstr.*, **32**, 438.
Gratzek, F. (1941). *Staff Bull. Univ. Mich. Hosp.*, **12**, 185.
Haudek, M. (1911). *Ver. Dtsch. RöntgenGes.*, **7**, 49.
Hill, L. F. (1948). In Grulee and Eley's *The Child in Health and Disease*, p. 389. Williams and Wilkins, Baltimore.
Illingworth, R. S., and Wright, T. (1948). *British Medical Journal*, **2**, 365.
Kayne, G. G., Pagel, W., and O'Shaughnessy, L. (1948). *Pulmonary Tuberculosis*, 2nd ed., p. 326. Oxford Univ. Press, London.
Klieneberger, C. (1908). *Ver. Dtsch. RöntgenGes.*, **4**, 49.
Lewison, M., Freilich, E. B., and Ragins, O. B. (1931). *Amer. Rev. Tuberc.*, **24**, 152.
Lincoln, E. M. (1947). Ibid., **56**, 75.
Löffler, W., and Piotti, A. (1948). In Fanconi and Löffler's *Streptomycin und Tuberkulose*, p. 55. Schwabe, Basel.
Lorber, J. (1950). *British Medical Journal*, **2**, 21.
Nelson, W. E. (1948). In Brennemann's *Practice of Pediatrics*, **2**, 52. Prior, Hagerstown.
Ott, A. (1930). *Fortschr. Röntgenstr.*, **41**, 404.
Otten, S. (1908). *Ver. Dtsch. RöntgenGes.*, **4**, 144.
Presuhn (1908). Ibid., **4**, 143.
Rigler, L. G. (1949). *Amer. J. Roentgenol.*, **61**, 743.
Rubie, J., and Mohun, A. F. (1949). *British Medical Journal*, **1**, 338.
Schinz, H. R., Baensch, W., and Friedl, E. (1939). *Lehrbuch der Röntgendiagnostik*, 4th ed., **2**, 1181. Thieme, Leipzig.
Schleicher, E. M. (1946). *Amer. Rev. Tuberc.*, **53**, 115.
Steiner, P. E. (1937). Ibid., **36**, 692.

SULPHONAMIDE SENSITIVITY OF H. INFLUENZAE STRAINS

WITH SPECIAL REFERENCE TO THE COMBINED USE OF ANTIBACTERIAL DRUGS

BY

K. ZINNEMANN, M.D.

(From the Department of Bacteriology, School of Medicine, Leeds)

It is now a commonly acknowledged therapeutic principle, as soon as treatment is begun, to use maximal doses of sulphonamides and of antibiotics to avoid, so far as is possible, the development of drug resistance in the infecting micro-organism. Nevertheless, the incidence of resistant strains has of late been commented upon and reported more frequently.

Haemophilus influenzae (Pfeiffer's bacillus) is sensitive to a comparatively wide range of sulphonamides and antibiotics, but it is also capable of developing strains resistant to the action of some of these drugs. It is therefore a suitable bacterium for the study of the antibacterial action of these preparations, and any theoretical and practical considerations arising from the study of its behaviour and of infections caused by it may be applicable to other pathogenic micro-organisms with a similar range of sensitivity.

Effects of Combination of Antibacterial Drugs

When two antibacterial drugs, each attacking bacterial populations in a different way, are allowed to act on the same bacterial culture the observed increase in the degree of sensitivity is exponential—that is, the effect of two or even more drugs is considerably greater than could be expected from the added values of the effects of each drug separately (Ungar, 1943; Thomas and Hayes, 1947; Mayr-Harting and Katscher, personal communication). This synergistic action is also well marked in strains resistant to penicillin when this antibiotic is combined with one of the sulphonamides (Chain and Duthie, 1945). Another principle involved, along with its bearing on clinical considerations with regard to the development of drug-resistant strains, has been stated very lucidly by Demerec (1948) as follows: "Theoretically, the most effective way of preventing the origin of resistant strains of bacteria is the use in clinical treatment of a mixture of two antibiotics, when such are available, that affect the same pathogen but are independent in their actions. The evidence of independence is that bacterial strains that have developed resistance to one antibiotic are still sensitive to the other, and vice versa. If such a mixture of two antibiotics is used, then only bacteria that are resistant to both can survive the treatment and form . . . resistant strains. Such bacteria would be exceedingly rare." It might be added that they would be rarer still if a third antibacterial drug with similar potency and mutation rate were employed.

Corresponding in vivo and Clinical Observations

American authors have produced *in vivo* experimental evidence showing that combination of the more effective sulphonamides with type-specific rabbit antiserum results not merely in an additive but in a synergistic effect (Pittman, 1942; Alexander and Leidy, 1943).

TABLE I.—*Clinical Results with Treatment of Various Combinations of Sulphonamides, Antiserum, and Antibiotics by Different Authors*

Author	Treatment				
	Sulphonamides	Serum	Penicillin	Streptomycin	Recovery Rate
Alexander *et al.* (1946b)	+	+	0	+	6/8
" "	0	+	0	+	3/3
" "	0	0	0	+	12/14
Zinnemann (1946)	+	0	+	0	8/15
Weinstein (1946)	0	0	0	+	7/9
Birmingham *et al.* (1946)	0	0	0	+	4/8
Logan and Herrell (1946)	+	+	0	+	3/4
Thomson *et al.* (1947)	+	0	+	0	3/4
Gottlieb *et al.* (1947)	+	0	+	0	3/4
Engback (1948)	+	+	0	+	6/7
Hoyne and Brown (1948)	+	0	0	+	26/28
Roscoe and Gleeson-White (1948)	0	0	0	+	3/4
Smythe (1948)	0	0	0	+	9/12
Kass (1948)	0	0	0	+	7/8
Braid and Meyer (1949)	+	0	+	0	8/11
" "	+	0	+	+	3/3
" "	+	0	0	+	1/1
Ounsted (1949)	+	0	0	+	12/13
Yampolsky and Jones (1949)	+	+	0	+	0/2
" "	+	0	0	+	19/20

Good therapeutic results have also been reported in larger series of cases treated with penicillin or streptomycin, either alone or in combination with sulphonamides or antiserum (see Table I).

The relapses frequently observed (Alexander, 1943; Zinnemann, 1946) after apparently successful treatment of *H. influenzae* meningitis seem to indicate not only survival of Pfeiffer's bacillus in inaccessible recesses of the cerebrospinal canal but possibly also the development of a strain of higher resistance to the particular form of treatment. Emergence of highly resistant strains in the case of streptomycin-treated patients has been demonstrated conclusively by a number of workers (Birmingham *et al.*, 1946; Alexander *et al.*, 1946b; Smythe, 1948; Roscoe and Gleeson-White, 1948).

At present we have at our disposal four clinically well tried substances attacking *H. influenzae*, each acting in a different way. These are: (1) Type-b-specific *H. influenzae* rabbit antiserum, which enters into an antigen–antibody reaction with the polysaccharides of the bacterial capsule. (2) Sulphonamides. It is claimed that they interfere with the intermediary metabolism of the bacterial cell by blocking the assimilation of para-aminobenzoic acid (Woods, 1940). (3) Penicillin, which acts on growing sensitive bacteria by preventing their multiplication (Garrod, 1945), possibly by blocking the passage of glutamic acid through the cell wall into the bacterial cell (Gale and Taylor, 1947). (4) Streptomycin, the mechanism of which is as yet little understood, but which has a rapid bactericidal action as distinct from the slower bacteriostatic and bactericidal effect of penicillin (Garrod, 1948; Alexander and Leidy, 1949). Another pointer to its possible mode of action is the interference of anaerobic conditions or of reducing agents with the antibacterial action of streptomycin (Bondi *et al.*, 1946). At a later date the newer antibiotics chloramphenicol and "aureomycin" may also be useful. These drugs are reported to evoke a pattern of development of resistance similar to that produced by penicillin (Alexander and Leidy, 1949; Demerec, 1949).

According to the foregoing considerations none of the earlier remedies successfully tried in severe *H. influenzae* infections has become obsolete in consequence of subsequent developments. There is every reason to suppose that the combination of therapeutic doses of sulphonamides, penicillin, and streptomycin—the first administered systemically and the other two both systemically and locally—is able to control any acute *H. influenzae* infection. It will, in the first instance, achieve speedy sterilization

of the affected organs or body fluids—a most useful characteristic of the action of streptomycin—while, secondly, it will at the same time prevent the high rate of drug-resistant strains observed in streptomycin-treated cases. If type-specific *H. influenzae* rabbit antiserum is also used its neutralizing action on the bacterial polysaccharide freely circulating in the blood and present in the cerebrospinal fluid will help the patient more rapidly to overcome a state of toxaemia, while the action of antiserum on the bacterial capsule is likely further to damage the invading micro-organisms. With regard to possible future developments, one has to keep in mind that a marked antagonistic action of some of the newer antibiotics on each other has been demonstrated recently when tested together against certain Gram-negative micro-organisms (Price *et al.*, 1949).

In practice three of the agents available—sulphadiazine, streptomycin, and penicillin or type-specific rabbit antiserum—have already been used simultaneously with good results as judged by the small number of cases (see Table I). Some experimental findings of Alexander and Leidy (1946) seemed to suggest that sulphonamides are incapable of enhancing the bactericidal effect of streptomycin. Potentiation of streptomycin by sulphonamides would not necessarily reveal itself under the experimental conditions used by these authors. This latter interpretation of their findings is supported by later papers recommending the combination of sulphadiazine, streptomycin, and type-specific rabbit antiserum in severe subacute cases and in children under 7 months of age (Alexander and Leidy, 1947, 1949).

Experimental Observations on Sulphonamide Sensitivity

It is likely, therefore, that for some time to come the sulphonamides will still have their value in the treatment of *H. influenzae* infections and in particular in *H. influenzae* meningitis. In view of a number of clinical reports mentioning resistance of some *H. influenzae* strains to one or the other sulphonamide (Pittman, 1942; McIntosh and Drysdale, 1945; Drysdale, McIntosh, and Brodie, 1946; Gottlieb, Forsyth, and Allott, 1947; Thomson, Bruce, and Green, 1947; Martin and Sureau, 1948) it seemed of practical importance to investigate this phenomenon *in vitro* in a greater number of strains than had been examined hitherto. Guyton (1940) had examined two strains for sulphonamide sensitivity, Pittman (1942) had noticed a variation in susceptibility to the same compound in some of six strains tested, and Alexander and Leidy (1943) in their inquiry into the synergistic effect of the various sulphonamides and rabbit antiserum had used only one strain.

Materials

Strains.—A collection of 50 capsulated and 50 non-capsulated strains of *H. influenzae* was investigated. The first group comprised 5 type a strains, 35 type b strains, one type c strain, three type d strains, one type e strain and three strains related to type e, and, finally, two type f strains. The majority of these strains had been isolated from cases of *H. influenzae* meningitis, some were originally found in the nasopharynx of children, the rarer types were stock strains kept for reference purposes, and four type b strains were obtained from the National Collection of Type Cultures. Twenty-four of the non-capsulated strains were isolated from pernasal swabs of children suspected of whooping-cough, two strains from the cerebrospinal fluid of cases of *H. influenzae* meningitis, two strains from antral washings, one from an eye swab, and the remainder from bronchial secretions and sputa.

Medium.—When choosing a nutrient medium in which to test sulphonamide sensitivity attention has to be paid to substances inhibiting the action of sulphonamides and known to be present in most media incorporating peptone. Neutralization of these inhibiting substances can be achieved by treatment with 5% horse blood (Harper and Cawston, 1945; Walker *et al.*, 1947). A Levinthal agar modified with this point in view was used. Ten per cent. oxalated horse blood was added to nutrient broth and incubated overnight at 37° C. On the next day this fresh horse-blood broth was used for making Pittman's (1931) modification of Levinthal agar, which was then poured into plates.

Technique.—The tests of sensitivity to the various sulphonamides were carried out on Levinthal-agar plates in two different ways. (1) By incorporating a suitable concentration of the sulphonamides into Levinthal-agar plates. Seven plates were necessary for each test, one for each sulphonamide, and a maximum of eight inoculations were placed on each plate. In this way seven *H. influenzae* strains and one other control culture—*Staphylococcus aureus* as a rule—could be tested in one experiment. (2) By the punch-plate method. Seven punch-holes in a single Levinthal-agar plate were filled with a solution of the seven different sulphonamides after the plate had been inoculated previously with a suitable dilution—1 in 100 or 1 in 1,000—of a 24-hour Levinthal broth culture of the *H. influenzae* strain under investigation.

The two techniques were applied to the same strains simultaneously, seven *H. influenzae* strains being tested against seven sulphonamides at a time.

The following sulphonamides were tested: sulphanilamide (henceforth abbreviated SA); sulphapyridine (SP); sulphathiazole (ST); sulphadiazine (SD); sulphadimidine, also known as "sulphamezathine" (SMZ); 2-(*p*-aminobenzenesulphamido)-4-methylpyrimidine, also known as sulphamerazine (SMR); and maphenide (MAPH) (4-aminomethylbenzenesulphonamide), also known as "marfanil" or "ambamide." The concentration tested was that corresponding approximately to the concentration obtained in the blood by the usually recommended dosages—that is, 10 mg. per 100 ml. This concentration was adopted for all seven sulphonamides. The readily soluble substances—SA and MAPH—were used as such to prepare solutions, while the more easily soluble sodium salts of the remaining five compounds were employed to make up stock solutions. All solutions were sterilized by filtration.

Results

Table II summarizes the results obtained with 50 capsulated strains tested by incorporating the sulphonamides in the medium. From 10 to 24% of the strains were completely inhibited. The majority of the strains were either markedly or slightly inhibited. One strain, the same in each instance, was resistant to 10 mg. per 100 ml. of all sulphonamides except ST, by which it was inhibited to a marked degree. The considerable number of strains insensitive to both SA and MAPH is remarkable, though perhaps not altogether surprising. There can be no doubt that with this technique ST is the most effective drug.

TABLE II.—*Capsulated Smooth H. influenzae Strains on Modified 10 mg. per 100 ml. Levinthal Agar*

Sulphonamide Tested	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
SA	13	32	5
SP	2	41	7
ST	0	38	12
SD	1	39	10
SMZ	1	41	8
SMR	1	41	8
MAPH	13	28	9

SA—sulphanilamide; SP—sulphapyridine; ST—sulphathiazole; SD—sulphadiazine; SMZ—sulphamezathine; SMR—sulphamerazine; MAPH—maphenide.

TABLE III.—*Capsulated Smooth H. influenzae Strains on Modified Levinthal Agar, Punch-plate Method*

Sulphonamide Tested	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
SA	37	12	1
SP	6	37	7
ST	3	34	13
SD	4	36	10
SMZ	5	35	10
SMR	4	33	13
MAPH	32	18	0

Table III gives the results obtained with the same strains tested by the punch-plate method. When compared with Table II a general shift is noticeable from right to left. This is particularly evident with strains completely inhibited by SA and MAPH and less so with strains inhibited by the other sulphonamides. However, when the markedly inhibited and partially insensitive strains are considered the shift becomes more pronounced. The obvious interpretation of this shift is that the punch-plate method is less sensitive and therefore less accurate than the method incorporating sulphonamide compounds into the medium. In Table III, as in Table II, ST appears to be the most potent sulphonamide.

TABLE IV.—*Non-capsulated Rough H. influenzae Strains on Modified 10 mg. per 100 ml. Sulphonamide Levinthal Agar*

Sulphonamide Tested	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
SA	6	34	10
SP	2	31	17
ST	2	23	25
SD	1	34	15
SMZ	2	37	11
SMR	2	35	13
MAPH	5	32	13

TABLE V.—*Non-capsulated Rough H. influenzae Strains on Modified Levinthal Agar, Punch-plate Method*

Sulphonamide Tested	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
SA	32	16	2
SP	6	36	8
ST	3	32	15
SD	4	32	14
SMZ	5	32	13
SMR	5	33	12
MAPH	42	8	0

Tables IV and V show the results obtained when non-capsulated strains are tested with the same techniques. Here, too, ST is the most effective compound, although in this group of strains there are two which are completely insensitive to ST. On the whole, the figures for completely and partially inhibited strains are higher than those obtained with capsulated strains. In other words, more non-capsulated respiratory strains are effectively controlled by sulphonamides than capsulated strains. On clinical grounds it had been suspected earlier that differences in sulphonamide sensitivity might exist between capsulated and non-capsulated strains of *H. influenzae* (Gordon, Woodcock, and Zinnemann, 1944). This suggestion appears now to be confirmed by *in vitro* tests.

In these experiments the same strain was usually resistant to many or all sulphonamides, but occasionally a strain was found which was resistant to only one or two sulphonamides. This resistance, however, is relative in so far as in these tests sensitivity to only one concentration, the one easily attainable in the serum, has been investigated. With few exceptions resistant strains showed some degree of sensitivity to ST. It might seem, therefore, that ST should be the sulphonamide of choice in *H. influenzae* infections. Unfortunately, however, only a small fraction of ST as compared with other sulphonamides appears in the C.S.F. As Table VI shows, the level in the C.S.F. of the sulphonamide least effective with regard to *H. influenzae*—that is, SA—is equal to the blood level, while the level of the most effective sulphonamide *in vitro*—that is, ST—is lowest. In the case of SD, SMZ, and SMR, which are nearly as effective as ST, about half to three-quarters of the blood level is reached in the C.S.F.

TABLE VI.—*Concentrations of the Various Sulphonamides in the C.S.F. in Relation to the Blood Levels*

Sulphonamide	Sulphonamide in C.S.F. as Compared with Blood Level	Authors
SA	Approximately 100%	Marshall *et al.* (1937); Allott (1938)
SP	60–80%	Hobson and MacQuaide (1938); Long and Feinstone (1938)
ST	20–30%	Banks (1941); Andersen and Simesen (1943)
SD	50–80%	Long (1941)
SMZ	60–80%	Kremer *et al.* (1945); Rose *et al.* (1943); Macartney *et al.* (1942)
SMR	50–75%	Hageman *et al.* (1943); Murphy *et al.* (1943)

On the basis of the present investigations it would seem that ST is best suited for *H. influenzae* infections other than meningitis. However, ST should not be dismissed altogether from the treatment of *H. influenzae* meningitis, for this infection is often accompanied by septicaemia (Smith, Wilson, and Hodes, 1946).

When the above facts had become evident it was thought that a combination of the most effective sulphonamides should be tested against a similar series of *H. influenzae* strains. A combination of three sulphonamides is available as "sulphatriad" (S3), and includes 37% ST, 37% SD, and 26% SMR. The original recommendation of this or similar combinations by Frisk *et al.* (1947), Lehr (1947), and Martin and Sureau (1948) was made in order to obtain a higher total blood level and/or to avoid renal complications. As these considerations are of some importance in severe *H. influenzae* meningitis cases receiving maximal doses of sulphonamides over longer periods, the reasons for testing a mixture of sulphonamides seemed to be all the more compelling.

Accordingly a stock solution was made of the sodium salts of ST, SD, and SMR in the proportions in which they are present in commercial S3. The total of sulphonamides of the stock solutions was adjusted to give a final concentration of 10 mg. per 100 ml. This concentration was then tested in the same way and, so far as possible, with the same strains as the seven sulphonamides in the preceding experiments. Nine of the capsulated and eleven of the non-capsulated strains had to be replaced by others, as they had been lost accidentally.

TABLE VII.—*Sensitivity of Capsulated H. influenzae Strains to 10 mg. per 100 ml. of S3 on Modified Levinthal Agar*

Technique of Test	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
S3 incorporated in medium	0	27	23
Punch-plate method	3	19	28

TABLE VIII.—*Sensitivity of Non-capsulated Rough H. Influenzae Strains to 10 mg. per 100 ml. of S3 on Modified Levinthal Agar*

Technique of Test	Insensitive Strains	Partially Sensitive and Markedly Inhibited Strains	Completely Inhibited Strains
S3 incorporated in medium	0	23	27
Punch-plate method	0	35	15

The results for capsulated *H. influenzae* strains recorded in Table VII suggest that S3 is at least equal to if not more effective than the single sulphonamides which it contains. In this particular instance the punch-plate method seems a more sensitive test than incorporation of the drug in the medium. No explanation is offered for this phenomenon, which is the opposite of that observed in the preceding series and the one following. The behaviour of non-capsulated strains, as shown in Table VIII, indicates a high degree of sensitivity to S3, no insensitive strain having been encountered by either method of testing. Tables VII and VIII are not strictly comparable to Tables II–V, as not all strains in the two sets of tables are identical. Yet, judging by the width of the zones of inhibition in the series using the punch-plate technique the majority of *H. influenzae* strains, both capsulated and non-capsulated, seem to be more sensitive to S3 than to any of the sulphonamides singly. Here again more non-capsulated strains are sensitive to S3 than capsulated ones.

Discussion

On the one hand, these experiments establish on a broad basis the bactericidal and bacteriostatic action of sulphonamides on *H. influenzae*, thus indicating their usefulness in combined chemotherapy. On the other hand, strains occur which are not inhibited by the standard concentration of SD. In such cases the recommendations of Alexander and Leidy (1943) with regard to SD are not applicable. The results presented here point to the necessity for testing each individual strain isolated from a clinical case for its sensitivity to a standard concentration of 10 mg. per 100 ml. of at least the following sulphonamides: ST, SD, SMZ, SMR, S3, and possibly MAPH. The simplest method is the punch-plate technique. It can be employed quite efficiently for daily routine purposes so long as one keeps in mind that a strain completely insensitive by this method may yet show sensitivity when the sulphonamides are incorporated in the medium and that a repetition of the test with this more complicated technique may therefore be necessary. A further advantage of the punch-plate technique is the ease with which potentially resistant strains can be discovered. Such strains show single colonies of normal size in the area of inhibition surrounding the punch-hole. Subcultures from such colonies yield strains of comparatively high resistance to sulphonamides. This phenomenon has been noticed in several of the strains tested. The observation seems to confirm the theory of progressive selection of *H. influenzae* strains resistant to sulphonamides.

The preparation of modified Levinthal agar may be somewhat difficult in certain circumstances. For this reason chocolate-agar plates prepared for routine purposes with oxalated horse blood were used in parallel with Levinthal-agar plates in all experiments described above in which the punch-plate technique was employed. The readings were as a rule less sensitive than those with the punch-hole technique on Levinthal-agar plates.

Summary

The recent literature on resistance to antibacterial drugs and on the combined use of these drugs has been reviewed.

The sensitivity to the various sulphonamides of 50 capsulated and an equal number of non-capsulated *H. influenzae* strains was tested with two different techniques on modified Levinthal agar.

In a concentration of 10 mg. per 100 ml. sulphathiazole is the most effective drug *in vitro*, almost equalled by sulphadiazine, sulphadimidine, and sulphamerazine. Sulphatriad seems to be more effective than any of its constituent sulphonamides alone.

Non-capsulated strains of *H. influenzae* show a higher *in vitro* sensitivity to sulphonamides than capsulated strains.

Individual strains of *H. influenzae* may be sensitive to the standard concentration of one sulphonamide and resistant to that of others. Strains may occur which are insensitive to the standard concentration of sulphadiazine. It is necessary, therefore, to test each strain from individual clinical cases for sulphonamide sensitivities.

Advantages and disadvantages of the bacteriological techniques employed are discussed and recommendations are made.

It is my pleasant duty to acknowledge generous gifts of drugs from May and Baker, Ltd., Imperial Chemical Industries, Ltd., and R. F. Reed, Ltd. The Medical Information Department of May and Baker, Ltd., was very helpful in finding data and references given in Table VI. Dr. Anna Mayr-Harting kindly discussed some of the genetic aspects with me. Dr. Edith A. Straker, and Drs. Betty Dawson, J. W. Czekalowski, and G. M. Williamson of this department, as well as the National Collection of Type Cultures, very obligingly supplied some of the H. influenzae strains used. I owe thanks to Mr. A. Myers and Mrs. B. Hewitt for the preparation of media used in the experiments.

REFERENCES

Alexander, H. E. (1943). *Amer. J. Dis. Child.*, **66**, 172.
—— and Leidy, G. (1943). *J. Pediat.*, **23**, 640.
—— —— (1946a). *Science*, **104**, 101.
—— —— (1947). *Amer. J. Med.*, **2**, 457.
—— —— (1949). *Pediatrics*, **3**, 277.
—— —— Rake, G., and Donovick, R. (1946b). *J. Amer. med. Ass.*, **132**, 434.
—— —— and Redman, W. (1949). *J. clin. Invest.*, **28**, 867.
Allott, E. N. (1938). *Lancet*, **2**, 13.
Andersen, A. H., and Simesen, M. H. (1943). *Acta med. scand.*, **114**, 103.
Banks, H. S. (1941). *Lancet*, **1**, 104.
Birmingham, J. R., Kaye, R., and Smith, M. H. D. (1946). *J. Pediat.*, **29**, 1.
Bondi, A., jun., Dietz, C. C., and Spaulding, E. H. (1946). *Science*, **103**, 399.
Braid, F., and Meyer, R. B. (1949). *British Medical Journal*, **2**, 11.
Chain, E., and Duthie, E. S. (1945). *Lancet*, **1**, 652.
Demerec, M. (1948). *J. Bact.*, **56**, 63.
—— (1949). *J. clin. Invest.*, **28**, 891.
Drysdale, C. F., McIntosh, D. G., and Brodie, J. (1946). *British Medical Journal*, **2**, 223.
Engbaek, H. C. (1948). *Acta med. scand.*, **131**, 146.
Frisk, A. R., Hagerman, G., Helander, S., and Sjögren, B. (1947). *British Medical Journal*, **1**, 7.
Gale, E. F., and Taylor, E. S. (1947). *J. gen. Microbiol.*, **1**, 314.
Garrod, L. P. (1945). *British Medical Journal*, **1**, 107.
—— (1948). Ibid., **1**, 382.
Gordon, J., Woodcock, H. E. de C., and Zinnemann, K. (1944). Ibid., **1**, 779.
Gottlieb, B., Forsyth, C. C., and Allott, E. N. (1947). *Lancet*, **2**, 164.
Guyton, J. S. (1940). *Arch. Ophthal.*, **23**, 1243.
Hageman, P. O., Harford, C. G., Sobin, S. S., and Ahrens, R. E. (1943). *J. Amer. med. Ass.*, **123**, 325.
Harper, G. J., and Cawston, W. C. (1945). *J. Path. Bact.*, **57**, 59.
Hobson, F. G., and MacQuaide, D. H. G. (1938). *Lancet*, **2**, 1213.
Hoyne, A. L., and Brown, R. H. (1948). *J. Amer. med. Ass.*, **136**, 597.
Kass, A. (1948). *Nord. Med.*, **41**, 851.
Kremer, M., Phillips, C. G., and Stanier, M. W. (1945). *Lancet*, **1**, 496.
Lehr, D. (1947). *British Medical Journal*, **2**, 943.
Logan, G. B., and Herrell, W. E. (1946). *Proc. Mayo Clin.*, **21**, 393.
Long, P. H. (1941). *Bull. Johns Hopk. Hosp.*, **68**, 350.
—— and Feinstone, W. H. (1938). *Proc. Soc. exp. Biol., N.Y.*, **39**, 486.
Macartney, D. W., Smith, G. S., Luxton, R. W., Ramsay, W. A., and Goldman, J. (1942). *Lancet*, **1**, 639.

McIntosh, D. G., and Drysdale, C. F. (1945). *British Medical Journal*, **2**, 796.
Marshall, E. K., Emerson, K., and Cutting, W. C. (1937). *J. Pharmacol.*, **61**, 196.
Martin, R., and Sureau, B. (1948). *Traitement moderne des méningites purulentes aiguës*, p. 86. Flammarion, Paris.
Murphy, F. D., Clark, J. K., and Flippin, H. F. (1943). *Amer. J. med. Sci.*, **205**, 717.
Ounsted, C. (1949). *Lancet*, **2**, 639.
Pittman, M. (1931). *J. exp. Med.*, **53**, 471.
—— (1942). *Publ. Hlth Rep., Wash.*, **57**, 1899.
Price, C. W., Randall, W. A., Welch, H., and Chandler, V. L. (1949). *Amer. J. publ. Hlth*, **39**, 340.
Roscoe, J. D., and Gleeson-White, M. H. (1948). *Lancet*, **2**, 885.
Rose, F. L., Martin, A. R., and Bevan, H. G. L. (1943). *J. Pharmacol.*, **77**, 127.
Smith, M. H. D., Wilson, P. E., and Hodes, H. L. (1946). *J. Amer. med. Ass.*, **130**, 331.
Smythe, P. M. (1948). *Lancet*, **2**, 485.
Thomas, J. C., and Hayes, W. (1947). *J. Hyg., Camb.*, **45**, 313.
Thomson, J., Bruce, L. M., and Green, M. G. (1947). *British Medical Journal*, **2**, 414.
Ungar, J. (1943). *Nature*, **152**, 245.
Walker, N., Philip, R., Smyth, M. M., and McLeod, J. W. (1947). *J. Path. Bact.*, **59**, 631.
Weinstein, L. (1946). *New Engl. J. Med.*, **235**, 101.
Woods, D. D. (1940). *Brit. J. exp. Path.*, **21**, 74.
Yampolsky, J., and Jones, J. P. (1949). *Amer. J. Dis. Child.*, **78**, 97.
Zinnemann, K. (1946). *British Medical Journal*, **2**, 931.

CHRONIC ADHESIVE SPINAL MENINGITIS ASSOCIATED WITH LUMBAR NAEVUS AND DIMPLE

BY

T. R. SAVAGE, B.M., M.R.C.P.

(From the Hospital for Sick Children, Great Ormond Street)

Chronic meningitis confined to the spinal theca has been described frequently during the last fifty years; it has been known by various synonyms—arachnitis adhesiva circumscripta, arachnoïdite cloisonnée, arachnoid cysts, circumscribed serous spinal meningitis, and chronic spinal meningitis.

The aetiology of the condition is obscure in most cases: Ford (1945) states that it may follow various types of meningitis, spinal analgesia, and, in the opinion of most authorities, trauma to the spine. The reason for this obscurity seems to be that chronic spinal meningitis is usually the end-result of a previously unrecognized inflammatory process, and there is a clearly defined picture in the later stages only, either clinically or at operation or necropsy.

The subject has been reviewed by Horsley (1909), Mauss and Krüger (1918), Elkington (1936), and Rocovich (1947); but these authors do not mention congenital dermal sinuses as an important cause of chronic spinal meningitis. Mallory (1892) described coccygeal sinuses and cysts without meningeal or spinal cord involvement, and discussed their pathogenesis, with particular reference to abnormal foetal development.

Moise (1926) states that the sacro-lumbar region is a common site for developmental anomalies, among which are included congenital dimples, sinuses, cysts, and tumours. These cysts and tumours may be dermoid or epidermoid (List, 1941). There is only occasionally a connexion between the spinal canal and the skin surface. Also there may be instances of spina bifida, with all gradations from an unnoticed spina bifida occulta with no evidence of an external defect to a fusion of the spinal cord with the integument. The cases showing a connexion between the spinal canal and the exterior do not as a rule survive infancy. Moise was the first to report a case of meningitis (*Staphylococcus albus*) secondary to a congenital dermal sinus; there were no symptoms until the age of 18; there was spina bifida and a direct connexion between the skin and the spinal cord, and the patient recovered after laminectomy with drainage.

Ripley and Thompson (1928) described a case of *Staph. albus* meningitis in which a pilonidal sinus was the route of infection. Walker and Bucy (1934) reported seven cases in which a congenital dermal sinus, appearing externally as a small dimple in the midline of the back, had become infected (two with *Staph. albus*); all the cases but one were associated with spina bifida occulta.

Other cases have been recorded by Stammers (1938), Boldrey and Elvidge (1939), List (1941), and Tizard (1950). O'Connell's case (1942), that of a child aged 4, had a lumbosacral port-wine stain and a small central pit extruding sebaceous material on pressure; this was complicated by recurring attacks of meningitis (coliform organisms) from the age of 8 months; the sinus was traced through a lumbar spina bifida to a large intradural abscess lying among the roots of the cauda equina.

Intramedullary abscess of the spinal cord complicating congenital dermal sinuses has been recorded by Kooistra (1942) and Shenkin and others (1944). Mount (1949) has been the first to describe a case with intracranial abscess as a similar complication.

The following case is reported because the causation of the condition and the route of infection raise some interesting problems, and because in several features it resembles previously reported cases, especially that of O'Connell.

Case Report

A girl aged 9 had backache for two weeks in 1947. In February, 1948, she again had severe backache, low in position, with delirium and pyrexia for one week, and was admitted to a hospital near her home.

Her own and her family history revealed nothing relevant. She was pale and thin; the posterior cervical and inguinal lymph nodes were enlarged; and flexion of the left hip with straight leg raising was limited. The white cells numbered 5,000 per c.mm. (neutrophils 39%), the E.S.R. (Wintrobe) was 7 mm. in one hour, and the Mantoux test (1 in 1,000) was negative. Her temperature and pulse became normal within three weeks; she received only sedatives.

In March, 1948, recrudescence of pain in the back and fever led to her readmission to the local hospital. There was limited mobility of the lumbar spine with spasm of the erector spinae. Swelling of joints, nodules, and skin rashes were absent; the white cells numbered 9,000 per c.mm. (neutrophils 50%), the E.S.R. (Wintrobe) was 19 mm. in one hour, the blood Wassermann reaction was negative, and blood culture was negative. Radiography showed spina bifida of the eleventh thoracic, fourth and fifth lumbar, and first sacral vertebrae. A tentative diagnosis of rheumatic fever was then made. She was kept flat in bed for four months and was in hospital for eight months; she was given salicylates and phenobarbitone.

In December, 1948, pain in the back and right lower limb and pyrexia reappeared.

In March, 1949, she was admitted to Great Ormond Street. She was miserable and wasted generally; there was a circular brown pigmented naevus about 2.5 cm. in diameter with a shallow dimple or pit about 3 mm. in diameter over the lumbar spine. Walking was painful and difficult. Sitting with her knees fully flexed was the position she adopted in bed. There was no neck rigidity. In the upper and lower limbs muscular development, tone, and power were poor and impaired equally with the rest of the body and on the two sides. There was no localized wasting; co-ordination was normal. The biceps, supinator, and triceps jerks were absent on the right and present on the left. The abdominal reflexes were present and equal. There was still gross limitation of straight leg raising—to 45 degrees. The right knee-jerk was exaggerated and the left

absent. Both ankle-jerks were absent and the plantar responses were both equivocal. There were no sensory changes or evidence of a sensory level.

Special Investigations

Radiography revealed no abnormality in the skull, lungs, heart outline, and mediastinum.

On March 19 the white cells numbered 12,650 (neutrophils 60%); the E.S.R. was 4 mm. in one hour; agglutinations against *Salmonella typhi, Salm. paratyphi* A and B, all with O and H antigens, and *Brucella abortus* were all negative. A catheter specimen of urine was normal.

On March 21 a lumbar puncture produced a dry tap from 3/4 and 4/5 lumbar spaces, but a faintly cloudy colourless fluid with clot from the 2/3 space; no resting pressure could be read because of crying. Examination of the fluid showed: 42 cells per c.mm. (98% monocytes); no organisms seen; culture sterile; protein, 275 mg. per 100 ml.; sugar, 50 mg. per 100 ml.; insufficient for chlorides; Wassermann reaction negative.

On March 25 a lumbar puncture in all the above spaces resulted in a dry tap. Cisternal puncture gave a slightly turbid colourless fluid with a clot: cells 25 per c.mm.; culture sterile; protein, 150 mg. per 100 ml.; sugar, 56 mg. per 100 ml.; chlorides, 735 mg. per 100 ml. On March 30 a post-nasal swab (for meningogocci) contained a few colonies of *Staph. albus*.

The provisional diagnosis at this time was chronic adhesive arachnoiditis following old meningitis, possibly meningococcal. The patient was transferred to the Atkinson Morley Hospital under Mr. Wylie McKissock for further investigation.

On April 11 a cisternal encephalogram revealed good and normal filling of the ventricular system. Lumbar myelography (1 ml. of "myodil" introduced into the cisterna magna) showed poor filling of the theca, and the appearances suggested an arachnoiditis with block at the level of the second lumbar vertebra (Figs. 1 and 2). With the head down, the theca was filled with air and the existence of spinal block was confirmed.

Mr. Wylie McKissock performed laminectomy of the second, third, and fourth lumbar vertebrae on April 19. The theca was

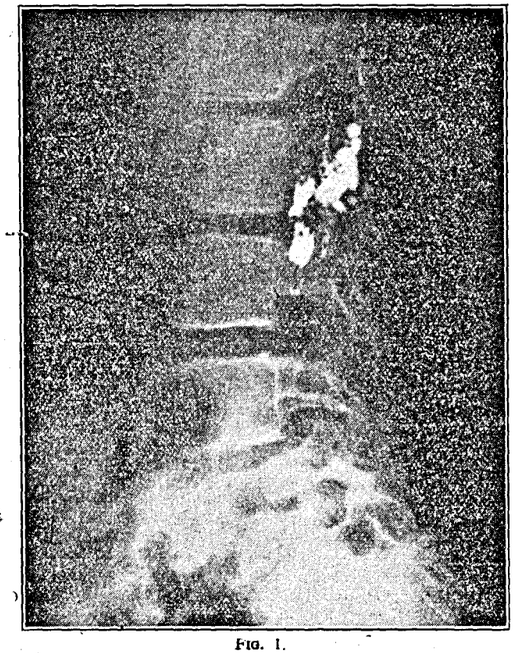


FIG. 1.

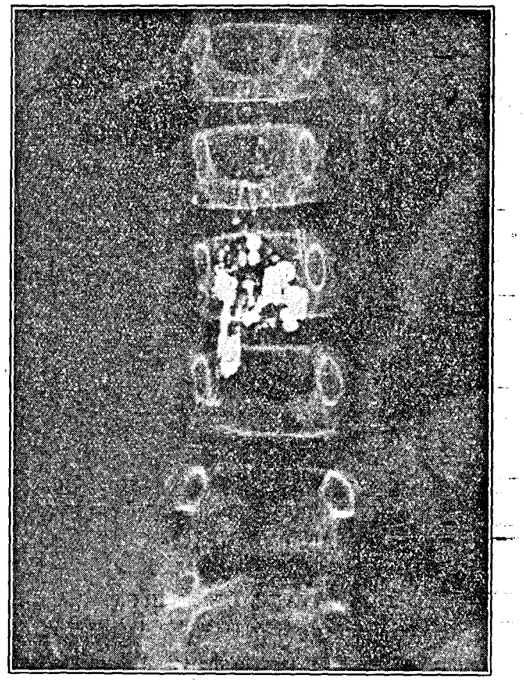


FIG. 2.

tense and bulging and unusually firm to the touch. The dura was found to be particularly thick and adherent to the underlying granulation tissue. The whole subdural space was filled with a mixture of granulation tissue, pus, and fibrous adhesions, in which most of the nerve roots were embedded. The dura was left open and the wound closed in layers over it. No sinus between the skin and spinal theca was found. A light growth of coliform organisms was obtained from a swab at operation.

In the immediate post-operative period penicillin was given four-hourly for three days (total 440,000 units) and streptomycin 4 g. over five days, both by intramuscular injection, and sulphadimidine by mouth for seven days (total 18 g.).

Post-operative Progress

The wound healed by first intention. Full movement in both lower limbs had returned 10 days after operation. The patient was free from pain in the back and legs. There was only occasional urinary incontinence, and the spine remained rather rigid. During the first few weeks the tendon-jerks in the right upper limb returned and equalled those on the left; the left knee-jerk returned and was brisk, the right knee-jerk remained exaggerated; both ankle-jerks could just be elicited; plantar responses were flexor; Rombergism was absent; her gait was normal except for some evidence of apprehension.

From May to September, 1949, she was symptomless except for a discharging sinus near the laminectomy scar. Her nutrition and muscular development improved greatly and she had even learned to swim.

On her fourth admission to hospital on September 26 (Atkinson Morley Hospital), for exploration and excision of the residual sinus, there was very slight weakness of the muscles moving the left knee- and ankle-joints. There was no wasting, and the muscular tone was good. All tendon-jerks were brisk, the right knee-jerk being slightly greater than the left; the plantar responses were flexor. Spinal movements were good and painless; there was no tenderness on pressure over the spine; the gait was normal. Pus was discharging from two small sinuses

in the laminectomy wound and from the small pit in the naevus. Radiography of the lumbar spine showed no myodil residues and no evidence of bone infection. *Staph. aureus* and *Neisseria catarrhalis* were cultured from the sinuses.

On October 4 the sinus was found to extend as deep as the anterior surface of the erector spinae. The wound healed, but discharged again intermittently. Swabs were repeatedly sterile on culture.

On January 24, 1950, the original wound, together with the naevus, was completely excised down to the block of fibrous tissue which covered the open theca; no true granulation tissue was discovered at any point.

During the next six months the sinus in the operation scar discharged intermittently, but the patient's general health was excellent; she remained symptomless and free from pain in the back and lower limbs. In July, 1950, there was a small discharging sinus in the lumbar scar; spinal movements were full except for slight limitation of flexion; straight leg raising was limited to 80 degrees (right and left) by pain in the hamstrings; right hip flexion was slightly weak; the right knee-jerk was very brisk, the left was normal; the right ankle-jerk was absent, the left was present on reinforcement; the plantar responses were flexor; sensation and gait were normal.

Discussion

This case has several features of interest, particularly from the aspect of diagnosis and the mode of infection.

Diagnosis of Site of Lesion.—Negative evidence included absence of a history of trauma and of radiographic signs of vertebral disease, and therefore indicated that the lesion was intradural: absence of involvement of the long tracts excluded an intramedullary lesion. Positive evidence depended chiefly on the presence of bilateral and asymmetrical changes in the tendon reflexes in the upper as well as the lower limbs, showing that spinal nerve roots in the cervical region as well as the cauda equina were involved; also, the existence of spinal block was demonstrated after lumbar puncture and contrast myelography. Spinal block was complete at the level of the second lumbar vertebra and was partial above the lumbar region.

Diagnosis of Nature of Lesion.—The long history of recurring bouts of pyrexia and back pain over more than twelve months strongly suggested an inflammatory process. An equally extensive intradural neoplastic lesion was only likely to be due to "seedling" metastases derived by gravity from an intracranial tumour, but there was no clinical or radiographic evidence of such a space-occupying lesion. Negative serological tests excluded syphilis as a cause.

The appearances at myelography were those of arachnoiditis, but all authorities agree that a pre-operative diagnosis of chronic adhesive spinal meningitis is seldom made, and that clinical distinction from spinal tumour is difficult. Mackay (1939) states that, clinically, such cases differ from those of extramedullary spinal tumour in the evidence of a diffuse disturbance of the spinal cord and roots, such as widely scattered paraesthesiae and pains, irregular and inconstant sensory disturbances, muscular atrophy and large fascicular twitches, painful muscular spasms, a mixture of exaggerated and diminished tendon reflexes, and arrest of iodized oil at multiple levels. There is absence of agreement concerning sensory disturbances, since Beaumont (1950) states that in spinal arachnoiditis the posterior roots are much more likely to be affected than the anterior. It is not clear why the first operation was followed by a return to normal of the upper-limb tendon-jerks; it has been suggested that this was an effect of chemotherapy. There remains the possibility that a dermoid is still present among the roots of the cauda equina.

Mode of Infection.—This is the chief problem of the case. In considering the possible routes by which infection reached the spinal meninges, there was no evidence of septicaemia or a primary infective focus elsewhere, at or before the onset of symptoms. There was no history of a lumbar puncture for diagnosis or spinal analgesia (Kremer, 1945). The presence together of a pigmented naevus with a dimple in the midline over the lumbar spine, spina bifida occulta of the eleventh thoracic, fourth and fifth lumbar, and first sacral vertebrae, and chronic adhesive arachnoiditis suggest that infection may have reached the meninges via a sinus, though such a sinus was not demonstrated at operation. Some support for this claim is provided by the close resemblance to the case described by O'Connell (1942).

I am indebted to Dr. Bernard Schlesinger and Mr. Wylie McKissock for permission to record the case that was under their care. I should like to thank Dr. Schlesinger for his interest and helpful criticism of this report, and Dr. E. J Glynn for his case notes.

REFERENCES

Beaumont, G. E. (1950). *Applied Medicine*, p. 478. Churchill, London.
Boldrey, E. B., and Elvidge, A. R. (1939). *Ann. Surg.*, **110**, 273.
Elkington, J. St. C. (1936). *Brain*, **59**, 181.
Ford, E. B. (1945). *Diseases of Nervous System in Infancy, Childhood, and Adolescence*, 2nd ed., p. 516. Thomas, Springfield.
Horsley, V. (1909). *British Medical Journal*, **1**, 513.
Kooistra, H. P. (1942). *Surgery*, **11**, 63.
Kremer, M. (1945). *British Medical Journal*, **2**, 309.
List, C. F. (1941). *Surg. Gynec. Obstet.*, **73**, 525.
Mackay, R. P. (1939). *J. Amer. med. Ass.*, **112**, 802.
Mallory, F. B. (1892). *Amer. J. med. Sci.*, **103**, 263.
Mauss, T., and Krüger, H. (1918). *Dtsch. Z. Nervenheilk.*, **62**, 1.
Moise, T. S. (1926). *Surg. Gynec. Obstet.*, **42**, 394.
Mount, L. A. (1949). *J. Amer. med. Ass.*, **139**, 1263.
O'Connell, J. E. A. (1942). *Proc. R. Soc. Med.*, **35**, 685.
Ripley, W., and Thompson, D. C. (1928). *Amer. J Dis. Child.*, **36**, 785.
Rocovich, P. M. (1947). *Bull. Los Angeles neurol. Soc.*, **12**, 69.
Shenkin, H. A., Hunt, A. D., jun., and Horn, R. C., jun. (1944). *Surg. Gynec. Obstet.*, **79**, 655.
Stammers, F. A. R. (1938). *Brit. J. Surg.*, **26**, 366.
Tizard, J. P. M. (1950). *Proc. R. Soc. Med.*, **43**, 247.
Walker, A. E., and Bucy, P. C. (1934). *Brain*, **57**, 401.

The following statement about the prophylactic administration of penicillin in certain cases has been approved by the American Council on Rheumatic Fever of the American Heart Association: "Following dental extractions and removal of tonsils and adenoids, bacteria are frequently present in the blood stream for short periods of time. In rheumatic individuals or in patients with congenital heart disease these bacteria may lodge in the heart valves and cause bacterial endocarditis. Although a variety of bacteria cause this disease, the majority of cases are due to alpha streptococci (*Streptococcus viridans*). Alpha streptococci are usually resistant to sulphonamide drugs. Penicillin is, therefore, recommended for prophylaxis as follows. (1) Except in emergencies operative procedures in rheumatic individuals should be deferred until there is no clinical evidence of rheumatic activity and laboratory tests indicate that the rheumatic process is subsiding. (2) Patients should be free from upper respiratory infection. (3) Minimum dosage of penicillin: (*a*) 300,000 units of aqueous penicillin intramuscularly 30–60 minutes before extraction or operation. (*b*) 300,000 units of procaine penicillin in oil injected intramuscularly at the same time in a different site. Penicillin prophylaxis is not necessary for the extraction of deciduous incisors or bicuspids unless infection of the gum is present. It should be used in the extraction of deciduous molars and all permanent teeth, and for tonsillectomy and adenoidectomy. In most instances it is best to extract one tooth at a time; multiple extractions should be avoided. In cases of extensive gum infection or severe root infections (apical abscesses) it is advisable to give several doses of penicillin starting the day before operation and continuing one or two days thereafter. Women with rheumatic or congenital heart disease should receive penicillin prophylaxis at the time of delivery. It is also recommended for patients requiring gastro-intestinal surgery."

A CASE OF CARDIAC ARREST

VAGAL INHIBITION RELIEVED BY PROCAINE

BY

HENRI L. M. ROUALLE, M.D., F.R.C.S.

Senior Surgical Registrar, Wellhouse Hospital, Barnet

Cardiac arrest occurs about twice a year in a busy surgical unit (Hamilton Bailey, 1941 ; Lahey and Ruzicka, 1950) ; it may arise quite unexpectedly in any operation or with any form of anaesthetic, and when it occurs very rapid measures must be taken if the patient is to survive. Anoxia lasting for more than 3½ minutes may lead to irreparable cerebral damage, and survival is unlikely if the circulation has been arrested for more than 8¼ minutes (Weinberger, Gibbon, and Gibbon, 1940).

No apology is therefore necessary in reporting a single case, and that ultimately unsuccessful, if the experience thereby obtained will contribute to success in the future.

Case Report

A man aged 48 was admitted on June 12, 1950, on account of a retrosternal goitre causing dysphagia, voice changes, and thyrotoxicosis of eight weeks' duration. He was a nervous patient with exophthalmos and a tachycardia of 140 a minute. His blood pressure was 170/70 mm. Hg ; B.M.R. +37% ; serum cholesterol 220 mg. per 100 ml. An electrocardiogram showed sinus tachycardia only. There was no evidence of cardiac failure.

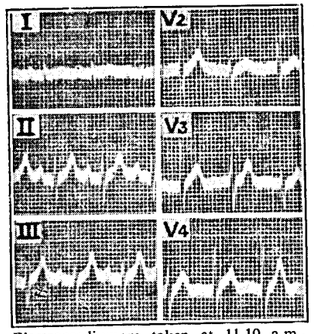
After two weeks' rest and sedation a course of Lugol's iodine was given in preparation for operation. On July 20 his pulse rate had steadied to 96 a minute and he was considered fit for operation.

Next day potassium bromide and chloral, 30 gr. (2 g.) each, and hyoscine, 1/150 gr. (0.43 mg.), were given at 7 a.m., followed by Lugol's iodine, 30 min. (1.8 ml.) by mouth. At 8.30 a.m. induction was begun smoothly, using gas and oxygen, supplemented by isopropyl chloride, and an endotracheal tube was passed without difficulty. At 8.40 a.m. he was brought into the theatre and lifted on to the operating table: he immediately gave a slight cough and raised his arms, and was then seen to change colour to a grey lividity. His pulse could not be detected.

His head was lowered, and controlled respiration with pure oxygen was begun. An intracardiac injection of 0.5 ml. of 1/1,000 adrenaline was given without effect, and an upper midline abdominal incision was made and infradiaphragmatic cardiac massage started by 8.48 a.m. Control of the heart was unsatisfactory and an antero-posterior incision was made through the diaphragm and three fingers were passed into the pericardial cavity.

The left ventricle was felt to be dilated, flaccid, and inert ; on the other hand, rhythmic rippling movements of the left auricle could be felt at about 160 a minute. Rhythmic compression of the ventricles at 60 to 80 beats a minute, allowing refilling between strokes, was maintained against the sternum without effect. Meanwhile occasional shallow jerky respirations continued ; the pupils remained moderately dilated. Controlled respiration with pure oxygen continued.

At 9.10 a.m. another 1 ml. of adrenaline was injected into the cavity of the right ventricle ; within two minutes the ventricle was felt to pass into a state of systole and a few rippling twitches followed. At 9.20 a.m. 3 ml. of 2% procaine was injected into the cavity of the ventricle: after a delay of about five minutes strong rhythmic contractions quite suddenly returned at about 100 a minute ; these began to weaken after a few minutes, but improved with further massage ; intermittent irregularity and weakening occurred. At 10 a.m. a further injection of 6 ml. of 2% procaine was given. By 10.10 a.m. normal rhythm was restored (see accompanying electrocardiogram). The abdomen was later closed. Respirations returned, but were of a rapid, gasping type, and the lividity persisted. Despite treatment in an oxygen tent, the pulse weakened gradually, and he died at 2.10 p.m. without regaining consciousness.



Electrocardiogram taken at 11.10 a.m., showing return to normal rhythm with marked variations in voltage.

Necropsy showed gross congestion of the upper part of the body, including the brain. The thyroid gland was much enlarged, weighing 4 oz. (113 g.), and completely encircled the trachea and oesophagus. The heart was enlarged, the muscle fibrous and not of good quality ; the only evidence of trauma was a small nick in the postero-inferior surface which had injured the descending branch of the right coronary vessel. About a pint (570 ml.) of blood had escaped into the left pleural sac, which had been opened.

Comment

The cardiac arrest was at the time attributed to failure of a thyrotoxic heart under the added strain of an anaesthetic, but the subsequent sudden restoration of normal rhythm following on the injection of procaine, when prolonged massage and two injections of adrenaline had completely failed, suggests that the immediate cause of the arrest was intense vagal inhibition. According to Fulton (1949), vagal stimulation weakens the force of the heart beat and depresses conduction within the heart, chiefly within the auricles and the A-V node, where it may produce all grades of A-V delay and dissociation. Vagal reflexes may be initiated from nerve endings in the aortic arch and carotid sinus, and also from any part of the respiratory tract from the nose to the trachea. Reid and Brace (1940) have demonstrated electrocardiographically that the insertion of an endotracheal tube under light anaesthesia may produce cardiac irregularities such as extrasystoles, delayed conduction time, and bradycardia, and that this vagal reflex can largely be abolished by atropine.

This case is in many respects similar to that reported by Adams and Hand (1942) in which a patient undergoing lobectomy for bronchiectasis gave three sharp coughs when endotracheal suction was applied: cardiac arrest occurred, and the circulation was kept going manually for 20 minutes. Adrenaline failed to produce any effect, but procaine was given intramuscularly at 15 minutes, and the heart restarted five minutes later, with complete recovery. Success in this case was probably due to the fact that as the thorax was open immediate compression of the heart was carried out and actual arrest of the circulation did not occur. Howkins *et al.* (1946), however, report a case in which the circulation was not established for 11 minutes and extensive cerebral changes were found after death on the twenty-sixth day. Recovery following 25 minutes' arrest relieved by intravenous procaine also occurred in a case quoted by Burstein (1949).

Although it has been customary to give adrenaline on these occasions, its value in complete arrest is doubtful, as there is no evidence that it restarts the heart and it may produce ventricular fibrillation. Lahey and Ruzicka (1950) recommend that a stock dose containing 9.5 ml. of 1% procaine with 0.5 ml. of 1/1,000 adrenaline should be kept ready in the operating theatre. The present case has shown, however, that, despite its dramatic effect, procaine may have no action for about five minutes, during which time severe damage to the brain will occur. Time should therefore not be wasted in awaiting the result of the procaine injection, and cardiac massage should be started at once. Our experience with the above case showed the difficulty of compressing the heart satisfactorily from below the diaphragm, as mentioned by Nicholson (1942), and that the transdiaphragmatic incision carries a risk of injury to the heart. Unless the abdomen be already open, Lahey and Ruzicka recommend a direct transthoracic approach through the fourth interspace, dividing the fourth and fifth costal cartilages. Lahey and Eversole (1950) suggest that a disconnected needle be passed through the fourth interspace into the ventricle as soon as the pulse becomes imperceptible ; if no movement be observable, or begins after the needle prick, the case is one of true cardiac arrest and not momentary inhibition as may occur following accidental pressure on the carotid sinus ; the procaine–adrenaline mixture is then injected in two instalments of 5 ml. each, and if there is no response within 30 seconds cardiac massage should be started at once. Lahey and Ruzicka report 46% of complete recoveries in 15 cases ; Hamilton Bailey had only four survivors of 40 cases, though the heart restarted in 13 ; and Barber and Madden (1945) reported 48 recoveries in 143 cases

Summary

A case of cardiac arrest is reported in which complete asystole persisted for 45 minutes despite cardiac massage and adrenaline, but normal rhythm was restored after two intracardiac injections of procaine, though the patient survived for only four hours. The immediate use of procaine, injected into the heart in preference to or with adrenaline, is suggested, but in view of its delayed action cardiac massage should be performed at once so that there is no interruption of the cerebral circulation.

I wish to acknowledge the counsel and assistance given at a time of stress by Dr. John Elam and Mr. Alan Small, to whom I am also indebted for permission to publish this report.

References

Adams, H. D., and Hand, L. V. (1942). *J. Amer. med. Ass.*, **118**, 133.
Bailey, Hamilton (1941). *British Medical Journal*, **2**, 84.
Barber, R. F., and Madden, J. L. (1945). *Amer. J. Surg.*, **70**, 135.
Burstein, C. L. (1949). *Anesthesiology*, **10**, 133.
Fulton, J. F. (1949). *Textbook of Physiology*, p. 664. Philadelphia.
Howkins, J., McLaughlin, C. R., and Daniel, P. (1946). *Lancet*, **1**, 488.
Lahey, F. H., and Eversole, U. H. (1950). *Lahey Clin. Bull.*, **6**, 226.
—— and Ruzicka, E. R. (1950). *Surg. Gynec. Obstet.*, **90**, 108.
Nicholson, J. C. (1942). *British Medical Journal*, **1**, 385.
Reid, L. C., and Brace, D. E. (1940). *Surg. Gynec. Obstet.*, **70**, 157.
Weinberger, L. M., Gibbon, M. H., and Gibbon, J. H. (1940). *Arch. Neurol. Psychol., Chicago*, **43**, 615.

A conference was held on July 14 at Salford, Lancashire, under the auspices of the public health department, to consider the better co-ordination of home and hospital services in the sphere of mental health. The conference was attended by local medical and nursing staff, social workers, and local government councillors. The Mayor of Salford, Alderman Frank Cowin, was in the chair. Dr. J. Bierer (Institute of Social Psychiatry, London) described his experience of day hospitals and therapeutic social clubs in the home management of psychotic patients. He had found day hospitals valuable for those who had spent many years in mental hospitals but were now at home, for patients who had undergone prefrontal leucotomy, for those discharged from hospital for after-treatment or unimproved, and at times to help delinquents in their return to society. A number of other speakers contributed to the conference.

Medical Memoranda

Acute Myocardial Infarction following Tetraethylammonium Chloride Therapy

Since Acheson and Moe (1945) drew attention to the autonomic ganglion blocking effect of the tetraethylammonium ion, preparations of this drug have been increasingly used in the investigation and treatment of hypertension and peripheral vascular disease. Lyons *et al.* (1947) confirm the usefulness of the drug in this respect and also record two cases in which intravenous administration dramatically relieved the pain of acute myocardial infarction. Lindgren and Frisk (1948) treated three cases of angina pectoris with tetraethylammonium bromide : this was followed by severe anginal attacks in two cases and by acute myocardial infarction in one. They conclude that the drug should be used with caution in angina pectoris and hypertension with marked arteriosclerosis. Below are reported three cases of occlusive arteriosclerosis of the lower limbs in which tetraethylammonium therapy was followed by acute myocardial infarction.

Case Reports

Case 1.—A man aged 41 was admitted to hospital on October 24, 1948, with a complaint of pain in both calves which came on after walking 50–100 yards (46–92 metres) and which disappeared on rest. He had also suffered from coldness of the feet for some years. No dyspnoea was present, nor did he complain of chest pain. His pulse was 70 a minute and regular, and the vessel wall was not palpable. The heart sounds were good, with no murmurs and a normal *x*-ray shadow. His blood pressure was 125/85 mm. Hg. Urinary investigation was negative. Both feet were cold and slightly congested, and ankle pulses were absent. His right great toe became increasingly discoloured. Right lumbar ganglionectomy was carried out on March 1, 1949, but no improvement followed. On March 30 the right lower limb was amputated because of spreading gangrene. Tetraethylammonium chloride, 6 ml. (7.5 mg. per kg.) twice daily by intramuscular injection, was started on July 14 and continued for five days. On July 30 6 ml. daily was given. On August 2 he had a sudden attack of pain in the neck and shoulders spreading to the chest, with dyspnoea. An electrocardiogram showed changes compatible with posterior myocardial infarction. *X*-ray examination revealed consolidation of the bases of both lungs. His blood pressure was 120/70 mm. Hg.

Case 2.—A man aged 71 complained in June, 1949, of pain in his calves after walking 60–70 yards (55–64 metres), with occasional slight breathlessness on exertion and mild precordial pain. These symptoms occurred only on exercise and were relieved by rest. His pulse was 80 a minute and regular ; the vessel wall was just palpable. The heart sounds were poor, without murmurs, and his blood pressure was 170/110 mm. Hg. Tetraethylammonium chloride, 2 ml. (3 mg. per kg.), was administered intravenously followed by 5 ml. (7.5 mg. per kg.) by the same route seven days later. Five days after the latter dose the patient suffered a severe attack of dyspnoea, precordial pain radiating to the finger-tips, and he was very restless. During the following two days signs of pericarditis developed and he died on the sixth day from congestive cardiac failure. (As this patient was treated at home no electrocardiographic confirmation exists, but the clinical picture was typical.)

Case 3.—A man aged 49 was admitted to hospital on June 14, 1949, with a complaint of pain in the calves after walking 50 yards (46 metres). This pain disappeared with rest. His feet were cold and congested, and the ankle pulses were absent.

The heart sounds were good, there were no murmurs, and the heart shadow was normal. His pulse was 74 a minute ; the vessel wall was not palpable. His blood pressure was 140/85 mm. Hg. Urinary investigations revealed nothing abnormal. On July 31 tetraethylammonium chloride, 6 ml. (8.5 mg. per kg.) twice daily by intramuscular injection, was started. On August 5 he had a sudden attack of dyspnoea, substernal pain radiating to the arms, diminished right respiratory movement, and poor air entry on the right side. *X*-ray examination showed slight elevation of the diaphragm. His blood pressure was 100/70 mm. Hg. An electrocardiogram showed changes consistent with posterior myocardial infarction.

Although the possibility of coincidence cannot be excluded, it is thought that in these cases tetraethylammonium therapy was at least a contributory cause of the acute cardiac lesions. Great care should be exercised in the use of this drug in any patient showing evidence of arteriosclerosis even in the absence of hypertension or marked cardiac symptoms.

I wish to thank Mr. J. Dunbar, surgeon, Glasgow Royal Infirmary, for permission to publish these cases.

D. J. LIVINGSTONE, F.R C.S.Ed., F.R.F.P.S.,
Assistant Surgeon to Out-patient Department, Glasgow Royal Infirmary.

REFERENCES

Acheson, G. H., and Moe, G. K. (1945). *J. Pharmacol.*, **84**, 189.
Lindgren, I., and Frisk, A. R. (1948). *Acta med. scand.*, **131**, 581.
Lyons, R. H., *et al.* (1947). *Amer. J. med. Sci.*, **213**, 315.

Sudden Death after Spontaneous Pneumothorax

Death in cases of spontaneous pneumothorax occurring in otherwise healthy persons is a rare event. A search of the literature has revealed no case similar to the one recorded below.

In this general medical charge (50 beds) of the Royal Infirmary, Edinburgh, from November, 1941, to January, 1950, there have been 12 cases of spontaneous pneumothorax with only one death. Of these 12 cases nine occurred in otherwise healthy males, two were associated with active pulmonary tuberculosis, and one case was of pyopneumothorax, a sequel to lobar pneumonia. One case developed a haemopneumothorax and there was an additional case of haemopneumothorax due to fractured ribs, both of these recovered. Pneumothorax also occurred in a case of bronchial neoplasm following bronchoscopy.

CASE REPORT

A railway engine driver aged 30 was admitted to the Royal Infirmary, Edinburgh, under the charge of Dr. T. R. R. Todd. He gave a history that in the morning of the previous day he experienced a sudden severe pain over the left lower chest, radiating to the left shoulder and associated with increasing dyspnoea. The episode occurred while painting his house. He went to bed, but his symptoms persisted and he vomited in the evening. His doctor thought he had a gross pleural effusion. Symptoms persisted unchanged overnight and he was admitted to hospital the next day.

He gave no previous history of serious illness and had served for 6½ years in the Army, being demobilized early in 1946 in Medical Grade I. His relatives stated that he had had a mild dry morning cough for the past few months and thought he had become thinner about the face recently. Several weeks previously he had complained of slight pain off and on in the left mid-zone of the chest anteriorly but had not sought medical advice. There was no family history suggestive of tuberculosis.

On admission he was seen to be well nourished, pale but not anaemic, perspiring, anxious, and dyspnoeic. His temperature was 97.8° F. (36.5° C.); his pulse was 102 a minute and regular but of poor volume. Both pulses were synchronous. His blood pressure was 118/78. His respiratory rate was 28 a minute and rather shallow. The chest showed markedly diminished movement on the left side with some displacement of the trachea to the right. The percussion note was hyperresonant all over the left lung and the breath sounds were absent on that side, being vesicular over the right lung with no accompaniments. Vocal resonance and fremitus were diminished to absent on the left side. The coin sign was present over the left chest.

The apex beat was not palpable, the left border of the heart was percussed just to the left of the sternum, the right border being percussible 2 in. (5 cm.) to the right of the midline. The heart sounds were closed in all areas and not unduly soft. No abnormality was detected elsewhere.

A diagnosis of spontaneous pneumothorax was made, and in view of the displacement of the mediastinum, the previous severe dyspnoea, and the dullness of the left chest detected by his own doctor on the previous day, though not confirmed by us, it was thought that a degree of tension had been present.

Air aspiration was considered, but as he seemed to be improving this was temporarily postponed. During the evening he became more comfortable (temperature 96.4° F. (35.8° C.), pulse 84, respirations 28), and, although still dyspnoeic, he slept most of the time. About 9 p.m. he turned over quietly on to his left side and died within two minutes, apparently from cardiac failure. The percussion note over the right lung had not altered.

Post-mortem examination was unfortunately refused. It was thought that a sudden mediastinal swing had occurred with possibly torsion of the great vessels at the base of the heart.

COMMENT

In this case the evidence does not suggest underlying pulmonary disease. From the falling pulse rate and the patient's appearance haemopneumothorax was not thought to be present. There was no evidence of bilateral pneumothorax, and, as no alteration of the percussion note was detected over the right lung immediately after death, this is not thought to have occurred as a sudden terminal event. On similar grounds mediastinal emphysema was excluded.

As already mentioned, from the severity of the symptoms and the clinical findings before admission tension pneumothorax was diagnosed ; but in view of the general improvement, the falling pulse rate, and the maintenance of blood pressure it was thought that the tension had diminished and was decreasing further on admission. For this reason air aspiration was not performed, because of the risk of reopening the valvular fistula in the lung. In reviewing the case it is possible that had this been done his life might have been saved.

The other point arising out of this case is that it is advisable in nursing such cases to keep them in the orthopnoeic position and to prevent them turning on to the affected side.

In the absence of a post-mortem examination the possibility of tuberculosis cannot be excluded, but the history and findings do not suggest this. Certainly there was no clinically detectable lesion on the right side.

I wish to thank Dr. T. R. R. Todd for permission to publish this case and also for helpful criticism and advice.

J. W. BUCHANAN, M.A., M.D., M.R C.P.Ed.,
Senior Medical Registrar, Royal Infirmary, Edinburgh.

Caldecote Hall, at Nuneaton, Warwickshire, announces that it is still open for patients. Since the resident medical superintendent, Dr. A. E. Carver, died three months ago there has been an impression that the Hall is closed. In fact a fully qualified nursing sister is in charge and the Hall is being regularly visited by a medical man until a resident medical superintendent is appointed.

Reviews

EAR, NOSE, AND THROAT

Common Diseases of the Ear, Nose, and Throat. By Philip Reading, M.S.(Lond.), F.R.C.S. (Pp. 288 ; 2 coloured plates and 37 text figures. £1 1s.) London: J. and A. Churchill. 1950.

This book is designed for students and newly qualified practitioners. Since the subject, which is a large one, is compressed into 270 pages, it is inevitable that anatomical descriptions are reduced to the minimum, but they are adequate. An inevitable result of compression, too, is that the author makes many dogmatic statements, but for the student that is no bad thing. Only emergency operations are discussed in detail. Of these, tracheotomy and its difficulties are clearly described and illustrated.

Nearly one-third of the book is on diseases of the ear ; the anatomical description is novel and arresting. But one statement about the temporal bone is misleading : the petrous is said to run towards the foramen magnum instead of the foramen lacerum medium. Acute infections of the middle ear are explained well and the bacteriology and pathology are clearly set out. It would be sounder to consider pain rather than deafness as the cardinal symptom, and there should be more emphasis on adequate and early administration of antibiotics and chemotherapy. Indeed, it would be helpful if the last chapter, which is on this subject, were placed early in the book. The coloured illustrations of the tympanic membrane are admirable. The important symptom of facial paralysis is not given its due prominence. After chemotherapy its occurrence may be the only symptom of mastoid involvement, and this ought to be in the practitioner's mind. Again, the author should point out that pain referred to the ear from teeth is always from the lower jaw. Advice on the treatment of acute otitis media and on detecting complications when treatment has failed is very good.

Subsequent chapters on mastoiditis and its treatment are also sound, as is the advice on meatitis. The author discusses vertigo fully, and by means of an ingenious diagram and its explanation shows the effects of loss of labyrinthine function. The caloric test of the function might well have been given first place to the exclusion of the rotatory and galvanic tests ; the fistula test or sign would come more appropriately in the chapter on chronic suppurative otitis media. Not everyone will agree that a dead labyrinth is best treated by radical mastoidectomy supplemented by labyrinthotomy. To decide on the type of deafness, tuning-fork tests are described. (Throughout Rinne is, in error, given an acute accent on the "e.") The voice is preferred to the audiometer for deciding the degree of deafness, but surely this almost universally used apparatus might have been allowed a few lines. Many will take exception to the statement that perception of the upper tones is progressively lost after the age of 21 ; experience disproves it. The chapters on the nose and paranasal sinuses offer excellent guidance to the practitioner.

There is a good chapter on intracranial infections resulting from suppuration in the ear or nasal sinuses ; the paths of infection are clearly described. The author gives a succinct account of the cerebrospinal fluid. Cerebral abscess and thrombosis of the cerebral sinuses are described well, and the treatment of these conditions is admirably set out. The chapters on the larynx are also good, the anatomy being clarified by a diagram, though another illustration might mislead because of a slight error in the placing of the "pointer" to the pyriform fossa. The functions of the larynx and their disorders are well described, as are its diseases and the results of inhaling foreign bodies. The account of tracheotomy is clear, and the detailed description of the aftercare of the patient will be useful to the inexperienced. A section follows on the throat and its ulceration and inflammation. It is well written, and the author emphasizes the importance of swabs in cases where the pathology is in doubt. The indications for tonsillectomy are well set out and conservative, though the anaesthetist will not agree with the opinion that pre-anaesthetics should not be given to children. The short chapter on deglutition and dysphagia must be read closely, for the author has omitted nothing, but has a few words to say on every condition. Lastly, there is a chapter on new growths of the upper respiratory tract ; again a few words only are devoted to each part, but they convey the essential facts.

W. M. MOLLISON.

RESEARCH METHODS

Methods in Medical Research. Volume 2. Julius H. Comroe, jun., Editor-in-Chief. (Pp. 361. $6.50.) Chicago: The Year Book Publishers, Inc.

The Americans have a great respect for methodology, and it is possible to take a degree in the methods, as distinct from the content, of a science. The Germans, who were great scientists before the Americans, frankly said, "Die Technik ist alles." In England we have too deep an affection for the amateur and the garret scientist to believe methodology is everything, and the story of penicillin has confirmed us in our respect for the divine spark. Let us hope that we have learnt the lesson that we need both the spark and the technique. Routine procedures are well described in books, but not so the latest methods of research. Editors of journals and periodicals are more interested in the results of experiments than the technique, and research procedures often undergo a continuous evolution.

For this reason a group of American workers has begun publication of a series of volumes entitled "Methods of Research." This second volume contains three sections—methods of study of bacterial viruses, by Mark H. Adams ; pulmonary function tests, by Julius H. Comroe ; and the assay of hormone secretions, by Eleanor H. Venning. This odd mixture seems unavoidable, and all one can do is to commend the articles to workers in the different fields with the information that they appear to be well done. The Year Book Publishers seem to have a valuable technique of their own which enables them to publish the "hot dope," as the Americans call it, in an incredibly short time and at a price which would be reasonable but for devaluation.

L. J. WITTS.

THE ACTION OF DIGITALIS

Digitalis and Other Cardiotonic Drugs. By Eli Rodin Movitt, M.D. Second edition. (Pp. 245 ; illustrated. £2 5s.) New York: Oxford University Press. London: Geoffrey Cumberlege. 1950.

During the last few years the action of digitalis has aroused fresh interest in several directions. The work of McMichael and Sharpey-Schafer has suggested that "digoxin" exerts its effect not directly on the heart but by a vascular action whereby the pressure in the right auricle is reduced. In the second edition of his book Dr. Movitt discusses their work, but shows that others, notably Stead and also Bloomfield, who have employed the same technique of right-heart

catheterization have obtained different results, which indicate that digitalis improves the cardiac output by an action on the heart itself.

In the treatment of congestive failure, Gold and his colleagues recommend first of all the use of mercurial diuretics and salt restriction. They say that these agents alone control the congestive failure in many patients who do not respond to digitalis. Dr. Movitt considers that Gold's view—that in such patients the use of digitalis is of little importance—is an extreme one, though he admits that in many cases digitalis is ineffective when the rhythm is normal. It is interesting to note this general agreement that, with a normal rhythm, digitalis is often without action. This was the view of Mackenzie and Lewis, who accordingly reserved digitalis for cases of fibrillation. Only a few years ago, however, they were considered to be out of date.

In discussing the part played by the vagus in bringing about the slowing which follows digitalis administration the author quotes the work of Porter, who believed that failure to demonstrate the vagus effect was due to the use of doses of atropine which were too small. The same point was shown by Lewis and his colleagues in 1922, though it is now overlooked.

The chief criticism, indeed, which is to be made of this book is that it contains only five references to the work of Lewis. It seems a pity that the careful studies he made should now receive so little attention. Perhaps he wrote too much.

J. H. BURN.

MEDICAL THERAPEUTICS FOR STUDENTS

Aids to Medical Treatment. By T. H. Crozier, B.Sc., M.D., D.P.H., F.R.C.P. 2nd edition. (Pp. 439. 7s. 6d.) London: Baillière, Tindall and Cox. 1950.

The second edition of this representative of the "Aids" series, written by Dr. Crozier and a team of contributors recruited from his colleagues in Belfast, has grown to a volume of 439 pages. This increase in bulk, although it may depress the student who is intent on hasty revision, rightly indicates the growing complexity of medical therapeutics. The difficulty of divorcing discussion of treatment from that of diagnosis is apparent in many textbooks of therapeutics; Dr. Crozier has avoided this pitfall. His descriptions of treatment contain the minimum of clinical details; they are complete, readable, and properly dogmatic. The book can be recommended as an accurate and full account of medical therapeutics to-day, and it will provide the student with more than he needs for his final examination. It is unfortunate that the first word of Chapter I should have been mis-spelt.

R. BODLEY SCOTT.

THE SOCIAL WORKER

Social Work in the Current Scene. Selected Papers, 76th Annual Meeting, National Conference of Social Work, Cleveland, Ohio, June 12–17, 1949. (Pp. 392. £1 18s.) New York: Columbia University Press. London: Geoffrey Cumberlege. 1950.

In this volume is published a selection of the papers delivered at the last Annual Meeting of the National Conference of Social Work. The papers included in the book comprise only a small proportion of those presented and are arranged in three sections—philosophy, programme, and practice—of which by far the largest is that on programme. This emphasis is perhaps typical of the whole attitude of the majority of the papers: even those which appear in other sections deal more with hopes than with facts and realities.

It has been commonly observed in much of the social work practised in America, as in many other countries, including Britain, that the social worker's attitude to the people among whom he practises is, consciously or unconsciously, condescending. Implicit in most of the papers in this book is the attitude that the conflicts experienced by individuals are due to some fault in them, that the social worker has the key which enables him to "adjust" them to society, and that he stands outside society and acts as guide, philosopher, and friend to the poor and the disabled, who, poor things, are incapable of managing their own affairs and need to be taught better. Although a number of the papers dutifully mention the fact that environment produces many of these conflicts or that the individual should have some rights, few go on to elaborate on the part which the social worker should play in the fight for a better environment. The elaboration is almost entirely on the role of the social worker in "treating" the individual or the family.

There are exceptions to this attitude in some of the papers, exceptions not only in the pious hopes they express but also in the underlying approach to the subject. In particular, Alva Myrdal discusses society's responsibilities towards children and poses a programme for child welfare which is comprehensive and realistic.

LILLI STEIN.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

The National Health Service. By R. Ormrod, M.A., B.M., B.Ch., and H. Walker. (Pp. 641. 27s. 6d.) London: Butterworth. 1950.

Pathologische Histologie. By M. Borst. 4th ed. (Pp. 539. M. 94.50.) Berlin: Springer. 1950.

Die Wirkungseinheit des Lebens. By L. Seitz. (Pp. 500. M. 30.) Berlin: Urban and Schwarzenberg. 1950.

Spezielle Chirurgische Diagnostik. By F. de Quervain. Edited by K. Lenggenhager. 10th ed. (Pp. 767. M. 75.) Berlin: Springer. 1950.

Lehrbuch der Kinderheilkunde. By R. Degkwitz and others. Edited by E. Rominger. 4th and 5th editions. (Pp. 971. M. 49.80.) Berlin: Springer. 1950.

An Atlas of Amputations (Henry Kimpton, 1949; £7), by Dr. D. B. Slocum, is well produced and illustrated, and the information is clearly set out. Written from the American point of view, it is not suitable for general use in Britain, but should find a place as a reference book in libraries. The discussion on surgical aspects is good, but some of the technique described differs from that in Britain. The author sets out the lengths of stumps—that is, ideal stumps—in inches, but patients differ in height, and they may be children. Indeed, he does not mention the special needs of child amputees. The section on complications of amputated stumps is sound, but little reference is made to the correct way to bandage stumps, though some complications that may result from incorrect bandaging are commented on. The discussion on the mechanics of the gait of the normal subject and the amputee is one of the best features of the book, and worth studying by all who work with amputees. The section on prostheses, which is fully illustrated, is devoted only to American types. Modern British artificial arms with quickly detachable appliances are considered to be in advance of those illustrated here. There is a good section on the methods of physical medicine in the treatment of the lower limbs, though again there is little reference to the importance of correctly bandaging each type of amputated stump.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY SEPTEMBER 23 1950

CONGENITAL HEART DISEASE

The newer methods of investigation of congenital heart disease, particularly cardiac catheterization and angiocardiography, have given valuable help in establishing the exact nature of the malformation. Many physicians familiar with the results of these investigations have the impression that the ordinary methods of clinical examination and of radiology of the heart have been largely superseded by these newer techniques and that a diagnosis can be made only with their aid. In the St. Cyres Lecture, published in this and last week's issues of the *Journal*, Dr. Paul Wood has demonstrated convincingly how the information gained by cardiac catheterization and, to a lesser extent, by angiocardiography may be used to increase the accuracy of clinical diagnosis through a better understanding of the physical signs elicited at the bedside. The emphasis he places on clinical signs is especially valuable at the present time in view of the tendency to rely more and more on the results of elaborate instrumental investigations.

In most of the common types of congenital heart lesion, with the exception of the ventricular septal defect, Wood's description of the clinical, catheter, and angiocardiographic findings is in general agreement with other published work. The diagnosis of a ventricular septal defect is usually based on the presence of a loud systolic murmur often associated with a thrill at the lower left sternal border without any other signs of heart disease, but only four of Wood's twenty-four cases would fit in with this description. In the others, in addition to the typical Roger murmur and thrill there was a thrusting left ventricular type of impulse and increased pulsation on the outflow tract of the right ventricle and pulmonary artery. A functional mitral diastolic murmur was present in most of the severe cases, and the radiological appearance was identical with that seen in a patent ductus arteriosus—with left ventricular enlargement, a prominent pulmonary artery, and increased pulmonary vascular markings. Selzer[1] reviewed the post-mortem findings in 92 cases of ventricular defect and reported that the size of the right ventricle and pulmonary artery bore a direct relationship to the size of the defect, and that since the defect was usually a small one there was often very little change in the size of the heart or the pulmonary artery. It seems likely that the majority of the cases Wood has described had a medium-sized or large defect, and the number of such cases may have been disproportionately big in his series. Clinical experience and necropsy findings suggest that the classical description of the "maladie de Roger" adequately covers the majority of cases of ventricular septal defect. Death from cardiac failure occurred in only 15% of Selzer's cases, and, since the risk of death from bacterial endocarditis is now a small one, a ventricular septal defect should still be considered a relatively benign lesion compatible with many years of active life. Brock's[2] demonstration of the successful treatment of pulmonary stenosis by pulmonary valvulotomy has emphasized the need for accurate diagnosis of this condition. It has become evident that pulmonary stenosis is not the rarity Taussig[3] stated it to be, so that Wood's detailed description of the various types of pulmonary stenosis is particularly welcome. In mild cases pulmonary stenosis may cause no symptoms and need no treatment, whereas the severe case should be benefited by surgery.

The value of angiocardiography as an aid to diagnosis is well shown in some of the illustrations accompanying Wood's paper. The technique of injection which has been most commonly used in this country is that described by Robb and Steinburg.[4] Recent technical developments with the *x*-ray camera in Scandinavia have shown that it is possible to obtain 12 pictures per second simultaneously in two planes, and it is probable that additional information about the heart action in health and disease will be obtained with this method. For routine use the simpler mechanical film-changing devices enabling pictures to be taken at one-second intervals give valuable information, particularly in cyanotic congenital heart disease. Campbell and Hills,[5] reporting their findings in 50 such cases investigated by angiocardiography, obtained clear evidence of the right-to-left shunt and overriding of the aorta in all cases with the tetralogy of Fallot. Direct demonstration of the actual pulmonary stenosis proved to be difficult because of the variable shape of the outflow tract of the right ventricle. Early filling of the pulmonary artery may occur in the presence of pulmonary stenosis, but later films showed no steady increase in the density of the lung fields. Similar findings in cyanotic congenital heart disease have been described by Zinsser and Kendrick.[6] They found angiocardiography to be less helpful than cardiac catheterization in patients with

[1] *Arch. intern. Med*, 1949, **81**, 798.
[2] *British Medical Journal*, 1948, **1**, 1121.
[3] *Congenital Malformation of the Heart*, 1947. Commonwealth Fund, New York.
[4] *Amer. J. Roentgen.*, 1939, **42**, 14.
[5] *Brit. Heart J.*, 1950, **12** 65.
[6] *Penn. med. J.*, 1949, **52**, 1665.
[7] *J. thorac. Surg.*, 1949, **18** 860.
[8] *Brit. Heart J.*, 1949, **11**, 398.

uncomplicated septal defects or a patent ductus arteriosus when the shunt is from left to right, although occasionally the sudden rise of pressure in the right auricle after the injection would cause a temporary reversal of the shunt through an atrial septal defect. Re-circulation of the dye through the right heart in this type of case was difficult to demonstrate, since some of the "diodrast" was often held up in the vein used for injection and might reach the heart at the time when re-circulation was likely to be occurring.

In cases of coarctation of the aorta or patent ductus arteriosus it is difficult sometimes to obtain satisfactory pictures of the aorta, because dilution of the bolus of diodrast in its passage through the right heart and lungs has occurred. Injection into the pulmonary artery through a cardiac catheter may overcome this difficulty, but the length and narrow bore of the catheter slow the speed of injection so that poor-contrast films may still be obtained. Direct injection into the arch of the aorta gives better results, and this has been carried out either by inserting a needle into the ascending aorta or by retrograde arterial catheterization. Burford, Carson, and Scott[7] have carried out direct aortography on 23 patients, using the left common carotid artery. Temporary occlusion of the artery distal to the point of injection prevented the dye passing directly into the cerebral circulation, and no complications were observed in any of their patients. They were able to demonstrate the detailed anatomy of the aorta and the exact site and extent of the stricture in patients with coarctation after injection of 20 ml. of dye. A patent ductus arteriosus could also be outlined, and this might be of help in differentiating those patients with an aortic septal defect or rupture of an aneurysm of the sinus of Valsalva into the pulmonary artery; in such cases clinical examination and the use of the cardiac catheter may give identical results. Fatti and Gilroy[8] have approached the same problem from a different direction: they inspected the arch of the aorta and the gap between it and the pulmonary artery with a thoracoscope. After induction of a small pneumothorax with 400–500 ml. of air they inserted the thoracoscope anteriorly into the second left interspace in the midclavicular line and obtained a satisfactory view. They were able to inspect the site of a coarctation and to demonstrate the presence of a patent ductus, while in one patient the pressure in the pulmonary artery was measured by needle puncture under direct vision.

Many patients with congenital heart disease are now treated surgically, and though the diagnosis of the malformation is usually possible by routine methods of examination the purpose of all these special investigations is to provide accurate details of the anatomy of the defect. The task of the surgeon is thus made less difficult.

COLCHICINE IN THE CHEMOTHERAPY OF CANCER

Colchicine, which was mentioned last week in the leading article about a secret remedy for cancer,[1] is a mitotic poison which has been much used in research as a chemotherapeutic agent for cancer. This alkaloid, which is extracted from the autumn crocus, is probably the most powerful "radiomimetic" drug known—that is, it reproduces the cellular changes induced in cells by *x* rays. Even at dilutions of 1 in 100,000,000 it can bring about the typical mitotic arrest at the metaphase stage. Microscopically, areas of a tissue treated with colchicine will sometimes show more cells in arrested division than in the resting state. Ludford,[2] who has ably reviewed the literature on this subject, examined the mode of action of colchicine on tissues grown *in vitro* and observed that the drug does not differentiate between embryonic and neoplastic tissue, which are equally sensitive to its mitosis-arresting activity. Other chemical and physical agents can inhibit mitosis, but, Ludford wrote, "colchicine is unique in that it does not arrest the initial phase of division but brings the process to a standstill at the metaphase in a remarkably wide range of concentrations." There is little evidence that colchicine stimulates mitosis as well as blocking it at metaphase, and, indeed, it has been reported that in high dilution it slows down the rate at which cells enter the mitotic cycle. Macroscopically, the most obvious effect of the drug on a tumour is to induce haemorrhage of the kind also caused by polysaccharide fractions of bacterial filtrates—for instance, from *Serratia marcescens*. Even in minute amounts, of the order of 0.1 μ, these cause necrosis and haemorrhage.[3] The similarity of the effects of colchicine and bacterial filtrates is close enough to have suggested that they inhibit tumour growth by the same mechanism—by attacking the sensitive cells of the capillary system of a rapidly growing tumour. One of the principal conditions of chemotherapy is maximal injury to tumour cells with minimal effect on normal tissue, and the use of colchicine appeared promising when examination by dark-ground illumination showed little alteration in the mitochondria and in the cytoplasmic granulation, indicating that the metabolic mechanism had escaped injury. Ludford found that mitosis could be blocked with dilutions of colchicine far below that required for metabolic disturbance: in one experiment a thousandth of the concentration needed for metabolic effect sufficed to arrest mitosis.

[1] *British Medical Journal*, 1950, **2**, 663.
[2] *J. nat. Cancer Inst.*, 1945, **6**, 89.
[3] See annotation in the *British Medical Journal*, 1950, **2**, 32.
[4] *Nature, Lond.*, 1935, **135**, 266.
[5] *Brit. J. Cancer*, 1948, **2**, 75.
[6] *Cancer Res.*, 1950, **10**, 420.
[7] *Surgery*, 1940, **7**, 696.

Amoroso[4] was one of the first to try the effect of colchicine on tumours in animals. He found that transplantable mouse carcinoma No. 63 responded by complete regression, and he successfully treated a carcinoma of the buccal mucous membrane in a dog. Among other early experiments with colchicine in animals the regression of multiple skin tumours in a mare has been recorded, and also of the Shope rabbit papilloma after the injection of a few milligrammes of the drug. In the latter case the treatment induced immunity to further infection by the virus. Colchicine has been used with success in experiments on the regression of a lymphoid tumour of the C3H strain of mice and on the Flexner–Jobling rat carcinoma. Ludford, after studying 17 different strains of transplantable tumours and 47 spontaneous mammary carcinomas, concluded that the lethal and chemotherapeutic doses are close to one another and that soft, highly cellular, rapidly growing tumours are the most responsive, the reaction of slow-growing tumours being negligible. In a detailed investigation[5] of the factors determining the action of colchicine on tumour growth he used a rapidly growing carcinosarcoma of the Strong A strain of mice. The transplants were treated with a 1 in 10,000 solution of the alkaloid, the total dose of 0.7 mg. being divided and spread over a few hours. The injections were repeated on the 26th and 35th day. After a sudden decline in the size of the tumour grafts growth was resumed, and on the 50th day after transplantation the experimental tumours were the same size as the controls on the 30th day. A spindle-celled sarcoma growing in Strong A mice was treated with a total of 0.154 mg. of colchicine. Two out of three tumours regressed completely. Nevertheless Ludford considers such success exceptional, the more typical result with colchicine being regression followed by recurrence. Among other factors which influence the effect of colchicine, he found that young adult mice are more resistant to the toxic action of the drug than very young or old mice, and that tumour regression is more obvious in strain A mice than in C57 mice. The results of treatment of mice bearing carcinoma 63—a soft, highly cellular tumour with a large number of mitotic figures—was to produce total regression in 5 mice out of 10. Three died of toxic effects, and the tumours of 2 continued to grow. The tumours which regressed showed extensive haemorrhage, just as in the case of tumours treated by bacterial filtrates. It has been suggested that the haemorrhage may be caused by pressure exerted on the newly formed capillaries by the tumour cells, which become swollen after colchicine treatment. Bass and Probet[6] in the U.S.A. recently reported the satisfactory treatment with colchicine of C3H hybrid mice bearing lymphosarcoma, the drug being given in doses of 0.5–0.75 mg. per kg. of body weight daily for 2 to 23 days. The regressions, expressed as fractions, were 8 out of 10 mice, 4/9, 12/20, and 10/28 in different experiments. The mice whose tumours regressed were observed for five months; immunity lasted at least 173 days after the original transplantation.

Although there is a close parallel between the nucleotoxic action of colchicine and of *x* rays—for instance, in the acquired tolerance of tumour cells to the drug and the acquired radio-resistance of tumours which were previously radio-sensitive—yet there are certain differences in the toxic effects on the nuclear chromatin. Colchicine is much more specific in its action on the nuclear structures. Ludford states that one of the outstanding difficulties in the colchicine treatment of tumours is the lack of cell-type specificity. Tests with the aim of supplementing the action of colchicine with radiotherapy have been, on the whole, without success. Several workers have investigated the action of colchicine in the treatment of cancer in man, but it was found that the drug caused very unpleasant symptoms, and sometimes death from colchicine poisoning. One woman was treated with colchicine combined with *x* rays for an adenomedullary carcinoma of the breast. The tumour at first shrank to a third of its original size, but then rapidly began to grow again, with fatal results. Another patient with an anaplastic carcinoma of the neck reacted in much the same way; the central portion of the tumour necrosed, but the peripheral layers grew with increasing speed.

Seed, Slaughter, and Limarzi,[7] after investigating the action of colchicine on human subjects and on laboratory animals, concluded that, "although the rapidly growing cancer cells are much more susceptible to the poison, the concomitant general toxic effect is much too great to expect any curative effect."

THE TREATMENT OF VOMITING

In the opening pages of this issue we publish the paper on the antihistamine compounds which Professor J. H. Burn read at the Annual Meeting of the B.M.A. in Liverpool. In his lucid review of the pharmacological action of this interesting group of drugs Professor Burn refers to a substance named "dramamine" which was introduced last year in the U.S.A. for the prevention and cure of seasickness. Those who were present at the Liverpool meeting also had the benefit of hearing Dr. Leslie Gay, of Baltimore, describe his original work with this drug.[1] Little attention has been given to its composition, but it is in fact a combination of "benadryl" with theophylline (into which a chlorine atom has been introduced). Both benadryl and dramamine are said to relieve the nausea and vomiting of pregnancy. Finch[2] believed that the success he had with benadryl was adequate proof that this symptom complex was an allergic reaction. The investigation of the

efficacy of dramamine in controlling morning sickness was carried out by Gay and Carliner,[3] who had done the original work on seasickness with this drug during an Atlantic crossing on a U.S. Army transport.[4] Forty-three pregnant women who had suffered for 4–6 weeks and had been treated unsuccessfully with various other remedies were given dramamine: 31 were completely relieved in three hours. Each patient continued to take 100 mg. of the drug three times daily: ten of them relapsed when a placebo was substituted, but recovered again when dramamine was resumed.

Beeler and his colleagues[5] have tested dramamine in irradiation sickness. The similarity between the lassitude, nausea and vomiting, anorexia, and malaise in motion and irradiation sickness suggested the trial. Eighty-two patients were treated and compared with 23 who received a placebo. Vomiting ceased in 65 of those given dramamine, but in only 3 of those given the placebo. The best results were obtained when 100 mg. of dramamine was given ½–1 hour before irradiation and repeated twice after irradiation, at 90 and 270 minutes. Campbell[6] found another use for dramamine—in the prevention of nausea and vomiting due to disorders of the vestibular apparatus, such as Ménière's disease, and after the fenestration operation for otosclerosis. Twenty-eight patients were given the drug after undergoing the fenestration operation, and all of them were relieved "to a large extent." Some could leave their beds on the day after operation, could drink freely and take soft food. Dramamine was given only on the day of operation and the following day, but there was no recurrence of vertigo and nausea when it was discontinued.

All the foregoing observations carry the suggestion that dramamine has properties unlike those of any other drug and that it alone can give relief in these conditions. None of the authors apparently thought of comparing dramamine with hyoscine, which was found by Holling, McArdle, and Trotter[7] during the war to be the best remedy for seasickness. Hyoscine of course is a cheap drug, but Chinn and Oberst[8] have recently brought it into the limelight as a competitor to the more expensive proprietary remedies. Working at the U.S.A.F. School of Aviation Medicine at Randolph Field, they have shown that benadryl and dramamine have an almost equal protective effect against airsickness, but that hyoscine is appreciably better. Thirty per cent. of those taking benadryl vomited, and 28.7% of those taking dramamine, but of those taking hyoscine only 19.3% vomited. It is a reasonable conclusion from this that on present evidence, in all the forms of sickness which have been considered—vomiting of pregnancy, irradiation sickness, sickness after labyrinth operations, and different forms of motion sickness—hyoscine is the best as it is certainly by far the cheapest remedy. It is also much less likely to cause drowsiness or confusion.

[1] *British Medical Journal*, 1950, **2**, 347.
[2] *Amer. J. Obstet. Gynec.*, 1949, **58**, 591.
[3] *Science*, 1949, **110**, 215.
[4] *Bull. Johns Hopk. Hosp.*, 1949, **84**, 470. See also leading article in the *British Medical Journal*, 1949, **1**, 855.
[5] *Proc. Mayo Clin.*, 1949, **24**, 477.
[6] *Laryngoscope*, 1949, **59**, 1261.
[7] *Lancet*, 1944, **1**, 127.
[8] *Proc. Soc. exp. Biol., N.Y.*, 1950, **73**, 218.

EARLY DIAGNOSIS OF MILIARY TUBERCULOSIS

It is now well known that early diagnosis of miliary tuberculosis is vital if treatment with streptomycin is to be successful. Unfortunately early diagnosis is not easy. The symptoms are indefinite and in no way pathognomonic of the disease: the insidious onset of malaise, disinclination for exertion, lassitude, and anorexia could be associated with many other conditions. What is needed is a greater awareness of the possibility of miliary tuberculosis when those symptoms arise without any other explanation, especially in a child and when the tuberculin test is known to be positive. The simple tuberculin-jelly test should be used more often in general practice, but the skin should be prepared in the way described by Pointon Dick.[1] A negative jelly test, though not entirely excluding tuberculosis, goes a long way towards doing so, while vague indefinite symptoms of ill-health in a child who gives a positive result to the test are highly suspicious of tuberculosis and are sufficient grounds for sending him to hospital for investigation. It would help the practitioner if the tuberculosis officer or chest physician would let him know when a child in his practice is found to be a contact of a patient with tuberculosis or to have a positive tuberculin reaction. It is not the general practitioner's responsibility to make a confident diagnosis of miliary tuberculosis but rather to bear the possibility of the condition in mind and, when suspicious, to send the child for specialist investigation.

The early diagnosis of miliary tuberculosis is not easy for the specialist, even when he is able to carry out all the usual investigations. A negative tuberculin test, first with 0.1 mg. and then with 1 mg. of old tuberculin, is only very rarely found in miliary tuberculosis in spite of the relative anergy to tuberculin which it is known to cause. The one definite physical sign on which to base a confident diagnosis of miliary tuberculosis is the presence of choroidal tubercles. Illingworth and Wright have described their appearance and characteristics in this *Journal*.[2] Careful search revealed their presence in 70 out of 114 cases (61%) of proved miliary tuberculosis. Only in very exceptional cases can choroidal tubercles be found in tuberculous patients without miliary spread,[3] but their absence clearly does not exclude miliary tuberculosis. Elsewhere in this issue Drs. J. L. Emery and J. Lorber point out how difficult it is to make an early diagnosis on radiological evidence. By correlating the *x*-ray appearances with the results of pathological examination of the lungs of 52 children these workers showed that there was no *x*-ray evidence of miliary tuberculosis at any stage of the disease in 34 of the children (65%), while at necropsy they found macroscopic miliary tubercles in 23 and microscopic ones in the remaining 11. In another six children, who had received streptomycin treatment, the last radiograph, taken within two weeks of death, showed no miliary lesions, though the diagnosis had been made on previous radiographical evidence; macroscopic miliary tubercles were found at necropsy in all six. In only 12 (23%) did the last *x*-ray examination before death reveal miliary lesions. It is clear that *x*-ray examination cannot be relied upon for the early diagnosis of miliary tuberculosis. This must depend on clinical judgment, the result of the tuberculin reaction, a reasoned assessment of the symptoms, a careful search for choroidal tubercles, and radiological examination of the chest, repeated when necessary.

[1] *British Medical Journal*, 1950, **2**, 141. See also annotation, on p. 154.
[2] Ibid., 1948, **2**, 365.
[3] Monbrun, A., and Lavat, J., *Bull. Soc. Ophtal. France*, 1949, Suppl. No. 3.

FRACTURE OF THE NECK OF THE FEMUR

In the lifetime of some of us, true, or so-called intracapsular, fracture of the neck of the femur—typically seen in old women—has passed through three phases. First came the phase of fatalism, with the supposition that such fractures never unite by bone—a phase of negligible or ineffective treatment. Next came the period of hopefulness, of which Whitman was the pioneer with his reduction of the fracture and plaster immobilization in an extreme position—a procedure which sometimes led to union of the fracture but was a severe test of the patient's endurance. Indeed, it provided an ordeal which many of the elderly and aged failed to survive. The introduction of skeletal fixation of the accurately reduced fracture—the third phase, of which Smith-Petersen was the brilliant pioneer—promoted union by proper immobilization. Technical improvements by Sven Johansson and others have made the operation relatively trivial for the patient, and it is life-saving in its early restoration of his comfort and mobility. In fact this operation has been so effective in saving life and restoring function that a new problem has arisen—namely, the frequent avascular necrosis of the femoral head. The dead head is replaced gradually by "creeping substitution." While this is in progress the structure is weakened, and the stress of weight-bearing, restored by effective treatment, may end in collapse of the head and consequent disorganization of the joint. There is no proved and practicable method of preventing this frequent calamity, which may occur as late as five years after fracture.

The surgeon's first anxiety must be the preservation of life in the aged victim of a severe and shocking injury. To this end many surgeons, perhaps most, would regard internal fixation of the fracture not only as necessary but as urgently necessary immediately primary shock is ended. On the other hand, these patients, though they withstand plaster immobilization so poorly, do well sitting up in a much-tilted bed with light-weight traction on the broken limb. Thus a feeble patient's fitness for operation may be greatly improved by a few days' delay with expert medical and nursing attention. Without these he will assuredly succumb. Whatever the policy about very early operation, the importance of early activity is incontestible in old people: they should sit out within a few days of operation, and early standing and walking should be encouraged. Often the flame of life burns so low in the aged that the least disturbance must extinguish it. Such patients cannot be expected to survive a disaster like a fractured femur; their days are already numbered. Not only are there patients in whom the general condition must forbid operation, but there are those in whom the softness of the bone—from osteoporosis or from Paget's disease—would doom it to failure. Fortunately there are some fractures of the femoral neck which require little or no local treatment—so-called abduction fractures, in which the head is impacted on to the upper angle of the stump.

Few conditions make a more insistent demand for good team-work than fracture of the femoral neck in the elderly. First-aid worker, general practitioner, surgeon, physician, anaesthetist, radiologist and radiographers, pathologist and, perhaps more than any, nurses have all an important part to play.

TREATMENT OF CARDIAC ARREST

So infrequently do instances of cardiac arrest on the operating table occur in the hands of any one surgeon that it is all the more important that new information should be brought to general attention. The drama of such incidents is heightened by the fact that if the circulation is not maintained fatal cerebral damage will inevitably occur within a very short time. Clinical experience suggests that if the cerebral circulation is interrupted for more than three and a half minutes chances of recovery are remote, and from this it naturally follows that immediate cardiac massage is the most important single method of treatment, combined of course with adequate ventilation of the lungs. Physiologists, in working with animals, have had much experience of cardiac arrest: this is usually due to excess anaesthetic, and in these circumstances immediate intracardiac administration of adrenaline almost always restarts the heart, though cardiac massage may also be necessary. In man, however, sudden cardiac arrest is more likely to be due to the onset of ventricular fibrillation, and various predisposing circumstances have been considered, among which may be mentioned the use of some of the gaseous anaesthetics, vagal inhibition of the heart, and cardiac disease. In the case of cardiac arrhythmias—produced, for instance, by cyclopropane—it is quite certain that the administration of adrenaline is harmful and may precipitate ventricular fibrillation, even though in the normal heart this drug will increase the strength and frequency of the beat. For this reason substances such as quinidine and local anaesthetics, which have been known since the work of Kochmann and Daels[1] in 1908 to reduce the irritability of the myocardium, have been tried in instances of sudden cardiac arrest. As reported by Mr. H. L. M. Roualle on another page, procaine may be administered intravenously or, if the heart is exposed, by topical application, and it has been found of real value according to Beck,[2] Lahey and Ruzicka,[3] and Burstein.[4] An adequate intravenous dose seems to be 100 mg. of procaine for an adult patient under general anaesthesia. Much more experience is required with this remedy, but because of the seriousness of the condition every new method should be given a fair trial. This cannot be done unless the procaine is ready to hand in the emergency equipment reserved for such incidents.

[1] *Arch. int. Pharmacodyn.*, 1908, **18**, 41.
[2] *Amer. J. Surg.*, 1941, **54**, 273.
[3] *Surg. Gynec. Obstet.*, 1950, **90**, 108.
[4] *Anesthesiology*, 1949, **10**, 133.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CHEMOTHERAPY—IV. THE NEWER ANTIBIOTICS

BY

LAWRENCE P. GARROD, M.D., F.R.C.P.

Bacteriologist, St. Bartholomew's Hospital; Professor of Bacteriology, University of London

A world-wide search for further antibiotics has now been in progress for nearly ten years. It has been far more extensive and systematic in the U.S.A. than anywhere else, and it is therefore not surprising that all its results of outstanding value are American monopolies. This survey has ranged over the whole plant kingdom, and interesting substances with antibacterial properties have been recovered from such things as algae, toadstools, bananas, and hops. They have also been found in many species of bacteria, some of them pathogenic. Despite this profusion and variety, properties such as to qualify antibiotics as chemotherapeutic agents are almost confined to those derived from the following three sources.

Higher Fungi.—Penicillia and *Aspergilli* in particular are frequent producers of antibiotics, but almost all of these other than penicillin itself are toxic, and no other is a suitable chemotherapeutic agent.

Actinomycetes.—These are the source of streptomycin, discovered in 1944, and of "aureomycin" and "chloromycetin," which have been known since 1948. These two are much the most important of the newer discoveries, and form the main subject of this article. Terramycin was first described only a few months ago, and its potentialities are still largely unexplored, but it is of similar nature to the two foregoing. Neomycin seems likely to prove too toxic for therapeutic use.

Bacilli.—This name is used in its generic sense, denoting Gram-positive sporogenous aerobes. These are the source of tyrothricin (originally "gramicidin"), now recognized as suitable only for local application, and of the polymyxins (including "aerosporin"), subtilin, bacitracin, ayfivin, licheniformin, and other substances which have been extensively studied and found to possess marked chemotherapeutic activity, susceptible organisms including many species of Gram-negative bacillus and in some cases the tubercle bacillus. Their disadvantage is a strong tendency to produce renal tubular degeneration, resulting in albuminuria and sometimes anuria. It is not yet certain how far this risk can be minimized or whether it may sometimes be justifiable to take it in order to deal with a serious and otherwise resistant infection.

Aureomycin and Chloromycetin

Except in a few research centres, these antibiotics are at present obtainable in this country only from Ministry of Health supply depots and are employed for the treatment of a few specified diseases in which their use is most strongly indicated. It is to be hoped that in time they will be more freely available; in the meantime this account of them may seem a little out of place in a "refresher course." However, it is written to complete a series and partly in anticipation of the future.

Aureomycin, derived from *Streptomyces aureofaciens*, so named from its golden yellow colour, is manufactured by Lederle & Co. The mould from which it is obtained is incidentally a valuable growth-stimulant for pigs and poultry. Chloromycetin (Parke, Davis & Co.) was originally obtained from *Streptomyces venezuelae*, but has now been synthesized. The synthetic product is that now marketed under the alternative name "chloramphenicol." These two antibiotics have many properties in common, notably their pharmacological behaviour, which differs from that of penicillin or streptomycin, with the result that they are administered in a different way.

Administration

It is fortunate that neither has to be administered by injection, since chloromycetin has much too low a solubility, and aureomycin hydrochloride, besides being none too soluble, forms a strongly acid solution which causes serious damage and severe pain when injected intramuscularly. (A form of aureomycin suitable for intravenous injection is available in the U.S.A. although not yet in England.) These difficulties are more or less unimportant, since both drugs exert their full effect when given by mouth, and the fact that the patient has merely to swallow capsules instead of submitting to injections is their most obvious advantage.

Capsules of either contain 250 mg., and two, three, or four may be given three or four times a day. Absorption is comparatively slow and incomplete, since both drugs have a marked effect on the intestinal flora. This is to a great extent suppressed, and the stools become almost odourless. Owing to slow absorption, the drug persists in the blood for as long as 12 hours or more after a single dose, and frequent administration is therefore unnecessary. Aureomycin also reaches the cerebrospinal fluid, and has been used successfully in meningitis. The intrathecal administration of either is out of the question. Both are excreted in the urine in fairly high concentration, though only a fraction of the dose administered can be thus accounted for.

Toxic Effects.—No serious toxic effects are known. Aureomycin has hitherto been apt to cause nausea, with or without vomiting, and diarrhoea in a minority of patients, but a more highly purified product now coming into use is said to obviate even this minor disadvantage. Chloromycetin is apt to cause only anorexia and dryness of the mouth.

Mode of Action.—Whereas penicillin and streptomycin are both bactericidal, aureomycin and chloromycetin are purely bacteriostatic in their action. The viable count of susceptible bacteria exposed to them *in vitro* under conditions favouring growth remains almost constant for many hours. Whatever the nature of this effect, it is apparently not one from which bacteria can learn to escape. A moderate and temporary increase in resistance to chloromycetin has occasionally been observed in some species, but even less evidence of any capacity on the part of bacteria to develop resistance has been observed in studies of aureomycin. It appears therefore that habituation, an ever-present threat to the usefulness of streptomycin, is not likely to impair that of either of these drugs, whether in the treatment of individual cases or by the general propagation of resistant strains.

General Indications.—These two antibiotics have a wide range of activity, overlapping that of penicillin and other chemotherapeutic agents to a considerable extent. It is by no means all-embracing: neither drug has any useful action on the tubercle bacillus, nor has chloromycetin on the spirochaete of syphilis or on the clostridia. Generally speaking, chloromycetin is the more effective against Gram-negative species, and aureomycin against Gram-positive. For the present, both drugs are likely to be used only in infections resistant to other forms of treatment, and the more important of these have now to be specified. Pride of place has to be given, not to any bacterial infection, but to rickettsial and certain virus diseases, the conquest of which is much the most notable achievement of these drugs.

Indications for Chloromycetin

Rickettsial Infections.—It is a staggering fact that all forms of typhus are now fully and easily amenable to chemotherapy. The story of the therapeutic trial of chloromycetin in scrub typhus in Malaya is now well known. Laboratory studies having shown that the drug possessed marked anti-rickettsial activity, a small supply was taken to Malaya and tried in cases of scrub typhus, with results so dramatic that from the first they left no room for doubt. A disease normally lasting a fortnight or more and having a far from negligible mortality could regularly be terminated in about 48 hours by administering only a few grammes of the drug. Small doses would also prevent the disease in subjects deliberately exposed to it. Similar curative effects are now known to be obtainable in epidemic typhus, murine typhus, and Rocky Mountain spotted fever. Aureomycin is also known to be effective in these three infections and in Q fever, the latter, incidentally, being the only rickettsial infection known to exist in the British Isles. Its recent recognition here suggests the possibility that more cases may come to light and provide a new though presumably restricted field of usefulness for this drug.

Typhoid Fever.—The action of chloromycetin in this disease is also unequivocal, if less dramatic, and the indication for it is imperative. There is a lag of about 48 hours before the treatment produces abatement of fever, and administration has to be continued for over a week if relapse is to be prevented. Bacteriaemia is regularly abolished, but the organism is not eliminated from the intestine, and the persistence of a carrier state is unfortunately not prevented. Severe cases of paratyphoid should also be treated with chloromycetin, as may other varieties of salmonella infection, including the acute enteritis caused by members of the food-poisoning group. Aureomycin, although possessing an *in vitro* activity against *Salm. typhi* not far removed from that of chloromycetin, has a disappointing and inconstant effect on typhoid fever. In this it behaves like streptomycin, both illustrating the fact that *in vitro* is not an invariable guarantee of *in vivo* activity.

Undulant Fever.—Chloromycetin has not been as extensively used as aureomycin in this disease, but the evidence, so far as it goes, is that their effects are similar, if not indistinguishable. Fever is terminated within a few days, and provided dosage is adequate and treatment continued long enough—usually 10 to 14 days—cure may be permanent. Relapse, if it occurs, responds to further treatment.

Other Indications.—Chloromycetin has been used successfully as a urinary antiseptic, despite the fact that a large proportion of it is excreted in an inactive form. Most organisms found in the urine are fully susceptible to it. Notable exceptions are *Ps. pyocyanea*, which is usually very resistant, and *Proteus vulgaris*, which is moderately so. It does not seem to be necessary to control the reaction of the urine in order to favour its effect. The drug will also cure gonorrhoea, with the advantage that, since it has little action on *Treponema pallidum*, there is no risk of masking syphilis. Other conditions in which its possible usefulness remains to be more fully explored are whooping-cough, cholera, and bacillary dysentery.

Indications for Aureomycin

As already stated, aureomycin is known to share the efficacy of chloromycetin in most rickettsial infections.

Virus Diseases.—There is unequivocal evidence of the efficacy of aureomycin in three virus diseases—primar atypical pneumonia, psittacosis, and lymphogranulom venereum—and the drug is definitely indicated in thes conditions. To what extent chloromycetin can replace for these purposes is not yet known: primary atvpic pneumonia is said to respond to both, though some ev dence suggests that aureomycin is preferable. It is als claimed that aureomycin can cut short an attack of herpe zoster, but this remains to be proved by further experience These are the only virus diseases, except perhaps trachoma at present known to be influenced. There is certainly n action on poliomyelitis or on influenza or the commor cold.

Undulant Fever.—As already stated, both antibiotics ar effective remedies for this disease, and aureomycin has been used the more extensively, proving its worth in infectio due to both *Br. abortus* and *Br. melitensis.*

Pneumonia.—It has repeatedly been emphasized b American authors that aureomycin is effective in al forms of pneumonia, whether due to pneumococci, strepto cocci, or staphylococci, to Gram-negative bacilli such as *H. influenzae* or *Bact. friedländeri*, or to the viruses of primary atypical pneumonia or psittacosis. The results in pneumococcal pneumonia have been found to equal those obtainable with penicillin. This all-embracing activity makes it possible to treat the disease successfully without even taking the trouble to discover its cause. When no facilities exist for doing so, this will of course be an inestimable advantage, and it seems likely that when aureomycin becomes freely available it will become standard treatment for pneumonia in general practice.

Staphylococcal Infections.—Aureomycin is the answer to the increasingly serious problem of penicillin-resistant staphylococcal infections. Some authorities in America take the view that aureomycin should be given from the first in staphylococcal septicaemia and other severe infections, pending an estimation of the sensitivity of the organism to penicillin. If this proves to be normal, then penicillin can be continued alone. The drug may now be obtained for such cases in this country if penicillin resistance has been confirmed, provided that the patient is in hospital.

Venereal Diseases.—Aureomycin is unique in having a therapeutic effect in all common forms of venereal disease. It will cure gonorrhoea; it has a pronounced effect in syphilis, though its relative value in various forms of this disease remains to be determined; as already mentioned, it is effective in lymphogranuloma venereum; and, finally, it will cure non-specific urethritis.

Urinary-tract Infections.—On account of its wide range of activity, and the simplicity of its administration, aureomycin is probably the most commonly used urinary antiseptic in the U.S.A. at the present time. The drug is so

freely available that it can be used routinely without first trying older remedies. The only common infections resistant to it, as to chloromycetin, are those due to *Ps. pyocyanea* and, to a less extent, *Proteus vulgaris*. So long as scarcity persists with us, a sensible policy would be to treat any coccal infection, at least in the first place, with penicillin, and to reserve aureomycin for coliform infections (other than the two mentioned) which have proved resistant both to sulphonamides and to streptomycin. Aureomycin is excreted unchanged in the urine, which it renders acid, a condition favouring its activity. It is not clear how short a period of treatment will suffice, but four days at the rate of 3 g. daily is certainly enough in some cases. Nor is it yet clear how its merits for this purpose compare with those of chloromycetin. In my limited experience, one case of *Bact. aerogenes* infection was cured with aureomycin when chloromycetin had failed.

Miscellaneous Indications.—According to some American authorities, aureomycin is the most effective of the antibiotics in the treatment of general peritonitis. It is recommended that the initial doses be given intravenously. There is reason to believe that it will be effective in spirochaetal infections other than syphilis, such as relapsing fever and Weil's disease. Its effect in amoebic dysentery, accidentally observed when it was administered for another condition, has now been extensively confirmed, though it does not seem to have been shown to be actually superior to that of emetine. The claim that aureomycin acts in infectious mononucleosis remains to be substantiated.

Neither of the new antibiotics has much scope as a local application, but aureomycin borate has been successfully used in this way in various forms of conjunctivitis.

Conclusion

It will be evident from this account that aureomycin is the most widely useful of all the antibiotics, though chloromycetin is its equal in some conditions, and in one at least (typhoid fever) its superior. Chloromycetin is now being manufactured in this country, whereas for the present at least aureomycin and terramycin, for which there is likely also to be a large demand, have to be paid for in dollars. We are in a strange situation when international economic considerations have to be given weight in therapeutic policy, but it seems at present an inescapable duty to prefer chloromycetin to either of the others when it will serve equally, or even nearly, as well.

THE PROTECTION OF LABORATORY ANIMALS

[BY A SPECIAL CORRESPONDENT]

A document has been received from Major C. W. Hume, director of the Universities Federation for Animal Welfare, entitled "First Draft for a Model Act for the Protection of Laboratory Animals." The covering note explains that the ultimate purpose of this draft is to enable U.F.A.W. to help inquirers from abroad who desire to promote such legislation in their own countries. Those in favour of legislation regulating the use of animals for experiment—and few who have experience in this country of the Cruelty to Animals Act of 1876 can doubt its value—will applaud Major Hume's intention, however much they may be driven to deplore the form which it takes.

Seventy-four years' experience in this country of an Act which was introduced following a Royal Commission, and which has been the subject of a prolonged and critical study by a second Royal Commission, has shown that the very delicate subject of animal experiments is capable of administrative control, provided the administration is wise, faithful, and not shackled by pettifogging statutory requirements. In so far as our present Act falls short of the ideal at which it aims, it is largely because its framers strove to crystallize in terms appropriate to 1876 ideas which were inevitably subject to change and development. For instance, the elaborate certificate system has proved a redundant safeguard of little value, the function for which it was designed having been usurped by the administration. The statute, however, requires that this machinery shall still operate, and the time of presidents and professors is taken up with scrutinizing and signing documents which are later checked at the Home Office; as often as not they are found wanting in some technical detail and have to be returned to the applicant to start their journey all over again.

The "Pain Condition"

The working of the present Act revolves round the so-called "pain condition," which accurately expresses the views of the second Royal Commission on Vivisection (1906–12) about the maximum amount of pain which in the pursuit of knowledge it was reasonable or justifiable to inflict on animals. It can be confidently asserted that this pain condition is rigidly observed. The obligation placed by it on the Home Office inspectors to order the destruction of animals which in their opinion are suffering unduly has not been called into action in recent years, and it must be emphatically stated that this, so far from being an indictment of inspectors, is a tribute to the conscientiousness of licensees and the sound sense of their colleagues.

In framing or administering an Act of this kind the guiding principle must be to relate the maximum amount of pain which it is permissible to inflict on animals for the acquisition of knowledge to that which public opinion tolerates in other pursuits. And since public opinion may vary from decade to decade allowance for this must be inherent in such an Act. Major Hume's draft is lengthy, specific to such a degree as to be unworkable, and inflexible, yet it still leaves unsolved many of the ambiguities of the Act of 1876. Moreover, the fact that many of his implications are scientifically unsound cannot be overlooked. To give but one example, he suggests that "the passage of a continuous electric current through the brain shall not be deemed to produce anaesthesia unless its path, amperage, and wave-form shall conform to requirements to be determined by the Minister in the light of experimental investigation." What can this mean if it does not imply that the Minister is to set up an advisory body to determine the path, amperage, and wave-form required to produce anaesthesia in all types of animal liable or likely to be the subject of experiment? One could add other examples, but to do so might suggest that this draft is capable of amendment and revision. This is not so. A wider knowledge of the administrative problems involved, of animals, and of scientists whose work demands the use of animals, is necessary to one who would tackle this problem usefully.

The draft suggests the setting up of a board of control to advise the Minister. This board "shall comprise persons who are competent to provide as wide an understanding as may be practicable of research in the sciences ancillary to medicine, persons with experience in veterinary practice, and persons who have been active in discouraging cruelty to animals." These three qualifications may presumably be mutually exclusive, so that we have the possibility of a board of control including persons who have been active in discouraging cruelty to animals but have no understanding of scientific matters—a dangerous situation.

What Is an Experiment?

Major Hume's Act proposes to regulate every "experiment" on a living animal, by which is meant "any test which is carried out on a living animal for a purpose other than veterinary diagnosis and is capable of causing suffering to, or interfering with, the normal health, comfort, or bodily or mental processes of the said animal, and includes *inter alia* any such test used for the purpose of biological assay." As an attempt at the admittedly difficult task of defining the term "experiment" this is remarkable only for the number of questions which it begs. But it is made quite clear later on that a licence shall be required even in experiments in which no pain or discomfort is caused. The implications of this affect every human activity in which animals have any part.

Although this draft falls far short of what might have been expected, it is only fair to point to its recognition of the fact that in one way at least the Act of 1876 is unduly restrictive. This is in the absolute prohibition of experiments, even on the anaesthetized, non-recovering animal, designed for the attainment of manual skill. Such a prohibition serves no useful purpose: indeed, it may well operate, from the animal as well as the human standpoint, in the reverse sense from that which was intended.

Major Hume remarks in his covering note that he takes personal responsibility for the views implied in this draft, but, since the document emanates from the headquarters of U.F.A.W., this organization may presumably be held to give it support. Were such an Act, or anything resembling it, to come into force in any country, animal experiments would for all practical purposes be brought to an end in that country. Alternatively, the Act would become a dead letter. To promote such legislation would therefore be a grave disservice to research and consequently to the whole community.

WORK OF W.H.O.

The World Health Organization celebrated its second birthday as a specialized agency of the United Nations on September 1, 1950, and took the occasion to summarize its work. To date 74 countries have ratified its constitution, although China, Albania, Bulgaria, the Byelorussian S.S.R., Czechoslovakia, Hungary, Rumania, the U.S.S.R., the Ukrainian S.S.R., and Poland are no longer participating. Southern Rhodesia has recently been admitted to W.H.O. as an associate member. While all countries benefit indirectly from the wide range of W.H.O.'s activities, well over half of them have been given direct assistance in one form or another in improving their health services. Projects of various kinds involving some 50 member States are at present under way.

Through regional offices already established—in New Delhi for South-east Asia, Alexandria for the Eastern Mediterranean, and Washington for the Americas (Pan-American Sanitary Bureau)—W.H.O. is able to give direct assistance to countries in meeting urgent health needs. Europe and the Western Pacific region are served through temporary offices located in Geneva and Hong Kong respectively. Within the framework of efforts to improve total health services, special emphasis is being given to malaria, tuberculosis, venereal diseases, environmental sanitation, maternal and child health, and nutrition. Meanwhile, all countries benefit from such overall services as the standardization of biological substances (penicillin, vitamins, etc.), the unification of pharmacopoeias, notifications of epidemics, international research on certain diseases, etc.

Some of the major projects which W.H.O. is carrying out at present through consultants, teachings, or demonstrations are:

Intensive malaria control demonstrations, with D.D.T.-spraying, in countries of South-east Asia and the Eastern Mediterranean. Seven training and demonstration teams are now at work in India, Pakistan, Thailand, and Afghanistan, with an advisory unit in Iran. W.H.O. also led a very successful antimalaria campaign among Arab refugees from Palestine.

Establishing of international training centres for tuberculosis control where doctors from several countries can study advances in this field. The first two centres have been established in Turkey and El Salvador. Others will follow in Pakistan, Burma, Ceylon, Thailand, and East Pakistan.

Demonstrations of the control of syphilis and yaws with penicillin treatment in countries of South-east Asia and in Haiti. W.H.O. specialists are working in regions where up to 85% of the population are found to have yaws and 50% syphilis.

Creation of the first international anaesthesiology centre in Copenhagen, where 21 W.H.O. Fellows from Northern and Central Europe are able to study modern methods of anaesthesia.

Publication of some 15 types of technical publications and scientific works.

Advice on the establishment of prenatal clinics, health education, modern obstetrics, paediatrics, and other subjects relating to the health of mothers and children. Some 15 countries have thus far received such assistance.

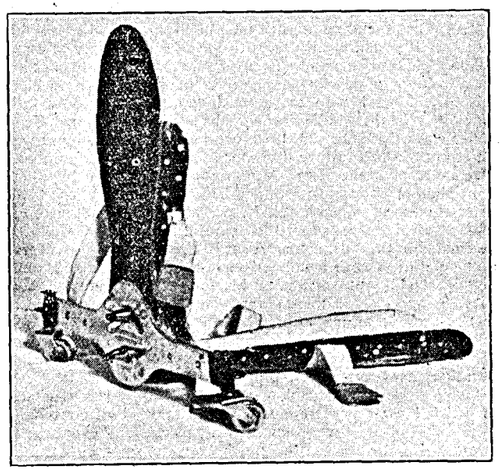
Supplementing these direct services, W.H.O. is organizing seminars grouping specialists from several countries in the hope of promoting useful exchange of scientific information, and perfecting the training of medical personnel. With the same objective in view W.H.O. is granting fellowships in specialized fields. Since September 1, 1948, nearly 500 fellowships have been awarded to people from over 30 countries.

W.H.O. is always ready to render emergency services as required. A supply of typhus vaccines was flown to Afghanistan recently when an epidemic threatened to assume dangerous proportions. Plans are now being made to send assistance to Korea. Epidemics were avoided when medical supplies were flown to the scene of two of the most violent earthquakes in the last few years—in Ecuador and Peru.

Preparations and Appliances

FOOT SPLINT

Mr. H. PETTY, F.R.C.S., consulting orthopaedic surgeon, Harrogate and Ripon Group of Hospitals, writes: I have designed the splint here illustrated primarily for use in the post-operative treatment of the vitallium cup arthroplasty. It enables the foot to be kept at right angles, and the amount of rotation of the



lower limb can be varied from full internal rotation to full external rotation, or it can be kept in the neutral position if desired, by means of the wing nut at the end of the splint.

Two very light castor wheels are attached to the base, which enable the splint to rest or move on a horizontal skating board. This foot-piece has been found extremely useful after many other orthopaedic procedures. It is very light, being constructed of duralumin, and was made for me by Messrs. A. Vizard, Ltd., Great George Street, Leeds, 1.

Sheffield Regional Hospital Board is to acquire Cannon Hall, Cawthorne, near Barnsley, for a mental hospital. The estate comprises 3,000 acres, of which the board proposes to acquire the hall, containing 32 rooms, outbuildings, garden and home farm, and some 270 acres of parkland. The new hospital will serve a population of 184,000 in the Barnsley area.

Correspondence

Distinction Awards

SIR,—During the course of the last week the chairman of the Distinction Awards Committee, Lord Moran, has addressed six meetings in the North-west Metropolitan Region. These meetings were arranged by the secretaries of certain management committees, and in the notices sent out it was stated that "Lord Moran . . . would like to have an opportunity of talking to consultants and explaining what is being done about distinction awards." The consultants concerned were invited to go to any of the six meetings which was most convenient to them.

I am informed that in the course of the various meetings Lord Moran asked those present to elect a single representative for each of several areas so that subcommittees could be formed which would send in their recommendations to the Distinction Awards Committee. Lord Moran said that a substantial proportion of these awards had already been earmarked and that the various subcommittees he was now forming would assist his own committee in making the remaining awards. The chairman of the Distinction Awards Committee also emphasized that there was now little time left in which to make these recommendations, and said that the work would have to be completed by the middle of October.

During one of the above meetings, at which I was not present and which was attended only by 4 of the 40 or so consultants in my own area, I was elected to one of the proposed subcommittees. While having no wish to burden your readers with my personal views on the distinction awards I feel that the above facts should be brought to their notice, and the following observations seem justifiable. First, the notices sent out to consultants contained no hint of the fact that Lord Moran was intending to delegate his responsibilities in this fashion. It would clearly seem to have been his duty to make this fact plain beforehand. Even so, one may seriously question the propriety of electing area representatives in this fashion. Secondly, Lord Moran emphasized that there was now little time left. In that he has been chairman of the Awards Committee since December 23, 1948, one may, perhaps, inquire why we are now asked to take decisions of so great importance with such indecent haste. Lord Moran could have made his intentions plain many months ago, and he might then have asked the staffs of non-teaching hospitals, or the area consultant committees, to give this matter their careful attention. Thirdly, as chairman of the Distinction Awards Committee, Lord Moran is (temporarily) both a salaried servant of the State and, more important still, the servant of his fellow consultants. Those who do approve of these awards are entitled to ask for as just as possible a method of selection.

Under the circumstances of my own election to one of these subcommittees I have thought it my duty to attend on the first occasion, as I was given only six days' notice of the first meeting. Since any defection on my part would leave the area in which I work unrepresented, I have notified all consultants in this area of the circumstances of my election. As representative of this same area on the North-west Metropolitan Regional Consultants Committee I have, however, called a meeting of all those concerned to discuss this subject and, if they so wish, to elect a representative in proper fashion. This meeting will take place in a few days, and I have made it clear that I must then resign from this Awards Subcommittee, whose task I consider as distasteful as its formation was irregular.

You, Sir, in your editorials and correspondence columns have published various views on the distinction awards, and I do not wish to enlarge on this subject now. I find myself in complete sympathy with those ideas which have been expressed in such eloquent and masterly fashion by Dr. F. M. R. Walshe, and I regret that our profession has suffered so seriously from lack of wise leadership in these difficult times. While members of the public and our general-practitioner colleagues watch our undignified scramble for these pensionable additions to the basic salary, I shall prefer to stick to my old-fashioned belief that the only true award for distinction is distinction.—I am, etc.,

Radlett, Herts. REGINALD S. MURLEY.

A Secret Remedy for Cancer

SIR,—I have no wish to reply to the personal comment on myself, and the Editor of *Picture Post* has asked me not to answer the abuse of the paper. I beg to take the factual points you make one by one and answer them in detail. (See *Journal*, September 16, p. 663.)

I am glad that you recognize with me that the Presbyterian Hospital is "in good standing." This supports my acceptance of details drawn from the hospital case histories and the official reports of the "Tumor Therapy Committee." I agree that the work is "entirely experimental." We stated that. But if the American committee did not feel the work done justified further investigation they would scarcely offer to set up a clinic in the Presbyterian Hospital for continued research on a larger scale as recently as July 31. These offers were made both directly to Rees Evans and to a lawyer of the highest repute. Mr. Rees Evans did not receive a single penny for his ten months' work in America, nor has he ever taken up any of the many commercial offers made to him, in spite of money difficulties.

You state that the Tumor Therapy Committee "evidently refused" to go further with the trial of Mr. Rees Evans's treatment "unless he agreed to divulge the composition of his drug to the Food and Drug Administration." I have already shown that this is untrue. The document on which you base your statement was signed during the investigations, which were then continued for several months. Attempts were made to dissuade Rees Evans from returning to England up to the very last moment.

You ask, "What is the evidence?" but have not tried to examine the data given you, except to pick out a few detailed points from the American experiment. This evidence falls into two parts, first the American experiment and then the statistical analysis of the British cases. You completely ignore this lengthy discussion of 100 of the British cases, extending over 30 years.

The point you raise about the biopsies is somewhat mysterious. We clearly pointed out that in two cases no biopsies were seen. As you know, Louise Gund had no biopsy, and the biopsy of Dr. Reilly was never seen, although his case was accepted as being biopsied on his own undertaking as a physican, a clear description of the findings being given. If there is another case that was not biopsied, then three leading members of the committee misinformed me. I do not believe this.

At the same time Rees Evans never received any proper account of the organization of the research, nor the research agreement he was led to believe would await him on his arrival. It is not surprising, therefore, that he would not commit himself until this was done. It can be stated now that he will give up his formulae quite willingly when an authoritative inquiry is really set up with all the proper safeguards to see that his claims are fairly treated.

You refer to the case of Rausch. He has suffered for some time from kidney trouble, and this is mentioned in the report submitted by the committee to the Federal Drug Administration (from which report this term "white kidney stones" was taken). It was not suspected of being cancerous and was not treated by Rees Evans. It is not clear whether this operation is for cancer, and we have asked for a full report on this point, preferring not to rely on an obscurely worded cable.

The case reported as dying is, I presume, Mrs. Barker. She was classified as terminal and, as you say in your comment, was only considered by us as a partial success. I think we were justified.

Your treatment of the early Cardigan cases, which have little to do with the report on David Rees Evans's work we presented, is, to say the least, ridiculous. One case only is mentioned—the only mention of an English case at all—I know of 43. You compare two photographs taken nearly 50 years apart, draw conclusions from them, and then proceed to repeat the old rote "zinc chloride" and "caustic," based on this alone, coupled with a most vague account of an analysis. The substances used by the old people and by Rees Evans are different, although they contain many of the same ingredients. If you had read my report you would have found accounts of tests for acidity, and a discussion of the possibility that a caustic is being used. Caustic corrodes: Rees Evans's fluids do not. When placed on the tenderest flesh, they do not eat into the healthy tissue. They can all be drunk safely.

This brings me to a further comment from America—that they contain tannic acid. Of course they do, as all herbal mixtures do. But the mixtures themselves are not acid. They are neutral and only become slightly acid after being kept for some time. All this is reported in my technical memorandum.

As for the colchicine: it was reported as cortisone when I was in America. Again I discussed this in my longer report. With regard to the convulsions, it is certainly odd that Miss Barrington (the case referred to) had a further convulsion two weeks after all Rees Evans's treatment had stopped. Other complaints, such as aphasia, gastro-intestinal symptoms, and muscular spasms, were either not recorded or, if they were, are not clearly correlated to any treatment of Rees Evans. Again this is discussed in the longer report, where it is pointed out that the much larger body of British evidence does not bear the matter out. When over a hundred cases are being considered, it would be expected that some account of such reactions would come to our notice from the patients themselves, let alone from medical sources. It should be borne in mind that the majority of these cases had appalling medical histories.

Your last point about disclosure I have already answered. It will be done when justice is done by the setting up of a fair and proper inquiry. Rees Evans will stand by its results, and, though it will take long and arduous work to obtain those results, I think we have justified our case in calling for it.

We have sent you a full report and we have offered to show you the vast mass of information in our files, yet you have neither examined the report nor asked for further information from us. I should like to repeat this invitation, and I hope that this time you will accept it.—I am, etc.,

London, E.C.4. DEREK WRAGGE MORLEY.

*** Our only comment on Mr. Morley's letter is that disclosure of the constituents of a secret remedy would bring an end to speculation.—ED., *B.M.J.*

SIR,—Referring to the article on cancer treatment which has appeared in a popular illustrated paper, may I as a trained pathologist be allowed to say that the microscopical examination of excised tissues, without clinical examination and observation over a period of time, may prove misleading—a remark that could be illustrated by several cogent examples? Under the cross-heading, "What the Microscope Showed," on page 33, considerable stress is placed on the selective killing of the cancer cells by the proliferation of connective tissue. Admittedly this does occur in the scirrhotic cancers of the very aged and can be considered as an attempt of the body to deal with cancer cells. The possible fallacy consists in obtaining a biopsy from a portion that is not active or has undergone radiological treatment—for example, in the centre of the tumour, as illustrated on page 41.

This is, however, a subject which can be left to others to discuss—attention can be focused on the assertions on page 33 where the experiments on 13 mice and 26 chickens are mentioned. Six of the untreated mice died within a week. "All the six treated mice lived for several months, and one was alive . . . nearly seven months after the first treatment. The thirteenth mouse, which had two large growths, survived for over two weeks under treatment." One might have preferred to learn about the size of the tumours and the particular type of neoplasm. Probably it was the usual mammary epithelial cancer of the mouse. What was the size of the growth on death?

The experiments on three-day-old chickens also lack definition, but it can be assumed that a "Rous virus" was employed; this is most active, so that, if only 6 out of 24 developed a growth, something must have been different from ordinary laboratory practice, where a 98% take is usual. In these important animal experiments it is not mentioned whether the treatment was external or internal—or perhaps a combination of both. Animal experiments are important, because it is not only possible to obtain reliable percentage figures but to compare the malignancy of various cancerous strains.—I am, etc.,

Little Shelford. H. P. BAYON.

Training for General Practice

SIR,—Surely Dr. Johnson's article (August 26, p. 493) is a condemnation of Dr. Johnson rather than Bart's. It is not conceivable that a man is unable to find interesting if not absorbing lecturers in one of the medical colleges of London University, and should he fail here I think that his prospect of succeeding elsewhere must be small where often there is only one teacher in a particular subject. I find that the teachers are not only pleased but anxious to see students from other colleges at their ward rounds and lectures.

Probably the best criticism of London University medical education is the continuing tendency to divorce medical students from those of other faculties. This cloistering may be desirable from the viewpoint of the transition from natural to medical sciences; but I can see no good reason why there should not be inter-college university residences (preferably in Bloomsbury) for all students rather than halls of residence provided by individual colleges.

It is not the duty of London University to provide a gradual transition for students from other universities; and I believe that Cambridge arranges a very excellent course in the long vacation term for their students, such that it would be an insult to make these students proceed to a similar course in London.

Finally, since Dr. Johnson was so obviously a fish out of water it would have been preferable had he found out how they taught at Bart's, and then if he decided it was what he wanted to proceed to gain admission rather than criticize a school because it failed to provide what he wanted. In view of the large number of excellent teachers I think this system has the advantages of a well-designed uniform course, combined with the original Italian idea of a university, that a student should be taught those subjects in which he is most interested by the teacher of his choice.—I am, etc.,

London, S.W.1. JOHN PRICE.

SIR,—I have read Dr. Donald McI. Johnson's article (August 26, p. 493) with interest and amazement. I went from Cambridge to Bart's at the same time as he did, and was trained in the same way—or shall I say was offered the same training? Whereas Dr. Johnson considers that he acquired his knowledge from books and surgical out-patients, I believe that as a student I learnt very little from books and nearly all I did learn was from wards and out-patients. I agree with him that the special departments were overcrowded. In my opinion insufficient emphasis is put on the importance of the "specials" for general practice. I was glad of the opportunity later on to supplement my knowledge of these departments even though I did see what I could at Bart's. It is so interesting to me to find that two of us found our clinical training so different. Dr. Johnson received "a mental shock." I found the whole period fascinating. There were many juniors—chief assistants—willing to help the struggling student. My most serious criticism is that there were far too many of us.—I am, etc.,

Bungay, Suffolk. P. G. LEVICK.

SIR,—After reading the article by Dr. Donald Johnson (August 26, p. 493) in which he gives his views on Bart's in 1924 I found a photograph of the residents in November, 1926. Of the 18 men in it, one died in 1928 and two I have lost touch with. The activities of the remaining 15 are as follows: a consulting pathologist, professor of paediatrics, Nuffield professor of orthopaedics, consulting anaesthetist, advising physician to May & Baker, E.N.T. consultant, consulting ophthalmic surgeon, consulting physician, superintendent of T.B. sanatorium, consulting gynaecologist, editor *B.M.J.*, and four of us are reasonably competent general practitioners.

Surely this is not a bad result for such allegedly poor training?—I am, etc.,

Twickenham. M. G. FITZGERALD.

SIR,—All doctors in practice, whether as specialists or as general practitioners, have memories of their student days. It is quite interesting to observe that these recollections vary depending upon how long ago the particular doctor was a student. Student days are an entity in themselves. The perspective varies with time. For example, a student does not always understand quite how his particular stage of training will help him in his future career. Later the newly qualified practitioner finds himself faced with practical problems with which he may not be able to cope. He may think that he ought to be able to do so. This is usually the first mistake.

The blunt fact of the matter is that practical problems can usually be assessed in simple practical terms. The proper assessment of simple facts is something that only comes with time. How very often are simple clinical matters resolved into two or three straightforward alternatives. The choice can be made only from a broad pattern of experience. Dr. Donald Johnson in his very interesting article (August 26, p. 493) refers to an evening emergency call. The context suggests that he expected to reach a correct conclusion. As a newly qualified man he expected to be correct. I humbly suggest that this was a mistake. The newly qualified practitioner may expect a good deal from himself. The general public do not expect great wisdom from a young man who has not had great experience. The public have a great respect for academic training. Experience is also necessary. Both experience and detailed academic training are required. There is no substitute for either.

I submit that it would be quite wrong to modify the present system of academic training, carried out in the main by specialists. The student receiving instruction in a hospital ward cannot be compared with an apprentice in a trade. Nevertheless, like an apprentice, there are many practical wrinkles which he must know. These can only be learnt slowly—namely, in practice of some sort or in hospital, which means working with the other doctors and dealing with patients away from their homes. If the practice is in a domestic field the patient is then visited at home and the newly qualified doctor may feel that he is intruding into a way of life that he possibly never knew existed.

I think it is the process of learning how the other half lives which is so startling. No amount of modification in the student's career will give him much information in this respect. On the other hand there is just so much of value in this experience, and I feel sure that it would then be correct for the doctor with growing experience to resume his association with specialists. The greatest fault in the system is that very often the general practitioner never takes up systematic instruction again. The average G.P. finds that, when he is ready to turn again to the hospital environment to refresh his theoretical knowledge, the claims of general practice upon his time and his attention have crowded out his life to such an extent that a material alteration in his way of life is, if not impossible, certainly improbable.

In considering the clinical training of the general practitioner it would be as well for critics to remember that nearly all theory has been elucidated in the first instance by practical experiment. Even the greatest scientific discoveries underlying clean-cut things were discovered and worked out in the first place by painstaking trial and error. This has been so even when the work has been conducted by a brilliant scientist. Any process of education is a mixture of theory and practice. I feel sure that it is the function of medical education to present the theory. It is the duty of the student to digest the theory and put it into practice. The ability to reproduce academic theory at examination times, in order formally to pass an examination, is of limited significance. What the newly qualified doctor does with his theory matters a great deal. No amount of alteration of medical education will influence this much.

—I am, etc.,

Scarborough. NOEL J. JACKSON.

SIR,—I feel sure that most Bart's men—especially those of us who qualified 25 years ago—will feel grateful to Dr. W. A. Bellamy for his letter (*Journal*, September 9, p. 623) in defence of his teachers. Unless my memory serves me falsely, the educational number of the *Journal* for 1925 reads somewhat as follows: "Most of you will eventually find your way into G.P. Do not expect to make a fortune. The most important thing is that you will be your own master, and be free to lead a full and interesting life." What now is our judgment upon this prophecy of a quarter of a century ago? But why this flight into the dim and distant past? Is it that we now in our dislike of the present and our fear of the future are turning in desperation to the past? That in our anxiety state we are trying to blame the "unimpeachable" for the unhappy state into which our own shortcomings have brought us? It would be better instead for us to plan for the future with more vigour, so that we may return to the way of life our masters prepared us for.—I am, etc.,

Leigh-on-Sea. THOMAS REES.

Chlorinated Swimming-pools and Poliomyelitis

SIR,—The letter from Mr. R. Ogier Ward in your issue of September 9 (p. 625) implies that chlorinated water in swimming-pools is dangerous and more likely to induce infection by the virus of poliomyelitis than prevent it. Is he arguing on sound lines? He believes that a nasal irritation may be set up by chlorinated water, which is no doubt true, as also may be conjunctivitis in certain persons and in certain concentrations of chlorine. I would argue that such irritations may cause transient discomfort, but unless the irritation is permanent or chronic (which is not the case from periodic visits to a swimming-pool) it is not harmful but may even be beneficial. Most of the proprietary gargles, for instance, either ordered by a medical man or more frequently purchased by the credulous public from the chemist's counter, are useless as bactericidal agents. What they do is to act as physical agents for the removal of mucus and debris and, secondly and more important, to irritate mucous membranes with which they come in contact and so *stimulate the further production of mucus*. This artificially stimulated mucus is poured out and, being bactericidal itself, helps to wash away recently implanted bacteria. I contend, therefore, that chlorinated swimming-bath water by intermittent or transient irritation of mucous membranes and by encouraging the flow of mucus does more good than harm, and does not "invite disaster."—I am, etc.,

Shrewsbury. A. D. SYMONS.

SIR,—I was very interested to read the communication on the above subject by Mr. R. O. Ward (September 9, p. 625), but feel that his experience with modern swimming-pools has been rather unfortunate. For some years now I have been associated with swimming-pools and swimmers, and, while I agree with Mr. Ward that one does from time to time meet with over-chlorinated swimming-pools, such occasions are fortunately uncommon. Disease of the ear, nose, and sinuses is one of the "occupational diseases" of swimming, but can be prevented to a large extent by not swimming when a coryza is present. If one indulges in swimming or diving during these circumstances, the mechanical action of the water may wash infection into the sinuses or middle ear. I feel convinced that the action is mechanical rather than chemical, because sinusitis and otitis media are more commonly seen in divers and back-crawl swimmers, where gravity and centrifugal force may play a greater part, than in free-style or breast-stroke swimmers.

Recently I examined 60 of Britain's leading performers, many of whom spend two to four hours per day swimming in order to reach the required standard necessary to achieve international honours. In only one case did I find evidence of otitis media—a healed drumhead. On the other hand, I found chronic otitis media to be common amongst divers of many nations during the 1948 Olympic Games. I have gone carefully into the records, and, so far as I can discover, only one case of poliomyelitis has occurred in a first-class British swimmer. That case was, tragically, fatal, and did not occur in this country but during a swimming meeting abroad, in an open-air pool.—I am, etc.,

Heswall, Cheshire. NOEL BLEASDALE,
Hon. Medical Officer,
English Amateur Swimming Association.

Osteoarthritis

SIR,—I have read with interest the letter from Mr. Franklyn Stonham (September 9, p. 629) on my paper on osteoarthritis in the refresher course (June 17, p. 1415), but he appears to have overlooked the context in parts and the fact that the refresher course is for busy general practitioners and not for surgeons. Since he criticizes my view that trauma is an important cause of osteoarthritis, in case I might be mistaken I have looked up Pemberton and Osgood, Cecil, Comroe, and Copeman, and find that they all regard trauma, especially of minor type as I point out, as being of importance, so I err in good company. It is my experience that massage is helpful and that muscle spasm is generally protective against the pain which is a feature of osteoarthritis. Since the paper was designed purely for the general practitioner details of operative methods were purposely omitted, and I said that if surgery is undertaken the earlier the better, but it is for the surgeon to determine the form it should take. This observation also covers manipulation under anaesthesia, which in my view should be undertaken only by an orthopaedic surgeon, and even then I have seen undesirable results. Exercises without weight-bearing and under instruction furnish the only form of manipulation that should be undertaken in general practice except in very exceptional circumstances. I therefore see no reason for withdrawing or modifying anything I said in the paper, which is based on nearly 50 years' close study of arthritic conditions.—I am, etc.,

Buxton. CHARLES W. BUCKLEY.

Treatment of Warts

SIR,—I was interested in the question in your issue of September 2 (p. 584) about wart weed, since I have just finished a thesis on warts and happen to have the relevant literature available.

Wart weed is a name which is used loosely to refer to a variety of plants, including the greater celandine (*Chelidonium majus*) and the sun spurge (*Euphorbia helioscopia*). The use of the milky juice of the spurges for the cure of warts is an old remedy, and is quoted by Cockayne in his compilation of Anglo-Saxon medicine. Modern references are to be found in two short articles by Michon[1] and Hissard.[2] Countrymen continue to use such plant juices not only, I believe, because countrymen are conservative, but because they have rid themselves of warts by these means.

The mechanism of cure in warts is always a difficult matter to assess. Warts are notoriously open to the influence of suggestion, and the darling remedy of one doctor is the despair of another. But there is one treatment which stands out above all the rest, and that is the use of podophyllin in condylomata acuminata (which are warts of the genital region). This remedy, which originated in folk medicine, depends on the interference with mitosis caused by podophyllotoxin, a portion of the resin of podophyllum. Podophyllin does not work well in common warts, which are more protected from contact with local applications by their structure and thick horny covering.

The resins of podophyllum and euphorbia have in common an irritant action. *Euphorbia peplus*, the petty spurge, known locally as "milk-weed," is in my experience a cause of contact dermatitis in gardeners; and according to Martindale *Euphorbia resinifera* is used as a vesicant by veterinary surgeons.

I believe, therefore, that the action of euphorbia resins on warts would be worth investigation. Patients and doctors would welcome an alternative to the present painful regime of freezing or frying, with the certainty of some degree of scarring to follow.—I am, etc.,

Cambridge. ALAN LYELL.

REFERENCES

1 *Bull. Soc. franc. Derm. Syph.*, 1927, **34**, 36.
2 Ibid., 1927, **34**, 695.

Acute Toxic Jaundice

SIR,—This case appears to be worth recording because it seems probable that the patient's jaundice and skin condition were caused by the administration of para-aminosalicylic acid (P.A.S.), as there was no case of infective hepatitis in the ward at the time.

A nurse aged 21 reported sick on March 6 with pain in her right chest with cough and sputum. She was found to have a pleural rub over the lower part of her right chest and loud rhonchi audible over the right base. Her blood sedimentation rate was 17 mm. in one hour; her sputum contained tubercle bacilli; the rectal temperature was raised to 100° F. (37.8° C.) in the evening. Her radiograph showed a density in the right middle zone spreading out from the hilus with a cavity in it.

A right artificial pneumothorax was commenced on March 19. On March 25 she was given P.A.S., 2 g. three times per day, slowly increased to 12 g. daily. She had a total of 163 g. up to the time when it was discontinued on April 13. It was stopped because she had vomited several times on April 10 and the vomiting persisted, and on April 13 she developed an urticarial rash. This rash, although quite trivial at first, became very alarming and spread over her whole body, was urticarial in some parts and morbilliform in others. Her face became swollen, her eyes could be opened only with difficulty, and her ankles and legs became swollen.

On April 16 she developed jaundice. Her stools were clay-coloured, her urine contained bile and a slight trace of albumin. The conjunctivae were yellow, but the jaundice was never very marked. It persisted for approximately 10 days. During this time her temperature rose steadily and for 10 days ranged between 101°–104° F. (38.3°–40° C.), and was on three occasions 105° F. (40.6° C.).

Her mental condition was never disturbed and she was always rational, but she was exceedingly difficult to rouse and would not take either food or drink, and towards the end of the 10 days when she was acutely ill had to be catheterized because of retention of urine. This retention persisted for five days. Her symptoms then began to abate, her temperature came down, her skin desquamated profusely in large dry scales in parts, and after approximately one week in this state her mental apathy disappeared and she again took an interest in her surroundings and rapidly became normal in this respect.

The artificial pneumothorax was maintained throughout her illness and is still quite satisfactory.

—I am, etc.,

Newcastle-upon-Tyne. GEORGE HURRELL.

Cortisone and Psychoses

SIR,—Despite much research into the role of cortisone in the human body, the significance of the psychological effects of the adreno-corticoids seems not to have been fully realized. *Par excellence*, the psychoses are "stress" diseases; they are precipitated by mental, physical, or physiological stresses. Once the stress disease is precipitated apathy results; the psychotic becomes hyporeactive to stimuli. This well-known phenomenon has been attributed to autonomic imbalance. The known physiological actions of cortisone show a more than coincidental resemblance to the biochemical findings peculiar to psychotics. Whether the causation of the psychoses can be explained along the lines of Selye's theories on adaptation and the biochemics of cortisone remains to be seen. The biochemically orientated psychiatrist will, however, see here a new vista, and one which should, without delay, be critically investigated.
—I am, etc.,

Cork, Eire. ROBERT A. MACCARTHY.

Optimism in Mental Hospitals

SIR,—The tone of the annotation under this heading (*Journal*, September 2, p. 568) suggests the advertisement of a sensational "psychological" film rather than a serious professional comment. The good results obtained by the newer methods of physical treatment in selected cases of mental disorder are of course well known, and I have had frequent occasion to appreciate the skill and success with which they are employed in the Crichton Royal itself and elsewhere. But the charge of "hopelessness, lethargy, and cynicism" brought comprehensively against mental hospital practice of "20 or even 15 years ago" makes one wonder how many mental hospitals, if any, the writer of the article had personally inspected at that time, with sufficient knowledge to give his opinions any value. It does not seem to have occurred to him that hopeless and lethargic cynics could never have produced and tested and developed the methods of treatment over which he now so exuberantly rejoices, and would not even have bothered themselves to look at the methods if presented to them ready-made. His jubilation about discharge rates is very difficult to understand. Patients may be discharged from hospitals in various states of health and for many different reasons. They may be recovered, improved, not improved, refusing treatment, incurable, unsuitable, moribund, or dead, but the writer of the article seems to imply that he would also be prepared, and even proud, to discharge patients whose continued presence would have an unfavourable effect on the hospital statistics. "Discharge rate" has no useful meaning unless related over a

period to various other factors, such as the recovery rate, the number of subsequent readmissions or relapses and, particularly, the type of case to which admission is granted or refused. Any mental hospital could easily, though shamefully, have a discharge rate of 100% by simply shutting its doors and its eyes to all applicants whose condition was such that they would need asylum, in the original and best sense of the term, for an indefinite period or for life. The writer's "optimism" has apparently blinded him to the fact that there are, and will continue to be, many such patients, or perhaps he does not greatly care what happens to them so long as they are not allowed to spoil the statistics. The real value of a "discharge rate" might perhaps be determined with fair accuracy by the relatives and practitioners who have to live with and care for the patients during the months or years after discharge, but such persons are apt to be regrettably uninterested in statistics.

The writer's general outlook is such that when he describes the need for certification as "mournful" one might be inclined to question the extent of his personal experience of cases in which that need existed, but he presumably means that certification is always to be mourned, not on the patient's account, but because it spoils the statistics. Whatever the success of new techniques in treatment, if "bare figures . . . in cold statistical form" are to become idols, and if the proper (though unpublished) motto for a mental hospital comes to be "Get well or get out," psychiatry will soon lose its soul, and the most brilliant statistics will not save it.—I am, etc.,

Glasgow. DAVID YELLOWLEES.

Foetal Pathology and Vitamin A

SIR,—Although at variance with his argument, I am in agreement with Dr. Bicknell (September 2, p. 576) that your leading article (August 12, p. 404) has not done justice to the extensive literature dealing with congenital abnormalities caused by experimental vitamin-A deprivation. Unfortunately all these experiments were carried out on animals, mainly rats. In every kind of animal experiment the application of the results to man is difficult, but in this special instance it seems nearly impossible.

In about 75% of the offspring of female rats kept on a vitamin-A-deficient diet[1] the young showed multiple ocular changes, the commonest of which was a fibrous retrolenticular membrane in place of the vitreous body; other abnormalities were colobomas, eversion of the retina, rudimentary development of the iris, of the ocular chambers, of the cornea and conjunctiva. In the same experiment abnormalities of the genito-urinary tract were found approximately in the same frequency,[2] like fused or horseshoe kidneys, undescended testes, absence of seminal vesicles, bulbo-urethral glands, vagina, etc. Furthermore, abnormalities of the heart and aortic arch,[3 4] mainly septal defects, retardation of myocardial development, absence of pulmonary vessels, open duct, etc., were present in about 44% of the offspring but in none of the controls. Animal experiments, however, do not always produce such uniform results. Thus in another series of rats kept on a vitamin-A-deficient diet congenital diaphragmatic hernia was produced in 18.9% of the young, but the incidence of this malformation in the offspring of another strain of rats kept under the same experimental conditions was only 0.9%.[4]

These animal experiments as well as the prenatal rubella syndrome[6] show clearly, as you, Sir, also emphasize, that genetic factors alone cannot always be invoked for the causation of these abnormalities. As some of the malformations caused by German measles during pregnancy are similar to those caused by vitamin A deprivation in rats, Bicknell is tempted to suggest that rubella acts on the human foetus by lowering the vitamin-A level in the maternal blood. This may be so; but whilst in the offspring of vitamin-A-deficient rats interventricular septum defect was the most frequent cardiac maldevelopment and patent ductus arteriosus one of the rarest, in three post-mortem examinations on the rubella syndrome all three infants had patent ducts, but interventricular septal defect was found only in one.[7] Moreover, in the rat experiments nearly all structures of the eye were involved, with the notable exception of the lens[3]; in the prenatal rubella syndrome the congenital cataract of the lens is the leading symptom. The severity of the rubella infection appears to be only of minor importance. Warkany[8] describes an infant with cataracts and congenital heart disease (p. 45) whose mother was unaware that she had been ill during her pregnancy. Two of her children had, however, German measles during the second month of pregnancy. He assumes that the mother had a symptomless infection and suggests a virus injury to the capillaries (which eventually may lead to nutritional disturbances affecting the foetus). This nutritional disturbance might consist of lowering of the maternal blood-vitamin-A level, as Bicknell suggests, only it appears strange that different structures of the same organs are involved in rats and man. Another point in need of clarification is this: it is suggested that nearly 100% of the mothers contracting German measles during the first two months of pregnancy have infants with congenital abnormalities.[9] Therefore it has to be assumed that the organogenic period during which these anomalies are produced lasts for several weeks. Even severe fevers do not, however, as a rule depress the vitamin A to an abnormally low level for several weeks; rubella on the other hand seems to produce congenital defects even if it is so mild as to pass unnoticed. In the light of these facts it seems more likely that the foetal damage is caused by direct virus action and not by the low vitamin-A level.

The following example further demonstrates the difficulty of the application of animal experiments to man. As already mentioned, the commonest congenital abnormality found in the offspring of rats kept on vitamin-A-deficient diet was a fibrous retrolenticular membrane, which was tentatively considered similar to retrolental fibroplasia occurring in man. During the recent International Congress of Ophthalmology[10] reference was made to the rapid increase in incidence of this congenital disease in the U.S.A. since 1943. It was estimated that a premature baby with a birth weight of less than 4 lb. has a 1:14 chance of being afflicted by congenital blindness from this disease. It was, however, found[11] that the limiting level of vitamin A producing the retrolental fibrous mass in rats was less than 16% of the normal, a deficiency which is unlikely to occur in pregnant American women.

Although I disagree with Bicknell's reasoning, I should like nevertheless to applaud his suggestion to give additional vitamin A to pregnant women contracting German measles. I would even go further and say that every pregnant woman suffering from any severe infection or febrile disease during the first trimester should be given additional vitamin A.—I am, etc.,

London, W.1. Z. A. LEITNER.

REFERENCES

1 Warkany, J., and Schraffenberger, E., *Arch. Ophthal., Chicago*, 1946, **35**, 150.
2 Wilson, J. G., and Warkany, J., *Amer. J. Anat.*, 1948, **83**, 357.
3 —— ——, ibid., 1949, **85**, 113.
4 —— ——, *Pediatrics*, 1950, **5**, 708.
5 Andersen, D. H., *Amer. J. Path.*, 1949, **25**, 163.
6 Gregg, N. M., *Trans. ophth. Soc. Aust.*, 1942, **3**, 35.
7 Swan, C., *J. Path. Bact.*, 1944, **56**, 289.
8 Warkany, J., *Advanc. Pediat.*, 1947, **2**, 1.
9 Swan, C., Tostevin, A. L., Moore, B., Mayo, H., and Black, G. H. B., *Med. J. Aust.*, 1943, **2**, 201.
10 Reese, A. B., and Blodi, F., *British Medical Journal*, 1950, **2**, 343.
11 Jackson, B., and Kinsey, V. E., *Amer. J. Ophthal.*, 1946, **29**, 1234.

Radiation in the Shoe Shop

SIR,—I would strongly endorse the views expressed in your leading article of September 2 (p. 565) that it might be wiser to discontinue the use of shoe-fitting *x*-ray fluoroscopes. Your remark that "points of pressure on the fleshy parts probably escape detection in any case" is, if I may say so, an understatement. I recently had occasion to use one of these fluoroscopes in a shoe shop when pressed to do so by the assistant. Immediately on exposing my foot to the *x* rays I noticed a loose nail lying horizontally in the centre of the sole of one shoe, and I pointed this out to the shop assistant, who was looking through her observation opening. She declared she could not detect the nail, but subsequently consented to remove it when I showed her the location on the shoe. I think one needs no further comment on the lack of value of the *x*-ray examination in fitting my foot. (The ectopic nail would have given early evidence of its presence.)

Last month I saw in a newspaper a picture of Christmas crackers being subjected to fluoroscopic examination to ensure that each cracker contained its toy or trinket. The worker was situated in front of a screen with quite a large-sized aperture which showed a row of crackers visible at one time, and it was stated that any unfilled cracker was removed. It would be interesting to know the dose of radiation received by this worker in a week.

The number of patients in hospitals and outside referred for *x*-ray examination or treatment is now so considerable that the dose of *x* rays received by the population as a whole is probably by no means negligible. We should advise that this dose be not increased unnecessarily in the factories and shops where *x*-ray installations and examinations may be made without medical advice or control.—I am, etc.,

London, W.C.1. PHYLLIS WADE.

Amalgamation of Radiological Societies

SIR,—I was impressed by the points raised by Dr. A. R. Thomas in his letter (August 26, p. 530). There are certainly four different bodies concerned with the interests of radiologists, and the British Institute of Radiology in addition has a large representation from physicists and from manufacturers of *x*-ray apparatus. There is an additional point of considerable importance that Dr. Thomas has not mentioned. All these bodies are concerned with the interests of diagnostic radiologists and radiotherapists. Before the war a very large proportion of radiologists were expected to undertake both diagnosis and therapy, and both these subjects were considered as one specialty. To-day the position is quite different and there is no more similarity between the diagnostic and therapeutic sections of our specialty than there is between, say, that of a gynaecologist and an orthopaedic surgeon. Surely the time has come when we should face up to these facts. The subscriptions of several of these bodies have risen considerably, largely owing to printing costs, and I think it would be desirable if each section produced its own journal at suitable intervals. Would it be possible for the organizers of the International Congress of Radiology to produce a full questionary to all concerned? Personally I would welcome one society confined entirely to each section, linked closely with the B.M.A.—I am, etc.,

Ipswich. C. H. C. DALTON.

Threats to General Hospitals

SIR,—Mr. John Howkins in his letter (July 22, p. 219) is quite right. The threat to the integrity of St. John's Hospital, Lewisham, is not an isolated example. In one hospital with which I am acquainted it was rumoured that the obstetrical department would be moved from the main hospital to another building altogether. This dismemberment of general hospitals, thus robbing them of the benefits of specialized departments, can only be a retrograde step, as Mr. Howkins says. Whilst on the surface it would appear that the isolation of specialized departments in separate self-contained hospitals is good planning, it encourages over-specialization. In the long run this can only be detrimental to the patient, for it is the disease rather than the patient which becomes the object of treatment. This aspect of medicine has recently been emphasized by Sir Henry Cohen (July 22, p. 179). It is to be hoped that this dismemberment of general hospitals will not be proceeded with, as they are undoubtedly the mainstay of the hospital service.—I am, etc.,

London, W.1. H. H. FOURACRE BARNS.

Kitchen Hygiene

SIR,—I read with interest your leading article on kitchen hygiene in the *Journal* of September 9, p. 613, and also the article by Drs. E. L. M. Millar and M. Pownall, "Food-poisoning in Sheffield in 1949" (*Journal*, September 2, p. 551). I have given considerable thought to the subject since reading the two articles and wonder if the following suggestions might be of value in reducing the incidence of hand-borne infections.

1. All food-handlers in restaurant kitchens should be provided with surgical-type rubber gloves made with specially long cuffs and supplied by the health department of the local authority concerned.
2. The kitchen workers should be taught to wash their hands on coming to work and should then put on the gloves and keep them on while handling food, cutlery, dishes, etc.
3. After finishing work the hands should be well washed with the gloves still on and then the gloves should be drawn off inside-out and placed to soak overnight in "dettol" solution or some other antiseptic.
4. It should be the responsibility of the local medical officer of health or a specially appointed borough food hygiene officer to instruct workers in the use of the gloves and, by frequent visits to catering establishments, enforce their use and issue replacements when necessary.
5. Personnel should be encouraged to believe that the wearing of gloves is also in their own interest (e.g., to protect their hands from detergents used in washing-up water).

I think the above suggestions would be of some help in the prevention of food-poisoning, because they would prevent contamination of food by minor, and often unnoticed, septic abrasions on hands; and gloves are far more easily cleansed than the human skin and have no nicks in them, like fingernail creases, in which dirt and therefore bacteria can collect.

I realize that the cost of the above measures might prove a serious obstacle to their application, but this would be countered by the saving in man-hours from the reduction in food-poisoning illness if the measures proved effective.—I am, etc.,

Chingford, E.4. W. K. SLACK.

Psychological Polemics

SIR,—Dr. E. Glover states (*Journal*, September 2, p. 576) that "Jungian theory is completely incompatible with Freudian theory" and that this is "a fact which Jung himself would not be inclined to deny." Jung has, in fact, denied it. In the first of his *Two Essays on Analytical Psychology* (trans. Baynes, 1928) he maintains that the theories of Adler and Freud are both "in a large measure correct" (p. 39), that the theoretical differences between them reflect the contrasted personalities of their originators (p. 41), and that the two approaches can be reconciled by the "standpoint superordinate to both," described in the subsequent chapters. In these Freud's views are given due place. For instance, Jung says, "In the treatment of a young extravert it is always advisable, indispensable indeed, to take full account of the Freudian standpoint," (p. 62). Elsewhere he has written (*Modern Man in Search of a Soul*, trans. Dell and Baynes, 1933, p. 134), "I am no opponent of Freud's; I am merely presented in that light by his own short-sightedness and that of his pupils."—I am, etc.,

London, N.W.3. DERRICK S. TROUTON.

Silicosis in Rhodesia

SIR,—In *Venture* (the journal of the Fabian Colonial Bureau) at page 7 of Volume 2, No. 6, dated July, 1950, occurs the following passage.

"In Northern Rhodesia one may note, with mixed feelings, the opening of the permanent headquarters of the silicosis bureau at Kitwe in the copperbelt, which will deal with upwards of 40,000 people a year afflicted in the lungs by rock particles from the mines."

The many medical men and others who are interested in pneumoconiosis should know that it is quite untrue that upwards of 40,000 cases of silicosis attributable to work in Northern Rhodesia mines are seen annually by the bureau, of which I have the honour to be chairman. About 40,000 persons are seen annually by the bureau at the routine examinations prescribed by law before engagement, and thereafter annually. Since the first discovery of silicosis in Northern Rhodesia mines in 1943 up to December 31, 1949, the total cases of silicosis discovered number 280 (Europeans 133; Africans 147), and among that number were no fewer than 133 (Europeans 117, Africans 16) whose silicosis was attributable, at least in part, to mining elsewhere than in Northern Rhodesia.—I am, etc.,

N. Rhodesia. JOHN F. C. HASLAM.

Radical Cure of Hernia

SIR,—Like King Charles's head, the radical cure of hernia is never long absent from the columns of the medical press (see *Journal*, September 9, p. 625), and apparently the search still goes on for something even thinner and more useless than the transversalis fascia. Surely the strongest and most efficient tissue in this region is the external oblique. If this is cut for some half an inch in the direction of the umbilicus, and pleated up by each stitch taking two or three bites, it can be sutured to Poupart's ligament as quite a thick bar. The lower flap of the external oblique, which should be left as long as possible, is then sutured over the upper flap. For direct hernia I put the upper flap below the cord, and in 15 or 20 years I have never seen a recurrence, though I was anxious to see one to find out, if possible, why it happened. The lower flap, it will be found, leaves a little of the cord exposed at the lower end, but gives

no trouble. For an ordinary indirect hernia it is quite satisfactory to put both layers in front of the cord, and I can recall only one recurrence in this method.

The two main points are the cutting of the external oblique and freeing it to get a good inch excess of tendon and then pleating it to form a thick bar of tissue. The conjoint tendon is sutured as in the ordinary Bassini operation.—I am, etc.,

Milford-on-Sea, Hants. H. J. NIGHTINGALE.

No Diagnosis without Clinical Investigation

SIR,—Up to the present the results of several million chest examinations by mass radiography have been returned to the Ministry of Health and the figures published by them. The abnormal cases are classified into diseases, the most important classification being that of active pulmonary tuberculosis. Unfortunately, no criterion has been set as to when this diagnosis should be made and included in the returns. Some units accept this classification immediately they find a suspicious soft upper zone lesion. Other units await the result of a first chest clinic investigation, when sputum tests, B.S.R., etc., have been performed. Here, again, the results are not altogether satisfactory, for I have myself had apparently soft lesions returned as inactive by a chest clinic; three months later a positive sputum is discovered and the result is altered. By this time, however, it has been classified in the Ministry returns as an inactive case. In addition to this, the length of time which chest clinics follow the apparently soft radiological lesions, with no definite symptoms, appears to vary considerably. I have found that some clinics will write these cases off after the preliminary investigation, and then find that they are returned later as sputum-positive cases with symptoms.

I would like to make a plea that a diagnosis of active pulmonary tuberculosis should never be made in mass radiography returns until after a full chest clinic investigation, and that the apparently soft radiological lesions in young persons with no symptoms or sputum should not be returned to us labelled inactive unless the subjects have been kept under observation for at least six months by the chest clinics. Furthermore, there should be a minimum follow-up period for these cases of at least two years. By this means we should have a uniform standard throughout the country, both as regards mass radiography findings and the chest clinic follow-up of early cases discovered.—I am, etc.,

Coventry. A. GORDON EVANS.

POINTS FROM LETTERS

Over-population

Dr. W. R. E. HARRISON (Buxted, Sussex) writes: When will men awake to the menace of over-population? Not until the "experts" stop confusing the issue with stories of land ripe for development from which science will be able to squeeze more and yet more food. The fact is that preventive medicine has suddenly disrupted the age-old plan of Nature. Infant mortality has been cut, epidemic diseases are on the way out, local famine can be stalled by dumping food from the air. Grand! But these happen to be the very sanctions which Nature was wont to use to mould her varied species and to keep her individuals fit. So what? Either prevention must devise man-made controls at least as effective as the old ones of Nature, or else Nature will be compelled to come back on us with cataclysmic action. And the longer the disequilibrium is allowed to grow, the bigger the jolt to put it right. Now, preventive medicine must, *a priori*, go hand in hand with politics, which may well be the reason why prevention has come to think exclusively in terms of *quantity* and has got itself bogged down in "welfare," leaving the harder, politically taboo side of the balance sheet—namely, birth control—in the hands of private enterprise, where inevitably it must lead to dysgenic breeding. Thus "progress" in our time has become the record of man's destruction of the world's bounty. Land is worked to desert; water everywhere polluted; towns turned into built-up areas: the lower animals, the so-called vermin, regarding us as the universal enemy. All this to what purpose? So that *Homo sapiens* may one day cover the face of the globe to the thickness of standing room only. And the remedy for this madness? Well, obviously there is no single panacea, but, for a beginning, suppose science and politics were to grow a bit more humble, recognizing the undoubted truth that man is a part only of Nature, and not the whole works.

Obituary

W. J. DILLING, M.B.

Dr. D. J. Browne writes: News of Professor W. J. Dilling's death (*Journal*, September 2, p. 579) brings sadness to his old students at the Liverpool medical school. One will always remember his lectures, fluently delivered as he paced the room. Pure pharmacology was never a dry subject in his hands. He could prevent the memorizing of doses from becoming dull, and his description of the actions of drugs such as strychnine, opium, and alcohol is still fresh in our memory. While he was dean of the medical faculty there existed a happy atmosphere of friendliness: interviewing the dean was certainly not an ordeal. Even the viva voce was robbed of its terrors in his presence. He was liberal in the extreme, and will be remembered as a university professor in the old tradition whose attitude to education and examinations was not strenuous as it is to-day. Because of our mutual interest in music I was in a position to see how greatly he influenced music culture in the university. The university music society owes its existence to him, and the orchestra was allowed to practise in the pharmacology department—the non-medical students blaming the odours of drugs for faulty intonation. Visiting artists to Liverpool often gave recitals at the Students Union. Even Sir Thomas Beecham was beguiled by Professor Dilling. And it was due to him that in Liverpool we have the finest concert hall in the country, the Philharmonic Hall. As chairman Dilling drove hard and spurred on the Philharmonic Society, the hall being finished just before the outbreak of the last war. The memory of his charming personality will live long in Liverpool.

Dr. JAMES CARRUTHERS YOUNG died at his home in Edgbaston on August 12 at the age of 62. He was educated at the Royal Grammar School, Newcastle-upon-Tyne, and at Durham University. He graduated M.B., B.S. in 1910, proceeding M.D., M.S. in 1914. In the years before the first world war he held four house appointments in the Royal Victoria Infirmary, Newcastle. When war broke out Young was already a special reserve lieutenant in the R.A.M.C. He was wounded in Gallipoli, twice mentioned in dispatches, and decorated with the Military Cross in France in 1917. After holding positions as surgeon-specialist and commandant of military hospitals he was released from the Army in April, 1919. By this time his interest in psychological medicine had been aroused, and he took a psychiatric post at Leytonstone and so passed into practical psychiatry. At one time or another he was resident physician at Bowden House, Harrow, and at Kenlow, Fife, physician to the Tavistock Clinic, and honorary medical psychologist to the Maida Vale Hospital. He also worked at the National Hospital, Queen Square, and did endocrine research at the Lister Institute. He was chairman of the Medical Society of Individual Psychology from 1933 to 1935. More recently he had been working as a specialist neuro-psychiatrist for the Ministry of Pensions at Birmingham.

Dr. H. Crichton-Miller writes: Dr. J. C. Young was one of the men who prove exceptions to the rule that a rolling stone gathers no moss. During the years between the wars he gathered experience in many fields of psychiatry. In 1921 he spent four months in Zurich undergoing a personal analysis with Jung. In his Continental travels he met Freud and Adler, In America he studied under Foster Kennedy, Adolf Meyer, Macphie Campbell, and elsewhere. But he still thirsted for further psychiatric experience, so he returned to Vienna in 1932 and studied under Bauer, Marburg, and Adler. His writings were numerous on dream psychology, analytic psychology, and recent advances in psychotherapy. He contributed many papers

to the Medical Society of Individual Psychology, and one entitled "An Experiment at Fontainebleau" he read before the British Psychological Medical Section. This was a great turning point in his philosophy. At Fontainebleau Ouspenski and Guirdjeff established what was popularly known as the "School of Forest Philosophy." "Jimmy" Young was one of the first to go there. It was soon after his arrival that Katherine Mansfield joined the group—against all medical advice, for she should have been in a sanatorium. Young told me that it took him exactly three weeks to "come out of the hypnosis." Many of us would like to have been free to browse in so many pastures, but, when all had been seen, consumed, and digested, Jimmy Young remained the same cheerful, lovable, and, withal, mercurial person who graduated at Durham 40 years ago.

Dr. WILLIAM THOMAS HILLIER, for 25 years clinical pathologist at the Birmingham General Hospital, died in Birmingham on August 18 aged 74. He was the son of Dr. James Hillier, of Ramsgate, and was educated at Taunton School. He studied medicine at the Middlesex Hospital and qualified in 1899, taking the D.P.H. in 1901. At first he turned his thoughts to surgery, but after he decided that this was not his bent he was appointed assistant to the director of the clinical laboratories at the Middlesex Hospital and pathologist to the Queen Elizabeth Hospital, Hackney Road. He was one of the first clinical pathologists in the country, and during the 20 years he was a student and pathologist at the Middlesex Hospital he won the enduring affection and respect of many men who afterwards became well known in medicine, surgery, and pathology. He had a great love of the sea and of natural history, and he spent many holidays working at the marine biological stations at Plymouth and elsewhere. He enlisted in the volunteer branch of the Royal Navy as a seaman, and, though he was a qualified doctor, he was content to serve as a petty officer. In the first world war he was captured when fighting with the Naval Brigade in the defence of Antwerp. However, he worked as a doctor in the prisoner-of-war camps, where, strangely enough, he obtained by dissection and microscopy a remarkable knowledge of the herring, which constituted the principal article of food at his camp. Hillier was awarded the O.B.E. as a result of his war service. In 1920 he became clinical pathologist at the Birmingham General Hospital, a post which he held until his retirement in 1946. Neat in appearance, pleasant and friendly in manner, and contented in disposition, he sought no personal advancement. He did not aspire to profound scientific learning, but by instinct he was a naturalist. Every week-end he walked long distances in the country, for he loved the countryside and its lore. He aided his friend, A. R. Thompson, in producing two books, *Nature by Night* and *Nature by Day*. He was a gentle man, and he showed that happiness of mind and greatness of soul are not necessarily accompanied by personal ambition.—H. W. F.

Dr. CEDRIC BAXTER, chairman of the Liverpool Local Medical Committee, died on August 22. He studied medicine at Liverpool University after having first entered upon a legal career. He graduated M.B., Ch.B. in 1925 and went into practice in Liverpool. Baxter took a keen interest in local medical affairs, and became prominent in the life of the city after his election to the Local Medical and Panel Committee about 20 years ago. He was a member of the Liverpool Insurance Committee for many years, and was its chairman when the functions of insurance committees ceased in July, 1948. In 1943 he was elected a member of the Insurance Acts Committee, and when the National Health Service came into operation he became a member of the General Medical Services Committee, and served upon this until his death. He was co-opted a member of the Lancashire Medical Committee upon his election to the central committee. A member of the Liverpool Executive Council from its inception, Dr. Baxter was elected chairman of the Local Medical Committee this year. He served upon the Public Relations Committee of the British Medical Association from 1947 to 1949. He was a prominent layman in the Roman Catholic Church, being honoured in 1932 when the Pope appointed him to be a Privy Chamberlain of the Cape and Sword.

V. T. T. writes: As a friend of 45 years' standing might I pay tribute to "Ceddie" Baxter? His natural kindliness and generosity gained him a wide circle of friends and the affectionate gratitude of his patients in the large practice founded by his father 75 years ago, and subsequently run by Ceddie and his surviving brother Cecil. As a young man he was a keen footballer and cricketer, and an amateur actor with the polish of a professional. He possessed a fine baritone voice and would entertain his friends with songs from grand opera, the music hall, or, best of all, from his self-composed repertory. He will be long mourned, for he was a family doctor of the best type, a true gentleman, a loyal friend, and a perfect host.

Dr. W. A. KIRKPATRICK died suddenly while visiting a patient on August 19. He was 47 years of age. William Alexander Kirkpatrick was born at Kelloe, Co. Durham, and was educated at Barnard Castle School and the University of Durham. He graduated M.B., B.S. in 1927. He had been in general practice at Skelton-in-Cleveland for 20 years, and he was also for a long time associated with the Cleveland Cottage Hospital. He was a justice of the peace for the North Riding of Yorkshire and chairman of the Juvenile Court at Loftus. He was a member of the British Medical Association of long standing, his offices including that of secretary of the Cleveland Division for several years. He also represented the Division at meetings in London during the war. He was a member of the Hazel Grove Lodge of Freemasons. His cheerful personality will be greatly missed both by his patients and his colleagues. He leaves a widow and three children, to whom great sympathy is extended.—F. O. G.

Dr. HERBERT ANDERSON ECCLES, of New Herrington, Co. Durham, died on August 29 at the age of 54. His studies at Aberdeen University were interrupted by the first world war, in which he served for four years in a field ambulance. He resumed his studies after the war ended, and graduated M.B., Ch.B. in 1923. After holding house appointments at the Children's Hospital, Aberdeen, and the Royal Infirmary, Sunderland, he settled in practice at New Herrington in 1925. He maintained his interest in service matters and acted as medical officer to the 7th Battalion Durham Light Infantry. On the outbreak of the second world war he joined his unit and served overseas in several theatres. He became an A.D.M.S., attaining the rank of lieutenant-colonel. Dr. Eccles was a keen rugby football enthusiast and played for Durham County on several occasions, including against the "All Blacks" team of 1924. As a practitioner he took a personal interest in his patients, not only in their illnesses but in their family affairs. Their welfare affected him much more than was generally appreciated. To those who had not the privilege of knowing him well he may have appeared unduly forceful and even blunt. Below this façade there existed a kind, almost sentimental, nature and a sincerity which endeared him to all who gained his friendship. He was a member of the B.M.A. for all his professional life and served on the executive committee of the Sunderland Division for many years. He will be sadly missed by a wide circle of friends in the North-east, in Edinburgh and Aberdeen, and particularly at his class reunion dinners which he so faithfully attended.—A. A. McI. N.

Dr. C. D. HENRY, who was a medical practitioner in Wellington, New Zealand, for nearly 50 years, died suddenly on July 13. He was the son of Dr. Joseph Henry, who served with distinction in the Maori war in the Auckland province and was afterwards member of the New Zealand Parliament. Claude Dawson Henry was educated at Wellington College, Cambridge University, and St. Bartholomew's Hospital. He graduated M.B., Ch.B. in 1894, and proceeded M.D. in 1906. After qualifying he returned to New Zealand and practised in Wellington continuously up to the time of his retirement to Silverstream some 11 years ago. He was honorary consulting physician to the Wellington Hospital, and was police

surgeon for 37 years. At Cambridge he was an enthusiastic cricketer and oarsman, and never lost interest in those sports. His kindness and consideration for his patients made him a much-loved man, while his qualities of character generally led to his appointment as a Commander of the Order of St. John. He is survived by his widow and four daughters.

Dr. T. David Lambert writes: May I be permitted to add a few words to the obituary of Dr. CLIVE VINCENT (August 26, p. 531)? I was fortunate enough to be a student with him at King's College and King's College Hospital, and later he joined me on the resident staff of the Connaught Hospital, Walthamstow. As a student he was extremely popular and most unconventional. He never seemed to work hard, but he always had a thorough grasp of his subject. His penetrating remarks while working and his succinct humour while relaxing were all the more stimulating when placed against the background of wartime difficulties meeting the students of his day. His brilliant photography set a very high standard for student hobbies. It was when he joined the resident staff of the Connaught Hospital that his abundant qualities shone through a certain shyness and it became evident that here was a man to be relied upon in any emergency. He attended to the never-ending flood of casualties with great good humour, and was loved by all the staff. On many occasions patients went out of their way to tell me how his kindness had helped them. To a fellow resident he was always willing to lend a helping hand in any capacity, and I can truly say that he made my stay at the Connaught memorable for the chance of working with him: it is hard to believe that such a charming and alive person is so soon lost to us. We are much the poorer for our loss, and our great sympathy must be extended to his widow.

Universities and Colleges

UNIVERSITY OF LONDON

The following special University Lectures have been arranged: at Westminster Medical School (Meyerstein Lecture Theatre), Horseferry Road, Westminster, London, S.W., Tuesday, October 10, 5.30 p.m., "Nature and Properties of Certain Metalloprotein Enzymes," by Professor D. Keilin, F.R.S., Molteno Institute, Cambridge; at London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C., Wednesday, October 11, 5.30 p.m., "The Development of Modern Renal Physiology," by Professor Homer W. Smith, College of Medicine, New York University; at St. Mary's Hospital Medical School (Wright-Fleming Institute Lecture Theatre), Paddington, London, W., Tuesday, October 17, 5 p.m., "Hormones of the Sympathetic Nervous System and the Adrenal Medulla," by Professor U. S. Von Euler, M.D., Fisiologiska Institutionen, Stockholm; at University College (Anatomy Theatre), Gower Street, London, W.C., Wednesday, December 6, 5.30 p.m., "The Cytoarchitectonic Organization of the Spinal Cord," by Professor Bror Rexed, Associate Professor, Karolinska Mediko-Kirurgiska Institutet, Stockholm. The lectures are addressed to students of the University and to others interested in the subjects. Admission is free, without ticket.

UNIVERSITY OF SHEFFIELD

Professor F. A. E. Crew, M.D., D.Sc., F.R.S., Bruce and John Usher Professor of Public Health and Social Medicine, University of Edinburgh, will deliver the opening sessional address of the Faculty of Medicine in the Firth Hall of the University, on Wednesday, October 11, at 5 p.m. His subject will be, "The Changing Emphasis in Medicine."

The Services

Group Captain C. H. C. Searby, R.A.A.F., has been appointed Honorary Surgeon to the King *vice* Air Vice-Marshal Sir Victor Hurley, K.B.E., C.B., C.M.G., V.D., R.A.A.F.(ret.).

No. 35

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	33	1	14	2	1	25	5	13	—	—
Deaths		—	—				—	—		
Diphtheria	51	6	18	3	—	53	8	23	2	7
Deaths	2	—	—	—	—	1	1	—	—	—
Dysentery	156	9	107		—	98	7	75	1	1
Deaths		—			—				—	—
Encephalitis, acute	5	—	1	—	—	2	—	—	—	—
Deaths		—					1			
Erysipelas			21	5	4		—	18	7	—
Deaths										
Infective enteritis or diarrhoea under 2 years				24	15				159	
Deaths	9		2	2	1	18	—	6	11	1
Measles*	3,413	199	60	50	29	1,168	92	39	63	20
Deaths†		1	—	—	—			—	—	—
Ophthalmia neonatorum	36	4	9		—	46	6	12	—	—
Deaths										
Paratyphoid fever	6	1	2 (B)	1 (B)	—	30	2	2 (B)	4 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	235	16	2		3	216	6	—	3	3
Deaths (from influenza)‡	4	2	—	1	—	2	1	—	—	1
Pneumonia, primary	96	13	94	¶	4	83	13	100	12	
Deaths			3						9	7
Poliomyelitis, acute	491	30	80	6	18	308	43	11	2	—
Deaths§	14	—		—		10	1			
Puerperal fever		—	9				—	4		
Deaths										
Puerperal pyrexia‖	68	5	7		1	108	13	11	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	715	42	108	39	31	701	71	127	69	51
Deaths†		—	—	—	—		—	—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	7	3	3	5	2	9	2	—	—	1
Deaths	—	—	—		—	—	—	—	—	1
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,671	325	223	100	42	1,615	77	72	61	78
Deaths	3	1	—	1	—	2	—	—	1	—
Deaths (0–1 year)	175	21	31	14	8	184	19	35	21	11
Deaths (excluding stillbirths)	3,847	598	500	150	78	3,732	602	514	136	111
Annual death rate (per 1,000 persons living)			10·0					10·3	8·4	
Live births	6,880	1054	783	385	185	7,501	1219	834	434	231
Annual rate per 1,000 persons living			15·7					16·7	26·9	
Stillbirths	187	21	25			185	21	32		
Rate per 1,000 total births (including stillborn)			31					37		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended September 9 were: paralytic, 327 (302); non-paralytic, 186 (189); total 513 (491). The figures for the previous week are in parentheses. There was an increase of 25 paralytic cases and a decrease of 3 non-paralytic cases compared with the preceding week. Non-paralytic cases in the week under review comprised 36.2% of the total compared with 38.5% in the preceding week.

Stafford had an increase of 15 notifications compared with the week before, otherwise any increases were fairly generally distributed. Material decreases occurred in Durham 7 and Norfolk 8. The following county areas have notified no cases in the five weeks up to and including September 9—Cambridge and Radnor. In the same period the following contributed 1 notification only—Suffolk (West), Isle of Ely, Soke of Peterborough, and Anglesey.

The uncorrected notifications for the week corresponding to that under review in 1947, 1948, and 1949 were 708, 76, and 306, respectively.

Total uncorrected notifications for 1950 up to and including the week under review are 5,126. The corresponding figures for 1947, 1948, and 1949 were 4,984, 1,214, and 2,647, respectively.

Discussion of Table

In *England and Wales* decreases were recorded in the number of notifications of measles 864, acute poliomyelitis 98, and whooping-cough 54; increases were reported for scarlet fever 80, acute pneumonia 58, and dysentery 19.

The largest declines in the incidence of measles were in London 117, Middlesex 81, Gloucestershire 57, and Essex 46. The largest increases in the number of notifications of whooping-cough were in Nottinghamshire 43 and Staffordshire 36, and the largest decreases were in Warwickshire 48, Middlesex 35, and London 29. No changes of any size occurred in the local trends of scarlet fever. The chief feature of the returns for diphtheria was an increase of 7 in Lancashire.

The main centres of dysentery were Lancashire 34 (Southport C.B. 6, Warrington C.B. 6); Leicestershire 25 (Leicester C.B. 25); Yorkshire West Riding 27 (Bradford C.B. 9); Cheshire 15 (Dukinfield M.B. 15); Durham 12; and London 9.

The largest returns of acute poliomyelitis were from Yorkshire West Riding 45 (Leeds C.B. 9, Sheffield C.B. 8); Lancashire 38 (Liverpool C.B. 9, Manchester C.B. 7, Salford C.B. 7); Gloucestershire 33 (Bristol C.B. 26); London 30 (Lewisham 5, Woolwich 4); Warwickshire 30 (Birmingham 20, Coventry C.B. 7); Durham 28 (Easington R.D. 4); Staffordshire 25 (Wolverhampton C.B. 6, Coseley U.D. 5); Essex 24 (Ilford M.B. 4, Thurrock U.D. 4); Kent 19 (Bexley M.B. 4); Middlesex 17 (Hendon M.B. 4); Norfolk 16 (Norwich C.B. 4, Depwade R.D. 4, Wayland R.D. 4); Leicestershire 16 (Leicester C.B. 11); Lincolnshire 13; Northumberland 13 (Newcastle-upon-Tyne C.B. 5); Southampton 12 (Bournemouth C.B. 6); Devonshire 12; and Glamorganshire 10.

In *Scotland* infectious diseases were less prevalent than in the previous week, with the exception of a rise of 21 in the number of notifications of dysentery; the falls included scarlet fever 29, measles 19, and whooping-cough 15. A small decline in the incidence of scarlet fever was recorded in every area except the northern. The rise in dysentery was due to an outbreak with 36 notifications in Stirling county. The other large centres of dysentery were Glasgow 42 and Edinburgh 13. A fall of 6 occurred in the number of notifications of acute poliomyelitis; the decline was confined to the western area, where 13 fewer cases were notified than in the preceding week. The largest returns of acute poliomyelitis were from Glasgow 17, Dundee 8, Fife county 8, and Edinburgh 5.

In *Eire* increases occurred in the number of notifications of whooping-cough 20 and scarlet fever 12, and a decrease of 14 was recorded for measles. The increase in the incidence of whooping-cough was general throughout the country, while the trends of scarlet fever and measles were mainly due to the experience of Dublin C.B.

In *Northern Ireland* an increase of 11 in the number of notifications of whooping-cough was the only variation in the trends of infectious diseases. Although the number of notifications of acute poliomyelitis was unchanged there were six areas involved compared with three in the preceding week.

Quarterly Returns for Northern Ireland

During the *fourth quarter of 1949* the birth rate was 19.9 per 1,000, and was 1.4 below the average of the five preceding fourth quarters. The infant mortality was 46 per 1,000 registered live births; it was 2 above the rate for the preceding fourth quarter, but 10 below the average of the five preceding fourth quarters. The general death rate was 11.3 per 1,000, being 0.2 below the average of the five preceding fourth quarters. The 332 deaths from the principal epidemic diseases included: diarrhoea and enteritis under 2 years 168, influenza 97, whooping-cough 41, diphtheria 10, and measles 8.

Quarterly Returns for Scotland

During the *first quarter of 1950* the birth rate was 18.5 per 1,000, being 1.1 below the average for the preceding five first quarters. The infant mortality was 46 per 1,000 registered live births, and was 14 below the five years' average for the first quarter. The general death rate was 14.7 per 1,000, and was 0.3 below the average of the five preceding first quarters. 294 deaths were attributed to the principal epidemic diseases; these included 256 from influenza, 22 from whooping-cough, and 9 from cerebrospinal fever. No deaths were registered as due to diphtheria. The death rate from all forms of tuberculosis was 65 per 100,000, that from respiratory tuberculosis being 58. The former rate is 13 below, and the latter 12 below, the rate for the first quarter of 1949.

Week Ending September 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 658, whooping-cough 3,682, diphtheria 44, measles 2,530, acute pneumonia 192, acute poliomyelitis 513, dysentery 205, paratyphoid fever 11, and typhoid fever 6.

Medical News

British Legion Village

Preston Hall, the British Legion village at Maidstone, Kent, celebrated its silver jubilee last April and has now published an illustrated brochure to mark the occasion. During the 25 years of its existence the village has provided the means for the treatment, training, and rehabilitation of over 10,000 ex-Service men and women suffering from pulmonary tuberculosis. It now contains 135 houses. One and a quarter million pounds have been paid in wages, and the industrial output of the rehabilitation factories has amounted to £2,190,000. Arrangements have been made with the Ministry of Labour for training to be given in carpentry, electrical and engineering maintenance, motor repairing, printing, painting and decorating, office routine, book-keeping, nursing, and hospital work. Since the introduction of the National Health Service Act the hutted hospital and main building at Preston Hall have been taken over by the hospital service, but the rehabilitation section (with over 200 beds), the factories, and the village remain with the British Legion. Both the hospital and rehabilitation sections still admit ex-Service patients from all parts of the country.

Director of Institute of Obstetrics and Gynaecology

On the retirement of Professor James Young from the Chair of Obstetrics and Gynaecology at the Postgraduate Medical School of London at the Hammersmith Hospital the Committee of Management of the Institute of Obstetrics and Gynaecology have invited Mr. Charles Read, M.B., F.R.C.S.Ed., F.R.C.O.G., to accept the newly created post of Director of the Institute.

International Congress on Diseases of the Chest

Sir Alexander Fleming was presented with the Gold Medal of the American College of Chest Physicians at the First International Congress on Diseases of the Chest, which was held at the Carlo Forlanini Institute, Rome, Italy, on September 17–20.

Congress of Cardiology

At the recent International Congress of Cardiology held in Paris the British Government was represented by Professor Crighton Bramwell and the Medical Research Council by Professor J. McMichael. Upwards of 50 members of the British Cardiac Society attended the congress, their representative being Sir John Parkinson.

COMING EVENTS

Hunterian Society

The official opening of the library and museum of the Hunterian Society and the annual party will take place at 41, Portland Place, London, W., on Thursday, October 5, from 6 to 8 p.m. The inauguration ceremony will be performed by the Rt. Hon. Lord Horder.

Wrexham and District Clinical Society

A dinner-meeting of the Wrexham and District Clinical Society will be held at Wynnstay Arms Hotel, Wrexham, on Thursday, October 5, at 7.30 p.m. After dinner Professor A. M. Boyd, professor of surgery in the University of Manchester, will speak on "The Management of Obliterative Vascular Disease of the Lower Extremities."

Royal Dental Hospital of London

The prize distribution and conversazione of the Royal Dental Hospital of London School of Dental Surgery (University of London) will be held at the Royal Dental Hospital, 32, Leicester Square, London, W.C., on Friday, October 6, at 8 p.m.

Maida Vale Hospital Medical School

Sir Hugh Cairns, Nuffield Professor of Surgery in the University of Oxford, will deliver the address on "Colloid Cyst of the Third Ventricle" at the opening of the autumn session of the Maida Vale Hospital Medical School on Friday, October 6, at 5 p.m. Admission is free to all medical graduates by ticket obtainable from the dean of the medical school, Maida Vale Hospital for Nervous Diseases, Maida Vale, London, W.9.

St. Stephen's Hospital

A concentrated week-end course on "The Chronic Rheumatic Diseases," with lectures, ward rounds, and practical demonstrations, will be held at the Rheumatism Unit of St. Stephen's Hospital, Fulham Road, Chelsea, S.W., on Saturday and Sunday, October 7 and 8. The course will be opened by the Rt. Hon. Lord Amulree, whose subject will be "The Social and Economic Aspects of the Chronic Rheumatism Disease." Sir Adolphe Abrahams will preside, and among those taking part are Drs. Francis Bach, Peter Bishop, Grace Batten, Eric Bywaters, Philip Ellman, David Shaw, and A. G. Signy, and Mr. Timbrell Fisher.

Austrian Congress of Occupational Medicine

The first Austrian Congress of Occupational Medicine will be held at the Billroth Haus, Frankgasse 8, Vienna, from October 17–19. Although primarily intended for Austrian specialists, it is expected that a number of delegates from other countries, particularly Germany, will attend. The World Health Organization will be represented by Dr. Burger, medical director of Philips, Eindhoven; and the International Labour Office will also be represented. At the close of the congress members will be able, if they wish, to participate in a sightseeing tour of industrial undertakings in Austria from October 20–24. Further particulars may be obtained from the secretary of the congress, Dr. Fritz Vering, Hygiene-Institut der Universität Wien, Kinderspitalgasse 15, Vienna 9.

SOCIETIES AND LECTURES

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

Tuesday

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—September 26, 5.30 p.m., "*Mechanism of Accommodation*," by Mr. E. F. Fincham.

Wednesday

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Ashford Hospital, London Road, Ashford, September 27, 4 p.m., annual general meeting, "*Leonardo da Vinci 'On the Human Body'*" (illustrated by slides), chairman's address by Dr. K. D. Keele.

Thursday

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—September 28, 5.30 p.m., "*The Ocular Aspects of Hypertension*," by Mr. E. F. King.

Friday

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, Cambridge, September 29, 2.30 p.m., two B.M.A. films will be shown: (1) "*Curare in the Treatment of Poliomyelitis*"; (2) "*A Severe Case of Infantile Paralysis*." Dr. C. G. Eastwood will open the discussion.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—September 29, 5.30 p.m., "*The Avoidance of Complication in the Surgery of Cataract Extraction*," by Mr. H. H. Skeoch.

KENT AND CANTERBURY HOSPITAL, Canterbury.—September 29, 8 p.m., clinical meeting.

● ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—September 29, 2.30 p.m., "*The Evolution of the Gynaecologist*," William Meredith Fletcher Shaw Memorial Lecture by Professor A. Leyland Robinson.

APPOINTMENTS

Dr. J. Greenwood Wilson, Medical Officer of Health, Cardiff, Glam, will take office as chairman of the council of the Royal Sanitary Institute on October 1, 1950.

DADDS, J. H., M.B., M.R.C.P., Consultant Chest Physician, Portsmouth Area, South-west Metropolitan Regional Hospital Board.

STOCKS, A. VERNON, M.B., Ch.B., D.P.H., Divisional Medical Officer (Lancashire County Council), Health Division No. 15 (comprising Eccles, Swinton and Pendlebury, Worsley, and Irlam).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Carnaghan.—On September 11, 1950, at Queen Elizabeth Hospital, Birmingham, to Marjorie, M.B., B.S. (formerly Bryan), wife of James Carnaghan, B.Sc., a daughter.

Hall.—On September 5, 1950, at King's College Hospital, London, to Diana, wife of G. F. M. Hall, M.D., a daughter—Wendy Macdonald.

Hamilton.—On September 12, 1950, at 69, Gerrard Street, Lozells, Birmingham, to Dr. Frank Hamilton and Mrs. Hamilton (formerly Lloyd-Morgan), a sister for Adrian—Susan.

Hylton.—On September 9, 1950, to Dr. Lorna Christine (formerly Petersen), wife of Dr. W. H. Hylton, a son.

Ritchie.—On September 8, 1950, in Edinburgh, to Dr. Elizabeth Ritchie, wife of Professor Anthony E. Ritchie, M.D., University of St. Andrews, a daughter.

West.—On September 11, 1950, at Grimsby, to Kathleen (formerly Stanhope), wife of Michael H. West, M.D., M.R.C.P., a daughter.

MARRIAGES

Broadhead—Moody.—On August 26, 1950, at Newport, Isle of Wight, Herman H. Broadhead M.A., M.B., B.Chir., to Jill Moody, S.R.N.

Shemilt—Brownscombe.—On September 25, 1950, at St. Decumans, Watchet, Philip Shemilt, M.B., F.R.C.S., to Janet Brownscombe.

DEATHS

Brennan.—On September 12, 1950, at Killarney, Charles Henry Brennan, M.C., L.R.C.P.&S.I.&L.M., D.P.H., late Kenya Medical Services.

Brodribb.—On September 16, 1950, at St. Augustine's Nursing Home, St. Leonards-on-Sea Aurthur Williamson Brodribb, M.B., B.Ch., J.P.

Burridge.—On September 15, 1950, at King Edward VII Hospital, Windsor, John Harold Burridge, M.B.E., M.R.C.S., L.R.C.P., of 70, Higher Drive, Banstead, Surrey.

Buxton.—On August 18, 1950, at 2, Eshe Road, Blundellsands, Liverpool, Doris Mildred Buxton, M.B., Ch.B., D.P.H., J.P.

Carruthers.—On September 12, 1950, at Meadow View, Wymondham, Norfolk, Norman Stuart Carruthers, F.R.C.S.Ed., D.L.O., aged 63.

Crosthwait.—On September 11, 1950, at "Kingswood," Surrenden Road, Brighton, William Sylvester Crosthwait, L.R.C.P.&S.I.&L.M., Major R.A.M.C., retired.

Macleod.—On September 9, 1950, at 1, Beech Avenue, Drummond, Inverness, Donald Macdonald Macleod, F.R.C.S.Ed.

Ogle-Skan.—On September 11, 1950, at 141, Lapwing Lane, Didsbury, Manchester, Henry William Ogle-Skan, M.R.C.S., L.R.C.P., aged 67.

Raymond.—On September 12, 1950, at Worthing Hospital, John Kimber Raymond, M.B., C.M., D.O.M.S., of 39, Winchester Road, Worthing, Sussex.

Vane-Sutton.—On September 10, 1950, in London, Harold John Vane-Sutton, M.R.C.S., L.R.C.P., of 2, Warwick Close, Kensington, London, W., aged 54.

Any Questions?

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

Continued Jaundice

Q.—*A case giving all the indications of simple catarrhal jaundice is still not completely recovered after three months. Treatment has been by diet, vitamin supplements (including vitamin K), methionine, simple diuretics, and rest in bed. The liver and gall-bladder feel normal, and liver-function tests all indicate the absence of significant liver damage. In the evening the urine is almost free of bile pigments and the conjunctivae are clear. In the morning, however, the urine is green and the conjunctivae are pigmented. Is there any advice you can give me about this case?*

A.—It is a wise rule to review the diagnosis critically whenever jaundice, apparently due to infective hepatitis, has lasted for more than six weeks. The practitioner should ask himself whether the cause might not, after all, be obstruction of the extrahepatic biliary passages. The distinction is difficult to make, and when no clinical or biochemical indication exists a liver puncture biopsy may settle the diagnosis. If there is evidence of biliary obstruction, exploration becomes advisable.

If parenchymatous hepatitis is established as the cause of the condition, the present treatment should be pursued patiently and in a spirit of restrained optimism. Subacute hepatitis may smoulder for six months or longer and then heal completely. The indications are for rest; a high-calorie diet, containing 120–150 g. of protein, a liberal quantity of carbohydrate, and enough fat to make it appetizing; and a full supplement of vitamins, including folic acid and crude liver extract.

Persistent Climacteric

Q.—*An unmarried woman, now 64, had her uterus removed for fibroids when she was 42 years of age. The ovaries were conserved, so she did not develop menopausal symptoms until four years after the operation. Since then—that is, for nearly 20 years—symptoms have continued in the form of hot flushes, sweating, and other vasomotor disturbances, which tend to get worse rather than better. Various oestrogens (including stilboestrol), corpus luteum hormone, and thyroid have been repeatedly tried, with no improvement. The basal metabolic rate was −12% before thyroid therapy, rising to +6% afterwards. Does the syndrome represent a prolonged climacteric, or is it something which tends to become chronic and to develop into a pathological entity? In any case, what is the cure?*

A.—The circumstances and the symptoms certainly point to a climacteric disturbance in the first place, and there is no doubt that in some women such disturbances can persist for many years. Sometimes the trouble is prolonged as a result of irregular and uncontrolled oestrogen therapy, and this too can create a degree of oestrogen resistance. Even so, however, it should be possible to control menopausal symptoms, temporarily at least, with an oestrogen as strong as stilboestrol, and if the symptoms do not respond it is fairly safe to assume that they are not due to the climacteric. This would appear to be the case here, and it is quite possible that even if the initial symptoms were genuine the condition is now one of neurosis. Apart from symptoms there is nothing in the clinical picture to indicate an endocrine disorder. The B.M.R. readings do not represent significant departures from normal. It might be worth trying to arrange with one of the larger laboratories for an estimation of the gonadotrophin output in the urine. If the symptoms are genuinely "menopausal" the level of this hormone should be considerably raised; if it is not, then another diagnosis must be looked for before treatment can be decided.

Substitutes for Morphine

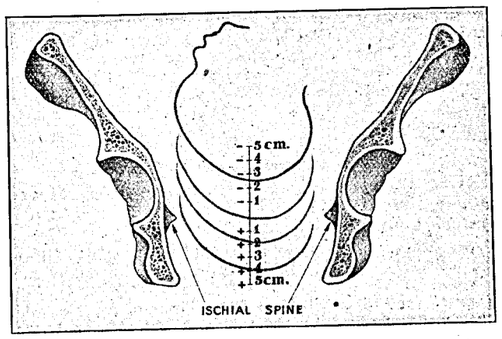
Q.—*How can the possibility of vomiting after morphine injection be averted? What is the maximum dose of morphine that can safely be given to patients with severe colic, and when and how often can the dose be repeated? What is a reliable substitute with all the advantages of morphine but unattended by vomiting and perhaps constipation?*

A.—Diamorphine (heroin) is less likely to cause vomiting and constipation than morphine. It is, however, a most powerful drug of addiction, and for this reason should never be frequently used, except in terminal cases of incurable malignant disease. The best substitute for morphine in severe pain due to colic is pethidine in doses of 100 mg., especially as it has an anti-spasmodic action in addition to its analgesic effect, whereas morphine causes contraction of smooth muscle and in cases of colic should therefore be given along with atropine. Pethidine is unlikely to cause vomiting or constipation and would seem to be the drug of choice in the circumstances mentioned. The maximum official dose of morphine is ½ gr. (21 mg.), though in most strong adults in very severe pain ½ gr. (32 mg.) can be given safely, and in those addicted to its use even larger doses may have to be employed. The frequency of subsequent doses can be judged only by the condition of the patient, but it is usually unwise to repeat a large dose of morphine without an interval of at least four hours.

Diameters of the Pelvis

Q.—*I have read in an article by S. A. Kaufman that the capacity of the mid-pelvis is estimated from the sum of the interspinous and posterior sagittal diameters, measured by x-ray pelvimetry. Could you please tell me what the posterior sagittal diameter is? Also in describing the position of the vertex in forceps deliveries—i.e., low, mid-low, or mid-forceps—he writes, "... when the bony vertex had reached the pelvic floor, corresponding to a station of +5. When the vertex was between the level of the spines and the pelvic floor, corresponding to a station of +1 to +4..." Would you please explain these "stations"?*

A.—This method of describing the station or degree of engagement of the foetal head was introduced by De Lee, of Chicago, and is described in De Lee and Greenhill's *Principles and Practice of Obstetrics*. (Fig. 259 on p. 233 of the ninth edition, 1947, is reproduced below.) The line between the tips of the ischial spines is taken as zero, and



when the vertex is below this the station is said to be +1 or +2, etc., the figures representing centimetres. When the vertex is above the interspinous line it is said to be −1 or −2, etc., according to the number of centimetres it falls short of engagement. The posterior sagittal diameter, as the term is ordinarily used, applies to the pelvic outlet, and is the distance between the lower end of the sacrum and the mid-point of a line drawn between the tuberosities of the ischium. It is not clear from the question whether the author quoted had in mind the distance between the sacrum and the mid-point of a line joining the ischial spines, but this seems a possibility.

Local Application of Streptomycin

Q.—*Can a solution of the calcium salt of streptomycin be successfully intubated into wounds through non-synthetic rubber tubing in the same manner as sodium penicillin, as a guard against infection, following the routine excision and débridement?*

A.—Streptomycin has been comparatively little used as a local application. The chief indication for this is the elimination or suppression of Gram-negative infection (*Proteus, Ps. pyocyanea,* etc.) from infected wounds or burns preparatory to skin-grafting. It could be used in the way suggested without harm and possibly with some benefit. That it is not so used is due to three reasons. (1) Prophylactic local applications to serious wounds ceased to be relied on when penicillin became available in sufficient quantities for parenteral use in such cases. (2) Penicillin, whether used locally or parenterally, is preferable for wound prophylaxis, since it is more efficient against Gram-positive infections, which are much more important than Gram-negative. It is highly active against streptococci and staphylococci and moderately so against the *Clostridia* of gas gangrene; and the respective activities of streptomycin against these two classes of organism are moderate to slight and *nil*. (3) Since bacteria tend to develop resistance to streptomycin readily and rapidly it should not be used except for the deliberate and well-considered treatment of a known infection. Three salts of streptomycin have been used—the hydrochloride, sulphate, and calcium chloride complex. Presumably the questioner refers to the latter. The answer applies to any of them.

Post-vaccinal Encephalitis

Q.—*Were any cases of post-vaccinal encephalitis recorded during the war, when millions of Service men and women must have been vaccinated against smallpox, often for the first time in their lives?*

A.—Information about the occurrence of post-vaccinal encephalitis from 1927–46 has been reported by E. T. Conybeare (*Mon. Bull. Min. Hlth,* April, 1948, p. 72). There it may be noted that in the age group over 15 years 42 cases of post-vaccinal encephalomyelitis were reported in the six years 1939–44, compared with only 13 in the preceding six years. Corresponding figures for the age group 2–15 years were 4 and 12, respectively. These data suggest that cases were occurring among young adults following vaccination on recruitment to the Services. In the whole period there was a preponderance of males in the young adult group but not in the younger age groups. Most of the cases occurred after primary vaccination. Conybeare estimates that the incidence of post-vaccinal encephalitis among young adults after primary vaccination was around 1 in 90,000 and the mortality rate 4 to 5 per million.

Test-papers for Sterilization

Q.—*I would be grateful for information regarding the nature of test-papers used to indicate adequate sterilization of syringes and other articles sterilized by dry heat.*

A.—The papers presumably referred to are intended to test the efficiency, not of sterilization by dry heat, but of autoclaving. Their preparation was described by R. J. Willan (*Lancet,* September 7, 1940, p. 294). Pieces of paper on which the word "sterilized" is printed are "lightly smeared with a mixture of starch 1 oz., iodine gr. 7, pot. iodide gr. 7, water to 10 oz., which when dry completely hides the lettering underneath a brownish-black coating." One of these is placed in the middle of a package of articles to be sterilized. It is said that if a temperature of 113° C. is reached the paper is decolorized and the printed word "sterilized" appears on a white background. A possible objection to this method of control—which applies also to the use of ampoules of a liquid which changes in colour from red through yellow to green—is that it takes insufficient account of the length of time for which the requisite temperature is maintained. The most reliable method of testing the efficiency of autoclaving is to introduce a package containing dried bacterial spores of known heat resistance, which are cultivated afterwards.

There is no similar method, so far as we are aware, of indicating the attainment of a temperature of 160° C., which is necessary for absolute sterilization by dry heat. There is also less necessity for such a test, since an ordinary thermometer can easily be introduced into the oven used for this purpose. Continental authorities rely on the browning of wool used to plug tubes containing syringes, but this is caused only by heating to about 180° C.—an unnecessarily high temperature.

Hereditary Influences in Paget's Disease

Q.—*Is there any evidence that Paget's disease assumes familial or hereditary characteristics? I have just encountered a case of a woman of 77 who is developing it. Her sister died earlier in the year of the same complaint, and there is evidence that their mother also suffered from it. Is there any chance of it appearing in the present generation?*

A.—It is assumed that the question refers to Paget's disease of bone. There is some evidence of hereditary and familial influences in this disease, though these are not pronounced. In 7 of 90 cases collected by Elmslie (*St Bart's Hosp. J.,* 1908, **44**, 121) other members of the family were affected, and many other instances have been recorded in brothers and sisters, or in parents and offspring. The most recent authoritative account of this affection appeared in the *Journal of Bone and Joint Surgery* (British volume), May, 1950.

Raynaud's Disease

Q.—*I have a patient with severe Raynaud's disease of many years' standing. Sympathectomy has been done on one side with no improvement, and the patient is unwilling to consider further operative treatment. Can you please let me know what is at present considered the best medical treatment for this condition? Several of the fingers are gangrenous at the tips.*

A.—There is general agreement that for true Raynaud's disease the most satisfactory treatment is sympathectomy. It is important to stress the adjective "true," because Raynaud's syndrome is often symptomatic of organic vascular disease resisting all treatment. It would be wise to encourage the patient to submit to a "novocain block" of the cervical sympathetic, as this would allow an accurate forecast of the effect of sympathectomy to be given.

Recently benzylimidazoline ("priscol") has been shown to benefit many patients with Raynaud's disease. It should be prescribed in doses of 25 mg. four times daily by mouth. Side-effects of this drug, especially palpitations, flushing, and giddiness, may be troublesome. Local acetyl-β-methylcholine ("carbachol") ionization is helpful in some patients.

NOTES AND COMMENTS

Nocturnal Cramps.—Dr. MARIE STOPES writes: Further to your reply on this (September 2, p. 584) it may be useful to ask if the patient uses a rubber hot-water bottle. Some years ago when pure rubber ones were not obtainable I suffered nightly agonies of cramp for a few weeks till I realized it was caused by the rubber. I discarded it in favour of a hot brick and have never had a touch of cramp from that day.

Dr. G. D. LAING (Limpsfield, Surrey) writes: I have always found that calcium gluconate three tablets t.i.d. is an almost certain cure, and it often improves the general health. I have used it for over 30 years and found it most effective.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Alitology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medsecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 30 1950

SMOKING AND CARCINOMA OF THE LUNG

PRELIMINARY REPORT

BY

RICHARD DOLL, M.D., M.R.C.P.

Member of the Statistical Research Unit of the Medical Research Council

AND

A. BRADFORD HILL, Ph.D., D.Sc.

Professor of Medical Statistics, London School of Hygiene and Tropical Medicine; Honorary Director of the Statistical Research Unit of the Medical Research Council

In England and Wales the phenomenal increase in the number of deaths attributed to cancer of the lung provides one of the most striking changes in the pattern of mortality recorded by the Registrar-General. For example, in the quarter of a century between 1922 and 1947 the annual number of deaths recorded increased from 612 to 9,287, or roughly fifteenfold. This remarkable increase is, of course, out of all proportion to the increase of population—both in total and, particularly, in its older age groups. Stocks (1947), using standardized death rates to allow for these population changes, shows the following trend: rate per 100,000 in 1901–20, males 1.1, females 0.7; rate per 100,000 in 1936–9, males 10.6, females 2.5. The rise seems to have been particularly rapid since the end of the first world war; between 1921–30 and 1940–4 the death rate of men at ages 45 and over increased sixfold and of women of the same ages approximately threefold. This increase is still continuing. It has occurred, too, in Switzerland, Denmark, the U.S.A., Canada, and Australia, and has been reported from Turkey and Japan.

Many writers have studied these changes, considering whether they denote a real increase in the incidence of the disease or are due merely to improved standards of diagnosis. Some believe that the latter factor can be regarded as wholly, or at least mainly, responsible—for example, Willis (1948), Clemmesen and Busk (1947), and Steiner (1944). On the other hand, Kennaway and Kennaway (1947) and Stocks (1947) have given good reasons for believing that the rise is at least partly real. The latter, for instance, has pointed out that "the increase of certified respiratory cancer mortality during the past 20 years has been as rapid in country districts as in the cities with the best diagnostic facilities, a fact which does not support the view that such increase merely reflects improved diagnosis of cases previously certified as bronchitis or other respiratory affections." He also draws attention to differences in mortality between some of the large cities of England and Wales, differences which it is difficult to explain in terms of diagnostic standards.

The large and continued increase in the recorded deaths even within the last five years, both in the national figures and in those from teaching hospitals, also makes it hard to believe that improved diagnosis is entirely responsible. In short, there is sufficient reason to reject that factor as the whole explanation, although no one would deny that it may well have been contributory. As a corollary, it is right and proper to seek for other causes.

Possible Causes of the Increase

Two main causes have from time to time been put forward: (1) a general atmospheric pollution from the exhaust fumes of cars, from the surface dust of tarred roads, and from gas-works, industrial plants, and coal fires; and (2) the smoking of tobacco. Some characteristics of the former have certainly become more prevalent in the last 50 years, and there is also no doubt that the smoking of cigarettes has greatly increased. Such associated changes in time can, however, be no more than suggestive, and until recently there has been singularly little more direct evidence. That evidence, based upon clinical experience and records, relates mainly to the use of tobacco. For instance, in Germany, Müller (1939) found that only 3 out of 86 male patients with cancer of the lung were non-smokers, while 56 were heavy smokers, and, in contrast, among 86 "healthy men of the same age groups" there were 14 non-smokers and only 31 heavy smokers. Similarly, in America, Schrek and his co-workers (1950) reported that 14.6% of 82 male patients with cancer of the lung were non-smokers, against 23.9% of 522 male patients admitted with cancer of sites other than the upper respiratory and digestive tracts. In this country, Thelwall Jones (1949—personal communication) found 8 non-smokers in 82 patients with proved carcinoma of the lung, compared with 11 in a corresponding group of patients with diseases other than cancer; this difference is slight, but it is more striking that there were 28 heavy smokers in the cancer group, against 14 in the comparative group.

Clearly none of these small-scale inquiries can be accepted as conclusive, but they all point in the same direction. Their evidence has now been borne out by the results of a large-scale inquiry undertaken in the U.S.A. by Wynder and Graham (1950).

Wynder and Graham found that of 605 men with epidermoid, undifferentiated, or histologically unclassified types of bronchial carcinoma only 1.3% were "non-smokers"—that is, had averaged less than one cigarette a day for the last 20 years—whereas 51.2% of them had smoked more than 20 cigarettes a day over the same

period. In contrast, they estimated from the experience of 882 other male patients that 14.6% of general hospital patients of the same age composition as the bronchial carcinoma cases are "non-smokers" and only 19.1% smoke more than 20 cigarettes a day. They found a similar contrast between the 25 women with epidermoid and undifferentiated bronchial carcinoma and the other female patients, but no such association with smoking could be found in the small group of patients with adenocarcinoma.

Present Investigation

The present investigation was planned in 1947, to be carried out on a sufficiently large scale to determine whether patients with carcinoma of the lung differed materially from other persons in respect of their smoking habits or in some other way which might be related to the atmospheric pollution theory. Patients with carcinoma of the stomach, colon, or rectum were also incorporated in the inquiry, as one of the contrasting groups, and special attention was therefore given at the same time to factors which might bear upon the aetiology of these forms of malignant disease. A separate report will be made upon these inquiries. The present study is confined to the question of smoking in relation to carcinoma of the lung.

The method of the investigation was as follows: Twenty London hospitals were asked to co-operate by notifying all patients admitted to them with carcinoma of the lung, stomach, colon, or rectum. For the most part these hospitals were initially confined to one region of London (the north-west), to allow ease of travelling, but others were subsequently added to increase the scope of the inquiry. A list of those taking part is given at the end of the paper. The method of notification varied; in some it was made by the admitting clerk on the basis of the admission diagnosis, in others by the house-physician when a reasonably confident clinical diagnosis had been made, and in yet others by the cancer registrar or the radiotherapy department. None of these methods is likely to have resulted in complete notification, but there is no reason to suppose that those who escaped notification were a selected group—that is, selected in such a way as to bias the inquiry—as the points of interest in the investigation were either not known or known only in broad outline by those responsible for notifying.

On receipt of the notification an almoner, engaged wholly on research, visited the hospital to interview the patient, using a set questionary. During the inquiry four almoners were employed and all the patients were interviewed by one or other of them. As well, however, as interviewing the notified patients with cancer of one of the four specified sites, the almoners were required to make similar inquiries of a group of "non-cancer control" patients. These patients were not notified, but for each lung-carcinoma patient visited at a hospital the almoners were instructed to interview a patient of the same sex, within the same five-year age group, and in the same hospital at or about the same time. (Where more than one suitable patient was available the choice fell upon the first one in the ward lists considered by the ward sister to be fit for interview.)

At two specialized hospitals (Brompton Hospital and Harefield Hospital) it was not always possible to secure a control patient by this method, and in such cases a control patient was taken from one of the two neighbouring hospitals, the Royal Cancer and Mount Vernon Hospitals. Even with this relaxation of the rule control cases were deficient at the Brompton Hospital and the numbers had to be made up by using the records of patients who had been interviewed as cancer patients, either there or at the Royal Cancer Hospital, but in whom cancer was finally excluded. Because of these differences in technique the records obtained from these hospitals were analysed separately. As, however, the results were in accordance with those found at the other hospitals, all the records are presented here as a single series.

In view of the method of notification used it could not be expected that the diagnosis then given would invariably be accurate. The diagnosis of each patient was checked, therefore, after discharge from or death in hospital, and this check was made in all but nine instances (0.4% of the total). In these few cases (three of carcinoma of the lung, two of carcinoma of the stomach, two of carcinoma of the rectum, and two non-cancer) no records of any sort could be traced, and they have had to be classified according to the information available at the time of their interview. As a general rule the hospital diagnosis on discharge was accepted as the final diagnosis, but occasionally later evidence became available—for example, by histological examination at necropsy—which contradicted that diagnosis. In these instances a change was made and the diagnosis based upon the best evidence.

The Data

Between April, 1948, and October, 1949, the notifications of cancer cases numbered 2,370. It was not, however, possible to interview all these patients. To begin with, it had been decided beforehand that no one of 75 years of age or more should be included in the inquiry, since it was unlikely that reliable histories could be obtained from the very old. There were 150 such patients. In a further 80 cases the diagnosis was incorrect and had been changed before the almoner paid her visit. Deducting these two groups leaves 2,140 patients who should have been interviewed. Of these, 408 could not be interviewed for the following reasons: already discharged 189, too ill 116, dead 67, too deaf 24, unable to speak English clearly 11, while in one case the almoner abandoned the interview as the patient's replies appeared wholly unreliable. No patient refused to be interviewed.

The proportion not seen is high, but there is no apparent reason why it should bias the results. It was in the main due to the time that inevitably elapsed between the date of notification and the date of the almoner's visit. The remaining 1,732 patients, presumed at the interview to be suffering from carcinoma of the lung, stomach, or large bowel, and the 743 general medical and surgical patients originally interviewed as controls, constitute the subjects of the investigation. The numbers falling in each disease group—that is, after consulting the hospital discharge diagnoses—are shown in Table I. The carcinoma cases are here divided into two groups: Group A consisting of cases in which the diagnoses were confirmed by necropsy, biopsy, or exploratory operation, and Group B of the remainder.

TABLE I.—*Number of Patients Interviewed in Each Disease Group, Subdivided According to Certainty of Diagnosis*

Disease Group	No. of Cases		
	Group A. Diagnosis Confirmed at Necropsy, etc.	Group B. Other Criteria of Diagnosis	Total
Carcinoma of lung	489	220	709
" " stomach	178	28	206
" " colon and rectum ..	412	19	431
Other malignant diseases ..	—	—	81
Diseases other than cancer (controls)	—	—	709
Other cases	—	—	335
Excluded	—	—	4
All cases	—	—	2,475

The 81 patients classified in Table I as having "other malignant diseases" were interviewed as cases of carcinoma of the lung, stomach, or large bowel, or as non-cancer controls. On the subsequent checking of the diagnosis either they were found to have primary carcinoma in some site other than one of those under special investigation or histological examination showed that the growth was not, in fact, carcinoma—for example, sarcoma, reticulo-endothelioma, etc. The 335 "other cases" either were interviewed as cases of carcinoma of the lung, stomach, or large bowel and were subsequently found not to be cases of malignant disease or, having been interviewed as non-cancer controls, they became redundant when the cases of carcinoma of the lung with which they were paired were found not to be carcinoma of the lung. The four "excluded" cases were excluded on grounds of doubt about their true category. Two were diagnosed at hospital as primary carcinoma of the lung, but there was reason to suppose that the growths might have been secondary to carcinoma of the breast and to carcinoma of the cervix uteri respectively; the other two showed evidence of primary carcinoma in two of the sites under special investigation—that is, lung and colon, and stomach and colon.

The 709 control patients with diseases other than cancer form a group which was, as previously stated, deliberately selected to be closely comparable in age and sex with the carcinoma of the lung patients. Comparisons between these two groups are shown in Table II.

TABLE II.—*Comparison Between Lung-carcinoma Patients and Non-cancer Patients Selected as Controls, With Regard to Sex, Age, Social Class, and Place of Residence*

Age	No. of Lung-carcinoma Patients		No. of Non-cancer Control Patients		Social Class (Registrar-General's Categories, Men Only)	No. of Lung-carcinoma Patients	No. of Non-cancer Patients
	M	F	M	F			
25– ..	2	1	2	1	I and II ..	77	87
30– ..	6	0	6	0	III ..	388	396
35– ..	18	3	18	3	IV and V ..	184	166
40– ..	36	4	36	4			
45– ..	87	10	87	10	All classes ..	649	649
50– ..	130	11	130	11			
55– ..	145	9	145	9	*Place of residence*		
60– ..	109	9	109	9	County of London	330	377
65– ..	88	9	89*	9	Outer London	203	231
70–74 ..	28	4	27*	4	Other county borough ..	23	16
					Urban district	95	54
					Rural district ..	43	27
					Abroad or in Services ..	15	4
All ages	649	60	649	60	Total (M + F) ..	709	709

* One control patient was selected, in error, from the wrong age group.

It will be seen that the lung-carcinoma patients and the control group of non-cancer patients are exactly comparable with regard to sex and age, but that there are some differences with regard to social class and place of residence. The difference in social class distribution is small and is no more than might easily be due to chance ($\chi^2=1.61$; n=2; $0.30<P<0.50$). The difference in place of residence is, however, large ($\chi^2=31.49$; n=5; $P<0.001$), and Table II shows that a higher proportion of the lung patients were resident outside London at the time of their admission to hospital. This difference can be explained on the grounds that people with cancer came to London from other parts of the country for treatment at special centres. When a comparison is made between the 98 lung-carcinoma patients and the 98 controls who were seen at district hospitals in London—that is, those regional board hospitals which do not have special surgical thoracic or radiotherapeutic centres—the difference disappears. Of these 98 patients with carcinoma of the lung, 56 lived in the County of London, 42 in outer London, and none elsewhere; of their non-cancer controls the corresponding numbers were 60, 38, and 0, clearly an insignificant difference.

It is evident, therefore, that the control group of patients with diseases other than cancer is strictly comparable with the group of lung-carcinoma patients in important respects but differs slightly with regard to the parts of England from which the patients were drawn. It is unlikely that this difference will invalidate comparisons, but it must be kept in mind; fortunately, it can be eliminated, if necessary, by confining comparisons to the smaller group of patients seen in the district hospitals.

Assessment of Smoking Habits

The assessment of the relation between tobacco-smoking and disease is complicated by the fact that smoking habits change. A man who has been a light smoker for years may become a heavy smoker; a heavy smoker may cut down his consumption or give up smoking—and, indeed, may do so repeatedly. An acute respiratory disease may force the sufferer to stop smoking, or he may be advised to stop for one of many pathological conditions. In 1947 a further complication was introduced by the Chancellor of the Exchequer, the duty on tobacco being raised to such an extent that many people made large cuts in the amount of tobacco they smoked—often to restore them partially or completely in the succeeding months. Fortunately the interviewing of patients was not begun till a year after the last major change was made in the tobacco duty; in any case the effect was minimized by interviewing the control patients *pari passu* with the lung-carcinoma patients, so that the change in price is likely to have affected all groups similarly.

The difficulties of a varying consumption can be largely overcome if a more detailed smoking history is taken than is customary in the course of an ordinary medical examination—for example, one man who was described in the hospital notes as being a non-smoker admitted to the almoner that he had been a very heavy smoker until a few years previously. In this investigation, therefore, the patients were closely questioned and asked (*a*) if they had smoked at any period of their lives; (*b*) the ages at which they had started and stopped; (*c*) the amount they were in the habit of smoking before the onset of the illness which had brought them into hospital; (*d*) the main changes in their smoking history and the maximum they had ever been in the habit of smoking; (*e*) the varying proportions smoked in pipes and cigarettes; and (*f*) whether or not they inhaled.

To record and subsequently to tabulate these details it was necessary to define what was meant by a smoker. Did the term, for example, include the woman who took one cigarette annually after her Christmas dinner, or the man of 50 who as a youth smoked a couple of cigarettes to see whether he liked it and decided he did not? If so, it is doubtful whether anyone at all could be described as a non-smoker. A smoker was therefore defined in this inquiry as a person who had smoked as much as one cigarette a day for as long as one year, and any less consistent amount was ignored. The histories obtained were, of course, a function of the patient's memory and veracity. To assess their reliability 50 unselected control patients with diseases other than cancer were interviewed a second time six months or more after their initial interview. Table III shows the comparison between the two answers obtained

TABLE III.—*Amount of Tobacco Smoked Daily Before Present Illness as Recorded at Two Interviews With the Same Patients at an Interval of Six Months or More*

First Interview No. of Persons Smoking	Second Interview. No. of Persons Smoking						
	0	1 cig.–	5 cigs.–	15 cigs.–	25 cigs.–	50 cigs.+	Total
0	8	1					9
1 cig.– ..		4	1				5
5 cigs.– ..		1	13	3			17
15 cigs – ..			4	9	1		14
25 cigs.– ..				1	3	0	4
50 cigs.+ ..					1	0	1
Total ..	8	6	18	13	5	0	50

to the question "How much did you smoke before the onset of your present illness?"

The answers to the other questions on smoking habits showed a variability comparable to that shown in Table III. It may be concluded, therefore, that, while the detailed smoking histories obtained by this investigation are not, as would be expected, strictly accurate, they are reliable enough to indicate general trends and to substantiate material differences between groups.

Smokers and Non-smokers

The simplest comparison that can be made to show whether there is any association at all between smoking and carcinoma of the lung is that between the proportion of lung-carcinoma patients who have been smokers and the proportion of smokers in the comparable group of subjects without carcinoma of the lung. Such a comparison is shown in Table IV.

TABLE IV.—*Proportion of Smokers and Non-smokers in Lung-carcinoma Patients and in Control Patients with Diseases Other Than Cancer*

Disease Group	No. of Non-smokers	No. of Smokers	Probability Test
Males: Lung-carcinoma patients (649)	2 (0·3%)	647	P (exact method) = 0·00000064
Control patients with diseases other than cancer (649) ..	27 (4·2%)	622	
Females: Lung-carcinoma patients (60)	19 (31·7%)	41	$\chi^2 = 5{\cdot}76$; n = 1 0·01 < P < 0·02
Control patients with diseases other than cancer (60) ..	32 (53·3%)	28	

It will be seen that the vast majority of men have been smokers at some period of their lives, but also that the very small proportion of those with carcinoma of the lung who have been non-smokers (0.3%) is most significantly less than the corresponding proportion in the control group of other patients (4.2%). As was to be expected, smoking is shown to be a much less common habit among women; but here again the habit was significantly more frequent among those with carcinoma of the lung. Only 31.7% of the lung-carcinoma group were non-smokers, compared with 53.3% in the control group.

Amount of Smoking

In the simple comparison of Table IV all smokers have been classified together, irrespective of the amount they smoked. In Table V they have been subdivided according to the amount they smoked immediately before the onset of the illness which brought them into hospital. (If they had given up smoking before then, they have been classified according to the amount smoked immediately prior to giving it up.) This classification is described subsequently as "the most recent amount smoked."

TABLE V.—*Most Recent Amount of Tobacco* Consumed Regularly by Smokers Before the Onset of Present Illness; Lung-carcinoma Patients and Control Patients with Diseases Other Than Cancer*

Disease Group	No. Smoking Daily					Probability Test
	1 Cig.–*	5 Cigs.–	15 Cigs.–	25 Cigs.–	50 Cigs.+	
Males: Lung-carcinoma patients (647)	33 (5·1%)	250 (38·6%)	196 (30·3%)	136 (21·0%)	32 (5·0%)	$\chi^2 = 36{\cdot}95$; n = 4; P < 0·001
Control patients with diseases other than cancer (622)..	55 (8·8%)	293 (47·1%)	190 (30·5%)	71 (11·4%)	13 (2·1%)	
Females: Lung-carcinoma patients (41)..	7 (17·1%)	19 (46·3%)	9 (22·0%)	6 (14·6%)	0 (0·0%)	$\chi^2 = 5{\cdot}72$; n = 2; 0·05 < P < 0·10 (Women smoking 15 or more cigarettes a day grouped together)
Control patients with diseases other than cancer (28) ..	12 (42·9%)	10 (35·7%)	6 (21·4%)	0 (0·0%)	0 (0·0%)	

* Ounces of tobacco have been expressed as being equivalent to so many cigarettes. There is 1 oz. of tobacco in 26·5 normal-size cigarettes, so that the conversion factor has been taken as: 1 oz. of tobacco a week = 4 cigarettes a day.

From Table V it will be seen that, apart from the general excess of smokers found (in Table IV) in lung-carcinoma patients, there is in this group a significantly higher proportion of heavier smokers and a correspondingly lower proportion of lighter smokers than in the comparative group of other patients. For instance, in the lung-carcinoma group 26.0% of the male patients fall in the two groups of highest consumption (25 cigarettes a day or more), while in the control group of other male patients only 13.5% are found there. The same trend is observable for women, but the numbers involved are small and the difference here between the carcinoma group and their control patients is not quite technically significant. If, however, the female lung-carcinoma patients are compared with the total

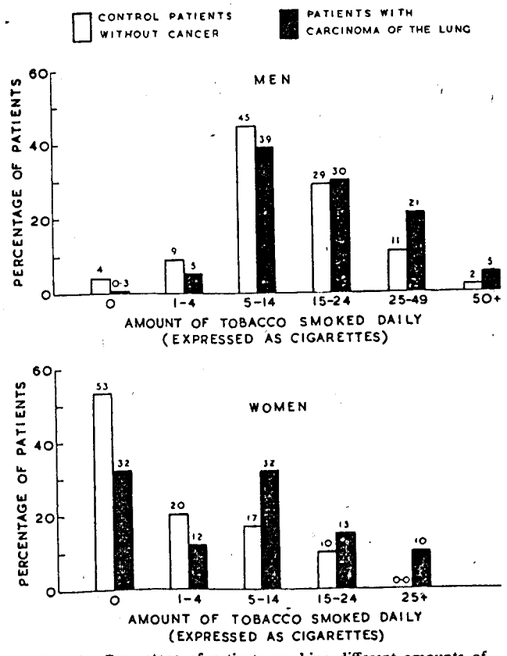


FIG. 1.—Percentage of patients smoking different amounts of tobacco daily.

TABLE VI.—*Maximum Amount of Tobacco Ever Consumed Regularly by Smokers; Lung-carcinoma Patients and Control Patients with Diseases Other Than Cancer*

Disease Group	No. Smoking as a Daily Maximum					Probability Test
	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.–	50 Cigs.+	
Males: Lung-carcinoma patients (647)	24 (3·7%)	208 (32·1%)	196 (30·3%)	174 (26·9%)	45 (7·0%)	$\chi^2 = 23{\cdot}16$; n = 4; P < 0·001
Control patients with diseases other than cancer (622)..	38 (6·1%)	242 (38·9%)	201 (32·3%)	118 (19·0%)	23 (3·7%)	
Females: Lung-carcinoma patients (41)..	6 (14·6%)	15 (36·6%)	12 (29·3%)	8 (19·5%)	0 (0·0%)	$\chi^2 = 7{\cdot}58$; n = 2; 0·02 < P < 0·05 (Women smoking 15 or more cigarettes a day grouped together)
Control patients with diseases other than cancer (28) ..	12 (42·9%)	9 (32·1%)	6 (21·4%)	0 (0·0%)	1 (3·6%)	

TABLE VII.—*Estimate of Total Amount of Tobacco Ever Consumed by Smokers; Lung-carcinoma Patients and Control Patients with Diseases Other Than Cancer*

Disease Group	No. Who have Smoked Altogether					Probability Test
	365 Cigs.–	50,000 Cigs.–	150,000 Cigs.–	250,000 Cigs.–	500,000 Cigs.+	
Males: Lung-carcinoma patients (647)	19 (2·9%)	145 (22·4%)	183 (28·3%)	225 (34·8%)	75 (11·6%)	$\chi^2 = 30{\cdot}60$; n = 4; P < 0·001
Control patients with diseases other than cancer (622)..	36 (5·8%)	190 (30·5%)	182 (29·3%)	179 (28·9%)	35 (5·6%)	
Females: Lung-carcinoma patients (41)..	10 (24·4%)	19 (46·3%)	5 (12·2%)	7 (17·1%)	0 (0·0%)	$\chi^2 = 12{\cdot}97$; n = 2; 0·001 < P < 0·01 (Women smoking 15 or more cigarettes a day grouped together)
Control patients with diseases other than cancer (28) ..	19 (67·9%)	5 (17·9%)	3 (10·7%)	1 (3·6%)	0 (0·0%)	

number of women interviewed—that is, bringing in the other cancer groups interviewed and making appropriate allowance for age differences between them—then the significance of the trend in their case also is established ($\chi^2 = 13.23$; n = 2; P approximately .0001).

The results given in Tables IV and V are shown together graphically in Fig. 1. (The percentages in the figure are not all exactly the same as those in the tables. In the figure the percentages are based on the total number of patients in each disease group, smokers and non-smokers alike; in Table V they are percentages of smokers alone.)

Smoking History

Going one stage further, it has been noted earlier that the amount smoked daily at any one period does not, of course, necessarily give a fair representation of the individual's smoking history. This has been overcome to some extent in the previous tables by classifying a patient as a non-smoker only if he has never smoked regularly, by classifying him according to the amount he last smoked regularly if he had given up smoking, and by ignoring changes in smoking habits which had taken place subsequent to the illness which brought the patient into hospital. Other methods of analysis have also been adopted. Thus Table VI shows the results in the two main groups when a comparison is made between the maximum amounts ever smoked regularly, and Table VII shows a comparison between the estimated total amounts of tobacco smoked throughout the patients' whole lives. The estimates of the total amount smoked (expressed as cigarettes) have been made by multiplying the daily amount of tobacco smoked by the number of days that the patient has been in the habit of smoking and making allowance for the major recorded changes in the smoking history. Such estimates may, needless to say, be only very rough approximations to the truth, but they are, it is thought, accurate enough to reveal broad differences between the groups.

The results in Tables V, VI, and VII are, it will be seen, closely similar. Whichever measure of smoking is taken, the same result is obtained—namely, a significant and clear relationship between smoking and carcinoma of the lung. It might perhaps have been expected that the more refined concepts—the maximum amount ever smoked and the total amount ever smoked—would have shown a closer relationship than the most recent amount smoked before the onset of the present illness. It must be supposed, however, that any greater efficiency that might be introduced by the use of these measures is counterbalanced by the inaccuracy which results from requiring the patient to remember habits of many years past. It seems, therefore, that we may reasonably adopt "the most recent amount smoked" in subsequent tables as the simplest characteristic to describe a patient's smoking experience.

Comparisons of the age at which patients began to smoke, the number of years they have smoked, and the number of years they have given up smoking are shown in Table VIII.

It will be seen that the lung-carcinoma patients showed a slight tendency to start smoking earlier in life, to continue longer, and to be less inclined to stop, but the differentiation is certainly not sharp and the difference is technically significant only with respect to length of time stopped.

Cigarettes and Pipes

So far no distinction has been made between cigarette and pipe smokers, and it is natural to ask whether both methods of smoking tobacco are equally related to carcinoma of the lung. Again the difficulty arises that a man who describes himself as a pipe smoker may have smoked cigarettes until shortly before interrogation, or, alternatively, he may have had his teeth extracted and substituted cigarettes for his pipe. To overcome this, we have excluded

TABLE VIII.—*Age of Starting to Smoke, Number of Years Smoked, and Number of Years Stopped Smoking in Lung-carcinoma Patients and Control Patients with Diseases Other Than Cancer (Male and Female)*

Age at Starting	Lung-carcinoma Patients		Control Patients		No. of Years Smoking	Lung-carcinoma Patients		Control Patients		No. of Years Stopped	Lung-carcinoma Patients		Control Patients	
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Under 20 ..	541	78·6	488	75·1	1–	14	5·1	18	7·7	0	649	94·3	590	90·8
20–	118	17·2	129	19·8	10–	21		32		1–	30	4·4	37	5·7
30–	17	4·2	22	5·1	20–	351	51·0	338	52·0	10–	4	1·3	14	3·5
40+	12		11		40+	302	43·9	262	40·3	20+	5		9	
All ages ..	688		650		Total	688		650		Tota	688		650	
$\chi^2 = 2{\cdot}40$; n = 2; 0·30 < P < 0·50					$\chi^2 = 4{\cdot}65$; n = 2; 0·05 < P < 0·10					$\chi^2 = 8{\cdot}59$; n = 2; 0·01 < P < 0·02				

all the men who gave a history of having ever consistently smoked both pipes and cigarettes and have compared the proportions of "pure pipe" and "pure cigarette" smokers among the lung-carcinoma and non-cancer control patients. The results are as follows: of the 525 lung-carcinoma patients who had smoked either pipes or cigarettes but not both 5.7% were pipe smokers and 94.3% were cigarette smokers; of 507 control patients with other diseases 9.7% were pipe smokers and 90.3% were cigarette smokers. The lower proportion of pipe smokers, and the corresponding excess of cigarette smokers, in the lung-carcinoma group is unlikely to be due to chance ($\chi^2=5.70$; $n=1$; $0.01<P<0.02$).

It therefore seems that pipe smoking is less closely related to carcinoma of the lung than cigarette smoking. On the other hand, it has been shown in Table V that light smoking is less closely related to carcinoma of the lung than heavy smoking, so that the result might be explained merely on the grounds that pipe smokers tend to smoke less tobacco.

In fact, pipe smokers do consume, on the average, less tobacco than cigarette smokers, but this is unlikely to be the whole explanation of the relative deficiency of pipe smokers observed in the carcinoma group. We find a higher proportion of cigarette smokers and a lower proportion of pipe smokers among the lung-carcinoma patients than among the control group of non-cancer patients at each level of consumption of tobacco—that is, at 1–4, 5–14, 15–24, and 25+ cigarettes or their equivalent a day. On the other hand, if we consider the "pure pipe" smokers by themselves and subdivide them according to the amount smoked, then we find a higher proportion of the carcinoma patients than of the control group in the higher smoking categories—that is, smoking more than 6 oz. of tobacco a week. In short, the results of this subdivision are similar to those shown in Table V for all smokers. It seems that the method by which the tobacco is smoked is of importance and that smoking a pipe, though also related to carcinoma of the lung, carries a smaller risk than smoking cigarettes. With the data at our disposal we are unable to determine how great the difference in risk may be.

Inhaling

Another difference between smokers is that some inhale and others do not. All patients who smoked were asked whether or not they inhaled, and the answers given by the lung-carcinoma and non-cancer control patients were as follows: of the 688 lung-carcinoma patients who smoked (men and women) 61.6% said they inhaled and 38.4% said they did not; the corresponding figures for the 650 patients with other diseases were 67.2% inhalers and 32.8% non-inhalers. It would appear that lung-carcinoma patients inhale slightly less often than other patients ($\chi^2=4.58$; $n=1$; $0.02<P<0.05$). However, the difference is not large, and if the lung-carcinoma patients are compared with all the other patients interviewed, and the necessary allowance is made for sex and age, the difference becomes insignificant ($\chi^2=0.19$; $n=1$; $0.50<P<0.70$).

Interpretation of Results

Though from the previous tables there seems to be no doubt that there is a direct association between smoking and carcinoma of the lung it is necessary to consider alternative explanations of the results. Could they be due to an unrepresentative sample of patients with carcinoma of the lung or to a choice of a control series which was not truly comparable? Could they have been produced by an exaggeration of their smoking habits by patients who thought they had an illness which could be attributed to smoking? Could they be produced by bias on the part of the interviewers in taking and interpreting the histories?

Selection of Patients for Interview

The method by which the patients with carcinoma of the lung were obtained has been discussed earlier; there is no reason to suppose that they were anything other than a representative sample of the lung-carcinoma patients attending the selected London hospitals. The control patients, as was shown in Table II, were exactly comparable so far as sex and age were concerned and they were sufficiently comparable with regard to social class for the difference between the two series to be ignored. They were not wholly comparable from the point of view of place of residence. The difference in this respect, however, was that more of the lung-carcinoma patients came from small towns and rural districts, and the figures in this inquiry show that consumption of tobacco per head in these areas is less than in London. Clearly this feature cannot have accounted for the observation that the lung-carcinoma patients smoked more. Further, if the comparison is confined to patients seen in district hospitals—and all of these resided in Greater London—the results are the same (Table IX).

TABLE IX.—*Most Recent Amount Smoked by Lung-carcinoma and Control Patients Seen in District Hospitals (Male and Female)*

Disease Group	No. Smoking Daily				
	0	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.+
Lung-carcinoma patients (98) ..	2	12	36	27	21
Control patients with diseases other than cancer (98) ..	9	9	50	19	11

$\chi^2 = 11.68$; $n = 4$; $0.01<P<0.02$

It might possibly be argued that the choice of a control group of patients with various medical and surgical conditions has, of itself, resulted in the selection of subjects with a smoking history less than the average. This would seem very unlikely, as we know of no evidence to suggest that less than average smoking is a characteristic of persons with any one group of diseases, and it certainly could not be held that it is equally a characteristic of persons suffering from all diseases other than carcinoma of the lung. Yet in Table X the smoking habits of the patients

TABLE X.—*Most Recent Amount Smoked by all Patients Other Than Those with Carcinoma of Lung, Divided According to Type of Disease (Male and Female)*

Disease Group	No. Smoking Daily				
	0	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.+
Cancer, other than carcinoma of lung (718)	236* *220·0*	78 *85·3*	237 *236·9*	110 *122·8*	57 *53·0*
Respiratory disease, other than cancer (335)	42 *47·0*	33 *29·7*	128 *136·1*	98 *84·1*	34 *38·1*
Cardiovascular disease (166) ..	22 *17·7*	19 *16·7*	64 *73·8*	38 *39·5*	23 *18·3*
Gastro-intestinal disease (328) ..	39 *55·7*	31 *32·3*	143 *130·2*	81 *75·8*	34 *34·5*
Other diseases (215)	38 *36·6*	24 *21·1*	91 *86·0*	44 *48·9*	18 *22·1*

$\chi^2 = 20.14$; $n = 16$; $0.20<P<0.30$.

* The roman figures show the actual numbers observed, those in italics are the numbers that would have occurred if the disease group in question had had in each sex and at each age exactly the same smoking habits as all the patients included in the table.

in five main groups of diseases are compared, allowing for their sex and age composition, and no significant difference can be demonstrated between them. (We have

brought into this table all the patients with diseases other than carcinoma of the lung.)

As in other tables where sex and age differences between groups have had to be taken into account, the "expected" numbers have been obtained by taking the actual numbers of patients with each type of disease in each age and sex subgroup, and calculating what proportion of them would fall in each smoking category if they had had exactly the same habits as all the patients included in the Table. In other words, we have computed what ought to be the smoking habits of each disease group if it behaved in each sex and at each age like the total population of patients, and compared them with what, in fact, they were. The relatively large numbers of non-smokers in some of the groups are due to the fact that these disease groups included many old women.

There remains the possibility that the interviewers, in selecting the control patients, took for interview from among the patients available for selection a disproportionate number of light smokers. It is difficult to see how they could have done so, but the point can be tested indirectly by comparing the smoking habits of the patients whom they did select for interview with the habits of the other patients, other than those with carcinoma of the lung, whose names were notified by the hospitals. The comparison is made in Table XI and reveals no appreciable difference between the two groups.

TABLE XI.—*Most Recent Amount Smoked by All Patients Other Than Those with Carcinoma of Lung, Divided According to Whether They Were Notified or Selected for Interview (Male and Female)*

Method of Selection of Patient	No. Smoking Daily				
	0	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.+
Notified by hospital (1,032) ..	307* *301·8*	114 *119·0*	354 *345·2*	179 *186·1*	78 *80·0*
Selected by interviewer (730) ..	70 *75·2*	71 *66·0*	309 *317·8*	192 *184·9*	88 *86·0*

$\chi^2 = 2.14$; $n = 4$; $0.70<P<0.80$.

* See footnote to Table X.

It can therefore be concluded that there is no evidence of any special bias in favour of light smokers in the selection of the control series of patients. In other words, the group of patients interviewed forms, we believe, a satisfactory control series for the lung-carcinoma patients from the point of view of comparison of smoking habits.

Patient's Smoking History

Another possibility to consider is that the lung-carcinoma patients tended to exaggerate their smoking habits. Most of these patients cannot have known that they were suffering from cancer, but they would have known that they had respiratory symptoms, and such knowledge might have influenced their replies to questions about the amount they smoked. However, Table X has already shown that patients with the other respiratory diseases did not give smoking histories appreciably different from those given by the patients with non-respiratory illnesses. There is no reason, therefore, to suppose that exaggeration on the part of the lung-carcinoma patients has been responsible for the results.

The Interviewers

When the investigation was planned it was hoped that the interviewers would know only that they were interviewing patients with cancer of one of several sites (lung, stomach, or large bowel) but not, at the time, the actual site. This, unfortunately, was impracticable; the site would be written on the notification form, or the nurse would refer to the diagnosis in pointing out the patient, or it would become known that only patients with cancer of one of the sites under investigation would be found in one particular ward. Out of 1,732 patients notified and interviewed as cases of cancer, the site of the growth was known to the interviewer at the time of interview in all but 61. Serious consideration must therefore be given to the possibility of interviewers' bias affecting the results (by the interviewers tending to scale up the smoking habits of the lung-carcinoma cases).

Fortunately the material provides a simple method of testing this point. A number of patients were interviewed who, at that time, were thought to have carcinoma of the lung but in whom the diagnosis was subsequently disproved. The smoking habits of these patients, believed by the interviewers to have carcinoma of the lung, can be compared with the habits of the patients who in fact had carcinoma of the lung and also with the habits of all the other patients. The result of making these comparisons is shown in Tables XII and XIII, and it will be seen that the smoking

TABLE XII.—*Most Recent Amount Smoked by Patients with Carcinoma of Lung and by Patients Thought Incorrectly by the Interviewers to be Suffering from Carcinoma of Lung (Male and Female)*

Disease Group	No. Smoking Daily				
	0	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.+
Patients with carcinoma of lung (709)	21* *31·7*	40 *48·0*	269 *276·0*	205 *201·0*	174 *152·7*
Patients incorrectly thought to have carcinoma of lung (209)†	35 *24·3*	25 *17·0*	83 *76·0*	50 *54·0*	16 *37·3*

$\chi^2 = 29.76$; $n = 4$; $P < 0.001$.

* See footnote to Table X.
† There is a large number of cases in this group because one hospital notified all cases admitted for bronchoscopy; 147 out of the 209 incorrectly thought to have carcinoma of the lung were interviewed at this hospital.

TABLE XIII.—*Most Recent Amount Smoked by Patients Incorrectly Thought by the Interviewers to be Suffering from Carcinoma of Lung and All Other Patients Not Suffering from Carcinoma of Lung (Male and Female)*

Disease Group	No. Smoking Daily				
	0	1 Cig.–	5 Cigs.–	15 Cigs.–	25 Cigs.+
Patients incorrectly thought to have carcinoma of lung (209)†	35* *36·8*	25 *20·4*	83 *82·0*	50 *48·8*	16 *20·8*
All other patients not suffering from carcinoma of lung (1,553)	342 *340·2*	160 *164·6*	580 *581·0*	321 *322·2*	150 *145·2*

$\chi^2 = 2.58$; $n = 4$; $0.50<P<0.70$.

* See footnote to Table X. † See footnote to Table XII.

habits of the patients who were incorrectly thought to have carcinoma of the lung at the time of interview are sharply distinguished from the habits of those patients who did in fact have carcinoma of the lung (Table XII), but they do not differ significantly from the habits of the other patients interviewed (Table XIII).

It is therefore clearly not possible to attribute the results of this inquiry to bias on the part of the interviewers, as, had there been any appreciable bias, the smoking habits of the patients thought incorrectly to have carcinoma of the lung would have been recorded as being like those of the true lung-carcinoma subjects and not the same as those without carcinoma of the lung.

We may add that the results cannot be due to different workers interviewing different numbers of patients in the cancer and control groups, for, while the four interviewers

did not see exactly the same proportions of patients in all the groups, the proportions were very close. Moreover, if the patients seen by each of the interviewers are treated as four separate investigations, highly significant differences are found between the lung-carcinoma patients and the other patients interviewed in three instances. In the fourth the difference is in the same direction, but, owing to the small number of patients seen, the results are not technically significant (P lies between 0.10 and 0.05; in this instance the almoner had to stop work because of illness, having seen only 46 patients with carcinoma of the lung).

Discussion

To summarize, it is not reasonable, in our view, to attribute the results to any special selection of cases or to bias in recording. In other words, it must be concluded that there is a real association between carcinoma of the lung and smoking. Further, the comparison of the smoking habits of patients in different disease groups, shown in Table X, revealed no association between smoking and other respiratory diseases or between smoking and cancer of the other sites (mainly stomach and large bowel). The association therefore seems to be specific to carcinoma of the lung. This is not necessarily to say that smoking causes carcinoma of the lung. The association would occur if carcinoma of the lung caused people to smoke or if both attributes were end-effects of a common cause. The habit of smoking was, however, invariably formed before the onset of the disease (as revealed by the production of symptoms), so that the disease cannot be held to have caused the habit; nor can we ourselves envisage any common cause likely to lead both to the development of the habit and to the development of the disease 20 to 50 years later. We therefore conclude that smoking is a factor, and an important factor, in the production of carcinoma of the lung.

The effect of smoking varies, as would be expected, with the amount smoked. The extent of the variation could be estimated by comparing the numbers of patients interviewed who had carcinoma of the lung with the corresponding numbers of people in the population, in the same age groups, who smoke the same amounts of tobacco. Our figures, however, are not representative of the whole country, and this may be of some importance, as countrymen smoke, on the average, less than city dwellers. Moreover, as was shown earlier, the carcinoma and the control patients were not comparable with regard to their places of residence. The difficulty can be overcome by confining the comparison to the inhabitants of Greater London.

If it be assumed that the patients without carcinoma of the lung who lived in Greater London at the time of their interview are typical of the inhabitants of Greater London with regard to their smoking habits, then the number of people in London smoking different amounts of tobacco can be estimated. Ratios can then be obtained between the numbers of patients seen with carcinoma of the lung and the estimated populations at risk who have smoked comparable amounts of tobacco. This has been done for each age group, and the results are shown in Table XIV. It must be stressed that the ratios shown in this table are not measures of the actual risks of developing carcinoma of the lung, but are put forward very tentatively as proportional to these risks.

Thus Table XIV shows clearly, and for each age group, the conclusion previously reached—that the risk of developing carcinoma of the lung increases steadily as the amount smoked increases. If the risk among non-smokers is taken

TABLE XIV.—*Ratios of Patients Interviewed With Carcinoma of Lung and with a Given Daily Consumption of Tobacco to the Estimated Populations in Greater London Smoking the Same Amounts (Male and Female Combined; Ratios per Million)*

Age	Daily Consumption of Tobacco						Total
	0	1–4 Cigs.	5–14 Cigs.	15–24 Cigs.	25–49 Cigs.	50 Cigs.+	
25– ..	*0**	*11*	*2*	*6*	*28*	—	*4*
35– ..	*2*	*9*	43	41	67	*77*	29
45– ..	*12*	34	178	241	429	667	147
55– ..	14	133	380	463	844	600	244
65–74 ..	21	110	300	510	*1,063*	*2,000*	186

* Ratios based on less than 5 cases of carcinoma of the lung are given in italics.

as unity and the resulting ratios in the three age groups in which a large number of patients were interviewed (ages 45 to 74) are averaged, the relative risks become 6, 19, 26, 49, and 65 when the number of cigarettes smoked a day are 3, 10, 20, 35, and, say, 60—that is, the mid-points of each smoking group. In other words, on the admittedly speculative assumptions we have made, the risk seems to vary in approximately simple proportion with the amount smoked.

One anomalous result of our inquiry appears to relate to inhaling. It would be natural to suppose that if smoking were harmful it would be more harmful if the smoke were inhaled. In fact, whether the patient inhaled or not did not seem to make any difference. It is possible that the patients were not fully aware of the meaning of the term and answered incorrectly, but the interviewers were not of that opinion. In the present state of knowledge it is more reasonable to accept the finding and wait until the size of the smoke particle which carries the carcinogen is determined. Until this is known nothing can be stated about the effect which any alteration in the rate and depth of respiration may have on the extent and site of deposition of the carcinogen (Davies, 1949).

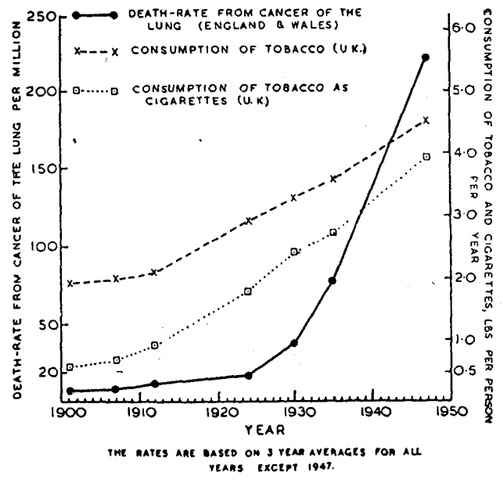


FIG. 2.—Death rate from cancer of the lung and rate of consumption of tobacco and cigarettes.

How, in conclusion, do these results fit in with other known facts about smoking and carcinoma of the lung? Both the consumption of tobacco and the number of deaths attributed to cancer of the lung are known to have increased, and to have increased largely, in many countries

this century. The trends in this country are given in Fig. 2, and show that over the last 25 years the increase in deaths attributed to cancer of the lung has been much greater than the increase in tobacco consumption. This might well be because the increased number of deaths in the latter years is partly an apparent increase, due to improved diagnosis; in other words, it is not wholly a reflection of increased prevalence of cancer of the lung. On the other hand, it is possible that the carcinogenic agent is introduced during the cultivation or preparation of tobacco for consumption and that changes in the methods of cultivation and preparation have occurred as well as changes in consumption. However that may be, it is clearly not possible to deduce a simple time relationship in this country between the consumption of tobacco and the number of deaths attributed to cancer of the lung.

The greater prevalence of carcinoma of the lung in men compared with women leads naturally to the suggestion that smoking may be a cause, since smoking is predominantly a male habit. Although increasing numbers of women are beginning to smoke, the great majority of women now of the cancer age have either never smoked or have only recently started to do so. It is therefore tempting to ascribe the high sex ratio to the greater consumption of tobacco by men. If this were true it would be expected that the incidence of carcinoma of the lung would be the same among non-smokers in both sexes. In this series, 2 out of 649 men and 19 out of 60 women with carcinoma of the lung were non-smokers.

To calculate the incidence rates among non-smokers of either sex it is necessary to estimate the number of non-smokers in the population from which the patients were drawn. For reasons given earlier this cannot be done, but an estimate can be obtained of the expected sex ratio of cases occurring among non-smokers in the Greater London area. From the experience of the patients without carcinoma of the lung who lived in Greater London at the time of their interview it can be calculated that there were, in 1948, 175,000 men and 1,582,000 women in London between the ages of 25 and 75 who had never been smokers according to our definition of the term. Taking these figures, subdivided by age, in association with the age distribution of the 16 cases of carcinoma of the lung observed among non-smokers living in Greater London, it can be calculated that, if the incidence of the disease were equal among non-smokers of both sexes, one case should have occurred in a man and 15 in women. In fact, the observed ratio was 0 to 16.

This finding is consistent with the theory that the risk of developing carcinoma of the lung is the same in both men and women, apart from the influence of smoking. It is not, however, possible to demonstrate with the data at our disposal that different amounts of smoking are sufficient to account for the overall sex ratio.

As to the nature of the carcinogen we have no evidence. The only carcinogenic substance which has been found in tobacco smoke is arsenic (Daff and Kennaway, 1950), but the evidence that arsenic can produce carcinoma of the lung is suggestive rather than conclusive (Hill and Faning, 1948). Should arsenic prove to be the carcinogen, the possibility arises that it is not the tobacco itself which is dangerous. Insecticides containing arsenic have been used for the protection of the growing crop since the end of the last century and might conceivably be the source of the responsible factor. This, too, might account for the observation that deaths from cancer of the lung have increased more rapidly than the consumption of tobacco.

Summary

The great increase in the number of deaths attributed to cancer of the lung in the last 25 years justifies the search for a cause in the environment. An investigation was therefore carried out into the possible association of carcinoma of the lung with smoking, exposure to car and fuel fumes, occupation, etc. The preliminary findings with regard to smoking are reported.

The material for the investigation was obtained from twenty hospitals in the London region which notified patients with cancer of the lung, stomach, and large bowel. Almoners then visited and interviewed each patient. The patients with carcinoma of the stomach and large bowel served for comparison and, in addition, the almoners interviewed a non-cancer control group of general hospital patients, chosen so as to be of the same sex and age as the lung-carcinoma patients.

Altogether 649 men and 60 women with carcinoma of the lung were interviewed. Of the men 0.3% and of the women 31.7% were non-smokers (as defined in the text). The corresponding figures for the non-cancer control groups were: men 4.2%, women 53.3%.

Among the smokers a relatively high proportion of the patients with carcinoma of the lung fell in the heavier smoking categories. For example, 26.0% of the male and 14.6% of the female lung-carcinoma patients who smoked gave as their most recent smoking habits prior to their illness the equivalent of 25 or more cigarettes a day, while only 13.5% of the male and none of the female non-cancer control patients smoked as much. Similar differences were found when comparisons were made between the maximum amounts ever smoked and the estimated total amounts ever smoked.

Cigarette smoking was more closely related to carcinoma of the lung than pipe smoking. No distinct association was found with inhaling.

Taken as a whole, the lung-carcinoma patients had begun to smoke earlier and had continued for longer than the controls, but the differences were very small and not statistically significant. Rather fewer lung-carcinoma patients had given up smoking.

Consideration has been given to the possibility that the results could have been produced by the selection of an unsuitable group of control patients, by patients with respiratory disease exaggerating their smoking habits, or by bias on the part of the interviewers. Reasons are given for excluding all these possibilities, and it is concluded that smoking is an important factor in the cause of carcinoma of the lung.

From consideration of the smoking histories given by the patients without cancer of the lung a tentative estimate was made of the number of people who smoked different amounts of tobacco in Greater London, and hence the relative risks of developing the disease among different grades of smokers were calculated. The figures obtained are admittedly speculative, but suggest that, above the age of 45, the risk of developing the disease increases in simple proportion with the amount smoked, and that it may be approximately 50 times as great among those who smoke 25 or more cigarettes a day as among non-smokers.

The observed sex ratio among non-smokers (based, it must be stressed, on very few cases) can be readily accounted for if the true incidence among non-smokers is equal in both sexes.

It is not possible to deduce a simple time relationship between the increased consumption of tobacco and the increased number of deaths attributed to cancer of the lung. This may be because part of the increase is apparent—that is, due to improved diagnosis—but it may also be because the carcinogen in tobacco smoke is introduced into the tobacco during its cultivation or preparation. Greater changes may have taken place in the methods involved in these processes than in the actual amount of tobacco consumed.

Co-operating Hospitals.—Brompton, Central Middlesex, Fulham, Hackney, Hammersmith, Harefield, Lambeth, Lewisham, Middlesex, Mount Vernon and the Radium Institute, New End, Royal Cancer, Royal Free, St. Bartholomew's,

St. Charles's, St. James', St. Mary's, St. Thomas's, University College, Whittington.

We are indebted to the staffs of the above-named hospitals for having allowed us to interview their patients and to have access to the hospital notes; also to the individual members of the staffs, both medical and lay, who notified the cases and collected the notes for examination. The work could not have been carried out without their co-operation. Sir Ernest Kennaway and Dr. Percy Stocks took part in a conference called by the Medical Research Council, at which this investigation was initiated, and we have been fortunate in having their helpful advice throughout its course. Professor W. D. Newcomb has advised us on individual problems of pathology. We are most grateful for this assistance. Finally, we wish to thank Miss Marna Buckatzsch, Miss Beryl Iago, Miss Keena Jones, and Miss Rosemary Thomson, who interviewed the patients and helped with the analysis of the results; and Dr. J. T. Boyd for assistance in the calculations.

REFERENCES

Clemmesen, J., and Busk, T. (1947). *Brit. J. Cancer*, **1**, 253.
Daff, M., and Kennaway, E. L. (1950). Ibid. In press.
Davies, C. N. (1949). *Brit. J. industr. Med.*, **6**, 245.
Hill, A. Bradford, and Faning, E. L. (1948). Ibid., **5**, 1.
Kennaway, E. L., and Kennaway, N. M. (1947). *Brit. J. Cancer*, **1**, 260.
Müller, F. H. (1939). *Z. Krebsforsch.*, **49**, 57.
Schrek, R., Baker, L. A., Ballard, G. P., and Dolgoff, S. (1950). *Cancer Res.*, **10**, 49.
Steiner, P. E. (1944). *Arch. Path.*, **37**, 185.
Stocks, P. (1947). Studies on Medical and Population Subjects, No. 1. Regional and Local Differences in Cancer Death Rates. H.M.S.O., London.
Willis, R. A. (1948). *Pathology of Tumours*. Butterworth, London.
Wynder, E. L., and Graham, E. A. (1950). *J. Amer. med. Ass.*, **143**, 329.

REGIME FOR TREATMENT OF SEVERE AND ACUTE LIVER DISEASE

BY

A. L. LATNER, M.D., M.Sc., D.I.C., A.R.C.S.

(From the Section of Chemical Pathology, Department of Pathology, Royal Victoria Infirmary, Newcastle-upon-Tyne)

In spite of increasing biochemical knowledge on the subject of liver necrosis, the high mortality rate of severe liver disease of acute onset remains a therapeutic challenge. Once coma has occurred a fatal outcome is probable; a recovery is always an event of note.

It is, however, a remarkable fact that even patients suffering from massive necrosis may linger on for a number of days. This is in marked contrast to the short period of survival of animals after hepatectomy. Moreover, in so-called "acute yellow atrophy" several of the liver's functions may remain apparently normal until death. Even the fasting blood-sugar level may remain within normal limits. This must surely mean that enough liver tissue survives to carry out certain highly important metabolic processes. There is also reason to believe that the histological picture of massive necrosis is not unrelated to post-mortem autolysis, and that much more liver tissue survives during life than is apparent after death (van Beek and Haex, 1943).

These facts are of great importance. If practically all the liver were necrotic during life, then treatment would obviously be useless. On the other hand, if large numbers of liver cells were diseased but not dead the possibility would remain that the process was reversible, and that a successful treatment might eventually be discovered. In the hope that the latter state of affairs actually occurs, I have been attempting over a number of years to treat these cases on biochemical principles.

Earlier Work

Some three years ago treatment was begun in a series of six patients in coma from acute liver disease (Latner and Mowbray—paper in preparation). By daily intravenous administration, each patient received 1 to 3 g. of cystine in addition to glucose and plasma. The importance of this amino-acid in the prevention of experimental necrosis had already been demonstrated (Glynn *et al.*, 1945). All these cases presented the clinical picture of "acute yellow atrophy" and all had a fatal outcome.

A gross amino-aciduria has been demonstrated in severe liver disease by paper chromatography (Dent, 1949). In view of the known increase in the amino-acid content of the blood, including the thioamino-acids, Dent has suggested that the necrotic liver cannot utilize them and they could not therefore be of much use in curative treatment.

There was some possibility that a reflex circulatory upset affecting the liver might prevent the cystine reaching the liver cells. With this possibility in view, tetraethylammonium bromide was administered to our sixth case as soon as it became obvious that there was no response to cystine. The downhill progress of the patient was in no way affected.

These discouraging results made it obvious that we were thinking along incorrect lines. The diseased liver cell required cystine to prevent necrosis but could not utilize it adequately from external sources. The problem, therefore, was to render the cells less sensitive to cystine deficiency, so that they could utilize their own cystine until such time as recovery was complete enough to allow them to use the amino-acids of surrounding tissue fluid. From this point of view the role assigned to tocopherol in the production of experimental hepatic necrosis (Schwarz, 1944; György, 1947; Himsworth and Lindan, 1949) assumes great importance. This vitamin has therefore been included in the regime of treatment described below.

The intracellular oxidative processes of the liver and other organs also require other vitamins. In their absence toxic products accumulate which could easily be a factor in the final death of liver cells. The successful application of massive doses of the vitamin-B group in the cholaemia of cirrhosis has already been reported (Patek *et al.*, 1948). This form of therapy was therefore also included in the regime.

Recent knowledge of the state of dynamic equilibrium of the body proteins also has a bearing on this problem. It seems likely that proteins are not only destroyed by wear and tear but are continuously being broken down and resynthesized at a remarkably rapid rate. This protein turnover can be demonstrated with radioactive tracers. One would not be far wrong in stating that every protein in the body was in a state of dynamic equilibrium with all other proteins (Whipple, 1948). The liver has been described as the master organ for protein metabolism. The diminution of the plasma proteins in severe disease of this organ could profoundly upset the normal equilibrium of the tissue proteins and so lead to metabolic upsets. The resulting toxic metabolites could act unfavourably on already damaged liver cells. It therefore becomes of great importance to administer plasma protein in severe liver disease, and for this reason it has been included in the regime.

Vitamins of the B group have been administered along with a dextrose solution in normal saline. The saline vehicle has been used because of the remarkable tendency for these patients to develop low plasma-chloride levels, probably related to vomiting and possibly to associated renal failure.

Large amounts of dextrose administered intravenously can lead to a dangerously low level of plasma potassium. This was in fact demonstrated in the one fatal case of this series. For this reason every pint (570 ml.) of dextrose in saline has also contained 0.5 g. of potassium chloride.

All patients in coma are very liable to develop aspiration pneumonia. This is well seen in liver necrosis; such patients seem to have a marked tendency to infection. For this reason penicillin has been administered daily. If this fails to control infection streptomycin may be used.

The Regime

The regime, as finally developed, is as follows.

Infusion 1.—To each pint of 10% dextrose in normal saline are added 50 mg. of thiamin hydrochloride, 150 mg. of nicotinamide, and 50 mg. of riboflavin as well as 0.5 g. of potassium chloride.

Infusion 2.—This consists of plasma to which the vitamins alone have been added in the same concentrations as in Infusion 1.

The patient's blood group is immediately determined and appropriate donors are contacted. Penicillin, 1,000,000 units, is administered daily for 10 days. During each 24 hours three separate pints of Infusion 1 are administered intravenously at six-hourly intervals and after a further six hours one pint of Infusion 2 is given. During this period 300 mg. of tocopherol is administered intramuscularly in three divided doses.

This treatment is continued until such time as fluids can be safely administered by mouth; usually two or three days. It is important to administer the tocopherol by mouth as soon as possible, as it is said to be much more effective by the oral route (Goettsch and Pappenheimer, 1941). As recovery sets in, the vitamin dosages are halved on consecutive days until they can be replaced by a reliable polyvitamin preparation, which is continued through convalescence.

As soon as the patient is able to take fluids by mouth, "hepovite" is administered in gradually increasing dosage until the patient is receiving 2 oz. (62 g.) daily in addition to the ordinary diet.

Unfortunately, in the early stages haemorrhagic incidents are common. In this series they have taken the form of epistaxis or melaena. It is of the greatest importance to be constantly on the alert for signs of severe haemorrhage. This must be treated by the immediate administration of appropriate amounts of fresh donor blood, to each pint of which the vitamins have been added in the same concentrations as in the infusions. It must be emphasized that for this purpose stored blood is useless, as the haemorrhage is due among other factors to prothrombin deficiency.

If an infection which is obviously not responding to penicillin develops, a course of streptomycin may be given. Sedatives are best avoided. However, these patients are liable to become very restless and extremely difficult to nurse, and on occasion it may be necessary to administer paraldehyde. Morphine should not be given.

The treatment has now been given in five instances, details of which follow. For the sake of brevity the regime is referred to as "the intravenous liver regime."

Case 1: Massive Necrosis Complicating Infective Hepatitis

A housewife aged 42 was jaundiced and stuporous on admission and soon lapsed into coma. One week previously she had felt unwell and had a temperature of 102.4° F. (39.1° C.). She suffered from anorexia and nausea, but drank quite copiously. Five days before admission she began to vomit a great deal, and this continued for three days. She had not vomited since, but suffered from severe nausea. Her temperature became normal two days before admission. By the next day she had become drowsy, and gradually got worse until she was answering questions only when spoken to sharply. Jaundice now became evident.

On examination it was found that she could be roused with difficulty to say an occasional word. She reacted vigorously to painful stimuli. Her conjunctivae were yellow and her skin slightly jaundiced. Her abdomen was tender all over, especially in the right upper quadrant, with some guarding on deep palpation. The liver could not be palpated, but there was a reduction in the area of hepatic dullness. Some bruising was present over the right lower shin, and the plantar responses were flexor. Her temperature was 98° F. (36.7° C.), pulse rate 92 a minute, and blood pressure 160/95 mm. Hg.

A specimen of urine contained albumin and bile pigments but no casts. The white cell count was 7,800 per c.mm. The serum thymol turbidity and flocculation were respectively 21 units and ++++. The plasma alkaline phosphatase and blood urea were respectively 18 units (Jenner and Kay) and 21 mg. per 100 ml.

Intravenous therapy was begun immediately. In this case the infusions contained no added potassium chloride, and tocopherol was given in much lower dosage than in the regime already described. The patient soon became extremely restless, and sedation was necessary. In spite of this, generalized twitchings of her muscles developed. On the second day of treatment she still remained comatose, with periods of extreme restlessness. By the afternoon of the next day she began to recover from her coma and was able to take fluids by mouth. The improvement continued, and by the fourth day of treatment she was speaking quite rationally and taking fluids well. On the fifth day she was much improved and talking quite rationally. She was feeling better but somewhat weak.

At this stage a cellulitis had begun in her right leg—the limb into which the intravenous drip was being administered. Her temperature was now 102° F. (38.9° C.). Sulphadimidine was given in an unsuccessful attempt to combat the infection. The temperature continued to rise, and by the next day it had reached 104° F. (40° C.), and she lapsed once more into coma. Her blood potassium was only 10.9 mg. per 100 ml. Her blood urea was 70 mg. per 100 ml. and the white cell count 23,000 per c.mm. In spite of the administration of 5 g. of potassium chloride by mouth and 2 g. intravenously she remained in coma and died next day.

One cannot escape the conclusion that the cellulitis played a large part in the causation of death, which may also have been contributed to by the lowered blood potassium. It was because of this case that potassium chloride was subsequently introduced into the routine intravenous therapy and the dosage of vitamin E was increased to 300 mg. daily. It is possible that the administration of streptomycin might have been a life-saving procedure.

Case 2: Infective Hepatitis with Massive Necrosis

A boy aged 9 was somewhat jaundiced on admission. He was delirious and had violent screaming bouts. He had first felt unwell five days previously and became delirious with severe epistaxis during the next 24 hours. The delirium continued up to the day of admission, when jaundice first appeared.

On examination he was seen to be very ill and somewhat dehydrated. A tinge of jaundice was present in the skin and conjunctivae, and purpuric spots were present on his back. His respirations were 45 a minute, his temperature was 99.4° F. (37.4° C.), and pulse rate 104. The liver seemed slightly enlarged. There was no neck rigidity and the plantar responses were flexor. Some moist sounds were present over both lungs. A specimen of urine contained albumin and bile pigments. Blood examination revealed a plasma bilirubin content of 4 mg. per 100 ml. and an alkaline phosphatase of 16.8 units (Jenner and Kay) per 100 ml. The thymol reactions were normal, but cephalin-cholesterol flocculation was ++++.

At this stage he was given 1,000,000 units of penicillin daily, and this was continued for 12 days. Next day he was very ill indeed, with alternating coma and restlessness. He had become more deeply jaundiced and a morbilliform eruption appeared on his trunk. The diagnosis of acute yellow atrophy was made and the prognosis was regarded as extremely grave. Examination of the urine by paper chromatography revealed a gross amino-aciduria.

The intravenous liver regime was now begun. In this case, however, all the vitamins were administered by intramuscular injection. On the third day after admission the patient suffered a severe epistaxis and his haemoglobin was shown to be 50% of normal. He was therefore given a pint (570 ml.) of blood. Next day he was much improved, was rational, and was able to drink. The drip was discontinued. He made rapid progress and was discharged 18 days after admission. Leptospiral agglutinations were negative 18 days after the onset of illness.

He was readmitted 10 days later for a lung abscess which responded well to treatment. When last seen, a year later, he appeared to be in good health.

Case 3: Massive Necrosis of the Puerperium

A housewife aged 25 was admitted in a confused and somewhat stuporous condition two days after the delivery of her first child. There was some jaundice of the skin and conjunctivae. She had begun vomiting a week before the birth of her child, and two days before delivery a slight jaundice was noted. It was hoped that delivery would result in improvement, which was apparent at first, but after 48 hours she relapsed into an almost comatose condition.

On examination liver dullness was markedly diminished: this was confirmed by a number of observers. She was somewhat confused, but could be made to answer questions more or less rationally. At this stage her urine contained bile but no albumin. Tyrosine and leucine crystals could not be demonstrated microscopically, but paper chromatography revealed a gross amino-aciduria. Blood examination disclosed a plasma bilirubin content of 3.36 mg. per 100 ml. The alkaline phosphatase and total serum protein were respectively 17.8 units (Jenner and Kay) and 4.2 g. per 100 ml. The plasma prothrombin was 61% of normal average and the serum thymol reactions were normal. The serum potassium level was only 12.3 mg. per 100 ml.

The patient was placed on the intravenous liver regime for three days and made a rapid recovery. One week later her serum protein had risen to 5.25 g. and her prothrombin was 88% of normal average. She was now shown to have a macrocytic anaemia, but marrow puncture revealed normoblastic erythropoiesis and no megaloblasts were seen. It is interesting to note that other cases in this series have developed a similar condition. The anaemia responded well to the administration of folic acid and a transfusion of the packed cells of two pints (1.14 l.) of blood. When last seen, six months later, she was in normal health.

Case 4: Hepato-renal Syndrome Following Cholecystectomy

A housewife aged 36 was obviously gravely ill when I first saw her. She was deeply jaundiced, vomited copiously, and was in a stupor from which she could not be roused. Her eyes remained turned upwards. She had been admitted to hospital 11 days previously with a history of deepening jaundice of 16 days' duration, not associated with pain but accompanied by severe nausea and itching. There had, however, been intermittent attacks of biliary colic for about eight months.

On admission, laboratory examination revealed that each 100 ml. of her plasma contained 13 mg. of bilirubin and 10.8 units of alkaline phosphatase (Jenner and Kay). The plasma prothrombin was 92% of normal average and the serum thymol reactions showed a turbidity of 5 units and ++++ flocculation. In spite of this evidence of hepatocellular damage, it was decided to operate because of the previous history of biliary colic. Cholecystectomy was performed and a small stone removed from the common bile duct, into which a drain was inserted. On the day after operation a transfusion of two pints of blood became necessary because of continual oozing from the wound. The patient was restless and vomiting, and her condition continued to deteriorate, with deepening jaundice. Because of continuous vomiting, intermittent gastric drainage was performed. She gradually became stuporous and developed oliguria.

Because of her abdominal incision, I was unable to carry out a complete clinical examination. This was made even more difficult by the presence of a large haematoma in the wound, which was still oozing blood. The spleen was not enlarged, and nothing abnormal was demonstrated in her chest. Her temperature was 99° F. (37.2° C.) and her pulse rate 100 a minute. A specimen of urine contained bile, and paper chromatography revealed a gross amino-aciduria. Her plasma bilirubin and blood urea were now respectively 32 mg. and 136 mg. per 100 ml.

The intravenous liver regime was immediately started and was continued for six days. For the first few days the patient remained exceedingly ill, with copious vomiting and well-marked oliguria. The wound haematoma increased in size but the jaundice diminished. On the last day of the regime the plasma bilirubin had fallen to 6.4 mg. per 100 ml. The blood urea, chloride (as Cl'), and potassium were respectively 200, 226, and 16.9 mg. per 100 ml. She was now able to take sips of fluid by mouth, and hepovite was administered. Oliguria still persisted, and in view of the low plasma chloride three pints (1.7 ml.) of 2.7% saline were administered intravenously over a period of 12 hours. This raised the plasma chloride to 311 mg. per 100 ml. (as Cl'), but the blood urea also rose to 440 mg. per 100 ml. A profuse diuresis now set in accompanied by much improvement in the patient's condition. In five days the blood urea had fallen to 110 mg. per 100 ml. The plasma chloride was now well within normal limits and the plasma bilirubin was 1.6 mg. per 100 ml. The red blood cell count was found to be only 2,800,000 per c.mm., the blood haemoglobin was 6.51 g. per 100 ml. A transfusion of two pints of blood was therefore given and folic acid administered.

On discharge, a fortnight later, all biochemical investigations were within normal limits. A high-protein diet supplemented by 2 oz. (62 g.) of hepovite daily was prescribed. When last seen five months after discharge she was fit and well and had obviously gained much weight. She had returned to normal housework.

Case 5: Acute Massive Necrosis of the Puerperium

A housewife aged 25 was admitted in a desperately ill condition; she was jaundiced and comatose. At the thirtieth week of her second pregnancy she felt weak and breathless and suffered from headaches and swelling of the ankles. Six weeks later she first saw a doctor, who delivered her of a stillborn child. Within half an hour she collapsed, became delirious, and then sank into a state of coma, and was admitted to Preston Hospital, North Shields. There was now persistent hiccup, and a deepening jaundice became evident. She was obviously moribund, and in this condition was transferred to the Royal Victoria Infirmary for treatment.

On examination it was found that she could occasionally be roused to mumble a few incoherent words. She suffered from repeated hiccup, jerking movements, and muscular twitchings. She was fairly deeply jaundiced and a well-marked fetor hepaticus was detected. Some spider naevi were present on her arms and face. There was also some palmar erythema. A number of bruises were present over the lower region of her back, particularly over the sacrum. In this position an early bedsore was evident. There was marked diminution of liver dullness and the uterus was enlarged to some 3 in. (7.6 cm.) above the symphysis. Crepitations and areas of diminished air entry were detected over both lung bases. The plantar responses were flexor. Her pulse rate was 100 a minute, blood pressure 70/40 mm. Hg, and temperature on admission 97.4° F. (36.3° C.).

A specimen of urine contained bile but no albumin, and a gross amino-aciduria was demonstrated by paper chromatography. This latter finding was confirmed in subsequent specimens. Examination of the blood revealed a red cell count of 3,600,000 per c.mm. and a leucocytosis of 33,200 cells per c.mm. The blood haemoglobin content was 7.4 g. per 100 ml. Plasma bilirubin, alkaline phosphatase, and total serum protein were respectively 5.6 mg., 21.5 units (Jenner and Kay), and 4.95 g. per 100 ml. The thymol reactions and zinc sulphate flocculation were within normal limits. The blood urea was raised to 352 mg. per 100 ml.

The patient was immediately placed on the intravenous liver regime and the response was dramatic. Twenty-four hours after admission she was free from hiccup for short periods and was able to recognize her relatives. She could now take some fluids by mouth. Forty-eight hours after admission she developed a severe melaena, which continued for three days and necessitated the administration over this period of five pints (2.84 l.) of blood containing added vitamins. During this time it was thought unnecessary to administer any plasma. The hiccup vanished on the third day of treatment, and she was alert and smiling and taking her food. The drip was discontinued on the fifth day.

She now developed a temperature of 102.4° F. (39.1° C.). In spite of the penicillin therapy a cellulitis of her right leg had developed and the bedsore had increased in size. Physical signs were still present over both lung bases. The penicillin was discontinued and a 10-day course of streptomycin begun with a dosage of 0.5 g. twice daily. As a result of this therapy her temperature fell to normal and all signs of infection disappeared. The slow healing of the bedsore somewhat prolonged her stay in hospital. On the twelfth day of her illness the plasma prothrombin was 70% of normal average, and subsequent blood examination revealed normal plasma bilirubin, alkaline phosphatase, and blood urea. The flocculation tests were, however, now abnormal. Leptospiral agglutinations were negative.

She was discharged from hospital six weeks after admission, and when last seen, six weeks later, was feeling perfectly well, had gained weight, and had returned to all her household duties. Nothing abnormal could be demonstrated by physical examination. Serum flocculation tests were markedly abnormal; the thymol and zinc sulphate turbidities were respectively 7 and 16 units, and the thymol and cephalin flocculations were each ++++.

Discussion

In five consecutive cases of severe liver disease there has thus been only one death. The expected mortality was much higher. Even the patient that died recovered from her coma. Her eventual death was in some measure due to a superadded infection and possibly to the fact that she did not receive the full regime.

Those patients who recovered have been observed for periods of up to one year. The most remarkable fact has been the degree of recovery they apparently achieved. After a preliminary period of weakness, lasting about a month and associated with fairly easy fatigue and swelling of the ankles, there has been a gradual return to apparently normal health. Three of the patients have remarked spontaneously on the great subjective improvement that occurred during the first few days of treatment. One now claims she feels better than she has done for years.

It is interesting to note that three of the patients developed a macrocytic anaemia during their stay in hospital. In one instance (Case 5) normoblasts were found in the peripheral blood.

It is felt that no apology need be made for the polytherapy. The liver is, after all, a highly complex organ, and it would be presumptuous to assume that any single substance could bring about its recovery from severe disease.

It might well be suggested that those cases that recovered would have done so spontaneously. Most medical men of some experience will remember having seen or heard of at least one case of severe liver disease which did not have the expected fatal outcome. It is extremely unlikely, however, that the recovery of four out of five consecutive cases would be unrelated to treatment. In this connexion it has already been mentioned that death occurred in each of six similar cases seen by me. In fact, this latter group may be regarded as a control series, as similar diagnostic criteria were used. It must be emphasized that all the cases that recovered showed at some stage the clinical picture of so-called "acute yellow atrophy." They all had gross amino-aciduria, which is known to be associated with a very grave prognosis (Dent, 1949).

Liver disease of acute onset and of great severity is fortunately relatively uncommon in this country. The cases herein reported have been seen over a period of three years. This work was done in a hospital which serves an extensive area and so a relatively large number of cases were seen in that time. The absolute number is, however, somewhat small, and for this reason it would perhaps be wise to restrain one's enthusiasm. The results of therapy have proved so remarkable that it is hoped that others will adopt the same regime in similar cases and so help to arrive at a final assessment of its value.

In conclusion, it should be pointed out that this form of therapy may also be used prophylactically after surgical operations on patients with severe liver impairment. These are notoriously bad surgical risks. The regime has already been successfully applied in two such cases.

Summary

A regime for the treatment of severe liver disease of acute onset is described.

Five cases have been treated, with only one death.

In contrast, six cases treated with cystine intravenously showed 100% mortality.

Two further cases have been successfully treated prophylactically after surgical intervention.

I am much indebted to various colleagues on the staff of the Royal Victoria Infirmary, Newcastle-upon-Tyne, for giving me such free access to their patients.

REFERENCES

Beek, C. van, and Haex, A. J. C. (1943). *Acta med. scand.*, **114**, 557.
Dent, C. E. (1949). Biochemical Society Symposia, No. 3, p. 34.
Glynn, L. E., Himsworth, H. P., and Neuberger, A. (1945). *Brit. J. exp. Path.*, **26**, 326.
Goettsch, M., and Pappenheimer, A. M. (1941). *J. Nutrit.*, **22**, 463.
György, P. (1947). *Sixth Conference on Liver Injury*, p. 67. Josiah Macy, jun., Foundation Conference, May.
Himsworth, H. P., and Lindan, O. (1949). *Nature*, **163**, 30.
Patek, A. J., Post, J., Ratnoff, O. D., Mankin, H., and Hillman, R. W. (1948). *J. Amer. med. Ass.*, **138**, 543.
Schwarz, K. (1944). *Hoppe-Seyl. Z.*, **281**, 109.
Whipple, G. H. (1948). *Haemoglobin Plasma Protein and Cell Protein*. Thomas, Springfield, Illinois.

The Ministry of Supply has recently given details of a new product from the Harwell atom pile which may take the place of radium in the treatment of some skin diseases. This is Ir^{192}, an isotope of the metal iridium. To make Ir^{192}, iridium is "cooked" inside the atom pile for three months. It is then ready for clinical use, although after a month it must be returned for further treatment inside the pile. The new isotope is not only cheaper and more plentiful than radium—it costs £12 to hire one dose for four weeks—but, because the radiation it emits is less powerful than that of radium, it can be used for treating skin disorders without danger of harming the bone structure underneath the skin. For the same reason very much less lead screening is required to shield the operator, and the equipment which houses the isotope is simpler and less expensive than radium appliances.

THE SYNDROME OF OBSTRUCTION OF INFERIOR VENA CAVA IN CHILDHOOD

BY

HARRY ANGELMAN, M.D., M.R.C.P., D.C.H.
E. G. HALL, M.B., Ch.B., B.Sc.

AND

R. SPENCER, M.B., Ch.B., B.Sc., F.R.C.S.Ed.
(From the Department of Child Health, University of Liverpool)

Obstruction of the inferior vena cava is uncommon at any age, but in children its incidence, especially when developmental in origin, is notably rare, and diagnosis in the early stages presents difficulties. Three cases are here described, all showing the same syndrome, although in one of them the obstruction was shown by venography to be in the femoral and iliac veins.

Case 1

A girl aged 4 years 10 months attended the out-patient department in March, 1949. Her parents had noted the development of enlarged veins over her abdomen when she was 18 months old, a few months after she had begun to walk. At the age of 3½ years a dilated vein became apparent along the inner side of her right leg. It was thought that the affected veins were increasing slowly in size; they were most noticeable when she laughed or cried. Apart from some nocturnal enuresis which had been present since infancy, no other abnormal features had been noted. She never became cyanosed, and did not lag behind other children in taking exercise. Her parents had taken her to hospital when she was 2 years old to obtain advice about the large veins, but no special treatment was recommended.

Her mother, a diabetic of 20 years' standing, was admitted to hospital during the fourth month of her pregnancy and remained there until fit to return home after delivery. No clinical details were obtainable from the hospital, but she said

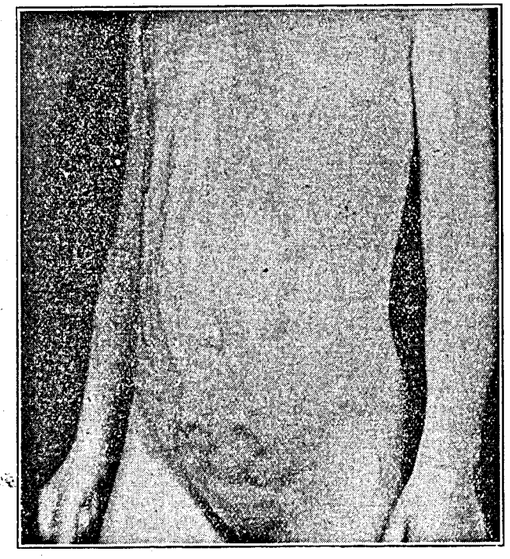


FIG. 1.—Case 1. Infra-red photograph of the superficial collateral venous circulation.

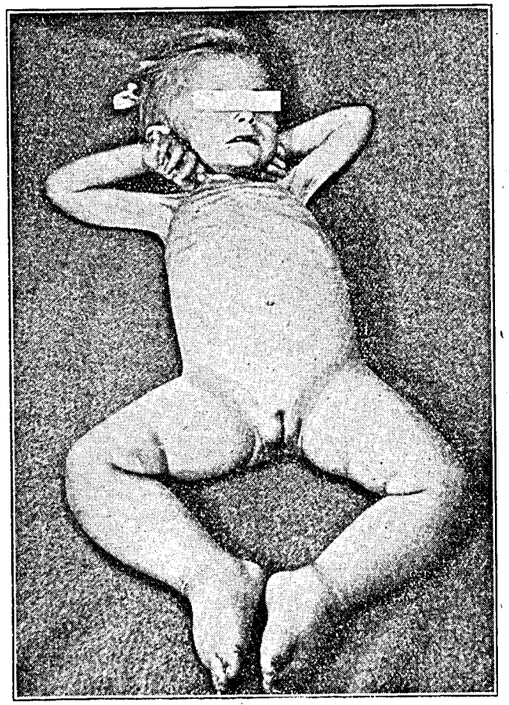


FIG. 2.—Case 2. Photograph of child after admission to hospital: Oedema evident, but the veins on the abdominal wall do not show.

that the baby had been born five weeks prematurely after she had been four days on the labour bed; and she had been given a spinal anaesthetic during the prolonged course of the labour. She did not see her baby until it was 3 weeks old, and at that time it looked healthy. The umbilicus was clean and healed. The weight at birth was not known, but at 5 weeks the infant weighed 6 lb. 9 oz. (3 kg.), and she was discharged from hospital at the age of 2 months. Various types of milk food were tried, as there was a tendency to vomit after feeds. The developmental history was normal, and the previous illnesses were rubella when 4 years old, and measles five weeks before the present observations. The father was quite well and there were no other children.

On examination the child was found to be lively and active and her weight was normal. Her mucous membranes were of a healthy pink colour. Dilated superficial veins were present over the lower part of her chest and especially over the abdominal wall, mainly on the lateral aspects, but there was no caput medusae (Fig. 1). The right medial saphenous vein was dilated, but not markedly so. Slight pitting oedema was present in the legs, below the knees. The blood flow in the dilated veins was from below upwards and they increased in size and tension when she strained and held her breath. The muscles of her calves, thighs, and buttocks were hypertrophied and powerful. Her heart and lungs were normal, and no mass could be palpated in her abdomen or pelvis.

She was admitted to hospital for further investigation. Her urine was free from albumin, cells, or casts. The Wassermann reaction was negative. A plain radiograph of her abdomen and an intravenous pyelogram were both normal, as were a full blood count, including bleeding and clotting times, and an electrocardiogram. A venogram was considered, but the admittedly slight risk involved in the procedure was not

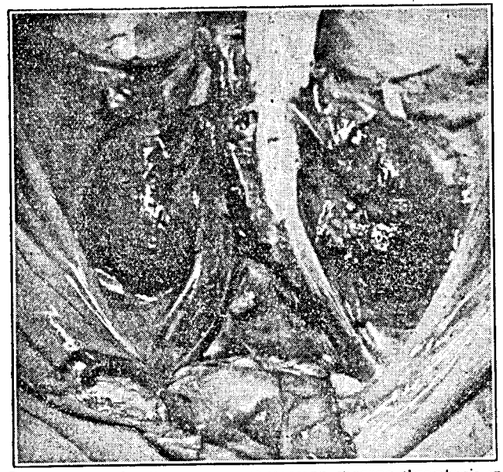


FIG. 3.—Case 2. Post-mortem photograph showing thrombosis in the inferior vena cava and renal veins.

considered justifiable since the parents were unwilling for any further investigation to be undertaken unless it would give help in treatment. Laparotomy was ruled out, as a serviceable collateral anastomosis had developed and there was no question of any mass compressing the inferior vena cava.

Case 2

A female child aged 15 months was admitted to hospital with a provisional diagnosis of acute nephritis. Three weeks previously she had developed diarrhoea, which continued for five days, and during this period she had passed six to eight motions a day. Since that time she had remained rather listless. One week before admission to hospital she was noted to have oliguria and some oedema of her feet. Her previous history revealed that she was born one month prematurely, her birth weight being 5 lb. 6 oz. (2.4 kg.), but her subsequent progress had been normal and free from incident.

On examination she appeared pale and puffy. There was marked oedema of both legs and of the abdominal wall below the umbilicus (Fig. 2). The superficial veins over the abdominal wall were prominent and their blood flow was from below upwards. The blood pressure was 145/95 mm. Hg. Her urine was loaded with albumin, containing a moderate number of red cells and occasional leucocytes, with some granular and hyaline casts. A blood count showed: haemoglobin, 9.4 g. per 100 ml. (Haldane); white cells, 13,200 per c.mm., with a slight excess of polymorphs. The blood urea was 38 mg. per 100 ml., and the total serum protein 4.4 g.%, with albumin 2.7 g.%.

A week after admission the right kidney was felt to be enlarged, and a few days later the left kidney could also be palpated. The oedema persisted and later involved the face and arms. The retinae remained quite normal. Urinary examination on several subsequent occasions showed the presence of albumin, moderate numbers of red cells and leucocytes, but no casts. The blood urea eventually rose to 56 mg. per 100 ml., and a later blood count showed: haemoglobin, 8.9 g. per 100 ml.; red cells, 3,000,000 per c.mm.; white cells, 36,600 per c.mm. A few days before she died some purpuric spots appeared on the abdominal wall, and an empyema developed in the right side of her chest.

At necropsy the whole length of the inferior vena cava, both renal veins, the left lateral sinus, and some branches of the pulmonary arteries were all found to be thrombosed. The thrombosis of the inferior vena cava extended from its origin in the abdomen right up to its entrance into the right auricle (Fig. 3). Extensions of the clot ran into but did not occlude the main hepatic veins. Above the renal veins it was firm, pale, dry, and retracted, and appeared to be of more recent origin than the clot in the lower third of the vessel. Both kidneys were slightly enlarged, but of normal appearance on cross-section, and histologically showed organizing thrombus, with recanalization at some sites in occasional arcuate veins. The large veins at the hila of the kidneys were of similar microscopical appearance, several showing extensive deposits of calcium. The thrombi in the main renal veins, lateral sinus, and lower third of the vena cava were apparently of the same age histologically. The thrombi in the branches of the pulmonary artery were also old and showed calcium deposition. Thus it seems that the initial thromboses occurred in the smaller branches of the renal veins. It is possible that the thrombosis in the branches of the pulmonary artery was superimposed on emboli.

Case 3

A girl aged 6 years 4 months was admitted to hospital in December, 1949, as the school medical officer had noted the presence of enlarged veins over the lower part of her abdominal wall during the course of a routine medical inspection. The enlarged veins had been present for three years and had caused her no inconvenience. There had been no swelling of her feet and no urinary symptoms. She led a full and active life without any undue distress on physical exertion.

Inquiry into her past history revealed that delivery had been normal and that she had been breast-fed up to the age of 7 months. When 14 months old she had been admitted to hospital because of a skin rash which involved the hands and feet. No diagnosis of the rash had been made, but while in hospital gastro-enteritis developed and an intravenous drip was set up in the right saphenous vein at the ankle. There was a history of a slight convulsion during this treatment, but she was later discharged from hospital quite well. At the age of 4 years 7 months she was admitted to hospital for febrile convulsions associated with pneumonia. Nine months later she was re-admitted with febrile convulsions associated with respiratory infection. It was soon after this latter illness that the enlarged abdominal veins were first noted.

Her mother suffered from pernicious anaemia, but her father and two sisters were in good health. The older members of the family were all liable to varicose veins.

On clinical examination the patient was noted to be a well-developed girl for her age. The abdomen was slightly prominent in the hypogastric region, and over the same area dilated superficial collateral veins were to be seen (Fig. 4). A large vein was visible arising from the region of the femoral canal on the left side, but there were no dilated veins in the



FIG. 4.—Case 3. Infra-red photograph showing superficial venous collateral circulation.

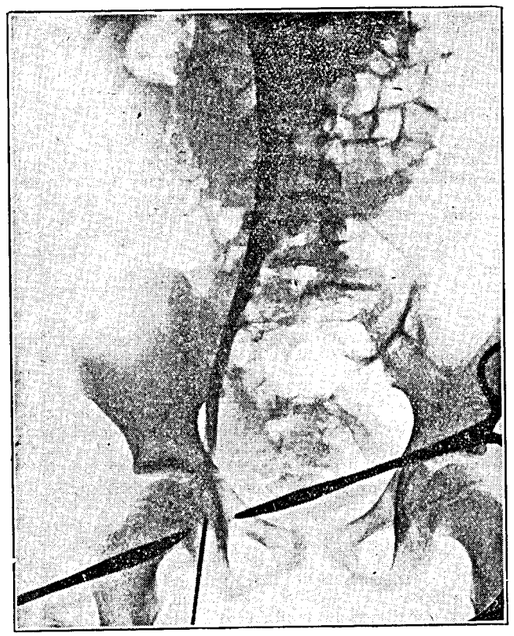


FIG. 5.—Case 3. Venogram, right side: this shows a normal picture. The left margin of the inferior vena cava is not entirely clear-cut, but this is probably due to displacement of the pyelosil by blood flowing in from the left common iliac vein.

legs. It was not possible to demonstrate the direction of the blood flow; strenuous exercise made the veins stand out a little more prominently, but no oedema of the legs followed. The remainder of the clinical examination revealed no abnormality.

Her blood count, blood urea, urinary examination, and urea-clearance test were all normal, and liver-function tests, including thymol turbidity and flocculation, colloidal gold, alkaline phosphatase, and serum bilirubin were also normal. It was decided to do a venogram.

Technique.—A sedative was given pre-operatively. The right femoral vein was exposed in the inguinal region, using local analgesia, and care was taken not to cut or damage any tributary veins. Then 15 ml. of 50% "pyelosil" was injected into the femoral vein in 15 seconds, and radiographs were taken at 5, 10, and 15 seconds from the beginning of the injection. An identical technique was used on the left side some days later. The left femoral vein was difficult to identify and to inject, as it was considerably thickened (see Figs. 5 and 6).

Discussion

Pleasants (1911) wrote a comprehensive report on obstruction of the inferior vena cava, which should be read by all interested in the subject for its detailed discussion of pathology. In dealing with the subject of congenital obstruction he mentions eight reported cases and includes one case of his own, but in only two instances was the developmental origin confirmed at necropsy. In the first (Cavasse, 1897), the vena cava below the renal veins was represented by a small fibrous cord, not connected with the veins of the legs but with a free ending at the level of the aortic bifurcation. The right femoral vein ended as a free fibrous cord just above the entrance of the saphenous vein. The patient died at the age of 54, a superficial collateral venous circulation not being evident until two years before his death. The clinical history of this case is in accord with the fact that dilated superficial veins do not appear unless other deep veins additional to the vena cava are obstructed. In the second case (Meyer, 1903) the patient was a youth aged 18 who died of erysipelas. At necropsy the upper part of the inferior vena cava at the level of the diaphragm and the superior vena cava above the entrance of the great azygos vein were obliterated, only fibrous remnants of the vessels remaining. The entire venous circulation was returned to the heart through the great azygos vein.

Four of the remaining cases were considered by Pleasants to be due to thrombosis occurring at or before the time of birth. The other three patients were all males, their ages being 17, 27, and 30 years. None of these patients had any history of an acute illness in the first few years of life, but in all the enlarged superficial veins had been noted in infancy. They all had varicose ulcers on their legs, but oedema was not evident.

One can postulate from the clinical findings that Case 1 has an obstruction not only of the inferior vena cava but also of the deep venous collaterals, as indicated by the presence of enlarged superficial veins in the abdominal wall. The finding of normal kidney function and absence of albuminuria probably places the lesion below the level of the renal veins. The oedema of the legs on exertion and the presence of a dilated right internal saphenous vein suggest that the iliac veins have been involved. No caput medusae is present, the enlarged veins are situated mainly on the lateral aspects of the abdominal wall, and neither ascites nor jaundice has been noted. The widespread occlusion of deep veins in this case must almost certainly be due to thrombosis, but there is no clue to why it occurred in early life.



FIG. 6.—Case 3. Venogram, left side: the femoral vein cannot be seen. The width of the external and common iliac veins is reduced and their outline is irregular. Dilated tortuous collateral veins are well shown.

It is rare for thrombosis of the inferior vena cava to present with a clinical picture of nephritis. Derow *et al.* (1939) have reported a case similar in many respects to Case 2, but the tempo of its course was slower. It concerned a boy aged 15, who, after an initial attack of nausea, vomiting, and anorexia, experienced pains in the costovertebral region. His urine contained albumin, some red and white blood corpuscles, and casts. He later developed oedema of his legs and ascites, and his blood proteins were low, with reversal of the albumin/globulin ratio. Enlarged veins then appeared on the front of his abdomen and chest. He died 22 months after the first symptoms had appeared, and necropsy revealed extensive thrombosis of the inferior vena cava, renal veins, portal veins, and proximal parts of the mesenteric veins. Some recanalization of the thrombosed portions of the affected vessels was present.

It is known that thrombosis of the inferior vena cava usually starts in the lower third and spreads upwards. It is rare for the clotting to begin in the renal veins and then spread to the vena cava. Accounts have been written of primary renal venous thrombosis in infancy by Morison (1945) and Fallon (1949), but in none of their cases was the vena cava involved. It is difficult to state the true reason for thrombosis occurring in this case. Dehydration, marasmus, and sepsis have all been postulated as causes, but there must be some other factor, otherwise the condition would occur much more frequently.

Case 3 is one of partial obstruction of the left common femoral and iliac veins, but it is included in this article to exemplify the difficulty of differential diagnosis. Without the help of a venogram the diagnosis would have remained one of obstruction of the inferior vena cava. Keller (1949) has reported a case of deep venous thrombosis occurring at the junction of the right femoral and saphenous veins in a male infant. The infant's grandfather forcibly compressed the upper parts of the legs while holding him during a ritual circumcision. The obstruction in the femoral vein was demonstrable as a filling defect in the venogram. Again, it is difficult to state the cause of the thrombosis in Case 3. If it had been present on the right side one would have tended to blame the intravenous drip. It is true that thrombosis spreads over from one common iliac vein to that on the other side, but the right common iliac vein in this case shows a normal outline in the venogram.

In view of the fact that a venogram was not done in Case 1, criticism might be levelled at the diagnosis. However, the superficial veins are so markedly dilated and extensive over the abdomen and chest that it is justifiable to assume that the inferior vena cava has been involved.

Obstruction of the inferior vena cava sounds a catastrophic event, but judgment of its gravity has been coloured by the fact that it is so often associated with diseases which of themselves may be fatal. Shattock (1913) described the case of Dr. W. Rivers Pollock, who, while a student at Cambridge, won the 120 yards hurdle race against Oxford. He held his breath all the time he was running, and while lying on the grass after the race he noticed a pain in his back. Oedema of the legs and lower part of the trunk soon followed, and a few days later dilated veins appeared on his legs and abdominal wall. His urine contained albumin. This occurred when he was 24 years old, but he lived for a further 25 years and spent a busy life in obstetric practice. At necropsy the inferior vena cava was found to be a flat ribbon-like structure from the hepatic veins downwards, both renal veins being occluded at their junction with the vena cava.

Another case of thrombosis of the inferior vena cava following exertion has been described by Foster, Brouwer, and Kurtz (1941), while Keen (1940) has described a case of thrombosis of the inferior vena cava, discovered in a dissecting-room subject aged 71. The former patient led a quite strenuous life, while the latter was not known to have suffered any disability attributable to caval obstruction. Nylander (1941) has for seven years observed a boy aged 9 who developed thrombosis of the inferior vena cava following osteomyelitis of the pelvis, and found his development to be quite normal.

We have felt justified in giving a good and hopeful prognosis to the parents of Cases 1 and 3, and the children's activities have not been restricted. It is possible that later in life, if pregnancy occurs, the condition might be aggravated by pressure of the gravid uterus on the deep collateral veins. Varicose ulcers may also be a troublesome feature in later years. The child described in Case 1 realizes that the appearance of her abdomen differs from that of her playmates, but so far it has not caused any psychological difficulties and she plays happily amongst other children, even when the prominent veins are in full view.

Summary

Two cases of obstruction of the inferior vena cava and one case of obstruction of the right common femoral and iliac veins are described in children. One patient has died, but the other two continue symptom-free and in good health. The subject is briefly reviewed.

We wish to thank Professor Norman B. Capon for permission to publish Case 1 and for his guidance in the preparation of this article. We also thank Dr. John D. Hay for his valuable help. Thanks are due to Dr. W. E. Crosbie, medical superintendent, Alder Hey Hospital, for permission to publish Cases 2 and 3, and to Mr. R. R. Green for the clinical photographs.

REFERENCES

Cavasse (1897). *Bull. Soc. anat. Paris*, **72**, 811.
Derow, H. A., Schlesinger, M. J., and Savitz, H. A. (1939). *Arch. intern. Med.*, **63**, 626.
Fallon, M. L. (1949). *Arch. Dis. Childh.*, **24**, 125.
Foster, R. C., Brouwer, S. W., and Kurtz, C. M. (1941). *J. Amer. med. Ass.*, **117**, 2167.
Keen, J. A. (1940). *British Medical Journal*, **2**, 823.
Keller, M. J. (1949). *J. Pediat.*, **34**, 482.
Meyer, A. (1903). *Med. Rec., N.Y.*, **63**, 806.
Morison, J. E. (1945). *Arch. Dis. Childh.*, **20**, 129.
Nylander, P. E. A. (1941). *Acta Soc. Med. "Duodecim,"* **27**, 1.
Pleasants, J. Hall (1911). *Johns Hopk. Hosp. Rep.*, **16**, 363.
Shattock, S. G. (1913). *British Medical Journal*, **1**, 385.

The progress made in the provision of special schools for handicapped children since the end of the war were given recently by Mr. George Tomlinson, the Minister of Education, who was speaking in Manchester at a conference of the Special Schools Association. He said that local education authorities had provided 121 new special schools during the last five years, 90 of them boarding schools. As a result, the number of children in special schools had increased in the last four years from 38,500 to over 47,000. Authorities had also opened 47 boarding homes for about 1,000 children and in addition were providing home tuition for another 1,000 children. They were making increasing use of independent special schools when places in their own schools were not available: about 600 handicapped children were being provided for in this way. The supply of teachers for special schools had kept pace with the increase in the number of handicapped children provided for, and there had been an increase of over 30% in the number of such teachers during the last 4½ years. Mr. Tomlinson agreed that there were shortages of special-school accommodation for nearly all categories of handicapped children. The provision of new special schools had to compete with the provision of schools for normal children, but he thought local education authorities were doing a good job of work.

SOME UNUSUAL BUT INSTRUCTIVE SURGICAL EMERGENCIES

BY

H. D. MOORE, F.R.C.S., F.R.C.S.Ed.

Surgical Tutor, the General Infirmary, Leeds

If the cause of acute symptoms is clear, proper treatment is begun without delay, including, if necessary, a well-placed incision. Only too often, however, the diagnosis is in doubt even in common conditions; and in uncommon ones the delays and difficulties are obviously increased.

The delays which occur are shown by the following eight cases, only two of which were admitted to hospital within twelve hours of the onset of the symptoms, two being delayed for two days, two for three days, one for seven days, and one for ten days. The difficulties in diagnosis are seen in the case reports which follow, and in the literature: for instance, in strangulation of the stomach in a diaphragmatic hernia operation is commonly delayed until gangrene has occurred (Warren, 1919), in biliary peritonitis a wrong diagnosis is usual (Fifield, 1926), and in strangulation of gut through a hole in the greater omentum a correct diagnosis has not been reported.

The following histories, with a brief discussion of the literature, are therefore presented in the hope that they may help in the diagnosis and treatment of future cases.

Strangulated Diaphragmatic Hernia

Case 1

A boy aged 16 was admitted on December 16, 1949, complaining of central abdominal pain, vomiting, and constipation for 10 days. His vomiting, which had occurred several times each day, consisted only of small amounts of greenish fluid; but his abdomen had become increasingly distended and he had passed neither faeces nor flatus for five days.

In June, 1949, he had had a similar attack lasting for three days, accompanied by pain in the left shoulder, but this attack had been mild and its history was not elicited until later. At the age of 16 months he had had a thoracotomy at the Radcliffe Infirmary for a left-sided empyema, and it was noted at the time that the tube was low and did not drain well. He had otherwise been in good health with normal appetite and bowel actions.

On examination (T. 98° F.—36.7° C.; P. 100; R. 20) his tongue was moist, his skin elastic, and he did not look ill, but his abdomen was very distended, with "ladder patterns" of bowel and visible peristalsis. There was a scar 2¼ in. (6.25 cm.) long in the left ninth intercostal space in the posterior axillary line. No other abnormality was found in the chest or elsewhere.

A plain radiograph of the abdomen and chest showed gross small-bowel dilatation and fluid levels, the stomach below the diaphragm in its normal position, and a small loop of bowel with a fluid level within the chest, in a postero-lateral position.

Gastric suction and intravenous fluids were begun and the abdomen was opened through an upper left paramedian incision. It was found that the splenic flexure of the colon had entered a diaphragmatic hernia to the left of the oesophagus and was tightly held, but the exposure was inadequate because of the distended gut. The incision was therefore continued across the rectus and into the tenth intercostal space, and the diaphragm was divided as far as the hernia, the procedure being extrapleural. It was then seen that omentum as well as gut had herniated and that the omentum was adherent to the sac, which was not lined with peritoneum. The omentum was divided, the gut was reduced and found to be viable, and the diaphragm and wound were repaired with continuous sutures of braided nylon.

The boy's condition caused some anxiety for 48 hours, but then became satisfactory and he went home on the eighteenth post-operative day. A barium meal and enema two months later showed no recurrence of the hernia.

Case 2

A woman aged 36, five months pregnant with her first child, was admitted as an emergency case on February 1, 1950. She had complained for one week of pain in the left hypochondrium through to the back, made worse by deep breathing, together with regurgitation of her food and slight shortness of breath on exertion. There were no other symptoms, but she had suffered from occasional attacks of epigastric discomfort and flatulence after meals for some years.

On examination (T. 98° F.—36.7° C.; P. 102; R. 24) she looked well, and was not short of breath or cyanosed. Her trachea was to the right of the midline, the apex beat to the right of the sternum, and the left side of the chest moved less than the right. There was dullness at the left base and breath sounds were absent, but neither bowel sounds nor splashing were heard in the chest, and the abdomen showed no abnormality.

Radiographs of the chest showed the heart displaced to the right and a large translucent area in the left side of the chest which, at first sight, appeared to be a cyst of the lung; a barium meal, however, showed it to be stomach within the chest, but with the cardio-oesophageal junction and the pylorus in their normal positions. It is of interest to note that when the patient was lying flat and on her right side some air and barium passed on into the duodenum.

On February 6 there was some lower abdominal pain and pain in the left shoulder; regurgitation of food continued. Next day the patient was retaining no food, so that laparotomy was decided upon.

Upon opening the abdomen a localized collection of pus and barium was found around a perforation of the cardio-oesophageal junction at the point where it was compressed by the hernial orifice in the diaphragm. The perforation was repaired, a tube was put down to the area, and a jejunostomy was done, but her condition was unsatisfactory after the operation. She miscarried on February 10 and died on the 13th.

Post-mortem examination revealed a diaphragmatic hernia, about 3 in. (7.5 cm.) in diameter, to the left of the oesophagus, and through it had passed almost the whole stomach, the splenic flexure of the colon, and the spleen. The stomach and colon were tightly compressed by the margins of the hole in the diaphragm, and there was an area of necrosis of the stomach at the site of the perforation (presumably from pressure of the hernial margin) and some blackening of the colon where it passed through the ring. There was no peritoneal lining to the hernial sac, which occupied two-thirds of the left side of the chest.

Comment on Cases 1 and 2

In the diagnosis of Case 1 it was obvious that there was a low intestinal obstruction, but its origin was not at first clear, although the thoracotomy wound had been observed. That a diaphragmatic hernia might follow thoracotomy in infancy was not considered until the *x*-ray films had been seen; and the case illustrates not only the possibility of such a hernia but the value of a plain radiograph of the abdomen, including the lower chest, in all cases of intestinal obstruction.

The actual cause of the hernia must remain doubtful. Bryan (1921) and Harrington (1948) state that a diaphragmatic hernia may follow an empyema or the use of a drainage tube near the diaphragm, but quote no cases; nor has it been possible to find cases reported. It seems more probable that the diaphragm was injured at the time of operation, because it was noted that the tube was very low in the chest and never drained properly; and it is well known that injuries to the diaphragm heal badly. Indeed, Guthrie (1855) stated that they never heal, although this has been shown to be incorrect (Greig, 1919; Meyer, 1919).

Case 2 illustrates one way in which a diaphragmatic hernia may present—that is, with repeated vomiting without other symptoms and with signs in the chest which are not obviously due to the presence of gut (Gaudier and Labré, 1918) and in which the *x*-ray findings at first sight suggest a pulmonary lesion or a raised diaphragm (Carter and Giuseffi, 1948).

I have been unable to find reports of any cases of intraperitoneal perforation of the stomach at the diaphragmatic ring, presumably from pressure necrosis, but Gaudier and Labré record a case which ended fatally from repeated haematemeses and was found at necropsy to have bled from an ulcer. The ulcer was on the lesser curvature of the stomach, most of which had herniated through the diaphragm into the chest, and was at the site of the firm diaphragmatic ring and away from the usual ulcer sites; the authors considered it to be due to the pressure of the ring.

Those diaphragmatic herniae which come to the surgeon as emergencies (Astley Cooper, 1804; Guthrie, 1855; Gaudier and Labré, 1918; Warren, 1919; Bryan, 1921; Harrington, 1948; Carter and Giuseffi, 1948; Borrie and Foreman, 1948) are usually the result of penetrating wounds, but congenital herniae and those resulting from crushing injuries also strangulate. The injury is nearly always on the left side, and most of the traumatic herniae which strangulate do so within three years of wounding, but may do so many years later. Even those on the right may obstruct (Astley Cooper, 1804).

Most of these patients have had no warning of impending trouble and are in good health at the time of strangulation; but about one-third have had premonitory symptoms, and many of these are in poor condition from voluntary starvation because of pain with their meals and vomiting. These warning symptoms can be divided into four groups: (*a*) Abdominal, of which the chief are "indigestion," pain in the epigastrium and other regions, vomiting, and constipation; (*b*) respiratory, such as dyspnoea on exertion or after meals; (*c*) cardiac, such as palpitations and precordial pain; (*d*) recurrent fever. Many of these patients have been treated as malingerers or have had a previous operation without any relief of their symptoms.

The actual obstructive attack is usually brought on by straining, coughing, or a meal. It is heralded by colic or upper abdominal pain which may radiate to the shoulder, and by vomiting; and it is well to bear in mind that these cases may present in two ways—the one being as an ordinary intestinal obstruction (Case 1), and the other as a strangulation of the stomach characterized by frequent vomiting and a flat empty abdomen (Case 2). Other signs may be entirely absent (Case 1), or may consist of dullness and diminished movement of the left side of the chest, with an apex beat which is displaced to the right (Case 2), and perhaps bowel sounds or splashing in the thorax. If the strangulation has lasted long enough, as is common because of the difficulties in diagnosis, there will be a serosanguineous effusion in the chest cavity, sometimes in large quantities, with dyspnoea, cyanosis, and tachycardia, which are apt to lead to a diagnosis of a purely pulmonary lesion.

The *x*-ray findings may consist of a heart displaced to the right, obvious bowel or stomach in the chest, or an apparently raised diaphragm or of appearances as in Case 2. If the effusion is big enough it may mask the underlying lesion. And, finally, the patient may be so ill that an *x*-ray examination is not attempted.

Treatment is operative. Conservative measures always result in death, as is so well described by Guthrie; but even with operation, unless undertaken very early, the prognosis is poor.

The incision can be abdominal (Harrington advises one parallel to the costal margin for the left side), which is most satisfactory if the bowel is not distended and if the liver is mobilized by division of the left triangular ligament; it can be thoracic, which is necessary on the right and good on the left because the contents of the hernia are usually adherent to the margins of the opening in the diaphragm or to the praecordium or chest wall, although it has the disadvantage, particularly if resection of gut is needed, of opening the pleura (but it is necessary to remember that the pleural cavity will usually communicate with the abdomen when the gut is withdrawn, whatever incision is used); or it may be abdomino-thoracic, which gives good exposure and can remain extrapleural, as in Case 1.

Biliary Peritonitis

Case 3

A man aged 59 had on the morning of December 7, 1948, an attack which his doctor diagnosed as acute cholecystitis. He was admitted on the evening of the 9th with a temperature of 101° F. (38.3° C.), pulse 120, and respirations 30 a minute. He was ill, with a dry tongue and lax skin and an obvious generalized peritonitis, which was thought to be arising from a ruptured empyema of the gall-bladder, although there were no localizing signs. He was not jaundiced.

Gastric suction, intravenous fluids, and chemotherapy were begun, and the abdomen was opened when his condition was a little better. The gut was found to be reddened and distended and there was much free bile in the peritoneal cavity. The gall-bladder, cystic duct, and common bile duct were thick and oedematous as far as the foramen of Winslow, where there was a hole 1 cm. in diameter in the common duct; below this the duct felt normal. No stones were found in the gall-bladder or ducts, or lying free; nor was there any localization of the perforation or of the bile by adhesions or omentum. The gall-bladder, which contained bile of normal appearance, and the common duct were drained.

Progress was not satisfactory, and on December 18 an upper intestinal fistula developed. On December 24 his abdomen burst. The leaking bowel presented and was found to be jejunum; this was repaired. On January 8 the wound burst and was again repaired, and on January 17 the patient died.

Case 4

A woman aged 62 was admitted as an emergency on February 24, 1949 (T. 97.4° F.—36.3° C.; P. 70; R. 20). Her history and physical findings were suggestive of acute cholecystitis of some 12 hours' duration, and she had suffered for some years from "indigestion" and flatulence after meals, especially with fatty foods.

Six hours later her pain was more severe and was generalized, as was her tenderness, and there was some distension of the abdomen; but her general condition, pulse, temperature, and respiration rate were unchanged. She clearly had a generalized peritonitis, but the normal temperature and pulse and the lack of toxicity made its origin doubtful, as it was not realized at the time that a biliary peritonitis can present in this way.

Her abdomen was opened and was found to contain much normal-looking bile, of which 20 oz. (568 ml.) was aspirated. There were a few adhesions between the gall-bladder and duodenum, but a close examination of the biliary system revealed no other abnormality. No site of biliary leak could be found.

Drainage of the gall-bladder was decided upon, and it seemed reasonable to do this internally rather than externally. A cholecyst-jejunostomy was therefore done.

Her post-operative course was uneventful and she was discharged on the seventeenth post-operative day. She has remained well up to the time of writing—more than a year later.

Case 5

A man aged 79 was admitted as an emergency on October 4, 1949 (T. 99° F.—37.2° C.; P. 80; R. 25), with an obvious generalized peritonitis and faint jaundice. His pain had begun 48 hours and his jaundice seven to eight days before admission. He was cyanosed, with gross venous congestion, and had a history of precordial pain with effort for some years, and breathlessness and swelling of the feet for one year. There was no past history suggestive of cholecystitis.

On opening the abdomen free normal-looking bile was found and some 25 oz. (710 ml.) sucked out. The gall-bladder was red, thickened, and distended, with one or two blackened areas but no perforation. No site of leakage was found, but the examination was cursory because of the patient's general condition. The gall-bladder, which contained bile normal in appearance and no stones, was drained and a second tube put into the region of the common duct.

The patient's cardiac condition remained precarious, and he died on the fifth post-operative day from heart failure.

Necropsy revealed no perforations in the biliary system; but there were several stones in the common bile duct, and gross myocardial degeneration.

Comment on Cases 3–5

Free escape of bile into the peritoneal cavity from perforation of an inflamed gall-bladder or bile duct (Case 3) is not only rare but a most serious affair. McWilliams (1912) found it to occur in only 0.9% of over 3,000 operations on the biliary system. In 90% of these the gall-bladder had perforated, and half of the patients died, but of those operated upon within 12 hours, with drainage of the gall-bladder and its site or with cholecystectomy, only 15% perished. The diagnosis of these cases can be most difficult, as is shown by 28 cases from the London Hospital, reported by Fifield (1926), of which 4 were diagnosed as intestinal obstruction, 3 as perforated peptic ulcer, 2 as high appendix abscess, and only 9 as acute cholecystitis; the rest were described as peritonitis of unknown origin.

In contrast to the severity of an infected biliary peritonitis is the escape of sterile bile as the result of an injury. Numerous cases have been reported and discussed (Ricketts, 1905; Wangensteen, 1926; Mentzner, 1934). These patients survive in good health for days or weeks, but they finally all die unless the bile is removed by frequent tappings or operation.

To complete the discussion of biliary peritonitis from an obvious source, it is of interest to mention post-operative leakage. Such a leak is usually harmless, but it can be a most serious matter. Cases described by Douglas and Grey Turner (1940) and Lewis (1940) were characterized by much post-operative pain in the right hypochondrium, followed, some 12 hours later, by profound shock. Lewis's case recovered rapidly when the collection of bile was drained; the other did not rally enough for laparotomy, and died.

Free bile in the peritoneal cavity without a perforation of the gall-bladder or bile ducts (Cases 4 and 5) is well recognized but is a rare and interesting phenomenon, and Case 4 is of particular interest because of the normal appearance of the biliary system (except for a few adhesions), and because the diagnosis could have been made from the rapid onset of peritoneal irritation and intestinal distension, without a rise in temperature and without the signs associated with a bacterial peritonitis.

Both cases are of interest in that they seem to support the view of Buchanan (1918) and Stenson (1937), based on a review of some 40 cases from the literature, that biliary peritonitis cannot be explained on any one theory. Thus Clairmont and von Haberer (1910) showed that ligation of the common duct in dogs will cause a biliary peritonitis without a perforation, and described a case following obstruction of the common duct in man. They suggested that the rise of pressure and distension may allow filtration of bile from an apparently normal gall-bladder in some unexplained way; but in Case 4 no obstruction was found, and certainly no distension of the gall-bladder or ducts. Blad (1917) suggested that, where there is obstruction of the ampulla of Vater, there may be a reflux of activated pancreatic juice into the gall-bladder, producing a digestion necrosis and permeability of its wall to bile, but without rupture (this can be produced experimentally in dogs). This theory would account very well for Case 5, but does not seem applicable to Case 4.

In some cases there may be a small perforation which cannot be found, especially if it is retroperitoneal (Nauwerck and Lübke, 1913; Buchanan, 1918; Cope, 1925). This is suggested by a case of Sohn's (quoted by Stenson, 1937) in which a needle was put into the common bile duct to locate it during an operation unconnected with the biliary system. The field was dry at the end of the operation, but the patient subsequently died of a biliary peritonitis. At necropsy the hole in the common duct was found only with the greatest difficulty. This theory might account for both cases, but it is difficult to believe that a considerable escape of bile would occur without at least some distension of the gall-bladder.

Finally, the leak may have occurred from rupture of a small duct on the surface of the liver (Buchanan, 1918; Smith, 1926), but no abnormality of the liver was seen, and the good result following cholecyst-enterostomy in Case 4 suggests that the leak was from the main bile duct system. Whether anastomosis of the gall-bladder to jejunum was a good idea remains to be seen, but the post-operative course was excellent, the patient has remained well for a year, and reports from the Mayo Clinic (Walters, Gray, and Priestly, 1948) and others (Peterson and Cole, 1948) suggest that cholecyst-enterostomy is a satisfactory operation.

Herniation of Gut, with Strangulation, Through a Hole in the Greater Omentum

Case 6

A woman aged 86 was admitted on January 5, 1949, complaining of a constant pain in the epigastrium and right hypochondrium for six hours. She had vomited four times, and her bowels had not been opened for 24 hours, but she had been passing flatus.

Her temperature was 97.6° F. (36.4° C.), pulse 89, and respirations 20 a minute, and she appeared to be neither ill nor distressed. Upon examination of her abdomen a tender indefinite intra-abdominal lump, about 5 in. (12.5 cm.) in diameter, which moved on respiration and was freely mobile, was found to the right of the umbilicus. No other signs were observed.

On the 6th her pain had gone and there was no further vomiting, but the mass was much more distinct. On the 7th she had a recurrence of pain, which was now severe. There was no vomiting and her temperature was 98° F. (36.7° C.), but her pulse had risen to 130 and her respirations to 30 a minute. Her abdomen was very tender to the right of the umbilicus, and rigidity of the abdomen rendered the lump impalpable. There was no distension.

Laparotomy was decided upon, and the abdomen was opened through a right para-umbilical incision. The intestines were not dilated. It was found that the greater omentum was attached in the region of the right internal inguinal ring (there was no hernia), and ileum had passed and strangulated through a hole in the omentum at the level of the umbilicus, forming a rounded mass. The gut was gangrenous; it was resected and end-to-end repair done; the omentum was freed and the hole repaired.

Her post-operative course was uneventful and she was discharged on the fourteenth post-operative day.

Case 7

A woman aged 53 was admitted on December 7, 1949, complaining of vague abdominal discomfort for some days and, beginning 20 hours before admission, severe central abdominal colic and vomiting.

Some hours after the start of the severe pain she was seen by her doctor, who diagnosed acute cholecystitis and gave her ¼ gr. (16 mg.) of morphine and 1/100 gr. (0.65 mg.) of atropine. This relieved her for some hours, but the pain recurred. She was then given 50 mg. of pethidine every four hours until her admission.

On admission her temperature was 98° F., pulse 100, and respirations 20 a minute. She was not in pain, but had a furred tongue, and there was localized tenderness and guarding over an area about 6 in. (15 cm.) in diameter to the right of the umbilicus. It was thought that an indefinite lump could be felt in this area, but the guarding made it difficult to be sure. The abdomen was flat.

When the effects of the pethidine had worn off, her colic and vomiting began again and her tenderness became more generalized. Intestinal obstruction was diagnosed and the cause tentatively suggested.

On opening the abdomen, conditions identical with Case 6 were found (except that the bowel was viable). The contracted state of all the intestines was striking. The offending omentum was dealt with and her post-operative course was uneventful.

Case 8

A man aged 68 was admitted to the General Infirmary, Leeds, on July 2, 1950, complaining of generalized colicky abdominal pain and vomiting for three days. His bowels had not acted during this period, nor had he passed any flatus. He had noticed constant abdominal pain and tenderness for about 12 hours, as well as the more severe spasms of colic.

On examination the temperature was 98° F., pulse 80, and respirations 20. The patient looked ill and had a dry furred tongue. His abdomen did not move with respirations, and was very tender and rigid all over, with shifting dullness in the flanks.

Rectal examination revealed a tense fluctuant swelling in the recto-vesical pouch, which was considered to be distended gut. No other abnormal physical signs were found.

Aspiration of the stomach and intravenous therapy were begun and the abdomen was opened. Much free blood-stained fluid was found, together with a tense segment of lower ileum, which had strangulated through a hole in the edge of the greater omentum and was lying in the pelvis. It was gangrenous and was resected, and a side-to-side anastomosis was done. The rest of the small bowel was only slightly distended.

The patient's post-operative course was uneventful, and he was discharged to a convalescent home on July 10.

Comment on Cases 6–8

Of the 25 cases of strangulation of gut through a hole in the greater omentum (22 listed since 1840 and three described above) all but three presented as typical acute intestinal obstruction of small bowel (Martzloff, 1930; Sanes and Postoloff, 1944; Hindmarsh, 1949). Of the 12 case histories which were available, one (Curran, 1869) showed acute localized tenderness and hyperaesthesia over the strangulated gut. Four cases (Lisanti, 1899; Sanes and Postoloff, 1944; Hindmarsh, 1949; and Case 7) presented with a tender palpable mass which was the involved bowel. Two cases had definite localized signs (tenderness and hyperaesthesia, Martzloff, 1930; a tender lump, Case 6), although neither presented as an intestinal obstruction. These signs would be expected from the pathology, for when the gut passes through the omentum it lies just behind, and is indeed held in contact with, the anterior abdominal wall, and when it becomes congested it should be palpable and must produce local irritation of the parietes. It should therefore be possible to suggest the cause of an acute intestinal obstruction of small bowel presenting with either of the above signs.

Considering Martzloff's case (where symptoms were present for at least nine days), Case 6, where a lump was present for at least two days before it finally strangulated, and Case 7, where the patient had had abdominal discomfort for some days before the final attack, it is evident that the bowel does not necessarily strangulate at once; but in none of the cases described could it have been long through the hole, for in none was it adherent to the omentum.

Summary

Two cases of strangulated diaphragmatic hernia are described. These illustrate the two ways in which a strangulated diaphragmatic hernia may present—that is, with or without premonitory symptoms and with or without signs in the chest, and as either a typical intestinal obstruction or as an obstruction of the stomach with a flat, empty abdomen.

Three cases of biliary peritonitis are recorded: one with a perforation in the common bile duct, and two with no demonstrable site for the biliary leak.

The theories of causation, and the treatment, are briefly discussed.

Three cases of herniation of gut, with strangulation, through a hole in the greater omentum, are reported. Such cases nearly always present as an acute strangulation of small bowel and often have localizing signs, so that a pre-operative diagnosis is possible.

Cases 1-7 were admitted to the Radcliffe Infirmary, Oxford, and Case 8 to the General Infirmary, Leeds. I would like to thank Dr. A. M. Cooke and Mr. Elliot Smith for allowing me to include Case 2, and Mr. D. A. Abernethy and Mr. H. W. Symons for permission to treat the remainder and publish this report.

References

(*a*) *Strangulated Diaphragmatic Hernia*

Borrie, J., and Foreman, H. M. (1948). *Lancet*, **2**, 12.
Bryan, C. W. G. (1921). *Brit. J. Surg.*, **9**, 117
Cooper, Sir Astley (1804). *The Anatomy and Surgical Treatment of Inguinal and Congenital Hernia.* London.
Carter, B. N., and Giuseffi, J. (1948). *Ann. Surg.*, **128**, 210.
Gaudier, H., and Labré, M. (1918). *Bull. Soc Chir. Paris*, **44**, 383.
Greig, D. M. (1919). *Edinb. med. J.*, **22**, 357.
Guthrie, G. J. (1855). *Commentaries on the Surgery of the War*, 6th ed., p. 499. London.
Harrington, S. W. (1948). *Surg. Gynec. Obstet.*, **86**, 735
Meyer, W. (1919). *Ann. Surg.*, **70**, 172.
Warren, R. (1919). *Lancet*, **1**, 1069.

(*b*) *Biliary Peritonitis*

Blad, A. (1917). *Arch. klin. Chir.*, **109**, 101.
Buchanan, J. J. (1918). *Surg. Gynec. Obstet.*, **26**, 303.
Clairmont, P., and von Haberer, H. (1910). *Mitt. Grenzgeb Med. Chir.*, **22**, 154.
Cope, Z. (1925). *Brit. J. Surg.*, **13**, 120.
Douglas, D. M., and Turner, G. Grey (1940). *British Medical Journal*, **2**, 280.
Fifield, L. R. (1926). Ibid., **2**, 635.
Lewis, Ivor (1940) Ibid., **2**, 384.
McWilliams, C. A. (1912). *Ann. Surg.*, **55**, 235.
Mentzner, S. H. (1934). *Arch. Surg., Chicago*, **29**, 227.
Nauwerck, C., and Lübke (1913). *Berl. klin. Wschr.*, **50**, 624.
Peterson, L. W., and Cole, W. H. (1948). *Arch. Surg., Chicago*, **56**, 445.
Ricketts, B. M. (1905). *St. Louis med. Rev.*, **51**, 108, 233, 276, 456, 476, 497; **52**, 4, 25.

Smith, W. (1926). *Ann. Surg.*, **83**, 55.
Sohn (Quoted by Stenson, W., 1937).
Stenson, W. (1937). *Amer. J. Surg.*, 37, 334.
Walters, W., Gray, H. K., and Priestly, J. T. (1948). *Proc. Mayo Clin.*, **23**, 44.
Wangensteen, O. H. (1926). *Ann. Surg.*, **84**, 691.

(c) *Herniation of Gut, with Strangulation, Through a Hole in the Greater Omentum*

Curran, J. W. (1869). *Med. Pr.*, **2**, 261.
Hindmarsh, F. D. (1949). *British Medical Journal*, **2**, 1274.
Lisanti, A. (1899). *Rif. Med.*, **2**, 303.
Martzloff, K. H. (1930). *Surg. Gynec. Obstet.*, **50**, 899.
Sanes, S., and Postoloff, A. V. (1944). *Gastroenterology*, **3**, 30.

FAMILIAL CRISIS IN ACHOLURIC JAUNDICE

BY

F. GRAHAM MARSON, M.B., M.R.C.P.
Senior Medical Registrar, General Hospital, Birmingham

M. J. MEYNELL, M.D., M.R.C.P.
Clinical Pathologist, General Hospital, Birmingham

AND

H. TABBUSH, M.B., D.P.H.
Senior Assistant, Medical Officer of Health, Smethwick

There are on record at least seven instances of spherocytic anaemia in which the haemolytic crisis occurred in a number of members of a family within a short interval (Murray-Lyon, 1935; Scott, 1935; Dedichen, 1937; Damashek, 1941; Lyngar, 1942; Horne *et al.*, 1945; Owren, 1948). We should like to present a series of four cases which occurred in a family of seven.

Case 1

Thomas C., aged 32, a zinc sprayer, on August 12, 1948, became giddy, had the "shivers," and went to bed. The next morning he awoke perspiring. He got up, but soon after developed dizziness and nausea. On the 14th his doctor considered him to be a case of catarrhal jaundice. Next day the patient arose and nearly collapsed. He was then sent to the Smethwick Fever Hospital as a case of typhoid fever. When seen he complained of abdominal pain. He had noticed that on several occasions his urine was dark.

On examination his temperature was 101° F. (38.3° C.), and pulse 80. The conjunctivae had an icteric tinge, and the spleen was enlarged and tender. Blood culture revealed no growth. A blood count on August 16 showed: red cells, 2,700,000; haemoglobin, 55%; colour index, 1; white cells, 2,300 (polymorphonuclears 50%); packed cell volume, 24%; mean cell volume, 88 μ^3; mean corpuscular haemoglobin concentration, 33%. The urine contained no urobilin.

The patient was transferred to the General Hospital, Birmingham, on August 19 under Professor Thomson. He was symptom-free and slightly icteric; the spleen was two finger-breadths below the costal margin; and his knee-jerks were diminished. Otherwise no abnormal physical signs were found. On the day of admission his blood count was as follows: red cells, 1,900,000; haemoglobin, 40%; colour index, 1.06; white cells, 6,300 (neutrophil polymorphonuclears 53%, eosinophils 4%, basophils 1%, lymphocytes 28.5%, monocytes 11%, metamyelocytes 1.5%, Türk cells 1%); packed cell volume, 15%; mean cell volume, 80 μ^3; mean corpuscular haemoglobin concentration, 37%; the red cells showed anisocytosis and spherocytosis; reticulocytes, 0.1%—two days later they were 0.4%.

The Donath-Landsteiner and acid haemolysin tests were negative. Agglutinations for leptospires were negative. Coombs's test was negative. The patient was Group O rhesus-positive. Urine at this time showed large amounts of urobilinogen. The serum bilirubin was 0.7 mg. per 100 ml.; direct van den Bergh negative; blood urea, 22 mg. per 100 ml.; Wassermann reaction doubtful; Kahn test negative.

On August 21, nine days after the onset of illness, a sternal puncture revealed:

		%		Normal %
Polymorphonuclears	Neutrophil	28·00		20–50
	Eosinophil	1·50		0–4
	Basophil	0·25		0–1
Metamyelocytes	Neutrophil	22·50		2·8–12
	Eosinophil	0·50		0–2·5
	Basophil	—		—
Myelocytes	Neutrophil	15·50		2–8
	Eosinophil	—		0–1
	Basophil	—		—
Premyelocytes		0·25		0·5–5
Myeloblasts		—		0–2·5
Lymphocytes		7·00		5–20
Plasma cells		1·00		0–1
Reticulum cells		1·75		—
Normoblasts	Late	0·50		7–19
	Intermediate	2·25		4–15
	Early	11·75		
Macronormoblasts	Late	0·25		—
	Intermediate	—		—
Proerythroblasts		6·75		0–4
Haemocytoblasts		—		0–1

Megakaryocytes were normal in number and appearance. The marrow showed some slight increased cellularity and a shift to the left of the erythroid and myeloid series.

On August 23 his blood count showed a marked change: red cells, 2,810,000; haemoglobin, 50%; colour index, 1.08; white cells, 16,100 (polymorphonuclears 52.5%, eosinophils 0.5%, lymphocytes 16.5%, monocytes 4.5%, premyelocytes 0.5%, myelocytes 4.0%, metamyelocytes 21.5%); reticulocytes, 16.2%; platelets, 439,000 per c.mm. A fragility test showed: commencing haemolysis, 0.60% saline (control, 0.40% saline); complete haemolysis, 0.32% saline (control, 0.32% saline).

By August 26 his reticulocytes were 25.2%, and on the 30th his haemoglobin had risen to 72%. A fragility test repeated several weeks later showed: commencing haemolysis, 0.64% saline (control, 0.44% saline); complete haemolysis, 0.44% saline (control, 0.32% saline).

Case 2

Thomas C., jun., a schoolboy aged 10, became ill with vomiting on August 1, eleven days before his father. He complained of headache and pain in the eyes, and was noticed to become rapidly pale. He was admitted to the fever hospital with a diagnosis of meningitis.

On examination he was extremely pale and had a temperature of 99.4° F. (37.4° C.). No other abnormal signs were found. The blood culture was sterile. His blood count five days after the beginning of the illness was as follows: red cells, 1,500,000; haemoglobin, 30%; colour index, 1; polymorphonuclears, 77%, with 3% myelocytes. He was transfused with two pints (1.14 litres) of blood, and his condition rapidly improved. The spleen was not palpable. He was transferred to the General Hospital on August 24.

On admission his blood count was: red cells, 3,910,000; haemoglobin, 76%; colour index, 0.97; white cells, 14,400 (neutrophil polymorphonuclears 75%, eosinophils 3%, lymphocytes 17.5%, monocytes 4.5%). Films showed anisocytosis, spherocytosis, and some polychromasia. Reticulocytes, 8.4%; platelets, 352,000 per c.mm. He was Group O, rhesus-positive. Coombs's test, the acid haemolysin test, Donath-Landsteiner test, and Wassermann reaction were negative. A fragility test showed: commencing haemolysis, 0.56% saline (control, 0.44% saline); complete haemolysis, 0.32% saline (control 0.28% saline).

The urine showed an excess of urobilin. Serum bilirubin was 1.1 mg. per 100 ml.; blood urea, 72 mg. per 100 ml.; and leptospiral agglutinations were negative. The sternal puncture showed increased cellularity. There was no other abnormality.

Cases 3 and 4

Case 3.—Valerie C., aged 6, first had abdominal pain and vomiting on August 10. She was admitted to the fever hospital on the 16th and found to be extremely pale, with a slight icteric tinge. Her temperature was normal. A blood count showed: red cells, 2,700,000; haemoglobin, 40%; colour index, 0.74; white cells, 20,600 (polymorphonuclears 50%, metamyelocytes 21%, myelocytes 7%). Anisocytosis, poikilocytosis, and polychromasia were present. Thirty-two normoblasts were seen in 200 white blood cells.

Case 4.—Baby Irene, aged 2, was noticed to be off colour for a few days at this time, but her condition did not cause undue alarm. A film done on September 1 showed anisocytosis, spherocytosis, and polychromasia. No other investigations were made.

Other Members of the Family

Mrs. C. and two daughters, Joan and Mary, were examined as out-patients. Fragility tests, van den Bergh test, reticulocyte count, and stained films were all negative. None of these three had an attack like the other members. A number of relations of Thomas C., sen., were examined. No evidence of spherocytosis was discovered apart from a slight but distinct spherocytosis in his mother.

The family has been kept under observation for over a year. Apart from an increased reticulocyte count and spherocytosis in the affected members, there is nothing to report.

Discussion

Owren (1948), who reports a series of crises occurring in a family within a short time of each other, gives the most complete observations yet published. In one patient, seen before the crisis began, he was able to study the events throughout. He concludes, with justification, that the crisis should not be called haemolytic, but aplastic. On the fourth day the red cell precursors had almost completely disappeared from the marrow. It was packed with myeloid cells showing maturation arrest with a diminution in segmented polymorphs. The megakaryocytes appeared normal in numbers and appearance. He states that in the crisis the output of urobilinogen in the urine diminishes, as does the serum icteric index. The degree of diminution would obviously depend on the length of the crisis. The crisis is marked by pallor and not icterus. In the case of Thomas C., sen., the interesting features are: when first seen he had a low white count and the urine showed no urobilin; when seen by us his reticulocytes were 0.1% and on the eleventh day after the onset they were 16.2%. This would appear to coincide with the evidence of Owren.

Dacie and Mollison (1943) have shown that the life-span of the red cell in this condition is less than 14 days. If there is marrow aplasia the red count should be halved in a week. During the crisis some azotaemia results, and blood ureas up to 160 mg. per 100 ml. are recorded. The cause of the latter, he suggests, is due to renal anoxia.

Dameshek and Bloom (1948) describe similar events in a case of haemolytic anaemia; unfortunately there was no familial evidence of the disease. They claim that the erythroid cells show maturation arrest in the proerythroblast stage at the height of the crisis. It is quite possible that if this case had been studied earlier in the crisis a picture not unlike that reported by Owren might have been found. These authors emphasize the point that the red cells in the peripheral blood were predominantly spherocytic during the crisis, and subsequently, with recovery, there was evidence of macrocytosis and spherocytosis. They use this as evidence for the view that in the crisis there is increased activity of a hypothetical haemolysin producing spherocytes. This assumption is obviously unsound; for if, as had been shown, there is a gross diminution in reticulocytes in the peripheral blood during the crisis the red cells will to a large extent be spherocytes.

Dameshek would explain the crisis as a combination of hypersplenism and a hypothetical haemolysin. Spherocytosis can be produced experimentally by introducing anti-red-cell sera, and is also found in acquired haemolytic anaemias in which a haemolysin can be demonstrated by the Coombs test. Not all acquired haemolytic anaemias showing evidence of a haemolysin produce spherocytosis.

A spherocyte is an old cell. The ageing process may occur rapidly, as in haemolytic anaemias. It is possible to conceive of other factors producing rapid ageing apart from haemolysins. Presumably in familial acholuric jaundice this is an inherited trait. Removal of the spleen does not alter the state of the red cell, which continues spherocytic. Crises usually disappear. In a very few instances recurrences have taken place. It seems acceptable that a condition of hypersplenism exists in this disease and that spherocytosis is a congenital abnormality of rapid ageing which has nothing to do with the activity of haemolysins.

The cause of the crisis still remains to be elucidated. Certainly, when a number of cases occur in a family it would point to an infection having an "incubation period." The common occurrence of gastro-intestinal symptoms—for example, nausea, vomiting, diarrhoea, abdominal pain—would fit in with an intestinal infection. It is known, however, that the haemolytic process, as produced experimentally, will cause a rise in temperature.

Summary

A series of crises is recorded in a family, four members of which were shown to have spherocytic anaemia of the familial type. All but one recovered spontaneously. Transfusion of two pints of blood was required in one case.

We wish to thank Professor A. P. Thomson for permission to publish; Dr. R. Gaddie for biochemical examinations; Dr. W. Weiner for rhesus typing and the Coombs tests; Miss E. Tacon, senior technician, for carrying out numerous haematological investigations; and Miss P. M. Weight, secretary, for her efforts in compiling and typewriting.

References

Dacie, J. V., and Mollison, P. L. (1943). *Lancet*, **1**, 550.
Damashek, W. (1941). *New Engl. J. Med.*, **224**, 52.
Dameshek, E., and Bloom, M. L. (1948). *Blood*, **3**, 1381.
Dedichen, H. G. (1937). *Norsk Mag. Laegevidensk.*, **98**, 279. Abstract in *British Medical Journal*, 1937, **1**, Epit. 73.
Horne, J. L., Lederer, H., Kirkpatrick, H. J. R., and Leys, D. G. (1945). *Lancet*, **2**, 33.
Lyngar, E. (1942). *Nord. Med.*, **14**, 1246.
Murray-Lyon, R. M. (1935). *British Medical Journal*, **1**, 50.
Owren, P. A. (1948). *Blood*, **3**, 231.
Scott, A. M. (1935). *Lancet*, **2**, 872.

The National Smoke Abatement Society celebrated its 21st birthday by holding its annual conference at Margate on September 27–29. In addition to discussions on railway smoke, and on domestic smoke prevention, particularly in the new towns, an afternoon was devoted to two papers on respiratory disease and atmospheric pollution. In one of them, Mr. R. E. Waller, of the Department of Pathology at St. Bartholomew's Hospital, pointed out that such carcinogenic substances as arsenic and 3:4-benzpyrene are known to occur in smoke from burning coal and in domestic soot, and described experiments to measure the 3:4-benzpyrene concentration in the atmosphere at different times of the year. It is highest during the winter, especially during fog, when the concentration may rise to 33 μg. per 100 cubic metres of air, and down to 1–2 μg. in the summer. It seems fairly certain that the source is the inefficient combustion of coal in the ordinary domestic fire, rather than the chimneys of properly working industrial furnaces and power stations, and the amount of benzpyrene in road dust and motor vehicle exhaust smoke is quantitatively small compared with that from coal. Atmospheric benzpyrene is present in the air in smoke particles and not appreciably as free vapour, and it is therefore important to know the size of these particles before being able to estimate the chance of the carcinogen reaching the lung tissue and being retained there. Until this fact is available, the relation of smoke to cancer of the lung will remain unsettled.

INTERSTITIAL EMPHYSEMA IN MEASLES

BY

J. J. LINEHAN, M.D., D.P.H., D.C.H.

Medical Superintendent, Croydon Isolation Hospital

If judged by the nature and limited number of references to it in the medical literature, the above complication of measles would appear to be very rare. I have therefore been prompted to report the occurrence of three cases at Croydon Isolation Hospital within a period of little over a year.

Case Reports

Case 1.—A girl aged 6 developed measles on January 28, 1949, the rash appearing on February 3. Interstitial emphysema of the chest wall was recognized by the practitioner in attendance on February 5 and admission to hospital was sought. On admission the emphysema was found to be of moderate degree, extending over the greater part of the left side of the chest wall and slightly into the left side of the neck along the line of the trachea. It was not sufficient to cause any obvious swelling of the tissues affected. There was no respiratory distress. Rhonchi were audible over the entire chest, but were of a high-pitched whistling type over the upper part of the left lung. (I believe that the latter phenomenon was in some way related to the source of the emphysema.) There were no other noteworthy features except that the measles rash, which was still well marked on admission, was of the type in which haemorrhagic effusion had occurred into the skin lesions—not in itself an uncommon phenomenon. The patient had a troublesome though not exceptionally severe cough. The emphysema was maximal on admission and thereafter absorbed rapidly so as to become imperceptible within four days. Other chest signs and symptoms cleared up with similar rapidity. Sulphadimidine by mouth was the only treatment given.

Case 2.—A boy aged 5½ was admitted late at night on March 20, 1949, as an emergency case because of respiratory distress. The illness began on March 14 with the usual catarrhal symptoms. The measles rash developed on the 18th. There was a history of persistent cough following influenza in the previous December. On admission a well-marked interstitial emphysema extended over both sides of the chest wall and upwards through the neck into the tissues of the cheeks. There was obvious swelling of the neck and face, especially on the left side. A moderate degree of dyspnoea and slight cyanosis were present. The patient had a cough which was not unduly troublesome, and scattered rales were heard throughout the chest. A fading morbilliform rash and measles stomatitis conformed to the stage of the illness. Besides giving sulphonamides, treatment in an oxygen tent was considered advisable. As in Case 1, there was immediate and rapid improvement. The oxygen was discontinued the next morning, and five days later no detectable emphysema was present. Except for the subsequent development of tonsillitis and otitis media, recovery was uneventful.

Case 3.—A boy aged 5½ was admitted on February 17, 1950, as a case of measles and pneumonia. The measles began on February 7, the rash appearing on the 11th. On admission the skin still showed the staining of a morbilliform rash and the mouth was still inflamed. Interstitial emphysema extended over the entire left side of the chest and upwards on each side of the trachea. The patient had an irritable cough and a cyanotic tinge, but was not dyspnoeic. I could not definitely determine whether there were any adventitious sounds apart from those arising from the emphysema. Again the subcutaneous emphysema cleared up rapidly from the time of admission and was fully absorbed by February 23. Rales were audible in the left base until March 2 and may have been related to the emphysema-producing lesion. An *x*-ray photograph of the chest showed no further abnormality apart from the appearance of air in the chest wall.

Discussion

Some textbooks on infectious diseases make no reference to interstitial, subcutaneous or surgical emphysema as a complication of measles, while those that do refer to it treat it as a very rare complication.

Goodall (1928) states : "As very rare complications [of measles] I have met with cases of nephritis, endo- and peri-carditis, parotid abscess, cellulitis with or without sloughing, and extensive (surgical) emphysema of the trunk and neck. (One case—the patient a boy of 6 years—had bronchitis with severe attacks of coughing : he recovered.)"

Rolleston and Ronaldson (1939) state : "Subcutaneous emphysema is another infrequent occurrence. It may be associated with bronchopneumonia or develop apart from any gross pulmonary lesion, when it has been attributed to rupture of the alveoli, bronchi, or larynx as the result of violent coughing. Ronaldson (1927), in reporting two cases in which cough was not a feature, suggested that weakening of the alveolar wall by toxic action rather than by over-distension was the usual explanation of this occurrence in measles."

Price (1947) states : "Rarely, mediastinal and subcutaneous emphysema have occurred."

In none of my cases was the cough particularly severe, which would confirm Ronaldson's suggestion that the cough can produce this effect only when combined with some pathological process in the respiratory tract. In this connexion, I think that the description of "autemphysema" in the *British Medical Journal* of January 14 and February 4, 1950 (pp. 105, 308), is suggestive. It is described how surgical emphysema is self-induced by malingerers by wounding the buccal mucosa and strongly distending the cheeks with air.

Measles has a well-known capacity for producing ulceration of mucous membranes, and such ulcers could act similarly to the self-induced trauma of the malingerer. I feel that some such discrete ulceration in the respiratory tract is a more probable source of air entry than a weakening of the alveolar walls by toxic action as suggested by Ronaldson. Cases in which measles toxaemia damaged the alveolar walls might be expected to produce more general evidence of lung involvement than was present in the cases I have described. The involvement of the chest wall in each case would indicate that the air did escape from some part of the respiratory tract within the lung, the subsequent spread being via the root of the lung and mediastinum to the tissues of the chest wall and neck, extending in one case to the face.

In the one case in which the face was involved, I think that origin from the buccal mucosa can be excluded. There was no evident lesion in the mouth. Also, in the description of cases produced by mouth injuries to which I have referred, the chest wall is not mentioned as being involved, though there was marked generalized swelling of the face and neck. I think, therefore, that in my three cases the causative lesion was intrapulmonary, probably a small ulcer in one of the larger bronchi. A common feature in all three cases was that the amount of air in the tissues rapidly reached a maximum and thereafter was progressively absorbed. This also would favour the idea of a single small lesion capable of sealing up quickly. So far as it is permissible to draw any generalized conclusion from three cases, it would seem that a favourable prognosis can be given even when the initial condition is somewhat alarming.

REFERENCES

Goodall, E. W. (1928). *A Textbook of Infectious Diseases*, 3rd ed. Lewis, London.
Grantham-Hill, C. (1950). *British Medical Journal*, **1**, 308.
Price, F. W. (1947). *A Textbook of the Practice of Medicine*, 7th ed.
Reading, P. (1950). *British Medical Journal*, **1**, 105.
Rolleston, J. D., and Ronaldson, G. W. (1940). *Acute Infectious Diseases*, 3rd ed. Heinemann, London.

Medical Memoranda

Contamination of Caesarean Wounds by Vernix Caseosa

The vernix caseosa, though one of the potential contaminants of the operative field in the caesarean operation, has for various reasons received as such little or no attention. Some of the neglect has been due to a belief that because the vernix is sterile it is therefore innocuous, some to a proper preoccupation with the problems of contamination by pyogenic organisms. That the vernix is not, however, an entirely innocuous contaminant is illustrated by the events that follow the rupture of an ovarian dermoid cyst. Such an accident, whether spontaneous, puerperal, or operative, is succeeded quite rapidly by a severe peritoneal reaction, and this usually in turn by a secondary invasion of the peritoneum by pyogenic organisms. Even a small amount of free sebaceous material may determine the reaction; in a recent case a severe lower abdominal peritonitis followed the rupture of a cyst no larger than a pullet's egg.

If the dermoid cyst that bursts is large, or if at operation much of the contents escape into the peritoneal cavity, a diffuse plastic peritonitis is certain unless a thorough cleansing is carried out at once. If any pockets of sebaceous material are left behind, then at the best the accident may be followed by the development of localized residual abscesses here and there throughout the peritoneal cavity, even under the diaphragm. Indeed, it may fairly be stated that a dermoid cyst is the one ovarian tumour which must not be tapped at operation.

Both the vernix caseosa and the contents of dermoid cysts, allied as they are in constitution, have similar properties as contaminants; both are unabsorbable and can be removed from the operation area only by a slow phagocytosis, a process carrying the certainty of adhesions and the chances of secondary infection. It seems likely that the escape of vernix into the peritoneal cavity or its inclusion in the abdominal incision is a potential cause of caesarean morbidity. This may be one of the reasons why caesarean section wounds seem more apt than others to heal by second intention; after a period of apparent healing by first intention pus is discharged from their lower end. On seeing an ugly caesarean scar it must be a common experience to draw the inference that the uterine scar must be equally unsound, an inference indeed almost expected from an examination candidate, yet to find at the repeat section that the secondary scar tissue is confined to the abdominal wall, the uterine scar itself being quite sound.

The amount of vernix soiling the operative field varies a great deal. For one thing the amount found covering the foetus varies for reasons that are as yet not understood. Again, the method by which the child is extracted has a bearing on the amount escaping into the wound. More escapes when the child is delivered by the breech or when any difficulty arises in the extraction. Large flakes escaping into the operative field are of course readily seen and removed. It is, however, important to look for and remove the smallest fragments and to recognize the potential contamination coming from the vernix which adheres to the gloves and swabs. Inspection of the surface of water used for rinsing the hands or the swabs will often show a film of liquefied vernix. All these are sources of contamination.

Once the importance of vernix spill is appreciated, suitable precautions come readily to mind. Packing off the peritoneal cavity before the uterus is opened is not a real protection, for once the foetus is extracted these packs always lie loose. "Tetra" cloths as usually employed do not protect the deep layers of the incision. The real protection is twofold; (1) a change of gloves, swabs, and rinsing water immediately the uterine incision is closed and before the peritoneum covering the lower segment is sutured; and (2) a meticulous removal of every fragment of the vernix caseosa from the operative field, the most likely places being the front of the broad ligaments and the lower angle of the abdominal incision behind the rectus sheath. If a transverse abdominal incision is used a careful inspection of the recess behind the lower flap of the sheath should be made. It is well, too, to wipe all the raw surfaces with a clean swab before any attempt at closure.

PERCY MALPAS, Ch.M., F.R.C.S., F.R.C.O.G.

Pethidine as an Adjunct to Nitrous Oxide and Oxygen Anaesthesia

Mushin and Rendell-Baker, in 1949, published a memorandum on the use of pethidine as a supplement to nitrous oxide and oxygen anaesthesia, a method which they had seen used successfully in America and had themselves adopted on 100 occasions. It appeared that this method might well be a useful innovation, and such has proved to be the case in the 150 administrations here recorded.

METHOD

The method suggested by Mushin and Rendell-Baker was adopted and has been adhered to throughout this series, although they themselves have on occasion given increased doses of pethidine.

The routine in the present series has been as follows : (1) Premedication has been by "omnopon" 1/3 gr. (22 mg.) and scopolamine 1/150 gr. (0.43 mg.) for all adults between the ages of 17 and 60 years; over 60 years, omnopon 1/6 gr. (11 mg.) and scopolamine 1/300 gr. (0.21 mg.). (2) Induction has been by a "sleep" dose of sodium thiopentone—usually between 0.2 and 0.3 g. is given in 5% solution. (3) Anaesthesia is begun with nitrous oxide and oxygen. (4) Pethidine is given in a dose of 25 mg. intravenously as soon as anaesthesia is smoothly established. (5) Tubarine or "flaxedil" is given at the requisite time should there be any undue movements of the patient or should great relaxation of the muscles be necessary.

This routine has been the standard in all cases except three. Of these, two were tough farm-labourers, and each had to have 0.5 g. of sodium thiopentone followed by 37.5 mg. of pethidine. The third was a girl who received 0.5 g. of sodium thiopentone originally, as she was to be examined under an anaesthetic before operation was decided upon.

The following table shows the nature of the cases which were selected as suitable :

Cases in the Series

Hernia (inguinal and femoral) ..	31	Hydrocele	2
Orthopaedic	19	Nephrolithotomy	1
Mastectomy (simple and radical)	12	Cystotomy	1
Varicose veins	10	Gynaecological; abdominal (hysterectomy, ovarian cyst, etc.)	27
Cystoscopy	3		
Prostatectomy (Millin's)	2		
Appendicectomy	10	Vaginal hysterectomy ..	1
Haemorrhoidectomy	3	Vaginal repair	13
Colostomy	4	Dilatation and curettage ..	7
Gastrectomy	1	Laparotomy	1
Circumcision (adult)	2		

A start was made with minor extra-abdominal cases, and gradually the scope was widened as more experience and confidence were gained. The method has now been adopted as almost routine except for the more difficult upper abdominal cases, such as gastrectomy. One gastrectomy is quoted here, but was not a complete success owing to the mistiming of a further dose of flaxedil, which led to the peritoneum being insufficiently relaxed for easy suture.

General Observations

Patients seldom suffer any side-effects from the use of pethidine. In a few cases there has been a marked reduction in the frequency, although not in the volume, of respiration. In two cases the respiration was reduced to seven a minute, and in one case to three. Adequate ventilation was easily obtained by "assisted respiration."

It is sometimes a little difficult to maintain adequate oxygenation combined with sufficient depth of anaesthesia during the earlier stages of the operation, but this is overcome by waiting a few minutes, allowing time for the patient to become stabilized on nitrous oxide, and giving an increased percentage of oxygen.

No significant alterations of blood pressure have been recorded as due to pethidine.

One outstanding feature is that apparently the sphincter ani becomes sufficiently insensitized to allow of such operations as haemorrhoidectomy and posterior colporrhaphy to be done without alteration in the patients' respiration and without any evidence of distress.

It is a little difficult to judge at what interval of time pethidine begins to exert its maximum effect, but probably this varies between five and ten minutes, as judged by the incidence of reflex movements when under the anaesthetic. It is possible that the more prolonged administration of nitrous oxide affects this estimate. It has not been found necessary to repeat the dosage of 25 mg. of pethidine at intervals of 25 to 30 minutes, and the effect of a single dose has been known to last up to 1½ hours.

Recovery is rapid, often occurring in the theatre, and almost always on the way back to the ward. Patients will almost immediately open their eyes upon request and will answer questions, but there is a varying period of amnesia lasting up to 1–1½ hours.

Another valuable point is that post-operative pain seems to be considerably reduced, and patients operated upon in the morning often do not require any post-operative sedative until late in the evening.

The present series is not large enough for the incidence of pulmonary complications to be judged accurately, but they have been remarkably few, and it is felt that this may largely be due to the reduction of immediate post-operative pain and the consequently increased movements of the patients.

The series reported is small, and further investigation is proceeding, but it was felt justified to publish results up to date in order to stimulate interest in a method which appears to be safe and also promises improvingly good results as more experience is gained in its use.

H. F. GRIFFITHS, M.D., D.A.,
Consultant Anaesthetist,
South-east Kent and Canterbury Areas.

Reference

Mushin, W. W., and Rendell-Baker, L. (1949). *British Medical Journal*, 2, 472.

Post-pneumonic Collapse of Right Lower Lobe Relieved by Bronchoscopic Aspiration

Atelectasis of the whole lung or of one lobe, whether post-operative or post-pneumonic, is considered to be due to bronchial obstruction. The sequence of events in either case is very much the same : (1) Production of excessive secretion. (2) Formation of occluding masses because of the recumbent position and reduced respiration through splinting of diaphragm and pain. (3) Movement of these masses upwards in the tract by ciliary action, somewhat on the principle of a ball-valve, allowing air to get out during expiration but preventing air getting in during inspiration. The shape of the bronchus being narrower in its distal portion than proximally explains how a plug of mucus can act in that manner. (4) Progressive shrinkage of the affected lobe takes place (aided by absorption of air into the blood stream) as the plug of mucus becomes immobilized by atmospheric pressure.

Whereas *post-operative* collapse and relief by bronchoscopic aspiration has been extensively reported, I could find mention of only two cases of *post-pneumonic* collapse relieved in this way (Mainzer, 1931). I therefore venture to report the following case.

Case Report

A married woman was admitted to the French Hospital on February 24, 1949, with a 10-day history of post-influenzal cough. Her temperature was 103° F. (39.4° C.) and pulse 120.

Physical examination showed dullness at the base of the right lung, which was opaque on *x*-ray examination. A diagnosis of lobar pneumonia with small pleural effusion was made by Dr. L. P. E. Laurent. Penicillin injections in full doses were given. The patient became afebrile and improved generally, but the dullness on the right side remained. *X*-ray examination four weeks after admission revealed a solid lower lobe with the diaphragm drawn upwards and the heart pulled to the right. The physician and the radiologist now began to suspect a neoplasm blocking the inferior bronchus.

The patient was referred to me, and bronchoscopy was carried out on March 29. The right main bronchus appeared congested, the entrance to the inferior bronchus was patent, and no neoplasm was seen. A bronchoscopic sucker was then introduced about an inch beyond the entrance to the lower lobe. While aspirating and withdrawing the sucker at the same time, a thick gelatinous, tenacious mucous plug was seen adhering to the distal end of the sucker. The patient's relief was almost immediate.

Within a few days physical examination showed some return of pulmonary function. Successive radiographs revealed the lobe expanding gradually, the diaphragm descending, and the heart resuming its normal position. Tomograms confirmed the absence of a neoplasm. The patient left hospital on May 2, having made a complete recovery.

ARTHUR MILLER, F.R.C.S.Ed.

Reference

Mainzer, F. S. (1931). *Amer. J. Surg.*, 12, 430.

Reviews

HAEMATOLOGY AND CLINICAL MEDICINE

Hemorrhagic Disorders. A Guide to Diagnosis and Treatment. By Paul M. Aggeler, M.D., and S. P. Lucia, M.D. Lettered and illustrated by Phylura Gibbs, Helene Cleare, and Jean Thompson under the supervision of Ralph Sweet. (Pp. 112. £3 15s.) Chicago: University of Chicago Press. Cambridge: University Press. 1950.

Atlas der Blutkrankheiten. By Dr. Karl Schleip and Professor Albert Alder. Fourth edition. (Pp. 256; 140 coloured illustrations. No price.) Berlin and Munich: Urban and Schwarzenberg. 1949.

Klinische Pathologie der Blutkrankheiten. By Professor Rudolf Schoen and Professor Walter Tischendorf. (Pp. 521; illustrated. M. 57.) Stuttgart: Georg Thieme. 1950.

The first two of these three works on haematology are picture books and can be briefly reviewed. The pages of the text of Aggeler and Lucia's book on haemorrhagic disorders were reproduced from an exhibit designed for teaching at the University of California Medical School. Anyone who has visited the Wellcome Medical Museum in London will be familiar with the use of panels of letterpress and pictures for visual education. Here there are some 80 pages on the same lines illustrating the physiology of haemostasis, the manifestations and treatment of haemorrhagic disorders, and the methods and results of special investigations. There is a final chapter on therapeutic agents and procedures, and a good bibliography. The book is prettily produced and will be useful to those planning similar teaching by demonstration. It would not be unfair to call it a child's guide to the haemorrhagic diseases, or to add that few children can afford £3 15s. for a book of this kind.

Schleip and Alder's book is the post-war fourth edition of an established atlas of blood diseases, with which Alder's atlas of the bone marrow has now been combined. The text is simple and orthodox, and the 140 pictures in colour are all of good quality. They are paintings which have been reproduced by a four-colour process. Slightly conventionalized, they will be more useful for teaching than for the settlement of haematological controversy. Plate 38 depicting ring bodies is reminiscent of Picasso's work, and the student must not expect Nature to imitate art quite so closely. The relatively short section on bone marrow gives the impression of an afterthought, and to separate the section on bone marrow from that on peripheral blood is not justified in an atlas of this kind; the material should be arranged in terms of processes and diseases. Many atlases of the blood are now appearing, probably more than the market can support. Schleip and Alder's belongs to the student class, which is already numerous and where survival depends on price and on the value of the plates as a guide to recognition of the simpler cytological subdivisions. Custer's atlas has given us a fair view of the morbid anatomy of the bone marrow, but there is still need for a definitive series of pictures of blood cells stained by the Romanowsky technique. This is unlikely to be achieved without international co-operation.

Schoen and Tischendorf's book on clinical pathology of the blood diseases is a more serious and important book than the other two reviewed here. It is a full-scale textbook of clinical haematology in the best German tradition and it is a work of scholarship. It is dated 1950, and the most recent discoveries outside as well as inside Germany have been digested, assimilated, and included in the text. The book begins with a section on the normal morphology and physiology of the blood-forming organs. There follows a short chapter on the interpretation and the errors of the technical methods. The authors then discuss the diseases of the blood under the headings of anaemias, disturbances of the marrow and spleen, haemorrhagic diseases, blastomatous disorders, and leukaemoid reactions. A final section is on the inheritance and familial incidence of blood diseases. The book is well produced, with full references and bibliography. It is printed in smallish type on a large page, with relatively few illustrations, and will not appeal to the casual reader. English readers likely to be specially interested are those who have a good knowledge of either German or haematology, and those who are delighted to see evidence of the renascence of German scientific publications.

Yet this book has perhaps a more general message for us. Its authors are a university professor of medicine and his senior assistant, and they write :

> "In spite of all recent developments, internal medicine is a unitary discipline which joins its many sectional parts into one whole. The synthesis between the clinic and special knowledge is possible only when the community of clinical workers develops its specialists by scientific investigation in the sectional parts. These will then not succumb to the danger of narrow specialism, but within the framework of the clinic they will preserve the vision of larger connexions, the general view."

This is still the faith in America, where the members of university departments of medicine inevitably engage in scientific investigation, and where the two leading textbooks of haematology have been written by university professors of medicine, Sturgis and Wintrobe. Aggeler and Lucia are professors of medicine engaged in instructing students in clinical medicine. Schleip and Alder are Privatdozenten; that is to say, assistant professors of internal medicine. In Great Britain we do not have the same belief in the competence of the physician to master laboratory procedure or to advance scientific knowledge, and the clinic, as distinct from the preclinical departments, has never been university-minded. The present hospital service has evolved out of the eighteenth-century voluntary hospital, the Emergency Medical Service, and the medical services of the armed Forces. The result is a service which is organized in terms of specialists. The medical specialist is a man who sees patients and the clinical pathologist is a man who examines specimens of blood. As medical establishments grow, their channels of communication are increasingly the standardized form for request and report. Recent letters to the *Journal* indicate that both sides are capable of a jealousy about their spheres of work which is more characteristic of the craft unions than the liberal professions.

Centralized clinical pathology has great advantages in the wider distribution of health care, though in the absence of control by the price mechanism it is likely to lead to some form of rationing of laboratory investigations. Not only are centralized laboratories necessary for clinical pathology in the regions, but so also are special centres for the organization of blood transfusion and blood grouping and similar purposes. It is less easy to justify the centralization of clinical pathology in the teaching hospitals, which have a special part to play in the National Health Service. They already have university departments of pathology, but they have not organized their clinical departments on university lines. This is a manifestation of the popular confusion of the function of the health services and the universities, of the regional hospitals and laboratories and the teaching hospitals. The results of this confusion are particularly obvious in haematology, where it is often impossible to make a clear distinction between investigation and treatment, so that the divorce of control of the patient from control of the laboratory may prevent the study of the patient as a whole.

L. J. WITTS.

APPLIED PHYSIOLOGY

Einführung in die pathologische Physiologie. By Professor F. Grosse-Brockhoff. (Pp. 645; 306 figures; bound, M. 39.60.) Berlin, Göttingen, and Heidelberg: Springer. 1950.

Disordered function is the essence of disease, and from the clinical point of view it is of more immediate interest than structural change. Applied physiology accordingly forms a substantial part of medicine and surgery. The short course in the subject customary in our medical schools should be regarded simply as an introduction to more detailed instruction in it at the bedside. It is doubtful whether undergraduates need textbooks of applied physiology, the essentials of the subject being integral parts of clinical instruction; graduates, on the other hand, may find such books useful, although many topics are too complex for textbook discussion and are best studied in the original literature.

Professor Grosse-Brockhoff intends his work to supplement Rein's *Physiologie* and Lehnartz's *Chemische Physiologie* and refers readers to these for detailed information. The book is a comprehensive and well-written summary of the subject and seems to be the result of efficient card-indexing. Everything possible has been done to make it easy for the reader to find what he wants: the analytical table of contents occupies twelve pages and makes the excellent index almost superfluous. Paper, printing, and binding are up to the best pre-war German standards. The book will be useful chiefly to German students but may also interest teachers of applied physiology outside Germany. The English-speaking world is already well catered for by the standard works of Samson Wright, Best and Taylor, and Fulton—to all of whom the author acknowledges his debt.

RAYMOND WHITEHEAD.

REGIONAL DERMATOLOGY

Regional Dermatologic Diagnosis: A Practical System of Dermatology for the Non-specialist. By Ervin Epstein, M.D. (Pp. 328; 148 illustrations. 42s.) London: Henry Kimpton. 1950.

Theoretically the idea of regional dermatology is attractive, for most dermatoses have their characteristic sites, but in practice this approach does not lend itself to treatment in a textbook. Sabouraud published a manual of regional dermatology in 1905, and an English translation appeared in 1906. Dr. Epstein has now produced an elegant little volume, well illustrated on the same lines. In an appendix he indicates the twenty dermatoses that constitute 75% of dermatological practice. Not more than two or three are limited to one region; the rest may occur anywhere on the body, a few having certain sites of election. That limits the value of a treatise on regional dermatology. Inevitably there is constant repetition, but the tyro may be helped by reference to such a work and be led to seek further information in standard textbooks.

That the author does not discuss chilblains in his account of finger lesions may reflect a low incidence in America. Neurodermatitis of eyelids, chronic eczema of wrists, secondary syphilis of the forehead, and lupus vulgaris of the neck are some further important omissions. Acute disseminated lupus erythematosus is mentioned in the section on the hand and chronic lupus erythematosus omitted, but the catalogue of regional diseases is on the whole accurate and adequate. The general practitioner, for whom the book is intended, will find this a helpful guide to diagnosis.

J. T. INGRAM.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Rheumatism. A series of Broadcast Talks given by "A Doctor." (Pp. 47. 1s.) London: Empire Rheumatism Council. 1950.

The Stammerer's Choice. By H. St. John Rumsey, M.A. (Pp. 134. 7s. 6d.) London: Methuen. 1950.

Simple Foot Exercises. By T. T. Stamm, F.R.C.S. (Pp. 6. 5s.) London: Foot Health Educational Bureau. 1950.

Overcoming Handicap. By R. W. Paterson. (Pp. 72. 3s. 6d.) London: Student Christian Movement Press. 1950.

Blood Groups in Man. By R. R. Race, Ph.D., M.R.C.S., and Ruth Sanger, Ph.D., B.Sc. (Pp. 290. 30s.) Oxford: Blackwell Scientific Publications. 1950.

New Frontiers of the Mind. By J. B. Rhine. (Pp. 220. 1s. 6d.) Harmondsworth: Penguin Books. 1950.

Fevers for Nurses. By G. E. Breen, M.D., D.P.H., D.O.M.S. 3rd ed. (Pp. 220. 7s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

Management of Obstetric Difficulties. By P. Titus, M.D. 4th ed. (Pp. 1,046. 100s.) London: Henry Kimpton. 1950

The Antihistamines. By S. M. Feinberg, M.D., and others. (Pp. 291. $4.) Chicago: Year Book Publishers. 1950.

Le Thermo-Climatisme Français. By C. Paulin. (Pp. 144. No price.) Paris: L'Expansion Scientifique Française. 1950.

Os et Tuberculose. By R. Kaufmann. (Pp. 152. No price) Paris: L'Expansion Scientifique Française. 1950.

La Lèpre. By R. Chaussinand. (Pp. 212. No price.) Paris: L'Expansion Scientifique Française. 1950.

Le Diabète Sucré. By R. Boulin. 2nd ed. (Pp. 121. No price.) Paris: L'Expansion Scientifique Française. 1950.

50 Années de Lutte contre la Tuberculose en Belgique, 1897-1947. By L'Œuvre Nationale Belge de Défense contre la Tuberculose. (Pp. 142. No price.) Brussels: L'Œuvre Nationale Belge de Défense contre la Tuberculose. 1950.

I Congreso Nacional de Geriatria: La Tuberculosis Pulmonar en el Anciano. By J. L. Alvarez-Sala Moris and R. Navarro Gutiérrez. (Pp. 151. No price); *La Diabetes Mellitus en los Viejos.* By C. Blanco Soler. (Pp. 23. No price); *Osteoporosis Senil.* By M. Pañella-Casas and J. Monteys-Porta. (Pp. 102. No price). Barcelona: Sociedad Española de Geriatria. 1950.

In the *Irish Medical Directory and Hospital Yearbook* for the year 1950 (Parkside Press, Dublin; 15s. 6d.) the Ministers for Health of Northern Ireland and Eire refer briefly to some of the recent legislation in their countries. Dame Dehra Parker says there is definite promise that the structure of the health services in Northern Ireland has been laid on solid foundations. There are signs, she writes, that the public are becoming accustomed to the new services and are making use of them far more as a matter of necessity than as a novelty, which at first often seemed to be the case. Accommodation for tuberculous patients has been increased during the year. Dr. Noel C. Browne, commenting on the state of affairs when self-government came to Southern Ireland, says that about one-third of the people of Dublin were living in dwellings which were or should have been condemned. Undernourishment was the rule in town and country, and tuberculosis rife. Inadequate health services laboured in vain against these evils. To-day, he writes, the people are better housed, better clothed, and better fed by far than they were 30 years ago. In the next seven years about £20.000.000 will be spent on hospitals, sanatoria, and other enterprises. The *Directory* sets out clearly the names and particulars of medical practitioners as well as of the hospitals, and there is a useful index to the hospitals.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY SEPTEMBER 30 1950

CIGARETTES AND CANCER

The steady increase in the recorded deaths from cancer of the lung is startling. In 1922 there were 612 deaths from this cause in England and Wales, compared with 9,287 in 1947—a fifteenfold increase. The trend is the same in all countries where Western civilization is predominant, except apparently in Iceland. There can be little doubt that the incidence of cancer of the lung is really increasing, and tarred roads, exhaust gases, common respiratory infections, certain types of occupation, and tobacco smoking have all been blamed for the greater frequency of the disease. Of these possible causes smoking seems the most likely, for the rise in the death rate from cancer of the lung has followed a great increase in the consumption of tobacco and cigarettes. Several groups of workers have undertaken investigations to prove or disprove the suggested association. It is not easy to adopt an unbiased attitude to the concept that smoking may cause cancer: we are all either smokers or non-smokers, and each group may regard the other as prejudiced. It is said that the reader of an American magazine was so disturbed by an article on the subject of smoking and cancer that he decided to give up reading. Those who smoke more than 40 cigarettes a day, allowing ten minutes per cigarette, are occupied with smoking for about 6½ hours. There are no days off, and therefore the heavy smoker smokes for about 46 hours a week. This almost amounts to an occupation. Moreover, smokers heavily outnumber non-smokers, and this complicates statistical considerations. Even so, the proof that cancer of the lung is associated with smoking must obviously be based on statistical and not on clinical evidence. In this country Dr. Richard Doll and Professor A. Bradford Hill, whose paper is published in the opening pages of this issue, have carried out a meticulously conducted inquiry, the results of which have very serious implications, for they conclude that "smoking is a factor, and an important factor, in the production of carcinoma of the lung." They also put forward the admittedly speculative suggestion that above the age of 45 the risk of developing the disease is fifty times as great among those who smoke twenty-five or more cigarettes a day as among non-smokers.

The ideal investigation would be to compare the incidence of lung cancer in a population exclusively composed of non-smokers with that in populations composed of smokers of various grades, from very light to excessive. The method adopted by Doll and Bradford Hill, who began their inquiry in 1947, was to obtain notifications of patients with cancer of the lung, stomach, and large bowel from twenty London hospitals, and to arrange for the interview of these patients by one of four almoners who were allotted to this work. The patients with cancer of the stomach and large bowel served for purposes of comparison, but the almoners also interviewed a control group of patients who did not have cancer but who, case for case, were of the same age and sex as the patients with cancer of the lung. The patients thus interviewed amounted to 2,475 and included 489 cases of cancer of the lung confirmed by necropsy, biopsy, or exploratory operation, and 220 others in whom the diagnosis was probably correct but made on different grounds. All the patients were asked whether they smoked or not, and, if they smoked, how many cigarettes or ounces of tobacco. An obvious preliminary difficulty was to decide where the line should be drawn between smokers and non-smokers, and also how to classify those who had once been smokers but had stopped. The definition of a smoker adopted in this inquiry was "a person who had smoked as much as one cigarette a day for as long as one year."

By comparing the proportion of patients with lung cancer who were smokers and the proportion of smokers in the comparable group of patients without lung cancer, Doll and Bradford Hill were able to show not only that the vast majority of men with carcinoma of the lung had been smokers at some period of their lives but also that the very small proportion (0.3%) of those who were non-smokers was most significantly less than the corresponding proportion (4.2%) in the control group. Further, there were relatively more heavy smokers among the patients with cancer of the lung (26% of the men and 14.6% of the women) than among the controls (13% of the men and none of the women). The risk, in fact, seemed to vary in approximately simple proportion to the amount smoked. Very similar results to those obtained by Doll and Bradford Hill have recently been reported from the U.S.A. by Wynder and Graham.[1] Their study covered 684 cases of bronchogenic carcinoma, 634 of the patients having been personally interviewed. They found that the non-smokers among male patients with cancer of the lung amounted to 1.3% of the total, compared with 14.6% of non-smokers among men in the general hospital population without cancer. Whereas only 19.1% of men in the latter were classified as "excessive and chain-smokers," as many as 51.2% of the patients with cancer came into this category.

In a recent report from Iceland Dungal[2] has drawn attention to the comparative rarity of lung cancer in

that island. His study is based on the records of 1,939 necropsies performed in Reykjavik from 1932 to 1948. There were 417 malignant growths in this series and 12 cases of primary lung carcinoma. This is a very much smaller proportion than is found in other comparable communities. Dungal points out that smoking, and particularly cigarette smoking, has only recently become popular in Iceland on a scale at all resembling that in most European countries. In 1945 the consumption of tobacco per head in Iceland reached 1 lb. per annum, whereas this figure was passed in Great Britain as long ago as 1920. It remains to be seen whether the incidence of lung cancer increases in Iceland during the next twenty years.

In the English investigation great pains were taken to avoid any sort of bias. The most likely source of error would seem to be in the interviewing, for even those who have no possible reason for being untruthful can be badly let down by their memories. Nevertheless, it is difficult to suggest what other precautions Doll and Bradford Hill might have taken to counter all possible criticisms of their method of investigation. They have even been able to show statistically that the results were in no way influenced through the fact that the interviewers knew in most cases whether or not the patient they were questioning had cancer of the lung. One unexpected result of the investigation was that inhaling cigarette smoke was not distinctly associated with lung cancer. In fact patients with this disease inhaled slightly less often than the controls. Wynder and Graham found that the proportion of men who smoked cigarettes as opposed to pipes among the patients with bronchogenic carcinoma was greater than that among the general hospital population of the same age-group, and they concluded that "the greater practice of inhalation among cigarette smokers is believed to be a factor in the increased incidence of the disease." Doll and Bradford Hill also found that pipe smoking was less closely related to cancer of the lung than cigarette smoking. They were not able to demonstrate with the data at their disposal that cancer of the lung is commoner in men than women because men smoke more, but they do suggest that their findings are consistent with the theory that, apart from the influence of smoking, the risk of developing carcinoma in the lung is the same in both men and women.

There is shortage of convincing experimental evidence about tobacco as a cause of cancer. Animals subjected to an atmosphere of smoke from mechanically smoked tobacco can be compared, not with smokers, but with non-smokers in a smoking compartment. It has never been proved experimentally that carcinogens are formed during the smoking of tobacco, though this would not be surprising in the light of the probable results of destructive distillation of any organic matter under conditions of restricted oxygenation. Kennaway[3] prepared carcinogenic tar from such different material as yeast and human skin. The distillation of coal in gasworks yields carcinogenic tar, and workers in the tar and pitch industry are eligible for compensation if they contract cancer of the exposed skin. Apart from the carcinogens which may be formed as a result of the burning of tobacco, it is also possible, as Doll and Bradford Hill point out, that arsenic in the insecticides with which the tobacco plants are sprayed could act as a carcinogen.

The practical question which the doctor in practice has to answer is whether any of his patients—for instance, those with smoker's cough—should be advised to give up smoking. In most textbooks of medicine and pathology reference is made to betel-nut chewer's cancer of the mouth. This is accepted as a well-established case of causal relationship, yet the actual incidence of cancer of the mouth in the population at risk would be difficult to compute accurately, since the habit is almost universal in many Asian communities. Certainly most betel-nut chewers do not contract cancer of the mouth; nor do many pitch and tar workers contract cancer of the skin, nor chimney-sweeps cancer of the scrotum. There is no evidence about the degree of risk which cigarette smokers take, but it does apparently increase in direct proportion to the amount smoked daily and to the total duration of the habit.

[1] *J. Amer. med. Ass.*, 1950, **143**, 329.
[2] *Lancet*, 1950, **2**, 245.
[3] *J. Path. Bact.*, 1924, **27**, 233.

MECHANISM OF RELIEF IN RHEUMATOID ARTHRITIS

Increased fat deposition is one of the signs of Cushing's syndrome, many of the metabolic features of which are widely attributed to increased adrenal cortical activity. Knowledge of the alterations in fat metabolism caused by adrenal steroids is less far advanced than that of changes in carbohydrate metabolism. The deposition of liver glycogen which may be thus induced is accompanied by hyperglycaemia and glycosuria. There is also known to occur a process of gluconeogenesis whereby the conversion of amino-acids to carbohydrates is increased. This process will not account for the total increase in carbohydrate which may be observed—which suggests diminished utilization. Carbohydrates "spared" in this way may undergo conversion to fat. Since Kendall[1] showed that 11-dehydrocorticosterone could induce an increase in the total fat content of the mouse carcass there has not been much work on this problem, though Evans and his colleagues[2] succeeded in demonstrating that adrenocorticotropin had the same effect on hypophysectomized rats. Ingle and his

[1] Conference on Metabolic Aspects of Convalescence, 1945. Josiah Macy Foundation, New York, p. 81.
[2] *Endocrinology*, 1949, **44**, 71.
[3] *Amer. J. Anat.*, 1948, **82**, 75.
[4] *J. clin. Endocrinol.*, 1949, **9**, 937.
[5] *Endocrinology*, 1949, **45**, 305.
[6] *J. Amer. med. Ass.*, 1950, **143**, 570.
[7] Conn, J. W., *et al.*, *J. Lab. clin. Med.*, 1950, **35**, 504.
[8] *Arch. intern. Med.*, 1949, **84**, 361.

co-workers[3] also found histological evidence of fatty infiltration of the liver in rats "force-fed" with carbohydrates and injected with A.C.T.H. In spite of rather scanty evidence these workers felt there might be some impairment of liver function. It must be acknowledged that attempts to produce fatty infiltration of the liver with A.C.T.H. have not been uniformly successful, for Jefferies[4] found that, although pituitary extracts would cause this condition, A.C.T.H. would not. Payne,[5] in short-term experiments with mice, found the potency of the "fat mobilizing factor" of the anterior pituitary was not related to the adrenocorticotropic potency of the preparations employed. In spite of this, the effect seemed to be dependent on the normal activity of the adrenal cortex, which probably maintained a basic level of glycogen as an intermediate in the fat-mobilizing process.

Against this background, which is not in all respects consistent, Archer[6] has lately propounded a theory that the beneficial effects of A.C.T.H. in rheumatoid arthritis may be dependent on the development of fatty infiltration of the liver and consequent hepatic dysfunction. He compares some of the biochemical changes found in jaundice and pregnancy—conditions associated with the alleviation of rheumatoid arthritis—with some of those caused by injections of A.C.T.H. It is unfortunate that one of these changes, hypercholesterolaemia, is the reverse of that often observed after A.C.T.H. injection,[7] and the only remaining feature in common appears to be decreased tolerance for carbohydrates. Archer states that gold, bismuth, and other drugs used in the treatment of rheumatoid arthritis are potentially damaging agents to the liver, and he puts forward some evidence to show that improvement after the administration of these drugs can be related to the appearance of abnormalities in the thymol turbidity, cephalin flocculation, and serum protein.[8] Many gaps need to be filled in before a theory such as this can be substantiated. Although it can be accepted that the adrenal cortex influences the deposition of body fat, the part it may play in inducing fatty infiltration of the liver is less clear. The deposition of fat in the liver which may occur in Cushing's syndrome could to some extent be associated with the cardiovascular changes found in that condition. The relation of fatty infiltration of the liver to impairment of cellular function needs to be more precisely defined. The conjecture that the success of gold therapy in rheumatoid arthritis is dependent on changes in the liver must also be examined further.

CANCER OF THE CERVIX

Statistical studies of the same subject may point to surprisingly diverse conclusions, because different observers may place different interpretations on the multiple variables concerned. Thus in the case of cancer of the cervix some investigators assess results on the basis of the clinical stage of the disease at the first full examination, while others correct the stage when the findings at operation or necropsy show the clinical assessment to have been incorrect. This latter approach may at first seem more scientific, but where it is employed the results of operative treatment cannot strictly be compared with the results of radiotherapy because the stage of the growth is not estimated by the same process. Nevertheless many facts of interest as well as of clinical significance are disclosed in three statistical surveys of cancer of the cervix which have been published in the last year. In the first of these, Maliphant[1] in this *Journal* reviewed 1,200 cases diagnosed between 1922 and 1946 and discussed the incidence and the relative importance of certain factors predisposing to this form of malignant disease. He found that the age of maximum risk was between 55 and 59. This serves as a reminder that more than half of the cases of cervical carcinoma occur after the menopause, a fact also emphasized by the other two investigators, Harnett[2] and Morris and Meigs.[3] In Harnett's 859 cases of cancer of the cervix the menopause occurred after the age of 48 years in only 17.8%, while in 288 cases of cancer of the body of the uterus the comparable figure was 30.4%. This lends support to the contention of Corscaden and Gusberg[4] that carcinoma corporis is commoner in women in whom the menopause has occurred later than the average.

Maliphant calculated the risk of carcinoma of the cervix in any one year between the ages of 35 and 64 to be 1 in 1,500 in parous women and 1 in 21,000 in single women. It is well known that cervical malignancy is predominantly a disease of parous women, but Maliphant observed that marriage alone, without pregnancy, doubled the risk. Here again the three surveys are in agreement, but Morris and Meigs also found that marriage below the age of 20 was a significant factor, for 45.4% of their patients could be put in this group as against 18.6% for the general female population of Massachusetts. Their figures, however, like those of Lane-Claypon,[5] do not bear out Maliphant's contention that the risk in the parous woman varies directly with the number of her pregnancies. None of the three surveys brought to light any evidence which directly

[1] *British Medical Journal*, 1949, **1**, 978.
[2] *Brit. J. Cancer*, 1949, **3**, 433.
[3] *Surg. Gynec. Obstet.*, 1950, **90**, 135.
[4] *Amer. J. Obstet. Gynec.*, 1947, **53**, 419.
[5] *Cancer of the Uterus*, Reports on Public Health and Medical Subjects, No. 40, 1927. H.M.S.O., London.
[6] *Amer. J. Obstet. Gynec.*, 1949, **58**, 851.
[7] Report of Discussion, ibid., 1949, **58**, 849.

incriminated the oestrogens as a cause of cancer of the cervix, and, in fact, in 75 of the 1,938 cases reviewed by Morris and Meigs bilateral oophorectomy had been carried out some years previously. In all three investigations a varying number of growths are reported to have arisen in the cervical stump after subtotal hysterectomy. The number of such cases can be and should be reduced, because, as Morris and Meigs point out, the risk of stump cancer is greater than whatever additional risk there may be in performing total in preference to subtotal hysterectomy—assuming the operator possesses the degree of surgical skill expected of those undertaking major surgery.

The commonest presenting symptom in cervical cancer is irregular or abnormal bleeding, often after coitus. In Harnett's series this was so in 67.5% and in the American series in 86%. It is surprising, however, to find that the second commonest presenting symptom (42%) in Morris and Meigs's series was pain, for this is commonly believed to be a relatively late complaint. Harnett found that in over 25% of his cases there was a lapse of more than six months between the onset of symptoms and medical consultation, and that in 10% the doctor allowed more than one further month to elapse before carrying out a vaginal examination. These errors of omission which delay diagnosis must affect the prognosis in individual cases, for it has been clearly and repeatedly shown that the results of treatment depend directly on the stage of the disease at which it is applied. Strangely enough, however, both Maliphant and Harnett found no close relation between the duration of symptoms and the stage of the cancer; indeed Harnett found the same five-year cure rate for cases treated within six months of the first symptom as for cases treated more than six months after the onset of symptoms. In Morris and Meigs's series, however, there was a consistent relationship between the duration of symptoms and the stage of the disease; and their five-year cure rate was 10% higher when treatment was commenced before symptoms had been present for six months.

There can be no possible doubt that early diagnosis must improve the outlook for the patient. For this reason the routine annual gynaecological examination of women over 35 has been recommended, but the number of cancers likely to be found in this way which would not otherwise have been detected would be relatively very small. Maliphant estimated that for every woman with cervicitis who developed carcinoma one thousand did not. The screening of women for uterine cancer by routine vaginal smears is employed in some clinics in the U.S.A., but this method is expensive, the number of trained cytologists is small, and there is at least a 10% false-negative rate. According to Novak[6] a positive test appears on the average once in every 500 hours of cytological study. In Chicago recently a simple chemical test for cancer of the cervix has been discussed.[7] As yet, however, none of these diagnostic aids is without some serious disadvantage, and none is a substitute for a competent vaginal examination and unrestricted recourse to biopsy. Meanwhile more should be done to inform, without alarming, the public of the importance of early consultation when gynaecological symptoms present, and the practitioner must regard the exclusion of cancer of the uterus as a necessity in all such cases.

CIRCULATORY OVERLOAD FROM TRANSFUSION

Now that it is so easy to obtain blood and plasma they tend to be transfused too readily. No transfusion should be given until the medical man in charge of a case is convinced that it is really necessary, and even then the risks must be borne in mind.

The dangers of whole blood and plasma transfusion fit into three main groups: first, immunological reactions; second, the risk of serum hepatitis; and, lastly, risks of circulatory embarrassment resulting from a too large or too rapid transfusion. This last hazard is common to all types of fluid administered intravenously. It can be avoided only by an accurate assessment of fluid needs, combined with a careful watch for the first signs of cardiac embarrassment during transfusion, especially a rise in peripheral venous pressure. The clinical signs of dehydration—a rising pulse rate and urine concentration, loss of skin elasticity and ocular tension, with dryness of the tongue—may be confusing at times. When there has been no haemorrhage or loss of plasma protein, the plasma specific gravity measured by the copper sulphate method[1] is a useful guide. This test is rapid and simple; for every 0.001 rise in plasma specific gravity above the normal level of 1.027 the patient may be presumed to lack 200 ml. of water. Again, blood concentration from dehydration can be assessed by determining the cell : plasma ratio with a haematocrit. This was seen to be especially useful in the late war during the treatment of burn shock, where rapid initial dehydration from exudation of protein and increased capillary permeability led to profound shock. Rapid and maintained plasma infusion to a normal and constant haematocrit value produced a steep fall in mortality.[2] When post-haemorrhagic dilution has taken place the packed cell volume will give a reasonable index for blood replacement, cells from 500 ml. of blood being required to raise the average packed cell volume 5%. Where the haemorrhage is of unknown size and there has been no time for compensatory dilution of blood, but rapid transfusion is indicated, the estimate of quantity must be made

[1] Van Slyke, D. D., *et al.*, *J. biol. Chem.*, 1950, **183**, 331.
[2] *Studies of Burns and Scalds.* M.R.C. Special Report Series. No. 249 London. 1944.
[3] *Surg. Gynec. Obstet.*, 1949, **89**, 442.
[4] Dolton, E. G., Gardner, E., and Wylie, W. D., *Lancet*, 1945, **1**, 531.
[5] *Surg. Gynec. Obstet.*, 1950, **90**, 455.
[6] Sharpey-Schafer, E. P., and Wallace, J., *British Medical Journal*, 1942, **2**, 304
[7] Sharpey-Shafer, E. P., *Lancet*, 1945, **2**, 296.
[8] Lattimer, J. K., *J. Urol.*, 1945, **54**, 312.
[9] Bull, G. M., Joekes, A. M., and Lowe, K. G., *Lancet*, 1949, **2**, 229.

by noting the improvement of blood pressure, and fall in pulse rate, with improvement in peripheral circulation. It is in these cases that a rapid transfusion is most needed but the dangers of over-transfusion are still present. For example, Pierce, Robbins, and Brunschwig[3] recently reported a method of rapid blood transfusion by means of an oxygen cylinder and flow-meter connected to the air-induction tube of the standard blood-transfusion bottle. The combined risks of excessive transfusion and air embolism,[4] even with the most careful supervision, must outweigh any possible advantages this technique might have in emergency treatment.

Three groups of cases are especially sensitive to a too rapid or too large transfusion. First, there are those subjects in whom the myocardium is not normal. Holden, Cole, and Portmann[5] stress again the dangers of overload in the atherosclerotic patient, or those with ischaemic heart disease. They point out that a rise in pulse rate and a fall in blood pressure during transfusion may not be an indication of further haemorrhage but rather of developing heart failure from overloading with fluid. Here the clue to the true position is the progressive and persistent rise in venous pressure which will precede the onset of pulmonary oedema. A transient rise in venous pressure will occur in normal subjects transfused with large quantities of fluid, but it is accompanied by little change in pulse or blood pressure.[6] In the second group typified by the severely anaemic patient, with a rapid collapsing pulse, warm pulsating extremities, high pulse pressure, and a raised venous pressure, even comparatively small transfusions may precipitate congestive cardiac failure.[7] Here very cautious transfusion of packed red cells should be given, with careful observation of venous pressure. Any further rise in the already high venous pressure should call for either the slowing or the cessation of the transfusion. If heart failure occurs, raising the head of the bed to encourage venous pooling in the legs is useful, and intravenous digitalis should be given. The third group includes those cases in which, it has recently been suggested, death from anuric or oliguric uraemia is probably due to overloading with water and to tissue oedema rather than to so-called uraemic toxaemia.[8 9] In this group it is important to restrict fluid, whether parenteral or by mouth, to a maximum 1,000 ml. more than the urine output for 24 hours. This will allow for replacement of water lost insensibly in respiration, etc., and prevent over-hydration.

ABDOMINAL ANGINA

Discussion of intra-abdominal vascular disease is usually limited to a consideration of massive mesenteric thrombosis or embolism with extensive infarction of the bowel. But there is evidence that abdominal pain or angina, comparable to cardiac angina or to claudication of the extremities, may accompany arteriosclerosis in the mesenteric vessels. It may also be possible that small infarctions of the intestine may heal without perforation if the terminal arterioles only are affected. Dunphy[1] reported that 7 out of 12 patients fatally ill with massive mesenteric thrombosis gave a history of repeated attacks of abdominal pain, previously undiagnosed, preceding the fatal attack by months or years. Cushman and his co-workers[2] described a patient who was treated for mesenteric thrombosis and died from another cause six months later. Necropsy revealed a healed infarct of the ileum. The Massachusetts General Hospital has reported the case-history of a patient subject to recurrent attacks of abdominal pain who had had two negative laparotomies and was then found to have gross arteriosclerosis of the mesenteric vessels and a fresh occlusion of the superior mesenteric artery.[3] Berman and Russo[4] have described the findings in a patient in whom abdominal pain was thought to be due to abdominal angina. This patient, a woman of 72, had had cramp-like pain for four weeks, more severe in the left side of the abdomen. For one week the pain was almost periodic, coming on two hours after eating. It was worse after large meals. The bowels were normal, and no melaena had occurred. A laparotomy was performed because of increasing pain and tenderness, and a moderate amount of serosanguineous fluid was found in the peritoneal cavity, together with numerous fine, flame-shaped haemorrhages in the mesentery of the middle part of the jejunum adjacent to the bowels. In the centre of this area there was a partially organized infarcted area (about 5 cm. in length) of the small bowel, with dimpling and contraction of the serosa. Peristaltic waves passed through this area, and it was decided to close the abdomen. Subsequently, by avoiding large meals, she had only occasional episodes of abdominal colic. Unexplained abdominal pain in the elderly is a not uncommon clinical problem, and a vascular cause should be included in the differential diagnosis. Berman and Russo consider that pain—"abdominal angina"—may arise from ischaemia associated with arteriosclerosis without infarction, but it is perhaps more probable that minor degrees of infarction are the cause of the more prominent symptoms.

COLONIAL HEALTH SERVICES

The standard of health in the colonial territories has greatly improved since the end of the war. A Command Paper[5] recently presented to Parliament by the Secretary of State contains some encouraging statistics. The health returns from Singapore, Malaya, and Hong Kong have improved each year since 1945. Singapore now claims to be the healthiest seaport in the East, with a death rate in 1949 as low as that in England and Wales, and an infant mortality of 72, compared with 130 ten years ago. In Cyprus in 1949 the death rate was one of the lowest in the world, and here the infant mortality has fallen from 180 to 70 in seven years. In the West Indies group, including Jamaica and Trinidad, the average length of life since 1921 has increased by more than fifteen years. The main cause for these improvements is the effective control of malaria, facilitated by the development of the new insecticides, particularly D.D.T., which may also prove to be hardly less effective in combating the tsetse fly. Other successes recorded are with chloramphenicol in treating scrub typhus in Malaya, the sulphone-derivatives in treating leprosy, and B.C.G. vaccine in preventing tuberculosis. The general policy of the medical administration is to push B.C.G.

[1] *Amer. J. med. Sci.*, 1936, **192**, 109.
[2] *Ann. Surg.*, 1941, **114**, 672.
[3] *New Engl. J. Med.*, 1949, **240**, 262.
[4] Ibid., 1950, **242**, 611.
[5] *The Colonial Territories (1949-50).* Cmd. 7958. London: H.M.S.O.

vaccination on the widest possible scale. In Kenya an extensive survey of the extent of tuberculosis has been completed, and progress along the same lines is being made in Northern Rhodesia and Uganda. An anti-tuberculosis campaign is proceeding vigorously in Fiji and in the Far East. Out-patient clinics have been established in the West Indies as adjuncts to sanatorium treatment.

The provision of sufficient hospital beds for the curative services remains an acute problem almost everywhere, but many hospital extensions have lately been made. In Northern Rhodesia (Broken Hill) a large hospital is nearing completion; new hospitals have been opened in the Somaliland Protectorate and in Zanzibar; plans for an ambitious scheme for the teaching hospital in Jamaica are well under way; and in many parts of the colonial territories new hospitals or special units have been set up. These territories comprise a population of 70,000,000 and an area of 2,000,000 square miles, and are highly varied geographically, economically, and culturally. The medical and health services must be adaptable, and much use is being made of mobile teams. There are mobile child-welfare clinics in Fiji and other territories, mobile health clinics in Cyprus and Malaya, and in Sarawak a system of mobile maritime dispensaries—ultimately to number fifteen—is being established. Though the medical work is so varied, the factor which militates most strongly against the development of the health services is the continuing shortage of fully qualified doctors. Recruitment of new staff during the year 1949–50 has not at any time kept pace with requirements, and at the end of the year the outstanding vacancies for medical officers totalled almost 200. Under a six-year scheme inaugurated in 1947 the Nuffield Foundation has made it possible for distinguished consultants to visit East and West Africa. Visits were paid last year by specialists in ophthalmology, paediatrics, internal medicine, venereal diseases, industrial health, and tropical medicine. All were completely successful and highly appreciated by the medical officers and Governments concerned, and it is clear that the scheme will do much to keep progress in all branches of medicine in the African colonial territories in line with modern trends in the United Kingdom.

HETRAZAN AND FILARIASIS

There is now little doubt that "hetrazan" (1-diethyl carbamyl-4-methylpiperazine hydrochloride) is to a certain extent an effective remedy against infections by filarial worms, especially *Loa loa*, the causal agent of Calabar swellings, and *Wuchereria bancrofti*, the main causative agent of filarial elephantiasis. Maldonado and his colleagues,[1] for instance, in Puerto Rico, found that in a Government-supported home for boys 31 of the 297 inmates harboured the microfilariae of *W. bancrofti*. No anti-mosquito measures of any sort were undertaken, and biting was practically unlimited; but hetrazan was given to 30 of those infected, a dose of 2 mg. per kg. body weight being administered three times a day at meal-times. At the end of a 21-day course 26 boys were free from microfilariae, and as a result of the reduction in microfilariae the incidence of infected mosquitoes, *Culex quinquefasciatus*, immediately fell very considerably. Similarly Hewitt and his colleagues[2] gave 100-mg. tablets three times a day for seven days to adults and proportionately less to children throughout the West Indian Island of St. Croix. Before treatment 15.9% of the population had been infected: a year later only 6.7% were positive, and, even when present, the numbers of microfilariae were then so low that most cases were probably not infective to mosquitoes. Although there were some minor complaints no serious reactions occurred, and in general treatment was well tolerated. The only reactions of any severity have been those reported in British Guiana, and even there they were few and far between.[3]

The mode of action of hetrazan is obscure. Although Hewitt and his colleagues[4] found that in frogs hetrazan directly affected the microfilariae of *Folyella dolichoptera*, no similar action has been seen on the microfilariae of *Litomosoides carinii* in the cotton rat. But Hawking and his colleagues[5] bring forward evidence to show that the drug acts like an opsonin, rendering the microfilariae susceptible to phagocytosis when they are present in the liver though they are less susceptible when they are in the spleen and marrow. The store of microfilariae in the pleural cavities is not destroyed, because no active phagocytic mechanism is present. *In vitro* hetrazan has no discernible effect on adult worms, but *in vivo* an intensive course of hetrazan was found to kill 9.3% of 431 adult female worms, whereas in control untreated animals only 0.76% of the worms died. Male worms of the cotton-rat filaria appear to be less susceptible than the females. Filarial worms present in the mosquito are unaffected. It seems probable that with *Loa loa* in man microfilariae also are much more susceptible than adult worms to hetrazan, though, as Stefanopoulo[6] has pointed out, adults may sometimes appear under the skin, die, and be absorbed or form small cysts.

To be effective in human beings one course of hetrazan is rarely enough; there is still need for more active compounds, and Sewell and Hawking[7] have tested no fewer than 280 compounds in cotton rats infected with the filarial worm *Litomosoides carinii*. Activity was limited to certain groups. All the antimony derivatives studied had an action on adult worms, as had 4 out of the 12 arsenicals investigated. Some activity against adult worms was found in 23 of 35 anil- and styryl-quinolines and benzthiazoles, and in two phenanthridinium salts and a cyanine dye as well. However, clinical trials in man on this type of compound have not been very encouraging.[8] In the diguanide series proguanil was the only one that was slightly active. Curiously enough, of all the substances tested only two showed any direct action on microfilariae—hetrazan and N:N:N:-trimethyl-N-diethylcarbamyl ethylene diamine. For the present, therefore, hetrazan, combining low toxicity with considerable chemotherapeutic activity, must be considered the most promising drug for the treatment of human filariasis.

[1] Maldonado, J. F., Hernández Morales, F., Vélez Herrera, F., and Thillet, C. J., *Puerto Rico J. publ. Hlth*, 1950, **25**, 291.
[2] Hewitt, R. I., White, E., Hewitt, D. B., Hardy, S. M., Wallace, W. S., and Anduze, R., *Amer. J. trop. Med.*, 1950, **30**, 443.
[3] Kenney, M., and Hewitt, R., ibid., 1949, **29**, 89.
[4] Hewitt, R. I., Kushner, S., Stewart, H. W., White, E., Wallace, W. S., and SubbaRow, Y., *J. Lab. clin. Med.*, 1947, **32**, 1314.
[5] Hawking, F., Sewell, P., and Thurston, J. P., *Brit. J. Pharmacol.*, 1950, **5**, 217.
[6] Stefanopoulo, G. J., *B.M.A. Proc. Ann. Meet.*, 1949, p. 283, London. Butterworth and Co.
[7] Sewell, P., and Hawking, F., *Brit. J. Pharmacol.*, 1950, **5**, 239.
[8] Peters, L., Bueding, E., Valk, A. D., jun., Higashi, A., and Welch, A. D., *J. Pharmacol.*, 1949, **95**, 212, 460.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

PINK DISEASE

BY

W. S. CRAIG, M.D., F.R.C.P.Ed., F.R.S.Ed.

Professor of Paediatrics and Child Health, University of Leeds

Pink disease is a clinical entity met with only in children. Most cases occur between the ages of 6 months and 3 years. The disease shows no predilection for either sex. Breast-fed infants enjoy no special immunity. There is a marked seasonal incidence, the majority of cases in this country occurring between December and April. Although statistics are not available there are grounds for believing that year-to-year variations in the incidence of pink disease are related to the severity of the winter, and that children in rural areas are more liable to develop the condition than those living in cities.

The condition is of particular importance to the family doctor because in the early days it may give rise to suspicions of one of the commoner infectious diseases, and because the exacting demands of the patient over a prolonged period inevitably disturb household routine. Treatment is dependent for success upon patience on the part of both family practitioner and parents, and upon the family doctor's ability to retain the confidence and co-operation of the mother.

The Fully Developed Clinical Picture

In its fully developed form the clinical picture of pink disease is unmistakable. The appearance of the child is one of abject misery. He is peevish and fretful, and whines unceasingly. Pathetically resigned to the misery of his own condition, he vents his irritability on others only when disturbed. He shows no response to any form of attention and is completely disconsolate. He resents approach, but is equally discontent when left to his own resources. All interest in toys is lost. Food has no attraction, no

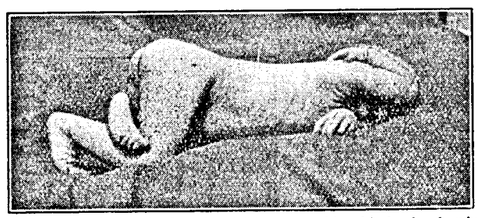


FIG. 1.—A typical attitude: the child is scratching his back, chewing his arm, and rubbing his feet together.

matter how varied or how attractively prepared. The child dislikes facing the light. Photophobia is common but may be absent, and when present it may be severe or slight. Aversion to light leads the child to turn his back to the window and to bury his head in the pillow or assume the so-called knee–elbow position. Whatever his position, he is never still, continually scratching himself, rubbing his hands and feet, or chewing his fingers (Fig. 1). If weakness keeps him recumbent he wriggles and writhes incessantly (Fig. 2). He may even pull his hair out. In its extreme form restlessness ceases only when, with fatigue added to weakness, the child falls asleep through sheer exhaustion. When this takes place sleep usually occurs during the day, the child continuing to be noisy and restless during the night.

The erythematous changes which have given rise to the name pink disease are to be looked for in the hands and feet. When dry and warm the extremities are bright pink in colour. If cold and clammy they have a bluish-red

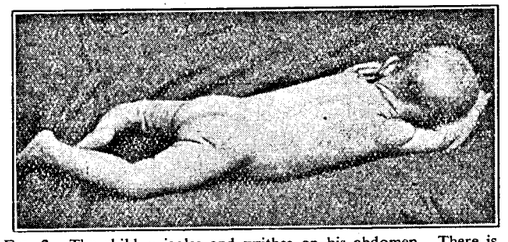


FIG. 2.—The child wriggles and writhes on his abdomen. There is an extensive erythema, wasting is severe, and the hair has fallen out.

appearance. The discoloration is most pronounced in the tips of the fingers and toes. Proximally it lessens in intensity and is scarcely perceptible above the level of the wrists and ankles. The erythema may vary from time to time in intensity and, less often, in extent. It may disappear completely, only to reappear. In addition to being discoloured the extremities are "puffy" or swollen, but there is no pitting oedema.

The skin over the affected parts has a glazed appearance and is often the site of local desquamation. Extremities showing these changes have been aptly described as looking like "raw beef" or "washerwoman's hands" (Fig. 4). Sensory changes occur and account for the local irritation evidenced by infants and for the feelings of tingling and numbness described by older children. Handling or manipulation of the extremities does not cause pain. The erythematous changes are not always confined to the hands and feet. Bright redness of the cheeks or of the nose may first attract attention, but is not met with in the



FIG. 3.—Another typical attitude in a child who has been disturbed. Peevishness, photophobia, wasting, hypotonia, and swelling of the feet are all evident. (Professor Charles McNeil's case.)

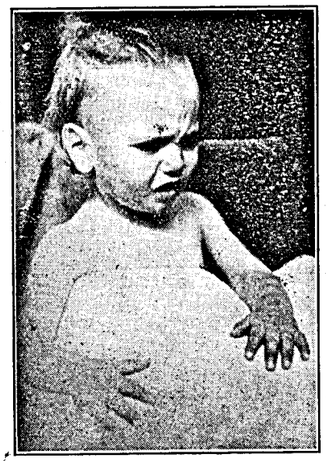


FIG. 4.—Showing the picture of abject misery, the "raw beef" hands, and pronounced photophobia. (Professor Charles McNeil's case.)

absence of changes in the hands or feet.

Excessive sweating is common and may become so profuse that the patient is literally drenched in perspiration many times daily. Persistent and profuse sweating in an afebrile child of under 3 years of age should always raise the question of pink disease. Sweating is accompanied by thirst, but by a thirst which is not commensurate with the amount of fluid lost via the skin; the former gives rise to a sudaminal rash which adds to the patient's acute discomfort. Occasionally sweating is absent. In that event the dry powdery skin covering the emaciated trunk and limbs contrasts strikingly with the sodden condition of the hands and feet.

Invariably lack of sleep, loss of appetite, unrelieved fatigue, and profuse sweating contribute to a severe loss in weight and to a state of unmistakable physical weakness. The abdomen may be scaphoid. These developments are accompanied by a generalized loss of muscle tone. The degree of hypotonia is so extreme as not to be entirely accounted for by the physical condition as a whole. Individual muscles or muscle groups lack bulk—and such bulk as they possess moulds readily in response to the gentle pressure of the bed-clothes with which they are in contact. Equally striking is the impression of a jelly-like consistence obtained by the examiner on gently palpating or handling the muscles. The tendon reflexes may be diminished or absent, but there is no muscular paralysis in the strict sense of the word.

Tachycardia is present in all cases, and is usually so pronounced that it can be confidently recognized despite the fretful reaction of these children to examination. The blood pressure is appreciably raised, but confirmation of this is not necessary for the purposes of diagnosis In an uncomplicated case the temperature is normal or slightly below normal: and there are no characteristic changes in the blood picture.

Development of the Picture

Such, then, is the clinical picture in fully developed form reached gradually over a period of several weeks. Rarely is the onset sudden. Usually it is gradual. In retrospect the earliest signs or symptoms are recognized as having been those of a mild upper respiratory catarrh. The catarrh may consist of little more than a discharging nose. There may or may not be slight fever. Not infrequently this is the only febrile phase during the entire course of an uncomplicated case of pink disease. Sometimes the catarrh tends to persist. More usually it simulates a mild coryza, disappears in less than a week, and is regarded at the time as having been a passing incident. A few days elapse, and then it is noticed that the child is not his usual self. The mother is disappointed that he has not improved according to her expectations and may even decide that "perhaps after all he has had an attack of influenza." More than anything else the child remains strangely restless: peevishness is added to restlessness, appetite is lost, and sleeplessness follows. In these circumstances any suggestion of photophobia should lead to a tentative diagnosis of pink disease even in the absence of discoloured or swollen extremities.

The more gross changes which occur in the hands and feet are preceded by the appearance of a general erythema covering limbs and trunk alike. The erythema is of a transient nature. After a varying interval of time it loses its general character and fades away over the trunk and limbs while becoming intensified in the hands and feet. When this stage has been reached there can be no mistaking the diagnosis. Symptoms may continue to worsen, but not necessarily so. Improvement can, and often does, set in without development of the complete clinical picture which has been described. In a case of average severity the clinical climax is reached in some six to eight weeks.

The Stage of Recovery

Whether signs and symptoms are of severe or moderate degree the disease runs a long course. In the mildest cases recovery takes six to eight weeks (Fig. 5). In general it

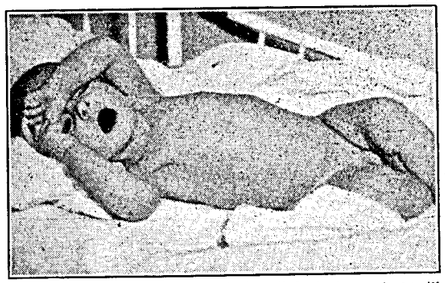


FIG. 5.—A child has passed the clinical climax but still shields his eyes from the light. Note the loose "pendulous" musculature of the limbs.

can be said that the time taken to reach the stage of clinical climax corresponds approximately to the further time required for symptoms to disappear completely. In the severest cases twelve months may elapse from the onset of the disease before symptoms finally and completely disappear. The trials of slow recovery are aggravated by the tendency for progress to be erratic and for relapses to occur.



FIG. 6.—Secondarily infected skin lesions. Wasting is severe and the extremities are swollen and discoloured.

Complications

Estimates concerning the incidence of fatal results vary from 5 to 10%. Intercurrent infections constitute the main threat to life. Of these the most serious is broncho-

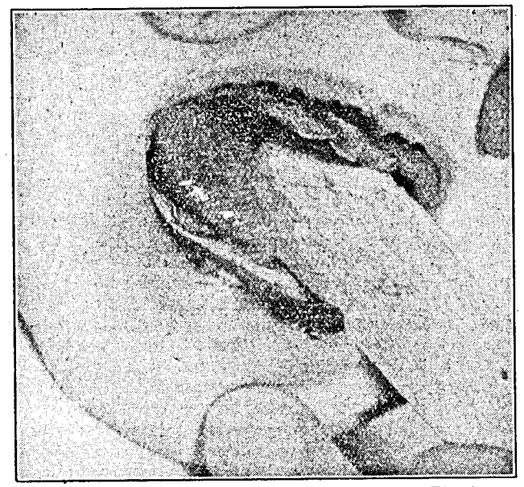


FIG. 7.—Swollen, deeply coloured, unhealthy gums. The incisor teeth subsequently fell out.

pneumonia. Exceptionally, sudden unexpected death follows acute cardiac failure. Pyelitis and otitis media may develop and the stools may become fetid. Trophic lesions are common, more especially in severely debilitated cases running a prolonged course. Rashes and other skin lesions which have become secondarily infected are slow to heal (Fig. 6).

If there is secondary infection the glands draining the affected areas become enlarged and sometimes tender. Fingers which have been rubbed or chewed are apt to become the site of resistant pulp or nail-fold infections. The hair may fall out. Frequently the gums are unhealthy in appearance, being swollen and of an unusual deep mulberry colour (Fig. 7). Gingivitis and stomatitis soon follow if measures are not taken to prevent the child biting his hands and fingers. When this occurs the teeth may fall out. Rectal prolapse is the commonest of the less serious complications. Children recovering from pink disease do so completely, except in so far as chest complications may result in varying degrees of pulmonary collapse and septic skin conditions may leave permanent scarring. Second attacks of pink disease do not occur.

Aetiology

The cause of pink disease is unknown. Allergy, endocrine dysfunction, toxicity due to arsenic and ergot, and photo-sensitivity have all been suspected in their day. Within recent years it has been suggested that mercury contained in medicinal tablets, ointments, or teething powders may be a contributory cause. This view is based on the finding of large amounts of mercury in the urine of children in whom a diagnosis of pink disease has been made and who have been given mercury in one of the forms mentioned. By no means all children excreting mercury in the urine show signs of pink disease, and it is possible that the development of the condition may be dependent in part upon individual susceptibility to mercury intoxication.

The significance of mercury as an aetiological factor must be looked upon as *sub judice*. The same may be said concerning prevailing theories that pink disease is a deficiency disease or a virus infection. Suspicions that pink disease was a form of polyneuritis stimulated trial of intensive vitamin B and liver therapy. Pioneer work along these lines gave promising results which have not been universally substantiated by subsequent clinical experience or by experimental studies. Those who favour the theory that pink disease is a virus infection are influenced by the catarrhal symptoms at the time of onset; by the liability of cases to occur in small local "crops"; and by recorded findings, at the few necropsies which have been carried out, of diffuse infiltrative lesions involving the cord and brain substance and of degenerative changes affecting the peripheral nerves.

Management and Care

The diagnosis of pink disease calls for a frank explanation of the implications. There is no specific treatment. Parents are readier to accept what is, after all, an unpalatable fact if they are at the same time told of prevailing doubts concerning aetiology. Mention of infection will prompt the question, "Is it catching?" The parents can be unhesitatingly reassured that there is little likelihood of any other member of the household contracting the condition. Recorded instances of two children in the same household suffering simultaneously from pink disease are few in number. On the other hand, it is not altogether rare for two members of a family to develop the condition at widely separated intervals—usually of years.

Inevitably the mother or father will ask concerning the desirability of hospital care. Many factors have to be taken into account in giving an answer. Whatever the ultimate decision the parents must know of their child's increased susceptibility to secondary infections and of the risks of his contracting such an infection in hospital. The mother should be told, and told with conviction, that she has it in her power to make a special contribution to the care of her child.

No matter the ideal, however, there is no escaping the practical difficulties. The mother may be too exhausted or her duties in the home may be such as to rule out any question of the child's being retained at home. Other circumstances peculiar to the home may point to the necessity for transfer of the child to hospital. So may the condition of the patient himself. The state of his skin and mucous membranes may call for more continuous nursing care than the district nurse can be expected to give; or the child may be so reluctant to take food that gavage in hospital is essential. In giving his advice the family doctor will be influenced by his knowledge of the facilities offered by whatever hospital he has in mind.

If it is decided to treat the child at home, full advantage should be taken of any home nursing service in the locality. Provided always that the suggestion appeals to her, steps should be taken to relieve the mother of some of her routine household duties by applying to the medical officer of health for the services of a home help. Alternatively, the help of an understanding relative or neighbour can be enlisted. Where arrangements of this sort are impracticable, a not altogether satisfactory compromise can sometimes be effected by temporarily admitting the child to hospital during such time as the mother gets a much-needed short rest.

For home treatment a room should, if possible, be selected which is quiet and well ventilated, which can be shaded without being completely darkened, and in which there is space for a couch or bed where the mother can rest during such time as the patient is asleep. An even room temperature in the neighbourhood of 60° F. (15.5° C.) should be maintained. Unless compelled by weakness to remain in bed the child should be allowed up for short periods once or twice daily, provided that he does not overfatigue himself and provided that he is protected from

draughts. With the disappearance of tachycardia the patient can be allowed out of doors, but must in the first instance be protected from direct sunlight, extremes of temperature, and boisterous winds.

The child should be given a warm as distinct from a hot bath morning and evening. In order to soothe and lessen skin irritation boric crystals (2 oz.—57 g.) should be added to each gallon (4.5 litres) of bath water. A preferable alternative is to bath the child in warm normal saline. Soap should not be used. Bathing must be followed by careful drying with a warm towel and by the application of pulverized fuller's earth or of a high-grade *baby* dusting powder. Calamine lotion is commonly used, but is less effective. Special attention should be paid to situations where there are opposed skin surfaces. The eyes should be bathed and the mouth rinsed with normal saline or boric lotion. Clothing must be light, and the garments next to the skin should be of cotton or silk. Frequent changes of clothing are necessary to avoid chilling while sweating persists. Cardboard splints may have to be applied to the limbs to prevent rubbing. Cotton mittens and socks are useful in protecting the hands and feet.

Feeding

Every effort must be made to ensure that the child obtains adequate nourishment despite his lack of appetite. If the mouth and gums are tender he should (depending upon his age) be fed by feeding-bottle or by a feeder to the spout of which a soft rubber tube has been attached. The use of metal spoons should be avoided as being likely to cause pain. Nourishment should be given frequently—hourly if necessary—in small amounts, and lukewarm or cold according to the child's preference. According to age, chicken jelly, coddled egg, barley jelly, fruit jelly, the cream of fresh milk, and ice-cream (from a reliable source) can be offered. With improvement of appetite in a child of over 9 months choice can be extended to include "smooth" items of semi-solid nourishment such as Benger's food, cornflour pudding, carefully prepared oat flour, egg custard, and fruit juices. At a later stage calves' liver, chicken, and rabbit (all of which should be pounded) and creamed vegetables can be gradually added. Hard or "crumbly" items of diet should not be given until the child shows a readiness to take them. At all times fluids should be allowed generously in the form of diluted milk, provided it does not prove nauseating, or of fresh fruit juices, suitably diluted and sweetened. The aim should be to establish the child on a full diet as soon as he is able to tolerate it.

Although there is no proof that pink disease is of itself a deficiency state the debilitated condition of the child with pink disease requires that an adequate vitamin intake should be assured. In a severe case it is a wise precaution daily to give cod-liver oil (in amounts corresponding to 1,500–2,000 i.u. of vitamin D), ascorbic acid (50 mg.), and one of the reliable preparations of the vitamin B complex.

Sedation

The restlessness and lack of sleep call for sedation. Chloral hydrate is the drug of choice (1–3 gr.—0.06–0.2 g.). On occasion potassium bromide (2–5 gr.—0.13–0.32 g.) is effective when chloral fails, but is apt to give rise to a bromide rash. Sometimes a combination of the two drugs gives the best results. Exceptionally, recourse to phenobarbitone for a limited period of time is necessary. Medicaments, no matter what their form, known to contain mercury should not be given; it should be remembered that teething powders are suspect in this connexion. The risk of secondary infections has been mentioned. Penicillin or sulphonamide therapy is indicated when these threaten, but is not to be regarded as an essential part of routine treatment. Atropine has been employed as a means of controlling the sweating, but the advantages are more than offset by the aggravation of thirst which results. Artificial sunlight and massage therapy are of value after symptoms of irritation and photophobia have disappeared and when the stage of convalescence is being approached. A simple bitter tonic is useful at this stage.

Ideally, the city child should be sent to the country for convalescence—preferably inland rather than to the seaside. In her own interest the mother should if possible accompany the child. Follow-up care must have as one aim the prevention of delayed respiratory complications.

I am indebted for the illustrations to Mr. W. Blackledge, Department of Photography, the University of Leeds, and to Mr. J. Hainsworth, Department of Medical Photography, St. James's Hospital, Leeds.

DISORDERED SOCIETY

BY

R. N. TRONCHIN-JAMES, M.R.C.S., L.R.C.P.

Working in an international organization for the care of refugees, in Austria, over a period of some 18 months, my attention has been drawn to interesting behaviour patterns, which, as I shall try to show later, seem to lend themselves to a more general application—that of human behaviour in the insecure and disordered world that we live in at present. After all, the refugee is the physical example of the insecurity that may overtake any of us.

The subject being complicated and controversial, only brief mention can be made of those working for or with the refugees and their motives for doing this work, and of the attitudes of the members of the occupying Power, the Austrian authorities, the voluntary agencies (mostly of various religious denominations), and members of missions sent by Governments to select candidates to emigrate to their various countries.

In the area to which I refer the organization employed an international staff of 45, comprising 12 different nationalities, to supervise the care of the refugees. A temporary organization of this type and size had not existed before, and many of the posts had no parallel elsewhere, so that the holders often had had entirely different training for doing the same job. For instance, "eligibility officers" decided whether a refugee should be accepted as a responsibility of the organization (with enormous advantages to the small proportion of stateless people who were entitled to this privilege), and "resettlement officers" gave the opportunity for and facilitated emigration. Such professions have not existed before and probably have no future to them, yet their incumbents were of overwhelming importance to the refugees.

The members of the occupying Power mostly dreamt of returning home, and anticipated fate by living a life in these alien fields as akin to that at home as possible. They were nominally all-powerful in the life of the organization and of the refugee, but—with rare, though important, exceptions—avoided contact with the problem except at the highest levels, where it could not be avoided. At times the Austrians performed their obligations to the refugees, which were considerable, only under duress.

The mission members were treated with particular respect, because it was they alone who could achieve the most important work of the organization, by selecting candidates to emigrate to their respective countries. That they also suffered from the frustrations and insecurity of modern life, even with their diplomatic passports and privileges, was nicely demonstrated when (in the middle of its work interviewing refugees) the members of the mission of a certain South American republic heard of a revolution in their country that made refugees of them also. The feelings of the candidates they had accepted for emigration, a work of course nullified by the upheaval, can be imagined.

Observations on Refugees in the Field

In dealing with a subject where so many factors come into play it is necessary to pass from the general to the particular. I shall limit myself to consideration of the non-Jewish refugees, and give a few rough statistics. Though a large number of statistics are available, I find that their value is vitiated by many factors, such as the transient nature of some of the population (a pogrom in Bucharest would produce two trainloads of Jews, who would depart just as rapidly to Israel as soon as arrangements were made) and the unevenness of the standard of data upon which the statistics were based: the figures I use are adjusted for such factors so as to have statistical value. My observations are mainly personal, though confirmed by discussions with others trained to observe and working in the same field.

Over the 18-months period some 30,000 non-Jewish refugees were in my medical charge; my work was largely administrative, with from 45 to 60 doctors and numerous ancillaries to assist me, and with a general hospital of 300 beds, a children's home, and other necessary installations. I had occasion to indulge in clinical medicine on few occasions only, such as when I discovered that the physicians at the hospital did not ask for, nor the pathologists know how to determine, the rhesus blood factor. My work went far beyond the fields of administrative medicine, because of the opportunity and co-operation of those in other branches of the organization.

The refugees referred to were ex-Allied nationals who had been deported by the Germans as slave labourers, or those who had fled for political reasons from Communist-occupied countries. About half of them lived, completely dependent on the organization, in hutted camps (or former barracks), where they received all the essentials of life free—lodging, food, fuel, medical care.

Refugee Population Under Consideration

	Oct. 1, 1948	March 31, 1950
Living in camp	12,450	6,000*
Living out of camp	11,482	4,294
Total eligible refugees ..	23,932	10,294

Resettled or repatriated during this period: 17,000 refugees.

* Including the following in special medical installations: 254, Refugee General Hospital; 105, Chronic Sick Home; 254, Old People's Homes.

The chief object of our work was, however, resettlement—that is, to encourage and facilitate emigration of the refugees to countries where they could become citizens; a few refugees also were repatriated to the countries of their origin in accordance with their wish. They consisted of nationals of all the countries of Eastern Europe, the first wave from the Baltic and Ukraine, and later from the Balkans, Czechoslovakia, and Hungary.†

†The Yugoslavs formed the biggest group, followed closely by the Hungarians. Next came the Ukrainians, then Czechs, Poles, and Russians. The Rumanians and Balts were the last considerable group.

In about the same proportion as a typical community in Europe they consisted of aristocrats and professional and working classes. I cite a few examples:

A Czechoslovak, a prosperous lawyer of middle age. His grandmother was a Jewess, and under the Nazis he was put in a concentration camp; with the Allied victory he regained possession of his practice and his house, but when Czechoslovakia acquired a Communist Government he was adjudged a "bourgeois" and dispossessed once more. He fled to Austria.

A Bulgarian peasant who owned a few acres and two cows; he was an ardent Catholic, and fled when the Communists took over his country.

An Estonian father and son, farm labourers, who were deported by the Germans in 1940 for slave labour. They got into Austria when the war came to an end, but have heard nothing from the rest of their family, who remained in Estonia. The father has an injured leg from an accident and, being 52, was not accepted by any country for emigration; the son refuses to leave without him.

A Yugoslavian coal-miner. He was a trade unionist, and, although a poor man who earned his living hewing coal, he had to flee when his brother was put into prison for his activities with the trade union.

A Hungarian count. His house was occupied as a school and his land taken away. The secret police were interested in him because he was receiving letters from abroad; he was warned that he was going to be arrested as a spy, so he fled the country.

About half the refugees fled their countries with their families, taking very little with them. The "hope that springs eternal in the human breast" did small service to refugees; hardly any of those with whom I had dealings made preparations against such an eventuality. A typical example was a friend of mine, a member of an old Czech family who had vast wealth and estates. When he fled he did not have any ready cash in the house, and the family jewels were inaccessible in a bank: he left literally in the clothes he stood up in.

These refugees lost nearly all those material things and psychic factors that give a sense of security. Not only were they no longer members of a "fatherland"; they had lost membership of their village or town community, of their social or professional group. Even if they found work they were badly paid and in a disadvantageous position in comparison with the native workers. They held most tenaciously to what they still possessed, and most important of all were any family members who had escaped with them.

A family of seven members—father and mother in their early forties, two sons, a daughter and son-in-law, with a baby—refused a most advantageous resettlement offer (where the father could work in his own profession as an engineer) because they could not take along their 82-years-old ailing grandmother. The father continues his job as luggage porter at the local station for a pittance.

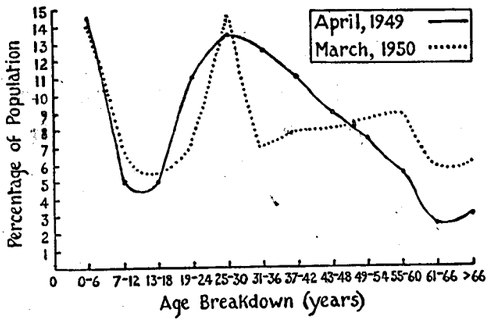
There are many such examples. So much having been given up when they fled as refugees, it was tragic to see the future of a whole young family sacrificed for the sake of one senile member. The enormous importance of this factor was overlooked administratively when setting up installations such as for vocational and rehabilitation training; it proved impossible to get the candidates to leave their families for a few months to travel a few dozen miles to enjoy the advantage of such training, which might be vital in getting them accepted by a country for resettlement. The difficulty in persuading a family to move from one pitiful room in a hut to another in a camp 10 miles away was another example of this conservatism: the room contained the few possessions they had escaped with or since acquired; they feared to change the room, feared that unimaginative bureaucracy would put their possessions

in store and not allow them to be used in their new habitation, or that they would get lost en route.

They clung also to their identity of national origin. In spite of their all being reduced to kinship at the lowest common denominator of existence—demand for security, warmth, food, and a roof—they maintained this identity. I had to be constantly on guard that the chief doctor at the hospital, a Hungarian, did not introduce his fellow-countrymen into every vacant post.

The first of the refugees were the youngest, healthiest, most active and alert. They had wasted little time in escaping from a dangerous or intolerable life, and emigrated as soon as possible to whatever country would accept them.

The age breakdown shows (non-Jewish refugees living in camps): April, 1949—out of 4,943 refugees 72.5% were under 42 years; March, 1950—out of 3,400 refugees 63% were under 42 years. The following graph gives the breakdown figures in greater detail.



The requirements of the resettlement missions varied, and often the most likely candidate was turned down without any reason being given. A healthy well-educated man of 47, whom I knew well, was rejected by 14 different missions before being accepted by the fifteenth. I discovered the reason for his rejection on one of these occasions over a glass of beer with the mission chief. The candidate was of Russian extraction, having left Russia in 1922, and the mission had secret orders not to accept any people of Russian extraction. The candidates were presented so that the country of the mission would not be accused of discrimination.* This was an extreme example, but it was most disheartening for the candidates to be presented and then rejected, and contributed to the form of neurosis which was prevalent among refugees, and which is described below.

Refugee Neurosis

On arrival in Austria the refugees were placed in camps, and all immediate responsibility was removed from them; they did not think about the future, and acquired a form of "institutional neurosis" with characteristic inertia. They had great difficulty in obtaining work and did not exert themselves to do so, mostly finding that they could not work in their own professions. This passivity and lack of initiative was encouraged by their dependent situation and loss of self-respect. The whole pattern of their social behaviour was broken down; those who had been Nazi slave labourers had not been permitted to marry, and now saw no reason for doing so, having lived with one woman, and perhaps had several children by her, over a number of years; refugees of Russian birth were legally prevented from marrying foreigners, a rule supported by Austrian law, even though they were refugees.

It is to be expected that people reduced to so extreme a condition of misfortune would lose much self-respect and dignity. There was regression to infantile emotional behaviour, squabbling, and feuding, with complete preoccupation with the present. At the hospital, where refugees worked and lived in conditions most nearly approximating to the normal of all those in our care, competent middle-aged doctors would hold secret meetings behind closed doors over some insignificant personal quarrel, jeopardizing the whole valuable work of the hospital and their own respected status. When the Hippocratic oath was recalled to their attention they behaved like children caught at the jam cupboard. Many of the doctors had had important positions in their own countries, and some had managed to escape with their motor-cars as well as their families: the chief doctor led a string quartet at the hospital. In spite of all these opportunities for normal living, however, they showed the same refusal to face the future and the same dependence as the other refugees. There was never any question of disciplinary problems; they worked extremely well and loyally, but they had as much sense of dignity as a small child. It was the job of those caring for them to goad them into activity: notices that they would have to care for themselves after a certain date, when the organization would be closing, were treated with scepticism. I cite an example:

Four months before the organization was scheduled to close, a doctor of 35, with a wife and two children, was offered a post as a doctor in an American dependency on three years' contract at $4,000 a year and his U.S. citizenship papers. It was a wonderful offer, but in spite of the persuasions of many people he delayed so long in accepting it that he nearly lost the opportunity by default. He had no reason for not accepting, nor any plan for the future. It was only by removing his present, as you might say—I dismissed him from his position in the hospital—that he was made to understand how very insecure that present was, with one small room in which his whole family lived and a pittance of a pay (less than one-tenth of what he was offered in the U.S.A.).

Once a refugee had been accepted to emigrate the conflict produced by the approaching date of departure produced a rash of physical complaints. Persons who had striven to get accepted by the mission fell and broke their legs, or their dentures were not ready by the date the transport was leaving, or they disappeared into hospital to have their varicose veins operated on. The reluctance of the older people to move was more understandable. Many of them had never travelled before: to go to a strange country, where an unknown language was spoken, far from Europe, perhaps leaving relatives behind, and (for the professional classes) to do a new and menial job, were powerful deterrents.

Acute neurosis of the kind that takes a patient to a doctor with symptoms was almost non-existent. The refugee had plenty of opportunity to go to the doctor and little else to do (there was never less than one doctor living and working in each camp per 400 population). I looked very carefully into the diagnostic criteria of the doctors but without producing evidence of these forms of neurosis.†

*Just at the time that this unfortunate man went through this experience an official poster was issued: "The organization is closing; you must make up your mind *now* whether you want to resettle. After June 30 the chance will have gone."

†I instructed the doctors to record all cases of persons going sick without a clear physical cause—e.g., back, stomach, and headache, sciatica, indigestion—and persons with a physical complaint that did not recover as quickly as could be anticipated under treatment, but still failed to get evidence of neurosis.

The incidence of psychosis in the population described was less than 0.1%. Hebephrenic schizophrenia was the predominant form.

The neurosis I describe is of an all-pervading chronic anxiety type, with suppression of volition, similar to what is seen when somebody suffers a severe shock—such as death of an important member of his family. These subjects brood on the past, barely live in the present, and give no thought to the future. The circumstances in which the refugees were placed were not conducive to the recovery, after due passage of time, that normally takes place following such a catastrophe in a mentally healthy person. These symptoms continued for years. The symptoms of neurosis met with in a normal community seem to be a luxury of civilization and an ordered society: typical hysteria—conversion symptoms without insight or hypochondriacal plaintiveness—is not seen among refugees; nor is the typical anxiety state. Nervous restlessness, dejection, apathetic lack of concentration, loss of appetite, unsatisfactory rest ("I need more sleep than usual, but awake tired, Doctor"), bad temper, etc., do not manifest themselves as symptoms. For instance, the apathy that I have described is not associated with excessive anxiety over or irritability in relation to their children or with lack of interest in them; the fathers share the mothers' work in caring for them, and this in spite of the fact that a whole family live in one small room and spend most of the day in it on top of each other—the typical father having no occupation. It is as if the father adopted what is usually considered in Europe as a passive female attitude and not a male active aggressive form of behaviour.

The refugee population was largely Slav in ethnic origin, and the Slavs are notoriously fatalistic: this I have taken into consideration, and what I describe goes far beyond this characteristic temperamental trait. It occurred as widely among refugees living outside camps as among those within, since neither group had security of status. When people are reduced to a simple struggle to survive, conversion or anxiety symptoms can achieve no object: in a totalitarian society illness is not tolerated among captives or slave labourers, so that survival often depends on not being ill—a fact of which the unconscious seems to take cognizance. That neurosis in such a community emerges when it is rewarded was borne out by findings among Jewish refugees, who occupied separate camps and whom otherwise I do not refer to. Here there was a noticeable amount of neurosis of the typical forms, which can be explained by the fact that the Jewish relief organizations were wealthy and thrust attentions on this smaller group of refugees. Symptoms produced tangible results (special food or living accommodation, a month in a mountain or spa hotel for "convalescence"). The Jewish population were also under great pressure to emigrate: the Israel Government would literally accept any Jew, without the tests which other countries demanded regarding age, health, profession, or morality, and which gave the other refugees time for adjustment or acquisition of the passive neurosis I have described. The world-wide wave of sympathy for Jews that followed their persecution, and the power, politically and over public opinion, of American Jewry, also placed them in a special category as refugees.

Conclusions

With his loss of national, civic, class, and professional identity the refugee has suffered permanent personal loss. The emotional impact of this loss is similar to that on someone in normal circumstances suffering the death of a most important member of his family. The symbolic importance of these factors on the emotional equilibrium must be stressed: in them is inherent the source of confidence, independence, self-respect, and the aggressiveness essential for making an adjustment to new circumstances in a different environment. People dealing with refugees must appreciate this, so that they can strive to replace these factors temporarily and, by understanding the refugee's loss, make him feel confident that he himself will be able to regain his status personally and permanently. This therapy cannot be carried out by people who are emotionally incapable of understanding it and either (*a*) identify themselves with the refugees in their plight, thus perpetuating their mental state by justifying it and condoning their hopelessness; or (*b*) by projection make a scapegoat of the refugee so as to give themselves a feeling of superiority, thus turning into an apparent reality what happens to be temporarily true as a result of a material situation.

Using the comparison of a refugee with a bereaved person, the psychological principles can be considered whereby refugees should be handled so as to achieve a complete recovery from the state of shock and the subsequent anxiety state that their situation has created. These principles can be divided into four stages: (1) The actively sympathetic and supportive. The friend encourages the bereaved to abreact and gives sympathy in an active manner. He insists on the bereaved staying with him and taking meals in his house. (2) The passively sympathetic. The friend allows the bereaved to abreact, but does not encourage him; he tries to divert him by unobtrusively placing opportunities of social or other activity in his way. (3) The actively encouraging. The friend will suggest to the bereaved that it is time he "cracked out of it," that it is what "she" would have wanted him to do, that he is still young or still has valuable work to do. (4) The coercive. If the therapy has not worked after going through the above stages the friend will now tell the bereaved that he is indulging himself, that he is being a bother to his friends, and that he had better do something about it or they will all be fed up with him.

Translated into terms of the refugee, the corresponding stages would be: (1) Take him into a camp; give him clothes, food, warmth, and appreciation of one's active concern for his welfare, including mental welfare (understanding and sympathy for what he has lost). (2) Divert him from his painful thoughts of the past by bringing to his attention the opportunities to resettle, to rehabilitate (medically, or to learn a trade that will be of value in a new life). Bring jobs to his attention and encourage him to work while awaiting resettlement. (3) He should be taken in hand briskly, the organization purposively replacing the lost "father figures." That this is an active need on the refugee's part was proved by his response if treated in this way: it is no good stopping at stage 2, leaving the onus of taking action on the refugee, and going straight on to stage 4 if he does not. The father figure may be stern, but he must be understanding and sympathetic; if he chastens it must be to produce results. (4) The threat of withdrawal, or actual withdrawal, of assistance from the refugee. In practice this stage was arrived at without putting stage 3 into effect, and therefore failed as a therapeutic measure, merely enabling the organization to free itself of responsibility.

Many refugees found jobs on their own initiative in the local economy, but for this reason the organization ceased to be interested in their welfare; they were merely exploited as cheap labour because of their disadvantageous position in relation to the native population. Rehabilitation and vocational training centres should be set up as a first

consideration. Life in camps and special installations should be arranged to give refugees the nearest approximation to a normal family life: every effort should be made to avoid institutional conditions, with the abnormal and dependent attitude that they imply, which perpetuate the pathological emotional state of the refugee.

Refugees have existed as long as the human race, but only recently has the human conscience evolved to the state of considering refugees a responsibility of mankind as a whole. This international organization was founded on grounds of expediency, and nothing of its scope had existed before. The work of the organization was (and is) a great physical success in caring for and resettling so many people under so many difficulties. However, that this work can be nullified if the psychological aspect does not receive full consideration is exemplified by the following press cutting from an American newspaper: "A 42-years-old refugee from Lithuania who had been over six months in New Orleans was found, having hung himself yesterday, after hearing a radio programme in which he believed he heard his name mentioned as going to be deported as a spy. Mrs. Y, his kindly sponsor, commented that she was never able to make him believe that he was in a free country."

Summary

Observations made over 18 months on a refugee population of 30,000 in Austria are recorded.

Although the population under consideration consisted of people of every age group and many nationalities, various creeds, and different professional, social, and economic status, their situation reduced them to a common plight with similar mental reactions.

The symptoms of more typical reactive or conversion neurosis were not found in this large population.

A form of neurosis widespread among the refugees is described. The symptoms are those of emotional shock persisting for years, with suppression of active and aggressive psychic qualities, lack of volition, and emotional incapacity to consider the future. There is positive resistance to change even though the present may be most insecure, uncomfortable, and completely different from the previous pattern of life.

The physical care of these refugees was good, and the physical necessity of emigrating them to new countries was dealt with energetically and with considerable success.

A primary object, when such situations have to be dealt with in the future, should be to aim at restoring the refugees to mental health as a first consideration, so that each regains the fullest vigour of his ethnic and individual capacities for dealing with the new situation and environment that he has to face. The capacity for adjustment to a new situation in which the individual is placed is a criterion of his mental health for community living. To restore to the refugee the fullest enjoyment of that capacity should therefore be a prominent aspect of the work of an organization caring for refugees, and, if successful, would enormously decrease the amount of purely supportive work that has to be done.

The Board of the Institute of Physics announces that the Institute's Certificate in Laboratory Arts will not be awarded after 1951 in view of the establishment of the Intermediate Certificate for Laboratory Technicians by the City and Guilds of London Institute. This institute has agreed that holders of the Institute of Physics Certificate shall be eligible to enter, should they so wish, the course for the Advanced Laboratory Technicians Certificate, which is to be established shortly, on the same terms as those who have passed examinations for the new Intermediate Certificate. Students who have already begun courses for the Institute of Physics Certificate will be able to complete these by 1951, after which the Institute of Physics will no longer examine in Laboratory Arts.

A MEDICAL STUDENT IN PRAGUE

BY

P. L. C. DIGGORY

President of the British Medical Students Association

Since few people can nowadays penetrate the Iron Curtain it is possible that even the personal and general impressions gained by a medical student observer to the World Student Congress, held in Prague in the second half of August, will be of interest to readers of the *Journal*. In Communist countries it appears impossible to divorce medicine from political life, and it will therefore be necessary to outline something of the Congress and of the political atmosphere prevailing before dealing with specifically medical questions.

Importance of Youth Movement

In Eastern European countries the youth movements and the student body as a whole have very much more importance than is granted to them in Great Britain. Mass youth rallies have come to form a normal part of the political life of "The Peoples' Democracies," and during the last 12 months Budapest, Sofia, East Berlin, and Prague have each been the scene of such a gathering. The recent Student Congress in Prague was the result of very extensive preparations, and must have been heavily subsidized by the Czechoslovakian State.

On arrival at Prague airport we were met by a small committee of welcome, and every student was presented with a bouquet of flowers; we were then whisked through the customs and taken by special bus direct to the Congress headquarters. *En route* we could not fail to notice the immense scale of the preparations; the streets were decorated and every shop displayed posters of welcome. Even the buses and trams carried slogans in honour of the Congress.

Giant portraits of Stalin smiled down at us from many public buildings, but it is difficult to know whether these were specially erected for the Congress or whether they now form a part of the normal street decorations.

The facilities provided for delegates in Prague were excellent. We were accommodated in large student hostels, and extremely efficient arrangements were made for the provision of food, easy travel, and free entertainment. It is typical that a whole fleet of buses had been diverted from their normal duties in the city and placed at our disposal.

During our stay we were to come to realize the privileged position of students in Czechoslovakia, all of them receiving a generous Government grant. In addition they are provided with accommodation in student hostels at extremely cheap rates. They are allowed to use workers' canteens and are able to travel on all forms of transport at greatly reduced fares. The president of the Czechoslovakian National Union of Students is *ex officio* a member of the Czech Parliament.

It will be realized that these privileges are not attained without sacrifice. To gain admission to a university in Czechoslovakia a student requires recommendations regarding his "reliability." The very fact that all students receive a grant from the State makes it possible for the Government, by withdrawing this grant at any time, to dismiss individual students. All faculties of the universities include in their curricula the compulsory study of political science: for 12 months every medical student must study this subject, and in his final examinations he sits a compulsory paper.

The whole system of education in Czechoslovakia has been remoulded since the Communists came into power. Political education is now an intrinsic part of the curriculum in even the most elementary schools. The young school-children first join the pioneer movement, which closely resembles the *Hitlerjugend*. A uniformed contingent of this organization paraded before the Congress, and a little boy of about 10 made a speech of welcome devoted largely to an attack upon the "Anglo-American imperialists." In second- and third-grade schools the Czech or Slovak languages are learned together with one foreign language. Before the war German or French was the usual foreign language selected; these have now been replaced by Russian.

The Student Congress

The Congress was the largest student gathering ever to be held, and it is perhaps not surprising that with over 1,500 students assembled in one hall informal debate was impracticable. In point of fact, most speakers used the rostrum to deliver a political diatribe rather than to address the assembled students.

Once again the amenities afforded were beyond reproach, and the simultaneous translation of all speeches into five languages and their transmission through a headphone system equalled the facilities at Lake Success.

The first indication of the trend which was to be followed in later speeches was given in the address of welcome by the Deputy Prime Minister, who bitterly attacked the Western Powers, with particular reference to American "aggression" in Korea, and who ended with a eulogy of the U.S.S.R. and of Stalin. This line was followed not only by the students themselves but also by a succession of guest speakers, including the Czech Prime Minister, several Ministers of Cabinet rank, the heads of the Churches, delegates of shopworkers and peasants, visiting scientists, and various other well-known personalities.

Many of us received our worst emotional shock when three bishops, heads of the Roman Catholic, Orthodox, and Czech national churches, made political speeches in support of the Stockholm appeal in addressing the Congress. The Orthodox bishop ended his address: "The blessing of the Almighty Lord on our great goal; long live unafraid the true fighters for peace, at the head of whom is our great Stalin."

The Congress sessions were conducted under a façade of democratic procedure, but actually the major decisions, and the very atmosphere and demonstrations, were clearly controlled by the leaders, and in particular by the Russian delegation. There were many instances of undemocratic behaviour of the Congress Praesidium, perhaps best exemplified by the fact that formal speeches had to be handed in 24 hours in advance, ostensibly to allow time for preparation of translations. Actually by this procedure not only was the secretariat able to call upon speakers in a pre-selected and carefully calculated order, but there is strong evidence that the draft speeches of certain Western delegates were made available in advance to the Communist speakers who had been chosen to reply. Occasionally even the façade of democracy broke down and the chair became openly partisan.

A significant feature of the Congress was the number of demonstrations which were directed against the Western students. Most of the demonstrations followed the same general pattern, and to understand them it must be appreciated that for the Communist students the atmosphere was one of almost religious fervour. The speaker would launch an attack on the "Anglo-American imperialists," usually followed by personal abuse of Mr. Jenkins, leader of the British delegation, and ending with either "Long Live Peace!", "Down with Imperialism!", or "Hands off Korea!" These exhortations were invariably followed by hysterical cheering and clapping, generally leading on to the newly developed technique of "rhythm-clapping," where words or syllables are accentuated by rhythmic hand-clapping. At this stage the cheering students would surge forward to the rostrum to embrace and to shower flowers upon the speaker, who would then be carried shoulder-high down the hall, usually together with the remainder of his delegation, and almost invariably paraded round and round the tables of the British delegation. It is mortifying to have to report that the British Communist students present—about 70 in all—played a leading part in these demonstrations. They presented the Korean delegation with a gift of penicillin, and delighted to carry these Korean students and their army leader round their British colleagues to the chant of "Hands off Korea!"

The demonstrations, which were to some extent symbolic, with the triumphant marching of the Eastern students around and between the tables of the isolated Western delegations, were undoubtedly a strong propaganda point, demonstrating the unity of "the students of the world" against the "imperialists." Unfortunately such demonstrations also broadened and perhaps biased the attitudes and opinions of the Western students, and hastened the splitting of the students present into two ideological groups. The Congress may not have actually increased the difficulties in the way of co-operation between students of the East and West, but it certainly made these difficulties more obvious.

Since Eastern students are prevented from travelling freely abroad it has been argued that the presence of students holding different views must have been an influence for good. Unfortunately the majority of students attending the Congress were drawn from the *élite* of Communism and were beyond the reach of argument; while the highly biased reporting in Eastern European newspapers made it impossible for the Western arguments to be heard beyond the Congress hall.

Colonial students were well represented, and, although the majority of their leaders were militant and aggressive Communists who mouthed slogans and expounded the universal panacea of Marxism, there were a number of colonial speakers whose reasoned arguments and obvious sincerity commanded respect. Delegates from Imperial countries came to realize how urgent it is that our system shall offer to colonial dependants the opportunity for a speedy rise in their living conditions and, in general, a fuller life under free democratic conditions. If we do not act quickly then these peoples will seek such benefits elsewhere. It is foolish to imagine that Russia can expand her colonial empire only by war: inactivity and neglect by colonial powers will effect the conquest far more certainly than military means.

Medicine

Any British medical student abroad is certain to be interested in the health services, and it is surprising to find that in a Communist State the national health service is as yet available only to approximately two-thirds of the population. There is no separate health tax comparable with the contributions to the National Health Insurance scheme in this country, but both the cost of health services and that of the national insurance scheme are borne by the State from funds raised by direct and indirect taxation. The organization of the service seems to be developing on

parallel lines with changes in most European countries; the importance of the general practitioner is rapidly decreasing and emphasis is being laid on the hospital and specialist services. We were told that a large number of new hospitals have been and are being built under the recent five-year plan, and in some districts experimental "health centres" have already been set up.

During our stay we were taken over two of the largest hospitals in Prague and some of us were also able to visit the International Student Sanatorium at Trebotov. In addition, it was possible to establish a more informal contact with some Czech doctors. We concluded that the hospital buildings were excellent, the main equipment—still largely German or American—very good, but that the minor equipment, such as hypodermic syringes, small surgical instruments, stethoscopes, needles, etc., was of an incredibly poor quality, probably because of the difficulty in obtaining stainless steel in Czechoslovakia. At a time when students in Britain are planning to establish special facilities for their tuberculous colleagues so that something of the university atmosphere and teaching may be available to them even while ill, it was particularly interesting to visit the International Student Sanatorium at Trebotov, where some of these aims have already been achieved. It is difficult to believe that the sanatorium is only 20 kilometres from Prague; it is surrounded by a pine and birch forest, and the atmosphere of peace and beauty suggests the very depths of the country.

The Bulovka Hospital, the largest in Prague, is situated on the outskirts of the city on a pleasant hill overlooking the River Vltava. The grounds of the hospital must be several acres in extent, as each department is housed in a separate pavilion—a scheme which adds greatly to the aesthetic value and is appreciated by convalescent patients but which introduces many problems of administration. We found, however, that the hospital was over-centralized, each department or specialty to a large measure being autonomous, with all the perils that this implies.

Both at the Bulovka Hospital and at the other large Prague hospital visited student delegates were formally welcomed by the directors, who made very many political points in their addresses of welcome. We were told that because of the happiness and security under the new regime chronic alcoholism was declining, psychiatric disorders decreasing, V.D. almost a rarity, and prostitution wiped out. We found that this political atmosphere prevailed throughout the medical profession, and after a tour of the hospitals we took part in a medical discussion, which unfortunately confirmed our fears. During discussion a French Communist student asked for an explanation of how dialectical materialism had affected Czech medicine, and it was apparent in the discussion that every single doctor of the Czech hospital staff present felt compelled to take part. In fact discussion on this point could be ended only by the intervention of the director himself.

In Czechoslovakia a doctor theoretically works only seven to eight hours a day, and when newly qualified commences with a salary of 7,000 crowns a month. In practice, because of the shortage of doctors, he works longer and is paid more. The system of promotion is peculiar, and there is "a special remuneration for industrious workers" which allows the young doctor to reach the highest salary ranges of his profession—that is, in the order of 25,000 crowns a month. To give these figures some meaning it should be mentioned that the minimum legal wage is 1,800 crowns a month, and that the average wage of a skilled worker is around 5,000 crowns a month, while a shock-worker may earn three times as much.

It was impossible in such a short visit to obtain any but the most general and personal of impressions, but we admired the close and cordial relations existing between the medical and non-medical staffs of Czech hospitals. Even the humblest laundry maid was regarded, and regarded herself, as an integral member of the hospital team and was assured that her opinions and suggestions would be welcomed at regular meetings where all the staff were represented.

General Impressions

The newspapers in Czechoslovakia are completely censored and present only one point of view, a fact which is accepted by many Czech intellectuals as an essential temporary expedient. Foreign newspapers can be imported into Czechoslovakia only under licence. These licences are very hard to obtain, and though the British delegates made application at the beginning of the Congress the *Daily Worker* was always the only paper on sale. Similarly air-mail copies of other English newspapers dispatched direct to the students in Prague failed to reach them. The bookshops stock little but the works of Marx, Lenin, and Engels, and the only English books we saw translated were certain of the works of Dickens—for example, *Oliver Twist, Bleak House.*

Apart from the censorship of the Press there are many other inroads into the liberty of the individual. Open opposition to the Government is a crime against the State, and, though three political parties are said to exist, all three are Communist and their programmes differ solely in the way in which they would achieve a fully Communist regime. If we accept that Czechoslovakia is a police State the reports of students being followed are not surprising. This was certainly true in the cases of the leaders of the British delegation. Towards the end of our visit the B.M.S.A. representative found himself being followed in the most obvious manner. This experience, though at first unpleasant, in no way interfered with one's freedom of movement and could at times be quite amusing. The worship of the U.S.S.R. and "the great father, leader, and teacher —J. V. Stalin"—is a feature of everyday life in Prague. It was strange to find that portraits of Stalin took precedence over the Czech President; the red flag over the Czech national flag. Most of the rooms in the student hostels were decorated with portraits of Stalin, similar to those invariably displayed in hospital dining-rooms and clinics. The fact that two odes were sung to Stalin at a concert given by the Russian students surprised no one but the naive British.

Among the people there is a genuine and deep desire for peace, but they are being educated to "fight for peace," and they already fear "imperialist aggression." In the event of war the ordinary citizen of Prague has been so prepared that he will certainly believe aggression to originate in the West. The fear of Fascism remains very real after the Nazi occupation. We visited Lidice, where we saw harrowing relics which keep alive the hatred of Fascism. There is no doubt that the Communist argument runs: "This is what Fascism did to us—we are the enemies of Fascism—our enemies are Fascists and will do deeds like this."

The Ministry of Health has announced revised rates of payment for health visitors, district nurses and midwives, and other nurses employed in the public health service, and also for senior nursing staff in mental hospitals. These new rates have been agreed by the Nurses and Midwives' Whitley Council, following an award made by the Industrial Court, and they are retrospective to February 1, 1949.

ANAESTHESIA IN FRANCE

The Bengué Memorial Award Lecture for 1950 was delivered by Dr. Nadia du Bouchet, head of the Anaesthetic Centre, Broussais Hospital, Paris, at the Royal Institute of Public Health and Hygiene, in London, on September 20. Mr. C. Price Thomas, F.R.C.S., was in the chair. The subject of the lecture was "Modern Anaesthesia in France and its Developments Related to Cardiac Surgery."

Dr. du Bouchet said that for a long time the science of anaesthesia had been essentially Anglo-Saxon. The interest that followed the discovery of nitrous oxide and ether had spread rapidly throughout the world but soon had died out everywhere except in England and America. In France, and elsewhere on the European continent, only a very few isolated persons, who to-day assumed the stature of pioneers, had continued to be interested in this branch of medicine. The majority of Continental surgeons considered that the administration of an anaesthetic was an act of minor importance which required no special training, and were willing to leave it to a first-year student, orderly, or a nurse. During the German occupation France lived in isolation with her old-fashioned methods.

It was not until the liberation of France that French surgeons first came in contact with the British and American surgical teams which included not only a surgeon but also an anaesthetist who was on an equal footing with the surgeon. At the same time, the most advanced French surgeons realized that certain recently developed fields of surgery would remain closed to them unless they could call upon scientifically organized anaesthetic assistance. Modern anaesthesia in France dated from this realization, and if the progress made in the past four years were considered there was every reason to be proud.

At the instigation of Professor Moulonguet a course in anaesthesia was organized at the Paris Medical Faculty, for which a diploma was granted. This course includes one year of theoretical study and two years of practice in various Paris hospitals. In Marseilles the Medical Faculty organized a similar course, at the instigation of Professor Vernejoul. Next, Dr. Kern, who was trained in England during the war, had organized an anaesthetic service which included a practical teaching centre, and Professor d'Allaines had created a similar service at the Broussais Hospital, which was now a centre for teaching anaesthetics as well as for cardiovascular surgery.

Dr. du Bouchet then described the methods of anaesthesia for thoracic surgery used at Broussais Hospital, where in the last two and a half years some 300 patients with the tetralogy of Fallot had been operated upon. In particular she reviewed the difficulties experienced in perfecting the anaesthesia for this condition, the value of the electrocardiogram during the operation, and the problems arising from the ligation of the vena cava in decompensated cardiac patients.

The W.H.O.-Unicef campaign against syphilis and yaws in Haiti has recently been described in this *Journal* (September 16, p. 668). A similar campaign against yaws in Indonesia has resulted in the examining of more than 25,000 persons and the treatment of 5,000 in the first few months of operations. Progress was reviewed in New York a short time ago by Professor Kenneth R. Hill, W.H.O. consultant for the project. Eventually the campaign sponsors hope to examine 2,500,000 to 3,000,000 children and adults in selected rural areas of Indonesia. After a two-year period in which most of the supplies will be provided by Unicef the Indonesian Government will take over the campaign. In the hot, damp climate of the rural districts visited to date an average of one out of every five persons tested had yaws. "We have found that the germ causing yaws is killed and disappears from the sores within 24 hours of treatment with penicillin," Professor Hill reported. Penicillin is cheaper and better suited to mass campaigns than the arsenic injections used in a yaws control programme conducted in Indonesia in 1935 to 1940. Although yaws will not be completely wiped out in the two-year campaign, it is expected that the disease may be cleared up entirely in ten to fifteen years if the Indonesian Government continues to control operations along the lines now followed.

Correspondence

Distinction Awards

SIR,—May I say at the outset that I was not a member of any committees set up by the regional board or board of governors to give evidence on distinction awards. As chairman of the Consultants and Specialists Committee I felt that it would be unwise to participate in these procedures. Indeed my committee, which has agreed with the principle of distinction awards, when asked to give evidence decided not to send names of individuals, but contented itself with suggestions as to the factors which should be taken into account in assessing merit.

Mr. R. S. Murley (September 23, p. 726) completely clouds the issue and does not realize that the Central Consultants Committee has spent much time in discussing the merit awards system of augmenting the basic salary of a certain proportion of consultants, which augmentation was deemed equitable both by the Spens Committee and by Parliament following the masterly survey of consultants' incomes analysed by Dr. Bradford Hill. And it must be remembered that these distinction awards are an element in remuneration. This factor influenced the Central Consultants and Specialists Committee in accepting the terms and conditions of service of hospital medical and dental staffs.

The real issue raised by Mr. Murley's letter is whether Lord Moran is right in going round the country addressing meetings of non-teaching consultants in order to elicit more information. A chairman's task is difficult. He must be able to guide his committee, but he must also have full knowledge of the problem. After reading Mr. Murley's letter I went to hear Lord Moran address two meetings in Manchester. He gave an extremely lucid and frank account of the procedure which had been adopted. He stated that his committee had received valuable evidence from the board of governors, regional boards, the Royal Colleges, and the various faculties, but that he was anxious to have further evidence from the non-teachers. He gave me the impression that he wished no stone unturned, so that when the awards were made the profession would consider that the procedure adopted had been just and equitable.

Knowing the difficulty I have had to contend with in the Central Consultants Committee, in our regional board, and the Representative Meeting owing to the decisions of the grading committees, I consider that the profession should be grateful to Lord Moran for the thoroughness with which he is performing his unenviable task. Mr. Murley could argue quite forcibly that there might be other methods of distributing these moneys, which, I repeat, are an element in remuneration. But for the moment the present method has been accepted by the consultants.

As chairman of the Central Consultants and Specialists Committee I feel it is my duty to lay these facts before you.—I am, etc.,

Manchester. R. L. NEWELL.

Psychology and Science

SIR,—Dr. F. M. R. Walshe's interesting paper on "Humanism, History, and Natural Science in Medicine" (August 12, p. 379) seems to suggest that natural science is something apart, almost holy. He gives me the impression that he regards natural science as a series of neat white Athenian temples in which old gentlemen with long white beards teach their disciples exact and absolute truth. Apart in the semi-darkness of ignorance, living perhaps in huts and having beards of less beautiful whiteness, dwell the historical scientists who, poor wretches, know the truth imperfectly and teach error, although perhaps not with intent. Amongst these outcasts is to be placed the psychiatrist with his strange theories.

Now I have tremendous respect for Dr. Walshe, but this is a thing which I cannot accept. Science is, I feel, only a collection of facts and an attempt to explain them so that we can predict what will occur in certain circumstances. Scientists try to explain these facts by various theories, and when, sooner or later, one of these theories seems to be better than the others

it is accepted and may even, if it allows us to predict enough, be dignified as a "law." In my utter ignorance it seems to me that the theories of Freud are no more fantastic than the theories of Hughlings Jackson and much less outrageous than those of the mathematicians with their talk of expanding universes and continuous creation.

It seems to me that it is as scientific for Freud to ask a patient to lie on a couch and talk without interruption so that he can examine his mind as it is for Hughlings Jackson to ask him to lie on a couch to prod his body. Moreover, psychiatry has sufficient facts to predict fairly well—as well, for example, as neurology. If a schizophrenic comes to me I can tell his relatives what are his chances of recovery just as well as Dr. Walshe can tell a man suffering from disseminated sclerosis that he cannot do much to cure him.

I beg, Sir, that we come off our high horses and realize that we are all ignoramuses trying to help our sick fellows, and whether we call ourselves this or that matters not one jot so long as we do our best for them.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

Training for General Practice

SIR,—It was to be expected that Dr. D. McI. Johnson's article of August 26 (p. 493) would call forth a spate of letters, from that of Dr. Geoffrey Evans (September 9, p. 622), who considers that Bart's "made a man of him," to that of Dr. W. A. Bellamy, with his superb old school tie and loyalty to everything good or bad. Doubtless Dr. Johnson has exaggerated, but there is much in what he writes. The object of all stages of education is to fit a person for what he has to do in life, and as by far the majority of hospital students are ultimately destined for general practice the main object of hospital training should be to turn out men with a knowledge of the things which a G.P. has to do.

It is obvious that he must have a general knowledge of medicine and surgery up to some accepted standard, but the tendency to-day seems to be to attempt to make him a little expert on an increasing number of special subjects. Much time is wasted in the exhibition of surgical procedures and medical rarities. I think it must be accepted that the newly qualified man is much more at sea in general practice than as a H.P. or H.S., and the reason for this must lie in his training. My father always maintained that no man should be allowed on a teaching staff who had not done two years as a G.P. I would suggest that much more teaching could be done in receiving-room and out-patient departments where men with this general experience would be dealing with the early stages of disease and treatment and so instil into their students that mental outlook which seems increasingly the perquisite of the good G.P.—I am, etc.,

Wanstead Park, Essex. M. C. STARK.

SIR,—My contemporary at Bart's, Dr. W. A. Bellamy, has leaped most efficiently to the defence (*Journal*, September 9, p. 622). As he says, there are things that he learnt that have been no use to him since, and I have no doubt he has learnt a lot in general practice that he was not taught at hospital. But it is a commonplace to say that the function of education is to make a man want to learn and to teach him the way to learn—not simply to pack him with a series of facts entirely based on their immediate practical value to him in everyday life.

A London medical student (*Journal*, August 26, p. 496) postulates that the first essential of qualification is the basic knowledge which is the stock-in-trade of the general practitioner, and that any further training should be additional—presumably postgraduate. However, is this basic knowledge all that is required? Should not the G.P. have a rather more general picture of medicine as a whole? He must know not only the immediate things he can do for his patient himself but also the things that might possibly be done for him by a specialist, and he must use his judgment to decide whether these things should be done in every case with a reasonable chance of benefit, having regard to the age, general condition, and circumstances generally of each individual patient.

However, I agree that a period or periods at intervals during his training should be, with great advantage to every student, spent working with an experienced G.P. Working in a general practice, with ready access to advice and help, is the only way of acquiring certain attributes in dealing with patients, their relatives, and their not entirely medical problems. It was a tremendous help to me while at Bart's to be continuously in contact with my father in general practice and to be able to some extent to correlate hospital training with the everyday work there.

With the present-day pressure of work in general practice, however, I foresee a great difficulty in getting sufficient numbers of general practitioners of the right type to give time to such periods of teaching.

To return to Bart's at the time Dr. D. McI. Johnson (*Journal*, August 26, p. 493) was so unhappy there—granting that too much time was spent in operating theatres, that some—not all by any means—set lectures were unhelpful, and that in some special departments my mind was in somewhat of a befuddled state, there was still a great deal to set on the credit side and indeed to very greatly outbalance the debit. In the first place, if practical teaching as opposed to too much theory is considered highly desirable I do not think I could be said to be unfortunate in my teachers, among whom were Sir Holburt Waring, Sir Girling Ball (who with some exaggeration used to say, "Never read a surgery book in my life, my boy"), J. B. Hume, John Hosford, Wilfred Shaw, A. C. Roxburgh, and a host of others too numerous to mention and with whom I did not perhaps come into quite such close contact. I should, however, also mention the very great deal to be learnt from a good nursing sister. I am sure that Miss Milne, Sister Henry of those days, will forgive me, if she reads these lines, for saying that there were times when my feelings towards her were homicidal but that the amount of help and knowledge she gave me was enormous. Secondly, I do not think it is possible to overrate what Dr. Geoffrey Evans (*Journal*, September 9, p. 622) has called "the tradition and atmosphere of St. Bartholomew's Hospital with its teachers, nurses, porters, and students," and I should add with its athletic clubs, students' union, and various societies and activities which, if one took the trouble to interest oneself in them, were such a source of enjoyment and inspiration. On the wall of my consulting-room opposite my desk is a photo of Sir Holburt Waring—his face is stern but there is that well-known flicker of a smile at the corner of his lips. Often in a crowded surgery when a patient has complained of some rectal symptom I have caught his eye—and have seldom been able to omit the rectal examination.—I am, etc.,

Gravesend. K. W. D. HARTLEY.

Visual Aids in Medical Teaching

SIR,—Having read the interesting and very instructive articles on medical education (*Journal*, August 26), which every young teacher should be compelled to read, it may perhaps be opportune to discuss in this connexion the subject of visual aids. The apparatus for such mechanical aids has been well described by Drs. R. Ollerenshaw and P. Hansell, but I agree with Professor Lauwerys that we have not yet learnt to use them to the best advantage. I have discussed the subject with my colleagues and find that most of them are far from enthusiastic about using such methods, and look upon a film only as an entertainment for the students. I think the idea still persists because most of the films last 20 minutes to half an hour. In my opinion, there is little if any value in such films in teaching medicine. What is really needed are short pieces of film, lasting perhaps two minutes, interspersed in a lecture to illustrate certain points. Some of these can best be illustrated by filmstrips or lantern slides. All these should also be available to the student outside the lecture hall.

In order to increase interest in such aids to teaching and to promote discussion it is hoped to arrange a joint meeting with the Royal Society of Medicine early in the New Year. It is also hoped to arrange some meetings, for film viewing, before the combined meeting takes place.—I am, etc.,

London, W.1. MALCOLM DONALDSON,
Chairman of the Medical Committee, Scientific Film Association.

Haematemesis from Leeches

SIR,—Dr. A. Cameron's interesting letter in this week's issue of the *Journal* (September 16, p. 679) prompts me to add that leeches may also cause haemoptysis. At the C.M.S. Hospital at Es Salt, some eighteen miles east of Dr. Cameron's refugee camp, quite a number of leeches have been removed from the throats of villagers and shepherds. One of the most grateful patients that I can remember was one from whom I removed a leech that was hanging in his trachea attached to the under side of a vocal cord. He had been coughing blood almost continuously for three days. One may swallow leeches or enable them to attach themselves to the pharynx either through drinking directly from the edge of a stream or through drinking stream-water from the spouts of stone water-jars into which it is difficult to see. The drinker holds the jar above his upturned face and pours the water straight into the pharynx, swallowing rhythmically the while without closing the lips.—I am, etc.,

Sheffield, 10. H. F. WEST.

Treatment of the Common Cold

SIR,—It was interesting to note in "Points from Letters" (September 9, p. 631) that I am not alone in presuming to dispute the findings and conclusions of the Medical Research Council and Lorriman and Martin trials. If we substitute "experience" for "impression" in your heading, the point at issue would be briefly summarized by "Clinical Experience versus Cold Science." Your correspondents may be unaware that as long ago as April 17, 1948, I recorded in your columns my own clinical observations and experiences over the previous two years in the use of antihistaminics in the treatment of the early stages of rhinorrhoea in acute coryza. This was followed later by the publication of the work and clinical experiences of others—Drs. Brewster, Arminio, Sweet, and Murray in America. All these published clinical experiences and results showed that it was likely that histamine activity occurred in the nasal mucosa during the early stages of acute coryza, and that if this could be controlled by adequate dosages of antihistaminics the secondary stage of muco-purulent catarrh did not occur and the condition was aborted.

The conclusions of the M.R.C. trials ask us to dismiss these clinical experiences as of no import by producing a mass of mathematical comparisons of the effects of an inadequate dosage of one antihistaminic with those of a presumed inert medication. In my view the only reliable estimation of the value of any therapeutic measure is the clinical observation of its use and adaptation over a prolonged period of time. After four and a half years of recorded personal clinical observations I can assure Colonel Crichton and Dr. Ambrose that their clinical impressions are largely in accord with my own experiences and those of other workers.

It might be trite to ask what therapeutic developments would be lost if we neglect to believe our own clinical experiences and accept "cold mathematics" in place of them.—I am, etc.,

Whitburn, Co. Durham. FRANK CORT.

Interesting Cancer Case

SIR,—The occurrence of multiple primary carcinomata has been taking up some space in the *Journal* recently. A case which has proved very interesting to me may be of interest to others of your readers.

A woman—aged 65—in 1940 had deep *x*-ray therapy for an evidently inoperable carcinoma of the right breast. When I first saw this patient in 1947 she had her entire right breast solid with an iron-hard growth. In the nipple area there was a fungating, bloody, spongy, smelling area, 3 in. in diameter, necessitating dressings every 10 or 15 minutes. The right axilla was filled with a massive growth as large as a tennis ball. Further examination revealed an obvious carcinoma in the left outer quadrant of the left breast with involvement also of the axillary glands. Furthermore, a basal cell carcinoma on the bridge of the nose was also bleeding and necessitating dressings. This seems to be an example of three primary carcinomata.

This woman is still alive as I write. She has had several three-month courses of methyl testosterone orally. Two weeks after the beginning of the first course the bloody discharge from both breast cancer and basal cell carcinoma ceased, and all three growths became increasingly reduced in size. There have been no dressings since. An intractable back pain was relieved as quickly.

I might add that a course of oestrogens, tried at the instigation of one of my colleagues, produced uterine bleeding in this post-menopausal patient.

Assuredly our ignorance of cancer is abysmal.—I am, etc.,

Wakefield, Quebec. J. H. S. GEGGIE.

Abnormalities in Developing Chickens

SIR,—Having read with very great interest the article by P. K. Duraiswami on insulin-induced skeletal abnormalities in developing chickens (*Journal*, August 12, p. 384), I would like to suggest that part of the work is repeated using fertile eggs in which the vitamin-B complex and manganese portions of the diet of the parent stock are known and standardized.

I do not doubt that his controls were adequate, but from the account given the eggs were taken from the same flock, and presumably they did not show the abnormalities mentioned. I introduce this point because in my examinations of some hundreds of "dead-in-shell" many of the conditions quoted by Mr. Duraiswami appeared quite regularly in so-called normal embryos. There can, of course, be no question of insulin-induced malformation in these cases. In practice one believes that they are linked with deficiencies of riboflavin and other members of the vitamin-B complex, and in some cases of chondrodystrophy also with manganese. The diet of the parent stock is faulty, but on other occasions it is an idiosyncrasy on the part of individual hens referable to their need for higher than normal amounts of the specific nutrients mentioned.

Mr. W. Marshall, of the Papworth Industries, has a very wide knowledge of the incidence of these embryonic abnormalities, and his paper to the Eighth World Poultry Congress should be read by all concerned, as well as the Storrs University *Bulletin* on "Hatchability and Environment."



Note how the head is tucked between the thighs, completely preventing hatching, and the position of the feet and toes.

Doubtless the whole matter is an interaction effect related to both genetic make-up and environment. In addition to the diet of the parent stock, marked fluctuations of temperatures during incubation are also known to be a major environmental factor. Presumably this is the equivalent of the "rubella" effect in pregnant women, and, if so, it shows the value of students having a knowledge of human as well as veterinary medicine where common problems are concerned.

I enclose a photograph of an abnormality of the type described.—I am, etc.,

London, E.C.4. W. P. BLOUNT.

REFERENCES

Marshall, W., *Official Report*, vol. 1, Eighth World Poultry Congress, Copenhagen, 1948.
Landauer, W., *Bulletin No.* 236, Storrs Agricultural Experiment Station, Storrs, Connecticut, 1941.

A Foreign Body in the Rectum

SIR,—Mr. J. B. Prendiville's description of a foreign body in the rectum (*Journal*, September 16, p. 680) prompts me to report a case that came under my care many years ago. The body was a torpedo-shaped piece of hard smooth wood with rounded ends, 8 in. (20 cm.) long, 1 in. (2.5 cm.) in diameter at its wider end, and somewhat smaller at the other. A hole was bored

near one end to which was fixed a cord, and, the wood being heavier than water, the apparatus was used to locate obstructions in drains. The mentality of the patient may be judged by his statement that he inserted the piece of wood into his rectum to relieve an attack of constipation: his attempt had been only too successful, but, as he had omitted to have the cord attached, the body had become irrecoverable.

On examination the wood was found lying mainly in the sigmoid colon. Its upper end could easily be felt in the region of the umbilicus, but pressure at this end only displaced it downward a centimetre or two, and its lower end could just be reached high in the rectum, and pointing downward and backwards towards the hollow of the sacrum. As perhaps over-vigorous efforts by the house-surgeon and myself to recover the body were therapeutically futile, it was decided to expose the rectum and incise it from behind. After a spinal analgesic had been given the patient was re-examined and it was then found that, owing to the resulting relaxation of the pelvic musculature, the body was delivered bi-manually without the least difficulty.

If I am confronted again with a similar case, spinal analgesia will be used unless there are the strongest contraindications. Mr. Prendiville does not mention what anaesthetic he used.—I am, etc.,

Birmingham, 15. J. W. RIDDOCH.

Poliomyelitis in General Practice

SIR,—Dr. Florence M. E. Davies (*Journal*, September 9, p. 629) would seem to suggest the random administration of penicillin, "blind," to all febrile cases, but I would suggest that the following case histories indicate the dangers of such treatment and, incidentally, probably show that the cases with which she dealt were not poliomyelitis.

During the course of two months we have seen some 15 cases which we have thought to be poliomyelitis. In only three has there been paralysis, and one patient died. Case 1 is typical of the outbreak.

Case 1.—Boy, aged 9. "Off colour" for a few days, then began to complain of headache. When first seen the child was lying very still and looked very anxious. Temperature 104° F. (40° C.), pulse 120. Marked neck rigidity, Kernig's sign doubtful. Complained of pain in the mid-thoracic region on firm flexion of the neck. Admitted to the Lincoln County Hospital. Dr. Trevor Wright, paediatrician to the hospital, informed us that lumbar puncture showed no abnormality except an increased cell count (lymphocytes, 9 per c.mm.), a finding which would tend to confirm the diagnosis of poliomyelitis. Recovery was uneventful; no paresis was noted.

Case 2.—Boy, aged 6. A similar story to the above. When first seen the child had such slight neck rigidity as to make one doubtful of its significance, but on the next day there was a left facial palsy, a very marked neck rigidity, and Kernig's sign was definite. Dr. Trevor Wright confirmed our diagnosis of acute polioencephalitis.

Cases 3–14.—One adult, the remainder children, varying in age from 6 months to 14 years. The baby, aged 6 months, was found on lumbar puncture to have a pneumococcal meningitis. One boy, aged 7, died within 24 hours of admission to hospital from an acute left ventricular failure due, probably, to involvement of the brain stem. The adult came to the surgery one day with a paresis of his calf muscles (rt.) and gave a description of the same sort of febrile illness one week previously. All other cases made an uneventful recovery with prolonged and absolute bed rest.

Case 15.—Woman, aged 29, para 3, two months pregnant. The onset was similar to those above. When first seen the patient complained particularly of the headache. There was slight neck rigidity and an indefinite Kernig's sign. The husband was told that poliomyelitis could not be excluded, but the case passed from our care at that stage for two weeks. At the end of that time one of us (J. W. G.) was again called to see her, and she was found to have a 60–75% loss of power in the right glutei, vasti, and hamstrings. She stated that she had had some forty injections, which she was told were penicillin, into the right buttock and thigh, and that she had been told that the resultant pain and the loss of power were the natural results of the injections. She was referred to Dr. J. Gibson Barrie, medical specialist at the Boston General Hospital, who agreed that she had in fact been suffering from poliomyelitis, and the appropriate therapy has brought about some regeneration.

The particular interest here, to our minds, is that the paresis should be so localized to the area of local trauma, and that it should appear after such trauma in a case so similar to the many others we saw, in the majority of whom there was no trauma and no paresis. Points which we noted in all cases were a tachycardia disproportionate to the pyrexia, the apparent anxiety of the child, and the complaint of mid-thoracic pain on flexion of the head on to the chest.

It is recognized that the evidence of one case cannot be of any real statistical significance, but it is suggested that, apart from this interesting case, sufficient evidence of the possible dangers of indiscriminate intramuscular injections in the presence of poliomyelitis epidemics has already been published, and we now feel that we should be most unwilling to give "penicillin in huge doses—early in any febrile condition."—We are, etc.,

Spilsby, Lincs. C. E. FRISKNEY.
J. W. GIBB.

Poliomyelitis: Age Incidence

SIR,—Since the publication of Dr. W. Howlett Kelleher's article on poliomyelitis in the *Journal* (September 2, p. 570) I have been conducting a preliminary survey of 152 cases of confirmed poliomyelitis admitted to the Moxley Hospital, Wednesbury, from January 1 to August 31 this year, and my findings may be of interest.

Ninety-three of the cases (60%) occurred in children under the age of 5 years, and the incidence was as follows:

Age	*Males*	*Females*
Under 1 year	3	7
1–2 years	15	17
2–3 ,,	6	6
3–4 ,,	13	12
4–5 ,,	8	6

Of the ten infants under 1 year of age only one had been breast fed. The type of paralysis occurring in these infants was as follows:

Slight residual weakness of one limb	2
Forearm paresis requiring orthopaedic treatment (one limb)	2
Leg paresis below knee requiring orthopaedic treatment (one limb)	2
Complete paralysis of both legs	1
Complete paralysis of both legs and one arm (Breast-fed male of 8 months)	1
Paralysis of all limbs and respiratory involvement	1
Fatal bulbo-spinal case (male of 11 months)	1

—I am, etc.,

Wolverhampton. C. SIMPSON SMITH.

Spread of Poliomyelitis

SIR,—Sewage sludge is being very largely used as a manure in gardens and allotments. Obtained in bulk, it contains a considerable amount of moisture and sprouts a luxuriant growth of tomato seedlings. Is it not possible that lowlier and more resistant organisms may survive and retain viability even in the dried product? Might it not be a useful precaution to prohibit distribution of sludge from an area of known infection? Alternatively, a certificate could be issued to the effect that the material had been tested for the presence of pathogenic organisms and certified as safe for use.—I am, etc.,

Woldingham, Surrey. J. O. V. JONES.

Domiciliary Treatment of Tuberculosis

SIR,—The stimulating letter of Dr. R. Crosbie Walsh (*Journal*, August 26, p. 525) and the encouraging replies of Drs. Meyer, Gray, and Chatterjee (September 9, p. 626) should not pass unnoticed by hospital boards responsible for the tuberculosis service. It appears that the facilities for in-patient diagnosis, assessment, and early treatment, so obviously enjoyed by Dr. Crosbie Walsh, are in fact better than those available to the tuberculosis officer he has so long by-passed. Unfortunately, whilst individual patients so admitted under his care doubtless have the advantage over those long awaiting a regional hospital bed, the numbers so treated make a negligible contribution to solving the tuberculosis problem as a whole and have no appreciable effect on the tuberculosis officer's waiting-list. Not until such facilities can be offered to all practitioners will the problem be solved. Chest physicians at teaching hospitals, to which he refers, also enjoy full facilities but are able to deal only with a selected few of the total number of cases, and the main responsibility for providing treatment remains with the organized tuberculosis service. This rests with the hospital boards, and they must see to it that their chest physicians and their chest clinics are equipped and staffed at least on a par with those of the teaching hospitals. Only then will the confidence and co-operation of general practitioners be secured, particularly in those areas where the ill-housed, ill-equipped, under-staffed tuberculosis dispensary is not just a memory of the past but continues as before, victim of an economic freeze.—I am, etc.,

London, S.W.2. C. FREDERICK PRICE.

Emergency Leucotomy

SIR,—I read with great interest Dr. M. O'C. Drury's report in the *Journal* of September 9 (p. 609) on the response of his patient's chest lesion following leucotomy, without bed rest or any other active treatment, and this is extremely gratifying. I think, however, that Dr. Drury's case would have been even more interesting had he mentioned that the diagnosis of pulmonary tuberculosis in this patient was confirmed by the finding of tubercle bacilli in the patient's sputum. The description of the radiological findings and the whole course of the chest disease would, in the absence of a positive sputum report, suggest a lung abscess following inhalation of food during tube feeding; but no doubt Dr. Drury will be able to enlighten us on this.—I am, etc.,

Hounslow, Middlesex. R. HELLER.

SIR,—The case report which appeared in your issue of September 9, p. 609, raises the question of selective gyrectomy—a practicable neurosurgical procedure, but too little adopted in this country. The enthusiasm with which the full prefrontal operation was received in psychiatric clinics can no longer be justified by the conclusions of closely studied cases. The variety of operations at our disposal now has a fair statistical valuation, and the method adopted should have more than a mere logical basis. In each case it should be possible to assess the type and extent of functional derangement and to correlate these facts with the known effect of gyrectomy. Our knowledge of the frontal areas in man is by no means complete, but the results of systematic experiments have shown which selected areas give the most beneficial psychiatric sequelae. Most workers agree that a transorbital approach gives a lesion that has little permanent effect in chronic psychotics. On the other hand, bilateral ablation of areas 9 and 10 (Brodmann) alone may give dramatic relief to schizophrenics and involuted groups without the entailment of a full leucotomy; in the interesting case reported of anorexia nervosa it would appear to be the operation of choice.—I am, etc.,

Leeds. P. P. NEWMAN.

Streptomycin in Foetal Blood

SIR,—Kane (1950) reports the delivery of a live infant occurring during the course of tuberculous meningitis under treatment with streptomycin in the mother. He also reports an abortion at about the 17th week. His first patient commenced treatment in the 29th week of pregnancy and was given 1.6 g. daily intramuscularly in two equal doses until after her confinement. Intrathecal injection of 100 mg. streptomycin was also given for a shorter period. Streptomycin concentrations in the mother's serum ranged from 2–4 μg. per ml. The infant apparently suffered no ill effects, and is progressing normally. Details of a similar case which I had the opportunity of observing are given below.

A woman aged 29 developed tuberculous meningitis, confirmed bacteriologically, at the 25th week of her third pregnancy. Treatment was started in the 27th week with streptomycin calcium chloride by the intramuscular route, 0.5 g. six-hourly, and intrathecally 100 mg. daily. Intramuscular dosage was reduced to 1.5 g. daily five weeks later, and ceased after a total of 60 days. Intrathecal injections were discontinued on the same day, with an interval of eight days during the course. Except for slight deafness, tinnitus, and dizziness, her condition was considered to be satisfactory, and pregnancy progressed normally.

Six weeks later she was transferred to this hospital on account of a clinical relapse, and for her confinement. She was drowsy, somewhat deaf to spoken words, and unable to hear a watch tick. On the same day streptomycin was recommenced at a dosage of 0.5 g. six-hourly intramuscularly at 6 and 12 o'clock, and 200 mg. daily intrathecally.

Labour commenced at 1.15 p.m. on the fourth day, and she was delivered of a normal infant weighing 5 lb. 6 oz. (2.4 kg.) by forceps delivery at 6.10 p.m. The placenta and membranes were expelled at 6.15 p.m. A specimen of maternal blood was taken at 6 p.m., six hours after the last intramuscular injection of streptomycin. The concentration of streptomycin in the blood was estimated by a tube method using a standard strain of *Bact. friedländeri*, and was found to be 1 unit per ml. (Dr. L. L. Griffiths). The concentration of streptomycin in the cord blood immediately after delivery was estimated by the same technique and found also to be 1 unit per ml.

The mother's subsequent progress has been stormy, with two relapses. She is left with gross deafness at all frequencies and a visual field defect, but retains unimpaired her personality and mental and physical powers.

The progress of the infant, on the other hand, has been very satisfactory. The Mantoux reaction (0.1 ml. of 1:1,000 solution) remains negative at nine months, and radiological examination of the chest normal. The child is considered normal in every way for her age. It has not been possible to carry out accurate audiometric and vestibular function tests, but she responds normally to sounds and has not the intonation of voice characteristic of severe degrees of deafness.

I am indebted to Mr. S. R. M. Bushby, of the Wellcome Research Laboratories, for help and work in an attempt to estimate the streptomycin content of the placenta.

—I am, etc.,

Farnborough, Kent. P. N. SWIFT.

REFERENCE

Kane, F. F., *British Medical Journal*, 1950, 1, 585.

Obstruction by Mango

SIR,—The article "Intestinal Obstruction Due to Food," by Mr. Neil Ward-McQuaid (*Journal*, May 13, p. 1106), and subsequent correspondence do not mention mangoes as a cause of obstruction. The following case observed by me might therefore be of interest.

An African male of about 30 years had recently acquired syphilis and a large bubo which broke down leaving a faecal fistula behind. In this condition he was admitted to hospital and an attempt was made to close the fistula surgically which was apparently successful. Three weeks after operation the patient, who had evaded supervision by frequent strolls into neighbouring villages, presented himself again, with distended abdomen, severe colicky pain, and a story of constipation for five days. On examination it was found that the fistula had reopened. No tumour could be felt. An enema had no result. Before further treatment could be given he collapsed and died. At the post-mortem examination the only significant finding was a large bolus of mango fibres impacted in the ileum near the ileo-caecal junction. The patient, having come from a famine area, had been eating mangoes, which were very plentiful at the time, almost continuously for one week.

I am grateful to the Director of Medical Services, Northern Rhodesia, for permission to publish this note.—I am, etc.,

N. Rhodesia. W. GILGES.

Modification of Boyle's Apparatus

SIR,—I read Dr. W. B. Primrose's account (September 16, p. 676) of his modification of Boyle's anaesthetic apparatus with interest, as it seems to be an inexpensive method of converting existing apparatus. However, he does not touch upon one of the main reasons for the design of special absorption units, which is that the basal oxygen flow was found not to vaporize sufficient ether to induce and maintain anaesthesia. The special absorption units incorporate ether vaporizers of special design, and so located that all the gases breathed by the patient pass through them once, as in the Coxeter–Mushin absorber, or twice, as in the M.I.E. absorber, each time they

complete a circuit of the apparatus. Apparently Dr. Primrose has not found it necessary to modify his apparatus to this end, and it would be interesting to know whether in fact he finds it suitable for ether anaesthesia; if so, it would seem a completely satisfactory substitute for the more expensive absorber units.—I am, etc.,

Winchester. D. ZUCK.

Cauterizing the Cervix

SIR,—Dr. Jean R. W. Ross has done well to draw attention (September 16, p. 647) once more to the importance of chronic cervicitis as a cause of gynaecological symptoms, particularly low backache, lower abdominal pain, especially in the right and left iliac fossa, frequency of micturition, and sterility. I have been cauterizing the cervix for this condition since 1929 and though I have not analysed my case records I feel sure that my results are comparable to hers in so far as the relief of these and other symptoms is concerned. The technique that I use differs somewhat from hers in a few respects. Thus I always begin the radial cauterization of the internal os—quite easy in the out-patient department—and without dilating the canal or using an anaesthetic. This is, I think, necessary, as in most cases there is an endocervicitis as well as the visible "erosion." I have long since ceased to order vaginal douches, as I feel that given by the patient herself they are as likely to introduce sepsis as to prevent it. I never get the patient back before ten weeks, as up to that time the cauterized area is still partly covered by granulation tissue. If then there is any unhealed area I recauterize it. Finally, before cauterizing it is well to touch the portio vaginalis and the cervical canal with pure "dettol" on a swab. Although I must have personally cauterized many hundreds of cases, including in every case the cervical canal, I have never met with one in which occlusion of the canal or of the external os occurred as the result of it, nor have I ever known it to cause dystocia.—I am, etc.,

Watford Heath. F. J. BROWNE.

Appeal for Bacteria

SIR,—I should be grateful if through the courtesy of your columns we could make an appeal for strains of *Pseudomonas aeruginosa*. We have carried out with some measure of success some work with a view to producing type-specific bacteriophages capable of lysing *P. aeruginosa*. We have, however, been able to deal only with strains obtained from the West of Scotland, and we should like, if possible, to get strains from other parts of the country. Any cultures sent to Professor J. P. Todd at the address below will be gratefully acknowledged and, if desired, the results of our findings communicated to the centre. Cultures should be accompanied with a note giving details of source and date of isolation.—We are, etc.,

Royal Technical College, George Street, Glasgow, C.1. JAMES P. TODD. CHARLES S. TERRY.

POINTS FROM LETTERS

A Plea for Better Understanding

Dr. C. E. BROWN (Whalley, Lancs) writes: With the present uncertain state of affairs pandemic throughout the world, and indeed with a war proceeding at the moment in Korea . . . some words should be said in an effort to understand and treat, with more comprehension than hitherto, that type of war casualty, the so-called "battle exhaustion" case, or, as he was more usually called, the "bomb-happy" case. Very often these men are shy, self-effacing, kindly, and sentimental; they have a greater depth of imaginative faculties, and because of this they feel pain both of the body as well as of the mind much more acutely than their fellow men. They are not psychopathic, nor do they suffer from endocrinological aberrations. These men are often misunderstood from the beginning, and because of their final failure to stand up to their extra burden become outcasts and are ostracized. . . . (They) need more careful initial examination when joining the Services, and should be assigned to more specific and suitable employment in their branch of the Service than has been done before in the last two wars.

Obituary

E. BOSDIN LEECH, M.D., F.R.C.P.

Dr. E. Bosdin Leech, consulting physician to the Manchester Royal Infirmary, died in Manchester on September 19, aged 75.

Ernest Bosdin Leech was the son of Sir Bosdin Leech, one-time Lord Mayor of Manchester and one of the promoters of the Manchester Ship Canal, and the nephew of David John Leech, the first professor of pharmacology at Manchester University. He was educated at Cheltenham College, Christ's College, Cambridge, and Manchester University. Qualifying in 1901, he graduated M.B., B.Chir. in 1903, and proceeded M.D. in 1907. After holding posts as house-physician, house-surgeon, medical registrar, director of the clinical laboratory, and resident medical officer at Manchester Infirmary he was elected to the honorary medical staff. He was a most enthusiastic teacher in the Manchester medical school. For many years he served on the cancer research committee in Manchester and on the board of the Chester Hospital. In another sphere of useful work he was a Home Office medical referee for industrial diseases. He took the M.R.C.P. examination in 1905 and became a Fellow in 1919. In the first world war he served with the R.A.M.C. in France, Mesopotamia, Southern India, and Belgium. For some 40 years Leech was one of the most active members of the Manchester Medical Society, working hard in its administration and building up its library, which is one of the best medical libraries in the country. He was elected president of the society in the 1934–5 session, the centenary year of its existence. This was an honour that pleased him all the more since his uncle had been president in its jubilee year 50 years before. His presidential address was entitled "Picturesque Episodes of Manchester Medical History." This was later published with many interesting illustrations. Leech presented to the society his own extensive and valuable collection of books about Manchester medical history and by Manchester medical men. Many of these books had come from the library of Dr. John Hull, the first president of the society. In 1938 he gave the Lloyd Roberts Memorial Lecture, entitled "Early Medicine and Quacks in Manchester." Besides being a great expert on local medical history Leech was also a keen antiquarian, being for many years a member of the Manchester Ancient Monuments and Lancashire Parish Register Societies. He was awarded the honorary degree of M.A. by Manchester University in 1937.

T. H. O. writes: With the passing of Bosdin Leech his colleagues and many generations of Manchester students mourn the loss of one who, above all else, commanded their affectionate respect. Brilliance was not his, nor did he make any pretensions to possess it, for in him sincerity was fundamental; but much knowledge and ability was devoted unsparingly to his hospital and medical school. Kindly and sympathetic, success brought no undue elation nor disappointment rancour, for he was incapable either of a mean action or an ungenerous word. His hospital has been fortunate in having been able to command the loyalty of so devoted a servant, and his friends will retain a memory of a good physician and a great gentleman.

Dr. CHARLES EDWIN PURSLOW, consulting obstetrical and gynaecological surgeon to the Birmingham United Hospitals, died in Birmingham on September 20 in his ninetieth year. He studied medicine at Birmingham University and graduated M.B.

(London) with first-class honours at the age of 23 in 1884. He proceeded M.D. two years later and took the M.R.C.P. examination in 1894. His main interest in medicine was in obstetrics, and after holding several house appointments he became honorary obstetric officer to the Queen's Hospital, Birmingham, in 1889. He was a lecturer in his subject at the University of Birmingham, and was an excellent teacher. A member of the B.M.A. for many years, he represented the Birmingham Division at meetings in London in 1915 and 1916.

Professor Hilda N. Lloyd writes: By the passing of "Charlie" Purslow, Birmingham has lost one of the "fathers" of medicine who has been an outstanding figure in the medical life of the city for the past 60 years. He served with devotion and loyalty until after the first world war the Birmingham hospitals and the expectant mothers who attended his out-patient clinics. The students who trained under him number hundreds, and several generations of them owe their knowledge and understanding of obstetrics to him. Purslow's image is particularly vivid in the memories of many of his students because he often was the medium through which they were introduced to surgery, since he operated on Saturday, the day when the preliminary classes were given. To watch his cheery rubicund face and figure operating—perhaps to produce a caesarean baby like a rabbit from a hat—was a memory that never faded. His sense of humour and equable temperament served him well in his dealings with his enormous following of patients. On the maternity district associated with the old Queen's Hospital his name was one to conjure with. Everyone knew and loved him, both patients and midwives, as well as the numerous progeny at whose birth he had presided. His surgery, though not spectacular, was sound; perhaps his asepsis to modern eyes would seem a little lacking, but his results were excellent. A great Victorian has passed, and with him a generation of great practitioners has now been closed. Men of his type were the salt of the earth, intensely individual and full of initiative and self-reliance. Purslow had few hobbies, but he was very fond of boating and sailing. He leaves behind a fragrant memory of work well done and a life well lived.

Dr. MARY BUCHAN DOUIE died on September 15 at the age of 89. She was the youngest daughter of the late Rev. D. Buchan Douie, of Largs, and she was educated at Edinburgh University and the London School of Medicine for Women. She graduated M.A. (Edinburgh) in 1893 and M.B. (London) in 1897. Almost immediately after qualification she became secretary of the London School of Medicine for Women, but she had to resign from this post in 1908 owing to ill-health.

S. T. W. writes: Dr. Douie's years at the London School of Medicine for Women were years of great activity, since, owing to continued large entries, the first rebuilding of the school was still in process at the time of her appointment. She showed a real knowledge of the school and its needs, bringing to bear on the problems which arose her own experience as a medical woman and the thoughtful energy which was one of her characteristics. During her last year she helped considerably the doctors who were trying to obtain the opening of the Royal Colleges to women, and it was a great satisfaction to her that their efforts were successful. After a complete recovery from her illness Dr. Douie took up active work again. She first helped Dr. Brodie, the professor of physiology in the University of Toronto, and on her return to England lectured for the L.C.C. and various societies. She had great mental and physical energy. Her wide knowledge of literature and her many journeys abroad, both on the Continent and in India, made her a most delightful and interesting companion. Although she has outlived most of her colleagues she will be missed by many of the younger generation and by her many friends.

Dr. WILLIAM HENRY WALKER MEWHIRTER died at his home in Belfast on August 14 at the age of 80. Born in Ballymena, County Antrim, he received his early education locally, and studied medicine at Queen's College, Belfast, graduating M.B., B.Ch. in 1898. He held the appointment of dispensary medical officer at Toome, County Antrim, from 1902 to 1919. During the 1914–18 war he served as a captain in the R.A.M.C., and from 1919 to 1937 was senior medical officer to the Ministry of Pensions at Birmingham, Blackpool, and Liverpool. Dr. Mewhirter served in the Merchant Navy as a medical officer from 1938, and continued serving in this capacity until his ship was torpedoed in the Indian Ocean in 1943. He then had to retire. In spite of increasing physical disability he retained his interest in professional matters. It was a measure of his kindliness and unselfishness that almost his last effort at speech was to inquire after the welfare of a neighbour: in this was epitomized a lifelong habit of outlook, devotion to duty, and courage of no mean order. His remaining contemporaries and colleagues will remember him with affection. Dr. Mewhirter was connected with the Masonic Order for more than 50 years. He is survived by his widow and two sons, to whom the sympathies of his friends are extended.—H. B. S.

Dr. H. MURRAY AGNEW, for nearly 30 years assistant school medical officer for Berkshire, died in Reading on August 30. He was the son of the late Dr. Samuel Agnew, of Lurgan, Northern Ireland, and he was educated at Lurgan College, the Royal Academical Institute, and Queen's College, Belfast. He qualified in 1904. During the first world war he served as a captain in the R.A.M.C. in France and Belgium. For his voluntary services to the civilian population during a serious epidemic in France he was awarded by the French President the Médaille de l'Assistance Publique. After demobilization he took the D.P.H.(Oxon), and in 1920 he was appointed assistant school medical officer by the Berkshire County Council.

W. R. H. writes: Many of his old colleagues will have learned with regret of the death of Dr. H. Murray Agnew, whose career in the school medical service, which began in 1920, was to last nearly to the end of his life. At that time in rural areas conditions were most discouraging, and a child's chances of overcoming physical handicaps depended very largely on the extent to which the individual school medical officer was willing to exert himself unofficially on his or her behalf. Agnew showed a truly missionary zeal in this direction, and the trust and appreciation of countless parents was his reward. A man of great kindness of heart, he never allowed the official aspect of his work to overshadow the human approach. His visits to rural schools were looked forward to by parents and teachers—and even by the children themselves—for he had a singularly disarming and genial way with them. He did not seek promotion: perhaps he realized that his ideals of service could best be achieved by continuing to devote himself to the work which he carried out with such a remarkable degree of faithfulness and skill. He really loved his work and had the satisfaction before he retired of seeing some of those whom he had known as children bringing their own children before him. His name will long be remembered with gratitude in many of the Berkshire villages which were the scene of his sustained and ungrudging labours.

Mr. FREDERICK CROOKS, for many years senior surgeon at the Nottingham General Hospital, died at Nottingham on August 31 at the age of 63. Mr. Crooks was born in County Derry, Northern Ireland, and educated at Cookstown High School and Queen's College, Belfast, where he gained many scholastic distinctions, graduating M.B., B.Ch. in 1911. He was appointed house-surgeon at the Nottingham General Hospital in 1911, and became resident surgical officer a year later. In 1914 he obtained the degree of Master of Surgery of Queen's University. Mr. Crooks served as a surgical specialist in the first world war, and upon his demobilization obtained his Fellowship of the Royal College of Surgeons of Edinburgh. In 1920 he was appointed honorary assistant surgeon to the Nottingham Children's Hospital, and a few years later became honorary surgeon, an appointment which he held until 1945, when he was appointed consulting surgeon to the hospital. In 1923 he was elected honorary assistant surgeon to the Nottingham General Hospital, where he devoted himself to establishing and developing an orthopaedic and accident department. Later he was appointed honorary surgeon to the hospital and surgeon

in charge of the accident and orthopaedic department. Other surgical appointments which he held were at the Nottingham City Hospital, the Chesterfield Royal Hospital, and the Berry Hill Rehabilitation Centre, Mansfield. During the second world war he was consulting orthopaedic surgeon to the Emergency Medical Service. Mr. Crooks had been treasurer, secretary, and president (for seven years) of the Nottingham Medico-Chirurgical Society. He was a fellow of the British Orthopaedic Association and president of the Nottingham Branch of the British Medical Association in 1948–9. Besides being a member of the orthopaedic advisory committee of the Sheffield Regional Hospital Board he was also a member of the No. 1 Hospital Management Committee, Nottingham. Mr. Crooks had a serious illness in 1945 from which he never completely recovered. Notwithstanding this his devotion to his work and patients never wavered, and he was actively engaged in his professional work until a few hours before his death. He was a brilliant surgeon who combined speed and dexterity greatly to the benefit of his patients. The excellence of the present orthopaedic and accident department of the Nottingham General Hospital is a tribute to his organizing ability and hard work, and the department will be a lasting memorial to him. The naming of the operating theatre at the Nottingham Children's Hospital—"The Frederick Crooks Theatre"—gave him great happiness. He was able to imbue his colleagues with his own enthusiasm, and no house-surgeon ever asked for help without receiving it in the kindest way. His foresight and wisdom in committee work were outstanding and his opinions were always valued highly. He married in 1920. It was always a pleasure to visit him and his wife, for their home was one of the happiest. Mr. Crooks will long be remembered with affection and admiration by his colleagues as well as by his numerous friends and patients. Their sympathy will be extended to his widow in her sudden bereavement.—J. S.

Mr. NORMAN STUART CARRUTHERS, surgeon-in-charge of the ear, nose, and throat department of the Norfolk and Norwich Hospital, died at Wymondham on September 12 at the age of 63. He studied medicine at Guy's Hospital and qualified in 1911. After holding a resident appointment as house-surgeon at Guy's he became senior clinical assistant at the Metropolitan Ear, Nose, and Throat Hospital, and surgical registrar at the Golden Square Throat Hospital. He obtained the Fellowship of the Royal College of Surgeons of Edinburgh in 1919 and the D.L.O. in 1924. For a short time he was in general practice in Acle, Norfolk, but in 1928 he became ear, nose, and throat surgeon at the Norfolk and Norwich and the Jenny Lind Hospitals in Norwich. He held these appointments until the time of his death. He was also aural surgeon and laryngologist to the City Isolation Hospital, Mundesley and Kelling Sanatoria, the Norfolk County Council, and the East Anglian School for Blind and Deaf Children. He published a number of papers on subjects connected with his specialty in this *Journal*. A keen member of the British Medical Association, Mr. Carruthers was at one time honorary secretary and later chairman of the East Norfolk Division.

Universities and Colleges

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY

The autumn term of the Institute of Obstetrics and Gynaecology (Chelsea Hospital for Women, Queen Charlotte's Maternity Hospital, and the Department of Obstetrics and Gynaecology at the Post-graduate Medical School) begins on October 2 and ends on November 25. General practitioners wishing further experience in obstetrics may attend on the practice of Queen Charlotte's Hospital for two or four weeks. They will be allowed to do normal deliveries and attend special lectures at all three hospitals of the Institute. An intensive course, suitable for those preparing for the M.D. and M.R.C.O.G. examinations, is being held from November 27 to December 9. Application forms and full details of fees may be obtained from the Secretary, the Institute of Obstetrics and Gynaecology, Chelsea Hospital for Women, Dovehouse Street, London, S.W.3.

No. 36

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 9.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	24	—	9	3	1	38	2	12	4	1
Deaths		—	—				—	2		
Diphtheria	44	6	16	1	3	66	9	21	—	4
Deaths	—	—	—	—	—	—	—	—	—	—
Dysentery	205	11	95		1	59	5	92	—	3
Deaths		—			—				—	—
Encephalitis, acute	8	1	—		—	2	—	2	—	—
Deaths		—		—						
Erysipelas			21	4	4			33	5	5
Deaths							—			
Infective enteritis or diarrhoea under 2 years				18	12				139	
Deaths	18		4	1	1	31	3	9	7	5
Measles*	2,530	162	96	71	32	875	66	43	22	43
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	32	3	9		—	38	2	5	—	—
Deaths										
Paratyphoid fever	11	1	1 (B)		—	20	—	1 (B)	4 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	192	10	2		3	205	9	5	—	1
Deaths (from influenza)‡	6	1	—	—	—	—	—	—	—	—
Pneumonia, primary	112	9	117	¶ 4	6	99	12	109	5 6	4
Deaths										
Poliomyelitis, acute	513	35	76	2	14	306	31	7	—	4
Deaths§	13	1		—		16	1			
Puerperal fever			8				—	5		
Deaths										
Puerperal pyrexia‖	54	5	15	2	1	103	8	1	—	3
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	658	58	127	46	45	729	66	137	88	69
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	2	—	—	—	3	—	4	5	—
Deaths	1	1	—		—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,682	280	311	98	31	1,228	60	62	87	71
Deaths	6	1	—	1	—	7	—	—	—	1
Deaths (0–1 year)	204	23	33	14	6	221	27	37	29	10
Deaths (excluding stillbirths)	3,962	589	507	130	89	3,862	597	496	149	103
Annual death rate (per 1,000 persons living)			10·2					9·9	9·2	
Live births	6,836	1104	780	409	203	7,208	1223	832	409	190
Annual rate per 1,000 persons living			15·7					16·7	25·3	
Stillbirths	175	20	27			173	19	29		
Rate per 1,000 total births (including stillborn)			33					34		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending September 16 were: paralytic, 291 (327); non-paralytic, 187 (186); total, 478 (513). The figures for the previous week are shown in parentheses. The total decrease compared with the preceding week was 35, all but one of which represented paralytic cases. Non-paralytic cases in the week under review comprised 39.1% of the total. The uncorrected notifications for the corresponding week in 1947, 1948, and 1949 were 614, 74, and 342 respectively.

The counties showing the most significant decrease in the incidence of cases were the West Riding of Yorkshire, Warwick, and Stafford, with 16, 10, and 10 fewer cases respectively. Material increases were notified in Worcester (12) and Dorset (6). No county area has been free of infection during the six weeks up to and including that ending September 16. But only one case has been notified in Anglesey and in Cambridge; there have been only two cases in the Isle of Ely and in Radnor.

The total number of notifications for 1950 up to and including the week under review is 5,604. The corresponding figures for 1947, 1948, and 1949 were 5,598, 1,288, and 2,989.

Discussion of Table

In *England and Wales* a decrease occurred in the number of notifications of measles 883, scarlet fever 57, and acute pneumonia 43; an increase was recorded for dysentery 49 and acute poliomyelitis 22.

A fall in the incidence of measles was general throughout the country, the largest falls being in Yorkshire West Riding 131 and Lancashire 118. Only small variations occurred in the local trends of scarlet fever; the largest was an increase of 16 in London. The chief feature of the returns of diphtheria was a fall of 12 in Lancashire. The largest fluctuations in the trends of whooping-cough were decreases in Yorkshire West Riding 81 and London 45, and an increase of 52 in Warwickshire. Dysentery was most prevalent in Leicestershire (all cases in Leicester C.B. 53); Lancashire 44 (Droylsden U.D. 18); Yorkshire West Riding 35 (Bradford C.B. 12); London 11; and Durham 11.

The largest returns of acute poliomyelitis were from Staffordshire 40 (Wolverhampton C.B. 15, West Bromwich C.B. 4, Brierley Hill U.D. 4); Yorkshire West Riding 40 (Sheffield C.B. 10, Leeds C.B. 8); Lancashire 37 (Liverpool C.B. 15, Manchester C.B. 7); London 35 (distributed over 22 boroughs); Warwickshire 35 (Birmingham C.B. 19, Coventry C.B. 6); Gloucestershire 29 (Bristol C.B. 20); Essex 22 (Ilford M.B. 5); Middlesex 21 (Harrow U.D. 6, Ealing M.B. 5); Durham 21 (Sunderland C.B. 4); Kent 19 (Sevenoaks R.D. 5); Devonshire 16; Lincolnshire 15; Glamorganshire 14 (Pontardawe R.D. 4); Northumberland 13 (Newcastle-upon-Tyne C.B. 7); Surrey 12 (Egham U.D. 4); Southampton 12 (Bournemouth C.B. 6); and Leicestershire 11 (Leicester C.B. 6).

In *Scotland* a decrease was reported in the number of notifications of whooping-cough 88 and dysentery 12, and an increase was recorded for measles 36 and scarlet fever 19. Twenty-one more cases of scarlet fever were notified in the western area than in the preceding week. Nine further cases were reported from the outbreak of dysentery in Stirling county, where 36 cases were notified in the previous week. The other main centres of dysentery were Glasgow 49, Edinburgh 14, and Dundee 10. The notifications of acute poliomyelitis were 4 fewer than in the preceding week, but in the western area a rise of 4 occurred. The largest returns for acute poliomyelitis were from Glasgow 15, Fife county 8, Dundee 6, Lanark county 5, Dunbarton county 4, and Paisley 4.

In *Eire* an increase of 21 in the number of notifications of measles was the only variation of any size in the trends of infectious diseases.

In *Northern Ireland* a small general increase in the notifications of scarlet fever resulted in a rise of 14 in the total notifications. The notifications of acute poliomyelitis declined by 4, the largest returns being from Down county 6 and Antrim county 4.

Week Ending September 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 750, whooping-cough 3,086, diphtheria 37, measles 2,494, acute pneumonia 218, acute poliomyelitis 478, dysentery 215, paratyphoid fever 11, and typhoid fever 8.

Medical News

Medical Research Council Travelling Awards

The Medical Research Council announces that it has made the following travelling awards for the academic year 1950–1: *Rockefeller Travelling Fellowships in Medicine.*—Dr. R. I. S. Bayliss, Senior Medical Registrar, Postgraduate Medical School of London; Dr. R. V. Coxon, Betty Brookes Fellow, Department of Biochemistry, Oxford University; Dr. J. E. French, University Demonstrator, Division of Laboratories, and Registrar, Department of Morbid Anatomy, Radcliffe Infirmary, Oxford; Mr. J. A. Key, First Assistant, Department of Surgery, University of Durham, and Professorial Surgical Clinic, Royal Victoria Infirmary, Newcastle-upon-Tyne; Dr. R. A. Shooter, Assistant Bacteriologist, St. Bartholomew's Hospital, and Lecturer in Bacteriology, St. Bartholomew's Hospital Medical College, London; Dr. E. A. Wright, Junior Lecturer in Pathology, Guy's Hospital Medical School, London. *Dorothy Temple Cross Research Travelling Fellowship in Tuberculosis.*—Mr. A. M. Macarthur, Registrar, Thoracic Unit, Postgraduate Medical School of London. *Alexander Pigott Wernher Memorial Trust Travelling Awards in Ophthalmology and Otology.*—(*a*) *Travelling Fellowship in Ophthalmology,* Dr. R. K. MacDonald, University of Toronto, Canada; (*b*) *Travelling Grants in Ophthalmology,* Dr. V. K. Chitnis, Grant Medical College, Bombay, Mr. F. J. Damato, Malta, Dr. Ruby Joseph, India; (*c*) *Travelling Grants in Otology,* Dr. R. A. Cooper, Sir Jamsetjee Jeejeebhoy Hospital, Bombay, Mr. M. S. Harrison, Surgeon, Ear, Nose, and Throat Departments, Lincoln, Grimsby, Boston, and Scunthorpe Hospitals, Dr. J. D. Hood, Otological Research Unit, National Hospital, Queen Square, London, Mr. G. H. Livingstone, Ear, Nose, and Throat Surgeon, United Oxford Hospitals. *Travelling Scholarships in Medical Science (tenable in France under an exchange scheme with the Centre Nationale de la Recherche Scientifique).* Dr. D. G. F. Harriman, Neurological Registrar, Royal Victoria Hospital, Belfast, and Department of Pathology, Queen's University, Belfast; Mr. S. D. Wainwright, Division of Bacterial Chemistry, National Institute for Medical Research, London.

New Diploma in Tropical Medicine and Hygiene

The London School of Hygiene and Tropical Medicine is to hold a course, open to a limited number of students, for the newly established diploma in tropical medicine and hygiene of the University of London, to cover the academic year starting October, 1951. The preliminary course will consist of about four months' basic instruction, followed by an examination for the certificate; the second part, open only to those with at least twelve months' experience of medical practice in a tropical country, will also last for about four months, and lead up to the university's final examination for the diploma in tropical medicine and hygiene. In the second part of the course the student must elect to study tropical hygiene, or clinical tropical medicine, or medical biology. Inquiries should be addressed to the Dean, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, who can supply copies of the regulations.

Wills

Dr. Francis Vincent Denne, of Torquay, left £13,985; Surgeon Captain Alfred Woollcombe, R.N. (ret.), of Okehampton, £10,754; Dr. James Carslaw, of Bearsden, £16,974; Dr. Henry William Beach, of Weymouth, £29,934; Lieutenant-Colonel Ferdinand Simeon Le Quesne, V.C., R.A.M.C. (ret.), of Bristol, formerly of Jersey, £59,431; Dr. Reginald Treacher Bowden, of Boscombe, £48,693.

COMING EVENTS

Institute of Dermatology

The Institute of Dermatology (British Postgraduate Medical Federation, University of London) has arranged a series of lectures for the winter session 1950–1 to be given at the institute, St. John's Hospital for Diseases of the Skin, Lisle Street, Leicester Square, London, W.C., from October 3 to March 27, 1951, at 5 p.m. Fees for the lectures are £3 3s. per month, £15 15s. for six months. Registered medical students may attend on signing their names and giving the name of their hospital. Further particulars may be obtained from the dean. Details will be published in the *Journal* week by week under "Societies and Lectures."

Charing Cross Hospital Medical School

The inaugural address at the opening of the 1950–1 session of the Charing Cross Hospital Medical School will be delivered by Dr. Gordon M. Holmes, F.R.S., in the council room of the hospital on Thursday, October 5, at 4 p.m.

Welsh National School of Medicine

The opening sessional address of the Welsh National School of Medicine will be given on Thursday, October 5, by Professor A. D. Macdonald, Leech Professor of Pharmacology in the University of Manchester.

Institute of Child Psychology

The Institute of Child Psychology will hold a dinner at the Holborn Restaurant, London, W.C., on Wednesday, October 11, at 7.30 for 8 p.m. Dr. Margaret Lowenfeld will speak on her visit to the U.S.A. and on the future work and plans of the Institute.

Royal Army Medical College

The Royal Army Medical College has arranged a series of evening lectures to be delivered in the Lecture Theatre of the college (entrance in John Islip Street, London, S.W.) on Thursdays, October 12 and 26, November 9 and 23, January 11, 1951, and February 8, 1951, at 5 p.m. The programme will cover professional subjects of interest to both Service and civilian doctors, and will be open to all medical practitioners without fee. Details will be published in the *Journal* week by week under "Societies and Lectures."

Medical Librarianship

A course of five lectures on the literature and librarianship of medicine will be given by W. J. Bishop, F.L.A., Librarian, Wellcome Historical Medical Library, at the North-Western Polytechnic, Prince of Wales Road, London, N.W.5, on Fridays, October 13 and 27, November 10 and 24, December 8, at 7 p.m. The fee for the whole course is 6s.

Guild of Hospital Librarians

The Guild of Hospital Librarians has arranged a conference on "The Physical Care of Books, Including the Spread of Infection by Books," to be held at Chaucer House, Malet Place, London, W.C., on Wednesday, October 18, at 5.30 p.m. Members and others interested are invited to attend. The conference fee is 2s. 6d., and applications should be sent to the honorary secretary, the Guild of Hospital Librarians, c/o Library Association, Malet Place, London, W.C.1.

Public Health Lectures

A series of popular lectures on subjects relating to the public health will be delivered at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W., on Wednesdays, October 18 and 25, and November 1, 8, 15, 22, and 29, at 3.30 p.m. Admission is free, without ticket. Details will be published in the *Journal* week by week under "Societies and Lectures."

SOCIETIES AND LECTURES

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

Monday

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—October 2, 5.30 p.m., "*Retinal Vasculitis*," by Mr. R. C. Davenport.

Tuesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 3, 5 p.m., "*The History of Dermatology*," by Dr. R. M. B. MacKenna.

Wednesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 4, 5 p.m., "*X-ray Technique*," by Dr. C. W. McKenny.

LONDON COUNTY MEDICAL SOCIETY.—At Royal Free Hospital (North-western Branch), Lawn Road, Hampstead, N.W., October 4, 3 p.m. Clinical meeting.

PHYSICAL SOCIETY: COLOUR GROUP.—At Imperial College, Imperial Institute Road, London, S.W., October 4, 3.30 p.m., 54th science meeting. Papers: "*The Dependence of Anomaloscope Matching on Field Size*," by Messrs. R. G. Horner and E. T. Purslow; "*Some Aspects of Colour Adaptation in the Central Fovea*," by Dr. E. N. Willmer.

Thursday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 5, 5 p.m., "*Physio- and Electro-therapy*," by Dr. R. T. Brain.

Friday

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—October 6, 5.30 p.m., "*The Placental Implant and Other Recent Therapeutic Measures*," by Mr. G. Mackie.

ROYAL SANITARY INSTITUTE.—At Central Library, Grimshaw Street, Burnley, October 6, 10.15 a.m., papers: "*Some Notes Relating to Ice Cream*," by Mr. F. Shuttleworth; "*Some Aspects of the Supervision of Food Supplies*," by Mr. J. King Shaw, M.R.C.V.S. Afternoon: visits will be made.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY, London, E., October 6. 8.30 p.m., "*Urology, Past, Present, and Future*," by Mr. A. Clifford Morson.

Saturday

BRITISH ASSOCIATION OF ALLERGISTS.—At Preliminary Training School, York County Hospital, October 7, 11 a.m., "*Allergy in Rheumatism*," by Dr. H. F. West; 11.30 a.m., discussion; 11.50 a.m., "*X-ray Appearances in Asthma*," by Dr. H. Royle; 12.20 p.m., discussion; 2.15 p.m., "*The Human Bronchus, a New Test in Experimental Physiology*," by Dr. L. M. Rosa; 2.30 p.m., "*Asthma Treatments Old and New*," by Dr. C. A. Clarke; 3 p.m., discussion; 3.20 p.m., "*The Role of Allergy in Dermatitis*," by Dr. H. R. Vickers; 3.50 p.m., discussion.

APPOINTMENTS

CLARK, D. H., M.A., M.B., M.R.C.P.Ed., D.P.M., Registrar, Maudsley Hospital, London, S.E.

MCWILLIAMS, LIONEL FRANCIS, *M.C.*, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, Bath.

MATTHEW, HENRY J. S., M.B., Ch.B., F.R.C.P.Ed., Assistant Physician (Consultant status), Royal Infirmary, Edinburgh.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bogdanovitch.—On September 22, 1950, to Mhairi (née Irvine), wife of Dr. Andrew Bogdanovitch, a son.

Hirst.—On September 9, 1950, at Leeds, to Dr. Stella Armitage (formerly Speight), wife of Dr. John Hirst, a son.

Portch.—On September 11 1950, at The Grange, Woolavington, near Bridgwater, to Thelma (formerly Morris, S.R.N.), wife of Dr. G. G. Portch, a son—Stephen Ralph.

Sweetnam.—On September 6, 1950, at Ryde, Isle of Wight, to Elizabeth, wife of Dr. M. T. Sweetnam, a daughter—Angela Catharine.

Williams.—On September 18, 1950, at Southsea, to Rosalind, wife of Bernard Williams, F.R.C.S., a daughter.

MARRIAGES

Hunter—Wynne Griffith.—On September 1, 1950, in Anglesey, Dr. H. Dugmore Hunter, to Elizabeth Grace Wynne Griffith.

Macdonald—Findlay.—On September 14, 1950, at Vancouver, British Columbia, Canada, Donald Macdonald, M.B., Ch.B., Ochil Hills Hospital, Kinrossshire, to Jean Cunningham Findlay.

DEATHS

Derham.—On September 14, 1950, at 9, Albert Road, Bexhill, Thomas Hanson Crossfield Derham, M.B., C.M., late of Preston, Lancs, aged 76.

Doule.—On September 15, 1950, Mary Buchan Douie, M.B., of Hampstead, London, N.W., aged 89.

Elliott.—On September 18, 1950, in London, Patricia Ruth Elliott, M.B.E., M.B., B.S., of St. Andrew's Orthopaedic Hospital, Singapore, aged 63.

Fielding.—On September 15, 1950, Saville James Fielding, M.B., B.S., of 68, Bethel Street, Norwich, aged 69.

Any Questions?

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

Muscular Spasm in Paraplegics

Q.—*How should severe muscle cramps in a paraplegic be treated?*

A.—Muscular spasm in a patient with paraplegia is an intractable symptom which causes much distress. Flexion movements are the most common, and, as these are excited reflexly, contact between the limbs and the bedclothes should be reduced as much as possible by means of a "cradle." Sedatives such as phenobarbitone may diminish the frequency and severity of the spasm. Recently curare has been used for this purpose, but reports on its efficacy are divided. Clarke and Hotston (*British Medical Journal*, 1948, **1**, 289) used "tubarine" (oily) in doses of 20 to 40 mg. intramuscularly once daily. One patient was much improved when this was prescribed with quinine sulphate 10 gr. (0.65 g.) three times a day by mouth; this combination might be worth further trial. The experiences of Kuhn, R. A., and Bickers, D. S. (*New Engl. J. Med.*, 1948, **238**, 615), were less encouraging.

Liver-function Tests in Infancy

Q.—*Could you let me know which liver-function tests are of value in the first two years of life, and for which particular types of lesion the individual tests are indicated? Where can I find some up-to-date information on this matter?*

A.—Liver-function tests in infancy are affected by both technical and physiological factors not present in adults. Thus, repeated bleedings are usually contraindicated, accurate urine collections may be difficult, and bile pigment metabolism is altered by the different nature of the bacterial flora of the intestine; this means that in the first few weeks of life bilirubin rather than stercobilin may be the principal faecal pigment and no urobilinogen may be formed. The proper dosage of drugs for tolerance tests is somewhat uncertain, and the normal limits for tests such as the serum alkaline phosphatase are difficult to define.

The most practical tests are probably the serum bilirubin, serum proteins, flocculation tests, urine tests for bilirubin and urobilinogen, and stool tests for the same two pigments. In the newborn the umbilical vein may be utilized for the bromsulphthalein test (see Mollison, P. L., and Cutbush, M., *Arch. Dis. Childh.*, 1949, **24**, 7). Such tests have been mainly used so far in the study of hepatitis, neonatal haemolysis, and in the demonstration of liver damage in conditions such as burns and familial hepatolenticular degeneration. Some further information may be obtained from Behrendt, H., *Diagnostic Tests for Infants and Children*, 1949, Interscience Publishers, New York.

Ephedrine and the Bladder

Q.—*An elderly male patient with mild bronchial asthma responds favourably to ephedrine in doses of ½ gr. (32 mg.) t.d.s. However, he complains that this causes difficulty in micturition, which he does not experience when not taking the drug. Is it possible in this case to combine the ephedrine with a parasympathomimetic drug which will correct the effect on the bladder without interfering with the action of ephedrine on the bronchial musculature? Is this effect on micturition usual, and how is it brought about?*

A.—It is quite common for ephedrine to produce vesical retention or frequency of micturition, as its sympathomimetic effect may increase the tone of the bladder or its sphincter. It is sometimes used with success for this purpose in nocturnal enuresis in children, though its undesirable effects on the bladder are most commonly observed in elderly men. The combination of a parasympathomimetic drug with ephedrine would antagonize the latter's beneficial action in asthma and would probably produce additional unpleasant side-effects. It would be better to try the effect of theophylline with ethylenediamine (aminophylline) in doses of 1½ to 3 gr. (97 to 194 mg.), which is often effective in mild bronchial spasm in the elderly without causing difficulty in micturition. Alternatively the patient could be taught to use an inhaler containing 1 in 100 adrenaline solution. It may seem paradoxical that both sympathomimetic drugs and parasympathomimetic drugs may increase bladder tone, but the innervation of the bladder is highly complex (too complex to describe adequately here) and it receives both motor and inhibitory fibres from both the parasympathetic and sympathetic systems.

Punch-drunkenness

Q.—*Is punch-drunkenness in boxers a real syndrome, and, if so, can it be considered as an occupational risk?*

A.—Punch-drunkenness, or, as it is sometimes called in the United States, "slug-happiness," is a real syndrome. Its pathological basis is thought to be multiple small traumatic haemorrhages or multiple areas of damaged nerve cells throughout the brain, resulting from repeated blunt head-injuries in boxers. The symptoms are usually of insidious onset, and occur especially in professional boxers who do not reach championship class and in order to make a living take part in a large number of fights, in many of which they receive considerable punishment. Loss of quickness on the feet and slowing up of the mental processes are early symptoms, and of course these result in the victims receiving even more punishment in the ring if, as often happens, for financial reasons they continue fighting. As the condition develops, muscle incoordination, tremor, extrapyramidal rigidity, ataxia, dysarthria and dementia gradually make their appearance. The clinical picture in an advanced case is one of extrapyramidal and cerebellar dysfunction combined with mental impairment.

Splenomegaly in Thrombocytopenic Purpura

Q.—*Is the spleen enlarged in thrombocytopenic purpura? Does an enlarged spleen contraindicate this diagnosis?*

A.—Palpable enlargement of the spleen occurs in about one-third of patients with primary or idiopathic thrombocytopenic purpura; it is never of notable degree. If the spleen extends more than 2 in. below the ribs, the thrombocytopenia is probably of secondary origin. Diseases, such as leukaemia, in which there is infiltration of the bone-marrow often present the combination of splenomegaly and thrombocytopenic purpura. Many varieties of splenic enlargement, unassociated with bone-marrow invasion, may be accompanied by thrombocytopenia which has been attributed to an inhibitory action of the spleen on platelet formation; this is the rule in congestive splenomegaly, and has been recorded in Hodgkin's disease, Boeck's sarcoid, kala-azar, and other forms of splenic tumour.

The Risk of Serious Congenital Malformations

Q.—*In your reply to the question about the inheritance of spina bifida (July 8, p. 122) you referred to "the one-in-forty chance that any random pregnancy will end in a serious malformation of one kind or another." What is the basis for this estimate?*

A.—In discussing with prospective parents the risk that their children may suffer from a particular hereditary abnormality it is useful to quote a figure for the chance that any random pregnancy may end in a serious malformation. The parents will then have a basis for comparison with the risk in their particular case. Without qualifications such a figure cannot be exact, as one would have to specify whether live births only are meant or whether stillbirths are included; there is actually no reason why late abortions should not be included also if data are available. Even with explanations and qualifications there must be differences of opinion about what constitutes a severe malformation; this accounts for a good deal of discrepancy in the published figures.

Malpas (1937) found 294 serious malformations in a series of 13,964 births, or one in 47. Laidtman (1948) found 73 in 3,593, or one in 49. Murphy (1947) estimated that 0.5% of live-born children and 3% of those stillborn are malformed.

Javert and Stander (1943) on the basis of 27.000 births give the high figure of just 3%, but some of the malformations included were of a relatively minor character. As pointed out by Carter (1950), however, it is possible that most series based on births in hospitals give too high a figure if, as is usual, emergency admissions are not separated from the booked cases. Taking the evidence as a whole, the figure of one in forty is probably too high if what constitutes a serious abnormality is fairly strictly interpreted and if it includes only those cases in which the malformation is apparent at birth. If, however, one includes also such errors of development, abiotrophies, and constitutional abnormalities as are manifested early in life it seems a reasonable estimate and an appropriate one to quote to parents.

REFERENCES
Carter, C. O., 1950. Data in course of publication. Personal communication.
Javert, C. T., and Stander, H. J., *Surg. Gynec. Obstet.*, 1943, **76**, 115.
Landman, B., *Arch. Dis. Childh.*, 1948, **23**, 237.
Malpas, P., *J. Obstet. Gynaec. Brit. Emp.*, 1937, **44**, 434.
Murphy, D. P., *Congenital Malformations*, 1947, 2nd ed. Philadelphia.

Sensitization to Bee-stings

Q.—*A lady has kept bees for over ten years, and has been stung many times with little effect. Two days ago, however, after a sting on the arm, she developed an itching rash within minutes of the sting, apparently of an urticarial nature, her tongue swelled, and she had slight difficulty in breathing. A capsule of "benadryl" eased matters, and a day later she had only a swelling of the arm and forearm. I am wondering what will happen if she gets another sting, as the question of continuing bee-keeping depends on this.*

A.—The writer's experience is that bee-keepers are enthusiasts and often are not easily amenable to reason. We, as medical men, can but advise, and the advice in this case is: no further bee-keeping if the person wishes to be certain of avoiding further generalized reactions. It is agreed that occasionally a sensitized person may be stung and have but little reaction, but the chances are so very much against this possibility that the risk cannot be advised. It is also a possibility that the next sting may be followed by a more severe reaction, and it would seem but common sense to avoid endangering life.

Sinus Tachycardia and Neurosis

Q.—*An intelligent active professional man, aged 34, with severe neurotic traits, experiences attacks of palpitation which are provoked by emotional strain and by slight exertion or excitement after eating a meal. The palpitation is in the nature of a sinus tachycardia, developing gradually and ending gradually; it occasionally reaches 150 per minute and may last eight hours, provoking apprehension and sometimes nausea and faintness. Past history and clinical and electrocardiographic examination are negative. Reassurance and phenobarbitone have no effect. Can you suggest a drug which could be taken a short time before any of the provoking circumstances mentioned above are encountered?*

A.—There is no drug which will prevent attacks of sinus tachycardia in psychoneurotic subjects, other than sedatives, and these are relatively impotent, as in the present case. The patient has two alternatives. Either he may learn to tolerate his symptoms, knowing that they are innocent and cannot harm him, or he should see a psychiatrist and obtain direct treatment for his psychoneurosis. The latter is advised in view of the severity of his symptoms.

Horseshoe Kidney

Q.—*What is the treatment for horseshoe kidney? I have a patient with this condition, and he suffers from periodical attacks of renal colic which are increasing in frequency.*

A.—In the condition of horseshoe kidney the ureters usually pass anterior to the isthmus, and it is not uncommon to find a dilatation of the ureters above this level and, still more so, a dilatation of the renal pelves. The exact connexion of the two conditions is not always easy to explain, but in some cases at any rate there is good reason to assume that there is mechanical obstruction owing to the relationship of the ureters to the isthmus, and therefore an operation is sometimes performed for the division of the isthmus. When operating upon a horseshoe kidney for the calculi which are sometimes associated with the condition the opportunity may be taken of dividing the isthmus in the hope of encouraging better drainage from the kidneys.

In the case described by your correspondent it would seem that such an operation is indicated and that relief from pain should result. Before making a final decision, however, it will be desirable to examine all the radiographs which have been taken—presumably some of them are excretion urograms—and probably to carry out bilateral ascending pyelography to get more precise information about the renal anatomy. If urography shows that the kidneys are not obstructed, then it will be very doubtful if benefit would result from the operation of dividing the isthmus.

Sulphur and Rheumatoid Arthritis

Q.—*How does sulphur act in early cases of rheumatoid arthritis?*

A.—The suggestion that sulphur is of value in rheumatoid arthritis is based on tenuous clinical impressions and not on scientific observations. Its use is only sanctified by tradition, and there is no factual evidence of its efficacy or of the mechanism by which it is alleged to act.

Faecal Fats in Pancreatic Disease and Sprue

Q.—*I understand that lipolytic enzymes are secreted by the intestine as well as the pancreas. Is there any point, therefore, in determining split and unsplit fat in faeces in the investigation of a case of suspected pancreatic disease? What are the modern views on the value of split and unsplit fat determinations in cases of the sprue syndrome? In fat-balance tests in suspected sprue, is there any risk to the patient in giving a diet containing 50 g. fat per day?*

A.—Lipolytic enzymes occur in intestinal bacteria as well as in the succus entericus. In cases of pancreatic disease, with complete absence of pancreatic enzymes on duodenal intubation, there may therefore be normal splitting of faecal fat.[1] Differential analysis of faecal fats into split and unsplit fractions is of such limited value that its discontinuance seems reasonable. For the differential diagnosis of pancreatic disease and the sprue syndrome intraduodenal intubation is preferred.[2] Fifty grammes of fat may safely be used for balance tests in suspected cases of sprue. In general, sprue patients tolerate this amount of fat well, provided that fats containing a high proportion of long-chain saturated fatty acids are avoided.

REFERENCES
[1] Cooke, W. T., Elkes, J. J., Frazer, A. C., Parkes, J., Peeney, A. L. P., Sammons, H. G., and Thomas, G., *Quart. J. Med.*, 1946, n.s., **15**, 141.
[2] Frazer, A. C., French, J. M., Sammons, H. G., Thomas, G., and Thompson, M. D., *Brit. J. Nutrit.*, 1949, **3**, 358, 363.

NOTES AND COMMENTS

Substitutes for Morphine.—Dr. R. H. FREEDMAN (Glasgow) writes: I find that the tendency to vomit after a morphine injection ("Any Questions?" September 23, p. 737) may be lessened or prevented by dissolving the morphine tablet in an ampoule of "coramine" (1.7 ml.) rather than in sterile water.

Correction.—In the section of the educational number (August 26, p. 520) containing information about the special diplomas in the various branches of medicine we omitted to mention that the Royal Medico-Psychological Association has recently instituted a Diploma in Psychological Medicine, the first examination for which was held in November, 1949.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aetiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 7 1950

CHILD HEALTH AND THE FUTURE*

BY

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

Nuffield Professor of Child Health, University of London; Physician, the Hospital for Sick Children, Great Ormond Street

I am deeply conscious of the honour conferred on me by the Trustees of the Dawson Williams Memorial Fund last year in recommending me as worthy of a prize for work for child health. I am particularly happy to be able to try in this lecture to discharge a debt to the forerunner whose name we honour. He was a noted paediatrician at the turn of the century, a member of the medical staff of the East London Hospital for Children at Shadwell who gave up his hospital work and practice to join the staff of the *British Medical Journal*, one of the few successful consultants ever to have devoted himself entirely to journalism. Dawson Williams gave me my first assignment (I believe that is the word) in medical journalism—an annotation on a book about medical missions, somewhere about 1923. I have been privileged to follow humbly in his career both as a paediatrician and in a part-time capacity in medical journalism.

When history is being made it is not always obvious to those taking part. At the present time and for some years past the improvement in infant and child health has been very remarkable, and yet the implications of this in the child-health services are not yet fully appreciated. Since much of what follows is in a critical mood it is necessary to state at the outset that those of us in academic posts in child health have a very definite responsibility in this matter, and in criticizing local authorities or central authorities in the health field we are including ourselves in our capacity as advisers or even participators in various aspects of the subject. Secondly, criticism will so far as possible have here its constructive side. It is proposed first to look at the infant-welfare scheme and next at the school health services. In each case the present arrangements will be scrutinized with special reference to what should be the objects of preventive paediatrics to-day—in other words, what are the diseases and disorders of children which call for preventive measures.

Infant-welfare Centres

To what extent does the average infant-welfare centre to-day differ from the milk depots of Budin in Paris of the last century or the earliest centres for distribution of milk and advice that were started in the north-western corner of England at the turn of the century? Milk is still distributed, with dried milk taking the place of milk in bottles. Vitamin preparations and certain infant foods are also distributed. Health visitors attend for weighing the babies and generally interpreting the advice of the medical officers who examine the infants periodically, advise on child care generally with special reference to diet, and deal to a varying degree with minor ailments. This service is correlated to an extent which varies in quality and quantity in different areas with home visiting by the health visitors. Immunization against diphtheria or vaccination against smallpox may be carried out in some centres either at the routine visits or at special sessions. Some medical officers do not approve of these services being mixed up with routine centre work, and yet they seem to me to be an essential part of preventive medicine. The compromise solution is, of course, to have special immunizing sessions.

To sum up, the infant-welfare centre began and has largely continued as part of a campaign to reduce deaths in infancy from digestive disorders. Indirectly the scheme has served to play a part in reducing the deficiency disorders. General advice on child care appears to vary very much in quality and in the energy with which it is given. It is unfortunately easy to get stale in this type of work, and it is perhaps a fair comment that in recent years the most valuable contributions to the management of breast-feeding, for example, have come, not as might have been expected from members of the infant-welfare service, but from "outsiders" such as Dr. Harold Waller and Dr. Charlotte Naish. This is a criticism not of individuals so much as of the way the service has somehow failed to produce opportunities for advances in knowledge. Indeed, with the well-known decline in breast-feeding it is pertinent to ask whether or not the infant-welfare service is everywhere pressing for natural feeding with full enthusiasm. I have heard a prominent medical officer of health state in public that he thought the merits of breast-feeding were greatly exaggerated. In quite recent times a medical practitioner, having carried out certain published investigations in breast-feeding, failed to secure appointment by a local authority for child-welfare work and was told that the lay members of the appropriate committee thought that she must be very narrow-minded and would expect all mothers to feed their babies. They considered that breast-feeding was an imposition on any woman now that the Government provided national dried milk. An infant-welfare service that is not whole-heartedly in favour of breast-feeding cannot surely be regarded as fulfilling its proper task in the community.

Yet by a paradox which is well recognized and not easy to explain a decline in breast-feeding has been accompanied by a sensational drop in the infant-mortality figures. For 1949 we are told that the provisional infant-mortality

*Dawson Williams Prize Lecture, delivered at the Annual Meeting of the British Medical Association, 1950.

rate is only 32 per 1,000 live births. Deaths certified as from gastro-enteritis in 1948 for the eleven months of the first year of life excluding the neonatal period were only a little over 2,000 for England and Wales, about half of the corresponding figure for 1947 and less than half of the total deaths in the same period in the same age group certified as due to bronchitis and pneumonia. Indeed, to-day after the newborn period it is acute respiratory disorders rather than digestive disorders which present the major difficulties. The preventive service has to a large extent won its fight against the scourge of infective diarrhoea as a national problem, although this is no excuse for allowing breast-feeding to decline still further or for slackening every effort to prevent outbreaks on a smaller scale in institutions. The newer antibiotics and a better understanding of the clinical management of the infant with the "diarrhoea and vomiting" syndrome may lower the death rate even further.

Need for Co-operation

Despite this remarkable improvement there are still gaps in the service, and this is particularly seen in the early weeks. There is not enough co-operation between the hospital, the general practitioner, and the child-welfare service in relation to the discharge of the newborn baby from hospital, and this is especially serious in reference to premature babies. The Biological and Medical Committee appointed by the Royal Commission on Population (1950) had something to say about this:

> "A serious defect in the maternity services is that women are often discharged from hospital on the ninth or tenth day before they have been taught how to handle their babies. Sometimes hospital almoners try to arrange for health visitors to supply the needed instruction, but this cannot always be managed, and the health visitor may not call for several weeks. Among women confined at home there is also frequently a gap between the time when the midwife ceases to come and the health visitor makes her first call, though during this period many women start taking their babies to infant-welfare centres and in this way receive continuing care and advice."

But it is the minority who receive this "continuing care and advice," and it ought to be the rule rather than the exception. A good slogan should be, "The health visitor on the doorstep to greet the mother on her arrival home." With a little organization between the ward sisters, the almoner, and the appropriate superintendent health visitor this can be achieved, and is achieved by some maternity hospitals and units. It might even go further and give the health visitor the chance to visit the hospital and see the mother before discharge. Continuity of feeding is important, especially if the baby is artificially fed, and maternity hospitals and units should see that their choice of dried milks, for example, and methods of feeding correlate closely with those available in the infant-welfare centres of the area to which mothers will subsequently go.

> In quite recent times, in a London borough which I would regard as well above the average for its standard of child-welfare work, a mother left hospital with her baby on a bottle with feeding instructions that could not be carried out at home, and she struggled in her amateurish way for nearly four weeks before bringing the baby to hospital. During the whole of that time no health visitor had called and the mother said she was too exhausted to get to a centre. A previous baby had died of gastro-enteritis in similar circumstances in another part of London.

If it is argued that the shortage of health visitors will not permit of these idealistic arrangements I would reply that in many areas health visitors are cluttered up with duties which intelligent lay people could perfectly well do. There is an urgent need for a sort of "job analysis" of a health visitor's work to see that she is not spending time as a clerk, a secretary, a food-store manager, and so forth.

Another method of co-operation in these early weeks which merits attention concerns the possible staffing of the paediatric side of maternity hospitals and units by medical officers of the local authority services. Both at Middlesex Hospital and at Queen Charlotte's Hospital I was privileged for some six years to look after the newborn babies in the wards and to follow them in orthodox infant-welfare centres attached to these hospitals. I am certain that it made for a high degree of continuity of care. Under the scheme proposed by the Ministry of Health circular 118/47, whereby joint appointments were advocated, with infant-welfare medical officers being eligible for part-time hospital work, I should have thought that hospital appointments for supervision of the newborn and of the premature infant would bring a measure of variety and responsibility to the work of infant-welfare-centre medical officers which is often lacking.

(At a different level, and for different reasons, the spirit of the circular is being carried out successfully at the Hospital for Sick Children, Great Ormond Street, whereby six medical officers of the London County Council attend for work in the out-patient department, one each day, and six registrars from the hospital supply one session each in the service of the London County Council. Similar schemes are no doubt in operation elsewhere.)

Prevention of Infections

This gap in the services in the early weeks is something which needs careful attention. The suggestions made require changes, and it is just the relatively unchanged nature of infant-welfare work over the past fifty years that causes some degree of anxiety. The infections of childhood that can be prevented by recognized methods of immunization are diphtheria, smallpox, and probably whooping-cough. Surely the welfare centre is the place where such methods should be preached and practised with the greatest hope of success.

The infectious disease, however, which has the highest numerical significance in childhood is tuberculosis. Dr. J. E. Geddes (1950), at the Eastbourne Congress of the Royal Sanitary Institute this year, gave the total deaths from infectious diseases for children under the age of 15 in Birmingham during the years 1946–9. In numerical order these ran as follows: scarlet fever, 2; diphtheria, 15; measles, 48; whooping-cough, 114; tuberculosis, 203. It is fair to ask, therefore, what the preventive child-health services are doing about tuberculosis. In the infant-welfare service the use of the tuberculin-patch test at intervals—for example every six months—followed by an *x*-ray examination if the test is found to have become positive, might prove very revealing, and I know that at some centres this is in fact the programme, or something like it. Yet when a young colleague of mine asked to be allowed to perform patch tests at a welfare centre at which he worked he was told by the medical officer of health that this could not be allowed, because it was not the "job" of the centre. This seems a strange decision. Surely the early detection of tuberculous infection, the tracking of contacts, and the use of B.C.G. vaccine for negative reactors amongst them could be made a fine co-operative effort between the infant welfare and the tuberculosis branches of the health service.

There is more to be said about this disease in relation to school-children. For the present it must be recorded with regret that a step in the prevention of tuberculosis is in some areas, for administrative reasons, not permitted amongst the most susceptible age group.

It has already been pointed out that respiratory disorders nowadays account for far more deaths than enteritis in the young infant. What can the infant-welfare service do about this problem? First, more must be known about the epidemiology and pathogenesis of respiratory tract infections in young infants. The work of Dr. F. J. W. Miller (1950) in Newcastle in this field will, it is hoped, be especially helpful. This is part of a morbidity survey carried out jointly by the University of Durham Department of Child Health and the Newcastle City Health Department. With the help of health visitors specially chosen for the work, a study of acute infections in the first five years of life is already revealing that acute infective disease at this age period is essentially a family infection. The "cold" of the baby or sore throat of the toddler is not an isolated phenomenon, but must be regarded, with special reference to prevention, from the basis of the household and the contacts all around in the family circle. This is an excellent example of field research by the preventive services at the infant-welfare-centre age. It may well indicate the lines upon which sound preventive measures to deal with acute respiratory disorders in infants can be evolved.

The Newcastle work lays stress upon the family as a unit in relation to infection of the "droplet" type. Has the infant-welfare movement as a whole given enough thought to the family as a unit in relation to its general work in child care? The father should certainly be known personally to the health visitor, and preferably also to the medical officer. It often occurred, when I was doing infant-welfare-centre work, that some aspect of the child's behaviour or even of physical appearance was clarified only after I had asked that the father attend. Actually, because of the peculiar circumstances of one of my centres with mothers who spoke little English and fathers who worked evening shifts in restaurants, I often had the pleasure of seeing the fathers attending with their babies, and I am sure that better work can be done with families in this way. This is particularly important with regard to psychological problems.

Mental Health

As modern methods of treatment and prevention have so radically improved the outlook for the child as regards physical disorders, it is possible to turn more definitely to study the psychological side, not on the relatively small scale available in the most valuable work of the child-guidance clinics dealing with more or less gross disorders, but in the much larger field afforded in the infant-welfare centres. More and more experts are tracing severe breakdowns of adolescence, leading to delinquency and mental misery, to events in the critical early years of life when disturbance of the profound yet delicate parent-child, and especially mother-child, relationship may wreak such havoc with a child's mind. The quality of advice on child care in the psychological field must vary very much, as in general terms the training of medical officers and of health visitors for this side of their work is minimal and is likely to remain so until radical reforms in the curriculum become effective. Unfortunately, too, the very mothers (and fathers) who are most in need of help are those who do not come to an infant-welfare centre. Yet the services of the centre—the advice—can be taken to them, and this is, in fact, being done in some areas as a method of tackling the "problem family." My point here is the simple one that the opportunity for establishing sound mental hygiene in the pre-school age is enormous, and yet, judging by the number of psychological troubles in later life, preventive measures are not proving very effective. In the figures for the "defects" found on routine medical inspection in schools of the London County Council (1948) the percentage of "psychological defects" is about the same as that for otitis media and for heart disease. The prevention of chronic ear trouble and of rheumatic heart disease is certainly approached with more enthusiasm than preventive mental hygiene.

A particular field in which the welfare centre could help is in regard to sex education. The recent developments in the schools whereby more sex instruction is being given has revealed that to begin sex education in the senior schools is much too late and may in fact lead, as it has done in the area of one school of my acquaintance, to almost an epidemic of sex offences between schoolboys and schoolgirls. What is happening is that the parents have no idea of how to deal with questions on sex matters or on the elementary facts of pregnancy and child-bearing. They fob the children off with unsatisfactory answers in early life, the child begins to learn from companions in the early years of school often in a soiled and dirty fashion, and then the "facts" are imparted in early adolescence, at an inflammable age, to children quite improperly prepared to receive them in this way. At the pre-school stage parents should be helped by series of talks on the whole subject of how to answer the inevitable questions of the young child. Discussion groups, especially if fathers can be persuaded to come, held in the evening would go a long way to help in this difficult and important field.

Yet another field in which somehow or other the infant-welfare centre ought to be doing more preventive work concerns the question of accidents. If the mortality figures for the 2- to 5-year-old group are examined it will be found that "violence" is responsible for the largest death rate. For 1948 the rate per million from this cause was 372 for males and 244 for females, compared with 222 and 208, respectively, for tuberculosis, 27 and 19 for diphtheria, 39 and 34 for measles, and 50 and 24 for appendicitis. The "violence" group can be subdivided into road-traffic accidents, which account for just under half of the total, and "other violent causes," which largely means burns and scalds. Is the infant-welfare service doing enough by means of educative measures—talks, posters, pamphlets—to play a part in preventing accidental deaths? It has been pointed out how very rare it is for a second case of severe burns to come to hospital from the same home (Colebrook, 1949), but what a tragically expensive way of teaching the parents. Instruction on non-inflammable clothes, especially night attire, on guards for open fires and stoves and all electric and gas fires, on street drill, and so forth seems to-day to be as important in preventing death and injury in childhood as instruction in infant feeding.

So far I have been dealing with the future of infant-welfare work as if the general pattern of the centre—the medical officer and the health visitor—was to remain essentially unchanged, and that such changes as were necessary were concerned with a different emphasis because of a changed disease pattern. It is important, however, to take this a stage further to see whether or not something more radical may not become desirable. This question largely arises because of the interesting studies in Luton of illness in infancy. The latest report from this town (Dykes, 1950) indicates that, whereas infant-mortality rates show a definite social gradient, infant morbidity does not. In less

favoured towns this may not yet be the case, but the Luton experience suggests that there comes a time when "no substantial reduction of infant sickness can be expected from general measures which fall within the scope of public health and social medicine." Since, however, a social gradient in regard to infant mortality still exists, it follows that practical measures may be expected to bring about a substantial reduction of the infant death rate.

I do not propose to discuss here the alarming conclusion that what determines—in a relatively favourable environment—whether an infant becomes ill or not in the first year of life is a constitutional factor to be controlled, if at all, by eugenics or by aspects of antenatal care which are not yet by any means apparent. What does seem important is that when an infant becomes ill the ultimate result of such illness would seem to depend upon the standards of care that are then applied. In the lower-income groups, failure to secure early medical attention may have, in the past, partly been governed by financial considerations, but education and lack of it as shown by fear and prejudice may have also played a part. It may be that with the passage of the National Health Service Act the financial barrier to early treatment will disappear.

The Luton report suggests that to lower the infant death rate still further will not necessarily be achieved, in a relatively favourable environment, by raising the income and economic status of the lowest social groups. "It seems rather," runs the report, "that this result will be achieved by ensuring that sick infants in the lower social groups are afforded a higher standard of medical and nursing care than some of them have hitherto enjoyed."

The Need for Change

Let us see where this is leading us. I have long held that preventive medicine should include not only measures to preserve health and prevent disease but also the adequate treatment of minor maladies and of serious illness in its early stages to prevent major catastrophes. The Luton experiences support this view. After a certain stage has been reached in the improvement of environment and the general standard of child care, further advances necessitate early medical help when infants are ill. Obviously at the early stage of illness treatment is best carried out in the home, with the use of hospital only when home circumstances are unfavourable.

The crucial question for the infant-welfare service is, "Who is to carry out this treatment?" I think the answer must be, "The family doctor," provided that he is given a better training in the care of sick children than has been possible in the curriculum of past times, and provided that he is given the services of home nurses well trained in the care of sick babies—a highly specialized type of work in grave danger of being submerged and lost in certain proposals for nursing reform. But if the next steps in reducing the infant mortality—the next steps in preventive work in the infant-welfare sphere—are to be along these lines, then surely the infant-welfare service must reorganize its whole staffing programme. Its medical officers should logically be the family doctors who will be carrying out the work in the homes as well as at the infant-welfare centres, and its health visitors must have a specialized training in the nursing of sick babies as well as in the education of mothers in the care of their children.

The infant-welfare centre would then become a consultative clinic where minor ailments could be treated, as well as continuing its educative functions and the preventive measures already discussed. The services of a consultant paediatrician will be required. This scheme would mean that, far from health visitors being given less training as nurses and more in social work, they would in fact require even greater training in the care of children in sickness and in health than they receive to-day.

It may be argued that Luton is not representative, that such revolutionary changes are unnecessary, and that the present pattern of infant-welfare work should continue. But the present-day facts of infant mortality and infant morbidity and their social significance are inescapable. A system largely planned and run on vital statistics which were valid 30 or 40 years ago may conceivably be ripe for revision. There is surely a case here for experiment on a bold scale, and a magnificent opportunity for infant welfare to step forward. Medical officers of health have expressed their feeling of frustration in the atmosphere of the Health Service. Surely a change in the whole mode of work of the infant-welfare service would give them an interest again in this field of preventive medicine.

School Medical Inspections

The school health service also presents aspects which have changed little in the last 30 or 40 years. The form of the medical service for school-children was largely determined in the period 1907–8 and was based on three routine medical inspections, the detection of defects, and arrangements for their treatment. In this basic service there has been little change. Workers in the service complain of the monotony of the school medical inspection, and whereas hitherto it has often been possible to dilute such work, so to speak, with maternity and child-welfare sessions, there is a clear lead in official circulars to let antenatal work go to obstetric teams and the child-welfare work, in part at any rate, to child-health officers.

Suppose that such officers, for the most part specialist paediatricians, also take over school medical sessions as they are already doing in some areas: it will surely be a waste of expensive medical man-power to employ such sessions in routine medical inspections. Across the Atlantic they have been asking for some years—what can the school physician detect that the school nurse cannot detect? I specially commend the New York study by Dr. Dorothy Nyswander (1942) and her colleagues for a more detailed answer than it is possible to give here. Workers in Canada have also criticized medical inspections by a school medical officer as being wasteful of time, money, and effort. It is argued that there are few defects which are not obvious on inspection or in which a careful history will not suggest the need for a medical examination. A competent nurse can "screen" the children and select those requiring a more detailed overhaul by a physician. Such a scheme is, I believe, already in operation in parts of Canada. In New York, as a result largely of the studies already mentioned, only entrants now have a complete medical examination and after that the school physician sees only children referred to him as a result of consultation between nurse and teacher.

Defenders of the present system will no doubt maintain that only by a medical examination can heart disease, for example, be detected. But without a history of rheumatism, without some cyanosis or shortness of breath, the apical systolic murmur in childhood is possibly best left undetected. If there is no history and the child is free from symptoms there is little danger of harm coming from the non-detection of a heart lesion. In any case it is illogical to insist that the heart must be examined by a doctor and not include full examination of the urine. The nurse could easily do the latter. She can also apply a tuberculin-patch test and refer those changing from negative to positive for further

examination, repeating the patch test at suitable intervals in the negative reactors. In view of the relatively high importance of tuberculosis in the mortality of childhood already mentioned it is surely illogical to defend current methods of inspection which do not include any special means to detect this important disease. Mass radiography is being used experimentally, I believe, for certain school-children, and the findings will be of great interest. There is almost certainly a field among school-children who react negatively to tuberculin for B.C.G. inoculation in certain circumstances.

If the school medical officer can somehow be released from the burden of routine inspections there is great scope for more interesting and more important work of a preventive type among children of school age. In passing, it is fair to record that the work of the school health service in regard to the handicapped child in this country is of a very high standard and the provisions made are viewed with admiration by visitors from many parts of the world. Moreover, the supervision of children in residential schools for the physically handicapped brings a special interest of a clinical type into the work of school doctors. This side of the work, however, is rescue work of a special and somewhat limited type dealing with a minority of lame ducks in the community. Even in this field I doubt if we are doing enough for the parents of educationally subnormal children or more especially the uneducable group. There is much unrelieved misery here.

Health Education by the School Doctor

On a much wider scale the health service can reach in the schools such an important population that the school doctor should be encouraged and able to play a part in the whole field of health education. He may or may not be a good teacher, but if he is, then surely he should be encouraged to take some part in teaching. Whether or not he does this, he should certainly be concerned with the syllabus, help to plan practical studies and visits of observation, and, above all, to see that the child learns the elements of hygiene by being able to practise them at school. This means that the school doctor should be directly interested in ventilation, lavatory and washing accommodation, drying facilities, and changing facilities. He should be concerned with school meals and milk in schools, using the opportunity to get the whole subject of food and nutrition, including food hygiene, put before the children.

In the field of physical education the school doctor should also be encouraged to show interest. There is a growing feeling that this subject, together with the whole study of remedial exercises, needs a more critical supervision than has hitherto been the custom. School medical records might well show that certain postural defects right themselves just as quickly without special exercises. I know that this is true in one area for scoliosis. School doctors could soon settle whether or not exercises are necessary for many conditions for which they are now ordered, and with this study the validity of the theories of certain schools and sects in physical education, and indeed in physiotherapy, could be tested.

There is also the question of the teaching of biology in schools and the associated problem of sex education. It is generally agreed that it is not wise for sex education to be dealt with in a highly specialized way by a visiting and strange teacher. But a school doctor who knows his school and is known by the children—by his contact in special medical examinations, through his interest in the food, lighting, and hygiene—would be no stranger, and he or she might well take some part in this important aspect of the curriculum. Such suggestions would bring the school doctor into much closer contact with the school staff than is generally the case to-day. They may learn to consult him on special problems concerning the children or concerning themselves. The head master or head mistress could come to find the doctor a real help in many aspects of the school life. In this way a contribution to health and happiness among school-children would be made which would be of far greater ultimate value than much of the inspection work done to-day.

In connexion with the school health work also I would commend the work of the school care committees in the London area. They are invaluable for much of the social and preventive work of the school services. They represent an aspect of social paediatrics for the child of school age which is an important part of the school health programme.

I have roamed far and wide in this subject. I repeat again that if there are faults in the child-health services to-day those of us in responsible positions must accept part of the blame. I have tried to indicate why I think the amazing change in the pattern of disease in infancy and childhood must mean a change in the methods and objects of preventive measures. I would especially stress the growing importance of such measures in the field of mental health.

I am aware that some, and possibly most, of the suggestions for changed procedure have already been adopted in certain areas by forward-looking authorities and their progressive medical officers. What can be done in one area can surely be done in most other areas. The child-health services of this country in their beginnings showed the whole world what could be accomplished in the fields of child welfare and school health. The changes, which seem to me urgently necessary, could well once again put these services right in the front of the campaign against death and disease and unhappiness in early life.

It will be clear that I am indebted to many sources for my ideas, some of which are recorded in the list of references. Apart from this there are many colleagues in the academic field and medical officers of health who have wittingly or unwittingly allowed me to gain access to their thoughts. I am also deeply grateful to St. Marylebone Borough Council, who employed me to conduct infant-welfare centres, and to the London County Council, who employed me as part-time medical officer in the school medical service for several years before the last war. Neither body is, of course, responsible for anything I have said in this lecture.

References

Colebrook, L., and Colebrook, Vera (1949). *Lancet*, **2**, 181.
Dykes, R. M. (1950). *Illness in Infancy*. Luton.
Geddes, J. E. (1950). *J. R. sanit. Inst.*, **70**, 341.
London County Council (1948). *Report of Medical Officer of Health and School Medical Officer*, p. 64.
Miller, F. J. W. (1950). *Publ. Hlth*, **63**, 61.
Nyswander, D. B. (1942). *Solving School Health Problems*. Commonwealth Fund and Humphrey Milford.
Report of Biological and Medical Committee (1950). *Papers of the Royal Commission on Population*, vol. 4.

According to a Home Office paper issued recently there was less juvenile delinquency in England and Wales in 1949 than in 1948. Those under the age of 14 found guilty of indictable offences and dealt with by magistrates' courts numbered 21,152 in 1947; 26,715 in 1948; and 24,872 in 1949. Those under 17 but 14 or more were 13,861 (1947); 16,991 (1948); and 15,064 (1949). A decline was also noted in those of all ages under 17 found guilty in higher courts: 681 (1947), 728 (1948), 494 (1949). Local authorities are urged to hold conferences with interested statutory and voluntary bodies to study ways of preventing juvenile crime, and many have already begun this work.

MANAGEMENT OF MALPOSITIONS OF THE VERTEX*

BY

HECTOR R. MacLENNAN, M.D., F.R.C.O.G. F.R.F.P.S.

Gynaecologist, Victoria Infirmary, Glasgow; Senior Assistant to the Regius Professor of Midwifery, University of Glasgow

With so much maternity work being done in hospitals there is to-day a tendency to study the various problems associated with obstetrics solely from the statistical angle. Of course, much very useful information is gained by this approach; but it can be cold and lifeless, and there are some problems which can be expressed in another way. It is not my intention to belittle the value of these statistical analyses, especially when, for all I know, there may be a Hogben sitting amongst us. I would prefer, however, to present the subject from the angle of the practitioner of obstetrics who is working on his own without the panoply of the hospital around him to share his burden and sometimes to shield him from his failures. I would rather talk of my experiences as an obstetrician doing private domiciliary midwifery than as a consultant engaged in institutional midwifery. By so doing we can meet on common ground and compare notes.

During the past twenty years I have myself conducted a fair number of booked confinements: excluding emergency calls, there are over 2,500 which can be drawn upon. From such a number it is possible to form a judgment on what constitutes a difficult vertex presentation. In these cases I carried out my own antenatal work, and almost all the patients had a radiological examination at the thirty-sixth to thirty-seventh week. It was thus possible to select, with some accuracy, the cases of malposition of the vertex, and the malpositions which I here deal with are the occipito-posterior position with the head lying in the oblique diameter of the brim, the direct occipito-posterior with the head lying in the conjugate, and the occipito-lateral with the long axis of the head lying in the transverse diameter of the brim.

Incidence

The first question to be considered is, How often do we encounter such cases, and do they in fact give rise to difficulty in labour? I found among my cases that the occipito-posterior position with the head in the oblique occurred in 15%, the occipito-lateral in 26%, and the direct occipito-posterior in only 1%. The very great differences in the incidence of occipito-posterior presentation which are recorded by various authors are in all probability due to the fact that the diagnosis was made at different times—before the onset and during labour—and that hospital records are in themselves often incomplete, lacking accurate information from which a reliable figure can be ascertained. Thus we have such differences as:

Seidentopf	12.4% in Chicago and 1.4% in Leipzig
Munro Kerr ..	20–25% in private practice, early in labour
McBride	4% in Glasgow
McGregor	6.8% in Edinburgh

Prognosis of Difficulty

As to whether or not the occipito-posterior position causes a difficult labour, we find that Munro Kerr and Chassar Moir state: "Occipito-posterior positions of the vertex have in recent years come to be looked upon as the *bête noire* of obstetric practice. It may be a somewhat exaggerated view to take of this very common complication—we think it is; nevertheless, the difficulties which develop may occasionally be very serious—particularly in primiparae—and they always demand judicious handling." And Morris says: "The detection of an occipito-posterior position prior to the onset of labour should not cause alarm, for in a very high proportion of cases correction at least to an occipito-lateral position occurs spontaneously when labour commences." These are two ways of regarding the problem. I would prefer to express it in a different way. The manner in which I venture to suggest it strikes most of us who are engaged in domiciliary midwifery is that an occipito-posterior presentation in a primigravida may at any time from the onset of labour until its completion bring very considerable difficulties—with a prolongation of the first stage, perhaps a very difficult forceps delivery in the second stage, and a possibly complicated third stage—and on that account it causes us concern and anxiety from the time when we first diagnose the condition until the confinement is successfully accomplished.

It is agreed that the occipito-posterior position and deep transverse arrest are responsible for a high percentage of the stillbirths which occur in mature infants. These cases play a large part in producing the dystocia which may be followed by the trauma of a difficult delivery, and, later, the increased possibility of haemorrhage from an atonic uterus. Trauma and haemorrhage in many instances will in turn be followed by obstetric shock, which is one of the major causes of maternal mortality and is to-day responsible for over 30% of the deaths in our hospital. In our part of the world occipito-posterior and deep transverse arrest is the commonest cause of failed forceps now that the grosser degrees of contracted pelvis have become less common and the general standard of midwifery has improved.

Knowing that this is so, and appreciating the danger not only to the child but occasionally to the mother, we can now comfort ourselves with the knowledge that the majority of occipito-posterior cases do not fulfil our worst fears. This, however, is cold comfort if, having at the thirty-sixth week made a diagnosis of an occipito-posterior position, we cannot prophesy with any certainty in any given case how it will finish, and if only when the case is finished are we able to experience relief in the knowledge that this was one of the many easy cases which gave no trouble. Wisdom after the event is very little consolation for the anxious foreboding we may have had for the last week or two before the confinement and at the actual confinement itself. Therefore, while fully admitting that many of these cases have simple uncomplicated confinements, let us examine in more detail the difficulties which we know may confront us—and which we fear—in an endeavour to find ways and means to deal with them when they do arise.

I shall consider first the primigravida. When the diagnosis of occipito-posterior or occipito-lateral presentation is made at the thirty-sixth week we know that in a number of cases this will have become anterior by the time the patient goes into labour, but where the head is engaged or even partially engaged at this time it is unlikely that there will be any improvement in the position before labour starts: in this I differ from Munro Kerr and Chassar Moir, who say that the third and fourth vertex positions are infrequent before the onset of labour and that the largest proportion develop early in labour. They therefore make an arbitrary division into primary and secondary occipito-posteriors. I regard this as the very reverse of what actually happens in practice.

*A British Medical Association Lecture given to the Birmingham Division on March 28.

Can one correct the position antenatally? Buist's pads have been advocated, and recently by no less an authority than Farquhar Murray, but we in Glasgow have been unsuccessful with this treatment. Postural treatment has been recommended, and this also has in our hands failed to produce satisfactory results. I know of no means of correcting this malposition antenatally. If there is no method of correction, is there any value in diagnosis? Most certainly there is. Most primigravidae hope for an easy and quick labour. They are fortified in this hope by some of their fortunate friends who have had the experience. Where the doctor in charge knows that the occipito-posterior presentation exists he should be able to prepare the patient for a labour which is unlikely to be short. In so doing it is essential that he should not alarm her, and it may be of value to have a word or two with the relatives. It should again be stressed that there is no need to give them cause for undue apprehension or concern, but a certain amount of psychological preparation can be quietly instilled into the minds of the patient and her associates, so that if labour does not follow a rapid course she does not become unduly despondent or panicky. When well carried out, this psychological preparation can only increase the confidence of the patient in her doctor, and thus will have an incalculably beneficial effect upon the whole course of the labour.

Clinical Post-maturity

In cases where the head is high and the position is posterior or lateral, the antenatal period may be prolonged beyond the expected date of confinement. In other words, such cases often become clinically post-mature. Prophecy of such an occurrence by the doctor in charge will also increase the confidence of the patient and prevent that rising tide of impatience and perturbation which is so apt to occur when a primigravida goes more than a few days past her expected date.

So much for the psychological value of antenatal diagnosis of the occipito-posterior position.

The question of clinical post-maturity may now be considered a little more fully, for it is often here that we meet our first difficulty. The longer pregnancy continues past the expected date the larger the child may become, the harder the head, the less easy the moulding, and the more difficult the ultimate confinement. Are we justified in inducing labour in such cases?

Before answering this question there is a further essential in the diagnosis. It is desirable to make a pre-delivery assessment of the pelvic capacity. This can be done by an internal digital pelvimetric examination. The shape of the brim can to some extent be appreciated, and, what is much more important, the curvature of the sacrum. A sacrum which is flattened antero-posteriorly will markedly reduce the pelvic capacity, and its full significance must be appreciated in determining the future course of the labour. The prominence of the ischial spines and the length of the sacro-spinous ligament should be ascertained. Caldwell and Moloy allow two fingerbreadths as a rough guide to a normal sacro-spinous ligament. The mobility of the coccyx, the width of the subpubic angle, and the posterior sagittal diameter are all of great value in determining the pelvic capacity. In these days of radiology much can be learned from a lateral view of the pelvis, which can be taken at the same time as the diagnosis of the foetal position is confirmed, and, while perhaps to have an *x*-ray pelvimetry in every primigravida would be desirable, it is a counsel of perfection and not always feasible. It should not replace internal digital pelvic examination, as it is really, to my mind, an adjuvant rather than a primary factor in diagnosis. The width of the sacro-sciatic notch, whether it is acutely angled or obtuse, will help to guide one in assessing an android pelvis, and this can be appreciated from a simple lateral view.

It is not my purpose to discuss the value of radiological pelvimetry. My own impression is that too much stress is being placed upon this. None the less, it does play an important part in the assessment of pelvic capacity, and before deciding the question of induction in a clinically post-mature patient the pelvic capacity would require to be known.

Induction of Labour

Where the capacity appears ample a modified medical induction is usually justified in a primigravida when she is a few days past term; but surgical induction is another matter, and here at the moment I am referring strictly to the primigravida. While surgical induction by artificial rupture of the membranes in primigravidae may frequently be followed by a satisfactory labour, there are occasions when this is not so. Where the cervix is long and hard, where there is no attempt at taking up the internal os, where it is displaced into the posterior fornix, induction may be followed by a long latent period, and foetal distress may become evident before it is possible to effect a vaginal delivery. Surgical induction of labour is therefore inadvisable in primigravidae when the grounds are solely clinical post-maturity and occipito-posterior presentation.

There are, however, special circumstances in which surgical induction is, I think, well justified, and indeed almost obligatory. Let us take for example an occipito-posterior position occurring in the patient whose pelvic capacity, while not contracted in any serious way, is not more than adequate for the average baby and where the child appears to be getting larger—here the certainty of disproportion looms ahead; or in the patient with a minor degree of restricted pelvic capacity, especially in the mid-plane or cavity. Again, there is the type of patient who has been married for a number of years and to whom the baby is more than ordinarily precious. She need not necessarily be an elderly primigravida. There is also the case of clinical post-maturity where careful observation of the foetal heart has disclosed irregularities, where the movement of the foetus has been noticed by the patient to become less obvious, or where there is reason to suspect the possibility of impending intrauterine death of the foetus—a most difficult type of case to diagnose with accuracy. If we treat any of these cases expectantly, the result may be disastrous to the child, and it is on this account that a number are subjected to caesarean section—and yet caesarean section may be entirely unnecessary.

Trial Induction

I would therefore at this stage put in a plea for what I have called elsewhere "trial induction" in such cases. By "trial induction" I mean that surgical induction of labour may be carried out on the understanding that, should the induction prove unsuccessful, it may be followed by caesarean section, under an "antibiotic umbrella." By this means a number of successful inductions will result and some unnecessary caesarean sections will be avoided. I should repeat, however, that trial induction and caesarean section are procedures to be reserved only for special cases in circumstances other than the mere presence of an occipito-posterior in a clinically post-mature patient, and they do not fall within the ambit of domiciliary midwifery. With the clinically post-mature primigravida who is to be

delivered at home, it is usually best to wait until labour begins spontaneously, and this may mean leaving her for anything up to two or even three weeks.

In multiparous patients the problem can be easily solved. The cervix is usually soft and patulous, membranes rupture easily, and the practice of timely induction in such cases will often avert the danger of a large child which can make occipito-posterior presentation doubly difficult.

Prolonged First Stage

When the patient ultimately goes into labour the first stage may be considerably prolonged. Whether this is due to the fact that the presenting part inaccurately fills the pelvis and fails to elicit what has been described as the cervical reflex, or to incoordinate uterine action, which so frequently accompanies this type of case, or whether it is due to some other factor, I do not propose to discuss. Suffice it to say that a prolonged first stage of labour with the occipito-posterior position is commonplace. How, then, are we to contend with the difficulty? In the initial hours of the first stage no treatment whatever is required. The patient should already have been psychologically prepared for such an eventuality. It is a mistake to administer sedatives too early in these cases. Patients should be allowed to "get on with the job," which the vast majority are prepared to do, but they should be assured of help and relief if they experience discomfort which distresses them. The cult of relaxation is valuable in such cases, and, while the patient should be allowed to move around, she should also be allowed to rest. A combination of activity alternating with rest will help labour to establish itself satisfactorily.

There are very few hospitals in the country to-day in which a prolonged first stage of labour can be adequately managed. The provision of first-stage rooms is lamentably inadequate. Comfortable rooms attractively furnished with comfortable chairs, and newspapers and magazines, are what is required. All too frequently the patient is placed in a common-room with other patients in more advanced stages of labour. The whole situation is macabre. How much more fortunate is the primigravida in the familiar surroundings of her own home.

When the patient shows signs of weariness she should immediately be given sedatives. I need hardly add that any form of oxytocic is definitely contraindicated at this stage. Where a mild sedative is required it is often wise to begin with gas-and-oxygen or gas, oxygen, and "trilene" from a "Portanaest" or some similar machine. The patient who is properly instructed in the use of this will experience considerable relief and will continue to have contractions. It is a common mistake to withhold the use of gas-and-oxygen until the beginning of the second stage, and equally I would suggest that it is a mistake to give the patient trilene too early. Trilene is much more powerful than gas-and-oxygen and is better reserved for later in labour. When gas-and-oxygen has been used for a reasonable time—and I would suggest that a couple of hours at this stage constitutes a reasonable time—pethidine may then be given; this is a valuable and safe sedative, and can usually be repeated until the desired effect is achieved. Morphine will always be regarded as a powerful sedative and one of the best at our disposal, especially when it is combined with a little hyoscine, but this should be used with caution. The proper time for the administration of morphine and hyoscine is at night. It is in the long watches of the night that courage fails, and it is then that morphine is most called for. The amount of morphine to be given in a protracted labour is limited, and it should therefore be used when it is likely to be of the greatest advantage, which is usually at night.

Apart from sedatives, it is important also to emphasize that the patient should be allowed adequate nourishment in the first stage of labour. She should be encouraged to take her normal meals, as there is no likelihood of an impending anaesthetic. This maintains her strength and fortifies the glycogen reserve in her liver. It also engenders in the patient's mind the feeling that there cannot be very much wrong if she is taking her food normally. By the time she gets towards the end of the first stage, which is, I think, the most painful period of any labour, she should be given adequate sedation. At this time particular attention should be paid to the bladder. So much for the first stage in primigravidae.

The Second Stage: Timing Intervention

When the patient enters the second stage of labour with a difficult vertex presentation—that is to say, occipito-posterior or occipito-lateral—great obstetric judgment will require to be exercised; for at this stage intervention becomes possible, and the doctor must decide whether or not it should be undertaken. Opinion on this subject tends to be divided rather sharply into two schools—the ultra-conservative school which will allow almost unlimited time for long rotation to take place and for spontaneous delivery to be effected, and the ultra-radical school which will carry out what some of our American friends call prophylactic forceps delivery and extract the child as soon as the cervix is fully dilated.

Don't be afraid of the via media, because it is the road most often right, and, while in the last instance it is usually a matter for the doctor in charge, there are a number of points which would help him to form a correct judgment. If the first stage of labour has not been unduly prolonged, and if the patient's condition is good when she nears the second stage and the foetal heart is beating strongly, there is every reason to allow her sufficient time to deliver herself naturally. It is impossible to improve upon natural results in such cases. In contrast, there is the patient who has had a prolonged and exhausting first stage; it is then unusual to find that her expulsive efforts in the second are effective. In such cases the head will tend to lie in the mid-pelvic cavity and assume the position of deep transverse arrest. Where this arrest is allowed to persist over a number of hours the consequent moulding of the foetal head merely renders the ultimate forceps delivery more difficult, while the patient is less able to withstand such intervention.

I am not really suggesting that the patient's life is in any great danger, but there is no doubt that a degree of obstetric shock often follows a difficult forceps delivery in a patient who has been in labour for several days. Furthermore, to leave for a long time a patient whose baby is in the position of deep transverse arrest may result in a stillbirth, which is a tragic sequel to a protracted labour and likely to leave a permanent scar on the patient's mind, if not anywhere else. The late Dr. Eneas Mackenzie, one of the wisest and most experienced general-practitioner obstetricians, once said to me, "One of the reasons why doctors apply forceps is not because they are in a hurry, but because they do not like to see poor folk suffer," and, while modern analgesia has obviated much of this suffering, it cannot be used indefinitely in the second stage of labour without risk to the child. There is therefore a very definite place for intervention early in the second stage when the first stage has been prolonged, and correspondingly later in the second stage when the first stage has been normal.

The Emergency Call

Sometimes a doctor is called, as an emergency or for a second opinion, to see a patient with an occipito-posterior presentation in the second stage of labour, dystocia having already occurred, and he may find a tired and even exhausted mother and the prospect of a difficult forceps delivery. Adequate care in the first stage would have averted such a state of affairs, but when it does exist it must be overcome. One decision which has to be taken is when to intervene. Generally speaking, such cases are not suitable for domestic confinement, for the accoucheur will need a good anaesthetist, and at the completion of delivery a variety of urgent functions may require to be carried out simultaneously. The child may need resuscitation, an episiotomy may have to be repaired, and an atonic uterus may require attention on account of third-stage bleeding. It is unusual in domiciliary surroundings to have enough assistance to perform all these functions together satisfactorily.

It might not be inappropriate here to refer to some technical points in the delivery by forceps of the deep transverse arrest and of the persistent occipito-posterior, although I realize that in doing so I am entering a field of almost wild controversy. In the great majority of cases the experienced obstetric practitioner will find no difficulty in manually rotating the head into an anterior position, and this is especially so if the intervention has been started before moulding has become extreme. It may be necessary to push the head fairly high up in the pelvis to effect this, but in a primigravida there is really little danger of such a procedure causing undue extension of the head or prolapse of the cord. He will then apply forceps and deliver slowly.

One has become accustomed to the advice than fundal pressure should be applied in the delivery of a breech to maintain flexion, so I think it is wise to have an assistant to apply such pressure in a forceps delivery, and for the same reason. Reasonable fundal pressure begun just before the forceps traction can be very helpful, but the whole procedure must be done slowly. There is a tendency to-day to hurry forceps deliveries quite unnecessarily.

In the cases in which rotation is impossible, owing either to very marked moulding or to slight cephalo-pelvic disproportion, the head should be delivered by the application of Kielland's forceps to the head in the transverse position, and in expert hands this gives first-class results. Equally, in inexpert hands it causes extensive laceration of the pelvic floor.

Alternatively, forceps may be applied over the face and occiput (the actual application is more usually oblique), and moderate traction may be exerted until rotation occurs in the plane of the outlet, when the forceps are removed and reapplied. This is a time-honoured method of delivery, and a great deal of nonsense has been talked about its lethal effect upon the child. With fundal pressure and reasonable traction there will be less danger to the child from such a manœuvre than might be anticipated, for the head has accommodated itself to the pelvis and is really being helped to "find its own way out." To the ardent apostle of Kielland's forceps I should say, If you have learned to use them, continue to do so. To those who prefer axis-traction forceps and are accustomed to their use, I would say the same. This is the art of obstetrics which must be acquired rather than taught, and if the best results are to be obtained the artist must be allowed to use the tools which he finds most natural to him. I would suggest that proficiency in the use of both Kielland's and axis-traction forceps has much to commend it.

The Persistent Occipito-posterior

Where short rotation occurs and persistent occipito-posterior presentation results, this will often be diagnosed from the fact that the head fails to advance despite the strong expulsive contractions. In such cases the vulva frequently gapes, but the head, instead of coming on to the perineum as one might anticipate, remains well back in the pelvis. As soon as a diagnosis of persistent occipito-posterior presentation is made, delivery should be carried out by forceps, and in certain circumstances it is quite permissible, and indeed advisable, to deliver it as a face-to-pubis. I would suggest that the criteria for delivery as a face-to-pubis would be that the diagnosis has been late and gross moulding has occurred in the persistent occipito-posterior position, or that there is contraction of what has been called the ischio-pubic segment of the pelvis. This is, of course, the funnel-shaped or android pelvis of to-day. There is much more room for the biparietal diameter in the ilio-sacral segment, and delivery can be effected with less traction and trauma to the child with the head in the posterior position provided that an ample episiotomy is carried out.

An interesting comment upon this type of delivery is that on occasion an occipito-anterior or an occipito-lateral presentation may undergo rotation backwards into the hollow of the sacrum, where the outlet is slightly contracted. This was adequately described by Herman many years ago, and has been referred to again by Cameron and Hewitt amongst others. None the less, while it is permissible to deliver the baby face-to-pubis in the circumstances outlined, as a rule manual rotation of the head to an anterior position gives most satisfactory results, particularly in multiparous patients.

Delivery of the Occipito-posterior in a Multiparous Patient

In the multiparous patient a complication of the occipito-posterior position is occasionally encountered to which inadequate attention has been paid. Where the uterine contractions have been of poor quality the multipara may reach full dilatation with the head remaining high in the pelvic cavity. In such cases it may be necessary to attempt delivery on account of foetal distress or for some other reason. Where the degree of flexion of the head is poor, great difficulty may be encountered quite unexpectedly in that the head extends whenever traction is applied by forceps, with the result that the blades tend to slip; or, again, in such cases the head may suddenly recede in the course of rotation from the pelvic cavity and the assistant has difficulty in bringing it back into the pelvic brim. I have encountered prolapse of the cord in such cases, and even prolapse of a limb.

Where any such unanticipated complication arises there is much to be said for a manœuvre which for no very good reason has now fallen into desuetude. I refer to internal version. I have carried out internal version myself in nine cases—in two of my private patients and seven of my hospital cases—and have been able to secure a live child. Had the attempt at delivery with forceps been continued it would have resulted in undue trauma to mother and child. The conditions which must necessarily exist for internal version are a good anaesthetic with reasonable laxity of the uterus and some liquor amnii in the cavity. It should not need to be emphasized, however, that this is not a procedure to be indulged in by the obstetric tyro, but it

can be of great assistance and is not unduly difficult to anyone with some experience of difficult midwifery.

The Third Stage after Anaesthesia

Any discussion of the management of difficult vertex presentations would be incomplete without mention of the management of the third stage. Where labour has been protracted and delivery effected by forceps under anaesthesia, we should anticipate the probability of third-stage bleeding. The uterus is frequently atonic, partly from exhaustion and partly as a result of the anaesthetic. The practice of completing the delivery of the child and allowing the patient to recover from the anaesthetic before dealing with the placenta is, I am convinced, a bad one; for where this is done excessive loss in the third stage is all too common, and a later attempt either to express or to remove the placenta will cause shock, which the patient can ill withstand.

I now prefer to complete the third stage before allowing the patient to come out of the anaesthetic. My own practice is to inject ergometrine after the delivery of the child and, within minutes, to deliver the placenta. This may sometimes be spontaneous where the anaesthetic is light. Often it can be easily effected by a mere expulsion, but, where this does not occur, expression or even manual removal is definitely preferable to administering a second anaesthetic some time after delivery and before the patient has had time to recover fully from the shock of the first. The so-called hour-glass constriction of the uterus rarely occurs, and when it does it can be easily overcome.

As I mentioned at the beginning of this lecture, I make no claim to any originality in the procedures which I have outlined in the management of cases of difficult vertex presentation. Sometimes, in this period of rapid medical progress, there is a danger of the obvious becoming less obvious. It is therefore advantageous to review the principles upon which we base our practice. I have tried to apply to my own practice some of the scientific advances which have been placed at our disposal during the past twenty years, and by so doing have endeavoured to enhance the art which has been handed down to us by generations of teachers and to evolve therefrom a form of management of difficult vertex presentations. This form of management, on the whole, has been found to give good results.

Basic principles for the provision of health care for children of school age have been defined by a group of medical men, health educators, and nurses called together by the World Health Organization under the chairmanship of Dr. Fraser Brockington (U.K.). The committee emphasized the need for school health services to be organized co-operatively. They should be "team projects," involving parents, community, professional groups, social agencies, and others interested in the welfare of the child. They should, moreover, be a direct continuation of pre-school services and be so correlated that the benefit of information about the child accumulated during the pre-school period might be available in the school health programme. Healthy school buildings, with good ventilation and lighting, and adequate washing and sanitary facilities, should not only promote the child's health but also serve as an educational example to the community. The committee considered that preventive measures against communicable diseases in childhood should be organized by each school; and, "for the very reason that the school is the centre of educational stimulation in most communities, it has a unique role to play in the dissemination of knowledge about communicable diseases." The committee also recommended the establishment, wherever possible, of health education programmes with parents and community groups, adapted to the social, cultural, and economic environment in which the children are living.

TREATMENT OF SEVERE HYPERTENSION WITH HEXAMETHONIUM BROMIDE

BY

ALLAN CAMPBELL, M.B., F.R.F.P.S.

AND

ERIC ROBERTSON, M.B., B.Sc.

Medical Registrars, Royal Alexandra Infirmary, Paisley

A number of drugs producing a fall in blood pressure have been investigated in an attempt to obtain a gradual but sustained fall in patients suffering from severe hypertension, as a support to the commonly employed measures of rest, sedation, limitation of salt intake, and diuretics. Treatment with thiocyanate has been reported on by Hines (1946) and Watkinson and Evans (1947), and this work has been reviewed favourably by Alstad (1948). More recently tetraethylammonium salts have been used by Lian and Bergamo (1948), Stead *et al.* (1948), and others. With these drugs it is possible to produce a marked fall in both the systolic and diastolic blood pressures, but protracted treatment is unsatisfactory in that it is limited by serious side-effects and by difficulties of administration.

Paton and Zaimis (1948) drew attention to the clinical potentiality of hexamethonium in hypertension, as they had found that, compared with tetraethylammonium, it gave a slower onset of action combined with a greater potency and longer duration of effect. They have recorded a detailed study of the ganglionic blocking action of hexamethonium and pentamethonium (Paton and Zaimis, 1949), the former being the more active. The clinical effect of these compounds upon the blood pressure was subsequently examined by Arnold and Rosenheim (1949), Burt and Graham (1950), and Kay and Smith (1950).

From this work it was evident that these drugs were capable of producing a marked and protracted reduction of the systolic and diastolic pressures, and they were therefore used in the treatment of patients suffering from severe hypertension. Eight cases of hypertension with papilloedema were selected for this trial and were treated with hexamethonium bromide.

Dosage and Method of Administration

A dose of 100 mg. administered intramuscularly every four hours was found to produce a progressive reduction in the blood pressure in all cases.

Subsequently, oral treatment was determined to be satisfactory, and indeed it produced a more constant fall of the blood pressure without the fluctuations encountered when the parenteral route was used. The drug was administered in solution formed by dissolving tablets—0.5 g. in 20 ml. of water. On the first day of treatment 0.25 g. should be given twice, followed by 0.25 g. thrice daily for the next two days, then 0.5 g. thrice daily for two days, the dosage being progressively increased until by the tenth day 0.5 g. is being given four to six times a day—a daily total of 2 to 3 g. It was found that the drug is more effective when given before meals.

Case 1

A woman aged 21 was seen in December, 1949, with dimness of vision and increasingly frequent headaches of over two months' duration. She was then in the third month of her first pregnancy. She had hypertension but no albuminuria, and there was no history of renal disease. Despite the termination of her pregnancy on February 2, 1950, the hypertension increased and albuminuria developed. She was pale, her blood pressure was 220/140, there was no evidence of arteriosclerosis, and the femoral pulses were easily felt. The heart was not enlarged and radiologically was normal in contour. The electrocardiogram was normal. Her vision was 6/36 both eyes; the fundi showed marked papilloedema of both disks, numerous soft exudates, and linear haemorrhages, with classical macular stars. There was fullness of the veins, with nipping at the A.V. crossings, and an A.V. ratio of 1:3.

Urine examination showed an albuminuria of three parts Esbach, occasional red cells, hyaline and granular casts, no pus cells or organisms. The specific gravity was fixed at 1004, with maximum urea concentration of 1.1%. The night volume exceeded the day volume. The blood urea was 115 mg. per 100 ml. A straight radiograph of the urinary tract revealed normal renal outlines, and no calculi were seen; the intravenous pyelogram showed no function up to 22 minutes. The sodium amytal test gave a maximum fall at the fifth hour, the systolic pressure dropping from 230 to 180, and the diastolic from 140 to 115 mm. of mercury.

The patient's progress with rest in bed, sedation, and a salt-free diet, which had been instituted on admission, was disappointing. Over a period of 10 weeks the vision did not improve, the physical findings were unaltered, and the lowest blood pressure recorded was 180/115 mm.

It was decided to use hexamethonium bromide orally. A small dosage was given initially, and within a few days was raised to a total of 3 g. daily, divided into six doses. Her blood pressure fell gradually during the next three weeks and settled to a systolic pressure between 120 and 140 and a diastolic of 80 to 95 mm. The blood urea fell to 70 mg. per 100 ml. Renal function tests showed a maximum concentration of 1018 and a maximum dilution of 1004. Albuminuria remained at two parts Esbach. Vision improved to 6/6 in both eyes; papilloedema disappeared; and fundal haemorrhages and exudates showed absorption and organization.

The patient was allowed up from May 21 and complained of some faintness due to postural hypotension for the first three days. On June 5 hexamethonium bromide was withdrawn, after seven weeks' treatment with it. There was no rise in her blood pressure, which after two months without treatment still varied between 130/95 and 120/75 mm. She was free of all symptoms, and has undertaken work as a nursing orderly in the wards for eight hours a day.

Case 2

This patient, a woman aged 46, was admitted on April 19, 1950, complaining of increasingly severe headaches of four years' duration, with recent transient paraesthesiae in one or more limbs, associated with severe paroxysms of occipital and frontal headaches, and followed by a transient loss of muscle power. She had had four normal pregnancies, the last nine years previously, at which time no hypertension was present. There was no history of renal disease.

On admission her blood pressure was 230/120 mm. The heart was not enlarged clinically, slight radial arteriosclerosis was noted, and the femoral pulses were present. Well-marked papilloedema was seen; the A.V. ratio was 1:2; slight exudates were present, but no haemorrhages. No albuminuria was found; the maximum concentration was 1025, and the minimum dilution of the specific gravity was 1005. Radiological examination of the urinary tract and chest revealed no abnormality. The sodium amytal test gave a maximum fall at the sixth hour—the systolic from 230 to 160 and the diastolic from 130 to 90 mm.

Absolute rest, sedation, a salt-poor low-calorie diet, and xanthine diuretics for three weeks produced no improvement in her condition or fall in blood pressure. On two occasions transitory arm and leg pareses occurred.

Oral treatment with hexamethonium was begun, the dosage being raised to 3 g. daily. Complete relief from all symptoms occurred within six days, her blood pressure falling to between 130/75 and 150/100 mm. She was allowed up, and during the next fortnight complained only of faintness due to postural hypotension. Fundal examination showed disappearance of papilloedema. The blood urea was 20 mg. per 100 ml., and there was no change in renal function. After a further month she was discharged, and attends as an out-patient, receiving a maintenance dosage of hexamethonium.

Case 3

A man aged 39 was admitted on April 20 with retrosternal discomfort and pain radiating down the left arm, occurring at rest and aggravated by effort. He complained also of palpitation and dyspnoea, and suffered from severe headaches. His vision had been failing for the past two months. There was a history of acute nephritis at the age of 20. The blood pressure was 240/120, the heart was slightly enlarged, and there was left ventricular preponderance in the electrocardiogram. Triple rhythm was present. The blood urea was 35 mg. per 100 ml. The maximum renal concentration was 1015 and the maximum dilution 1002. The fall obtained in the sodium amytal test was 240 to 190 systolic and only 140 to 130 diastolic.

After 14 days in bed on a salt-poor low-calorie diet and phenobarbitone, 1 gr. (65 mg.) three times a day, the patient complained of deterioration of vision; increasing papilloedema was observed in addition to numerous linear haemorrhages and exudates.

Hexamethonium bromide was given orally—a total of 3 g. daily. His vision improved, the headache, retrosternal discomfort, pain, and dyspnoea disappeared, and he was allowed up on May 31, his pressure varying between 115/75 and 145/95 with occasional transient variations above these limits. The blood urea was 30 mg. per 100 ml., and the renal function tests were unaltered. After a further month in hospital he was discharged on maintenance dosage. He felt well and was symptom-free.

Case 4

A woman aged 50 was admitted with essential hypertension of 10 years' duration. Cardiac enlargement, moderate arteriosclerosis, and papilloedema were present. Her blood pressure was 230/140 mm.

No improvement was noted during four months of hospital treatment, and on June 14 hexamethonium was given orally, 3 g. daily. In 10 days the blood pressure fell to 160/100 mm. and remained fairly constant. The patient became ambulant and all symptoms were completely relieved.

Case 5

This patient, a man aged 56, developed severe hypertensive heart failure and was admitted on April 24, when cardiac asthma was found to be a prominent feature. There was no history of renal disease. During the next fortnight his blood pressure was constantly 260/155. The heart was clinically enlarged, and radiological examination showed an increase of the transverse diameter of the heart and pulmonary congestion indicating left heart failure. Medium crepitations were present at both bases. Papilloedema was observed. Preliminary treatment without hexamethonium had no effect and the prognosis was grave.

Hexamethonium was given in total dosage of 2.5 g. a day from May 11. From being orthopnoeic the patient became symptom-free and ambulant in 35 days. His blood pressure varied between 140 and 150 systolic and 80 and 110 diastolic. There was no clinical evidence of cardiac enlargement. Radiological examination revealed a transverse diameter of the heart which was within normal limits. A month later he became capable of light exercise without dyspnoea, and he has been discharged on maintenance dosage.

Case 6

A woman aged 49 had been treated in bed for the previous 10 months at home with no relief of her symptoms of dyspnoea on effort and at rest, anginal pain, severe headaches, and failing vision. Her blood pressure on admission was 240/160 mm. There was gross cardiac enlargement, left ventricular preponderance, and triple rhythm. Marked papilloedema and numerous exudates and haemorrhages were seen. She was admitted on

June 14 and treated from the 25th with hexamethonium bromide, 2.5 g. total a day. Her blood pressure fell in 10 days to 170/110 mm. and there had already been relief of dyspnoea, anginal pain, and headache; after a further three weeks she was allowed up, and improvement has been maintained.

Case 7

This patient, a woman aged 41, was admitted on February 15, 1950, with a history of cardiac asthma, severe headaches, and dyspnoea on effort of two years' duration. She had had acute nephritis at the age of 20. Gross heart enlargement was present and triple rhythm. There was early papilloedema with exudates and haemorrhages. Her blood pressure during the next three months in hospital with routine medical treatment was at a constant level of 275/170 mm.

Hexamethonium treatment was begun on June 14 and raised to a total daily dosage of 3 g. Her blood pressure fell to 180/120 mm., and remained at this level. The headaches and dyspnoea disappeared, papilloedema regressed, and the patient could sleep recumbent. After four weeks' treatment hexamethonium was withdrawn. There was no subsequent rise of her blood pressure. She is ambulant and well.

Case 8

A man aged 30 was admitted on April 5 with malignant hypertension, and his blood pressure was found to be 195/130 mm. The symptoms were of four weeks' duration, and during the next two weeks of observation a rapid deterioration in his condition took place, headache, nausea, and vomiting being associated with gross fundal changes and visual failure. There was an albuminuria of four parts Esbach with numerous red cells microscopically and a blood urea of 100 mg. per 100 ml. The intravenous pyelogram showed no function in either kidney after 25 minutes.

Hexamethonium treatment was begun on April 17 in a dosage of 3 g. a day, which produced a steady fall of blood pressure to 130/80 mm. Complete relief of headache followed. The fundal changes regressed, with some improvement in vision. There has been no change in his renal function, and albuminuria averages two parts Esbach.

Hexamethonium was withdrawn on July 9. There was no alteration in the blood pressure for the next month, but a subsequent rise of blood pressure to 170/110 mm. necessitated a further course of treatment with hexamethonium, which has reduced the pressure again to within normal limits, and his blood urea has fallen to 30 mg. per 100 ml.

Discussion

Throughout this series the substitution of normal therapeutic measures other than rest in bed by oral medication with hexamethonium bromide led to an immediate fall in the blood pressure to a level which could readily be maintained by a daily total dosage of 2 to 3 g.

The most striking results were obtained in Cases 1 and 8, young patients with no previous history of renal disease, with symptoms of short duration and rapid progression, and with no arteriosclerosis. Although there was a remote possibility of a remission in Case 1, there can be no doubt about the efficacy of the intervention of hexamethonium in Case 8.

In the presence of long-standing hypertension without a previous history of renal disease, the blood pressure could be reduced to within normal limits or to such levels as were considered desirable clinically. Thus in Cases 5, 6, and 7 gross arteriosclerotic changes were present and reduction of the blood pressure to normal limits was considered inadvisable.

Headache has been abolished, papilloedema has markedly regressed, and vision has improved in every case. All the patients are now ambulant.

Complete relief from paroxysmal nocturnal dyspnoea was observed in Cases 5, 6, and 7, and from angina in Case 3, contrary to the experience of Bjorkenheim (1948) with tetraethylammonium. Clinical and radiological evidence of the return of an enlarged heart to normal size was obtained in Case 5.

Alteration of the balance of fluid intake and output was negligible during treatment, and the volume of urine was slightly increased at first in some patients. It was possible to lower the blood pressure sufficiently to relieve symptoms in patients with chronic nephritis without disturbing renal function.

Hexamethonium was withdrawn in Cases 1, 7, and 8 without an immediate rise in the blood pressure; and, although Case 8 required further treatment, Case 1 still had a stable normal level of pressure after eight weeks. It seems likely that continuous administration may be unnecessary.

During the earlier part of this trial, shortages of hexamethonium led to substitution by pentamethonium bromide and iodide. This drug was found to be less effective in equal dosage, and nausea and tachycardia were troublesome. Hexamethonium is considered preferable.

Side-effects.—Blurring of vision, dry mouth, nausea and heartburn, and constipation were encountered in every case from the beginning of treatment. These side-effects were not severe and disappeared during the first two weeks, but recurred and disappeared with any significant increase in dosage. However, apparent paralytic ileus was encountered in two patients, necessitating withdrawal of hexamethonium for a period of 24 hours and treatment by the administration of a high enema, full dosage being subsequently resumed without complication. It was found necessary to begin treatment with a small dose of the drug, as the administration of a full dose initially produced a circulatory collapse in two patients. Faintness due to postural hypotension was complained of when patients became ambulant, but was of only a few days' duration.

Summary

Eight cases of severe hypertension have been treated with hexamethonium bromide, with a marked lowering of the blood pressure and relief of symptoms. Although experience with this series of patients is limited and the place of hexamethonium in the treatment of hypertension has still to be defined, this preliminary report is recorded because hexamethonium seems to provide a useful method of reducing the blood pressure in severe hypertension, with ready administration and relative freedom from toxicity.

We wish to express our thanks to Dr. J. Gibson Graham and Dr. A. E. Struthers for their encouragement, and to Dr. Thomas Parker for his permission to record these results. We thank Drs. R. Erskine, I. Muir, and N. Murray, house-physicians, for their kind assistance. We are indebted to May and Baker Ltd. for providing the supplies and information which enabled this trial to be undertaken.

References

Alstad, K. S. (1948). *British Medical Journal*, **1**, 250.
Arnold, P., and Rosenheim, M. L. (1949). *Lancet*, **2**, 321.
Bjorkenheim, G. (1948). *Finska Ink. Hand.*, **91**, 153.
Burt, C. C., and Graham, A. J. P. (1950). *British Medical Journal*, **1**, 455.
Hines, E. A. (1946). *N. Amer. Clin.*, **30**, 869.
Kay, A. W., and Smith, A. N. (1950). *British Medical Journal*, **1**, 460.
Lian, C., and Bergamo, G. (1948). *Sem. Hôp. Paris*, **24**, 547, 2237.
Paton, W. D. M., and Zaimis, E. J. (1948). *Nature*, **162**, 810.
—— —— (1949). *Brit. J. Pharmacol.*, **4**, 381.
Stead, W. W., Reiser, M. F., Rapoport, S., and Ferris, E. R. (1948). *J. clin. Invest.*, **27**, 766.
Watkinson, G., and Evans, G. (1947). *British Medical Journal*, **1**, 595.

EFFECT OF ORAL HEXAMETHONIUM SALTS ON GASTRIC SECRETION

BY

A. W. KAY, M.D., Ch.M.

AND

A. N. SMITH, M.B., Ch.B.

Hall Tutorial Fellow, University of Glasgow

(From the Peptic Ulcer Clinic, Western Infirmary, Glasgow)

Hexamethylene-*bis*trimethyl-ammonium (hexamethonium) iodide (C6) has been shown by Paton and Zaimis (1949) to exert a blocking effect at the synapses of autonomic ganglia. In a previous paper (Kay and Smith, 1950) we have shown that this compound, when given intramuscularly, inhibits the gastric secretion and motility. In the present paper we give the results obtained with the same drug administered by mouth, and also compare the effects of the other halides.

In the first series of experiments we have observed the effect of a single dose of the iodide salt on the gastric secretion; in the second, the effect of repeated administration; and in the third, the comparative effects of equivalent doses of the iodide, bromide, and chloride.

Effect on Spontaneous Gastric Secretion

Ten male patients with duodenal ulceration were selected for study. Cases of peptic ulcer complicated by organic stenosis were excluded, since it was felt that the use of hexamethonium iodide would exaggerate gastric retention. Secretion tests were begun at 9 a.m., after a 12-hour fasting period. In the control test, specimens were aspirated every 30 minutes for a period of three hours. On the following day 500 mg. of the drug was given by stomach tube immediately on removal of the fasting juice. After one hour specimens were aspirated at 30-minute intervals. This method was used for six patients. In the other four, to avoid aspiration of unabsorbed drug retained in the stomach, the first aspiration was delayed until two hours after giving the drug.

At each aspiration the stomach was emptied, and the volume, bile staining, and titratable free hydrochloric acid were noted. All saliva was expectorated. It will be seen from Figs. 1 and 2 that achlorhydria was reached in five patients, being of short duration in three and lasting four hours in the other two. Of the remainder, three patients showed an appreciable fall in the level of acidity. Two, however, showed no significant change. That the reduction of acidity was due to diminished secretion and not to regurgitation of duodenal juice was indicated by the small volume of the fluid withdrawn and the absence of bile.

Effect of a Repeated Dose on Spontaneous Gastric Secretion

In view of the variable results noted above, it seemed desirable to determine if consistent results were obtained in individual patients. With this in view 500 mg. of hexamethonium iodide was administered to four patients on two successive occasions and the results compared with preliminary and final controls. As in the first group, the drug was given after aspiration of the fasting juice. Beginning one hour later, specimens were removed at half-hourly intervals. The results are shown in Fig. 3. It will be

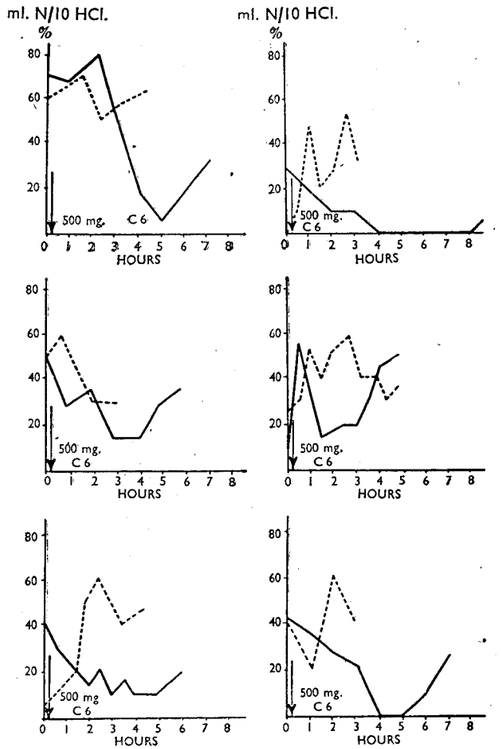


Fig. 1.—Spontaneous gastric secretion. Effect of oral C6, dosage 500 mg. (six cases). Broken line shows control readings.

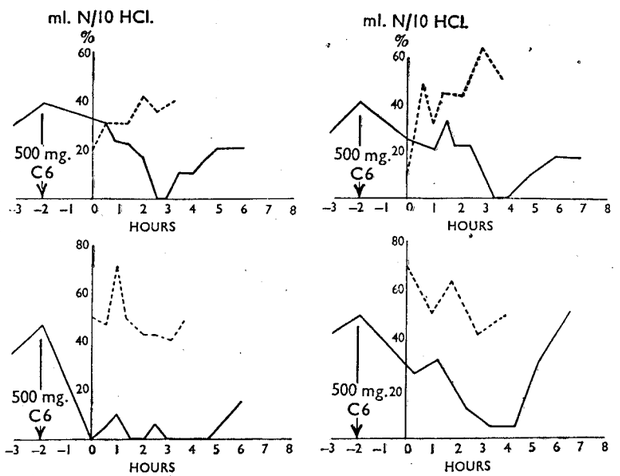


Fig. 2.—Spontaneous gastric secretion. Effect of oral C6, dosage 500 mg. (four cases).

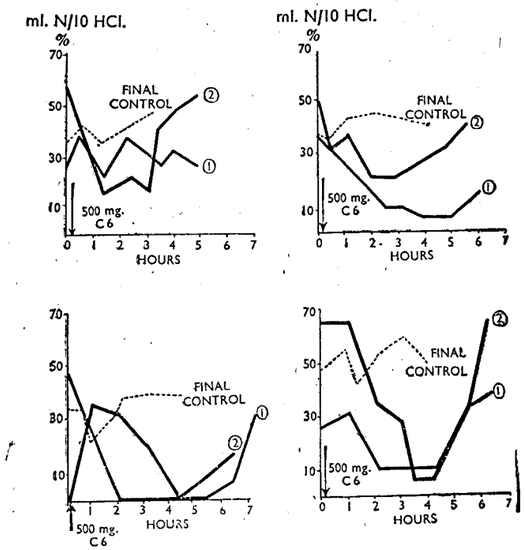


Fig. 3.—Repeated administration with final control.

seen that, while the effects differed in the four individuals, in each of them the successive results were consistent. It will be noted also that there was no evidence of prolonged action of the drug from one day to the next.

Comparison of Hexamethonium Halides

In a further series of six patients the action of equivalent amounts of hexamethonium iodide (500 mg.), hexamethonium bromide (440 mg.), and hexamethonium chloride (340 mg.) was tested on spontaneous gastric secretion. Control tests were performed before and after the test experiments. To avoid fallacies due to possible summation effects, the methonium salts were given in varying order, using all combinations. The tests were made on consecutive days, and in each case the fasting juice was removed, followed by a further specimen one hour later. The drug was then given and repeated aspiration delayed for two hours.

The average figures of the six cases are shown in Fig. 4, from which it will be seen that the iodide appears to give the most effective control of spontaneous secretion, the chloride being the least effective. Results obtained with individual patients agreed with the above finding in four cases; in one case the bromide gave a more satisfactory result, while another was inconclusive.

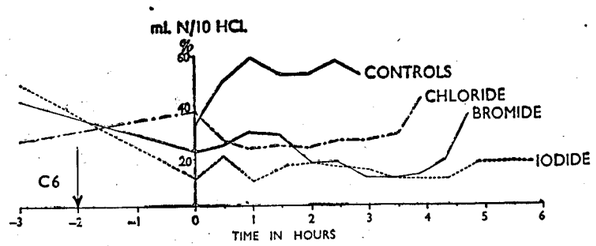


Fig 4.—Comparison of hexamethonium halides: oral administration. Average of six cases.

Observations on Side-effects.—During this investigation hexamethonium was administered on 36 occasions. Observations were made throughout on the frequency and severity of the known side-effects. After 12 of the administrations there was definite impairment of accommodation with resultant blurring of vision, though this was severe in only two cases. There was no visual upset in the remaining 24, but 8 patients complained of heaviness about the eyes; dryness of the mouth was mentioned by three patients; there was a tendency to constipation in several patients, especially in the group receiving hexamethonium on successive days. The sensation of warmth noted after intramuscular injections was not evident after oral administration.

Hypotension

It was found that with the patient supine there was an average drop of 5–10 mm. Hg in systolic and diastolic blood pressure. On standing motionless the fall in blood pressure was increased by 15 mm. Hg. This hypotension, elicited in the above manner, was present from one hour after administration, reached a maximum at two to two and a half hours, and lasted three to four hours. In these circumstances several patients complained of faintness, which was relieved by recumbency. It should be noted, however, that the subjects of this investigation had been fasting for more than 12 hours. It was noted that by taking active exercise faintness was prevented or overcome.

As an experiment under more rigorous conditions in which postural hypotension would be seen at the maximum, the action of hexamethonium was studied in four post-operative cases. They were males, aged 14, 21, 23, and 62 years, and were examined within one week of operation (ruptured appendix, perforated ulcer, inguinal hernia, and appendicitis). The patient aged 21 was ambulant for the first time. In this series particular note was taken of the effect on the blood pressure of standing motionless and of active movements.

Before giving hexamethonium, blood-pressure readings were obtained with the patient at rest in bed, immediately on standing, after standing motionless for five minutes, after walking for five minutes, and, finally, after recumbency for five minutes. Similar observations were made one, two, three, and four hours after 500 mg. of hexamethonium orally. On successive days the drug was given (*a*) after 12 hours' fast, the patient fasting throughout; (*b*) after 12 hours' fast, the administration being followed immediately by a meal; and (*c*) after a meal.

In control observations (without hexamethonium) immediately on standing there was a slight fall of blood pressure (5–10 mm. Hg), which was rapidly compensated by vasoconstriction. After hexamethonium, in two cases a similar fall of pressure occurred, but persisted while the patient remained motionless. In the third (Fig. 5) the fall was considerable (from 100/60 to 65/45). In the fourth there was a transitory severe hypotension with a feeling of faintness. In all cases the pressure rose towards the normal level when purposeful activity was begun. The findings in the man aged 62 are shown in Fig. 5.

When the drug was given on an empty stomach the blood-pressure changes were of the same order, whether the patient was subsequently given a meal or kept fasting, though in the latter state the subjective sensations were severe. When the drug was given after a meal, however, the hypotension on standing was slightly less. This may have been due to delayed absorption, a point which requires further study.

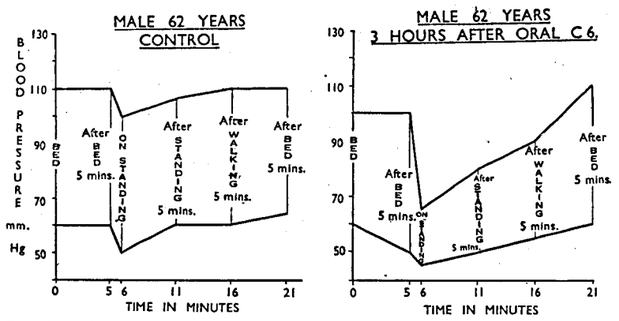


Fig. 5.—Effect of posture and activity on blood pressure before and after C6.

Discussion

Our observations show that hexamethonium iodide given by mouth may depress the acid secretion, but does so less consistently than when administered intramuscularly. In about one-third of our cases the secretion was depressed to the point of achlorhydria, in one-third there was an appreciable lowering, while in the remainder there was no demonstrable effect. Since in this refractory group there were side-effects, including hypotension, the failure cannot be attributed entirely to faulty absorption. The observation that in four cases consecutive experiments gave closely similar results suggests that the failures may be due to individual variations in susceptibility to the drug.

Experimental work has shown that hexamethonium appears to be more effective in blocking the cat's superior cervical ganglion when this ganglion is excited frequently and for a long period than when it is excited briefly and with less frequent stimuli (Paton; personal communication). It seems possible, therefore, that hexamethonium may in some cases depress abnormal ganglionic activity before it interferes with normal function. Thus the gastric effects would be most marked in cases with excessive vagal tone. Indeed, we gained the impression that side-effects such as hypotension were least marked in these cases in which acid secretion was most affected. Thus the drug may act at different sites in different individuals, according to the nature of the predominant autonomic tone.

The three halide salts of hexamethonium have been compared as regards their action on spontaneous gastric secretion. In this small series we gained the impression that the iodide and bromide gave better control of secretion than the chloride. This slight difference in potency may depend on a variation in the absorption of these compounds, though further investigation will be required on this point.

The beneficial effects of parasympathetic blockade are partly offset by the undesirable side-effects resulting from blockade of the sympathetic ganglia, the most notable of which is postural hypotension. The normal drop in blood pressure which occurs on standing is rapidly compensated by vasoconstriction. After oral administration of hexamethonium this mechanism is more or less depressed and postural hypotension is therefore apt to occur, but this can be controlled by muscular activity or recumbency. A feeling of faintness is rare except when standing motionless. The possibility of these symptoms arising is greater in the fasting patients. In general, however, faintness has been an uncommon experience in our series, presumably because standing motionless for several minutes on end is a rare event in everyday life. It is possible that the small risk of faintness could be removed by the use of a long-acting sympathomimetic drug.

Summary

Hexamethonium iodide was given orally to 10 patients with duodenal ulcer—five were rendered achlorhydric, three had a substantial fall in gastric acidity, and in two there was no significant difference between control and test observations.

Comparable results were obtained for each individual when the drug was given on repeated occasions. The effect was not prolonged from one day to the next.

All hexamethonium halides were found to be active in controlling spontaneous gastric secretion. In a small series of cases the iodide and bromide were found to produce a greater fall in gastric acidity than the chloride.

Side-effects, notably postural hypotension, may be present during routine administration of the drug.

Rigorous conditions for an experiment with four patients produced marked hypotension reduced by activity and by the taking of food.

Throughout the investigation a variability of the action of the drug characteristic to the individual was noted.

We are indebted to Professor C. F. W. Illingworth for his advice and helpful criticism throughout this investigation. We wish to acknowledge the interest taken by Dr. W. D. M. Paton, of the National Institute for Medical Research, in this work, and to record our thanks to Dr. N. S. Conway for kind assistance. Our thanks are also due to Mr. Gabriel Donald and the technical staff of the Surgery Department, University of Glasgow, and to May and Baker Ltd. for supplies of hexamethonium salts.

References

Kay, A. W., and Smith, A. N. (1950). *British Medical Journal*, **1**, 460.
Paton, W. D. M., and Zaimis, E. J. (1949). *Brit. J. Pharmacol.*, **4**, 381.

On September 9 President Truman signed a Bill making lawful the call-up of all United States doctors, dentists, and "allied specialists" (including pharmacists, veterinary surgeons, and osteopaths), who are less than 50 years old, for a period of thirty-two months' military service. At the same time the Defence Department has issued a statement to explain in what order doctors will be called. It is intended that the first group will be those who received all or part of their professional training under wartime special training schemes but who had no military service owing to the ending of the 1939–45 war before they qualified. Next come those trained under these schemes but having military experience, those with least service being called first. Finally, all medical officers on the Reserve will be recalled in an order of priority, men trained at Government expense first, those with less than ninety days' active service, then those with less than twenty-one months, then those who had never previously served; and finally doctors who trained at their own expense and have a military record. The officers' Reserve is voluntary, and every medical volunteer gets a pay bonus of $100 (£35) per month, to which the conscript will not be entitled. It is hoped that this, taken with the new call-up, will encourage volunteering to such an extent that it will in fact be unnecessary to apply conscription. The American Services say they need an additional 5,000 doctors and 2,000 dentists this year, and, if all the men trained at least partly with Government aid during World War II but who saw no service can be induced to volunteer, this need will be met. If conscription should prove necessary, it will be administered with the help of a national medical committee which will consider civilian needs in each district; and interns in civilian hospitals will be reserved for a period of twelve months.

CLINICAL ASSESSMENT OF RAPIDLY ACTING AGENTS IN RHEUMATOID ARTHRITIS

BY

C. E. QUIN, M.D., M.R.C.P.

R. M. MASON, M.A., B.M., M.R.C.P.

(From the Arthur Stanley Institute, Middlesex Hospital)

AND

J. KNOWELDEN, M.D., D.P.H.

(From the London School of Hygiene and Tropical Medicine)

The discovery by Hench, Kendall, Slocumb, and Polley (1949) of the therapeutic effects of cortisone in rheumatoid arthritis has stimulated the trial of many other steroids whose action might possibly be similar. Unfortunately the lack of cortisone in this country, with which such substances could be directly compared, has led to considerable difficulty in the interpretation of results. That many therapeutic trials have been carried out using unsatisfactory experimental methods has been strikingly illustrated by the recent controversy over the efficacy or otherwise of deoxycortone and ascorbic acid in rheumatoid arthritis. Some workers (Lewin and Wassén, 1949; LeVay and Loxton, 1950; and others) claim categorically that very remarkable results were being obtained; others (Kellgren, 1949; Spies *et al.*, 1949; Kersley *et al.*, 1950; Fletcher *et al.*, 1950; Copeman *et al.*, 1950) declare equally definitely that their results were negative. Similar claims, though less dramatic, are being made for other steroids lacking an oxygen atom at the 11 position—for example, "pregnenolone" (Davison *et al.*, 1950; Freeman *et al.*, 1950)—but, again, others have failed to confirm these results (Henderson *et al.*, 1950, who quote much unpublished work).

Clinical improvement has been the basis of most claims of therapeutic success. It is necessary, however, to support these claims by the demonstration that such improvement is real, and that it is due in fact to the particular substance administered. Quite apart from normal fluctuations occurring as part of the natural history of rheumatoid arthritis, the psychological effect of giving a new treatment may be considerable, especially as the dramatic effects of cortisone have become widely known. That such effects may be pronounced has been emphasized by Wolf (1950) in a paper entitled "The Effects of Suggestion and Conditioning on the Action of Chemical Agents—the Pharmacology of Placebos."

Our aim has been to adopt methods of assessment of clinical improvement, with special reference to rheumatoid arthritis, which will show conclusively whether or not an apparently beneficial effect is due to the trial substance. A detailed description of the methods used is given. These have been applied to deoxycortone and ascorbic acid therapy as described by Lewin and Wassén (1949), since their claims were both dramatic and precise: improvement was said to occur within minutes of a single combined injection, and this therefore presented the problem of assessment in the simplest possible terms. It is, however, suggested that these methods might be capable of development and modification for other substances which may become available from time to time.

Experimental Methods

The method used involved the clinical assessment of patients suffering from rheumatoid arthritis before and after injection: it was designed to include the following precautions:

Adequate Numbers.—A sufficiently large number was treated to enable a satisfactory statistical analysis to be carried out where necessary.

Placebo Control.—All patients received both test substance and control injection on separate occasions. They were unaware that placebo injections were being used, and the order of injection was statistically randomized.

Observer Control.—The observer was unaware of the nature of the injection given when carrying out the assessment, nor did he have available any record of previous results.

In addition, care was taken to avoid psychological pressure in that patients were told they were not receiving cortisone or A.C.T.H., and that this was simply a scientific investigation into a substance whose effects were not known. It was made absolutely clear that this was an investigation in which they were being asked to co-operate and that it was not part of their treatment.

Since the full assessment of a case of rheumatoid arthritis is a long and tedious business it was necessary to select certain features which would reasonably be expected to be affected if an active agent were used. Such features were both subjective and objective. The subjective phenomena considered were pain and stiffness. Objective measurements were made of joint tenderness, muscle power as measured by the power of grip, range of movement as illustrated by the range of abduction of the shoulder-joint, and the speed of movement by the time taken to walk a distance of 8 yards (7.3 m.), including climbing some steps. While these are by no means complete—and experience will probably suggest other criteria—they cover most of the recognized features of the disability of rheumatoid arthritis.

Joint swelling as such was not measured. We have not established a satisfactory method of doing this, but it would seem reasonable to suppose that any significant reduction in swelling would be manifested by some change in the other features measured. Nor were pathological criteria included, since these have been the subject of careful investigation by others (Bywaters *et al.*, 1950; Dresner *et al.*, 1950), and, as has already been explained, the object was primarily to find out whether clinical improvement took place.

Details of Methods Used

Forty-three patients—33 female and 10 male—were selected for the trial at their routine visits for consultation or treatment. The diagnosis of rheumatoid arthritis was based on the presence of chronic progressive polyarthritis, largely symmetrical, tending to affect the peripheral joints early, with muscle-wasting, constitutional disturbance, and loss of weight, but with no evidence of any specific infective organism. The patients all fell into Stage 1, 2, or 3 of rheumatoid arthritis as defined by Steinbrocker *et al.* (1949). The age distribution, duration of symptoms, and sedimentation rate within three months of the trial are shown in Table I. It will be seen that no case with an E.S.R. below 15 mm. (Westergren) in the first hour was included. Radiographic changes characteristic of the disease were present in all 36 cases in which an *x*-ray examination had been carried out. The experimental nature of the treatment was made clear to all the patients, but few of those

TABLE I.—*Age Distribution, Duration of Symptoms, and E.S.R.*

Age		Duration of Symptoms		Sedimentation Rates (Westergren)	
Years	No. of Cases	Years	No. of Cases	Mm. in 1st Hour	No. of Cases
25– ..	3	1–	7	15–	9
35– ..	8	4–	9	25–	15
45– ..	14	7–	12	35–	6
55– ..	14	10–	6	45–	6
65 and over	4	13–	3	55–	5
		16 and over	6	65 and over	2
Total ..	43		43		43

asked refused to take part in the investigation. They were not told what drugs were being used or that control injections of an inert substance would also be given, but it was made clear that they were not receiving cortisone. They were asked not to take aspirin or other analgesics on the days of the injections.

Patients came up in groups of 10 to 12 to be tested and questioned individually by one of us. They were asked whether they had any pain and, if so, whether it was constant or only present on movement. They were also asked whether stiffness was present and, if so, which part of the body was chiefly affected.

In order to elicit joint tenderness, a swollen joint was squeezed between finger and thumb, maximal force being exerted. In the case of proximal interphalangeal joints, which were usually selected, pressure was applied to their lateral and medial aspects. The amount of joint tenderness was graded arbitrarily according to the patient's reaction to this procedure. If the patient said spontaneously or on questioning that the joint was tender, the amount of tenderness was graded as 1; if in addition he winced or grimaced, the grading was 2; if the reaction was more violent and accompanied by withdrawal of the hand, the grading was 3; if no tenderness could be elicited the grading was 0. This grading is rather similar to that used by Hench *et al.* (1950). They, however, describe some six grades of tenderness; our figures are therefore not comparable with theirs.

For testing grip a rolled sphygmomanometer cuff was used. The end of the cuff was sewn firmly to the roll so as to ensure a cylinder of constant size when inflated. The cuff was inflated until a pressure of 50 mm. Hg was registered on the sphygmomanometer. The diameter of the cylinder was then approximately 6 cm. The patient was told to put his elbow on the table with his forearm inclined to an angle of 45 degrees. The cuff was placed in his hand and he was told to squeeze it as hard as possible and maintain the pressure. The height of the mercury column could not be seen by the patient. The pressure which he was able to maintain for two or three seconds was then recorded, the grip being measured in the right and left hand alternately (Kellgren and Janus, 1950—personal communication). Three readings were taken from each hand, and subsequently the mean of these readings was calculated.

The patient was then asked to abduct his shoulder to the fullest possible extent. The arm was not allowed to move forwards, so that true abduction was carried out. The amount of abduction was recorded in degrees, and, though this is a visual estimate without instrumental aid, a considerable measure of accuracy can be obtained.

He was then asked to walk as quickly as possible from one end of the room to the other, some steps being placed in his path. The length of the room was 12 ft. 4 in. (3.76 m.) and the height of the steps 14 in. (35 cm.) (three steps were involved of 6 in. (15 cm.), 8 in. (20 cm.), and 6 in. with no hand rail). The time taken to complete the course was measured with a stopwatch.

After being tested the patient received in a separate room his injection from whichever observer was not doing the assessing on that particular group (22 patients were injected by C. E Q. and 21 by R. M. M.). Numbered envelopes had previously been prepared giving the order of injection, which was randomized. Each patient received a serial number, and the order in which his injections were to be given was determined by opening the corresponding envelope. The nature of the injection was thus concealed from the observer until the group he was assessing had completed the trial.

The technique of injection was as follows: 5 mg. of deoxycortone in 1 ml. of oil or 1 ml. of saline was injected into the muscles of the outer side of the thigh, followed in one or two minutes by 1 g. of ascorbic acid in 10 ml. of aqueous solution or 10 ml. of saline intravenously.

One hour after injection the patient was asked whether his pain was better, unchanged, or worse, and whether his stiffness was less, unchanged, or greater. When the patient reported improvement or deterioration, its extent was graded as "slight," "moderate," or "marked" according to the impression made by his statement. Any other effects from the injections were noted and the tests previously described were then repeated. The assessor was not allowed to see the results of any previous tests when making his assessment. Finally, one week later we noted any improvement or deterioration which had occurred and, in particular, whether the arthritis was better or worse than before the injection.

Results

Subjective Changes.—An analysis of the subjective impressions of the patients following injection is shown in Tables II, III, and IV. In Table II the overall

TABLE II.—*Overall Assessment (Subjective)*

Condition After Treatment Relative to Condition Before	No. of Cases			
	1 Hour After Injection		1 Week After Injection	
	Da/asc.	Saline	Da/asc.	Saline
Better	24	24	18	16
Unchanged	16	18	19	18
Worse	3	1	5	8
Total ..	43	43	42	42

One patient did not return for assessment after final injection and has been excluded from comparison one week after.
Da/asc. = deoxycortone and ascorbic acid.

TABLE III.—*Pain*

Pain 1 Hour After Treatment Relative to Pain Before		No. of Cases			
		Da/asc.		Saline	
Better	Marked	1	18	1	17
	Moderate	12		11	
	Slight	5		5	
Unchanged		23		26	
Worse		2		—	
Total		43		43	

Da/asc. = Deoxycortone and ascorbic acid.

improvement or deterioration, whether affecting pain or stiffness, is recorded. Pain and stiffness are considered separately in Tables III and IV, and the grading of the responses is shown. It is clear from these tables that there was subjective improvement in many patients, no less than 58% claiming this to be the case one hour after either

Table IV.—*Stiffness*

Stiffness 1 Hour After Treatment Relative to Stiffness Before	No. of Cases	
	Da/asc.	Saline
Better { Marked	—	1
Better { Moderate	11 } 19	6 } 19
Better { Slight	8 }	12 }
Unchanged	23	22
Worse	1	2
Total	43	43

Da/asc. = Deoxycortone and ascorbic acid.

injection. It is also clear from the tables that the test substance was no more effective than saline in this respect. Only one patient showed marked subjective improvement, and this occurred after each injection. One hour after the first injection (deoxycortone and ascorbic acid) he said there was a dramatic relief of his pain and considerable diminution of stiffness. At the end of a week he said that some days he "had been better, some days worse," but, on the whole, slight improvement had occurred. He was then given his control injection of saline, and one hour later said that "almost immediately after the injection there was a glow and complete relief of pain—it was dramatic." The pain had "gone completely" from his hands, and this time a marked relief of stiffness had also occurred. A week later he said that his improvement had been maintained for four days and that he had then relapsed, although not quite to his pre-injection level.

Joint Tenderness.—The degree of joint tenderness of the selected joint at the first assessment was as follows: 4 cases showed grade 1 tenderness only, 26 cases grade 2, and 13 cases grade 3. The wrist-joint was used in 4 cases, a metacarpo-phalangeal joint in 1 case, and a proximal interphalangeal joint in 38 cases. As can be seen from Table V, the numbers of those improved after injection were relatively small and the difference between the effects

Table V.—*Joint Tenderness*

Tenderness 1 Hour After Treatment Relative to Tenderness Before	No. of Cases	
	Da/asc.	Saline
Better by 1 point on scale	8	7
Unchanged	34	32
Worse by 1 point on scale	1	4
Total	43	43

Joint tenderness was measured on a scale: 0 = no pain; 1 = slight pain; 2 = wincing; 3 = wincing and withdrawal.
Da/asc = Deoxycortone and ascorbic acid.

of deoxycortone/ascorbic acid and saline is negligible. No formal tests of significance are required to stress the similarity between the figures.

Grip Test.—The average power of grip in each hand before and after injection, measured in mm. Hg over and above the 50 mm. Hg to which the cuff was inflated, is shown in Table VI, together with the average increase

Table VI.—*Grip Test. Average of Three Readings (mm. Hg)*

	Right hand			Left hand		
	Before Injection	After Injection	Difference	Before Injection	After Injection	Difference
Da/asc.	50	55	+5	47	52	+5
Saline	51	55	+4	48	52	+4

Da/asc. = Deoxycortone and ascorbic acid.

in grip after injection. Table VII gives the frequency distribution of the range of improvement or deterioration Taking both hands together (86 hands, 43 patients), an increased grip was recorded in 65 after deoxycortone/ascorbic acid and in 56 after saline. It will be seen from Table VI that the difference in the average increase in grip after test substance as compared with control amounted to 5−4=1 mm. Hg in favour of the test substance for each hand. Such differences are of no practical significance even if they were technically so. Using a significance test, however, for right hands t=0.433, P>0.6, and for left hands t=0.757, P>0.4. Evidently in this experiment the effect of deoxycortone/ascorbic acid on the power of grip was not significantly different from that of saline.

Table VII.—*Grip Test*

Difference between Grip 1 Hour After Injection and Grip Before Injection (mm. Hg)	No. of Cases					
	Right Hand		Left Hand		Both Hands	
	Da/asc.	Saline	Da/asc.	Saline	Da/asc.	Saline
Better by more than 10	9	11	9	11	18	22
,, ,, 5·1–10	10	9	13	5	23	14
,, ,, 0·1–5·0	14	8	10	12	24	20
Worse by 0·0–4·9	5	8	8	8	13	16
,, 5·0–9·9	3	4	1	5	4	9
,, more than 9·9	2	3	2	2	4	5
Total	43	43	43	43	86	86

Da/asc. = Deoxycortone and ascorbic acid.

Shoulder Abduction.—Patients with a full range of abduction of the shoulders had to be excluded from the analysis of this test since the only change possible would have been a deterioration. Only 24 right shoulders and 26 left shoulders were therefore available in our cases. The average range of abduction of the shoulder-joint in these cases, measured in degrees, is shown in Table VIII.

Table VIII.—*Average Shoulder-joint Abduction in Degrees*

	Right Shoulder			Left Shoulder		
	Before Injection	After Injection	Difference	Before Injection	After Injection	Difference
Da/asc.	109	112	+3	100	106	+6
Saline	102	108	+6	100	105	+5

Da/asc = Deoxycortone and ascorbic acid.

The difference in response for right shoulders was 6−3=3 degrees in favour of saline, and for left shoulders 6−5=1 degree in favour of deoxycortone/ascorbic acid. As already described, these measurements were made without instrumental aid, and such changes are, of course, well within the experimental error of the method. In any case, such differences are of no practical importance and technically not significant (right P>0.4, left P>0.8). Table IX shows the frequency distribution of the range

Table IX.—*Shoulder Abduction*

Difference between Abduction 1 Hour After Injection and Abduction Before Injection (Degrees)	No. of Cases					
	Right Shoulder		Left Shoulder		Both Shoulders	
	Da/asc.	Saline	Da/asc.	Saline	Da/asc.	Saline
Improvement:						
20 and over	4	3	4	3	8	6
15	—	2	2	2	2	4
10	5	5	3	4	8	9
5	3	1	3	—	6	1
No change	7	10	10	13	17	23
Deterioration:						
5	—	1	—	1	—	2
10	2	1	—	3	2	4
15	—	—	2	—	2	—
20 and over	3	1	2	—	5	1
Total	24	24	26	26	50	50

Da/asc. = Deoxycortone and ascorbic acid.
Patients who had a maximum range (180 degrees) before injection of either Da/asc. or saline were excluded from this tabulation. Abduction was measured to the nearest 5 degrees, and the scale of differences therefore is discrete.

of improvement or deterioration, and it reveals that where improvements of 15 degrees or better are considered the figures for deoxycortone/ascorbic acid and saline, taking right and left shoulders together, are identical, in each case 10 shoulders showing this amount of improvement. Again, therefore, the test substance has been shown to be without benefit.

Step Test.—From Table X it can be seen that after deoxycortone/ascorbic acid 30 patients showed an improvement on their time, and after saline 29. One patient had

Table X.—*Step Test*

Difference Between Time 1 Hour After Injection and Time Before Injection (Seconds)	No. of Cases	
	Da/asc.	Saline
Better by more than 6·0	—	3
,, 4·1–6·0	4	4
,, 2·1–4·0	9	6
,, 0·1–2·0	17	16
Worse by 0·0–1·9	12	12
,, 2·0–3·9	—	—
,, 4·0–5·9	—	1
Total	42	42

Da/asc. = Deoxycortone and ascorbic acid.
One patient who was unable to complete the test before saline injection has been excluded from the comparison.

to be excluded as she could not satisfactorily complete the test before her first injection. The average improvement in the times taken following injection (Table XI) was

Table XI.—*Step Test*

	Average Time Taken in Seconds		
	Before Injection	After Injection	Difference
Da/asc.	14·7	13·4	−1·3
Saline	14·9	13·3	−1·6

Da/asc. = Deoxycortone and ascorbic acid.

1.3 seconds after test substance and 1.6 seconds after control injection, giving an advantage of 0.3 second to saline. This difference is again without practical or technical significance (t=0.573, P>0.5).

Discussion

As Bywaters *et al.* (1950) have pointed out, the presentation of statistically negative results such as we have shown in the objective tests described does not necessarily prove that the particular treatment is without effect, since the wrong criteria may have been chosen for measurement. However, in this investigation no difference could be detected in the subjective responses to deoxycortone/ascorbic acid as compared with saline: and, in fact, there is a marked similarity between the effects of control and test substances in this connexion.

It has already been shown by Kellgren (1949), Spies *et al.* (1949), and Bywaters *et al.* (1950) on small series of in-patients that deoxycortone/ascorbic acid therapy is without effect in rheumatoid arthritis, but the finding that no less than 58% of the 43 out-patients treated by us showed subjective improvement is of considerable interest. It emphasizes the fact that the strictest control methods are necessary to demonstrate that this is not in fact due to the test substance. It was possible to do this by proper randomization of the control injections, combined with the other precautions described, and it seems probable that these effects are simply due to the psychological effect on the patient of the administration of a new treatment. This may also explain the good results which have been claimed for this treatment.

Conclusions

This investigation indicates that the intramuscular injection of 5 mg. of deoxycortone followed immediately by the intravenous administration of 1 g. of ascorbic acid has no specific therapeutic effect on out-patients suffering from rheumatoid arthritis. This applies to subjective effects as well as the degree of joint tenderness, power of grip, range of shoulder abduction, and speed of walking. It also suggests that the injection of any substance of no therapeutic value whatever may produce a transient subjective improvement in approximately two-thirds of cases of rheumatoid arthritis.

Summary

Forty-three patients with active rheumatoid arthritis have been treated with deoxycortone and ascorbic acid, with saline controls.

Subjective improvement occurred to an equal extent after both test and control injections.

No significant difference could be detected when the results of objective tests with control injections were compared with those in which the test substance was used.

The methods of control and assessment used are described.

Our thanks are due to Dr. W. S. C. Copeman, Professor A. Bradford Hill, and Dr. Oswald Savage for their advice and encouragement, and to the physicians of the Arthur Stanley Institute for allowing us to use their cases. We are also much indebted to Mrs. A. E. White for her help with the injections.

References

Bywaters, E. G. L., Dixon, A. St. J., and Wild, J. B. (1950). *Lancet*, **1**, 951.
Copeman, W. S. C., *et al.* (1950). *British Medical Journal*, **1**, 1006.
Davison, R., Koets, P., Snow, W. G., and Gabrielson, L. C. (1950). *Arch. intern. Med.*, **85**, 365.
Dresner, E., Pugh, L. G. C., and Wild, J. B. (1950). *Lancet*, **1**, 1149.
Fletcher, E., Lush, B., Buchan, J. F., and Wolff, S. (1950). Ibid., **1**, 94.
Freeman, M., Pincus, G., Johnson, C. W., Bachrach, S., McCabe, G. E., and MacGilpin, H. M. (1950). *J. Amer. med. Ass.*, **142**, 1124.
Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1949). *Proc. Mayo Clin.*, **24**, 181.
——— ——— ——— ——— (1950). *Arch. intern. Med.*, **85**, 545.
Henderson, E., Weinberg, M., and Wright, W. A. (1950). *J. clin. Endocrinol.*, **10**, 455.
Kellgren, J. H. (1949). *Lancet*, **2**, 1108.
Kersley, G. D., Mandel, L., and Jeffrey, M. R. (1950). *Lancet*, **1**, 703.
LeVay, D., and Loxton, G. E. (1950). Ibid., **1**, 209.
Lewin, E., and Wassén, E. (1949). Ibid., **2**, 993.
Spies, T. D., Stone, R. E., De Maeyer, E., and Niedermeier, W (1949). Ibid., **2**, 1219.
Steinbrocker, O., Traeger, C. H., and Batterman, R. C. (1949). *J. Amer. med. Ass.*, **140**, 659.
Wolf, S. (1950). *J. clin. Invest.*, **29**, 100.

The report of the first session of the Joint I.L.O./W.H.O. Committee on the Hygiene of Seafarers has just been published as No. 20 in the Technical Report Series of the World Health Organization. The committee reviewed some of the main problems affecting the health of seafarers, including such subjects as medical examinations, medicine chests on board ship, accommodation and food supplies on board, hospital treatment on board and in foreign ports, rehabilitation, and social welfare. It was decided that W.H.O. should be asked to investigate the means whereby seamen might be medically examined with a view to preventing the employment of those suffering from active pulmonary tuberculosis. Suggestions were also invited for devising a practical procedure for the medical examination of all new entrants into the service and for ensuring regular periodical examinations thereafter. On the important subject of venereal disease the committee recommended that the attention of Governments be drawn to the importance of maritime nations adhering to the Brussels Agreement of 1924 as an interim measure until a broader instrument, in the form of international health regulations for venereal-disease control, may be established.

FIVE CASES OF PUERPERAL TETANUS (ONE ASSOCIATED WITH ECLAMPSIA)

BY

D. B. JELLIFFE, M.D., M.R.C.P., D.C.H., D.T.M.&H.
A. H. C. WALKER, M.R.C.O.G

AND

STAFFORD MATTHEWS, F.R.C.S.Ed., M.R.C.O.G.

(From the Departments of Medicine and Obstetrics and Gynaecology, University College, Ibadan, Nigeria)

Tetanus is a rare complication of pregnancy, being more often seen during the puerperium. Schneider (1926) collected 109 cases from the literature, and Weinstein and Beacham (1941) reviewed 170 cases of post-abortal tetanus with a mortality of 84%. In tropical countries, especially India, China, and Africa, the condition is undoubtedly more common than these surveys of the literature would indicate.

Tetanus is said to follow abortion more frequently than it does labour at term. Infection often results from criminal interference or operative procedures, as in Case 1. In Cases 2 and 4 there was no such interference so far as could be ascertained, though native medicines are often introduced into the vagina. In Cases 3 and 5 a history of an unsterile procedure at home was elicited.

Clostridium tetani has been isolated from uterine lochia, but was not found in the two cases of the present series investigated bacteriologically. De Lee (1947) records that in Peiping approximately one-third of the population are carriers of the tetanus bacillus, but he does not specify whether this refers to the flora of the vagina or of the intestinal tract.

The incubation period of puerperal tetanus varies from four to twenty-one days (De Lee, 1947). The shorter the incubation period the worse the prognosis. According to Stander (1935) the first symptoms have been known to appear before the completion of labour. In Cases 1 and 4 the incubation period was eight days; in Cases 2 and 5 it was five days; and in Case 3 the first symptom was on the tenth day.

De Lee (1947) states that the incubation period for puerperal tetanus "is shorter than the incubation period in non-pregnant individuals." This is not borne out by the figures for the incubation period for non-puerperal tetanus given by most authors (Whitby, 1938; Brain, 1940; Price, 1946; Cecil, 1947; Harries and Mitman, 1947; Tidy, 1949).

Ibadan is the largest native city in Africa, with a population of over half a million. Living conditions are primitive and a knowledge of hygiene is almost completely lacking. Most of the inhabitants live in crumbling mud-brick houses. Tetanus is common, especially during the dry dusty season, and the portals of entry are often trivial—for example, tropical ulcers, infected "jigger" burrows (*Tunga penetrans*), the umbilical cord in the newborn (Jelliffe, 1950), etc. In India, Rogers (1944) emphasized the importance of dust-contaminated wounds as a cause of tetanus.

A labour managed according to native custom is favourable to the introduction of *Cl. tetani* into the birth canal, as the following brief description illustrates.

At the beginning of labour the patient is removed to the backyard or to a room in a mud house, the floor of which has been prepared by polishing with leaves. When the contractions assume a bearing-down character the patient is placed in a squatting or kneeling position, so that her buttocks are resting on the ground or on her heels and with the vulva touching or close to the ground. She remains in this position throughout the second and third stages of labour. If labour is delayed she may stay in this position for many hours or days, to the extent that lower-limb palsies are not uncommon.

The floor is very apt to be contaminated by goat faeces, which have been shown on many occasions to contain spores of *Cl. tetani*. In addition, Kerrin (1929) found that about 18% of a series of hen faeces examined by him contained *Cl. tetani*. In Ibadan, hens stray inside the houses as commonly as goats.

During the descent of the presenting part, a pad, which is usually a dirty cloth, is placed over the anus in order to protect the perineum, and on occasion native medicines are introduced into the vagina or smeared on the vulva, especially in cases of abnormal labour. After the completion of labour the vulva is cleaned with an unsterile decoction of herbs. This is repeated on the morning and evening of the next day. A torn perineum is similarly treated.

Case 1

An Ibo primipara aged 18 was admitted on March 20, 1950. She was at term and gave a history of having had two fits at about one and a half and two hours before admission. Labour had not begun. She had attended another antenatal clinic, and the pregnancy was reported to have been uneventful until March 16, when marked oedema was found, but she refused admission. Immediately before the first fit she had complained of frontal headache. While being admitted a third eclamptic fit occurred.

On examination the temperature was 99.8° F. (37.7° C.), pulse 88, respirations 22, and blood pressure 130/110 mm. Hg. There was marked oedema of the legs, abdominal wall, and face. Crepitations were heard at both lung bases. Abdominal examination revealed a tense uterus, reaching to the xiphisternum, suggesting hydramnios. Only one foetal heart was heard. Per rectum the cervical canal was felt to be taken up and the position of the head was high mid-cavity. Albumin was not found in a catheter specimen of urine. A modified Stroganoff method of treatment was instituted, using morphine, paraldehyde, and magnesium sulphate, together with a post-partum course of quinine sulphate as an antimalarial.

Eight fits followed in the next 12 hours, five of which were precipitated at short intervals by the onset of uterine contractions, necessitating further sedation and the administration of chloroform. Fifteen hours after admission the urine was found to be solid with albumin. The temperature was 102° F. (38.9° C.), pulse 124, and blood pressure 164/90 mm. Hg. The cervix became fully dilated some 19 hours after admission. After one and a half hours in the second stage, forceps were applied and a fresh stillbirth, weight 5 lb. 2 oz. (2.3 kg.), was delivered. A second foetus was found presenting by the head, but, as it failed to engage on rupturing the membranes, an internal version and breech extraction was performed. This was followed by manual removal of the placenta, which weighed 29 oz. (0.82 kg.) and macroscopically did not seem unduly infarcted. The baby, which weighed 5 lb. 4 oz. (2.4 kg.), has survived.

Next day the patient's temperature was 104.4° F. (40.2° C.), pulse 168, respirations 36, and blood pressure 124/94 mm. Hg. The urine was solid with albumin. Crepitations were not heard at the lung bases. Sedation was continued, together with penicillin, sulphathiazole, and quinine. Her general condition improved rapidly, but she had two further fits at an interval of five minutes, occurring 48 hours after the last fit and 40 hours after delivery. Thereafter the temperature and the pulse settled, the urine contained a trace of albumin, and the blood pressure fell to 108/60 mm. Hg.

The patient seemed to have made an uneventful recovery, when, on the eighth day after delivery at 2.30 a.m., she developed a severe pain in the back of the head and neck.

There were no definite signs. Morphine, ¼ gr. (16 mg.), was given. At 9 a.m. opisthotonos and considerable neck rigidity had developed. The muscles of the abdominal wall were board-like. Kernig's sign was markedly positive. Moderate trismus was present. She was fully conscious. Her temperature was 98.6° F. (37° C.) and the pulse 90. A lumbar puncture showed crystal-clear fluid under no increase of pressure.

Treatment was begun with antitetanus serum, 100,000 units intravenously, together with 100,000 units intramuscularly, sodium amytal, 0.5 g. intramuscularly at 9.30 a.m. and at 1 p.m., and procaine penicillin 1 ml. intramuscularly. At 1.30 p.m. she was much worse. Nuchal rigidity, opisthotonos, and trismus were marked. The body was held in hyperextension. There were no true generalized spasms, but repeated localized spasms of the jaw muscles made swallowing difficult and caused her to bite her tongue repeatedly. Morphine, ¼ gr., was given.

At 4.30 p.m. the patient was drowsy. Spasms were less frequent, her temperature was 99° F. (37.2° C.), and pulse 105. Sodium amytal, 0.5 g., was given intramuscularly. Following this, she slept through the night, and began having localized tetanic spasms only early the next morning.

At 8.30 a.m. on March 29 sodium amytal, 0.5 g., was given intramuscularly, as the patient had become restless and was having frequent generalized spasms. Trismus was very marked, and nasal feeding was started with a Ryle's tube. A vaginal examination showed the fundus uteri to be at the level of the umbilicus. The lochia were noted to be offensive and a high vaginal swab was taken, but *Cl. tetani* was not identified.

At 1 p.m. she had become comatose, although still in hyperextension. Sodium amytal, 0.25 g., was given at 9.30 a.m. and at 12 noon. The temperature had now risen to 104° F. (40° C.) with a pulse of 168. No new physical signs could be found. The lungs were clear. Procaine penicillin, 1 ml. intramuscularly, and quinine dihydrochloride, 10 gr. (0.65 g.) intramuscularly, were given. The temperature continued to rise during the night (107° F. (41.7° C.) at 2 a.m.) despite repeated tepid sponging. The patient did not recover consciousness, and died at 6 a.m. on March 30.

Impression.—A fulminating case of puerperal tetanus, with terminal hyperpyrexia, following eclampsia.

Case 2

A Yoruba woman of about 40 was admitted on January 12, 1950, at 1 a.m. She was a 4-para and gave a history of having aborted spontaneously 10 days before admission, after two months' amenorrhoea. On the fifth day after aborting she developed a stiff neck. Examination showed considerable neck rigidity, together with moderate trismus and rigidity of the muscles of the anterior abdominal wall. Kernig's sign was negative. There were no other abnormal physical signs. Her temperature was 99° F. (37.2° C.) and her pulse 120.

On admission she was given 200,000 units of antitetanus serum intravenously and morphine ¼ gr. This was followed by sodium amytal, 0.5 g. intramuscularly at 9 a.m. and 3 p.m., and phenobarbitone, 2 gr. (0.13 g.) three times a day. On January 13 the patient's condition was rather worse. Generalized spasms occurred if she was disturbed. Neck rigidity was more marked. At 2 p.m. her condition had deteriorated considerably. Generalized spasms were occurring every few minutes. Trismus was pronounced and the recti were board-like. A further injection of sodium amytal, 0.5 g., was given at 3 p.m. At 7.15 p.m. she became restless. The spasms recurred every two minutes or so, and she died at 7.50 p.m.

Impression.—A fulminating case of puerperal tetanus with a short incubation period.

Case 3

A Yoruba woman of about 30 was admitted on March 8, 1950, at 10.30 p.m. She was a primipara and gave a history of having had a normal full-time delivery at home 14 days previously. The delivery was conducted according to native custom with the patient kneeling throughout the later stages of labour. She stated that after expulsion of the placenta something protruded from the vagina (? cervix). Her attendants gave her a sitz bath containing native medicines, replaced the prolapsed tissue with a rag, and applied a dirty pad. Ten days after delivery the patient complained of difficulty in opening her mouth and of stiffness of the neck. Examination showed considerable nuchal rigidity, the neck being held in hyperextension, together with a moderate degree of trismus. The muscles of the abdominal wall were slightly rigid. Kernig's sign was negative. No generalized spasms were observed.

A purulent discharge was the only abnormality revealed by vaginal examination, the involution of the uterus being normal. Bacteriological examination did not show *Cl. tetani*. Her temperature was 99° F. (37.2° C.) and pulse 110. Her tongue was heavily furred and superficial ulceration was present around the edge. She was moderately well nourished, not anaemic, and showed no abnormality in either the respiratory or the cardiovascular system.

Treatment was begun with antitetanus serum, 200,000 units intravenously, sodium amytal, 0.5 g. intramuscularly at 11 a.m. and 5 p.m., and phenobarbitone, 3 gr. (0.2 g.) orally three times a day.

On March 9 the patient was having generalized spasms whenever she was disturbed, but was otherwise sleeping most of the time. Trismus was more marked, so that feeding was difficult. The temperature varied from 99.8° to 100.2° F. (37.7° to 37.9° C.). Sodium amytal, 0.5 g., was given intramuscularly at 5 a.m. and a course of crystalline penicillin was started (100,000 units intramuscularly twice daily). On March 10 generalized spasms were occurring more often, at about half-hourly intervals. On March 12 the fits were rather less frequent. The bowels had not been open since admission, so an enema was given. Fluids were taken fairly well. She was having phenobarbitone, 3 gr. by mouth three times a day.

On March 14 there was considerable improvement, although an occasional spasm of the face and neck occurred. The generalized spasms had stopped. She was able to swallow quite well. The vaginal discharge had also stopped. On March 17 there was considerable residual stiffness, the neck being still held in hyperextension, with rigid abdominal muscles. Absolute constipation persisted, enemas being required every third day. The mouth was clean and she was able to drink easily. Phenobarbitone was reduced to 2 gr. three times a day. On March 21 there had been no recurrence of the tetanic spasms, and the patient slept most of the time. Phenobarbitone was reduced to 1 gr. thrice daily, and on March 24 it was discontinued.

On March 30 there was no hyperextension of the neck, but residual nuchal stiffness was still present. She was able to walk if supported, but was very stiff-legged. Her back was still held in hyperextension and the abdominal muscles were very rigid. She could open her mouth three-quarters of the way and her bowels opened unaided. She insisted on taking her own discharge.

Impression.—A case of puerperal tetanus of moderate severity, responding rapidly to treatment.

Case 4

An Ibo woman aged about 27 was admitted on June 6, 1950, 10 days after the birth of her first child—a normal male infant. She had conducted her own confinement in her house. Labour had been uncomplicated and had lasted only five hours. No native medicines had been administered. Clean rags had been used as a vaginal pad. The patient gave a two-day history of difficulty in opening the mouth and of stiffness of the neck. No vaginal discharge had been noticed.

On examination definite trismus, neck retraction, and cervical stiffness were found. There was no abdominal rigidity or stiffness of the back. Her temperature was 99.5° F. (37.5° C.) and her pulse 100. Vaginal examination revealed no abnormality, the uterus being at the normal stage of involution. Treatment was begun with antitetanus serum, 200,000 units intravenously, sodium amytal, 0.5 g. intramuscularly, phenobarbitone, 2 gr. (0.13 g.) orally three times a day, and a course of crystalline penicillin (100,000 units intramuscularly twice daily).

On June 7 the trismus and neck rigidity had become much more pronounced, though she was still able to swallow. Stiffness of the muscles of the back and the abdomen had developed. There were no generalized tetanic spasms. Treatment was continued with phenobarbitone, 2 gr. four-hourly, and crystalline penicillin, 100,000 units intramuscularly twice daily. During the following week no real change occurred in the patient's condition. She was able to swallow and continued to feed the baby. On June 16 she had improved considerably, the stiffness of the cervical, abdominal, and back muscles having become much less. Phenobarbitone was reduced to 2 gr. three times a day and the penicillin was discontinued.

On June 18 she was able to walk about unaided, though she still had a minimal degree of trismus, neck rigidity, and stiffness of the musculature of the back. She was discharged at her own request.

Impression.—A mild case of puerperal tetanus responding rapidly to treatment.

Case 5

A Yoruba woman aged about 25 was admitted to hospital on June 17, 1950. She was a primipara, having given birth to a normal male child 10 days before admission. The early stages of labour had been easy, lasting only a few hours. Expulsion of the placenta, however, had been incomplete. The patient had then been made to blow into a calabash horn in an attempt to force out the retained portion of placenta. This had been unsuccessful. Attendant relatives had then tried to assist by swabbing out the vagina with plugs of fresh kapok. The woman was not certain whether the remainder of the placenta had been eventually removed or not. No native medicines had been administered during labour. Dirty rags had been used as a vaginal pad.

The patient had been quite well, save for a profuse white vaginal discharge, until five days after delivery, when she developed slight stiffness of the neck and trismus. This had become progressively worse, and on admission the trismus and cervical stiffness had become very severe. Swallowing had become difficult, and in addition she complained of lower abdominal pain and backache.

Examination showed an ill, poorly nourished young woman. Her skin was covered with the pigmented macules of old smallpox. There was marked trismus, neck retraction, and rigidity of the abdominal and back muscles. Her temperature was 101° F. (38.3° C.) and the pulse 104. The gynaecological report (Dr. J. G. Dumoulin) was: "Per abdomen, the fundus is up to the umbilicus and slightly tender; there is no tenderness in the iliac fossae. Per vaginam, a slight greenish-yellow discharge is present. The uterus is bulky and tender. There is nothing abnormal in the fornices. No active gynaecological treatment is required."

Treatment was started with antitetanus serum, 200.000 units intramuscularly, sodium amytal, 0.5 g. intramuscularly at 10 a.m. and 6 p.m., phenobarbitone 2 gr. orally four-hourly day and night, and procaine penicillin 1 ml. intramuscularly daily.

On June 18 the patient had developed full tetanic spasms. These occurred every two minutes. The temperature was 102.5° F. (39.15° C.) and the pulse 120. She was still able to swallow with difficulty. Sodium amytal, 0.5 g., was given at 10 a.m., 2 p.m., and 10 p.m. On June 19 the tetanic spasms had become almost continuous. Sodium amytal, 0.5 g., was given intramuscularly at 6 a.m. At 10 a.m. the temperature rose to 104° F. (40° C.) and the patient became stuporous. She died at 11 a.m.

Impression.—A severe and rapidly fatal case of puerperal tetanus, with terminal hyperpyrexia.

Discussion

It is not the purpose of this paper to discuss the treatment of tetanus, other than to advocate the prophylactic administration of antitetanus serum in the Tropics before undertaking any gynaecological operation, major or minor, and to all obstetrical cases that require intervention. In patients admitted with a retained placenta it is also advisable to give antitetanus serum to the baby in view of the local method of treating the cord before admission.

Tetanus associated with eclampsia seems to have been unrecorded. In Case 1 there was an interval of five and a half days between the last eclamptic fit and the onset of tetanus, from which the patient died two days later. The difference between the two types of fits was striking and clear-cut. Despite the onset of tetanus, the signs of toxaemia of pregnancy did not recur. In addition, the naked-eye and microscopical appearances at necropsy did not reveal any abnormality that could be attributed to eclampsia, from which, therefore, the patient seems to have recovered completely.

The terms "tetanus uteri," "tetanic contraction of the uterus," and "tetany of the uterus," as used by most American authors, are confusing and illustrate the need for greater uniformity and precision in obstetric nomenclature.

It is probable that the incidence of tetanus in Ibadan is much higher than case records indicate, as local women prefer domiciliary confinements and do not readily seek hospital advice for puerperal complications.

Summary

Five cases of puerperal tetanus are recorded, one of which followed eclampsia. The prevalence of tetanus is discussed in especial relation to local primitive conditions. The importance of prophylactic antitetanus serum in obstetrical and gynaecological practice in tropical countries is stressed.

References

Brain, W. R. (1940). *Diseases of the Nervous System*, p. 686. London.
Cecil, R. L. (1947). *Textbook of Medicine*, p. 217. Philadelphia.
De Lee, J. B. (1947). *Principles and Practice of Obstetrics*, 9th ed., p. 436. Philadelphia.
Harries, E. H. R., and Mitman, M. (1947). *A Clinical Practice of Infectious Diseases*, p. 557. Edinburgh.
Jelliffe, D. B. (1950). *Arch. Dis. Childh.*, **25**, 190.
Kerrin, J. C. (1929). *Brit. J. exp. Path.*, **10**, 370.
Price, F. W. (1946). *A Textbook of the Practice of Medicine*, p. 55. London.
Rogers, L. (1944). *Indian med. Gaz.*, **79**, 297.
Schneider, G. H. (1926). *Med. Klinik*, **22**, 134.
Stander, H. J. (1935). Williams's *Obstetrics*, p. 1333. New York.
Tidy, H. L. (1949). *A Synopsis of Medicine*, p. 126. Bristol.
Weinstein, B. B., and Beacham, W. D. (1941). *Amer. J. Obstet. Gynec.*, **42**, 1031.
Whitby, L. E. H. (1938). *Medical Bacteriology*, p. 168. London.

In co-operation with national government, and with Unicef, W.H.O. has launched practical malaria-control projects in four rural areas in India, as well as one in Thailand and two in Afghanistan, since the opening of its regional office in New Delhi in January, 1949. A W.H.O. venereal-disease-control project is operating successfully in North India. Maternal and child-health projects have begun in India and, in co-operation with Unicef, in Afghanistan. W.H.O. is participating with Unicef in yaws-control projects in Indonesia and Thailand. W.H.O. fellowships have enabled 61 doctors and health workers from countries of South-east Asia to obtain advanced training abroad, and a sum of $40,600 has been allotted by W.H.O. to countries in the region for the purchase of urgently needed medical literature and teaching equipment. Assistance has been given to Ceylon in its anti-filariasis campaign, and to Afghanistan in fighting louse-borne typhus. W.H.O. experts in the treatment and rehabilitation of poliomyelitis victims have given training courses in India to local health workers. This W.H.O. regional office for South-east Asia is one of the three regional offices already established by the organization, the other two serving the eastern Mediterranean region and the Americas (Pan-American Sanitary Bureau). In addition, temporary offices for Europe and the Western Pacific are functioning in Geneva and Hong Kong, respectively.

SEVEN CASES OF BARIUM CARBONATE POISONING

BY

GEOFFREY DEAN, M.B., M.R.C.P.

Port Elizabeth, South Africa

Seven patients were given barium carbonate for barium-meal investigations in December, 1948. Pure barium carbonate is a white powder exactly similar in appearance to barium sulphate and is commonly used as a rat poison. It had been placed by mistake in the barium sulphate container at the wholesale premises, and was therefore dispensed instead of barium sulphate in the preparation of the barium cream supplied to the radiologist. The quantity administered in all cases except the fatal one was a glassful, which was later shown to be equivalent to 4.26 oz. (133 g.) of dry barium carbonate. In the fatal case half this quantity was administered.

Case Reports

Case 1.—A healthy man aged 48 swallowed a chicken bone which lodged in his oesophagus. Forty hours later he was sent for *x*-ray examination. He swallowed half a glass of barium cream. The *x*-ray film confirmed the presence of the bone and he was admitted to hospital for its removal. An hour and a half after the barium swallow he was examined by the anaesthetist, who found him fit except for a raised blood pressure, 180/130, which was attributed to nervousness. While his throat was being sprayed with cocaine and adrenaline he vomited. He was given "omnopon," ½ gr. (22 mg.), and hyoscine, 1/100 gr. (0.65 g.). Half an hour later 0.7 g. of thiopentone and 8 mg. of "tubarine" were given. The bone was not impacted and was removed uneventfully. The patient recovered from the anaesthetic, and then started to vomit and purge; this was accompanied by severe griping abdominal pain, tenesmus, and the desire to micturate. He was very thirsty and soon began to complain of heaviness in his limbs and coldness. The vomiting ceased but the diarrhoea continued, he sweated profusely, and his pulse became thready and irregular; his temperature was normal and his mind clear. He was treated with warmth, hot drinks, intravenous glucose saline, nikethamide, adrenaline, and brandy. His pulse became imperceptible, and 11 hours after the operation and 13 hours after the barium he died. At necropsy acid-soluble barium compound was found in the stomach, liver, and kidneys. The equivalent of 2.75 gr. (0.18 g.) of barium carbonate was recovered from the stomach.

Case 2.—This patient was given a full glass of barium cream (equivalent to 4 oz. of barium carbonate). An hour later he started to vomit and had diarrhoea with abdominal colic; his vision was blurred. He was taken to his family doctor, who found him shocked, cyanosed, and sweating, and able to move his limbs only with great difficulty. He complained of heaviness in the arms and legs, he could talk only in a whisper, his pulse was slow and irregular; his mind was clear. I was called in consultation and advised warmth, hot drinks, nikethamide, and a sedative. Eight hours after the barium he was still able to move his limbs only with great difficulty; he had no convulsions. His pulse was 90 and still irregular. An electrocardiogram showed extrasystoles. His blood pressure was 160/100. The reflexes were all present but diminished; the Babinski responses were flexor. Twelve hours later he was improving, but remained in bed in the doctor's house extremely ill for over a week.

Case 3.—A married woman aged about 30 was given a full glass of the cream. Within two hours her face felt stiff and her vision was blurred. A little later vomiting started, followed by diarrhoea and tenesmus. When examined three hours after the meal she was weak, cyanosed, and sweating; her mind was clear, and her pulse was grossly irregular. Her blood pressure was 180/110. An electrocardiogram showed extrasystoles. The muscles of the arms and legs were painful and extremely weak, and she could move only with the greatest difficulty. All the reflexes were present but greatly reduced; there were no convulsive movements. She was immediately admitted to hospital, treated for shock, and given magnesium sulphate—a known antidote for barium carbonate, reacting with it to form insoluble barium sulphate. The weakness of her limbs and irregularity of the heart persisted for nearly a week, but she eventually recovered and was discharged after 16 days in hospital.

Case 4.—A pensioner with hypertensive failure was given a full glass of the cream for a barium meal. Vomiting and diarrhoea started after he returned home. However, he was not so ill as the other patients, perhaps because he had an achlorhydria, or at least a hypochlorhydria, which prevented or diminished the formation of barium chloride in his stomach. Also he took castor oil and, later, Epsom salts. He was admitted to hospital, where I saw him. Two days later he said he felt fitter than for many months. The dyspnoea which had greatly troubled him was much improved; this was considered to be due to the digitalis-like action of soluble barium salts on the heart muscle. Ten days later, however, he had a small cerebral thrombosis, followed after four days by a second which resulted in a left hemiplegia. He gradually recovered, but two months later a fall from his chair resulted in a large extradural haemorrhage and he died within a few days. In this case an elderly man with a weakened myocardium recovered from 4 oz. of barium carbonate; his death may have been indirectly due to the poisoning.

Case 5.—A married woman drank a full glass of the cream for a barium meal. About an hour later she felt as if her face was distorted and her lips were swollen; she complained of double vision. Vomiting, diarrhoea, and tenesmus soon followed. When seen by her family doctor she was cold and collapsed, in a state of shock, with a highly irregular pulse. Several hours later magnesium sulphate was given and she gradually recovered over the course of a few days.

Case 6.—A man was given a full glass of the barium cream and was told to take two teaspoonfuls of Epsom salts in an hour's time to keep the contents of the intestines liquid and so help to outline the appendix. He returned nearly five hours later, having vomited once but otherwise feeling well. In this case the taking of magnesium sulphate had apparently prevented harmful absorption.

Case 7.—This patient left by ship on the same day that he swallowed a glassful of the barium carbonate cream for *x*-ray purposes. He also vomited and had diarrhoea, and was given magnesium sulphate, but no further details are available.

Comment

The quantity of barium carbonate given in a glass of barium cream was estimated by the government analytical chemist at Port Elizabeth. He found that a full tumbler of the cream used contained 4.26 oz. (133 g.) of dry barium carbonate. All six patients who took this amount recovered. In the fatal case it was estimated that the patient, who was given half a glassful of barium cream, took three mouthfuls; this amount was estimated to contain approximately 1.7 oz. (53 g.).

In the stomach barium carbonate is converted by the free hydrochloric acid, if present, into barium chloride; it is absorbed from the small intestine and not from the stomach; there is, therefore, a time lag before symptoms become apparent.

Sydney Smith and Cook (1948) quote two fatal cases of barium carbonate poisoning after the ingestion of 1 dr. (4 g.). Fatal cases have also been recorded after 60 gr. (4 g.) of barium chloride (Blythe and Blythe, 1920; Sydney Smith, 1943) and after 12 gr. (0.8 g.) (Goodman and Gilman, 1941).

The pharmacology of barium has been described by Cushny (1936), who states that its chief action is to strengthen the contraction of all forms of muscle, probably by direct action on the contractile tissue. In this outbreak the effect on muscle greatly predominated over any other action: striated muscle, non-striated muscle, and the cardiovascular musculature were all affected.

In the above cases the first symptom to appear was often a peculiar stiffness about the mouth, accompanied by blurring of vision. This was rapidly followed by salivation, nausea, vomiting, diarrhoea, severe colic, tenesmus, and an intense desire to pass water. Within an hour skeletal-muscle weakness became pronounced and movement was difficult; the legs were weaker than the arms. The typical patient appeared clammy and pale, realized he was desperately ill, and talked only in a whisper; the pulse was extremely irregular, probably owing to very frequent extrasystoles; the blood pressure was raised. Even when *in extremis* the pulse did not become fast, but remained irregular and gradually became weaker. In no case was there convincing evidence of any direct poisonous action on the central nervous system; the mind always remained clear, there were no convulsions or tetanic contractions, the reflexes were diminished but not absent, the plantar responses were flexor, and there was no true paralysis.

Summary and Conclusion

Seven cases of poisoning by pure barium carbonate are described, only one of which was fatal. In this case the barium was followed by heavy sedation and an anaesthetic, which delayed vomiting and purging. The dose administered in all cases was many times that usually considered lethal. The large amount of barium carbonate administered caused rapid onset of vomiting and diarrhoea, which may account for recovery where a smaller dose might have been fatal. Magnesium sulphate, which was given in some cases, proved an excellent antidote. The symptoms were remarkably constant and all of them could be attributed to direct action on muscle. There was no evidence of any effect on the central nervous system: in this respect our views on alimentary barium poisoning should be reviewed; it may be that some of the symptoms described by other authors were due to impurities in the barium.

Finally, I would make the suggestion that barium carbonate, which in its pure form is a white powder, should be coloured by a distinctive dye so that the above mistake does not occur again.

I would like to thank all the doctors concerned with these cases for their help and co-operation in the preparation of this article.

Bibliography

Allen, A. S. (1943). *Chin. med. J.*, **61**, 296.
Blythe, A. W. and M. W. (1920). *Poisons: their Effects and Detection*. London.
Chopra, R. N., and Chakravarty, B. (1940). *Indian med. Gaz.*, **75**, 330.
Chou, C., and Chin, Y. C. (1943). *Chin. med. J.*, **61**, 313.
Cushny, A. R. (1936). *Pharmacology and Therapeutics*. London.
Du, K. T., and Dung, C. L. (1943). *Chin. med. J.*, **61**, 302.
Goodman, L., and Gilman, A. (1941). *Pharmacological Basis of Therapeutics*, p. 608. New York.
Hale-White, W. (1947). *Materia Medica*. London.
Hirvonen, M. (1944). *Acta med. scand.*, **119**, 112.
Huang, Keh-Wei (1943). *Chin. med. J.*, **61**, 305.
Ku, D. Y., Yen, C. K., and Li, C. C. (1934). Ibid., **61**, 303.
Monteiro, E. S., and Pallister, R. A. (1946). *Med. J. Malaya*, **1**, 7.
Morton, W. (1945). *Lancet*, **2**, 738.
Smith, Sydney (1943). *Forensic Medicine*. London.
—— and Cook, W. G. H. (1948). *Taylor's Principles and Practice of Medical Jurisprudence*, 10th ed. London.

The address of the staff side secretary of the General Council and the Administrative and Clerical Staffs Council of the Whitley Councils for the Health Services (Great Britain) is now 75, Portland Place, London, W.1 (Telephone, Langham 5041).

Medical Memoranda

Latent Amoebic Dysentery

The following case is of interest on account of the exceptionally long interval between infection and the development of symptoms, and because the diagnosis of amoebic dysentery was at first missed in spite of considerable investigation. It raises, too, the problem of whether the infection was contracted abroad or was of indigenous origin.

Case Report

The patient, an intelligent man aged 60, had spent much of his early life abroad with the Army. He had had little illness apart from malaria, and, although he had never had injection treatment for dysentery, he had been admitted to Army hospitals three times for diarrhoea whilst on active service in Mesopotamia between 1916 and 1918. He returned finally to England in 1919 and five years later left the Army to become a postman. He remained in good health until January, 1944, when he developed intermittent diarrhoea following the death of his youngest daughter from encephalitis. He lost weight, the diarrhoea continued, and his general condition deteriorated. Six months later he was admitted to a general hospital, where a diagnosis of ulcerative colitis was made. The condition improved following sulphaguanidine treatment, but after his discharge from hospital relapses became more frequent, especially during the winter, and he was compelled to retire from public service in June, 1945.

In the autumn of 1947 he contracted whooping-cough and it was for that reason that I first saw him. He looked extremely ill, very pale, and emaciated, and he had a severe glossitis. Diarrhoea was troublesome, with six to ten motions daily, the stools containing both blood and mucus. He weighed only 8 st. (50.1 kg.).

A blood count showed: haemoglobin, 45%; red cells 4,000,000 per c.mm. I assumed the previous diagnosis of ulcerative colitis to be correct, and therefore gave him a course of sulphaguanidine, followed by oral iron and injections of crude liver and riboflavin.

Two months later the whooping-cough had completely subsided, but the diarrhoea persisted. The possibility of this being a case of amoebic dysentery had by now occurred to me, and he was eventually admitted to hospital on February 2, 1948, for further investigation. Next day a sigmoidoscopy (8 in.—20 cm.) revealed several crateriform ulcers with haemorrhage suggestive of chronic amoebic dysentery. The stools were examined microscopically, and amoebae containing ingested erythrocytes and exhibiting pseudopodial motility characteristic of *Entamoeba histolytica* were observed in two separate specimens. A radiograph of the chest and screening showed the right diaphragm to be raised and the right costophrenic angle to be partly obscured. The white blood cells numbered 8,300, with 86% polymorphs and 1% eosinophils.

A comprehensive course of treatment was instituted combining succinylsulphathiazole, emetine hydrochloride, chiniofon retention enemata, emetine and bismuth iodide capsules, and acetarsol tablets. Vitamin B complex and "fersolate" tablets were given orally, together with a low-residue diet. The response to treatment was most satisfactory. Bowel action became normal after the fifth day of treatment and by the end of one month the patient had gained 28 lb. (12.7 kg.) in weight. By then sigmoidoscopy showed an almost normal mucosa and the stools were negative for *E. histolytica* cysts. A blood count showed: haemoglobin, 75%; red cells, 5,300,000 per c.mm.

Convalescence was progressive and uneventful, and six months later he had regained all but 3 lb. (1.4 kg.) of his normal 12 st. (76.2 kg.) weight, and was able to undertake light work. A year after treatment sigmoidoscopy revealed no ulcers and no *E. histolytica* cysts.

Comment

It seems very improbable that this was a case of indigenous amoebic dysentery, and much more likely that it was a relapse from a previously unrecognized infection contracted abroad. That *E. histolytica* may remain dormant for many years before giving rise to symptoms is well known. Many cases of amoebic abscess of the liver are found up to 30 years after the primary infection. It is much less common for amoebic dysentery to recur after such a long interval of freedom. In this case it is estimated to be 28 years, which so far as I can discover is the longest interval on record. Dobell and Stevenson (1918) described a case diagnosed 34 years after the original infection, but the patient had had subacute dysentery for ten years before their investigation and consequent discovery of *E. histolytica* in the stools.

It may be salutary to recall that Manson-Bahr (1943) states that ulcerative or mucous colitis not infrequently follows amoebic dysentery. Perhaps there are other cases of supposed ulcerative colitis like this one, in which an unrecognized infection of *E. histolytica* is the underlying cause of symptoms.

I am indebted to Dr. Carey Lynch, pathologist, Torbay Hospital, for confirming the presence of *E. histolytica* in the stools.

Angus Everard, M.B., Ch.B.,
Medical Officer, Newton Abbot Hospital.

References

Dobell, C., and Stevenson, A. C. (1918). *Trans. Soc. trop. Med.*, **11**, 4.
Manson-Bahr, P. H. (1943). *The Dysenteric Disorders*, 2nd ed. Cassell, London.

Two Cases of Paratyphoid Fever Treated with Chloramphenicol

Comparatively few cases of paratyphoid fever treated with chloramphenicol have so far been reported, and there seems to be an impression that paratyphoid infection may be more resistant to chloramphenicol than is typhoid infection (*British Medical Journal*, 1949, **2**, 919).

It is, fortunately, not easy, at any rate in this country and at the present time, to find opportunity of trying out the drug on a large series of paratyphoid infections. If a comparatively large outbreak did occur it might be difficult or even unjustifiable on humanitarian grounds to take strictly alternate cases as controls if, as seems likely, chloramphenicol is potently curative. In these circumstances it may be of interest to report the following two cases of paratyphoid fever (both of type B and Vi phage type 1) recently treated with chloramphenicol.

Case 1

A girl aged 4½ was admitted for investigation on September 1, 1949, in about her tenth day of disease, as a case of continued pyrexia. There had also been malaise, anorexia, headache, stiffness of the neck, and a tendency to several loose motions a day in the three days or so before admission. Examination did not reveal any conclusive physical signs, but toxaemia was fairly marked, the child being pale, limp, and supine, with a temperature of 103° F. (39.4° C.).

Culture of a rectal swab on the day after admission, and a faecal specimen on September 4, gave a growth of *Salmonella paratyphi B*. Blood culture was negative. The Widal reaction was: *Salm. paratyphi B* H, 1 in 500; O, 1 in 250; other groups, negative. There was no history of T.A.B. inoculations. Chloramphenicol was administered from September 4 to 12, a total of 6.25 g. being given, beginning with one capsule (0.25 g.) and following with half a capsule (0.125 g.) every four hours until the course was terminated. The patient's general condition showed clear improvement within 36 hours, but her temperature, though showing marked decline within this period (indeed the first normal reading occurred as early as 40 hours after the drug was first given), did not reach persistently normal levels until the fifth day of the drug. No further positive cultures from repeated faecal specimens were obtained, and she was discharged home on October 8 apparently in very good health.

Case 2

A youth aged 19 was admitted on September 22, 1949, in about the twelfth day of disease. His illness began rather suddenly with diarrhoea, which largely cleared up after about five days; there was no diarrhoea after admission. In the meantime, toxaemia had become increasingly evident, and, when admitted, his tongue was dry and brown, there was a profuse crop of rose spots, and his temperature on the evening of the day of admission was 104° F. (40° C.) and pulse 68.

Blood cultures and faeces gave a growth of *Salm. paratyphi B*. The Widal reaction was: *Salm. typhi* H, 1 in 5,000; *Salm. paratyphi B* H, 1 in 5,000; *Salm. typhi* O, negative; *Salm. paratyphi B* O, negative. There was no history of T.A.B. inoculations. Chloramphenicol was started on September 24 with six capsules (1.5 g.), followed in two hours by six more capsules, then one capsule (0.25 g.) every two hours until September 27, then four-hourly until October 1, and six-hourly until October 3—a total of 21 g. The temperature showed a downward trend inside 24 hours of the drug being commenced, and the first normal four-hourly reading occurred in about 48 hours from the start. It became persistently normal on the sixth day of administration, in spite of a temporary return to somewhat higher levels on the fourth and fifth days. This rise followed and may have been related to a decision not to wait for the temperature to become completely normal before making a reduction in the dosage from 0.25 g. two-hourly to 0.25 g. four-hourly at the beginning of the fourth day of treatment. A bolder dosage policy might, therefore, have resulted in an earlier return to normal temperature. Faecal cultures from the patient were still positive on October 26.

Comment

Toxic reactions that could be attributed to the drug were not observed in either case, and the drug was well tolerated and easily given. There was a strong clinical impression that improvement in the general condition proceeded at a faster pace than resolution of the pyrexia. It is possible that either of these two cases would have improved during the same period without the drug being given. Nevertheless, it is a fact that they both improved in a similar fashion whilst having the drug, and that clinical amelioration was evident within 24 to 48 hours of the drug being started. In the second case, particularly, toxaemia was sufficiently pronounced to have given rise to the fear of a prolonged and stormy course.

Acknowledgment is due to Dr. R. E. Jones, of the Coventry Laboratory of the Public Health Laboratory Service, for bacteriological data.

J. F. Galpine, M.D., M.R.C.P.Ed., D.P.H., D.C.H.
Joyce W. Brown, M.B., D.P.H.

A scholarship of £100 to £150 will be awarded by the National Association for the Prevention of Tuberculosis to a registered female nurse working at the time of her application in a hospital in Scotland. The scholarship will enable her to spend a period of from three to six months in postgraduate study in hospitals or clinics in (*a*) Scotland, (*b*) England, or (*c*) Scandinavia. Particulars may be obtained from Miss A. J. Weir, Scottish Secretary, N.A.P.T., 65, Castle Street, Edinburgh, 2, by December 1.

Reviews

CHEMOTHERAPY

Recent Advances in Chemotherapy. By G. M. Findlay, C.B.E., Sc.D., M.D., F.R.C.P. Third edition. Volume 1. (Pp. 625. £1 16s.) London: J. and A. Churchill. 1950.

The responsibilities of an author in the "Recent Advances" series vary greatly with his subject. Anatomy, for instance, is comparatively static, and progress in a number of other branches of medicine is not so rapid that a new edition requires more than one or two new chapters and scattered additions and subtractions elsewhere. But the task facing the author of the volume on chemotherapy, of which the last edition appeared in 1939, was truly formidable, and he has met it with such determination that he is expanding one volume into four. Of those which have yet to appear, one will be exclusively on malaria, the third on bacterial, rickettsial, and virus infections, and the fourth on sulphonamides and antibiotics and general principles. In this arrangement it seems that the last volume must involve some repetition of the third, but when it has been carried through the series will be, so far as can at present be foreseen, the only up-to-date account of a form of progress which has already changed the face of medicine and bids fair to transform it into almost a new subject. It may well be that psychiatry and geriatrics will take the leading places in the medicine of the future, the treatment or prevention of microbic infection having become so simple as to take a quite secondary place.

The main subject of this the first volume is protozoal infections other than malaria, and the account of trypanosomiasis naturally occupies most space, next to it in importance coming leishmaniasis and amoebic dysentery. Among minor infections of this kind, trichomoniasis and giardiasis are alone in having almost everyday interest in this country; otherwise the appeal of the greater part of this volume is mainly to the worker abroad. These chapters are prefaced by one on diseases due to "insects," which is mainly about scabies, and another on helminthic infestations, where the author discusses chiefly schistosomiasis and the new work on filariasis resulting from American occupation of the Pacific. He includes an account of the uses of phenothiazine and newer methods of eliminating cestodes and nematodes generally. The volume as a whole is a reminder that, while progress has been much more spectacular against bacteria and protista, medicine has been far from slow in combating animal parasites of all kinds. When they are described and appraised together, the number of effective new drugs available for these purposes is surprising.

The reader will form a deep respect for the author's knowledge of chemistry and pharmacology, and for the industry with which he has collected so great a mass of information about the treatment of such a variety of diseases. He will particularly appreciate the somewhat cynical humour often displayed, and frequent references to the early history of the subject, even extending to the pre-Christian era and attributing the invention of chemotherapeutic aerosols to Tobias. We are reminded in connexion with fleas that they apparently had an aversion to Pepys, and referred to a recent paper in which it is recorded that a certain man's sweat was lethal to ticks: "When they fed on him they fell off dead." It is disappointing that the only illustrations are chemical formulae, and sometimes an assessment of the relative value of the several new drugs described for a single purpose seems lacking. The chapter on amoebiasis was evidently written too early to accord "aureomycin" its rightful place in this connexion, but such omissions are inevitable in any work on so rapidly expanding a subject. The whole book is very fully documented, titles of papers as well as references being given. This volume is in itself a great achievement: its companions will be awaited with keen interest, and even with some anxiety lest this herculean task should prove to be beyond the capacity of a single author.

L. P. Garrod.

IDENTIFICATION OF TUMOUR CELLS

The Cytologic Diagnosis of Cancer. By the staff of the Vincent Memorial Laboratory of the Vincent Memorial Hospital, Boston. (Pp. 229; illustrated. £1 13s.) Philadelphia and London: W. B. Saunders Company. 1950.

All experienced histopathologists practise "cytologic diagnosis" in that they search for, and sometimes find, undoubted tumour cells in various body fluids and secretions. Of recent years there has sprung up a group of enthusiasts in this field who claim to have attained a proficiency much superior to that of other histologists and to be able to identify isolated tumour cells with great accuracy. This book is by such a group. It is essentially an atlas of photomicrographs designed to show the diagnostic features of malignant cells in smears from secretions and effusions. The illustrations are beautifully produced; and, if pictorial evidence capable of settling the doubts of more cautious pathologists were forthcoming, we might expect to find it here. But it is not so; the following grounds for doubt remain.

While some of the figures show indubitable tumour cells which we can all recognize, there are many others—for example, 36, 38, 41, 44, 46, 47, to mention only a few—in which the nature of the supposed tumour cells is at least arguable, and we may wonder if the authors may not be misled by their own enthusiasm. There will be many pathologists who will not agree that irregularity of chromatin, "glazing" of nuclei, wrinkled nuclear borders, and cytoplasmic or nuclear vacuolation are as diagnostic of malignancy as the authors suppose.

The authors give no details about the patients from whom the smears came, so that we cannot judge of the validity of the diagnoses attached to the doubtful pictures. There have been cases recorded in detail by advocates of the method—for example, that of Gates and her colleagues (*Cancer*, 1949, **2**, 838)—in which "malignant" cells were repeatedly identified by "experts" but no tumour could be found subsequently in the surgically removed uterus.

The book gives no statistical evidence of the accuracy of the authors' methods and criteria, because, they say, this is "available in the numerous papers in the literature." The reviewer questions this, on the ground set out in the preceding paragraph, and on the same grounds as did Ferguson (*Cancer*, 1949, **2**, 845), who pointed out that the proportion of false positive misdiagnoses is, on the figures of the enthusiasts themselves, far from negligible, ranging between 5% and 30% of their positive smear diagnoses.

The authors give no evidence that they are well acquainted with tissue pathology; indeed, there is evidence to the contrary. Thus, they say nothing of those cases—far from rare, especially in the cervix uteri—in which competent pathologists have real difficulty in deciding from serial sections of a small lesion whether it is an early cancer or merely a hyperplasia or metaplasia. They say nothing of the fact that not a few malignant tumours consist of well-differentiated cells which, in isolation, do not differ structurally from normal or hyperplastic cells. They say nothing of the great cellular atypism that can occur in non-neoplastic lesions; and one wonders if they are aware that many a regenerative hyperplasia shows much more "malignant" cells (judged by the criteria accepted in this book) than many a carcinoma. Very probably there is room for improvement in the work of some pathologists in their identification of tumour cells in fluids, but this will be achieved only by those with a sound knowledge of histopathology, both of cancer and non-cancer tissues. Purely "cytologic diagnosis" will always suffer from a high proportion of either doubt or error.

Rupert A. Willis.

TELLING THE DIABETIC

Helpful Hints to the Diabetic. By W. S. Collens, B.S., M.D., and L. C. Boas, A.B., M.D. (Pp. 135; 64 figs. 21s. 6d.) Oxford: Blackwell Scientific Publications. 1949.

This is one of those books which invite the patient to co-operate in the treatment of his disease. The nature, symptoms, and principles of treatment are discussed in terms presumably intended to enlighten the sufferer, although it is questionable whether such phrases as "Diabetes is a disease in which the normal process of the utilization of glucose by the cell is impaired because of a disturbance in the function of insulin" would mean much to the ordinary diabetic out-patient. The authors' prose style is based on the principle of avoiding a word of two syllables when one of three is available; thus glucose is never used, but always "utilized"; food is not eaten, but "ingested"; the diabetic does not crave for sugar, but has "an abnormal desire for unusual quantities of sweet and starchy foods."

Food tables are designed for the American larder and are of little help to the diabetic in this country. More than ten pages are devoted to an exposure of the "cures" for diabetes which adorn the advertisement columns of American newspapers, a topic of little interest to the English diabetic. Although the chapters on administration of insulin and urine testing are clear, readable, and excellently illustrated, this book cannot be recommended to diabetic patients in Britain, who are already well served by native authors.

R. Bodley Scott.

INDUSTRIAL TOXICOLOGY

The Chemistry of Industrial Toxicology. By Hervey B. Elkins. (Pp. 406. £2 4s.) New York: John Wiley and Sons. London: Chapman and Hall. 1950.

The author says that this book is an attempt "to treat industrial poisons primarily from the point of view of the chemist and engineer." Any industrial medical officer experienced in the chemical and related industries will know the nature of the problem which he should face but which, not infrequently, he gives up. It is that *he* should learn a great deal of industrial chemistry and that the *chemist and chemical engineer* should be induced to understand the nature of industrial poisonings, acute and chronic, and the way in which co-operation with the medical department can assure good health and happy, productive work. The points of view of doctor and technologist will never be identical, but much can be done to bring them together to the benefit of the worker. For this the doctor must shed his pomposity and his mystery-man state of mind, and the technologist must climb down from his pinnacle of electron shells and thermodynamics.

The author of this book has taken a rather different attitude towards what is needed by the chemist and engineer, for he has given them much useful information on sampling and analytical methods, a valuable chapter on maximum allowable concentrations, and over 180 pages of, in the main, short paragraphs on a large number of elements and compounds of industrial significance. Most paragraphs are preceded by some physical data and a note on harmful effects, as, for example, "Damage to lungs, eyes, skin." Physiology is discussed in two chapters. The references to the literature will probably be more useful than the text.

The dilemma before the author in writing a book of this kind is not underrated, nor is the notable effort made. Perhaps a book on this subject suitable for technologists cannot be written by a single individual. But, if written, it must be much more graphic in precisely the field which the present author says is not his business. Except in the section on analytical methods there is no chemistry in this book, unless giving the empirical formula of a compound is called chemistry; except in the most summary and rudimentary way there is no toxicology. The book is expensive for what it offers. It certainly is not suitable for continuous reading and is hardly authoritative enough for a reference book. But it deserves a place in the chemical factory or laboratory for its collections of useful quantitative data.

M. W. Goldblatt.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

British Surgical Practice. Edited by Sir Ernest Rock Carling, F.R.C.S., F.R.C.P., and Sir James Paterson Ross, K.C.V.O., M.S., F.R.C.S. Vol. 8. (Pp. 597. 60s.) London: Butterworth. 1950.

Humanism, History, and Natural Science in Medicine. By F. M. R. Walshe, M.D., D.Sc., F.R.S. The Linacre Lecture, 1950. (Pp. 29. 1s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

A Text-Book of X-Ray Diagnosis. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., and P. Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E. Vol. 3. 2nd ed. (Pp. 830. 70s.) London: H. K. Lewis. 1950.

The Biochemistry of the Nucleic Acids. By J. N. Davidson, D.Sc., M.D. (Pp. 163. 7s. 6d.) London: Methuen. 1950.

Science News 17. Edited by J. L. Crammer. (Pp. 156. 1s. 6d.) Harmondsworth: Penguin Books. 1950.

Manual of Zen Buddhism. By D. T. Suzuki, D.Litt. (Pp. 192. 15s.) London: Rider. 1950.

Practical Histology Class Notes. By H. S. D. Garven, B.Sc., M.D., F.R.S.Ed. Parts I and II. (Pp. 220. 20s.) Glasgow: John Smith. 1950.

Facial Paralysis. By J. Parkes Findlay, M.B., Ch.M. (Pp. 47. 17s. 6d.) Sydney: Distributed by Angus and Robertson, Ltd., 89, Castlereagh Street, Sydney, Australia. 1950.

Tumours of the Peripheral Nervous System. By A. P. Stout, M.D. Section II, Fascicle 6, of *Atlas of Tumour Pathology.* (Pp. 57. 60 cents.) Washington, 25, D.C.: Armed Forces Institute of Pathology. 1950.

Primer Congreso Mexicano de Ginecologia y Obstetricia: Official Proceedings. (Pp. 833. No price.) Mexico: Asociacion Mexicana de Ginecologia y Obstetricia. 1949.

Medizinische Psychologie. By E. Kretschmer, Ph.D., 10th ed. (Pp. 304. M. 24.) Stuttgart: Georg Thieme. 1950.

Das Strichbild. By R. Pophal. (Pp. 60. M. 6.60.) Stuttgart: Georg Thieme. 1950.

Erythroblastosis Foetalis und Blutaustausch. By A. S. Wiener and I. B. Wexler. (Pp. 56. M. 4.20.) Stuttgart: Georg Thieme. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY OCTOBER 7 1950

WOMEN IN MEDICINE

Whether or not one holds with Sir Robert Hutchison[1] that women in men's schools are a disturbing element, the fact must be faced that all the London medical schools, for better or for worse, are now co-educational. The medical schools this week are beginning their new year and are celebrating the event by dining and speech-making. One such speech, by a woman to a woman's medical school, we print elsewhere in this issue. Professor Lillian Penson, who is Vice-Chancellor of London University, usefully reminds her audience that they are part of a university—an idea students who live in the sprawling mass that is London may from time to time forget.

When the Goodenough Committee[2] reported in May, 1944, it drew attention to the difficulties besetting women undergraduates who wished to study medicine in London. While in the rest of Britain medical co-education had for many years been a familiar feature, in London at the time of its report nine out of the fifteen medical schools of London University admitted men students only. At the same time entry to one school—the London School of Medicine for Women, now the Royal Free Hospital Medical School—was limited to women. The Goodenough Committee considered that "in the interests of the public and of the medical profession . . . co-education should become the normal practice in every medical school." And, furthermore, the committee added that the number of women students in any one school should be a "reasonable proportion" of the whole, reason dictating that this should be one woman to every four men. At almost the same time the Senate of London University said that its policy was to open all the London medical schools to men and women on terms of equal opportunity. The matter was clinched when the University Grants Committee said to the medical schools in effect, "No co-education, no grant." By 1947 all the medical schools of London University were co-educational.

As Table I at page 833 shows, in Britain the proportion of women medical students to men in 1938–9 was 1:5.7. The provincial, Scottish, and Welsh universities, which between them accounted for 1,275 out of the 1,930 women medical students in Great Britain, showed the "reasonable" proportion of one woman to four men. In the schools of London University no fewer than 357 of the 551 women medical students were segregated in the London School of Medicine for Women, the remaining 194 being dispersed in King's College (24), King's College Hospital (50), Queen Mary College (4), University College (59), and University College Hospital (57). There were also 38 women undergraduates at the West London Hospital for Women. Taking the figures for London as a whole, there was one woman to every eight men medical students. In the Scottish extra-mural schools (the Anderson College of Medicine and St. Mungo's College, Glasgow, and the School of Medicine of the Royal Colleges, Edinburgh), there was one woman to every nineteen men. But these schools were exceptional, as in 1938–9 over 40% of the Scottish extra-mural students were from foreign countries.

By 1948–9 the total number of women medical students in Britain had risen by 1,001 (2,931 as against 1,930 in 1938–9), while the number of men students had fallen by 756 (10,281 as against 11,037). By that year the proportion of women students to men had risen to 1 : 3.5. This represents an increase of 50% over the figure for 1938–9 (1 : 5.7). In Scotland, Wales, and the provinces there was very nearly one woman student to every three men, while in London the proportion of women (18.9%) was close to the 1 : 4 proposed by the Goodenough Committee. On the debit side of the balance it must be recorded that the West London Hospital for Women, which in 1948–9 had 68 women, has now ceased to recruit undergraduate students, and will in future restrict itself to postgraduate teaching.

If we look more closely at the situation in London, we see from Table II at page 833 that the schools which were co-educational before the war have continued to train about the same proportion of women students. King's College and King's College Hospital taken together averaged 1 : 5.7 in 1948–9; University College and University College Hospital show a slightly higher proportion of women, 1 : 4.7; at Queen Mary College, the figure is a little less, 1:9. But it is the nine naughty schools which formerly were the stronghold of the male that arouse most interest. None of them has yet attained the "reasonable proportion" suggested by the Goodenough Committee. St. Bartholomew's, Charing Cross, and St. George's Hospitals come nearest with one woman to every seven men. Those lagging behind in gallantry are Guy's, the London, and Westminster, where the proportion is less than 1 : 19. Intermediate, with a slightly higher proportion of women than this latter group, are the Middlesex, St. Mary's, and St. Thomas's Hospitals. When the Royal Free Hospital is included, the total proportion of women medical students at London University in 1948–9 falls only just short of the 1:4 recommended in the Goodenough Report. If each school had its reasonable proportion of women there would then be 479 more women medical students in London than at present. Unless extra facilities were provided, this would mean so many fewer places for men—a reflection which may make one question the wisdom of trying to spread the load too widely. At a time when so many students are clamouring at the gates of the medical schools, feminists should take note of the fact that at the Royal Free Hospital, also co-educational, there was last year the very unreasonable proportion of only 1 man to every 93 women medical students.

[1] Hutchison, Sir Robert, *British Medical Journal*, 1941, **2**, 623.
[2] *Report of the Interdepartmental Committee on Medical Schools*, H.M.S.O., 1944.

THE TREATMENT OF RABIES

Having eradicated rabies 50 years ago, we in this country are apt to forget that it still exists in most other parts of the world. No continent is exempt, and even in the United States there are still some 50 human cases annually, as well as many thousands of affected animals. The treatment of the presumably infected human being is thus an ever-present problem throughout the world, as of course is the control of the disease in animals. It was therefore natural that the World Health Organization, at its Second Assembly, should have decided to convene an expert committee on rabies. This committee, which included three representatives from the U.S.A. and one each from England, France, India, and Persia, met in Geneva in April last, and the report[1] of this meeting has now been circulated. It serves as a reminder that much progress has been made in methods of immunization, the general application of which should have valuable results.

Many of the recommendations of the committee are concerned with the method of preparation of the vaccine for the immunization of human beings or dogs. Desiccation, as in the original Pasteurian method, or treatment with phenol has generally been used up to the present as a means of inactivating the virus. There is now strong evidence that a more potent vaccine can be secured when inactivation is carried out by exposure to ultra-violet light. A good account of this method is given by Habel,[2] of the U.S. Public Health Service, himself a member of the committee. Infected brains are emulsified in buffered salt solution by means of a Waring blender and exposed to light from a special lamp in a thin-walled rotating quartz tube. The time required for inactivating rabies virus varies from 0.34 to 0.72 seconds, even though the suspension be as concentrated as 20% —a proof not only of the efficiency of irradiation but of the extraordinary capacity of the Waring blender, now an indispensable laboratory tool for many purposes, to reduce tissues to particles of little more than nuclear size. Habel found the degree of protection afforded by vaccine prepared in this way to be much greater than that conferred by a phenolized vaccine. It is of course very desirable that the immunizing potency of any vaccine used should be ascertained by a standard method, and the method of test described by Habel and Wright[3] forms the subject of another recommendation by the committee. It consists in administering six intraperitoneal doses of vaccine to mice at two-day intervals, followed by intracerebral inoculation with fixed virus, of which test animals receive larger doses than the controls. Owing to variations in the properties of virus used for this purpose in different laboratories, it is proposed to make available a standard challenge virus for use in these tests. The type of vaccine advocated for the prophylactic immunization of dogs is that prepared by cultivation of the Flury strain of virus in eggs, as described by Koprowski and Black.[4] A potency test for this vaccine, carried out in guinea-pigs, is also prescribed.

The most serious drawback of vaccine treatment for rabies in man has been the occasional occurrence of paralysis, due to a demyelinating lesion in the cord. This has always been regarded as a peculiar reaction to some constituent of nervous tissue in the vaccine rather than as an effect of the virus, and therefore there has always been a possibility that this unknown factor could be identified or at least eliminated. Progress in this direction has been made, though the committee considers that further study is called for. It is now said to be possible to detect the paralysis-producing factor by inoculating guinea-pigs with a mixture containing the brain suspension and a suspension of mycobacteria in mineral oil. Furthermore, Bell, Wright, and Habel[5] claim to have removed the factor from a brain suspension previously extracted and inactivated with benzene by the addition of calcium acetate; the washed deposit then constitutes the vaccine, the factor having remained in solution. As the report observes, this danger could also be eliminated by using egg-cultivated virus in place of brain suspensions for preparing vaccines for human use, if this should prove feasible.

Another section of the report discusses the use of immune serum, with or without vaccine, for the treatment of presumably infected persons. On theoretical grounds this should be very effective if given at a sufficiently early stage, but the evidence of its value is conflicting and unsatisfactory. Habel[6] has reviewed this evidence and reported studies of his own of the preparation of immune serum in rabbits, its concentration, and its protective effect in guinea-pigs, mice, and monkeys

[1] The report will be printed as an official document of the W.H.O. Technical Report Series. Copies may be obtained from the World Health Organization, Sales Section, Palais des Nations, Geneva, Switzerland.
[2] *Publ. Hlth Rep., Wash.*, 1947, **62**, 791.
[3] Ibid., 1948, **63**, 44.
[4] *J. Immunol.*, 1950, **64**, 185.
[5] *Proc. Soc. exp. Biol., N.Y.*, 1949, **70**, 457.
[6] *Publ. Hlth Rep., Wash.*, 1945, **60**, 545.
[7] *Amer. J. Med.*, 1950, **8**, 412.

when administered after their inoculation with street or fixed virus. It is clear from his results that the degree of protection afforded by serum is greater than that by vaccine, the best results being obtained with the two combined. It has to be remembered in this connexion that post-infection treatment of small animals with vaccine is never very successful, the incubation period being short compared with that in man. Koprowski, van der Scheer, and Black[7] have recently made still stronger claims. The material used was the γ globulin from the serum of rabbits or sheep immunized with vaccine made from the egg-adapted Flury strain and from rabbit-brain fixed virus. This serum neutralized large multiples of a lethal dose of virus when mixtures were injected intracerebrally in mice, and protected the majority of guinea-pigs and hamsters when given 24 hours after bilateral intramasseteric inoculation with street virus. Animals so inoculated and treated with vaccine all died. The serum has also been successfully used in 20 human subjects with either laboratory or street infections, some of a very dangerous nature. The authors made assays of the protective titre of the serum of some of these individuals, with interesting results. In those given vaccine only the titre never exceeded 1 in 6 and was often less than 1 in 2. In one subject given serum as well as vaccine it was 1 in 50 on the day after the serum was given, and 1 in 65, 70, and 55 after 3, 7, and 30 days respectively. This single piece of evidence strongly suggests that such serum gives a high degree of initial protection, which can be maintained by subsequent doses of vaccine. An immediately practical recommendation in the report is that a trial of immune serum should be made in Persia, where rabid wolf-bites, often involving the face, have a mortality exceeding 30% despite treatment with phenolized vaccine. There were 60 such cases last year, and there have been 22 during the first four months of 1950. The report includes a map of Persia showing the air and road routes by which it is hoped that serum may be dispatched to the aid of patients. It is laid down that serum must be given within three days, and that it is not to be used for infiltration of the area of the bite. Alternate cases are also to be given vaccine. Samples of the vaccine used and specimens of serum obtained at different stages of immunization are to be sent to Dr. Habel by air mail for tests of potency and of neutralizing power. If this trial proves feasible its results should be of great interest. The form of the disease is evidently as severe as any known, and the mortality is such that more effective treatment should declare itself unequivocally.

The committee also considered other aspects of diagnosis, treatment, and control. It recommends the intracerebral inoculation of mice or hamsters for confirming the presence of the virus in animal material, and redefines precisely the indications for antirabic treatment. Methods of control in animals are discussed at length; it is suggested that a field demonstration of the use of egg-culture vaccine in dogs should be undertaken in a country where canine rabies is endemic. In view of the recent recognition of the infection in various wild animals other than canines the committee considered that further oecological studies were necessary and also further studies by recently developed methods of the properties of different strains of virus. It is proposed that the committee should meet again next year, and an international conference on rabies is also projected, but is unlikely to take place before 1953.

PREVENTIVE PAEDIATRICS

When a public highway has been in use for a long time it wears into deepening tracks as well as potholes. The authorities may say, rather peevishly, that they are constantly doing repairs, but they ignore the fact that even the best roads need reconstruction from time to time. So it is with other public services, such as infant welfare and school medicine. They have a fine record of progress soundly buttressed by statistics showing a remarkable improvement in child health. Yet Professor Alan Moncrieff has had the courage to challenge them in their strength and to suggest radical changes. In his Dawson Williams Prize Lecture, which is published in the opening pages of this issue, he first discusses the work of infant-welfare centres, applying the test of preventive paediatrics to the diseases and disorders of children. In this respect he feels that the service has somehow failed to provide opportunities for advances in knowledge. The most valuable recent advances in the management of breast-feeding, for example, have come from outside, and the more practical applications of immunization and the trial of the newer antibiotics have been accepted with the reluctance which so often accompanies a too tidy administration. One of the obvious difficulties of criticism is that the infant-welfare services vary enormously from area to area. It is perhaps hardly fair to cite a comment of a prominent M.O.H. as evidence that the service is disloyal to breast-feeding. What is clear, however, is that there are serious gaps in the scheme, especially in its contribution to the early weeks of infant life. There are many lessons yet to be learned about the care of the newborn, and better co-operation is needed between the infant-welfare service, the hospitals, and general practitioners. Professor Moncrieff quotes a comment of the Royal Commission on

[1] *Solving School Health Problems*, 1942, Commonwealth Fund and Humphrey Milford.

Population that "a serious defect in the maternity services is that women are often discharged from hospital on the ninth or tenth day, before they have been taught to handle their babies." This criticism is too frequently true, but the remedy that the health visitor should be on the doorstep to greet the mother on her arrival home surely falls short of the target: the careful training of every expectant mother should begin at the infant-welfare centre long before her first baby arrives. This is the practice of progressive centres, where demonstrations of the everyday duties of motherhood are carried out by health visitors and voluntary workers. Nevertheless, there is a great waste of a health visitor's time in routine work which could easily be done by lay helpers.

On the clinical side Moncrieff is undoubtedly on strong ground when he pleads that the paediatric service in maternity hospitals should provide continuous supervision from birth through infancy. By this means more could be learned about the origins and progress of the common infections of childhood, and also of the so-called defects such as adenoids. The significance of tuberculosis in the early years of life has been slurred over, and it is time for the infant-welfare movement to take up an aggressive attitude. As Moncrieff says, "Surely the early detection of tuberculous infection, the tracking of contacts, the use of B.C.G. vaccine for negative reactors amongst them, could be made a fine co-operative effort between the infant welfare and tuberculosis branches of the health service." There are many other fields, some hardly cultivated at all, in which the welfare centre could help—the promotion of mental health through parent education; an approach by similar methods to sex teaching; and intelligent instruction on the prevention of accidents in the home. Recent studies on infant morbidity indicate a need for the more prompt and efficient care of minor maladies, and of serious illness before it becomes serious. Who is to carry out this treatment? Surely it must be the family doctor in the family home. Moncrieff goes on to say that the medical officers of the infant-welfare centre should logically be the family doctors who will be carrying out the work in the homes. Hitherto, this sensible view has been limited by the element of time and the barrier of competition. The family doctor, working more or less by himself, has in fact found it difficult to arrive at an infant-welfare centre at the scheduled time. Lateness and irregularity of attendance are fatal to the work of a centre. Again, general practitioners have found it embarrassing at infant-welfare centres to treat, or even to examine, the children of other practitioners' patients. Moncrieff says wisely that the health visitor of the future should not be made into a subsidiary social worker: she should in fact receive more training than at present in the nursing of children. In addition, she ought to be trained in educational methods. The family doctor may not have much opportunity to become proficient in this vital subject, yet health education must remain within the province of doctor and nurse because of its ever-changing medical background. It might be reasonable to suggest that the educational work of infant-welfare centres should be undertaken by health visitors and supervised by the medical officer of health and his staff.

The essential structure of the school health service has changed little during the past generation or so, although of course many advances in clinical medicine have been adopted. The most notable progress has been made in the ascertainment and care of handicapped children. A reconstruction of this service is overdue. Nyswander's[1] careful study in the United States exposes the principal weakness of our own system, for she showed that a trained teacher working in harmony with a nurse can detect with great accuracy those school-children who ought to be seen by the physician. If they err, as they will do, on the safe side, no harm is done. The results are wholly beneficial: each child with a suspected defect is examined at leisure by a physician trained in child health instead of being subjected to a dreary routine of superficial inspection. The entire screening system is strengthened, with economy in both man-power and money. The responsibility thrown upon teacher and nurse is a stimulus rather than a burden to them, and it tends to improve co-operation. The school physician on his part is given time for careful, interesting clinical work and opportunity to observe the progress of all the children who suffer from a mental or physical handicap. Most important of all, the parents appreciate the value of thorough examination and gain confidence in the service as a whole. The physician, escaping thus happily from a wilderness of routine inspections, can devote more time to the broader aspects of preventive medicine in his school work.

Moncrieff justly stresses health education, a subject in which every school health officer should be trained, and he urges the importance of bringing him into the teaching programme, both in hygiene and in physical education. There are still many areas in which the school health staff is not consulted on the teaching of hygiene, on sex education, or even on physical training; and there are education authorities which do not give him a voice in the planning of ventilation, lavatories, rooms for drying and changing, and other essential health equipment in schools. This is patently wrong and ought to be remedied without delay. It is no answer to say that some authorities have already adopted the reconstruction which Moncrieff recommends. The time has come for it to be generally accepted.

DRUG ACTION AND SUGGESTION

The clinical trial of a drug may, for obvious reasons, bear little relationship to its effect upon an isolated organ suspended in a standard solution. Clinically the action of the drug can be profoundly modified by numerous factors arising from the vagaries of the intact patient, while in laboratory experiments the effect depends only on the pharmacological action of the drug itself. Those who have attempted to obtain basal conditions for such a clinical test as the B.M.R. will appreciate the difficulties involved, particularly the difficulty of obtaining a basal mental state. Wolf[1] has recently demonstrated the effect of psychological influences on the pharmacological action of drugs in a series of experiments mostly carried out on Tom—his famous modern Alexis St. Martin—who has a large gastric fistula. Wolf has been able to correlate changes in the colour and turgidity of Tom's gastric mucous membrane with measurements of secretion and motility, and he found that the factors apparently of importance in experiments with drugs were the state of the end-organ when the drug was given; the setting in which the drug was employed, including the mode of administration and the effects of suggestion, implicit or expressed; and previously established habits of reaction. Thus urogastrone administered at a time when Tom's stomach was in a normal state usually induced an inhibition of secretion associated with pallor of the mucous membrane. If, on the other hand, it was given when his stomach was turgid and actively secreting, due to a period of frustration, gastric hyperfunction was actually somewhat enhanced rather than inhibited. Further, resentment caused by a hypodermic injection of distilled water greatly increased gastric hyperaemia and secretion. The introduction of 10 ml. of the syrup of ipecacuanha through a Levine tube into the stomachs of two female subjects constantly caused nausea and vomiting, the effect being shown objectively by the characteristic cessation of gastric contractions in kymographic recordings. When, however, a second dose was introduced through the tube, this time with the reassurance that the symptoms would be abolished by it, the nausea subsided and gastric contractions recurred. Doubtless this mechanism operates in any enthusiastic therapeutic regime and is the stock-in-trade of faith healers. In the last of the experiments Tom was conditioned to the administration of neostigmine, to which he invariably reacted with the usual abdominal cramps and diarrhoea and with gastric hyperaemia, hypersecretion, and hypermotility. But when, unknown to him, tap-water, lactose, and even atropine (a direct antagonist to neostigmine) were substituted, identical effects were obtained.

Such experiences confirm what is well known but sometimes forgotten, that the human body reacts not only to physical and chemical stimulation but also to the symbolic stimuli of words and events which have acquired a special significance for the individual. Not only the frequency but the magnitude of the "placebo effects" reported in these experiments was impressive, and they should certainly be taken into account in pharmacological experiments in man and even in the intact animal. Elsewhere in this issue Drs. C. E. Quin, R. M. Mason, and J. Knowelden discuss the difficulty of assessing improvement during the drug treatment of rheumatoid arthritis. When investigating the value of deoxycortone and ascorbic acid injections they found that subjective improvement occurred to an equal extent after both test and control injections, and that when objective tests were used the results obtained with the test substance and the control injections were the same. It is customary to control the clinical trial of drugs with inert placebos when the data to be evaluated are subjective, but when they are objective placebo control is usually omitted. The need for such control is suggested by the fact that placebo effects may be potent enough to cause not only objective changes at the end-organ resembling those attributable to potent pharmacological action but even reversal of the expected action. Thus the familiar difficulty of evaluating the effect of new drugs on patients arises not only from uncritical therapeutic enthusiasm but also from the actual pharmacological effects of "placebo action."

[1] *J. clin. Invest.*, 1950, **29**, 100.

HEXAMETHONIUM

If methyl groups are substituted for hydrogen in the ammonium radical, and if two of the trimethylammonium groups so formed are joined by a chain of six $-CH_2-$ groups, the result is hexamethonium. This was examined in the first place as a substance which might have the properties of D-tubocurarine, but was found by Paton and Zaimis[1] to be much inferior in this respect to decamethonium, which is now commonly used in anaesthesia as a curarizing agent. Hexamethonium was indeed first introduced as an antidote to decamethonium. It has, however, a certain curarizing action which is much more evident at the sympathetic ganglion than at the motor end-plate in skeletal muscle. The transmission of the nerve impulse from the motor nerve to the motor end-plate and likewise the transmission from a preganglionic fibre to a postganglionic fibre in the autonomic system are both believed to be effected through the liberation of acetylcholine, and a curare-like substance which blocks the first transmission should also block the second. D-Tubocurarine is more active at the motor end-plate, while hexamethonium is much more effective at the autonomic ganglion, though both have some action at both sites of transmission. The reports published in this issue by Drs. A. Campbell and E. Robertson on the treatment of hypertension and by Drs. A. W. Kay and A. N. Smith on the effect of hexamethonium on gastric secretion are both based on the property which hexamethonium possesses to block transmission at the autonomic ganglia. The effect on hypertension is due to block in the sympathetic autonomic ganglia, and that on gastric secretion to block in the cranio-sacral autonomic ganglia, if we use Langley's term—that is to say, in the vagal ganglia, which are supposed to exist in the stomach wall.

The sympathetic ganglion is a point in the efferent sympathetic pathway which corresponds to the junction between the upper motor neurone and the lower motor neurone running to skeletal muscle. A block at the sympathetic ganglia interrupts the stream of motor impulses, causing vasoconstriction. Campbell and Robertson have found that daily administration of hexamethonium for a period from one to five weeks brings down the blood pressure and that it remains down when the drug is discontinued. This is a remarkable and hopeful result. The cause of the hypertension is either excessive tone in the arteries or an excess of constrictor impulses from the sympathetic centres. While it is clear that the blood pressure will fall when constrictor impulses are excluded, whatever the cause of the hypertension, it is not clear why the blood pressure does not rise again when the block is removed. Failure to do so suggests that the hypertension is due to some vicious circle, and once this is broken the hypertension disappears.

The action of hexamethonium in diminishing gastric secretion is due to block of the secretory impulses coming down the vagus nerves. Kay and Smith found that when the drug was given by mouth its effect varied in different patients: five out of ten had achlorhydria, three had diminished secretion, while in two there was no effect. They also found that the iodide and bromide salts were more active than the chloride, though it is difficult to see what can be the reason for this. The side-effects do not appear to have been serious in either investigation: when postural hypotension occurred it could be overcome by activity.

[1] Brit. J. Pharmacol., 1949, **4**, 381.

AN ACCIDENT IN THE X-RAY ROOM

All who work in radiological departments are well aware of the danger of accidents occurring to those who misuse electrical apparatus, and stringent precautions are taken to guard against disaster. The report appearing on another page by Dr. Geoffrey Dean illustrates a different danger—that is, the accidental administration of a barium compound other than the harmless insoluble barium sulphate for outlining the alimentary tract. Seven patients received a dose of barium carbonate much in excess of doses that had proved fatal in earlier recorded cases. Fortunately only one case was fatal. This patient had less barium than the other six, but was given an anaesthetic soon after: the effect was to prevent the vomiting and diarrhoea which, Dr. Dean believes, were responsible for hastening the excretion of the barium and so saving the lives of the others. The symptoms were similar in all the patients, with the classical signs of salivation, abdominal cramps, vomiting, and purgation. At the beginning of their illness a number of patients noted a peculiar stiffness of the face and blurred or double vision: these symptoms are not described in the standard textbooks and are worth bearing in mind. Early diagnosis in such cases is of special importance, because there is an effective antidote in magnesium or sodium sulphate. Magnesium sulphate was given for another purpose to one of Dr. Dean's patients immediately after the barium, and he escaped all the worst symptoms. The poison had no action on the central nervous system, and, apart from the intestinal disturbances, progressive muscular weakness was the main feature. This is in agreement with the pharmacologists' views on the action of barium—that it affects the muscle fibres rather than the nervous system. Many textbooks mention that convulsions occur in barium poisoning, though one older authority[1] emphasizes that muscular weakness and paralysis rather than contractures dominate the picture of barium poisoning in man.

This accident occurred because the wholesale chemist had put barium carbonate into containers labelled barium sulphate. We are all inclined to accept without question that the statement on any label does in fact correctly record the nature of the contents of the container. Some years ago Keall and his colleagues[2] described three cases of tellurium poisoning with two fatalities among patients given the contents of a bottle labelled "sodium iodide" for retrograde pyelography. The solution was in fact 12½% sodium tellurite, but the authors gave no details about how the mistake was made. There are, of course, many ways in which the wrong contents or the wrong slip of paper might find their way into or on to a container. Some organizations are well aware of this and have established expensive but effective checks to ensure that none but correctly labelled materials leave their premises. If hospitals decide to deal only with such firms they should be prepared to pay the slightly greater cost as the price of safety.

[1] Schmiedeberg, O., *Pharmakologie*, 1902, Leipzig.
[2] *Brit. J. industr. Med.*, 1944, **3**, 175.

VICTORY MEDAL FOR DIABETES

Dr. Elliott P. Joslin, who celebrated his 81st birthday last June, is known throughout the world as a distinguished veteran in the fight against diabetes. Just over two years ago, as part of his effort to educate diabetic patients in healthy living and to show them what proper care can do, he founded a Victory Medal to be presented to any person who is still free of all vascular disease after a quarter-century or more with proved diabetes. In the 24 months up to June 1, 1950, he had found 20 patients who passed this test, and last year[1] he personally handed one medal to Dr. R. D. Lawrence, who for 20 years has led an active professional life as a consultant in diabetes and is said to have been one of the first people in Britain to receive insulin.

On behalf of the Advisory Committee of the Diabetes Fund of the Boston Safe Deposit and Trust Company, which holds and administers the Medal fund, Dr. Howard F. Root has now invited (see p. 840) the Editor of the *British Medical Journal* to award a bronze Victory Medal in Britain. This gift has been accepted with warm appreciation as a generous gesture of good will from our American colleagues, and the medal is now in the office of the *Journal*. It is hoped to set up a small informal committee to decide how best to award it. The medal, illustrated in Dr. Root's letter, has been designed by Amelia Peabody. It measures 2 inches across, and on the reverse side appear these words: "For life and health through perseverance and scientific medicine."

On October 12, the first degree day of the Michaelmas Term at Oxford, the Osler Memorial Medal will be presented to Sir Ernest Laurence Kennaway, F.R.S., who is an honorary Fellow of New College. The award was instituted in 1925 as a memorial to Sir William Osler, Regius Professor of Medicine at Oxford from 1904 to 1919. The medal is given to the Oxford medical graduate who has made the most valuable contribution to the science, art, or literature of medicine and who has not previously held the award. It is given once every five years only. Sir Ernest Kennaway, who is Professor Emeritus of Experimental Pathology in the University of London, has devoted a large part of his career to cancer research in this country and in the U.S.A.

[1] See *British Medical Journal*, 1949, **1**, 1090.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE CARDIOGRAM IN CLINICAL DIAGNOSIS AND PROGNOSIS

I. THEORETICAL CONSIDERATIONS

BY

TERENCE EAST, M.A., D.M., F.R.C.P.

Senior Physician and Physician in Charge of Cardiological Department, King's College Hospital

When the muscle fibres of the heart pass from the resting to the active phase of systolic contraction electrical changes take place. These can be recorded by a suitable instrument. Several types have been used. The string galvanometer makes a photographic record of the greatly magnified movements of an almost invisible fibre. The currents from the heart may be intensified by thermionic valves to work a mirror galvanometer which writes on sensitive paper with a beam of light. The cathode-ray oscillograph may illuminate a fluorescent screen; direct records may be made on special paper by heated points, or traced with ink. The result of all these methods is the cardiogram.

I will consider for a moment the unit—the muscle cell. At rest it is polarized, with a negative charge of anions lining its semi-permeable membrane on the inside, balanced against a positive charge of kations on the outside. When the "stimulus" for action reaches this cell it becomes depolarized, the ions change position, and the cell achieves its one purpose in life—contraction. The process of depolarization is associated with a difference of electrical potential at the ends of the cell, and current flows. Contraction over, repolarization sets in, starting where depolarization began, and again there is a difference of electrical potential and a flow of current, but opposite in sense to that of depolarization. Polarization being complete, current ceases to flow, and there is diastolic rest until the next phase of systolic activity. Any type of electrocardiograph will record these currents.

What has been instanced above must be multiplied untold times when we attempt to conceive the total systolic activity of the syncytium of cells which compose the whole heart muscle. One must remember, too, that the impulse for action passes throughout this mass during a definite interval of time, and that, so far as the auricles are concerned, these impulses are merely simple transmissions through the muscle sheet. But in the ventricles there is a special telegraph apparatus—the Purkinje system—which distributes the impulse as rapidly as possible through these chambers, which are indeed muscular cups. It must also be remembered that the general distribution of the spread of the impulse, considered in three dimensions, is opposite on the two sides, right and left.

Normal Cardiogram: Nomenclature

The apparatus is so arranged that a positive potential will produce a deflection from the base-line (which is spoken of as isoelectric) in an upward direction; a negative potential will give a downward deflection. Hence the direction of deflections is usually spoken of as positive or negative (or upward or downward). It is a fundamental fact that so long as an impulse is travelling towards a recording electrode the potential of that electrode is positive. Similarly when an impulse is receding from an electrode its potential is negative (Fig. 1).

Standardization.—It is now the universal practice to standardize the deflections so that a difference of potential of one millivolt causes a movement of one centimetre.

Auricular Activity.—The electrical potentials developed by auricular systole cause a small deflection, which is always labelled P. As a rule it is positive in standard Leads I and II. It may be negative in standard Lead III. It is shown best by standard Lead II, VR, VF, and V_1. (See below for the explanation of these terms.)

Ventricular Activity.—The impulse reaches the ventricles after a short interval occupied by its passage through the conducting tissues. The first indication of electrical change may be a negative or downward deflection Q. This varies much in size in different leads. Its presence may be physiological merely, or definitely pathological in significance. It is not always seen. It may be followed by a positive deflection R; if Q is wanting this will be the first deflection. It varies much in height for many reasons. After this may come a negative deflection S, again very variable in depth. If the sole deflection recorded be negative there has been some doubt whether it should be called Q or S. It is safest to label it with both letters.

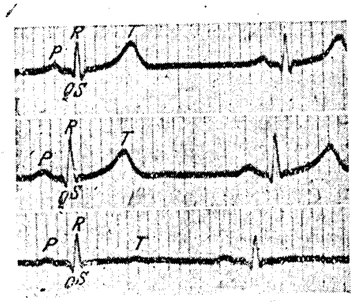


FIG. 1.—Normal electrocardiogram

The QRS complex, as it is called, coincides with the process of activation of the ventricles, or the beginning of ventricular systole. Following this phase, for the instant when all the muscle is in a state of activity, there is no difference of potential anywhere, and the recording curve is at the base-line again. Then that part of the myocardium which first became depolarized starts to become repolarized and for the moment, until repolarization is everywhere complete, there is electrical disequilibrium. This causes a further flow of current through the galvanometer, and a flattened curved wave is recorded which is always labelled T. It is usually positive; in fact, in some leads a negative T can always be regarded as of pathological significance, but in others this is not so. The shape of the wave may be very important and indicate the cause of an abnormal appearance. Sometimes the S–T or RS–T phase is not at the base-line, or isoelectric: it is then said that there is S–T (RS–T) deviation—positive or negative. This may be of great pathological importance in indicating myocardial disease.

It must be remembered that, as in all natural things, the range of the normal cardiogram is wide, and that its limits are by no means clearly defined. Long experience is needed to appreciate these points. The variations in the size and shape of the deflections are considerable, and depend on such causes as the lie of the heart in the chest, the vigour of the heart, the resistance of the skin, and other factors but little understood.

Time Measurements.—All cardiograms show a time scale, usually in 1/5 and 1/25 second. It is convenient to mention here that the interval between the beginning of the wave of auricular systole (P) and the wave of ventricular systole (Q or R) should not normally exceed 0.2 second. The duration of the QRS complex should not normally exceed 0.1 second.

Technique

For many years the standard three bipolar leads from the contacts placed on the arms and the left leg were all that could be offered. Then a fourth lead from the front of the chest in the region of the apex of the heart was added. The potential at the exploring, or precordial, electrode was much higher than that at the distal electrode, which was placed on either the right arm (CR) or left foot (CF), so that the curve was practically derived direct from the region of the heart itself. The next step was to use a variety of precordial contacts, starting with the first position in the fourth intercostal space just to the right of the sternum, the second just to the left of the sternum at the same level, and so on to the sixth in the left mid-axillary line; the fourth position being in the left mid-clavicular line in the fifth interspace. All those were bipolar leads.

The latest development is the introduction of unipolar leads. There are three unipolar limb leads, from the right and left arms and the left leg. It will be appreciated that there is obviously a close relationship between the standard bipolar limb leads and the unipolar limb leads. Lead I records the difference of potential between the right arm and the left arm. The unipolar arm leads record only the electrical potential at each arm.

In the same way standard bipolar limb Lead II records the difference of potential between the right arm and the left leg; and standard bipolar limb Lead III the difference of potential between the left arm and the left leg. The unipolar limb lead from the left leg records only the changes of potential in that limb.

By a similar method unipolar precordial leads have come into use, numbered 1 to 6 (7 and 8 may be added if need be).

The letter V (voltage) has been employed to indicate unipolar contact—VR, VL, VF, for the right and left arms and the left foot, and V_{1-6} for the precordial contacts.

CR and CF were the initials indicating the bipolar precordial (or chest) leads, with the right arm or left foot as the distal electrode, respectively.

This brief survey of the technical side of the nomenclature is needed, partly because the terms may be unfamiliar to many, and also to show that in the past few years a very considerable development in technique has taken place. At present it may be said that the full electrical exploration of the heart requires at least 12 leads, and possibly some six or more at higher levels on the chest. The additional value of oesophageal leads, or of contacts placed on the back of the thorax or on the epigastrium, is still to be assessed. How far the original bipolar limb leads will be retained remains to be seen, and how many of the new ones will be used in the first stages is still uncertain. The introduction of the direct-writing type of cardiograph is a great advantage over the older photographic models; much time can be saved and the use of multiple leads greatly facilitated. It may well be that the simplicity of this technique will enable many or all to be used.

Cardiogram and Position of Heart

The general direction of the spread of the current of activation through the ventricles is downwards and forwards and to the left. Roughly, this is at an angle of about 60 degrees to the horizontal. The direction of this electrical change at any given moment is called the electrical axis.

The lie of the heart in the thorax varies much with a patient's build and with the position of the diaphragm. A person with a long narrow chest will have a vertical heart; a person of stocky build, with wide chest and horizontal rib margins, will have a transversely placed heart. Obesity, pregnancy, and the expiratory phase of respiration will raise the diaphragm and make the heart more transverse. These changes in position alter the appearance of the cardiogram in the standard bipolar limb leads and in the unipolar limb leads.

The expression "left axis deviation" was coined to describe an anticlockwise rotation of the heart's axis in a frontal plane, upwards and to the left. The expression "right axis deviation" describes the opposite, a rotation in a clockwise direction, downwards and to the right. These changes may be caused by the build of the patient or by the phase of respiration. But enlargement of either ventricle also causes them and to a far greater degree than other means. Enlargement of the left ventricle is associated with left axis deviation, enlargement of the right ventricle with right axis deviation. The terms "left and right ventricular preponderance or predominance" were also in vogue to describe these curves.

Cardiogram in Cardiac Enlargement

As many of the features of position and enlargement are closely connected it is convenient to discuss enlargement at this stage, though it is in a sense a myocardial abnormality. The extent to which active hypertrophy of either or both ventricles may produce characteristic curves is very variable. Very often recognizable reliable changes are not seen: on the other hand, if they are present they should be capable of interpretation. In order to find out whether there is hypertrophy of the ventricles one should examine the patient clinically and with the fluoroscopic screen rather than the cardiogram. But there are occasions on which the cardiogram may give useful confirmatory evidence concerning which ventricle is enlarged. This hint is particularly useful in congenital defects.

Considerable increase in size of either ventricle may be present without any modification of the curve; for example, there may be obvious enlargement of the left ventricle from hypertension and yet a normal curve may be obtained. The reason for this is not understood. But once a certain degree of hypertrophy has been reached the characteristic cardiograms are usually seen. In many cases it is possible to gauge the degree of change in the heart by the type of curve. What the causes are, and in what proportion they operate in producing the curves of hypertrophy, is still far from clear. The altered position or lie of the heart in the chest and the increase in the thickness of the ventricular wall are probably the important ones. The most recent trend, due to the use of unipolar leads, is to indicate the position of the heart—horizontal, semi-horizontal, vertical, and so on—and also to refer to any suggestion of hypertrophy.

The right ventricle may influence the change in the curve in the same way as the left; but its relatively smaller normal bulk requires gross increase to produce much effect, so it therefore seems relatively late.

For the most part gross cardiac enlargement is due to valvular disease or hypertension, or congenital defects; less commonly to abnormalities in the pulmonary circulation. The cardiogram will then to some extent help to gauge the degree of deviation from the normal, and so help to assess the gravity of the case. The changes associated with hypertrophy of one or other ventricle give a progressively abnormal type of curve, and so may indicate to which stage the disease has reached.

It must be remembered that in some cases of hypertensive heart disease ischaemic lesions may be present as well. These would increase the gravity of the prognosis. The cardiogram may reveal them.

The cardiogram is quite useless in the early diagnosis of valvular disease, or in the direct diagnosis of valvular disease at all; only indirectly, by indicating ventricular hypertrophy, may the curve suggest that a defect in the function of a particular valve may be the cause of it.

Fig. 1 is reproduced from Scherf and Boyd's *Clinical Electrocardiography* by permission of the authors and Messrs. Heinemann Medical Books, Ltd.

UNIVERSITY VENTURES OLD AND NEW*

BY

LILLIAN PENSON, LL.D., D.Litt., Ph.D.

Vice-Chancellor of the University of London; Professor of Modern History in the University of London

All university education, and indeed all education and all activities of universities, could be brought under my title. For, whatever can be said for or against the educational process, it is a constant series of ventures—often over seas which are unknown and therefore uncharted. Which of them shall I choose?

There is first the venture of doing things for the first time. Some of you may well feel that you have a special claim to inclusion here. It is your first year in the school or your first year of a new and different part of your course. I can assure you, however, that these particular types of venture do not stop here. I claim a special place in this category myself—by asserting that few people so often do strange acts for which they feel at best only partly qualified. I should like to warn you of this in case any of you are thinking of becoming vice-chancellors. The things may be different, but the process remains the same.

But it is of collective rather than individual ventures that I want mainly to speak—appropriately enough to a world where emphasis is growing on the importance of collective action or, if you prefer it, combined operations. The use of the last term will in itself be enough to show that collective action is in the last resort the action of individuals. The antithesis is an unreal one. Somewhere in all collective action there is someone who is making a decision. Frederick the Great once said that he disliked councils because they were always timid. One of the problems of the modern world is to secure that this is not true. Individual responsibility and individual initiative are, when it comes to the point, essential to all organizations, large or small. That cannot need emphasis in a medical school which has, at least in its associated hospitals, so many examples of the individual idiosyncrasies of the members of the human race.

We start, then, with the knowledge that these corporate activities of ours are at heart the activities of individuals. And I am choosing at random. The first I would call the venture of choosing and finding the subjects of academic study. We have been on the whole conservative in this country in our attitude to university education. Some countries have gone further than we have in the direction of including among the courses which could be taken for university degrees a number of forms of training which are training for a particular type of post, and it may well be that there will be further pressure upon us in this country. No one would in fact be prepared to say that subjects should be excluded because they are useful. We are driven to the harder task of defining what we mean in a positive form. What are the characteristics which entitle a subject to be put on the right side of the line? Perhaps the nearest that we can get to it is to say that every subject which should be included contains in it an unlimited possibility of development by research. This on the whole is a good approximation to the truth, for it implies something which I believe to be fundamental to undergraduate study, that what is being studied is something which is constantly changing and which therefore holds out a promise in the future which no undergraduate can hope to reach.

It is true that one of the difficulties of all university education at the present day—and I imagine that this applies to the faculty of medicine just as much as to any other—is that the body of knowledge already obtained is so great that it is necessary to go a very long way before even a glimpse is caught of the knowledge of the future. So far as undergraduates are concerned this situation has obvious drawbacks. We all maintain, those of us who teach in universities, whatever our subjects may be, that we are doing or trying to do something more than impose upon the memories of our students masses of detailed information which indeed is all recorded in numerous textbooks which are available to them. Yet in our candid moments we have all to own that a good memory can carry an undergraduate a very long way.

This brings me to another of the several ventures which are included under my title—the venture which must be of necessity a combined effort on the part of the university teacher and the man or woman who is being taught. This is the venture of seeing beyond the factual information which it is essential to impart or absorb to the as yet unproved or unascertained items of knowledge which lie beyond. It is a venture which requires above all an effort of faith, and I should be prepared to prophesy that a great many of you who are now beginning your university career will find a good many moments, if you take what I have said seriously, when you wonder whether it is anything but moonshine.

If this is a venture of faith and the most constant of all the ventures with which we are concerned; it is nevertheless only one of the many differing things which can be brought under my heading. I should like to refer in the first place to some matters with which I have been concerned.

During the war—and I am not concerned for the moment in dealing with the reason—there was a greatly increased sense of purpose in relation to a totally different aspect of governmental activity: the welfare of colonial peoples. It is difficult to give a date to this development, but roughly speaking it came with the middle period of the war, although of course its history could be traced back to the pre-war era. It will be enough for the moment to refer to the decision in 1940 to grant a substantial sum of money by parliamentary action to what is technically described as "Colonial Development and Welfare." One of the results of this policy has been the establishment of a number of new university institutions in the colonial areas. A commission was appointed in August, 1943, to inquire into this matter: "To consider the principles which should guide the promotion of higher education, learning and research and the development of universities in the colonies. . . ."

*Inaugural address at the opening of the 1950–1 session of the Royal Free Hospital School of Medicine, delivered at B.M.A. House on September 29.

Ventures Overseas

I was a member of this commission, and shared with a number of other people, therefore (there were sixteen of us in all), the task of making recommendations on this subject. I am glad to say that it was one of the commissions—of which, whatever the general public may think, there are many—which led to some practical results. Roughly speaking it may be said to have led to two main classes of results: to the transformation into universities or university colleges of certain institutions which were already in existence—for example, the colleges in Singapore have since been transformed into the University of Malaya, and two institutions in Africa which were not at the time of university status at all—Makerere College in Uganda and Gordon Memorial College, Khartum—have been transformed into university colleges; that is one group of results. The second is the founding of new university colleges—two of them in West Africa at Ibadan in Nigeria and Accra in the Gold Coast, and the other in the West Indies in Jamaica. I am not going to venture to speak of this last, much as I should like to do so; Professor Lucas Keene knows it well, and has contributed so much of value to it that it would be impertinence to say much in her presence. Nor shall I refer to Nigeria, which I have never visited, while Professor Killick has. All these are ventures which, like all other actions or series of actions that can be included in that term, are acts of very considerable faith on the part of those who carry them out. The institutions which I know best, at Khartum and in Jamaica, belong to the two different categories which I have mentioned; they have a great many other differences as well.

The College of Khartum is essentially a Moslem institution in a predominantly Moslem country. There are no religious tests and there are in fact now a few Christian students. The majority of the staff is Christian, but, as is appropriate in a Moslem country, the outlook of the College is strongly affected by the predominant religion. The weekly holiday is on Friday and not on Sunday. There is not yet a mosque attached to the College, but the new buildings which are envisaged will include one. This affects perhaps the study or teaching in certain faculties, but does not alter materially the fundamental characteristics of university institutions. Another interesting characteristic is the fact that the Anglo-Egyptian Sudan is far more completely a socialist State than the Britain of to-day. The effect of this fact is that practically every occupation which is open to the students of the College is in government service of one kind or another. It is thus more difficult to maintain that university education in the Sudan is something more than training for a particular occupation. Another element in the situation is to a large extent common to all these new institutions. It is the difficulty of making it clear that a university course is something other than the successful passing of appropriate examinations. This difficulty is the greater because in all these regions, where only a very small minority of school-boys or school-girls can possibly hope to reach the stage at which they could enter a university institution, the passing of examinations looms very large in the educational system. At almost every stage of their early education they have to face a competitive examination upon the results of which they keep or lose their place on the educational ladder. By the time, therefore, that a student reaches a university college he has almost inevitably become imbued with the idea that what matters is a successful climbing of the next particular step.

No student in London whose private interests lie in art or in music can legitimately complain if provision is not made at his own particular institution. The opportunities not only in other parts of the university but in London as a whole are so great that his difficulty is rather a matter of choice than anything else. He may well, and of course often does, complain that with all these opportunities he lacks time to take advantage of them, and thus it comes about that, while in these new university ventures overseas the chief need is to provide for something which will interest and stimulate students outside their compulsory curriculum, in our own case the parallel need is rather to see to it that everybody has time to take advantage of some of the many opportunities which at present exist.

There is naturally something exciting in these university ventures in distant countries which is lacking in our own problems. There is something exciting for visitors to these regions simply because the countries themselves are in so many ways different from our own. There is a measure of excitement from the point of view of the peoples themselves. Colleges necessarily live there in a blaze of publicity which is fortunately lacking, for example, in London. To a very large measure the hopes of the peoples for self-government are tied up in the progress of the college: their national pride is involved in its success.

University Education for All

Nevertheless, most of our university activity here could be brought in one form or another under the heading of a venture. This is perhaps particularly true in our own day, since there has been such spectacular development in university education in the past hundred years. Most of the modern universities in England have grown to maturity in that period, and we ourselves in London only celebrated our centenary fourteen years ago, and our older colleges, though some of them are older than the university itself, are for the most part the product of the nineteenth century. What is interesting as we look back upon this historical record is that there were a number of differing influences which went to make the different university institutions and indeed the university itself. If we reflect upon these factors and try to pick out one thing above others which characterizes the movement as a whole, I think it would be the attempt to provide university education of one kind or another for virtually all comers. The absence of restrictions upon first creed—it is difficult to think that only a hundred years ago that was a matter of burning importance—and later on race or sex is one way of bringing out this insistence upon a universal opportunity. We have at the same time to realize that in our age also there are ventures to be faced almost, if not quite, as important as those which were involved in the great university development of the nineteenth century. In almost every respect our outlook on university affairs needs to be adjusted to the new circumstances of our own age. The great ideal for which I have said our own

university stood, the provision of opportunities for university education for all those who by one means or another could achieve it, has a new bearing when so much of university education is achieved not by individual unaided effort but by the grant of support in one form or another by the State. This is one of the main problems facing universities at the present time, and our new venture of the mid-twentieth century is perhaps above all to find a way of reconciling two things—the great tradition to which we are almost without exception devoted, the freedom of universities and, within measure, of students in universities, and the necessity of finding some proper method of determining the proportion of people, and indeed the actual persons, in the population who should be enabled to enter upon a university life. There is no easy answer. It is easy to adopt phrases such as "service to the community" or "the good of the community," or even the older phrase of "equal chances for all," but none of these is satisfactory as a solution of the practical problems with which we are all faced.

It is undoubtedly true in university as in other aspects of life that there is a danger lest the matters which are of concern for the future should be decided almost wholly by people who by the mere passing of time belong largely to the past. I am not, however, so far removed from my own generation as to think that the younger anyone is the better their judgment. There is a great deal to be said for that peculiar, as it seems to us, constitution which is one of the many which were invented by the fertile brains of French revolutionaries which divided the population into the young and the old rather arbitrarily at the age of 40 and gave to the young the duty of formulating ideas and to the "ancients" the duty of criticizing them and the power to prevent any of them from being put into action. It embodied at any rate one fundamental principle, that in all developments which could possibly be brought under the word which I have used in my title it is necessary to blend together the old and the new, and to give some opportunity, however small, to the trying out of new ideas.

MIDDLESEX HOSPITAL MEDICAL SCHOOL

The annual dinner of the Middlesex Hospital Medical School was held at the Savoy Hotel on September 28. Mr. E. W. Riches presided over a record attendance, the number of covers laid being greater even than at the dinners before the second or the first world war. The principal guests included Lord Webb-Johnson, the presidents of the three Royal Colleges, the regius professors of Oxford and Cambridge, the principal of the University of London, the medical directors-general of the Royal Navy and the Royal Air Force, the secretary of the Ministry of Health, the chief administrative officer of the North-west Metropolitan Regional Hospital Board, the mayor of St. Marylebone, and the medical officer of health to the London County Council.

The chairman said that among the former Middlesex men who had died during the past year was Warwick Deeping, the novelist, and mentioned that when one of Mr. Deeping's novels was filmed Middlesex men took part "to ensure accuracy of technique." It was unusual for a hospital to have two of its members knighted in the same year, and he congratulated Sir Harold Boldero, dean of the school, and Sir Harold Graham Hodgson. Another tribute was the institution by the Royal Australasian College of Surgeons of a Gordon-Taylor Prize. He announced that the *Archives of Middlesex Hospital* would be revived in 1951. Many of them, he continued, had been a little critical of the increase of administrative and clerical staff under the National Health Service, but, with a total population at Middlesex of about 2,500, the administrative staff formed about 8%. With the ratio of nurses to patients now approximately 1:1, and bearing in mind the vast services rendered apart from treatment, the percentage did not seem to be excessive. The new department of physiotherapy at the Middlesex, opened during the year, was agreed to be one of the best of its kind. In the medical school, the first two women students of Middlesex—Verity Wills and Jean Shanks—had qualified.

Responding to the toast of "The Hospital and School," the dean, Sir Harold Boldero, declared, "We are prepared to back youth at the Middlesex." After welcoming Professor Walls as the new professor of anatomy, Sir Harold turned to the increase in facilities in the clinical years at the school. They were grateful to their friends at the Central Middlesex Hospital, and in particular Dr. Joules, for an arrangement whereby students would go to that hospital for a portion of their clinical period. They were also beginning to develop their associated hospitals for teaching purposes—the Soho Hospital for Women, in gynaecology, and Harefield Sanatorium, for tuberculosis.

Mr. R. W. Gilliatt, as Senior Broderip Scholar, in a further and admirable response to the toast, referred to the ex-Servicemen who had returned to complete their training after the war; the first of these had qualified during the past year. Mr. D. H. Patey, in proposing the health of the chairman, mentioned that among those present was the chairman's daughter, herself a student at the hospital.

KING'S COLLEGE HOSPITAL

SIR LIONEL WHITBY ON THE ADVANCE OF MEDICINE

At the opening of the 121st winter session of King's College Hospital Medical School on September 29, with Mr. J. B. Hunter presiding, the scholarships and prizes were presented by Sir Lionel Whitby, regius professor of physic, University of Cambridge.

Sir LIONEL WHITBY said that King's College was one of the younger generation of great teaching hospitals, having been founded not in the eighteenth but in the nineteenth century. It was founded by churchmen, three years after University College, largely to counteract that seat of learning where no religious instruction was given. There had been three hospitals, two on the Strand site, and the present magnificent building on Denmark Hill, opened in 1913. At the time of the foundation of the hospital the practice of medicine was just about to pass from the empirical to the rational phase. Before that time there had been only one outstanding contribution to the control of disease—also a brilliant piece of empiricism—Edward Jenner's successful cross-immunization experiment with cowpox.

The council of the hospital was wise enough in 1877 to create an additional chair of clinical surgery and to invite Joseph Lister to join the staff. Nowadays there was no part of the body which could not be explored with complete freedom from the bogy of sepsis. From Lister's time until now there had been an epoch-making transition from the empirical to the rational, or from the pharmacopoeial to the specific. There had grown up an immense accumulation of knowledge of the habits of parasites and of the complex science of immunology. Not much more than 50 years ago most of the drugs in medicine were used—with much art and some skill and a certain measure of success—only for the alleviation of symptoms. There was little or no knowledge of their action on the primary cause of the disease. The advances in rational therapy had yielded a rich dividend.

It was remarkable to read the lives of men who had, so to speak, a foot in both eras. One such was his famous predecessor at Cambridge, Clifford Allbutt, of whom Sir Humphry Rolleston said that during his 89 years he witnessed changes in medicine which were never likely to be equalled. That, of course, was no longer true, for the speed of the advance had greatly quickened since Allbutt's death in 1925. Allbutt was born before the introduction of anaesthesia. He saw the development of bacteriology, immunology, antiseptic and aseptic surgery, the creation of the nursing profession,

astonishing progress in public health and preventive medicine, the discovery of *x* rays, radium, and vitamins, the beginnings of cardiology, biochemistry, endocrinology, and specialisms in many spheres.

The rapid evolution of medicine in this century had had a great impact upon its central figure, the patient. A man must now have many doctors and not just one, and because of the volume of ancillary examinations which were deemed necessary a serious illness was beyond the purse of the average person. This fact had hastened the institution of a State medical service, and in all civilized countries some form of subsidized service was developing. The British experiment had shown the fantastic cost of making everything free. In a case no more serious than pyrexia of unknown origin, which in due course might cure itself, the cost of establishing the diagnosis and determining whether the case was amenable to modern chemotherapy, and whether it was likely to be a menace to anyone else, was something like £50; while a case requiring thoracoplasty for tuberculosis might involve, before the job was completely finished, an expenditure of as much as £1,000. All were familiar with the formidable cost of such preparations as penicillin and streptomycin, yet in the interests of humanity these must not be withheld on economic grounds. It would obviously be a travesty of justice were such treatment available only to a few rich people.

The public had become aware of the notable advances in medicine. Not that the information given to them by the lay press was always accurate. He found himself being sometimes surprised by his own ignorance of the latest advances of medicine when these were mentioned to him by a lay friend who had skimmed an article in some publication or other. Indeed, the doctor who wished really to keep up to date would be well advised to subscribe, not only to the orthodox medical journals, but to the *Reader's Digest*, *Life*, and similar publications. (Laughter.)

The intervention of the State in medicine had been occasioned by war. The tremendous events of the last 50 years had forced the State first to interest itself in public health and then to extend its interest to the individual. But it was a remarkable fact that no sooner was the cure of one disease accomplished than another took its place. Moreover, in the enthusiasm of the sulphonamide era it was thought that such a disease as gonorrhoea had been brought under control, but now it was known that the organism was rapidly able to adapt itself to such drugs. The same thing might happen in due course with penicillin. Chronic disease, the degenerative processes which crippled and disabled in later life, and the activity of the malignant cell were not yet comprehended, much less controlled.

In conclusion Sir Lionel Whitby declared that individualism had done so much for medicine in the past that were it to be extinguished, either by State service or by regulations of any kind, or by too much insistence on plans and planning, then the future advances in medicine would never reach the high achievements of the past.

MEDICAL STUDENTS IN GREAT BRITAIN

In the two tables on this page the numbers of medical students in training during the last pre-war academic year (1938–9) have been compared with those in 1948–9. Table I shows the overall picture in Great Britain, and Table II deals with the medical schools of London University. In both tables clinical and preclinical students are considered together.

The rise in number of women medical students, as shown in these tables, is discussed in a leading article at p. 822.

TABLE I.—*Total Clinical and Preclinical Medical Students in Great Britain in the Academic Years 1938–9 and 1948–9*

	Men		Women		Total		Percentage Women	
	1938-9	1948-9	1938-9	1948-9	1938-9	1948-9	1938-9	1948-9
London:								
(1) Schools of University	4,513	4,096	551	888	5,064	4,984	10·9 / 100 } 11·5	17·8 / 85 } 18·9
(2) West London Hospital for Women*	—	12	38	68	38	80		
Universities in provinces and Wales	2,879	3,337	708	1,104	3,587	4,441	19·7	24·9
Scotland:								
(1) Universities	2,336	2,836†	567	871†	2,903	3,707†	19·5 / 4·8 } 14·8	23·5
(2) Extra-mural schools	1,309		66		1,375			
Totals	11,037	10,281	1,930	2,931	12,967	13,212	14·9	22·2

* The West London Hospital for Women no longer admits new undergraduate medical students.
† This figure includes returns from the Anderson College of Medicine and St. Mungo's College, both in Glasgow, and from the School of Medicine of the Royal College in Edinburgh. These schools were classified as extra-mural in 1938-9; and at that time over 40% of the undergraduate medical students at these schools were from foreign countries.

TABLE II.—*Total Clinical and Preclinical Medical Students in the Schools of London University in the Academic Years 1938–9 and 1948–9**

Medical School	Men		Women		Total		Percentage Women	
	1938-9	1948-9	1938-9	1948-9	1938-9	1948-9	1938-9	1948-9
Charing Cross Hospital	122	146	—	21	122	167	0	12·6
Guy's Hospital	593	597	—	28	593	625	0	4·5
King's College	291	276	24	41	315	317	7·6	12·9
King's College Hospital	153	146	50	37	203	183	24·6	20·2
London Hospital	427	476	—	24	427	500	0	4·8
Royal Free Hospital†	—	5	357	464	357	469	100	98·9
Middlesex Hospital	437	418	—	32	437	450	0	7·1
Queen Mary College	42	47	4	5	46	52	8·7	9·6
St Bartholomew's Hospital	828	610	—	83	828	693	0	12·0
St. George's Hospital	119	115	—	17	119	132	0	12·9
St. Mary's Hospital	436	410	—	25	436	435	0	5·7
St. Thomas's Hospital	475	348	—	27	475	375	0	7·2
University College	178	117	59	29	237	146	24·9	19·9
University College Hospital	275	256	57	49	332	305	17·2	16·1
Westminster Hospital	137	129	—	6	137	135	0	4·4
Totals	4,513	4,096	551	888	5,064	4,984	10·9	17·8

* Figures for the West London Hospital for Women, which is not a university medical school, are shown in Table I.
† Formerly London School of Medicine for Women.

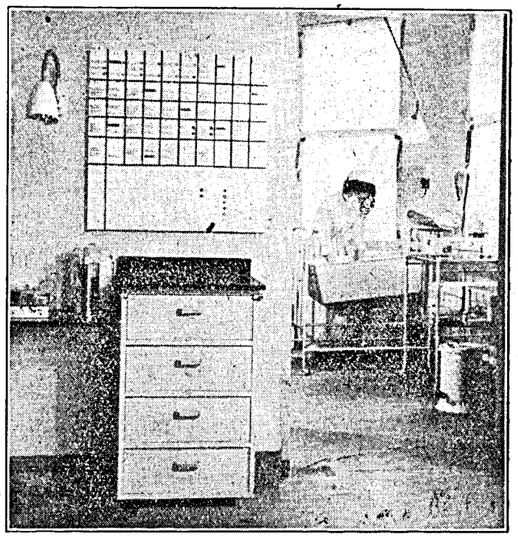
PREMATURE BABY UNIT

A unit for premature babies was opened on October 1 at the Obstetric Hospital, University College Hospital, London. The unit consists of two nurseries, each with six cots, and in addition an isolation nursery with two cots. One of the nurseries, called the "hot" nursery, is heated by electric wall-panels thermostatically controlled to 75° F. (23.9° C.). Here piped oxygen is available for each cot from a bank of oxygen cylinders outside the unit. The other, or cooler, nursery has the normal hospital heating, and the temperature will vary by a few degrees so that the babies can gradually become acclimatized. Babies under 4 lb. (1.8 kg.) in weight will be started in the "hot" nursery, and then, when they become able to control their own temperature, will be transferred to the other, while larger babies will be able to begin in the cooler nursery.

Some of the cots are fitted with a "perspex" lid, converting them into oxygen tents while affording the nurse a clear view of the child. One cot has an oxygen cylinder attached, and is for carrying the newborn babies from the delivery room. Between the two nurseries is the sister's duty room, where mothers who live near can come and feed their babies. There is also attached to the unit a milk-kitchen where foods are made up and sterilized. Breast-milk from the baby's mother will be used if possible, and in addition there is a breast-milk bank where the milk is stored in the frozen state. A coloured chart, marked for every half-hour of the twenty-four, indicates to the nurses the feeding times of all the babies.

The unit is intended to take not only babies born in the hospital but, up to about half its accommodation, babies born outside. Babies weighing less than 5 lb. (2.27 kg.) who are in need of special care which cannot be provided at home can be admitted by arrangement with the children's house-physician at University College Hospital. A specially constructed cot, with an oxygen cylinder, enables the baby to be brought by ambulance or car without need for any special attention to the atmosphere of the vehicle. A member of the premature-baby-unit staff will collect the baby by ambulance at any time of day or night from anywhere in the London area.

There are two other premature baby units in London, but this is the first to be constructed in a London undergraduate teaching hospital.



The physician responsible for the unit is Dr. Bernard Schlesinger, and the staff consists of a sister-in-charge and eight nurses, five day and three night. Sister E. M. Edwards achieved a record low mortality (8.1%) with an improvised premature baby nursery during the war. Of the babies born in the Obstetric Hospital about one in every sixteen is premature, and with the premature baby the danger of dying during the first month of life is twenty times greater than for the full-term baby, so that more than half the babies who die are premature, and die from causes directly related to prematurity. It is believed that this special care, with a trained staff available to handle and feed the babies, and the provision of extra warmth and oxygen, may result in halving the mortality.



KNOCKSHINNOCH COLLIERY DISASTER

The Scottish Secretary of the B.M.A. has received the following letter from the divisional medical officer of the National Coal Board in Scotland:

At last week's meeting of your Colliery Practitioners' Subcommittee I made some remarks about the excellent response the Knockshinnoch Castle Colliery disaster had elicited from the medical profession round about. Although we are writing to each doctor who helped us, I think it fitting that I should send you, as representing the medical profession in Scotland, a written appreciation of the doctors who helped.

The event at Knockshinnoch Castle Colliery, New Cumnock, created a potential or actual demand on doctors for the space of some 60 hours, and throughout that time we had a ready response not only from the local general practitioners but from the staff of the hospitals and from other doctors many miles away. This involved, in some cases, a stay of a couple of days at the colliery and a long spell underground—a stout effort for some who had no previous experience of mines.

I must say that although I expected willing help I was not quite prepared either for the number of helpers or for the extent of their help. Also worthy of note was the very smooth collaboration of all the doctors concerned. I assure you it is a great comfort to us, and must be to all our men, to know that in a crisis we can count on receiving such assistance.

I have not singled out any individuals, since any distinction, where all gave of their best, would be invidious, but I attach a full list of our helpers.

The Secretary of State for Scotland has also sent his thanks to the medical and nursing staff of Ballochmyle Hospital for the way they transported and treated 98 patients from the colliery.

Correspondence

A Secret Remedy for Cancer

SIR,—I am a week late in congratulating you upon your excellent leading article in the *Journal* of September 16 (p. 663). I do so now because my letter in response to an invitation from *Picture Post* to give them my opinion on their article was not published by them. This was not unexpected, as in it I observed that I had "rarely, in a long experience, known a reputable journal do such a great disservice to the community."—I am, etc.,

London, W.1. HORDER.

Distinction Awards

SIR,—Mr. R. S. Murley does Lord Moran less than justice in his comments in your issue of September 23, p. 726, on the meetings called by Lord Moran in the North-west Metropolitan Region to discuss the whole question of distinction awards. I am sure that this is only because Mr. Murley was not present at the meeting and is incompletely informed about what went on, since it seems fair to assume that the meetings were conducted on the same basis as one held in the South-eastern Metropolitan Region at which I personally was present. At this meeting it was made abundantly clear that Lord Moran, so far from delegating his responsibilities, was in fact putting in a tremendous amount of time and work in order to discharge those responsibilities to everybody's satisfaction. He intimated that, although the Distinction Awards Committee had an enormous amount of information available about consultants, it would be helpful if subcommittees elected in the various regions by the local consultants would give the Central Awards Committee their views on which consultants should become the recipients of distinction awards. He did not demand that a subcommittee should be formed, but hoped that it would be. Those of us present were not compelled to form the committee then and there, and we could have called further meetings to discuss it, or have carried out the election of the committee in any way which we saw fit. It seems, therefore, quite unfair to blame Lord Moran for his attempt to gain further information which might make the decisions on these distinction awards fairer than otherwise, and if Mr. Murley has any complaint of the manner of his own election to the local subcommittee, surely it should be addressed to his colleagues who attended the meeting and elected him?

While Mr. Murley may be on firmer ground when complaining of the shortness of the time allowed for these subcommittees to deliberate, he is on less firm ground in complaining that his subcommittee has to make "decisions of so great importance." In fact his committee is not being asked to make any decision at all, but is simply being asked for its opinion. It is being asked to provide one facet of evidence and not to allot the distinction awards; and it must surely be inferred that those at least of his colleagues who elected him must consider that Mr. Murley already has sufficient knowledge of his colleagues' ability and qualifications to be able to express an opinion on them. Viewed in this light, the length of time remaining for deliberation may not seem too short after all.

Mr. Murley further states that the consultants are entitled to ask for as just a method as possible of selection. At the meeting at which I was present, Lord Moran made it abundantly clear that the Central Distinction Awards Committee was making unusually exhaustive investigations in its efforts to make the selection fair, and that this request for the opinions of local subcommittees, albeit perhaps a little tardy, was only intended to round off the evidence so that so far as was humanly possible no one could feel that any claim of his to distinction had been overlooked.

On the question of the distastefulness of his task, Mr. Murley must, I think, have felt that it was distasteful to him largely because it is a new and unfamiliar task, but the principle of choice underlying this task is nothing new, and I have little doubt that Mr. Murley has on numerous occasions sat in judgment without a qualm upon, admittedly, a junior colleague when deciding his fitness for an appointment.

This brings us, I think, to the whole kernel of the acrid discussion which has gone on about distinction awards. Mr. Murley says that the only true reward for distinction is distinction, but it would be ignoring the facts of the situation to pretend that a certain, shall we say, financial improvement was not prone to accompany distinction in the old days, and it would be ignoring human nature to pretend that this fact did not influence those who chose medicine as a profession. I, no less than Mr. Murley, have viewed the whole question of distinction awards with distaste and misgivings, but in the light of the above consideration it seems fair to crystallize the problem down to one simple question: Is it worse to accept a financial award for distinction when it is judged by one's own colleagues on the fairest basis that they can devise, than to accept that award piecemeal when it is based upon the estimate patients have of one and which they show by their willingness to pay private fees? Quite honestly I cannot see that there is very much in it. On the one hand, patients may be somewhat gulled by plausible and smooth-mannered doctors; on the other, Central Awards Committees, no matter how conscientious, are very likely to make errors of judgment and overlook deserving individuals. Looking at it from this point of view, it was with some relief that I heard Lord Moran say that the whole point of the system of distinction awards was to preserve an incentive by which to draw able men into the profession when, as it seemed, the rewards of private practice are likely steadily to dwindle.

If there is any substance in the argument that the awards are to take the place of the financial rewards of private practice, it is obvious that hard facts make it necessary that the system of awards shall be started as soon as possible, and it should be remembered that we are, after all, free at any time to change and modify the system of selection and the size of the awards in any way that we think right. We are even free, as a magnificent gesture of renunciation, to hand the money all back again.—I am, etc.,

Shorne, near Gravesend. O. J. VAUGHAN-JACKSON.

SIR,—Dr. R. S. Murley's timely letter (September 23, p. 726) on this subject underlines the profound disquiet existing throughout the consulting side of the profession. Even more disturbing is the disclosure of the almost complete apathy shown towards the subject as a whole when four consultants of the forty entitled to attend turned up at the local meeting called by Lord Moran. Whenever this topic has arisen at any hospital committee meeting I have attended during the past fifteen months the same lack of interest, coupled with ironic expressions of derision, has been evinced. The root of this attitude lies in the generally held conviction that the non-teaching hospital men have been sold out to their teaching hospital colleagues as a deliberate act of "Divide and rule" by the Minister, a feeling which is emphasized whenever the activities of the selection boards for new appointments in our area come up for discussion.

It is conceded by most of us that inevitably the Service will become organized on lines similar to those existing in the medical side of the armed Forces, and that it is more tactful to restrain public expressions of criticism where these seem unlikely to influence the trend of events. The dry rot has set in. It is definitely not wise to become an overt malcontent.

Dr. Murley invites attention to the "indecent haste" characterizing Lord Moran's present activities. His area was given four weeks to organize the required form of assistance to the awards committee, which "has to complete its work by the middle of October." My hospital group was invited to meet Lord Moran for the same purpose on October 5! Mid-October was then less than ten days off! Would any self-respecting consultant in this area feel it worth the time involved in allocating an evening for so nebulous a purpose; or even worth while putting pen to paper to criticize so patent a device to clothe exclusive and arbitrary decisions with the more pleasing robes of democratic participation and acquiescence? Last August the awards committee made use of a similar strategy in the S.W. regional area when they arbitrarily excluded all those consultants appointed after appeal regrading from participation in routine merit award consideration, the reason given being

that there had been "insufficient time available to their office staff" to include the recently arrived new names on their typewritten duplicated list. They found two months insufficient for this purpose. No one in the area bothered to protest.

It is obvious that the merit awards committee can do what it likes, that it likes doing it, and that it need apprehend no spirited organized attempt to question its findings, or the details upon which such findings are based in any individual case. The Minister will continue to expect two men doing exactly the same type of clinical work to accept utterly different rates of remuneration side by side in brotherly amity. One will secure the "rate for the job," the other "the distinction of his own distinction."

The worst feature of the matter is that the awards are for life and pensionable. Surely at the outset of a new and necessarily experimental State medical scheme its organizers ought not to saddle the country with irrevocable financial commitments of this controversial type and magnitude. If the awards are to be made at all, they should be for maximum periods of three to five years, non-pensionable, renewable by further re-election, and coupled with a system of outright lump sum awards from time to time (in the manner of the Nobel prizes) for unquestioned contributions to the advance of medical science. —I am, etc.,

London, W.1. LIONEL M. GREEN.

Improving the Medical Curriculum

SIR,—I wish to congratulate you, first of all, on an exceedingly interesting educational number of the *Journal* (August 26), which is well worth and demands the attention of all those interested in medical education. Having as long ago as 1933 advocated a special course of education for those students intending to enter general practice, I was particularly interested in those articles dealing with that side of medicine. I have in the past advocated four things which I thought would improve the work of the general practitioner: the development of treatment centres, now known as rheumatic clinics; the provision of centres for clinical pathology, *x*-ray investigations, and physiotherapy for the general practitioner; the association of general practitioners with the work of hospitals; a special pre-graduate course for general practitioners. The first rheumatic clinic was developed at my suggestion by the Kensington division of the London County branch of the B.R.C.S. as long ago as 1922. There seems to be general agreement about my second and third points, and somewhat unexpectedly I now find support for my fourth proposition.

I feel that I somewhat light-heartedly suggested a special course of instruction for students intending to engage in general practice; the subject is obviously a very complicated one, but I still think I was right. But we must first decide what form this special education is to take. I do not feel that wholesale condemnation of previous methods such as characterizes Dr. Donald Johnson's article (p. 493) will advance us much. Unless medical education deteriorated much from the standards of 25 years before Dr. Johnson's time I cannot think many of his criticisms are or were justified. Of course our ideas of education have evolved and are still evolving, but I think much of the student's failure to benefit from instruction lies at the student's door. I am sure much of my failure could be attributed to myself.

Still considerable improvements in medical education are attainable, but we must make up our minds what these should be. It has been suggested that a general practitioner should take part in the teaching. Probably a sound suggestion, but what is he or she to teach? So far the role assigned to him seems to be little more than instructor in the necessary deportment towards patient and relatives. The Syracuse Medical School (U.S.A.) makes the student take an interest in one patient, not only studying him in hospital, but investigating his home surroundings and conditions. The general-practitioner teacher could give much useful instruction here.

I am no educationist, but, stepping in where angels fear to tread, I suggested in a memorandum to the conference of representatives of the Universities, Royal Colleges, and the Society of Apothecaries, met to consider the medical curriculum, that the prospective general practitioner should be taught thoroughly the common diseases, relying on the consultant for the rarer diseases, yet having fuller instruction in such of these latter diseases as throw light on organic function—e.g., osteitis fibrosa cystica due to overfunctioning of those little-understood parathyroid glands. With his curriculum thus modified the student should receive fuller instruction in such subjects as dietetics, balneology and other forms of physical treatment, psychology, and industrial medicine.

These are my views, but the whole subject is beset with difficulties. Nevertheless it behoves us to decide what alterations, if any, are desirable.—I am, etc.,

London, W.8. HAROLD H. SANGUINETTI.

"Dramamine" and Sea-sickness

SIR,—Your recent observations (*Journal*, September 23, p. 719) again champion hyoscine against the antihistamine drugs in the treatment of motion sickness. Recently, I took an appointment as a ship surgeon for a short period. I tried out the routine suggested by Dr. F. K. Beaumont in a letter to the *Journal* (1949), **2**, 1473. This was to take an "antergan" 100 mg. tablet at night and "phenergan" 25 mg. tablets t.d.s. I was very much impressed with the results obtained using these antihistamine drugs in treating sea-sickness among the passengers. Also for the first time I avoided being sea-sick myself.

It seems to be difficult to produce statistical evidence that these drugs are more efficacious than hyoscine, but from my own observations I feel very convinced that the proof of this pudding is in the eating. It would be interesting to know if Dr. Beaumont, who, I believe, is ship surgeon in the *Queen Elizabeth*, still prefers the antihistamines to hyoscine. —I am, etc.,

London, W.2. M. F. BETHELL.

SIR,—As an off-shore cruising addict and a thoroughly bad sailor I have for many years tried the current remedies for sea-sickness, from "mothersil" to hyoscine, with and without amphetamine. The trouble with all I have previously used has been that, taken over a period of days, the side-effects—dryness, anorexia, and loss of visual accommodation—have been almost as trying as the original complaint. In other words they have been effective for short periods but not for long.

This summer, however, over a period of several days I used "dramamine" in conditions which would ordinarily have prostrated me, and found it to be, for me at least, the answer to a sailor's prayer. I say "prostrated" advisedly—my variety of the complaint being that while horizontal I am perfectly comfortable, but when vertical I am anything but. With dramamine I could eat normally, stand my watches without undue somnolence, and, except for slight but not unpleasant dryness, felt no side-effects at all.

There are probably many individual types of sea-sickness, as there are of most allergic troubles, and the remark at the end of your annotation on Professor J. H. Burn's interesting article (September 23, p. 691), that hyoscine is best, may hold for the group of such troubles taken as a whole, but in my own case it certainly does not.—I am, etc.,

Beccles, Suffolk. C. GRANTHAM-HILL.

Antihistaminics and Nocturnal Frequency

SIR,—After reading Professor J. H. Burn's interesting paper on the pharmacological action of antihistamine compounds in the *Journal* (September 23, p. 691), I am prompted to record that I have found these substances to be effective in relieving some patients suffering from nocturnal frequency of micturition, which is usually due to prostatic enlargement. My attention was first drawn to this therapeutic use of antihistamine drugs by my colleague, Mr. Ian Robin. He had occasion to prescribe "anthisan" to a middle-aged man suffering from rhinitis; his patient noticed that after taking this drug not only were the symptoms of rhinitis relieved, but his sleep was no longer disturbed by a troublesome frequency of micturition from which he also suffered.

Subsequently I have prescribed "benadryl" to six unselected patients suffering from frequent nocturia; three derived relief. In one of the latter cases the patient after taking the drug declined to undergo an operation for prostatectomy to which he had previously agreed, for the frequency of micturition had greatly diminished, seemingly as a result of medication. Admittedly, one cannot draw any definite conclusions from such few cases, but I hope after a more extensive and carefully controlled trial with antihistamine substances that these compounds will be found to be useful in relieving the troublesome bladder symptom of nocturnal frequency.—I am, etc.,

London, W.1. VALENTINE SWAIN.

Infection by Syringe

SIR,—I was greatly interested in the paper by Dr. R. J. Evans and Professor E. T. C. Spooner (July 22, p. 185), your annotation on the subject (p. 204), and the three subsequent letters from Sir Alexander Fleming and Drs. G. Bousfield and R. R. Hughes (August 5, pp. 365 and 366). There are two points arising out of this paper and correspondence which I think merit further attention. The first is the renewed support given to the use of hot oil as a sterilizing agent by Sir Alexander Fleming, since there has been a wide fluctuation of opinion on the value of this method of sterilization in recent years. In 1941 an M.R.C. committee advocated the sterilization of syringes by drawing up oil at a temperature of 120°–130° C. with inversion of the syringe. It was stated that 160° C. should not be exceeded. In 1940, however, Bigger and others had written, "We have proved experimentally that the drawing up of boiling oil into the barrel of a syringe fails to sterilize it if sporing organisms are present even in small numbers," and in 1945 a special M.R.C. committee condemned the use of hot oil for syringe sterilization, stating that "even vegetative organisms dried on the glass are not uniformly destroyed." In 1946 Rogers (as Sir Alexander has pointed out) again recommended the method and put forward experimental evidence of the efficiency of oil at 120°–140° C.

I became personally interested in this question, since I had been in the habit of using hot oil for resterilization of syringes between injections until the report of Bigger and his co-workers came to my notice. In 1945, therefore, I carried out a series of experiments in an attempt to evolve a method by which hot-oil sterilization could be made effective.

My experiments were interrupted and showed no promise of success, so the work was never published. Since, however, it supports the conclusions of the special M.R.C. committee and it appears contrary to the subsequently published findings of Rogers, I propose to summarize it briefly here before attempting to reconcile these opposing views.

My approach to the problem was influenced by two considerations: the first that heating by hot oil is a form of application of *dry* heat, the second that any contaminant gaining admission to a syringe while in use will be in a watery environment. In this connexion it should be noted that it was "vegetative organisms *dried on the glass*" (my italics) that were stated to have survived the experiments carried out by the members of the special M.R.C. committee, and that in his letter Sir Alexander Fleming refers to *the boiling of the water in the needle* as the means of destruction of pathogens in the latter when it is dipped in oil at 150°–160° C. for 10 seconds. I therefore carried out parallel experiments on wet-contaminated and dry-contaminated syringes. In other tests 0.1–0.2 ml. of water was introduced into the contaminated syringes before hot oil was drawn up. The intention in these last tests was that the water should be boiled by the entering oil and the steam so produced become the effective bactericidal agent.

Experiments were carried out on these lines at various temperatures and for different periods of exposure. The number of times oil was admitted and expelled was varied, and tests were made with and without inversion of the syringe. The contaminant used was *Staph. pyogenes*, and it was proposed to employ *B. subtilis* later if success was achieved against the former species. *B. subtilis* was in fact never used, however, as, even with oil temperatures up to 170° C. and moisture present, all staphylococci in the syringe were not killed, and cultures of saline and bicarbonate solutions used to wash out the treated syringes were positive.

In order to reconcile these differences it is, I suggest, necessary to give separate consideration to *primary* and *secondary* contamination and to the requirements for sterilization of articles exposed to either. Primary contamination might be defined as the type of contamination liable to follow exposure to general internal and external contact with bacteria or other infective agents. The term secondary contamination could suitably be applied to the entry of such agents into, or via, the needle of a sterile syringe, following its use for making an injection. Primary sterilization to overcome primary contamination must therefore be capable of destroying organisms on the side of the piston and on that part of the inner surface of the upper end of the barrel of the syringe which remains in contact with the piston even when it is withdrawn to the limit possible while in use. These areas cannot come into direct contact with any fluid drawn up into the syringe. Their sterilization by means of the heat of such a fluid must be brought about indirectly through the piston. For this to be effective is a practical impossibility. A metal piston heated to such a degree will become jammed—or crack the glass barrel. A glass plunger would never reach an adequate temperature throughout owing to poor conductivity. It follows that primary sterilization by the drawing up of hot oil into an assembled syringe must be unreliable.

In the case of secondary sterilization after injection of the contents of a previously sterilized syringe, however, conditions are very different. Here any secondary contamination which may have occurred will be limited to the needle or distal end of the barrel of the syringe. Organisms will be suspended in fluid. Contaminants will thus come into immediate close contact with the hot oil introduced, so that their destruction when the temperature of the latter is adequate should be ensured.

The different results obtained by Rogers and myself may be subject to explanation on such lines. In my experiments contamination of the side of the piston and upper part of the interior of the barrel was ensured. In Rogers's first three observations contamination appears to have been produced by aspiration. Whether aspiration contamination is of primary or secondary type (as defined above) might well depend on the degree to which the interior of the syringe can be made wet, and this in turn be limited by the presence of a film of oil. It appears that Rogers maintains his syringes in an oily state. It is therefore suggested that the nature of contamination produced and adequately dealt with in his first experiments resembled secondary contamination in that the inaccessible parts of the syringe remained bacteria-free. When he used a method involving frank primary contamination, it seems that the separate parts of the syringe were treated by immersion in the oil.

The second point which seemed to me to call for attention concerns the distance up the needle lumen which may be contaminated before its removal from the syringe, following injection of an infected tissue or cavity. If, as seems unlikely, however, the greater length of the needle is internally contaminated failure of sterilization by merely dipping the needle in hot oil (Sir A. Fleming) or flaming a platinum one (annotation) might possibly occur, since heating of the distal portion of the infected column of fluid might drive the upper portion still containing viable organisms upwards towards, or into, the syringe. The upper limit of internal needle contamination might be investigated by contaminating needles on the lines described by Dr. Evans and Professor Spooner, cutting off with a sterile cutter various lengths of different needles while still in place on the syringes, injecting the sterile contents of the syringe through the needle butt into a suitable medium or animal, and noting the length of needle which has to be removed for the syringe contents passing through the butt to remain sterile.

To avoid the complicating factor of external contamination the needle might be treated by the external application of a volatile disinfectant, insoluble in water and active against the contaminant (e.g., ether for coliform bacilli). The needle might if necessary be sealed before such treatment with, for example, sterile paraffin.

In conclusion: The methods suggested by your correspondents for control of backward contamination can be experimentally tested. It would, I suggest, be most valuable if this were done by experiments on the lines of those described by Dr. Evans

and Professor Spooner and preferably by them. Only then can a final judgment be given on the best method of preventing such backward contamination of a syringe and its contents.—I am, etc.,

Fayid, M.E.L.F. G. T. L. Archer, Colonel, R.A.M.C.

References

Bigger, J. W., *et al.*, *British Medical Journal*, 1940, **1**, 79.
M.R.C. War Memorandum No. 6, 1941. London.
M.R.C. War Memorandum No. 15, 1945. London.
Rogers, K. B., *Lancet*, 1946, **2**, 87.

Sir,—With reference to the article by Drs. R. J. Evans and E. T. C. Spooner on the transfer of infection by syringes during mass inoculation (*Journal*, July 22, p. 185), I wonder if the method adopted by me about 20 years ago during a cholera epidemic in Bombay might overcome the difficulty of the infected needle. After each inoculation two or three drops of the vaccine were expelled into a kidney-tray and rejected, and the needle was dipped at once into hot "vaseline" kept over a bunsen flame and maintained at between 160° and 170° C. The vaseline tends to make the needle puncture easier and less painful.

Changing the needle after each injection will be a surer way of ensuring sterility, but when one had to inoculate nearly 300 medical students and an equal number of nurses in the course of an afternoon, besides the routine laboratory work, the time factor was a consideration.—I am, etc.,

Bombay. P. A. Dalal.

Mortality in Bleeding Peptic Ulcer

Sir,—The discrepancies in the mortality rates reported from Newcastle and Aberdeen (see *Journal*, July 15, pp. 133, 138, 153) are interesting and important. Is the low mortality at Newcastle representative for the district, or is it exceptional to Dr. A. G. Ogilvie's wards? In view of the comments of a previous correspondent I will not present a burden of statistics, but I have looked up the death rate from peptic ulcer in Aberdeen and in Newcastle in the Annual Reports published by the Registrar-General and it is clear that there is little between the two cities. It is, therefore, unlikely that Dr. Ogilvie's experience is representative of Newcastle as a whole. I think the excellence of his figures is due to two reasons. First, while not professing to be particularly interested in gastroenterology, he has been particularly vigilant of emergencies admitted to his wards—a time-consuming task which nevertheless pays good dividends with patients with bleeding ulcer, particularly when under 70. Secondly, he has been distinctly lucky in having so few admissions over 70. In the Central Middlesex Hospital 20% of my admissions with haematemesis and melaena are over 70, and in this age group there is a mortality of at least 30%, a heavy statistical millstone. Ogilvie and Spencer had only 2% of patients over 70, and it is likely that the old decrepit bleeders, whom we know so well in this district hospital, do not find their way to his teaching wards.

Haematemesis and melaena form an appreciable part of the emergency work of all hospitals, and the varying mortality figures reported suggest that there may still be scope for improvement in management. At St. Mark's Hospital there is an admirable custom of reviewing the work of the hospital every three to six months, and the meeting is attended by all members of the consulting staff. It would be entirely feasible for members of the staffs of hospitals to review certain groups of admissions, such as haematemesis, at intervals and agree on lines of treatment, particularly in regard to indications for operation. Moreover, periodic review of cases might stimulate extra interest and vigilance for these patients—so necessary in preventing the patient from reaching anoxaemic levels, and so necessary for selecting the right case for operation without undue delay. Such reviews might help to reduce the mortality of mass hospital statistics to the lower figures to be found among series reported by interested individuals.—I am, etc.,

London, N.W.10. F. Avery Jones.

Amplifying Heart Sounds

Sir,—I read with interest and surprise the annotation (*Journal*, September 2, p. 567) on phonocardiography. The reproduction of the heart sounds and murmurs through a loudspeaker, though practised by some workers, can never be really satisfactory. The frequency response of a loudspeaker is far from ideal. The high frequency components of the sounds tend to be projected forward in a narrow beam and the low frequency ones tend to escape sidewards unless special precautions are adopted. Those near the sound reproducer hear the sounds as of a quality and intensity different from those further away. The quality of the sounds as perceived by the ear is modified by the physiology of hearing, as a study of Fletcher and Munson's normal threshold curves of audibility shows. The reverberation effects due to the acoustics of the room further complicate matters. Unless special precautions are taken the microphone picks up the amplified sounds coming from the loudspeaker and these are further amplified. This means that acoustic feedback is set up and the amplified sounds tend to be further distorted. As a matter of fact they may eventually be replaced by a howl whose pitch depends upon the characteristics of the microphone, the sound amplifier, the loudspeaker, and the distance between the loudspeaker and the microphone. It is no wonder that the average auscultator rejects these distorted sounds as being a faithful reproduction. The ear is very tolerant to bad reproduction, but there is a limit to what even it can stand.

It is rather unfortunate that the annotation suggested that a loudspeaker may be used and did not mention that multiple moving-coil headphones are the method of choice for teaching purposes. The degree of faithful reproduction obtained by this method is greater than by any other. There is the added advantage that the patient is not upset by hearing his own amplified heart sounds. It is possible by adjusting a frequency control to enable the auscultator to obtain the degree of pitch and quality of the acoustic stethoscope, but from a purely scientific point of view it would appear to be fundamentally unsound to deteriorate a method which is capable of improved reproduction to the level of a stethoscope which was originally invented a hundred years ago. It seems that the auscultator should learn to hear the heart sounds truly, and that the method should not be debased to the level of his previous experience. Tone controls can be justifiably used to accentuate wanted sounds or murmurs, but it is very desirable that the auscultator should know the exact physical effects of what he is doing. The loudness of the sounds as heard through the headphones can be governed by a tone-compensated gain-control which helps to correct certain deficiencies in the human hearing.

I note that the annotation states that a loudspeaker may replace the recording apparatus of the phonocardiograph. I would suggest that the words "may replace" should not have been used but rather the words "may be used with." It is highly desirable that a subjective method like auscultation should be simultaneously correlated with an objective method such as phonocardiography.

The annotation states that it is very difficult to obtain faithful reproduction by this or other mechanical devices, and indeed, however faithful the reproduction, the method seems to be of very limited value. This, I would suggest, is untrue. It is also untrue that there can be no effective substitute for the practice of the close personal application of the acoustic stethoscope. Since the acoustic stethoscope is nothing more than a hearing-aid, and an obsolete form at that, I suggest that it should be replaced by a properly designed electronic stethoscope. It is also desirable that the auscultator should have his audiogram done and that the electronic stethoscope be suitably adjusted to compensate for any defects in his hearing.

The best method is the one introduced by myself, which incorporates a double-beam cathode-ray oscilloscope with a fluorescent screen of long afterglow. The method permits the direct, instantaneous, and constant viewing of two phenomena such as the phonocardiogram and electrocardiogram, the phonocardiogram and electrical-sphygmogram, etc., without the necessity of photographic registration and consequent delay in developing film. At the same time the heart sounds can be heard through moving-coil headphones by one or many auscultators. The logarithmic, stethoscopic, and linear phonocardiograms are easily recorded. It is possible with this method for a group of students to hear and see the sounds produced by the heart, including those not audible to the human ear with the ordinary stethoscope, as well as the sounds and murmurs reasonably amplified which he should be able to hear with the simple stethoscope. At the same time they give visible evidence of the correlation of these sounds with the various phases of the cardiac cycle. The simultaneous seeing and hearing of the same phenomena by the teacher and student is an advantage, as the student's immediate attention can be drawn to the feature commented upon by the teacher. The traces on the long afterglow screen provide identifying characteristics of the murmurs and sounds—so that the auscultator will know for what to listen. The auscultator associates the traces with their sounds and quickly recognizes the sounds within his own particular auditory limits by hearing alone. Not the least advantage is the saving of the instructor's time and the patient's strength.

It is necessary for the advancement of phonocardiography that it should develop in a favourable climate of opinion. Manufacturers, physicists, and medical research workers will be chary of producing suitable instruments if the view expressed in the annotation is typical of the reaction of the profession to these new advances.—I am, etc.,

Gorseinon, Glam. G. E. Donovan.

References

Donovan, G. E., *J. Instn Elect. Engrs*, 1943, **90**, 38.
—— *Irish J. med. Sci.*, 1943, **6S**, 583.
—— *Med. Pr.* (abstract), 1943, **209**, 298.
—— *Proc. R. Soc. Med.*, 1943, **36**, 603.
—— *Lancet*, 1944, **1**, 500.
—— *Brit. med. Bull.*, 1945, **3**, 137.
—— *Lancet*, 1948, **2**, 401.

Johann Mikulicz-Radecki: A Reply

Sir,—Sir Gordon Gordon-Taylor was quite justified in referring to Johann von Mikulicz-Radecki as a German surgeon rather than a Polish patriot as Dr. Galewski does (*Journal*, September 9, p. 630).

Johannes von Mikulicz-Radecki was born in Czernowitz on May 18, 1850, which was at that time the capital of the Austrian county Bukovina and a German-speaking city. Hence a Rumanian chauvinist might claim Mikulicz-Radecki as a Rumanian. His father was born in Sniatyn, which is in Eastern Galicia, and since this region is now under Russian domination the Russians will probably be delighted to claim Mikulicz-Radecki as a Russian surgeon. Some, however, regard Mikulicz-Radecki, because of his origin, as a Ukrainian.

All this meant very little at a time when these regions belonged to Austria, and it may be claimed that Mikulicz-Radecki was a typical Austrian, not only because of his origin and the civilization to which he undoubtedly belonged, but also because of his own personal character. He was not affected by nationalism and nationalistic politics, and was deeply interested in music, which earned him the first interest of Billroth, his Viennese teacher in surgery. Furthermore, Mikulicz-Radecki's father was an Imperial Councillor, and this title would have never been conferred or accepted if he had been a rebel, which Dr. Galewski claims him to have been. It is of interest that at that time the Austrian Empire maintained two Polish universities, whereas neither in the German nor in the Russian part of Poland was any such university in existence. Furthermore, Mikulicz-Radecki was educated exclusively in German-speaking schools although there were numerous Polish-speaking schools at his disposal in Austria.

After Mikulicz-Radecki had graduated he was appointed by Billroth and quickly rose to be his second assistant, next to Wölfler. Soon afterwards he received the lectorship of the Viennese medical faculty and the title of *Dozent* was conferred on him. This did not involve his leaving the faculty; on the contrary, he would have lost the title if he had left the faculty. Furthermore, he was appointed director of the surgical department of the Viennese Poliklinik. The professorship in Graz was not withheld because he was a Polish national but because Wölfler was his senior. It is of interest that in Austria even a Pole could become a prime minister (this actually happened), and there were a number of Polish cabinet ministers quite apart from numerous high officials both in the civil service and at Court.

When Mikulicz-Radecki was offered the chair at Cracow he was quite embarrassed because did not have sufficient command of the Polish language. He had to acquire it. He was even regarded as a stranger in Cracow for some time, and not until later did he receive the public recognition which was intended to prevent him from accepting an invitation to Königsberg, in Prussia. Actually Mikulicz-Radecki went gladly to Germany, where he had much wider opportunities for work. He was later on invited to Breslau from Königsberg, and at Breslau his clinic was so well endowed that he refused a subsequent invitation to become Gussenbauer's successor in Vienna. Mikulicz-Radecki developed a carcinoma while living in Breslau and he died on June 5, 1905. In view of his lifelong teaching in German-speaking universities in Vienna, Königsberg, and Breslau, and because of his membership of the Deutsche Gesellschaft für Chirurgie, he may be regarded as a German surgeon just as much as the Swiss Kocher or the Austrian Finsterer. These facts can be found in the *Wien. klin. Wschr.*, 1905, **18**, 67, *Zbl. Chir.*, 1905, **32**, No. 26, and in textbooks on the history of medicine.—I am, etc.,

London, W.1. Albert W. Bauer.

Infection from the Bite of a Bear

Sir,—Human infections with organisms of the *Pasteurella* group occurring in this country are perhaps sufficiently rare to merit recording the following case.

A man aged 41, an animal-trainer, was admitted to the County Hospital, Hereford, on September 29, 1948, suffering from wounds to his right hand caused by the bite of a bear three days previously. Lacerations were present on both palmar and dorsal surfaces and had been previously sutured. The hand was swollen and the wound on the dorsum was discharging. The temperature was 100.9° F. pulse 88, and respiration 20 per minute. No lymphangitis or adenitis was present. Sutures on the dorsum were removed and treatment commenced with penicillin, 50,000 units three-hourly by injection; sulphathiazole 2 g. followed by 1 g. four-hourly was also given for 48 hours.

A swab taken from the wound on admission showed, in the direct film, pus with Gram-positive cocci and occasional Gram-negative short bacilli. Cultures, on blood agar plates, gave a profuse growth of alpha-haemolytic streptococci and a Gram-negative cocco-bacillus, both sensitive to penicillin (by paper disk method).

The wound continued to discharge. A further swab taken on October 8 showed, in the direct film, pus with a few Gram-positive cocci and small Gram-negative cocci and bacilli. Cultures yielded a pure growth of a Gram-negative cocco-bacillus, sensitive to penicillin. In spite of continued penicillin, the wound was slow to heal and was twice explored and drained (on October 20 and November 4). A further swab taken on October 30 yielded *Staphylococcus pyogenes* insensitive to penicillin. Penicillin was then discontinued and sulphadiazine given until November 12. By November 18 the wound was healed and finger movements good apart from some difficulty in opposing the little finger to the thumb.

The further investigation of the organism twice isolated from the wound showed the following characters. A 24-hour culture on blood agar yielded flat, 2 mm. diameter, shiny, translucent, convex, non-haemolytic colonies, under both aerobic and anaerobic conditions. Films from this showed a small Gram-negative cocco-bacillus with filaments up to 10-15 μ. In broth cultures a turbidity with a thick deposit was produced. Growth was poor on nutrient agar and slow in peptone water. Fermentation reactions: acid in glucose, mannite, sucrose, xylose, slight in maltose, no change in lactose, litmus milk, or salicin. No liquefaction of gelatin or serum was produced. The organism was non-motile and produced indole in peptone water. Mice inoculated with a suspension of a 24-hour Loeffler slope culture were unaffected.

The organism appeared, therefore, to be an avirulent strain of *Pasteurella septica*. Group II,[1] belonging to the group of organisms causing pasteurellosis or haemorrhagic septicaemia of fowls and mammals. Previous cases have been described following cat and dog bites,[2] some being complicated by osteomyelitis. Occasional cases have developed pleurisy or meningitis. Organisms of this group are said to be widely distributed,

being frequently found in the upper air passages of normal cattle, horses, swine, sheep, dogs, and cats, and less frequently in the intestinal tract. It is somewhat surprising, therefore, that they are not more frequently found in wounds from animal bites.

I am indebted to Dr. Pat Brown, medical superintendent of the County Hospital, Hereford, for permission to use the case notes, and to Dr. M. E. Morgan Thomas, of the Central Public Health Laboratory, who performed the animal inoculations, for help in identification of the organism.

—I am, etc.,

Hereford. W. H. J. Baker.

References

[1] Mackie, T. J., and McCartney, J. E., *Handbook of Practical Bacteriology*, 1948, p 446, 8th ed. Edinburgh: E. & S. Livingstone.
[2] Topley and Wilson's *Principles of Bacteriology and Immunity*, 1946, **2**, 1648 3rd ed. London: Edward Arnold.

Preventing Wastage of Stored Blood

Sir,—It is obviously desirable to eliminate avoidable wastage of stored blood. In consequence of the spoiling of bottles of whole blood due to refrigeration faults we decided to install refrigerator alarm systems in a group of general hospitals after consultation with the regional blood transfusion service. The basic idea is by no means new, but the system does not appear to be widely used. The electrical alarm system is so arranged that any potentially dangerous deviation from normal storage temperature causes a bell to ring continuously in the porter's lodge. The alarm signal can be stopped only by operating a switch on the refrigerator. Out of normal laboratory hours, one of the previously instructed porters on duty deals with the fault if he is able. If not, he consults a member of the hospital blood transfusion laboratory, who takes appropriate action. A common fault is simply the failure to close refrigerator doors after the removal of blood. The alarm systems have cost approximately £70, but already over the past few months we have probably saved 200 bottles of blood.—I am, etc.,

Sheffield. E. K. Blackburn.

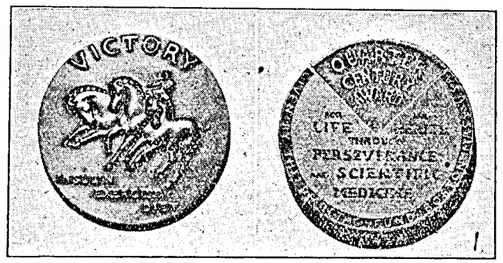
Diabetes without Vascular Disorder after 25 Years

Sir,—On reading the letter concerning vascular changes in diabetes by Dr. G. M. Wauchope in the *British Medical Journal* (August 5, p. 368) I am impressed by her careful statements about a persistent high blood sugar and the relation of diabetes to vascular changes. It is important to emphasize that a persistent high blood sugar means that a harmful and disturbed condition of metabolism is present in the body cells and apparently that the cells particularly concerned in the structure of the arteries, arterioles, and capillaries are vulnerable to this disturbed metabolism.

At the annual meeting of the American Diabetes Association held at San Francisco on June 24, 1950, Dr. E. T. Bell, of Minneapolis, compared the pathology of 1,200 diabetic patients at necropsy with the pathology of 49,000 non-diabetic patients examined in the last 30 years in the pathological laboratory of the University of Minnesota. He pointed out the extraordinary frequency of arteriosclerotic lesions in the coronary arteries, the legs, and the kidneys in diabetics, especially when the diabetes was of long duration. He noted that arteriolar disease of advanced degree illustrated by the Kimmelstiehl-Wilson lesions is 100 times as common in diabetics as in non-diabetics.

In an analysis of 250 young diabetic patients by H. F. Root, R. H. Sinden, and R. Zanca (*Amer. J. digest. Dis.*, 1950, **17**, 179) we have summarized the results of careful *x*-ray examinations of these young patients after having diabetes 10 to 29 years. Few escaped some evidence of calcification or some retinal haemorrhages. Nevertheless we were able to show that young diabetic patients whose diabetes began under 30 years of age could be divided into two groups at the end of 20 years. Those who had practised fair control of diabetes showed retinal haemorrhages in only 18% of the series, whereas those whose diabetic control had been grossly irregular in spite of taking insulin showed retinal haemorrhages in 85% of the group.

A Quarter-century Victory Medal (illustrated below) is now offered by the Diabetes Fund (chairman, advisory committee, Dr. Elliott P. Joslin) at the Boston Safe Deposit and Trust Company in Boston to any diabetic patient who, having had proved diabetes for 25 years, is still free from *x*-ray evidence of calcified arteries, retinitis, albuminuria, hypertension, or other degenerative changes. Already 20 patients have won this medal. It would



be desirable for anyone who sees many diabetic patients living for more than 25 years without vascular complications to provide *x*-ray and chemical evidence of freedom from such changes in order that such a patient might receive the Victory Medal which is to be deposited in your editorial office.

One of the Quarter-century Victory Medals is being sent in the hope that you will be kind enough to give it to any diabetic patient proved to have true diabetes mellitus for more than 25 years who at the end of that time shows roentgenograms of the legs, the pelvis, and a lateral film of the abdominal aorta to be free from calcification, and who has no albuminuria, hypertension, retinitis, or other degenerative disease.—I am, etc.,

New England Deaconess Hospital, Boston, Massachusetts. Howard F. Root.

*** The kind offer of a Victory Medal referred to by Dr. Howard F. Root is discussed in an annotation at p. 827.—Ed., *B.M.J.*

POINTS FROM LETTERS

The Roots of All Evil

Dr. A. Lewis (London, W.9) writes: Your correspondents, Drs. Lennox Johnston and F. C. Morgan (September 9, p. 630) would be far less likely to find themselves in a minority crusade if they were a little less sweeping in their assertions. Few doctors could fail to join them in a campaign against *excessive* smoking, nor could many fail to agree that the inhalation of tobacco smoke is unlikely to do good to any kind of cough whatever its aetiology. But how far are Drs. Johnston and Morgan justified in announcing that failure to get rid of tobacco is probably the main cause of failure to get rid of tuberculosis? The pathogenicity, infectivity, and chronicity of tuberculosis depend on several factors, and the extent to which these may be affected by smoking may not be so great as they would have us believe. . . . Not satisfied with this, Drs. Johnston and Morgan go on to argue that, because of its bad effect on tuberculosis (which most of us admit) and because of other ill effects of excessive smoking, *all* tobacco smoking could (and should) be abolished to the advantage of the community. Perhaps it could. But it is only one of the so-called "evils" with which a civilized community indulges itself. I feel, for instance, that a strong case could be made against tea. . . . I have no doubt that Drs. Johnston and Morgan could if they tried bring a good case on a sound scientific basis for the abolition of kissing. But if they charged all who failed to join them with promiscuous lasciviousness they could hardly be surprised if their accusations were met with ribald cries of "Whack ho!". . . Until Drs. Johnston and Morgan can show that a little of what I fancy does me harm I hope the world will still find me willing to appreciate anything from a pipe and a glass of beer to a Havana cigar and a vintage brandy.

Congenital Malformation and Disease

Dr. Charles Schiff (London, E.8) writes: Dr. Paul Wood's St. Cyres Lecture (*Journal*, September 16, p. 639, and September 23, p. 693) is entitled "Congenital Heart Disease." Since faulty wording is apt to lead to faulty thinking, it is surely not pedantic to point out that the Lecture deals with various kinds of congenital heart malformation and not with disease.

Obituary

S. ROODHOUSE GLOYNE, M.D.

Dr. S. R. Gloyne, consulting pathologist to the London Chest Hospital and King Edward VII Sanatorium, Midhurst, died in London on September 25.

Stephen Roodhouse Gloyne studied medicine at Leeds University and the Middlesex Hospital. He graduated M.B., Ch.B. in 1906, took the D.P.H. from St. George's Hospital in 1908, and proceeded M.D. in 1909. He became pathologist to the London Chest Hospital in 1911, and remained on the staff of that hospital until his retirement two years ago. It was at St. George's Hospital that he met Mr. A. W. Smart, who joined him as senior laboratory technician in 1920, a partnership which lasted nearly 30 years. Gloyne was a recognized authority on the pathology of respiratory diseases, especially industrial diseases of the lung. With the late Dr. Burton Wood he reported on the effects of asbestos dust on the lungs, and he was made a member of the Medical Board for Silicosis and Asbestosis. He was also well known for his work on tuberculosis, being president of the British Tuberculosis Association in 1938. When the Thoracic Society was formed he was made a vice-president. In 1948 he was awarded the Weber-Parkes Prize by the Royal College of Physicians.

Dr. E. H. Hudson writes: "Old Gloyne" was a term of endearment by which Stephen Roodhouse Gloyne was known among his intimate friends and numbers of visitors from all parts of the world. His silver hair belied him—he was not old. His mind and actions were young, and he enjoyed youth's company. His unfailing cheerfulness and sage wisdom made many seek his counsel and seek his advice in committee too. A Yorkshireman, of Quaker upbringing, he was, as one would expect, a warm-hearted, generous character. His real attachment to Victoria Park seems to date from the 1914–18 war, when owing to the shortage of medical staff he came to live in the hospital and combined the duties of pathologist and resident medical officer. He became part and parcel of the hospital, and it is impossible to think of the two apart. He had a happy knack of making visitors feel at home, both in the hospital and laboratory, and if he saw a new resident ill at ease he would immediately break the ice and make him feel he was no foreign body. In the common-room at the hospital, where most of us will remember him, he had his special after-lunch seat at the end of the sofa, which we always left for him. At these times art, politics, cricket, literature, and medicine were all subjects for discussion, and all took part. He was a keen cricketer and a member of the M.C.C.; a true Yorkshireman, he followed his county with great interest. When war came again in 1939, with the staff sadly depleted through the deaths of Chandler and Burton Wood, Gloyne shouldered fresh responsibility. He was a moving spirit in preparing a country branch at Camberley for evacuation of the main hospital. When the hospital was badly bombed in 1941 his laboratory received a direct hit, and he saw a life's work disappear in a night; all his museum specimens, so laboriously gathered, all his personal papers, section blocks, and his new microscope of which he was so proud, vanished. He immediately organized a highly efficient temporary laboratory which is still functioning, and in spite of his great personal loss and anxiety he placed his country house at the disposal of the matron as a rest centre for the nursing staff. Gloyne was a most lovable man. He was a scholar with a great appreciation of beauty. We knew him to be a fine pathologist, and we shall always remember his merry infectious laugh.

H. de CARLE WOODCOCK, M.D., F.R.C.P.Ed.

Dr. H. de Carle Woodcock, who devoted a great part of his career to developing the tuberculosis service in Leeds, died on September 5 in Leeds aged 89 years.

Herbert de Carle Woodcock received his medical education at Leeds and Edinburgh Universities, at the Middlesex Hospital, and at the Johns Hopkins Hospital, Baltimore. He qualified in 1885 and soon afterwards went into general practice in an industrial part of Leeds. He continued his medical studies, however, taking the English Conjoint qualification in 1889, the D.P.H. in 1901, and the M.R.C.P.(Edinburgh) in 1911. In 1911 also he graduated M.D.(Durham), and in 1918 he became a Fellow of the Royal College of Physicians of Edinburgh. It was while he was in general practice that his attention was directed to the growing menace of tuberculosis and to the urgency of the need to alleviate the suffering of the victims and save from infection those who had to live in close contact with them, often in poverty and squalor. A crusade was started, and the Leeds Association for the Prevention and Cure of Tuberculosis was founded at the end of the last century. A public appeal for funds made it possible for two small sanatoria and a dispensary to be built. Woodcock, of course, was a member of the honorary medical staff, and into his self-appointed task he put his whole heart and soul, visiting sanatoria in Europe and America and acquainting himself with all the current literature. In Edinburgh, where Dr. Robert Philip had opened the first tuberculosis dispensary in Great Britain, he spent a considerable time, gaining valuable experience. He was constantly thinking out new methods of treatment, some of which still survive. In the first world war Woodcock brought his skill and judgment to the problems connected with recruitment and the treatment of infected men discharged from the Forces. He also took a leading part in founding a tuberculosis society for ex-Service men. When the Leeds Association for the Prevention and Cure of Tuberculosis was taken over by the corporation, Woodcock continued, as chief clinical tuberculosis officer, to devote much time to the work. He was an active member of the National Association for the Prevention of Tuberculosis and was president of the Tuberculosis Congress in 1929. He retired from active practice in 1934, when his sight failed.

J. J. J. writes: Dr. Woodcock built up a large practice in Leeds, and established himself so firmly in the affections of his patients and the public in general that long after he had left the district in which he practised his name remained a household word. As the tuberculosis work grew he found that he had to devote himself entirely to it and abandon general practice. This meant severing his connexion with many old patients and friends and giving up a lucrative source of income, but to a man with his burning zest no sacrifice was too great. He was interested in many branches of social work, indeed in anything that would build up a resistance against "the enemy" he had sworn to defeat. A convincing speaker, a clear and original thinker, and a facile writer, he could be a charming companion and conversationalist. His knowledge of general as well as medical literature was extensive. Besides many articles in magazines and newspapers he was the author of a book, *The Doctor and the People*, which gave a fascinating picture of life in

a working-class district. In his home life he was extremely happy; he kept open house in his younger days, and was never happier than when he had young people around him. The staff of the Leeds Dispensary loved him as a father and would do anything to serve him. He treated them with the greatest generosity. Progress in science owes much to the pioneers. They get very little recognition, at least from their own generation, and no reward. Woodcock was a pioneer, one of a number who in the first half of this century blazed the trail in the field of tuberculosis in this country. He laboured better than he knew, and his successors have entered into his labours.

A. E. N. writes: I had known Dr. Woodcock for nearly 50 years. This was a privilege which I appreciated increasingly as the years went by; and especially so for the last 20 years when old age and blindness had severed for him the normal contacts of a physician. It was then that the essential qualities of his mind stood out undisturbed by the daily cares of competitive work. There are few who wholly escape the mental rigidities of the eighth and ninth decades of life. Dr. Woodcock was one of them. As the years rolled on a larger proportion of each day was spent in sleep, but when awake he was wholly so—as mentally agile in current affairs, in literary discrimination, and in philosophical outlook as ever he had been. Though completely blind for over 10 years, he could seize on the character and mental outlook of a stranger within a matter of minutes from the time of his first introduction. After a single reading to him of an hour's essay or treatise he had summed it up in detail and made a close estimation of its value.

Dr. JAMES STEWART JOWETT LEE died suddenly at his home in Belfast on August 3. He studied medicine at Queen's University, Belfast, and graduated M.B., B.Ch. in 1920. He took the D.P.H. in 1922. Before going into practice Dr. Lee was senior demonstrator in physiology and demonstrator in pathology at Queen's University. A member of the Ulster Medical Society and the British Medical Association, he was keenly interested in the work of the Association in Belfast. During the air raids on Belfast in 1941 he did excellent work in a first-aid post in one of the most heavily damaged areas of the city. James Lee was a good doctor, and his tragically sudden death came as a great shock to his patients and colleagues in North Belfast. He leaves a widow and three young children.—F. W. M.

Dr. RINGLAND GILMORE BOYD, senior assistant medical officer of health for Gloucestershire, was killed in a road accident on August 17. He was a member of a well-known family in County Derry, Northern Ireland, and was educated at Coleraine Academy and Queen's University, Belfast. He graduated M.B., B.Chir. in 1941, and after joining the R.A.M.C. he served with distinction in Africa, Sicily, and Italy. He was awarded the Military Cross in 1942. After attaining the rank of lieutenant-colonel, he was demobilized in 1947. Returning to Belfast, he took the D.P.H. and entered the public health service as an assistant M.O.H. in Manchester. Later he moved to Gloucestershire, and was appointed senior assistant county medical officer as recently as last April. A very skilful tennis player, Boyd had many successes in tournaments in Gloucester, Cheltenham, Cirencester, and Ledbury. He won the tennis championship at Gloucester last year and again this year. He was also an outstanding badminton player. He had charm without being effusive, and great ability with modesty. He had also a strong belief in the principles of freedom, honourable human relationships, and justice. As a sportsman he was outstanding, and as a friend loyal and dependable. He was highly thought of by senior and junior colleagues, and it is a tragedy that he should be killed on the road during the ordinary course of his duties after having withstood the perils of active service in war.—J. K. M.

Dr. JACQUES DE FOURMESTRAUX, director of the surgical clinic at Chartres, was killed recently in a road accident. We are indebted to Mr. H. W. S. Wright for the following appreciation:

British surgeons who are members of the French and British Associations of Surgeons will share with their French colleagues the sense of loss which comes to European surgery with the death of Jacques de Fourmestraux. Those who attended the French Congress of Surgery in 1947 will remember its president, and those who were at the Association of Surgeons meeting in London in 1946 and Oxford in 1947, and at the International Congress in London in the same year, will recollect a massive, dark Frenchman, hair brushed back, with a dark upturned moustache. At first sight perhaps a cheerful farmer up from the country, but then one glance at his kindly, intelligent, widely set apart eyes above the firm chin and humorous mouth showed that here was no ordinary man. He was born in 1879, and after a brilliant career in Paris, where he was a pupil of de Picqué and de Berger, his sense of adventure led him away from Paris to Chartres, where he organized a surgical clinic which might well be the envy of many university towns. He was a general surgeon in the best and highest sense of the word, and his writings range over the whole realm of surgery. I think he was the first man in Paris to suture a wound of the heart, an operation which he performed in 1905. He was, moreover, an authority on the history of French medicine and the author of a standard work on the history of French surgery. At home de Fourmestraux was a sort of uncrowned king of Chartres. From cathedral and cottage, from *préfecture* and farmhouse, they all came to seek his help. No trouble was too small for his consideration, and no call on his wisdom and sympathy ever went unanswered. Above all things he had a genius for friendship, and no one with whom he shared his greatness of heart and spirit will ever forget him. I sat with him last June for an hour in a café in Brussels; he talked with wisdom and wit about the origin of place names in central France, about speed in surgery, about his farm, and then, with a far-away look which seemed to come from the past and go towards the dim horizons of the future, he said with great delight: "At last I have managed to get a suite of rooms in my clinic for any surgeon who cares to come. I like to have young people visit me nowadays; I think that is the best way I can help. The world is too complicated for one man to do much." Our sympathy goes out to his wife and his family.

A memorial service for the late Dr. Herbert Morley Fletcher, who was senior consulting physician to St. Bartholomew's Hospital, will be held in the church of St. Bartholomew-the-Great on Wednesday, October 11, at 12.30 p.m.

Medical Notes in Parliament

Smoke Abatement

Mr. F. LONGDEN raised, on September 19, the problem of smoke abatement. He recalled that the Minister of Health had said in 1949 that he contemplated introducing no legislation on the subject. But from Birmingham, which had some 6,000 factories with more than 24,000 chimney-stacks, the chief medical officer told him that in 1948–9, of two standard atmospheric-pollution-deposit gauges, the central one had recorded a total deposit of 330.9 tons per square mile, while a similar gauge on the south-west boundary in West Heath had recorded a total deposit of 191.5 tons per square mile during the year. The inspector of factories for Birmingham told him that the insoluble deposits consisted mainly of mineral matter, grit, ash, soot, and tar, while the soluble deposits were mainly of sulphates, chlorides, calcium, and sodium salts. In the opinion of the inspector about 60% of the pollution was from industrial sources. Every medical officer must know that the effects on health must be bad, particularly in the matter of lung troubles such as bronchitis, pneumonia, and cancer. There was a need for more powers for local authorities to employ inspectors and for stricter control and severer penalties for deliberate evasion. The Birmingham inspector referred to pollution caused by emission of fumes from processes such as brass casting, aluminium melting, scrap-metal recovery, and enamelling ovens. He himself had worked in an iron foundry where fumes got into the nose, eyes, and lungs. He asked whether, if legislation could not be contemplated, there could not be more intense investigation and administration to reduce this waste of health and wealth.

Dr. BARNET STROSS, as a medical man, remarked that there was something to be said for the contention that the higher incidence of carcinoma of the bronchial tubes now found in elderly people might result from the tarry deposits inhaled from the atmosphere.

Mr. A. BLENKINSOP, replying for the Ministry of Health, said local authorities had fairly wide powers and in most cases controlled emission of black smoke. Over pollution from chemical works the Ministry of Health had direct responsibility under the Alkali Acts and could take direct action. Local authorities were active in using their powers, but were often defeated by the general anxiety to secure full production. The Ministry of Health with the Ministry of Fuel and Power, was doing all it could to secure training in better stoking and to secure more efficient plant. Powers had been taken in some towns to provide for smokeless zones where, after proper notice, it would be a punishable offence to create smoke. As these smokeless areas were gradually extended, some steady improvement would be seen.

National Service

When asked on September 19 whether National Service men due to enter a university in October would be exempted from a further six months' service under the National Service Act which had become law on the previous day, the Minister of Labour said arrangements had been made for the early release of the men concerned. Applications should be made through the ordinary Service channels. These men would be discharged at the end of their 18 months' service and would not be liable for another six months' service.

In reply to another question, he said that all men attending for medical examination under the National Service Acts were asked to give the Medical Board full details of their medical history. Any certificates from general practitioners or consultants that a man might produce received full consideration.

Welfare Foods.—The stocks of welfare foods in distribution in the United Kingdom at the end of the July accounting period, 1950, were: National dried milk, 3,987,000 tins against 2,959,000 tins in 1945; cod-liver oil, 2,485,000 bottles against 1,955,000 in 1945; vitamin A and D tablets, 585,000 packets against 405,000 in 1945; and orange juice, 6,830,000 bottles against 4,184,000 in 1945.

Universities and Colleges

UNIVERSITY OF MANCHESTER

Dr. Kathleen V. Lodge has been appointed demonstrator in pathology.

Dr. Stanley Wyatt (lecturer in occupational health), Dr. G. W. Boden (assistant lecturer in radiotherapy), and Dr. J. K. Craig (demonstrator in physiology) have resigned the posts indicated in parentheses.

UNIVERSITY OF SHEFFIELD

At a Congregation held on September 23 the following degrees were conferred.

M.B., CH.B.—H. Bailey, Patricia T. Ferraro, W. E. Freeman, L. G. Gordon, Shelagh Hannath, E. A. Johnson, F. E. Neal, N. L. Sarkar, J. D. Warren.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Dr. Philip S. Hench, of the Mayo Clinic, Rochester, U.S.A., will deliver the inaugural Walker Trust Lecture entitled "The Effect of Cortisone and A.C.T.H. on Rheumatic Diseases" in the Hall of the Faculty (242, St. Vincent Street, Glasgow) on Monday, October 16, at 4 p.m. Admission is by ticket, which may be obtained free of charge on application to the secretary of the Faculty.

No. 37

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 16.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	28	4	13	2	—	34	2	25	4	—
Deaths		—	—				—	—		
Diphtheria	37	6	10	2	3	78	10	30	6	5
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	215	10	94	1	—	86	7	54	1	2
Deaths		2			—				—	—
Encephalitis, acute	11	1	1	1	—	1	—	—	—	—
Deaths		—		—			—			
Erysipelas			21	8	2			27	2	1
Deaths							—			
Infective enteritis or diarrhoea under 2 years				28	13				142	
Deaths	12		3	2	1	27	—	11	16	4
Measles*	2,494	146	80	35	45	688	42	40	48	40
Deaths†		—	2	—	—			1	1	—
Ophthalmia neonatorum	52	9	7		—	54	12	6	—	—
Deaths										
Paratyphoid fever	11	1	—		—	18	1	5(B)	2(B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	218	14	1		1	211	10	2	1	2
Deaths (from influenza)‡	1	—	—	—	—	6	—	—	—	—
Pneumonia, primary			128	¶				85	10	
Deaths	108	11		6	4	116	18		9	3
Poliomyelitis, acute	478	29	77	3	24	342	41	8	3	3
Deaths§	23	2		—		20	2			
Puerperal fever			6				—	10		
Deaths										
Puerperal pyrexia‖	87	7	8		—	118	9	4	—	2
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	750	49	148	51	47	942	75	132	62	96
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	8	2	3	2	—	4	1	1	2	—
Deaths	1	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	4	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,086	267	186	65	19	1,180	48	75	33	45
Deaths	8	2	—	1	—	1	—	—	—	—
Deaths (0–1 year)	193	24	31	16	8	225	26	49	36	15
Deaths (excluding still-births)	4,074	627	492	158	105	3,702	567	482	162	88
Annual death rate (per 1,000 persons living)			9·9			•		9·7	10·0	
Live births	6,602	1056	828	431	213	7,099	1098	891	373	225
Annual rate per 1,000 persons living			16·6					17·9	23·1	
Stillbirths	179	21	23			188	17	27		
Rate per 1,000 total births (including stillborn)			27					29		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending September 23 were: paralytic, 268 (291); non-paralytic, 151 (187); total, 419 (478). The figures for the previous week are in parentheses. For the second successive week there has been a decided fall in the total number of cases. Non-paralytic cases were 36% of the total during the week under review.

Decreases were fairly widespread, but were more marked in counties heavily affected earlier in the year. Stafford and Gloucester had 13 fewer cases than during the previous week; Worcester 11 fewer and Warwick 10 fewer. Material increases were shown in Kent and Northumberland with 9 more cases each. Surrey had an increase of 7 cases and Lancashire one of 6 cases.

The uncorrected notifications for the corresponding week in 1947, 1948, and 1949 were 594, 73, and 295 respectively. Total uncorrected notifications for 1950, up to and including the week under review, were 6,023. The corresponding figures for 1947, 1948, and 1949 were 6,192, 1,361, and 3,284.

Discussion of Table

In *England and Wales* a fall occurred in the number of notifications of whooping-cough 596, measles 36, and acute poliomyelitis 35; a rise was reported for scarlet fever 92, acute pneumonia 26, and dysentery 10.

The largest variation in the local trends of scarlet fever was a rise of 27 in Yorkshire West Riding. A decline in the incidence of measles was reported throughout the country; the outstanding exceptions were rises in Lincolnshire 184 (due to a big outbreak in Spalding U.D.) and Yorkshire West Riding 76. The largest returns of diphtheria during the week were those of Bootle C.B. and Birmingham C.B., with 4 notifications each. The largest falls in the notifications of whooping-cough were from Warwickshire 75 and Middlesex 67, and the most notable exception to the general downward trend was a rise of 20 in Staffordshire.

The chief centres of dysentery were Lancashire 55 (Droylsden U.D. 11, Great Harwood U.D. 10); Leicestershire 49 (Leicester C.B. 42); Yorkshire West Riding 32 (Shipley U.D. 10, Bradford C.B. 7); Durham 14 (South Shields C.B. 8); Surrey 13 (Coulsdon and Purley U.D. 10); and London 10.

The chief features of the returns for acute poliomyelitis were a rise in the South-west counties of 13 and a rise of 12 in Worcestershire. The largest returns were from Lancashire 35 (Liverpool C.B. 15, Manchester C.B. 13); Gloucestershire 31 (Bristol C.B. 25); Staffordshire 30 (Rowley Regis M.B. 4); London 29 (Islington 4, Southwark 4); Warwickshire 25 (Birmingham C.B. 14, Coventry C.B. 7); Middlesex 24 (Harrow U.D. 4); Yorkshire West Riding 24 (Sheffield C.B. 7, Leeds C.B. 4, York C.B. 4); Durham 23 (distributed over 15 areas); Essex 16 (Walthamstow M.B. 4); Worcestershire 16 (Dudley C.B. 5); Devonshire 15 (Newton Abbot R.D. 4); Dorsetshire 14; Kent 14 (Orpington U.D. 5); Lincolnshire 12 (Grimsby C.B. 5); Nottinghamshire 11 (Nottingham C.B. 4); Southampton 11 (Bournemouth C.B. 4); Leicestershire 10; and Somerset 10.

In *Scotland* a fall occurred in the number of notifications of whooping-cough 125 and measles 16; a rise was recorded for scarlet fever 21. The notifications of scarlet fever fell by 10 in the Western area, but a small rise occurred in the other areas. The largest returns of dysentery were from Glasgow 39, Stirling county 20, and Edinburgh 12. Very little change occurred in the geographical distribution of acute poliomyelitis; the largest returns were from Glasgow 16, Fife county 11, Dundee 7, Lanark county 7, and Edinburgh 4.

In *Eire* decreases were recorded in the number of notifications of measles 36 and whooping-cough 33; a rise of 10 occurred in the notifications of diarrhoea and enteritis. A fall in the incidence of measles and whooping-cough was general throughout the country, while the rise in diarrhoea and enteritis was confined to Dublin C.B.

In *Northern Ireland* a rise of 13 occurred in the number of notifications of measles, and a fall of 12 was reported for whooping-cough. An increase of 10 was recorded for the notifications of acute poliomyelitis. The largest returns for acute poliomyelitis were from Antrim county 8, Down county 7, Belfast C.B. 5, and Armagh county 3.

Week Ending September 23

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 771, whooping-cough 2,935, diphtheria 38, measles 2,673, acute pneumonia 260, acute poliomyelitis 419, dysentery 170, paratyphoid fever 9, and typhoid fever 3.

Medical News

W.H.O. Mission to Korea

The World Health Organization has appointed a special mission to Korea to assist in the administration of health and relief programmes for the civilian population. The director of the mission, Dr. W. H. Crichton, C.I.E., has already left to assume his new post. He will be assisted by five public health teams composed of medical officers and sanitary engineers now being recruited by W.H.O. in Europe, South America, and the United States. The W.H.O. mission to Korea will be put at the disposal of the unified command and will assist the South Korean Ministries of Public Health and Social Welfare. The mission will help to reorganize health services for the population and assist in relief programmes and in the control and prevention of communicable diseases.

Neurosurgical Congress in Bologna

Dr. A. J. H. Hewer, consulting anaesthetist to the Middlesex Hospital, visited Italy between September 26 and October 3 to read a paper on anaesthesia with special reference to neurosurgery at a congress of neurosurgeons at Bologna. The visit was sponsored by the British Council.

Visits to Finland

Professor R. Cruickshank, of the Wright-Fleming Institute, St. Mary's Hospital, London, gave three lectures for the British Council in Finland between September 17 and 21. At the University of Helsinki he spoke on "The Chemotherapy of Tuberculosis," to the Society of Pathologists in Helsinki on "The Epidemiology and Control of Whooping-cough," and to the medical faculty of the University of Turku on "Modern Antibiotic Therapy."

Another visitor to Helsinki, during the fortnight September 11 to 26, was Miss E. M. Crothers, general superintendent of the Queen's Institute of District Nursing, who lectured and demonstrated on home nursing methods at the invitation of the Finnish State Medical Board.

Visit to Yugoslavia

Dr. Marc Daniels, of the M.R.C. Tuberculosis Research Unit, spoke in Belgrade and other Yugoslav centres on "The Chemotherapy of Tuberculosis" and "The Epidemiology of Tuberculosis" between September 22 and October 6 on behalf of the British Council.

Vellore Christian Medical College

The Golden Jubilee celebrations of the Christian Medical College at Vellore, South India, are being celebrated in London on October 12. The college has recently been granted permanent affiliation to the University of Madras, and is the only Christian medical college in India and Pakistan where men and women can take the M.B., B.S. degree. It is also the only university school of nursing in South India. The hospital has 468 beds, with a staff of 60 doctors and 120 nurses, and it offers a complete medical service. A valuable side of the hospital's work is its rural medical service: mobile dispensaries go out weekly, treating on each trip up to 300 patients. At present there are over 160 students in the medical school, which has many Europeans on the teaching staff. At a medical meeting, which is to be held in the Caxton Hall, Westminster, on October 12 at 5.30 p.m., the chair will be taken by Sir George McRobert, former professor of medicine, Madras College, and speakers will include Sir Henry Holland, C.I.E., and Drs. J. Donald Ball and Leela Chacko. A coloured film showing the work of the college will be shown before the medical meeting at 5 p.m. Application for afternoon tea tickets should be addressed to the Secretary, "Friends of Vellore," Annandale, North End Road, London, N.W.11.

R.C.O.G. Dinner

The annual dinner of the Royal College of Obstetricians and Gynaecologists was held at the Dorchester Hotel on September 29, when the president of the College, Professor Hilda Lloyd, was in the chair. The large number of distinguished guests included the Lord Mayor of London, Sir John Anderson, and the vice-chancellor of the University of London.

In proposing the health of the College, Sir John Anderson said it gave him special pleasure to be invited as the chief guest, because as chairman of the Postgraduate Medical Federation he was concerned with advanced medical education. Responsibility for higher medical education was shared between the universities and the royal colleges. The federation was encouraging the recognition by the universities of a series of specialist institutes for postgraduate teaching. One of these was the Institute of Obstetrics and Gynaecology, founded in 1948 and based on the Hammersmith Hospital, Queen Charlotte's Maternity Hospital, and the Chelsea Hospital for Women. Co-ordination of these activities was met by a representation of the colleges on the governing body of the Postgraduate Federation and also by the establishment of a joint board. The Royal College of Obstetricians and Gynaecologists was responsible for the standards of consultants in these subjects, and its sphere extended to all parts of the Commonwealth. It had no responsibility comparable with the older colleges for undergraduate training. Through its diploma of membership the College had influenced higher medical education substantially in respect of clinical practice. Referring to finance, Sir John observed that the colleges had to depend on their own resources. So long as this was the case they could claim a degree of independence not consistent with reliance on Exchequer grants. Such independence was important and valuable, and he hoped that the time was not far distant when the College could command resources comparable, in relation to their needs, to those at the disposal of the older colleges.

In response, Professor Hilda Lloyd welcomed new fellows and members, and in particular those from the Dominions. She referred appreciatively to the three years of office held by Sir William Gilliatt and the work he had done to raise the status of the College. Their facilities for research were restricted for lack of funds. But they were making some headway. £60,000 had been raised by the appeal fund organized by the College. Sir Arthur Sims and his family had given funds to establish a Commonwealth Travelling Professorship tenable every other year. The Bernhard Baron trustees had given £10,000 towards travelling scholarships. These gifts had brought their funds within the region of £100,000. Professor Hilda Lloyd mentioned that the Royal College of Obstetricians and Gynaecologists now had a seat on the G.M.C. They also had regional councils in New Zealand, Canada, and Australia.

The health of the guests was proposed by Mr. G. F. Gibberd and responded to by Dr. W. Russell Brain, the president of the Royal College of Physicians.

King's College Hospital Medical School

The annual dinner of King's College Hospital Medical School was held at Claridge's Hotel on September 30 with Sir Cecil Wakeley, P.R.C.S., in the chair. The toast to the medical school was proposed by Dr. Lawrence Dulake, who spoke as a general practitioner looking back on the value of the training given to him. The main object of a medical school was to turn out good doctors—not special kinds of doctors. The medical school, in fact, concentrated on basic training. When the speaker was a student he and his contemporaries thought the curriculum was good, but he believed it was far better to-day. In his experience psychosomatic disturbances accounted for 60% of the G.P.'s work, and it would be a great step forward in the training of students when full emphasis was given to psychiatric considerations. Dr. Dulake expressed confidence in the future of King's, which was safe in the hands of the present staff and of the King's men and women who were scattered about the world. In his reply Mr. Harold Edwards, the dean of the medical school, said that the intake of students was still rising. With three London University gold medallists they had had a fine year of academic successes. The need for more beds was as great as ever, and at last there did seem to be some hope that building would be begun. In proposing the health of the chairman, Dr. F. S. Cooksey said that Sir Cecil Wakeley was the ninth old King's man to be president of the Royal College of Surgeons. His contributions to surgery, to his medical school, to the Royal Naval medical service, and to his own great college were outstanding. Sir Cecil Wakeley, replying, said that it was just after the first world war that the first lecture by a G.P. was given to King's students. On the whole he thought that the clinical acumen of physicians in the Victorian age was probably better than it is to-day. In some important things the student did not now acquire the knowledge his predecessors acquired 20 or 30 years ago. He earnestly hoped that it would never be the common practice in this country for students to be examined by their own teachers only. This would not be for the good of the profession.

COMING EVENTS

Lectures on Ophthalmology

A series of four lectures on ophthalmology began in the Department of Ophthalmology of the University of Glasgow on October 4, when Dr. Fergus Campbell spoke on "Experimental Corneal Lesions." Further lectures will be given on October 11, 18, and 25, details of which will be published in the "Societies and Lectures" column of the *Journal*.

Fellowship of Postgraduate Medicine

The Fellowship of Postgraduate Medicine, 1, Wimpole Street, London, W., has arranged a concentrated practical week-end course in the "Rheumatic Diseases" with clinical lectures, practical demonstrations, and ward rounds at the Rheumatism Unit, St. Stephen's Hospital, Fulham Road, London, S.W., on Saturday and Sunday, October 7 and 8. The programme is as follows: October 7, 10 a.m., introductory address by the Rt. Hon. Lord Amulree, "The Social and Economic Aspects of the Chronic Rheumatic Diseases"; 11 a.m., Dr. Peter Bishop, "The Endocrine Aspects of the Chronic Rheumatic Diseases"; 12 noon, Dr. Philip Ellman, "Rheumatoid Disease—its Widespread Clinical Manifestations"; 2 p.m., Dr. Francis Bach, "The Management of the Rheumatic Patient"; 3 p.m., Dr. Francis Bach and the medical registrars, demonstration of methods of physical treatment and rehabilitation; 4.30 to 5.30 p.m., Dr. E. G. L. Bywaters, "Pathology of the Chronic Rheumatic Diseases." October 8, 10 a.m., Dr. Philip Ellman and the medical registrars, ward round with demonstration of cases; 11.15 a.m., Dr. Philip Ellman, "Joint Lesions in General Medicine"; 12 noon, Dr. David Shaw, "Psychiatric Factors in the Chronic Rheumatic Diseases"; 2 p.m., Mr. Timbrell Fisher, "Orthopaedic Aspects of Rheumatic Disease and the Prevention and Treatment of Deformities"; 3 p.m., Mr. Timbrell Fisher, demonstration of cases and treatment by manipulation (if cases are available); 4.30 to 6 p.m., lantern lecture by Dr. Grace Batten, "The Radiological Diagnosis of the Rheumatic Diseases." The fee for the course, open only to members of the Fellowship of Postgraduate Medicine, is £2 12s. 6d. payable in advance to the Fellowship of Medicine. Lunch will be provided at the hospital and is included in the fee.

British Postgraduate Medical Federation Lectures

The series of lectures on "The Scientific Basis of Medicine" arranged by the British Postgraduate Medical Federation will begin on Tuesday, October 10, and will continue until Tuesday, March 20, 1951. Lectures will be given at 5.30 p.m. on Tuesdays and Thursdays at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.

Admission is free without ticket. The programme for the period October 10 to December 21 will be found in the advertisement columns. Details will be published in the "Societies and Lectures" column of the *Journal* week by week.

Royal Institute of Philosophy

The 1950–1 programme of lectures of the Royal Institute of Philosophy has been arranged as follows: October 13, 20, and 27, and November 3, a course of four lectures on "Synoptic Philosophy (A Philosophy of Nature)," by Mr. G. J. Whitrow, D.Phil.; November 10, "Aristotle's Doctrine Concerning the Connexion of Soul and Body," by Mr. W. F. R. Hardie; November 17, "The Notion of an Imperative in Morality and Elsewhere," by Professor C. D. Broad; November 24, "The Nature of Aesthetic Experience," by the Earl of Listowel; January 26 and February 2, 9, and 16, a course of four lectures on "The Philosophy of Mind and Value," by Mr. A. J. T. Wisdom; February 23, "The Nature of Religious Knowledge," by the Very Rev. W. R. Matthews (Dean of St. Paul's Cathedral); and March 2, "The Function of Art in Civilization," by Mr. Stanley Spencer. The lectures will be delivered at University Hall, 14, Gordon Square, London, W.C., at 5.15 p.m.; they are open to the public, and tickets of admission may be obtained, free of charge, from the director of studies of the institute.

Neurological Diseases in Children

The Institute of Child Health (Hospital for Sick Children, Great Ormond Street, London, W.C.) in conjunction with the Institute of Neurology (National Hospital, Queen Square, London, W.C.) has arranged a series of 10 lectures on "Neurological Diseases in Children" to be given at the Institute of Neurology, National Hospital, on Mondays from October 16 to December 18 at 5 p.m. There is a fee for the lectures, and tickets will be issued in advance. Details will be published in the "Societies and Lectures" column of the *Journal* week by week.

27th General Hospital

A reunion dinner of the 27th General Hospital will be held at the Eccleston Hotel, Eccleston Square, London, S.W., on Saturday, October 21, at 6.30 for 7.15 p.m., when Lieutenant-Colonel Colin Wilson will preside. Tickets (inclusive) £1; informal dress. Inquiries should be addressed to Dr. L. S. Potter, B.M.A. House, Tavistock Square, London, W.C.1.

I.B.P. Medical Group Conference

The Medical Group of the Institute of British Photographers is holding a one-day conference on Saturday, October 28, 1950, at the Polytechnic, Regent Street, London, W.1, which will include a demonstration of cavity photography by Mr. F. Wardlaw, of Manchester, a lecture-demonstration on "Autostereoscopic Photography and Radiography," by Mr. L. P. C. J. Dudley, and the showing of two films, one on "Carcinoma of Fauces Treated by Beam-directed *X* Rays," by Mr. J. Larway, of Sheffield, and the other on "Examination of the Cervical Lymph Nodes," presented by Dr. Peter Hansell, of the Westminster Hospital. The conference is open to all interested in medical photography, and tickets (price 12s. 6d.) can be obtained from the secretary, Institute of British Photographers, 49, Gordon Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Friday

Royal Medical Society, 7, Melbourne Place, Edinburgh.—October 6, 8 p.m., "*The Use of Radioactive Isotopes in Science and Industry*," inaugural address by Sir Edward Appleton.

Monday

Edinburgh University.—At Surgery Lecture Theatre, University New Buildings, Edinburgh, October 9, 5 p.m., "*The Indications for Surgery in Peptic Ulcer*," Macarthur postgraduate lecture by Mr. Norman C. Tanner.

Institute of Ophthalmology (University of London), Judd Street, London, W.C.—October 9, 5.30 p.m., "*The Anatomy of the Ocular Muscles*," by Dr. F. Stansfield.

Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E.—October 9, 4.30 p.m., lecture-demonstration for postgraduates by Dr. E. Stengel.

Medical Society of London, 11, Chandos Street, Cavendish Square, London, W.—October 9, 8.30 p.m., annual general meeting; 8.45 p.m., "*Occultism in the Days of Lettsom*," pres.dential address by Dr. A. H. Douthwaite.

●Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—October 9, 5 p.m., "*Surgery of the Pancreas*," by Professor C. F. W Illingworth; 6.15 p.m., "*The Nodular Breast*," by Mr. Hedley Atkins.

●Royal College of Surgeons of England: Faculty of Anaesthetists, Lincoln's Inn Fields, London, W.C.—October 9, 10 a.m., "*Blood Transfusion*," by Dr. H. F. Brewer; 11.30 a.m., "*Lumbar Puncture and Spinal Anaesthesia*," by Dr. H. W. C. Griffiths; 2.30 p.m., "*Blood Transfusion*," by Dr. H. F. Brewer; 4 p.m., "*Lumbar Puncture and Spinal Anaesthesia*," by Dr. H. W. C. Griffiths.

Tuesday

British Postgraduate Medical Federation.—At London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., October 10, 5.30 p.m., "*Scientific Method in Medical Research*," by Sir Henry Dale, O.M., F.R.S.

Chelsea Clinical Society.—At South Kensington Hotel, 47, Queen's Gate Terrace, London, S.W., October 10, 7 for 7.30 p.m., "*Plastic Surgery and the Arts*," discussion to be opened by Mr. Adrian Hill and Mr. Henry E. Blake.

Edinburgh University.—At Surgery Lecture Theatre, University New Buildings, Edinburgh, October 10, 5 p.m., "*Operative Methods in the Treatment of Peptic Ulcer*," Macarthur postgraduate lecture by Mr. Norman C. Tanner.

●Institute of Dermatology, Lisle Street, Leicester Square, London, W.C.—October 10, 5 p.m., "*Eczema and/or Dermatitis*," by Dr. J. E. M. Wigley.

London University.—At Westminster Medical School (Meyerstein Lecture Theatre), Horseferry Road, Westminster, London, S.W., October 10, 5.30 p.m., "*Nature and Properties of Certain Metalloprotein Enzymes*," by Professor D. Keilin, F.R.S.

●Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—October 10, 5 p.m., "*Congenital Abnormalities of the Foot*," by Mr. John Bruce; 6.15 p.m., "*Intracranial Suppuration*," by Sir Hugh Cairns.

●Royal College of Surgeons of England: Faculty of Anaesthetists, Lincoln's Inn Fields, London, W.C.—October 10, 10 a.m., "*Absorption Technique*," by Dr. W. Mushin; 11.30 a.m., "*Volatile Anaesthetics*," by Professor R. R. Macintosh; 2 p.m., "*Anaesthesia in Children*," by Dr. R. W. Cope; 3.30 p.m., "*Volatile Anaesthetics*" by Professor R. R. Macintosh, 5 p.m., "*Anaesthesia in Children*," by Dr. R. W. Cope.

University College.—At Anatomy Theatre, Gower Street, London, W.C., October 10, 1.15 p.m., "*Human Biology as an Academic Topic*," by Professor J. B. S. Haldane, F.R.S.

Wednesday

Edinburgh University.—At Surgery Lecture Theatre, University New Buildings, Edinburgh, October 11, 5 p.m., "*Treatment of the Complications of Peptic Ulcer*," Macarthur postgraduate lecture by Mr. Norman C. Tanner.

Glasgow University.—In Department of Ophthalmology, October 11, 8 p.m., "*Clinical Investigations with Aureomycin*," by Professor W. J. B. Riddell.

●Institute of Dermatology, Lisle Street, Leicester Square, London, W.C.—October 11, 5 p.m., "*X-ray Technique*," by Dr. C. W. McKenny.

London University.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 11, 5.30 p.m., "*The Development of Modern Renal Physiology*," by Professor Homer W. Smith (New York).

●Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—October 11, 5 p.m., "*Femoral Hernia*," by Mr. Peter McEvedy; 6.15 p.m., "*Tuberculous Cervical Glands*," by Mr. C. J. B Murray.

●Royal College of Surgeons of England: Faculty of Anaesthetists, Lincoln's Inn Fields, London, W.C.—October 11, 10 a.m., "*Volatile Anaesthetics*," by Professor R. R. Macintosh; 11.30 a.m., "*Intravenous Anaesthesia*," by Dr. A. H. Galley; 2.30 p.m., "*Intravenous Anaesthesia*," by Dr. A. H. Galley; 4 p.m., "*Choice of Anaesthetic*," by Dr. J. H. T. Challis.

Royal Medical Society.—At 26, Chalmers Street, Edinburgh, October 11, 7.30 p.m., clinical meeting.

Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.—October 11, 2.30 p.m., symposium: "*The Care of the Aged Healthy, the Aged Infirm, and the Aged who are Chronically Sick*," by (*a*) Dr. H. L. Glyn Hughes, (*b*) Dr. G. S. Wigley, (*c*) Sir Edward Bligh, and (*d*) Dr. F. R. O'Shiel.

Society of Chemical Industry: Food Group.—At Medical Society of London, 11, Chandos Street, Cavendish Square, London, W., October 11, 3 p.m., meeting of Microbiological Panel. Symposium: "*Air Disinfection and Sterilization*." Papers by Mr. C. E. Coulthard, Dr. O. M. Lidwell, Dr. R. E. O. Williams, Dr. A. Parker and Mr. G. B. Cherry, and Mr. F. E. S. Wright. Dr. R. B. Bourdillon will open a discussion.

South-west London Medical Society.—At Bolingbroke Hospital, Wandsworth Common, London, S.W., October 11, 8.30 p.m., "*Vascular Disorders of the Feet*," by Mr. A. M. Desmond.

Thursday

British Postgraduate Medical Federation.—At London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., October 12, 5.30 p.m., "*Fat Soluble Vitamins and Bone Formation*," by Sir Edward Mellanby, F.R.S.

●Institute of Dermatology, Lisle Street, Leicester Square, London, W.C.—October 12, 5 p.m., "*Pathology*," by Dr. J. O. Oliver.

Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E.—October 12, 3 p.m., "*The Nature of the Nerve Impulse*," by Dr. B. Katz.

North-east London Clinical Society.—At Prince of Wales's General Hospital, Tottenham, N., October 12, 8.15 p.m., "*Thrombosis and Embolism*," by Mr. Maurice Lee. To be illustrated by a film.

Royal Army Medical College.—At Lecture Theatre, John Islip Street, London, S.W., October 12, 5 p.m., "*The History of Smallpox in the British Isles*," by Sir William MacArthur.

●Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—October 12, 5 p.m., "*Acute Intestinal Obstruction*," by Mr. Grant Massie; 6.15 p.m., "*Surgery of the Adrenal*," by Mr. L. R. Broster.

●Royal College of Surgeons of England: Faculty of Anaesthetists, Lincoln's Inn Fields, London, W.C.—October 12, 10 a.m., "*Anaesthesia for Thoracic Surgery*," by Dr. A. I. Parry Brown; 11.30 a.m., "*Muscle Relaxants*," by Dr. T. Cecil Gray; 2.30 p.m., "*Anaesthesia for Thoracic Surgery*," by Dr. A. I. Parry Brown; 4 p.m., "*Muscle Relaxants*," by Dr. T. Cecil Gray.

University College.—At Anatomy Theatre, Gower Street, London, W.C., October 12, 1.15 p.m., "*Man as a Subject for Scientific Study*," by Professor J. Z. Young, F.R.S.

Friday

Edinburgh University.—At Anatomy Lecture Theatre, University New Buildings, Edinburgh, October 13, 5 p.m., "*The Present Status of Cortisone and A.C.T.H. in General Medicine*," Macarthur postgraduate lecture by Dr. Philip S. Hench (Minnesota, U.S.A.).

Institute of Ophthalmology (University of London), Judd Street, London, W.C.—October 13, 5.30 p.m., "*Detachment Operations other than Diathermy*," by Mr. A. Lister.

●Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.—October 13, 5 p.m., "*Bone Sarcoma*," by Sir Stanford Cade; 6.15 p.m., "*Fractures of the Femoral Shaft*," by Mr. H. L. C. Wood.

●Royal College of Surgeons of England: Faculty of Anaesthetists, Lincoln's Inn Fields, London, W.C.—October 13, 10 a.m., "*Principles of Anaesthetic Apparatus*," by Dr. H. G. Epstein; 11.30 a.m., "*The Circulation During Anaesthesia*," by Professor E. A. Pask; 2.30 p.m., "*Principles of Anaesthetic Apparatus*," by Dr. H. G. Epstein; 4 p.m., "*The Circulation During Anaesthesia*," by Professor E. A. Pask.

Royal Medical Society, 7, Melbourne Place, Edinburgh.—October 13, 8 p.m., "*Diseases of the Cotton Industry*," dissertation by Dr. J. G. E. Smith.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Macphail.—On September 11, 1950, at Queen Charlotte's Hospital, to Dr. Margarett Macphail (formerly Hutchinson), wife of Dr. D. S. Macphail, a daughter.

Parkes Bowen.—On September 23, 1950, to Sheila (formerly Robinson), wife of Dr. David Parkes Bowen, a daughter—Penelope Susan.

Whitehouse.—On September 20, 1950, at Ashleigh, Gosforth, Newcastle-upon-Tyne, to Joan (formerly Tully), wife of Dr. Dennis Whitehouse, a brother for Peter—Michael David.

DEATHS

Abercrombie.—On September 30, 1950, at Plymouth, Massachusetts, Peter Henderson Abercrombie, M.D., of Putney Hill, London, S.W., aged 83.

Ball.—On September 25, 1950, at University College Hospital, London, W.C. Cecil Glyn Ball, M.B., B.S., C.P.H., of 213, Everton Drive, Stanmore, Middlesex, aged 30.

Edington.—On September 23, 1950, at 21, Brunswick Square, Penrith, Daniel Charles Edington M.D.

Ferguson.—On September 27, 1950, Robert Ferguson, M.D., of Albury Nook, South Eden Park Road, Beckenham, Kent, late of Ongar, Essex, aged 81.

Garner.—On September 16, 1950, at "Brookfield," Irlam Road, Flixton, Manchester Charles Garner, M.D., aged 75.

Gloyne.—On September 25, 1950, Stephen Roodhouse Gloyne, M.D., D.P.H., of 190, Chiltern Court, London, N.W.

Harris.—On September 16, 1950, at the London Hospital, Charles Harris, L.R.C.P.&S.Ed., D.P.H., of 44, Carden Avenue, Patcham, Brighton, aged 65.

Humphery.—On September 22, 1950, at Stradbroke Priory, near Diss, Norfolk, Geoffrey Per y Humphery, M.B., C.M., Brevet Lieutenant-Colonel, R.A.M.C., retired, aged 83.

Jarratt.—On September 19, 1950, at 14, St. James' Road, Bridlington, Yorks. Alfred Kaye Jarratt, M.B., C.M., aged 82.

Leech.—On September 19, 1950, at Chadlington House, Victoria Park, Manchester, Ernest Bosdin Leech, M.D., F.R.C.P., aged 75.

Leys.—On September 15, 1950, at "Culdearn," Grantown-on-Spey, Morayshire, John Leys, M.D., aged 85.

Purslow.—On September 20, 1950, at 65, Sir Harry's Road, Edgbaston, Birmingham, Charles Edwin Purslow, M.D., aged 89.

Rawlence.—On September 17, 1950, following an operation, Harold Ernest Rawlence, O.B.E., M.D., F.R.C.S.Ed., of Stoford House, Stoford, near Salisbury, Wilts.

Swyer.—On September 21, 1950, at the Queen Mary Hospital, Millbank, London, S.W., James Edward Swyer, M.R.C.S., L.R.C.P., Colonel, A.M.S.

Walters.—On September 16, 1950, William James Walters, M.R.C.S., L.R.C.P., of 185, Whitehall Road, Gateshead, late of Bryn Road, Swansea, aged 59.

Any Questions?

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

Diastolic Murmurs

Q.—*How can the "innocent" diastolic murmur be diagnosed, and what is its significance?*

A.—Strictly speaking, there is no such thing as an innocent diastolic murmur. There are functional diastolic murmurs which are innocent in the sense that they do not denote valve disease; on the other hand, they may indicate something even more serious. For example, practically all pulmonary diastolic murmurs are functional and depend upon dilatation of the pulmonary artery and valve ring. A functional aortic diastolic murmur occurs in about 10% of cases of severe hypertension for similar reasons. A functional mitral diastolic murmur may be heard in patent ductus arteriosus, ventricular septal defect, and occasionally in thyrotoxicosis, and signifies a greatly augmented mitral blood flow. There is no difference in the timing and quality of such functional murmurs from those due to organic disease of the valve, but the clinical circumstances are different. The correct diagnosis is thus arrived at only after a full consideration of all the features of the case, not just by auscultation alone.

A soft respiratory murmur may occasionally be heard in diastole at the left sternal border, and this of course is innocent. It is difficult to hear, varies with respiration, and may have an unusual relationship to the second heart sound as compared with intracardiac murmurs. A soft pericardial friction rub in diastole may also be mistaken for a diastolic murmur.

Prickly Heat

Q.—*What is the modern specific treatment, if any, for prickly heat?*

A.—There is no truly specific treatment for prickly heat. The most important thing to do is to supply animal or vegetable fat to the epidermis. This is best done by rubbing in daily ung. adipis lanae hydrosi. The second thing is to use a mild antiseptic to kill the invading staphylococci. Brilliant green is the least irritating and can be incorporated in the ointment, but its staining properties make it objectionable to use. An alternative would be to swab once daily with a 1:1,500 solution of mercury perchloride. Anything that removes the natural grease from the skin must be avoided; soap should not be used more than once daily. Swabbing with alcoholic solutions is to be condemned.

Testing Visual Acuity in a Small Surgery

Q.—*I have a surgery which is not 6 metres (19.7 ft.) long, and I wish to use my Snellen's test-type card. Can you please tell me: (1) Is a mirror-image card available so that I may put the card 13 ft. (3.97 m.) from the mirror and the patient 7 ft. (2.14 m.) from the mirror? (2) Is there any simple way of reading my test-type card at a distance of 13 ft., instead of at 20 ft. (6.1 m.), and expressing the result in the standard way?*

A.—(1) Special types are made by the dispensing opticians who supply ophthalmic apparatus, with letters reversed for reading in a mirror. The results are satisfactory, but in a few cases a psychological effect is produced which makes the record of visual acuity a little inaccurate. In some cases it is possible to put a window fairly high up on the wall facing the patient with the usual test-types attached high up on the opposite wall in the adjoining room or passage, the card being moved by cords from the examiner's position. By this means it may be possible to get the full 6 metres.

(2) No. But the visual acuity at 13 ft. can be recorded fairly correctly as 4/12 and 4/18, etc. These figures, however, cannot accurately be converted to, say, 6/18 or 6/24.

Barbiturates and Loss of Memory

Q.—*Is it common for patients taking nightly doses of "seconal" ½ gr. (194 mg.) or "sodium amytal" 3 gr. (32 mg.) over long periods to suffer from some degree of loss of memory? If so, what is the best alternative treatment?*

A.—It is not common for patients taking seconal or sodium amytal in the moderate doses mentioned to suffer from disturbances of memory. These barbiturates are relatively short-acting ones, and have no cumulative effects even if taken for prolonged periods, provided the renal function is not profoundly depressed. The best alternative hypnotic to barbiturates is chloral hydrate in a dose of 10–20 gr. (0.65–1.29 g.) well diluted.

Amphetamine during Lactation

Q.—*Is there any contraindication to the use of an amphetamine preparation in a nursing mother as an aid to weight reduction? Would the milk contain sufficient of the drug to cause the baby to be restless? Is there any objection to starting the course of amphetamine at the beginning of lactation?*

A.—A nursing mother should not use an amphetamine preparation as an aid to weight reduction. It is very likely that the drug would enter the milk and that the baby would be restless and wakeful. To start the course of amphetamine at the beginning of lactation is the worst time, for then the baby is most easily upset.

Excessive Libido

Q.—*What is the best method of reducing the libido of a healthy man, aged 23? There has been no relief with carbromal 10 gr. (0.65 g.) given in the afternoon, nor with phenobarbitone 1 gr. (65 mg.) t.d.s. and butobarbitone 1½ gr. (97 mg.) at tea-time. My patient fears that the frequency with which he indulges in intercourse is undermining his health.*

A.—It would appear that the patient is asking that his libido should be reduced because he himself believes that the frequency of intercourse is "undermining his health." In other words, the patient and not the doctor is deciding that treatment is necessary. Whilst it is reasonable to give stilboestrol to a patient with phthisis who has a haemoptysis after having intercourse, this treatment is not indicated in the present case. Normal intercourse does not undermine a patient's health, and excessive intercourse only makes him tired. The right treatment here is to get rid of the patient's fears and not of his libido.

Immunization of Allergic Children

Q.—*What is the best procedure to adopt in immunizing children who give a history of asthma and similar allergic conditions?*

A.—The important point is that these children should be immunized with preparations which do not contain serum. They can be immunized with alum-precipitated toxoids in the usual way.

Methyl Bromide and Ethylene Oxide Poisoning

Q.—*Methyl bromide and ethylene oxide are both extensively used for the fumigation of stored products. What is the immediate first-aid treatment to an operator who has been exposed to either of these gases? What are the physiological changes and pathological findings in cases of poisoning?*

A.—The concentrations of methyl bromide and ethylene oxide commonly used for fumigation are so small that poisoning from inhalation of the vapour is unlikely to occur. Wyers (*Brit. J. industr. Med.*, 1945, **2**, 24) describes the causes of poisoning from methyl bromide; he points out that careless handling of the materials and failure to appreciate the risk of poisoning are common among workmen. Men engaged in fumigating should work in pairs, and not singly. Protective clothing must include masks and gloves, and rooms should be thoroughly ventilated after fumigation. Periodic medical examination of workers assists in detecting early symptoms and in drawing attention to possible sources of exposure. Workers who experience symptoms such as headache, smarting of the eyes, loss of appetite, abdominal discomfort, or numbness of the feet should be removed at once from further exposure and kept at rest in bed under close observation for several days. Delayed symptoms, including visual disturbances such as difficulty in focusing and amblyopia, apathy, drowsiness, and epileptiform attacks, may occur from 2 to 16 hours after exposure, and death from pulmonary oedema has occurred after 48 hours. There is no specific treatment once these symptoms have developed. Liquid methyl bromide causes burns with marked vesication, redness and swelling of the superficial layers of the skin. Washing in weak sodium carbonate solution, by decomposing the methyl bromide, may help to prevent skin lesions. Chlorbutol ointment relieves the pain of burns.

Little is known about the physiological effect of methyl bromide. There is an increase of non-volatile bromide in the blood (normal 0–1.5 mg. %) and in the cerebrospinal fluid. Methyl bromide cannot be detected in the tissues, and there is no evidence of a cumulative effect nor of acquired sensitivity to it. Necropsy reveals congestion and cloudy swelling of the kidneys and liver, congestion and oedema of the lungs, and oedema of the brain with perivascular haemorrhages (Clarke *et al., Brit. J. industr. Med.*, 1945, **2**, 17).

Ethylene oxide is not particularly toxic to man. It is an irritant gas and causes irritation of the eyes and nose with blood-stained watery discharge from the nostrils. In experimental animals the principal changes at necropsy are found in the respiratory system (Fairhall, *Industrial Toxicology*, Baltimore, 1949, p. 341). In high concentrations the irritant properties of ethylene oxide give warning of its presence. First-aid treatment consists in removal from exposure, rest in bed, and observation for 48 hours until the risk of delayed pulmonary oedema is past.

Corona Diaphragmatica

Q.—*A transverse row of venules is frequently seen running across the front of the chest wall, more usually on the left. Each venule runs more or less vertically, and the condition suggests some obstruction to the deep veins at the level of the diaphragm. What is the significance of this condition?*

A.—A band of dilated superficial venules, embracing the thorax at a level roughly corresponding with that of the diaphragmatic attachment, is commonly seen in males above middle age. It has been termed the "corona diaphragmatica." This phenomenon is compatible with health and does not indicate venous obstruction or any other disease process.

Antihistamine Drugs and Peptic Ulcer

Q.—*Is anything known about the value of antihistamine drugs in the treatment of peptic ulcers?*

A.—Unfortunately the antihistamine drugs have the effect of increasing rather than decreasing the amount of acid secreted by the stomach. This has been studied by Doran (*Lancet*, 1947, **2**, 490) and by Deutsch (*Klin. Med., Wien*, 1947, **2**, 1113). In one of Doran's patients with a duodenal ulcer there was a huge increase in the acidity of the fasting contents after 300 mg. of "benadryl" had been administered. It has been shown that benadryl does not protect guinea-pigs against the development of ulcer after the implantation of histamine in beeswax (Crane *et al., Amer. J. digest. Dis.*, 1947, **14**, 56).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 14 1950

A STUDY OF CORTISONE AND OTHER STEROIDS IN RHEUMATOID ARTHRITIS*

BY

W. S. C. COPEMAN, M.D., F.R.C.P.
Physician-in-Charge, and Physician to Arthur Stanley Institute, Middlesex Hospital, and Hospital of St. John and St. Elizabeth

OSWALD SAVAGE, M.R.C.P.
Assistant Physician, and Physician to Arthur Stanley Institute, Middlesex Hospital

P. M. F. BISHOP, D.M.
Endocrinologist, Guy's Hospital and Chelsea Hospital for Women

E. C. DODDS, M.V.O., M.D., F.R.C.P., F.R.S.
Director, Courtauld Institute of Biochemistry, Middlesex Hospital

B. GOTTLIEB, M.D., M.R.C.P.
Senior Physician, St. Mary Abbots Hospital

J. H. H. GLYN, M.B. **A. A. HENLY, Ph.D.** AND **A. E. KELLIE, Ph.D., A.R.I.C.**
(From the Rheumatism Department, West London Hospital)

Soon after Hench, Kendall, Slocumb, and Polley (1949) announced their preliminary results in treating active rheumatoid arthritis with 17-hydroxy-11-dehydrocorticosterone ("compound E"), hereafter called "cortisone," two of us (W. S. C. C. and O. S.), with others, had an opportunity of visiting the Mayo Clinic and seeing for ourselves the remarkable and rapid results obtained with this substance. It was at once obvious that owing to the difficulties and high cost of production cortisone would not be available for some time in this country even for a limited clinical trial on a research basis.

Consequently the present group was formed with the object of testing, with concurrent metabolic studies, other steroids which were more readily available, and of devising methods by which improvement in rheumatoid arthritis could be assessed in therapeutic trials of any substances which might be thought to have a cortisone-like action.

On the occasion of a second visit to the Mayo Clinic by one of us (O. S.) a small supply of cortisone was made available to us at the instigation of Dr. Philip Hench.

The present report deals with the results of the administration of cortisone to five patients suffering from rheumatoid arthritis and 35 patients treated with other steroids.

Methods

In this condition, in which the severity of the disease may fluctuate from day to day and criteria of activity depend to a large extent on the patient's own account of his pain and disability, assessment of improvement is notoriously difficult. Moreover, in addition to the normal variations which occur as a part of the natural history of rheumatoid arthritis, the psychological effect of giving a new treatment may be very considerable, as has recently been shown by Quin, Mason, and Knowelden (1950).

After discussion with Professor Bradford Hill it was decided to "screen" certain steroids by giving them to a small number of patients and assessing the results. In the event of a significant improvement occurring a second therapeutic trial was to be set up, in which the effect of the steroid would be compared with that of an inert substance indistinguishable from it in appearance, so that neither the patient nor those responsible for administering the injections and assessing the clinical results should know which compound was being given. The two substances, however, would be labelled in such a way that they could be identified in Professor Bradford Hill's department.

This latter method of trial was used in the case of cortisone on five patients who had previously received one of the other steroids; cholesterol was employed as the inert substance. Dr. J. Knowelden, lecturer in medical statistics at the London School of Hygiene and Tropical Medicine, working in Professor Bradford Hill's department, kindly handled this part of the trial.

The cases selected were patients suffering for more than six months from polyarthritis of the rheumatoid type, with symmetrical involvement of the peripheral joints, and tenderness, restricted range of movement, loss of weight, anaemia, and a raised erythrocyte sedimentation rate (E.S.R.). Cases with radiological evidence of minimal joint destruction were chosen so that restoration of full joint movement was still theoretically possible.

Patients were admitted to hospital for the trials and were all volunteers. They were not necessarily confined to bed, and in some cases they returned home for a part of each day so that they were able to judge for themselves whether there was improvement in their ability to carry out domestic duties. Patients were selected from out-patients attending the West London Hospital and the Arthur Stanley Institute of the Middlesex Hospital, and were admitted to the West London Hospital, the Hospital

*This study was aided by grants from the Medical Research Council, the Empire Rheumatism Council, and the Dan Mason Research Foundation of the West London Hospital.

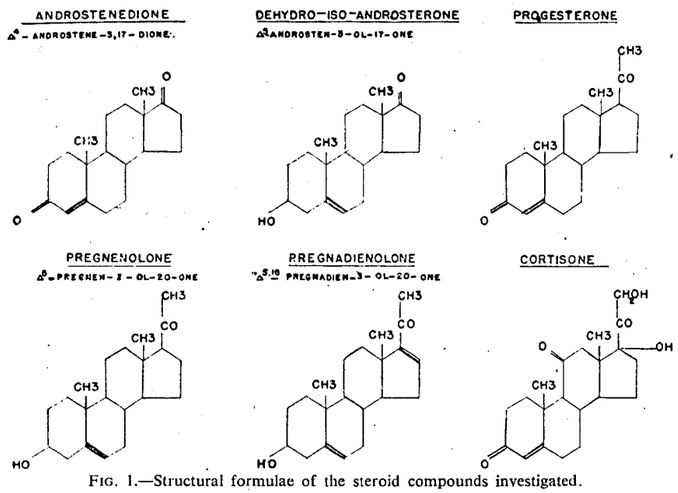


FIG. 1.—Structural formulae of the steroid compounds investigated.

of St. John and St. Elizabeth, or St. Mary Abbots Hospital. Each section of the metabolic studies was, however, carried out in the same laboratory in each case.

Each ten-day trial followed a period of observation in hospital of at least a week, during which a full assessment was carried out, as well as during and after the trial period.

Assessment of Effect

The following criteria were used in assessing the results of the trials:

1. Answers to standard questions were recorded on a "Wirek" magnetic wire recorder, so that the whole interrogative interview could be reproduced at a later date for consideration by both observer and patient. The following are examples of the standard questions used: "How long does it take you to dress?"; "Can you dress fully without assistance?"; "How many tablets do you take daily to relieve the pain?"; "How many times nightly do you wake up with pain?"

2. Repeated examination by the same observer of joints for tenderness on firm pressure, swelling, and range of movement; the results being charted as follows: "1" is recorded when firm pressure over a joint gives rise to pain; "2" when it causes the patient to wince; "3" when the affected limb is in addition involuntarily withdrawn.

3. The grip test.—A blood-pressure cuff is folded up and sewn together into a suitable shape to be gripped in the palm of the hand and is inflated to 30 mm. Hg. The patient is then asked to squeeze it as tightly as he can, and the pressure recorded on the manometer is noted. The mean of three grips with each hand is taken.

4. Certain functional tests using most of the joints of the body, such as walking, climbing a standard set of steps, putting on a coat, getting up and down from a chair. These movements were timed, and could be assessed simply as "positive" or "negative." The tests most often repeated are those which the patient can just accomplish, because they most clearly demonstrate the degree of disability. They may vary from case to case.

5. Patient's own assessment.—During the period of observation patients were taught to assess their own condition from day to day, taking "100" as the "base-line" condition before the trial began. Subsequent figures above 100 indicated deterioration, whereas those under 100 denoted improvement.

6. Certain haematological studies, such as the erythrocyte sedimentation rate, the eosinophil count, and the haemoglobin percentage.

7. Filming certain standard movements before and after therapeutic trials in some cases.

8. Metabolic studies.—In selecting the urinary estimations to be undertaken in the present study it was decided to confine the investigations to those which were reported to have yielded significant results in the early published work on cortisone. These were: (1) 17-ketosteroids, estimated by the method of Callow, Callow, and Emmens (1938). (2) Pregnanediol, determined by a modification of the method of Sommerville, Gough, and Marrian (1948) in which the second and third reprecipitations from aqueous ethanol were replaced by washing with petroleum ether. (3) Corticoids, estimated by the periodic acid oxidation method, using a procedure similar to that described by Corcoran and Page (1948). The conditions of the hydrolysis and extraction were rigidly standardized in order to obtain comparable results. (4) Uric acid. (5) Creatinine. (6) The uric acid/creatinine ratio. Metabolic studies were undertaken on six patients receiving progesterone (Fig. 2), four patients receiving pregnenolone (Fig. 3), two patients receiving dehydro-*iso*-androsterone (Fig. 4), three patients receiving androstenedione, one patient receiving pregnadienolone, and four patients receiving cortisone (Figs. 5 and 6).

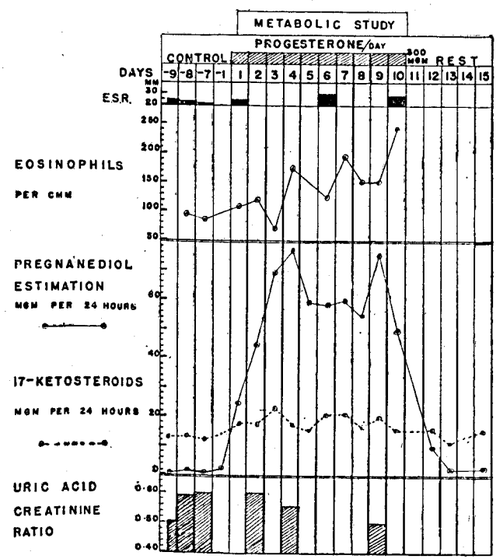


FIG. 2.—A metabolic study of a therapeutic trial with progesterone.

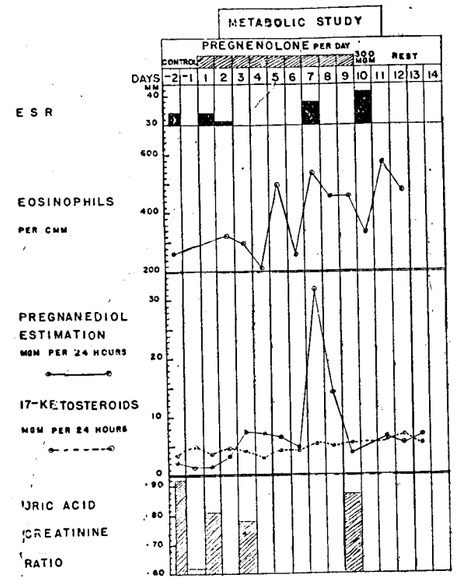


FIG. 3.—A metabolic study of a therapeutic trial with pregnenolone.

Materials

The steroid compounds investigated, other than cortisone, were androstenedione, dehydro-*iso*-androsterone, progesterone, pregnenolone, and pregnadienolone. Their structural formulae are shown in Fig. 1.

It was decided to use high doses of each steroid because it had been shown by the original workers at the Mayo Clinic that only high doses of cortisone would produce results in rheumatoid arthritis. The compounds were in most cases dissolved in ethyl oleate, and the chief factor limiting dosage was the volume of injected oil that the patient could tolerate.

Results

The accompanying Table is a summary of the results of administration of cortisone and other steroids in 40 cases of active rheumatoid arthritis.

Androstenedione.—Six patients were given 100 mg. daily for ten days. There was no clinical improvement in any case. The metabolic study showed a rise in 17-ketosteroids excretion. The uric acid/creatinine ratio showed a steady rise during the administration of androstenedione, but with all the other compounds this ratio fluctuated in a manner which did not indicate any significant trend.

Dehydro-iso-androsterone.—This compound was administered to four patients in daily doses of 300 mg. Slight transient improvement was recorded in one case only. Fig. 4 shows the results of a metabolic study. The increased output of 17-ketosteroids will be noted.

Progesterone.—Twelve patients (ten women and two men) were treated with 300–500 mg. daily for ten days. In every case there was a marked rise in sedimentation rate during progesterone administration. Only in the following case was any improvement seen.

Case 1.—A married woman aged 55 had been disabled with rheumatoid arthritis for six years. Five days after the injection of 300 mg. of progesterone daily she showed marked improvement, being able to run up and down the ward and raise her arms in a way she had been unable to do for three years. The improvement was maintained on 500 mg. daily until the end of the trial period, but when the inert control substance was administered she relapsed to her former state. No improvement occurred during a further period of treatment with 300 mg. of progesterone daily.

This suggests that progesterone is not so effectively metabolized in rheumatoid arthritics as in normal individuals. In this connexion it is of interest that the pregnanediol output was low (13.5 mg./24 hours) in the first period of progesterone administration, when there was marked improvement, and much higher (45 mg./24 hours) during the second course of progesterone, which proved ineffective. It seems possible that the progesterone was being more efficiently utilized during the first course of administration, and that this coincided with the beneficial effect.

Fig. 2 shows a metabolic study performed during a therapeutic trial with progesterone.

Pregnenolone.—No improvement was recorded in the eight cases of the present series. Fig. 3 shows the results of a metabolic study. There was no significant change other than an unexplained rise in the pregnanediol excretion on the seventh day. The E.S.R. rose during treatment.

Results of Administration of Cortisone and Other Steroids in 40 Cases of Rheumatoid Arthritis

Substance Used For Ten Days	No. of Cases	Improvement			No Apparent Effect	Toxic Effect Sufficient to Stop Treatment	Made Worse
		Dramatic	Marked	Slight			
Progesterone (300-500 mg./day)	12		1		8	2	1
Pregnenolone (100-300 mg./day)	8				8		
Androstenedione (100 mg./day)	6				6		
Dehydro-*iso*-androsterone (300 mg./day)	4			1	3		
Pregnadienolone (200 mg./day)	5				3	2	
Cortisone (Day 1, 300 mg., Day 2, 200 mg. Day 3-10, 100 mg.)	5	4	1				

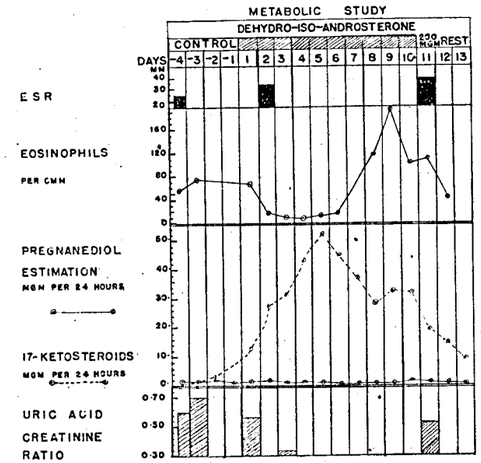


FIG. 4.—A metabolic study of a therapeutic trial with dehydro-*iso*-androsterone.

Pregnadienolone. — This substance was administered in arachis oil in doses of 200 mg. daily for ten days to five patients. In two cases the injections had to be discontinued because of urticarial reactions. In no case was there any improvement.

Cortisone

Five patients were given cortisone and the inert substance, the materials being labelled so that the observers did not know which was the active and which the control compound. After the clinical results had been assessed it transpired that cholesterol had been given first in three cases and cortisone in the remaining two: 300 mg. was administered on the first day, 200 mg. on the second day, and 100 mg. daily for the following eight days.

In all five patients the E.S.R. fell significantly during the cortisone trials. There was no marked rise in haemoglobin percentage in any case, though all the patients were anaemic. The number of eosinophils was considerably diminished throughout the trial (except in one case in which they rose on the eighth day), though they did not disappear completely. There was a sharp rise when cortisone administration was discontinued. In the two cases in which 17-ketosteroids were repeatedly estimated the level rose when cortisone was given, returning to normal subsequently. Similarly, the urinary corticoids rose during treatment, sometimes to three or four times the original level. Less than 2% of the administered cortisone was excreted in the urine as "corticoid" (that is, formaldehydogenic neutral lipid). This agrees with the findings of Sprague *et al.* (1950).

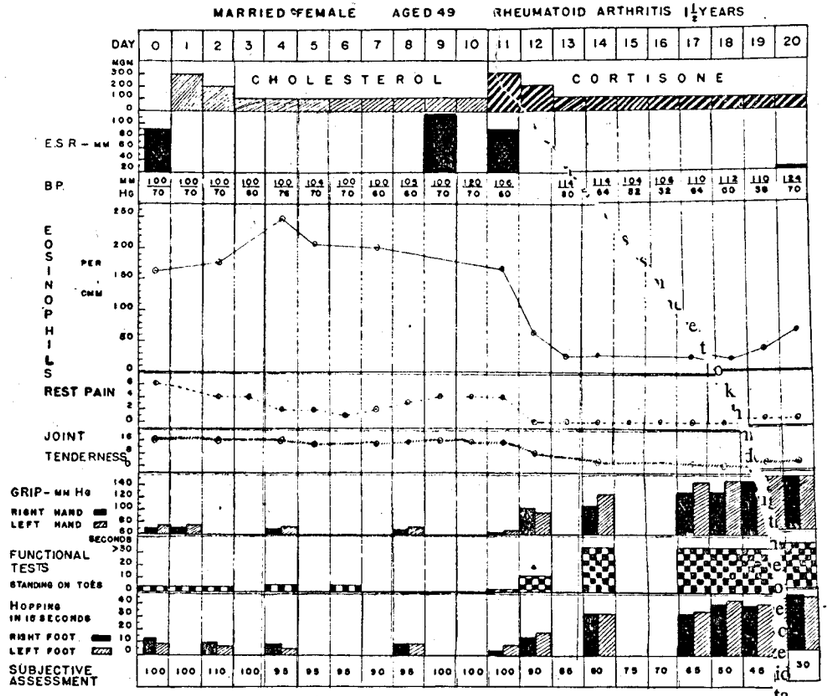


FIG. 5.—Showing the continued improvement throughout a trial with cortisone. (Case 2.)

Four patients gained from 2 to 4 lb. (0.9 to 1.8 kg.) in weight in ten days. There was marked increase in uric acid excretion; in one case the figure rose from 95 mg./24 hours to 429 mg./24 hours on the first day, and to 618 mg./24 hours on the second day of cortisone administration. The urinary creatinine figure rose from 699 mg./24 hours to 968 mg./24 hours on the second day.

All five patients receiving cortisone were women—two of the pre-menopausal, and three of the post-menopausal age. The treatment did not interfere with the menstrual cycles of the former or induce uterine bleeding in the latter.

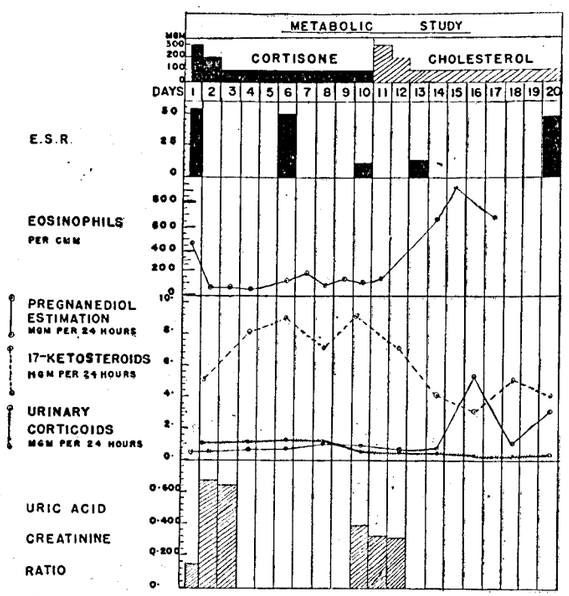


FIG. 6.—A metabolic study of a therapeutic trial with cortisone. (Case 4.)

Case 2

A married woman of 49 had suffered for one and a half years from rheumatoid arthritis, starting in the feet and gradually spreading to the knees, hands, and shoulders with development of nodules on the fingers. She was unable to do her cooking or housework, could not put on her dressing-gown unaided, or hold a cup of tea with one hand. She was taking 10 tablets of codeine daily and was awakened each night with pain. In the previous six months the erythrocyte sedimentation rates were repeatedly found to lie between 50 mm. and 60 mm. in one hour (Westergren). Previous trials with two other steroids had failed to help her.

The response to cortisone was dramatic. On the second day of administration she could hold a pot of tea with one hand and slept throughout the night; on the third day she could put on her dressing-gown unaided. After this she was allowed to go home each day and found she was able to cook

and undertake housework without pain, though it tired her to do so. Fig. 5 indicates the continued improvement throughout the trial.

One month later the residual improvement was considered to be about half as much as she had attained during the course of cortisone therapy, although the E.S.R. had risen to 54 mm. in one hour within a week of discontinuing the injections.

Case 3

An unmarried woman aged 41. The onset, seven months previously, had been febrile with rapid deterioration, and at the beginning of the therapeutic trial she was completely bedridden and in constant pain. The E.S.R. while she was attending as an out-patient was 100 mm. in one hour (Westergren) and had fallen to 60 mm. in one hour after she had been in hospital three months. She had failed to improve while receiving the cholesterol injections, but the improvement with cortisone was dramatic. After receiving 300 mg. on the first day she no longer complained of pain at rest, and on the third day she could get out of bed unaided and stand for a minute. Her grip improved from 60 to 140 mm. Hg with the right hand. The E.S.R. fell from 60 mm. to 20 mm. in one hour during the course of cortisone injections, and she assessed her improvement at 50% at the end of the 10-day course.

A month later she retained half the improvement she had shown during treatment and the E.S.R. had risen to 42 mm. in one hour.

Case 4

An unmarried woman of 55 had suffered from rheumatoid arthritis for three years with a gradual onset involving the knees and spreading to the hands, wrists, elbows, ankles, and shoulders. Previous therapy and steroid trials had failed to help her. She showed marked "ganglionic" swellings at the interphalangeal and wrist joints and could raise her arms only with difficulty. She could walk fairly well, but had been unable to take a bath without assistance for two years. The interphalangeal, wrist, elbow, shoulder, knee, and foot joints were tender on pressure and the E.S.R. had remained at 50 to 60 mm. in one hour each week for the previous two months.

The response to cortisone was dramatic. By the third day she had no pain at rest and the joints were less swollen and no longer tender. On the seventh day she could extend her arms above her head 20 times in one minute, and on the eighth day she took a bath without assistance. During the period of observation she had been unable to jump, but on the tenth she could do so 40 times in one minute. The E.S.R. fell from 54 to 11 mm. in one hour during the trial. She assessed her improvement as 60%.

A month later she had completely relapsed and the E.S.R. had risen to 50 mm. in one hour within 10 days of cortisone being discontinued. The metabolic study is shown in Fig. 6.

Case 5

A married woman aged 38 had suffered from rheumatoid arthritis for three and a half years, starting during her fifth pregnancy involving the hands, wrists, ankles, and feet, with mild joint pains. These became severe three months after parturition and progressed rapidly. She lost 2½ st. (15.9 kg.) in weight, and for the last nine months had suffered from lassitude. She took an hour to dress herself and was unable to carry out most of her household duties, such as holding plates and work involving kneeling. The fact that the E.S.R., which had been 40–50 mm. in one hour for the previous four months, had dropped to 17 mm. just before the trial, however, suggested that the condition might be entering a stage of remission.

The response to cortisone was dramatic, but not as rapid as in the three previous cases. On the second day she no longer complained of pain at rest and most of the tenderness had disappeared, but she did not consider herself much improved until the third day, when she could kneel for the first time without pain. After the fourth day she improved more rapidly, and by the tenth day she could climb on to her bed easily and unaided. The grip of her right hand had strengthened from 100 to 200 mm. Hg and the left hand 90 to 185 mm. Hg. The E.S.R. fell from 17 mm. to 6 mm. in one hour. She assessed her improvement as 50%.

During the subsequent 10-day course of cholesterol injections she retained about half the improvement she had achieved, although the E.S.R. rose again to 23 mm. in one hour. A month later she retained the same degree of improvement, although the E.S.R. had risen further to 43 mm. in one hour.

Case 6

An unmarried woman of 30 had suffered from mild rheumatoid arthritis for four and a half years. Though she was able to continue her clerical work she complained of marked stiffness on rising and a chronic effusion in the left knee. The interphalangeal, metacarpo-phalangeal, and wrist joints and the left knee and mid-tarsal joints were tender, and she was taking an average of 10 codeine tablets daily. The E.S.R., which had fluctuated between 16 mm. and 60 mm. in one hour during the last year, was 20 mm. at the beginning of the clinical trial.

The response to cortisone was marked but not dramatic. The left knee was no longer painful at rest and the wrist-joint tenderness was less, although it did not entirely disappear. The effusion in the left knee subsided. She assessed her own improvement as only 30%, in spite of the fact that she was able to go up and down a flight of steps in eight seconds at the end of the trial, whereas previously it had taken her double that time.

A month later she had retained all her improvement and the E.S.R. was 12 mm. in one hour.

Discussion

Progesterone

Sommerville, Marrian, Duthie, and Sinclair (1950) found that rheumatoid arthritics of both sexes excrete an unusually high proportion of intramuscularly administered progesterone in the urine as pregnanediol. This suggests inadequate metabolism of progesterone, and the observation in one case of the present series, that the pregnanediol excretion was higher when the progesterone proved clinically beneficial than later when it failed to reproduce clinical benefit, would support this contention. Alexander and Duthie (1950) reported five cases treated with progesterone in doses lower than those used in the present study, with no improvement.

Pregnenolone

Davison *et al.* (1950) reported improvement in cases of rheumatoid arthritis and ankylosing spondylitis with 300 mg. daily and also in lower dosage. They noticed clinical improvement within a week, with reduction in the E.S.R., and claimed that, although pregnenolone is less rapidly effective than cortisone or adrenocorticotrophic hormone (A.C.T.H.), it appears to be free from toxic effects and is cheap and easy to make. Ishmael *et al.* (1949) reported promising results in various rheumatic conditions, including rheumatoid arthritis, with 100 mg. daily. Freeman *et al.* (1950) claimed good results with pregnenolone by mouth in daily doses of 500 to 700 mg. Stock and McLure (1950) obtained objective improvement in three cases out of ten treated for two weeks with 200 mg. daily. Guest *et al.* (1950) treated 17 cases, of which only one showed improvement.

It was impossible to detect any improvement in the eight patients given pregnenolone in the present series.

Pregnadienolone

This compound has a double bond between C_{16} and C_{17}. It seemed possible, therefore, that it might give rise to a metabolic derivative in which the double bond had been converted into a hydroxyl substituent at the 17-carbon atom, such as is found in compound E and "compound F." It did not prove effective, however, in clinical trial.

Cortisone

Mason, Myers, and Kendall (1936) reported on the physiological activity of the crystalline compound E which they had isolated from the adrenal cortex. The same compound was also isolated by Wintersteiner and Pfiffner (1936) and by Reichstein (1936).

The metabolic effects of this and other cortical compounds have been reviewed by Venning (1948). Recently the results of metabolic studies on patients with rheumatoid arthritis treated with cortisone have been published by Sprague *et al.* (1950). Carlisle (1950) has summarized its clinical uses.

In the original series of 14 patients studied at the Mayo Clinic (Hench *et al.*, 1949) all responded dramatically with loss of stiffness, pain, and tenderness, and improvement in articular and muscular function, often within 48 hours. Sedimentation rates decreased within one or two weeks. Every patient except one relapsed when treatment was discontinued.

Boland and Headley (1949) reported the results of treating eight cases of rheumatoid arthritis with cortisone. In five the disease was severe and the initial dose of 300 mg. was followed by 100 mg. daily for seven days. All improved "rapidly and remarkably" except for one diabetic patient, who improved more slowly but also relapsed more slowly when the drug was withdrawn. Lower doses (50 mg. daily for 10 to 15 days) were given in the three less severe cases, and by the end of the course the clinical manifestations had subsided almost completely and the sedimentation rate was normal. No side-effects were noted.

Hench *et al.* (1950) reported a further series of 21 patients. Improvement was either "marked" or "very marked" except in one case in which it was only moderate. According to these experienced workers the sequence of events is usually as follows: decreased stiffness and aching; diminished tenderness and swelling within the first 12 to 48 hours; complete relief of pain and sometimes swelling during the first week.

Freyberg (1950) recorded 17 cases treated with cortisone with uniformly good results, which could be maintained with 100 mg. three times a week.

Boland (1950) reviewed the literature concerning 160 cases of rheumatic disease, mostly rheumatoid arthritis, which had been treated with cortisone. In rheumatoid arthritis results have with very few exceptions confirmed the dramatic findings of Hench *et al.* (1949).

Side-effects can best be avoided and clinical remission maintained by giving 200 mg. of cortisone on the first day and subsequently 100 mg. daily until the clinical symptoms and E.S.R. subside (usually in two to eight weeks). Dosage is then gradually reduced to the lowest level that will control the condition.

The present study records the results of the first European clinical trial of cortisone in the treatment of rheumatoid arthritis, and each of the five patients treated has shown unequivocal response which completely confirms the claims of the American workers.

Eosinophils.—Most authors (Thorn *et al.*, 1950) report that whereas with A.C.T.H. there is complete disappearance of eosinophils starting about six hours after the first injection, with cortisone there may be no significant eosinopenia. In the present series there was a marked diminution in eosinophils, which was maintained while cortisone was administered.

Side-effects

Side-effects consisting in sodium retention, leading to oedema, alkalosis, glycosuria, acne, hirsutism, striae, and the rounding of the face seen in Cushing's syndrome, have occasionally been recorded after prolonged cortisone therapy. With the recent tendency to use lower maintenance doses, however, they occur less commonly, and according to Baehr and Soffer (1950) are more likely to be seen during the treatment of such acute conditions as disseminated lupus erythematosus than in rheumatoid arthritis. Boland (1950) suggests that they should be referred to as "signs of hyperadrenalism" rather than as "toxic effects."

Freyberg (1950) has encountered no serious complications in a series of 17 patients treated with cortisone, some for as long as 160 days. Hench *et al.* (1950) reported mild and reversible side-effects in eight out of 21 patients treated for periods of up to seven months; in four patients the side-effects were pronounced.

Treatment had to be discontinued in the present series on four occasions (see Table)—in two cases because of an urticarial reaction, presumably to the vehicle, and in the others on account of severe pain at the site of the injection. No side-effects occurred in any of the cases treated with cortisone, although a careful watch was kept for signs of oedema, rounding of the face, acne, glycosuria, and hypertension.

The psychological reactions of the patients were interesting; all were delighted with their improvement, but none was unnaturally excited or displayed euphoria or exhibitionism. This may be because they were warned, as had the patients receiving the other steroids, that there was a ten-day supply only for each of them and that it would therefore be necessary to discontinue treatment at the end of that time even if improvement occurred.

Summary

Forty patients suffering from rheumatoid arthritis have been submitted to clinical trials with cortisone and five other steroid compounds.

The following criteria were used to assess the effects of these compounds: (1) Recorded interviews before, during, and after treatment. (2) Filming of certain movements in selected cases. (3) Assessment of joint tenderness and range of movement. (4) Functional tests such as walking, climbing steps, putting on a coat, and mounting a chair. (5) Personal assessment of improvement by the patient. (6) Eosinophil counts, erythrocyte sedimentation rate, and haemoglobin determination. (7) Urinary 17-ketosteroid, pregnanediol, and "corticoid" estimations.

Cortisone was used in five cases, with cholesterol as a control substance. Although it was not known at the time of administration which compound was being used, the dramatic clinical effects of cortisone were immediately obvious.

The other steroid compounds employed were androstenedione, dehydro-*iso*-androsterone, progesterone, pregnenolone, and pregnadienolone. These proved ineffective, except in one case treated with progesterone in which there was a remission of symptoms, which was not repeated when a second course was administered.

We wish to acknowledge the valuable assistance given to us by the following pathologists and biochemists and their assistants: Dr. H. E. Archer, West London Hospital; Dr. A. G. Signy, St. Mary Abbots Hospital; and Dr. R. G. L. Waller, West London Hospital.

The materials used in these trials were generously supplied by the following firms, whose scientific directors we should like to thank for their interest and co-operation: Cortisone by Dr. J. M. Carlisle, of Messrs. Merck and Co., Rahway, N.J., U.S.A.; progesterone, androstenedione, dehydro-*iso*-androsterone, and pregnenolone by Sir Jack Drummond, F.R.S., of Boots Pure Drug Co., Ltd.; and pregnenolone and pregnadienolone by Dr. B. M. Merriman, of British Drug Houses Ltd. Other substances, including material for controls, were kindly supplied by the following firms: Messrs. Allen and Hanburys Ltd., Bayer Products Ltd., Benger Laboratories Ltd., Ciba Laboratories Ltd., and Roche Products Ltd.

References

Alexander, W. R. M., and Duthie, J. J. R. (1950). *Lancet*, **1**, 297.
Baehr, G., and Soffer, L. J. (1950). *Bull. N.Y. Acad. Med.*, **26**, 229.
Boland, E. W. (1950). *Ann. rheum. Dis.*, **9**, 1.
—— and Headley, N. E. (1949). *J. Amer. med. Ass.*, **141**, 301.
Callow, N. H., Callow, R. K., and Emmens, C. W. (1938). *Biochem. J.*, **32**, 1312.
Carlisle, J. M. (1950). *British Medical Journal*, **2**, 590.
Corcoran, A. C., and Page, I. H. (1948). *J. Lab. clin. Med.*, **33**, 1326.
Davison, R., Koets, P., Snow, W. G., and Gabrielson, L. G. (1950). *Arch. intern. Med.*, **35**, 365.
Freeman, H., Pincus, G., Johnson, C. W., Bachrach, S., McCabe, G. E., and MacGilpin, H. (1950). *J. Amer. med. Ass.*, **142**, 1124.
Freyberg, R. H. (1950). *Bull. N.Y. Acad. Med.*, **26**, 206.
Guest, C. M., Kammerer, W. H., Cecil, R. L., and Berson, S. A. (1950). *J. Amer. med. Ass.*, **143**, 338.
Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1949). *Proc. Mayo Clin.*, **24**, 181.
—— —— —— —— (1950). *Arch. intern. Med.*, **85**, 545.
Ishmael, W. K., Hellbaum, A., Kuhn, J. F., and Duffy, M. (1949). *J. Okla. med. Ass.*, **42**, 434.
Mason, H. L., Myers, C. S., and Kendall, E. C. (1936). *J. biol. Chem.*, **116**, 267.
Quin, C. E., Mason, R. M., and Knowelden, J. (1950). *British Medical Journal*, **2**, 810.
Reichstein, T. (1936). *Helv. chim. Acta*, **19**, 1107.
Sommerville, I. F., Gough, N., and Marrian, G. F. (1948). *J. Endocrinol.*, **5**, 247.
—— Marrian, G. F., Duthie, J. J. R., and Sinclair, R. J. G. (1950). *Lancet*, **1**, 116.
Sprague, R. G., Power, M. H., Mason, H. L., Albert, A., Mathieson, D. R., Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1950). *Arch. intern. Med.*, **85**, 199.
Stock, J. P. P., and McLure, E. C. (1950). *Lancet*, **2**, 125.
Thorn, G. W., Forsham, P. H., Frawley, T. F., Hill, S. R., Roche, M., Staehelin, D., and Wilson, D. L (1950). *New Engl. J. Med.*, **242**, 783.
Venning, E. H. (1948). *Med. Clin. N. Amer.*, **32**, 89.
Wintersteiner, O., and Pfiffner, J. J. (1936). *J. Biol. Chem.*, **116**, 291.

A "Brochure of Instruments and Accessories for Radio-isotope Applications" has just been issued by the Scientific Instrument Manufacturers Association (of Great Britain, Ltd.) in collaboration with the Atomic Energy Research Establishment, Harwell. It is likely to be a useful booklet for all interested in employing radio-isotopes in their work, since it is in effect a directory to all instrument manufacturers, to consultants capable of advising in work of this kind, and to the suppliers of radio-isotopes (at Harwell and at the Radiochemical Centre, Amersham), as well as providing a short discussion on the kinds of instruments to be employed in different situations. Thus Geiger-Müller counters may register either the total radiation they receive in a given time or the rate at which they receive it; they may be sealed off or have an arrangement for introducing the substance to be assayed for radioactivity actually into the counter tube. Scintillation counters contain phosphors which sparkle as gamma rays strike them, and a device for counting the flashes. Ionization chambers measure in a given time the total radiation due to nuclear particles striking the atoms of gas in the chamber. Several kinds of instruments are available for health monitoring. A small direct-reading ionization chamber set in a fountain-pen-like cylinder measures the cumulative exposure to radiation of the person who wears it in his pocket. A hand-and-foot monitor looks something like a weighing-machine, on which the person under examination stands. Under its platform are two G.-M. counters, which measure the radiation from dirt on the shoes, while at arm height are pockets into which the hands can be thrust to have their radioactivity assayed by further adjacent counters. Two frisking probes are counters attached to the sides of the machine by long flexible leads. It is interesting to note that no less than six different firms make G.-M. counters, and eight produce monitoring instruments. In addition to the official isotope information office at Harwell there are also three private firms of consultants in this field of work. Copies of the brochure can be obtained free of charge from the publishers.

INSULIN AND E.C.T. IN TREATMENT OF RHEUMATOID ARTHRITIS

REPORT ON A PILOT SERIES OF CASES

BY

G. D. KERSLEY, M.D., F.R.C.P.
L. MANDEL, M.B., M.R.C.P.
M. R. JEFFREY, M.B., M.R.C.P.
M. H. L. DESMARAIS, M.R.C.S., L.R.C.P., D.Phys.Med.

AND

E. BENE, M.D.

(From the South-west and Oxford Regional Rheumatism Research Unit, Royal National Hospital for Rheumatic Diseases, Bath)

Insulin has been used as a "tonic" and as a method of increasing weight in rheumatoid arthritis for a number of years (Copeman, 1931). The more recent theories of the part played by the pituitary adrenal mechanism in this disease have suggested another reason for this type of therapy. Cannon *et al.* (1924) found that insulin hypoglycaemia provoked the liberation of adrenaline, and since then evidence has been produced which is claimed to show that the adrenal cortex can be stimulated in this way, either directly in hypophysectomized animals or indirectly by stimulation of the pituitary with liberated adrenaline (Langecker, 1928; Miller *et al.*, 1941; Godlowski, 1947). It seemed that this explained the benefit obtained from insulin shock therapy and electric convulsion therapy (E.C.T.) in many mental disorders. Moreover, it had been noted that the combination of rheumatoid arthritis and epilepsy was extremely rare. On the suggestion of one of us (M. H. L. D.) it was decided to treat a pilot series of cases of active rheumatoid arthritis with insulin hypoglycaemia and a second series with E.C.T., and observe the clinical and biochemical results.

Methods and Techniques

All patients were suffering from active rheumatoid arthritis, and in addition to insulin therapy all received the same basic regime of treatment, which included rest splints, remedial exercises, and physiotherapy. Treatment was not begun until patients had had two weeks' basic physical treatment in hospital.

The method used was based on the modified insulin technique as described by Sargant and Slater (1948). Attempts were made to induce hypoglycaemic reactions every morning for five days each week, leaving Saturday and Sunday free of treatment. Treatment was carried out over a period of three or four weeks. A good hypoglycaemic reaction was indicated by marked flushing and sweating, weakness, drowsiness, and tremor. The reaction was normally interrupted three hours after the dose of insulin by a meal containing 16 oz. (454 g.) of mashed potatoes flavoured with an egg, or other suitable breakfast dish, together with bread-and-butter, jam, porridge, and sugared tea. Only if the patient went into sopor or coma, or had convulsions, was hypoglycaemia interrupted earlier by intravenous glucose. This had to be carried out in four patients (Cases 21, 23, 30, 33).

Patients were assessed clinically every week, before, during, and just after treatment, and also at varying periods after treatment was completed. The assessment included observations on the general feeling of well-being, mental outlook, subjective pain (including rest pain),

stiffness, swelling, range of movement, deep hyperalgesia, in addition to functional ability—e.g., ability to dress, shave, brush the hair, walk, use a knife and fork. Patients were also weighed weekly before, during, and after treatment, before breakfast, and after emptying the bladder and, if possible, bowels.

In view of the rapid increase in weight during and the decrease after treatment, fluid balances were performed latterly before and after treatment.

During the week before starting treatment, estimations of sedimentation rate (E.S.R.), haemoglobin, haematocrit, fasting blood sugar, and serum potassium were carried out. Urinary uric acid and creatinine levels were estimated on a 24-hour specimen in all cases and 17-ketosteroids in 8 cases (Nos. 8, 10, 17, 18, 23, 24, 25, 26). In addition the basic level of circulating eosinophils was ascertained under strict standard conditions (see below), together with changes of such levels in response to injections of adrenaline and A.C.T.H.

During treatment, on the first day on which the patient showed a good hypoglycaemic reaction, similar controlled estimations of eosinophil counts, serum potassium, blood sugar, and urinary uric acid and creatinine levels were carried out. The same tests were repeated during the week following completion of treatment.

The "activity index" referred to in Tables I and II represents an attempt to give a numerical value to the activity of the disease. The index is derived from four factors—change in weight, E.S.R., haemoglobin levels, and degree of pain at rest. These are graded on a three-point scale, as explained in a previous paper (Kersley *et al.*, 1950).

Blood sugars were estimated by the method of Folin and Wu, and urinary uric acid and creatinine by Folin's method.

TABLE I

Case No.	Age and Sex	Duration of Disease (Years)	Duration of Treatment (Days) Total	Effective	Min. Dose Insulin to Produce Hypoglycaemia (Units)	Clinical Degree of Hypoglycaemia	Clinical Change	Change in Activity Index
1	38 F	1/2	13	10	20	Marked	++	+2
2	35 F	1/2	13	10	32	"	++	0
3	31 F	2 1/2	13	10	28	"	++	+1
4	53 F	2	13	0	60	Nil	0	−1
5	30 F	20	19	12	44	Moderate	+	+2
6	21 F	1 9/12	15	11	32	Marked	0	+2
7	58 F	7	9	6	24	Moderate	0	+1
8	54 F	1 9/12	15	11	24	Marked	+	+4
9	52 M	1/2	19	17	40	"	++	+3
10	64 M	4 1/2	15	1	112	"	0	+1
11	50 M	10	19	7	108	Slight	+	0
12	21 M	5	26	10	72	Moderate	0	+2
13	45 M	1 9/12	20	15	52	Marked	++	−1
14	22 F	1	20	16	36	"	++	−1
15	62 M	1 9/12	19	16	24	"	0	+2
16	68 M	5 9/12	19	10	64	Moderate	+	0
17	45 F	1/2	19	17	32	Marked	0	0
18	47 F	2	19	17	24	"	++	+3
19	65 M	12	20	17	40	"	++	+1
20	54 M	18	20	16	48	"	−	+2
21	43 F	12	20	15	20	"	+	+1
22	41 F	2	20	18	30	"	++	+3
23	42 F	2	20	7	88	"	++	0
24	57 M	1/2	20	17	48	"	++	+2
25	56 F	1/2	20	12	64	"	++	+1
26	58 M	6	18	13	48	"	++	+3
27	50 F	3 1/4	15	13	24	"	++	+2
28	55 F	2	15	13	24	"	++	+3
29	46 F	2	15	13	36	"	++	+2
30	45 M	3	19	15	48	"	+	0
31	32 F	1 9/12	15	14	16	"	++	+2
32	55 M	10	19	6	108	Slight	+	+2
33	50 M	4	19	16	48	Marked	++	+2
34	45 M	1 6/12	19	12	52	Moderate	+	0
35	40 M	5/12	14	11	48	Marked	+	+2
36	40 F	10	13	12	24	"	++	0
37	48 F	1 6/12	19	18	32	"	++	+1
38	21 F	5	20	17	52	"	++	+1
39	36 M	1 6/12	19	5	64	"	0	+2
40	38 F	14	15	12	68	"	++	+2

Clinical change: − = Deterioration. 0 = No change. + = Slight improvement. ++ = Marked improvement.

During the latter period of these observations total neutral 17-ketosteroids were estimated in the urine by the modified method of Callow *et al.* (1938), where creatinine levels of the 24-hour urine specimens were constant.

Serum potassium estimations were carried out by the method of King (1946). These tests were done before treatment was started (fasting) and on the first day of definite clinical hypoglycaemic reaction, both at 10 a.m. (at the height of hypoglycaemia) and at 3 p.m. (when the eosinopenic response was maximal).

Circulating eosinophils were counted by the Randolph (1949) technique, four improved Neubauer chambers being used. Three o'clock was chosen for the time of the second eosinophil count because we ascertained by preliminary observations that the maximal eosinophil depression occurred about that time, the figure varying little between 2 p.m. and 3.30 p.m. The count was thus made about 4½ hours after the ending of hypoglycaemia by breakfast. The counts are given in Table II. In addition to the counts observed, the 3 p.m. figure was expressed as a percentage of the 10 a.m. value (columns 3 and 6); the ratio of the "hypo. day" to the "control day" represents the true depression consequent upon hypoglycaemia. Cases 1–4 did not have an adequate control estimation; all of them, however, showed considerable eosinophil depression after hypoglycaemia.

Results and Observations

Of 40 cases (17 male and 23 female) in whom treatment has been completed, 22 (55%—6 male and 16 female) showed marked clinical improvement, 9 (22.5%—6 male and 3 female) showed slight clinical improvement, and 8 (20%—4 male and 4 female) showed no significant change. One patient (Case 20) deteriorated (see Tables).

In most cases in which there was marked clinical improvement, such improvement occurred after the first week's treatment (shortly after a hypoglycaemic reaction was obtained) and continued throughout the whole course. Improvement was pronounced in all aspects, especially in general feeling of well-being and mental outlook, with loss of malaise and increase of appetite, lessening of pains in joints (including rest pain), and deep hyperalgesia. The general impression was that the joints of the upper limbs improved more than those of the lower limbs, and that joints more recently affected showed an earlier and more marked response than the others.

In those patients only slightly improved, improvement affected some joints but not others, and the patient's condition often varied throughout treatment. Although there was frequent subjective improvement, objective change was not significant.

Of the 8 patients in whom there was no change, one (Case 7) had had treatment for only nine days, when therapy had to be stopped because the hypoglycaemia was causing her to become mentally confused and irrational; in another (Case 17), though the pains in the upper limbs improved very slightly, the knees flared up during treatment.

All patients showed a gain in weight. The mean initial weight for men was 133 lb.—range 105–170 lb.— (60.3 kg.; range 47.6–77.1 kg.) and for women was 111 lb.—range 78–165 lb. (50.3 kg.; range 35.4–74.8 kg.). The mean increase in weight for men was 7 lb.—range 1–15 lb.—(3.17 kg.; range 0.45–6.8 kg.) and for women 6 lb.—range 2–11 lb.—(2.72 kg.; range 0.9–4.99 kg.).

All the 22 cases showing marked clinical improvement had quite definite and pronounced hypoglycaemic reactions

clinically. Of the 9 cases which had slight clinical improvement, 4 had marked, 3 had moderate, and 2 had slight hypoglycaemic reactions. Of the 8 cases which showed no significant clinical change, 5 had marked, 2 had moderate, and 1 had no hypoglycaemic reaction.

Of the 22 cases which showed pronounced clinical improvement, 15 had had the disease for three years or less and 7 for over three years. Those patients with slight or no clinical improvement fell equally into these two duration groups.

There was no obvious change in the sedimentation rates during treatment.

Of 39 cases, 14 (36%) showed an increase of more than 1 g./100 ml. Hb, 3 a decrease of more than 1 g./100 ml., and 22 a change of less than 1 g./100 ml. No consistent significant alteration was observed between the haemoglobin levels estimated at maximum hypoglycaemia and 4½ hours later.

As these cases were not under continuous treatment in a metabolic ward, it was considered that any change in the urinary uric-acid/creatinine ratio of less than 40% might be fallacious. Only 11 cases (27.5%) had an increase of more than 40% during the course of treatment. Of these 11 cases, 8 had marked clinical improvement.

Satisfactory total neutral 17-ketosteroid estimations were made in only 8 cases, which is obviously an insufficient number from which to draw conclusions; but it is perhaps of interest that those cases which showed clinical improvement had either a reduction or no change in ketosteroid levels.

The most striking biochemical result of all these investigations was the almost constant decrease in serum potassium levels during hypoglycaemia and an increase in these values 4½ hours later in all cases. In 34 cases the potassium level was lowered during hypoglycaemia by amounts ranging from 0.8 to 9.4 mg./100 ml.; in one case the value was unaltered and in another case it rose by 3.3 mg. (Cases 34 and 20 respectively). In the cases showing a fall the mean control value was 19.8 mg. and the hypoglycaemic value 15.9 mg., the mean fall being 3.9 mg./100 ml. (20%). The lowest figure recorded was 13.0 mg.

At the time of maximal eosinopenia (3 p.m.) the mean potassium level had risen to 20.9 mg.—i.e., 1.1 mg. above the control value. Some increase above the hypoglycaemic level was present in every case: in 13 cases the control value was exceeded by more than 1 mg./100 ml., the highest figure recorded being 27.5 mg.

TABLE II

No.	Eosinophils: Control 10 a.m. (1)	Control 3 p.m. (2)	(2)/(1)% (3)	Hypoglycaemic 10 a.m. (4)	Hypoglycaemic 3 p.m. (5)	(5)/(4)% (6)	True Depression 100−(6)/(3)%	Potassium: Control	Potassium: Hypoglycaemic 10 a.m.	Potassium: Hypoglycaemic 3 p.m.	Sugar: Fasting	Sugar: Hypoglycaemic	Adrenaline Test	A.C.T.H. Test	U.A./Cr. Ratio	Clinical Change*	Change* in Activity Index
1	—	—	—	117	55	47	—	20·8	17·6	21·2	83	50	Neg.	—	+	++	+2
2	—	—	—	405	183	45	—	18·2	13·9	21·4	100	50	"	+	+	++	0
3	—	—	—	78	40	51	—	18·8	16·3	19·8	83	52	Pos.	0	+	++	+1
4	—	—	—	190	30	16	—	21·6	17·0	21·6	95	60	Neg.	+	0	+	−1
5	155	268	173	205	44	21	88	—	—	—	90	—	Pos.	0	+	0	+2
6	122	161	132	239	33	14	89	18·7	16·9	25·8	90	52	D. pos.	0	0	+	+2
7	89	89	100	105	33	31	69	18·3	15·1	19·0	95	40	"	0	0	+	+1
8	139	155	83	228	10	4	95	22·1	15·8	22·3	100	50	Neg.	0	0	+	+4
9	450	455	101	461	61	13	97	20·2	15·7	20·5	90	52	D. pos.	0	+	++	+3
10	83	161	194	195	178	96	52	19·8	18·9	24·7	95	77	"	0	0	+	+1
11	305	322	106	250	51	20	81	21·3	16·9	27·5	95	43	Neg.	0	+	0	0
12	78	95	122	50	22	44	64	—	—	—	100	44	"	+	0	+	+2
13	100	155	155	155	22	14	91	23·7	14·3	19·2	86	42	Pos.	0	+	++	−1
14	272	239	88	300	122	37	58	19·0	16·2	18·7	100	44	Neg.	—	+	+	−1
15	172	94	55	211	144	68	+23	19·5	15·9	19·8	95	50	"	Pos.	+	0	+2
16	245	165	67	255	110	43	36	16·5	13·5	16·6	90	58	"	D. pos.	+	+	0
17	39	50	128	45	17	38	70	16·4	14·7	16·8	83	58	"	Pos.	+	0	0
18	161	217	135	167	28	17	87	18·5	13·6	18·1	83	66	—	Neg.	+	++	+3
19	83	110	132	128	155	43	67	21·7	20·9	23·7	95	—	Neg.	—	0	++	+1
20	44	81	184	55	78	142	23	16·7	20·0	25·5	111	43	Pos.	—	0	—	+2
21	56	95	170	56	0	0	100	16·7	14·8	22·0	100	45	Neg.	—	+	+	+1
22	44	61	138	50	22	44	68	19·6	15·2	20·8	83	42	"	—	+	++	+3
23	39	94	242	317	111	35	86	20·0	15·6	16·1	62	44	Pos.	—	0	++	0
24	83	150	181	95	80	84	54	18·8	16·5	20·0	90	68	"	—	0	++	+2
25	33	22	67	90	40	44	34	20·7	17·5	23·6	125	50	D. pos.	—	0	++	+1
26	70	190	272	415	185	45	83	20·3	15·4	21·9	116	—	Pos.	—	0	++	+3
27	67	61	91	78	17	22	76	21·0	17·0	19·5	80	68	D. pos.	—	0	++	+2
28	56	83	148	222	28	12	92	20·0	14·6	20·7	80	40	"	Pos.	0	++	+3
29	289	445	154	545	330	61	60	20·4	16·0	18·6	86	43	Pos.	—	0	++	+2
30	89	117	131	155	22	14	89	23·2	15·5	20·4	100	40	"	—	0	+	0
31	500	605	121	565	38	7	94	20·9	13·9	19·0	63	30	"	—	0	++	+2
32	378	372	98	33	50	152	+55	—	—	—	74	—	Neg.	Neg.	0	+	+2
33	144	167	116	100	67	67	42	21·0	18·5	21·4	72	46	"	—	0	++	+2
34	189	278	147	44	33	75	49	15·6	15·5	16·1	76	30	"	D. pos.	0	+	0
35	139	122	88	139	61	43	50	—	—	—	64	39	Pos.	—	0	+	+2
36	78	105	135	33	28	85	37	18·0	14·5	17·8	80	47	Neg.	—	+	++	0
37	189	150	80	72	44	61	24	21·7	17·4	22·2	82	28	"	—	+	++	+1
38	17	22	129	55	9	15	88	17·4	16·2	18·4	80	47	Pos.	—	+	++	+1
39	133	183	138	44	22	50	64	17·5	14·7	18·2	66	58	"	—	0	0	+2
40	111	100	90	167	22	13	86	18·8	13·0	18·3	80	38	Neg.	—	0	++	+2

U.A./Cr. ratio: 0 = Unchanged; + = Increased. * Brought forward from Table I.

Lowering of the fasting blood sugar level, by amounts ranging from 12 to 66% of that level, was achieved in all of the 36 cases examined. Contrary to expectations, little correlation was apparent between the degree of eosinophil depression and either the percentage depression of blood sugar relative to the fasting value or the absolute values for blood sugar obtaining during hypoglycaemia.

A wide variation in susceptibility both to the hypoglycaemic action of insulin and to the eosinopenic action of hypoglycaemia was apparent. In Case 37, for example, a fall in the blood sugar from 82 to 28 mg./100 ml.—a drop of 66%—produced only a 24% reduction in eosinophils whereas in Case 27 a fall in blood sugar from 80 to 68 mg./100 ml. produced an eosinophil depression of 76%.

Of the 36 adequately controlled cases, 34 showed a depression of eosinophils following hypoglycaemia; 26 of these had decreased by 50% and 15 by more than 75% at the 3 p.m. count.

Comparison of the 10 a.m. figures for control and "hypo." days showed that there was no consistent change in eosinophils during hypoglycaemia.

Of the two patients who failed to show any depression of eosinophils, one (Case 32) never had a good hypoglycaemic reaction clinically, although his insulin dosage was raised to 116 units. Nevertheless, on the last day of treatment his eosinophils did in fact fall from 483 at 10 a.m. to 211 at 3 p.m.—a true depression of 55%. Unfortunately, the blood sugar was not estimated. The other patient (Case 15) showed a considerable spontaneous decrease of eosinophils during the control day, a decrease materially unaltered by clinically adequate hypoglycaemic reactions. Case 32 showed only very slight clinical improvement, and Case 15 none whatever.

The Adrenaline Test

The effect upon circulating eosinophils of 0.3 mg. of adrenaline hydrochloride, given subcutaneously in the front of the forearm, was estimated by comparing the change produced after four hours in the number of eosinophils with that occurring spontaneously over a similar period on a previous control day.

The patient remained in bed until the completion of the test. A normal breakfast was given at about 7.30 a.m. and then no food until lunch at 12.30 p.m. Eosinophils were counted at 12 noon and again four hours later, the adrenaline injection being given immediately after the first eosinophil count on the appropriate day. The 4 p.m. figures were expressed as a percentage of the 12 noon value, comparison of these percentages revealing the change produced by adrenaline.

Thirty-nine cases were tested in this way, the results being as follows:

Eosinophil depression	>50%	30–49%	<30%
Men (17 cases)	7	2	8
Women (22 cases)	6	5	11

Thus half of both the male and the female cases showed an insignificant change (leading article, *Lancet*, 1950, **1**, 1042), about one-third gave the response stated to be normal by Recant *et al.* (1950), and the remainder showed a distinct but less than normal depression.

Of the 22 patients showing marked clinical improvement, 21 had an adrenaline test performed before therapy was instituted. Of these, 8 showed a positive reaction (eosinophil depression >50%), 9 showed a negative reaction (eosinophil depression <30%), and 4 showed a doubtful positive reaction (eosinophil depression 30–49%). Of the 9 patients showing a slight clinical improvement and the 8 patients showing no change, 4 had a positive reaction, 10 a negative reaction, and 3 a doubtful reaction. The patient who deteriorated had a positive reaction. There does not seem to be a correlation, therefore, between the adrenaline test results and the degree of clinical improvement.

The eosinophil count varies very considerably in the same person from day to day and in the course of the day, and we are well aware that a procedure involving only one control and one test day cannot be highly accurate. It was hoped, however, that this relatively crude test would prove of value in distinguishing those patients who would respond well to therapeutic hypoglycaemia, but it has not done so. Furthermore, no correlation was found between the adrenaline test and any of the laboratory tests carried out.

There is a suggestion that the cases giving a negative adrenaline reaction show a smaller increase in weight and that a smaller proportion of them achieve a satisfactory depression of eosinophils than occurs in the adrenaline-positive cases, but the test certainly does not decide which patients will respond well to insulin therapy.

A.C.T.H. Test

The effect of A.C.T.H. upon circulating eosinophils was estimated in 10 patients before treatment, the conduct and timing of the test being exactly the same as for the adrenaline test except that a dose of 12.5 mg. A.C.T.H. was injected intramuscularly after the first eosinophil count. This small dose was used partly to stretch our supply to its maximum, but also to ascertain whether any considerable variation in individual susceptibility to the eosinophil-depressing action occurred, and, if so, whether the "sensitive" group would respond better to insulin therapy than the insensitive.

Of the 10 patients tested, 6 showed a depression of 50% or more of circulating eosinophils after four hours (of these, 4 had a marked clinical improvement and 2 showed no clinical change); 2 a depression between 30 and 50% (both these patients showed only slight clinical improvement), and 2 no significant change (one with marked and one with slight clinical improvement). One of the cases with a negative A.C.T.H. reaction and both cases with a doubtful positive had negative adrenaline reactions; the other negative A.C.T.H. case did not, unfortunately, have an adrenaline test. Of the 6 showing positive A.C.T.H. reactions 3 cases had negative, 1 case had a doubtful positive, and 2 cases had a positive adrenaline reaction.

From the above it is obvious that our results show no correlation between the adrenaline and A.C.T.H. reactions or between either of these and the clinical progress of the cases.

Clinical Follow-up of Patients

Of the 40 patients, up to date 25 have been followed up for periods varying from four weeks to four months.

Of those showing marked clinical improvement (16 of the 25), 10 (Cases 1, 13, 14, 18, 19, 23, 24, 25, 27, 29) maintained their improvement for four to six weeks after completion of treatment. The remaining six (Cases 2, 3, 9, 26, 28, 31) relapsed after periods varying from two to five weeks after completion. Of these, Case 2 was given a second course of insulin lasting one week, 13 weeks after the first course, with slight improvement only. In the following week she was given one dose of insulin with little change, and shortly after this she developed gastro-enteritis followed by attacks of spontaneous hypoglycaemia, during which time her arthritis again improved. This case will be the subject of a further communication later.

Of those showing slight clinical improvement (5 of the 23), 3 patients (5, 11, 21) maintained their improvement for five weeks, whereas 2 patients (8, 16) relapsed within two weeks of the completion of treatment.

Further clinical follow-ups are proceeding.

Electric Convulsion Therapy

Altogether 11 patients were treated with electric convulsion therapy combined with curare. The technique employed was, after premedication with morphine and atropine, to give 0.5 g. of thiopentone sodium combined with, or followed immediately by, 2 mg. of D-tubocurarine chloride per stone (5.2 kg.) body weight, intravenously. After an interval of 2–2½ minutes an electric shock was given in a dose of 120 or 130 volts for 0.3 second. In 4 patients, as a control, the above technique was used, omitting the actual electric shock in the first instance.

In 2 cases only one shock was given. In one there was no significant change, but in the other there was considerable improvement in the patient's general feeling of well-being and mental outlook, together with reduction of pains in his joints, especially the feet. He could walk without pain and could stand on his toes, a thing he had been unable to do for the past 18 months. This improvement was noted on the evening of the day of therapy and lasted for three weeks, but then his symptoms recurred.

In 2 cases two shocks were given at an interval of five days. In one there was no significant change; the other improved shortly after the first shock, only to relapse again after three days, and after the second shock there was considerable deterioration in the patient's condition in all aspects.

In 1 case three shocks were given at weekly intervals. Considerable improvement was noted on recovery from the shock, and this lasted six days. After the second shock there was again improvement, but much less in degree and lasting only three days. No significant change occurred after the third shock.

In 2 cases two shocks were given at an interval of five days, followed by six more shocks on alternate days over a period of two weeks. One of these cases improved after the first and second shocks, relapse occurring in each instance after 24 hours. After the remaining shocks, however, the patient showed progressive slight improvement of the pains in the joints of the upper limbs, but those in the knees remained unchanged. The improvement noted after completing the course of E.C.T. continued for the next three and a half months, with a slight temporary relapse about six weeks after completion of treatment. The other patient also improved after the first and second shocks, relapsing in each instance after three to four days. Again after the remaining shocks the patient progressively improved, with no relapse, regarding both her general health and the pains and stiffness. This improvement had lasted 10 weeks when she was last seen.

In 3 cases eight shocks were given on alternate days over a period of three weeks following one control. In one patient there was no significant change; in another, slight improvement was seen after the last three shocks, but this was maintained for only two weeks; the third patient progressively improved throughout treatment and continued to do so even more significantly during the next two months, at the end of which time the patient was symptomless and felt extremely well generally, with minimal physical signs.

In 1 case six shocks were given on alternate days over a period of two weeks following one control. Treatment was not continued, because of the development of thrombophlebitis in the arm vein. This patient showed no significant clinical change.

Thus of all the 11 patients treated with E.C.T., 3 showed marked clinical improvement, 3 slight clinical improvement, and 5 no significant clinical change. The average number of shocks given was five.

No significant drop in the number of circulating eosinophils was observed five hours after E.C.T.

Discussion

Arising out of our findings there are a few points worthy of some discussion. Although it was recognized that small doses of insulin had been used for many years for increasing weight, the constancy, magnitude, and rapidity of the increase with the larger doses employed in this series were quite remarkable. This increase was observed even in the worst cases, which had been deteriorating continuously for a year or more in spite of all treatment, including gold, transfusions, etc. Obviously the psychological effect of this weight increase must be considered in the assessment of subjective improvement. In the week after treatment was discontinued about half the cases showed a loss of part of the weight gained. In view of this, fluid balances were charted for the week before and the week after treatment in the last 14 cases treated. During treatment the hypoglycaemic sweats made any balancing of intake against urinary output quite useless. Even without obvious sweating it was realized that the results might be fallacious, as borne out by Talbott's (1943) observations on a paradoxical increase in weight coupled with diuresis in certain phases of gout, explained by him as due to changes in insensible perspiration. It was thought, however, that even this rough test might give some evidence whether water retention played any part in the very rapid changes in weight.

Before receiving insulin treatment all the patients except one showed a positive fluid balance, whereas after treatment 10 of the cases showed a negative and only 4 a positive fluid balance. Of the 10 showing a negative fluid balance 6 had a loss in weight of 1–3 lb. (0.45–1.36 kg.), 3 had a gain in weight of 1 lb., and in one the weight did not change in the week following treatment (Table III). Observations on fluid balance are continuing.

TABLE III.—*Fluid Balance Chart*

No.	Pre-Insulin (fl. oz.) *Intake	Output	Diff.	Post-Insulin (fl. oz.) *Intake	Output	Diff.	Gain Wt. (lb.) During Treatment	Change Wt. (lb.) After Treatment	Clinical Progress
27	59·6	55·8	+3·8	67·1	66·1	+1·0	+7	−1	++
28	66·2	57·2	+9·0	70·8	76·8	−6·0	+9	−1	++
29	44·8	42·0	+2·8	50·9	57·5	−6·6	+11	−1	++
30	52·4	55·4	−1·0	56·0	56·4	−0·4	+9	+1	+
31	58·4	52·0	+6·4	70·3	72·0	−1·7	+9	−1	++
32	65·0	61·7	+3·3	54·0	55·4	−1·4	+6	−2	+
33	59·0	46·4	+12·6	62·0	62·3	−0·3	+6	0	++
34	53·8	22·0	+31·8	56·3	42·0	+14·3	+5	−1	+
35	56·4	50·0	+6·4	64·6	75·1	−10·5	+13	−3	+
36	48·4	42·8	+5·6	45·0	43·3	+1·7	+5	+1	+
37	44·4	41·6	+2·8	50·3	51·4	−1·1	+9	−1	++
38	44·0	40·2	+3·8	44·2	47·3	−3·1	+7	−1	++
39	41·8	38·8	+3·0	55·7	53·7	+2·0	+7	−1	0
40	45·7	45·0	+0·7	45·4	48·8	−3·4	+7	+1	++

One fluid ounce = 28·4 ml. One pound = 0.37 kg. * Average daily figure.

In spite of the high percentage of cases that showed marked clinical improvement, usually starting in the first week, there were no consistent changes in the E.S.R. during the period of observation. This is not in conformity with the findings of Godlowski (1949) in his single case.

The uric acid excretion was significantly increased in only 11 cases, but this is not surprising in view of the comparatively small average increase in uric acid found by Sprague *et al.* (1950) even on administration of 200 mg. of cortisone.

The changes in the serum potassium were the most constant of all the biochemical findings in our series. The reduction of potassium at the height of hypoglycaemia is well recognized (Cantarow and Trumper, 1945), but the rise 4½ hours later, at the point of eosinopenia, is worthy of notice. Sprague found that a drop in potassium was the most constant biochemical finding of any in treatment with cortisone or A.C.T.H.

The absence of correlation of eosinopenia with clinical progress is of interest, as is the constancy of the fall of eosinophils with insulin but absence of change with E.C.T. The suggestion that insulin hypoglycaemia acts by stimulation of the pituitary through the production of adrenaline is borne out neither by the response of the patients to adrenaline—which showed little correlation with their response to insulin—nor by our previous indifferent results when 5 cases of rheumatoid arthritis were treated with adrenaline in oil (unpublished). It seems, however, that direct stimulation of the adrenal cortex, as has been shown to occur in hypophysectomized animals, is more likely;

or the synergic action of insulin and endogenous cortisone may be a factor in our results (Henderson *et al.*, 1950).

It is stressed that the use of insulin hypoglycaemia should not be looked upon, at all events at present, as a new treatment for rheumatoid arthritis. This is only a report on a pilot series of cases, which require further control and follow-up. Further information is being sought on such problems as potassium excretion, fluid retention, correlation of results with A.C.T.H.-sensitivity, and the value of intermittent treatment.

Summary

Forty cases of active rheumatoid arthritis have been treated five times weekly for either three or four weeks with insulin hypoglycaemia.

Twenty-two of these cases showed marked clinical improvement, nine slight improvement, eight no change, and one deteriorated.

Ten maintained their marked improvement and three moderate improvement six weeks after completion of treatment.

In cases showing definite improvement, this usually began within a week of starting treatment.

All cases increased in weight, some remarkably.

The serum potassium was lowered in 34 out of 36 cases at the height of hypoglycaemia, and had risen again in all cases four and a half hours later, at the time of maximal eosinopenia —in 13 significantly above the control value.

Urinary uric acid excretion was significantly raised in 11 cases during treatment, but there was no increase in the neutral 17-ketosteroids in the eight cases in which these were estimated.

The sedimentation rate was not significantly changed.

Fourteen cases showed an increase and three a decrease of more than 1 g./100 ml. in haemoglobin.

Thirty-four cases showed a significant fall in circulating eosinophils four and a half hours after maximal hypoglycaemia. There was no marked correlation, however, between the degree of fall and the degree of hypoglycaemia or the clinical improvement. There was very little correlation between the eosinophil depression produced by adrenaline or A.C.T.H. and either the clinical response or the degree of eosinopenia following hypoglycaemia.

Eleven cases were treated by E.C.T. with an average of five shocks each. Three showed marked improvement, three slight improvement, and five no change.

No significant fall of eosinophils was found as the result of electric convulsion therapy.

We would like to thank Dr. Tyndall, of Messrs. Organon, Ltd., and the Medical Research Council for donations of A.C.T.H., the Empire Rheumatism Council for financial assistance in laboratory expenses, and Drs. J. B. Bennett, T. Northover, R. Pearson, L. Scott White, and J. Thoresby for their help and suggestions; also the nursing and secretarial staff of the unit.

References

Callow, N. H., *et al.* (1938). *Biochem. J.*, **32**, 1312.
Cannon, W. B., *et al.* (1924). *Amer. J. Physiol.*, **69**, 46.
Cantarow, A., and Trumper, M. (1945). *Clinical Biochemistry*, 3rd ed. Saunders, Philadelphia.
Copeman, W. S. C. (1931). *British Medical Journal*, **2**, 1130.
Godlowski, Z. Z. (1947). *Edinb. med. J.*, **54**, 239.
—— (1949). *Ann. rheum. Dis.*, **8**, 285.
Henderson, E., *et al.* (1950). *J. clin. Endocrinol.*, **10**, 800.
Kersley, G. D., *et al.* (1950). *Lancet*, **1**, 703, 1153.
King, E. J. (1946). *Micro-analysis in Medical Biochemistry*, 1st ed. Churchill, London.
Langecker, H. (1928). *Arch. exp. Path. Pharm.*, **134**, 155.
Miller, R. A., *et al.* (1941). *Proc. Soc. exp. Biol., N.Y.*, **47**, 449.
Randolph, T. G. (1949). *J. Lab. clin. Med.*, **34**, 1696.
Recant, L., *et al.* (1950). *J. clin. Endocrinol.*, **10**, 187.
Sargant, W., and Slater, E. (1948). *An Introduction to Physical Methods in Psychiatry*, 2nd ed. Livingstone, Edinburgh.
Sprague, R. G., *et al.* (1950). *Arch. intern. Med.*, **85**, 199.
Talbott, J. H. (1943). *Gout*. Oxford Univ. Press, London.

THE EFFECT OF CORTISONE ON THE CARDIOGRAM IN CHRONIC ADRENAL INSUFFICIENCY*

BY

WALTER SOMERVILLE, M.D., M.R.C.P.

Senior Registrar, Cardiographic Department, Middlesex Hospital; formerly Assistant in Medicine, Peter Bent Brigham Hospital, Boston, U.S.A.

The beneficial effects of cortisone (17-hydroxy-11-dehydrocorticosterone) on chronic adrenal insufficiency (Thorn, Bayles, Massell, Forsham, Hill, Smith, and Warren, 1949) suggested that the cardiovascular system, which is often involved in this condition, might take part in the improvement. In a typical and severe case the heart is smaller than normal, the blood pressure lower, and the cardiogram shows non-specific abnormalities. These are, in order of frequency, abnormally flat or inverted T waves, prolonged QT interval, low voltage, prolonged PR or QRS interval, and depressed ST segment. On the other hand, the cardiovascular system, including the cardiogram, may be normal (Somerville and Levine, 1950).

Present Series

This series comprises 11 patients (3 males and 8 females) with proved chronic adrenal insufficiency treated with cortisone under the direction of Dr. George W. Thorn. The ages ranged between 14 and 55 years. All had been treated previously with replacement therapy for periods of 2–28 years (average 9 years). The cardiograms of six patients showed one or more of the abnormalities mentioned above. In five instances the cardiograms were normal. The clinical and metabolic changes following cortisone therapy in these patients have been reported elsewhere (Thorn, Forsham, Bennett, Roche, Reiss, Slessor, Flink, and Somerville, 1949).

Cortisone was given by intramuscular injection in total doses of 163 to 850 mg. over periods of 5 to 18 days. In three instances cortisone pellets were implanted subcutaneously and the dosage was estimated from the predetermined rate of absorption of the pellets. Several of the patients were given additional replacement therapy in small amounts, but from previous experience with such measures in these patients no effect was expected on the cardiovascular system.

Table showing changes Occurring in the Cardiogram during Cortisone Therapy

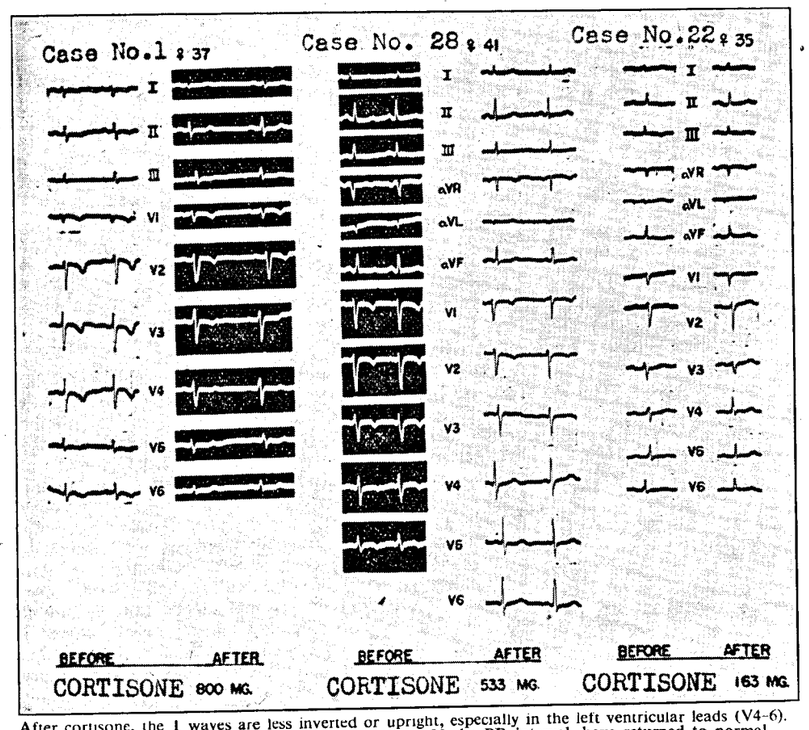
Case No.	Cortisone: Dose (mg.)	Cortisone: Period of Admin. (Days)		Cardiogram: Low Voltage	Cardiogram: Prolonged PR	Cardiogram: Prolonged QT	Cardiogram: Depressed ST	Cardiogram: Abnormal T	Result
1	800	18	Before					++	Improved
			After					−	
9	300	27	Before					+	,,
			After					−	
22	163	36	Before	+	+			++	,,
			After	+	−			−	
28	533	19	Before			+		++	,,
			After			−		−	
6	290	17	Before	+		+	+	++	Unchanged
			After	See note		+	+	++	
5	530	20	Before	+				++	,,
			After	+				++	
12	375	9	Normal before and after						
15	276	9			,,	,,	,,	,,	
49	275	4			,,	,,	,,	,,	
65a	850	5			,,	,,	,,	,,	
71	200	5			,,	,,	,,	,,	

Note.—Abnormalities persisting after cortisone may have been, in part, residue of recent pericarditis.

* From the Medical Clinic of the Peter Bent Brigham Hospital and the Department of Medicine, Harvard Medical School, Boston, U.S.A.

Results

The changes noted in the cardiogram during cortisone therapy are summarized in the Table. Four of the six abnormal cardiograms improved and two were unchanged. Improvement was represented by flat or inverted T waves becoming upright (see Fig.); shortening of a prolonged PR interval (one case) or QT (corrected) interval (one case). The five normal cardiograms were unchanged.



After cortisone, the T waves are less inverted or upright, especially in the left ventricular leads (V4–6). In Case 28 the corrected QT interval, and in Case 22 the PR interval, have returned to normal.

The duration of the cardiographic improvement after cortisone is uncertain. In one patient the cardiogram had partly regressed towards its original abnormal state two months after cortisone was discontinued. Throughout the observation period and for several weeks before cortisone was given this patient had been receiving small supportive doses of "percorten." In two other patients treated with cortisone pellets inserted subcutaneously the improvement was still present after two to five months.

The heart size, expressed in terms of the transverse diameter determined radiologically, was measured in six patients before and after cortisone therapy. In four the size of the heart increased, in one (normal at the beginning of treatment) it decreased, and in one it was unchanged. In no instance was the size increased beyond normal, and in general the greatest increase was observed in those patients in whom the heart size was smallest when cortisone therapy was instituted.

Changes in blood pressure were not remarkable. In two patients there was a slight increase. No significant alteration was noted in the remainder.

Discussion

The nature of the changes in the cardiovascular system in chronic adrenal insufficiency which give rise to the abnormal cardiogram is unknown. Thorn, Dorrance, and Day (1942) suggested that deficiency of adrenocortical carbohydrate-regulating factors might be responsible, since the cardiogram is usually abnormal in those patients who are unable to fast for 24 hours without a steady fall in blood-sugar levels or severe hypoglycaemic reactions. Cortisone and other 11, 17-oxysteroids are the most active carbohydrate-regulating adrenocortical steroids, and their administration increases the threshold at which hypoglycaemic symptoms occur (Thorn, Koepf, Lewis, and Olsen, 1940). The improvement in four of the six abnormal cardiograms in the present series may be thus explained in part. Yet normal cardiograms may be found in many patients with chronic adrenal insufficiency in whom deficiency of adrenocortical carbohydrate-regulating steroids may be demonstrated by the eosinophil reaction to the A.C.T.H. test described by Thorn, Forsham, Prunty, and Hills (1948). Therefore other factors must exist which lead to cardiographic abnormalities and which are influenced by cortisone, but at present they are unknown.

An increase in heart size following cortisone therapy is in itself unlikely to account for the cardiographic improvement. The incidence of normal and abnormal cardiograms was almost identical whether the heart size was normal, above normal, or below normal in 131 observations on 71 patients with chronic adrenal insufficiency (Somerville and Levine, 1950).

Perera *et al.* (1950) remarked on slight improvement in the cardiogram of a single patient with chronic adrenal insufficiency treated with 400 mg. of cortisone over a period of five days. Commenting on the small increase in blood pressure which they noted, these authors suggested that cortisone may act as a pressor substance in the absence of the adrenal cortex. In the present series cardiographic improvement occurred without changes in blood pressure.

Abnormal cardiograms recorded in acute rheumatic fever have reverted to normal in the course of cortisone therapy. Hench, Slocumb, Barnes, Smith, Polley, and Kendall (1949) have described instances in which prolonged PR intervals, ST segment deviation, and abnormal T waves returned to normal 7–26 days after the beginning

of cortisone therapy. No remarkable effects were noted by these workers on heart size or blood pressure, but in three cases tachycardia was replaced by bradycardia. The dosages of cortisone used were considerably greater than in the present series; on reducing the daily dosage from 200 mg. to 100 mg. the heart rate increased to normal levels. Hench and his associates offered no explanation of the cardiovascular action of cortisone.

Summary

Cortisone was administered to 11 patients (3 males and 8 females) with chronic adrenal insufficiency.

The drug was given by intramuscular injection or pellet implantation in doses of 163 to 850 mg. over 5 to 18 days.

All patients had been treated previously by various forms of replacement therapy.

The cardiograms in six of the patients showed the abnormalities often encountered in chronic adrenal insufficiency—namely, abnormal T waves or prolonged PR or QT intervals. In the remaining five patients the cardiograms were normal.

After cortisone therapy four of the six abnormal cardiograms improved, and two were unchanged. No effect was noted in the five normal cardiograms. The improvement was still present in one patient five months after the treatment was stopped. In two others in whom cortisone pellets had been implanted cardiographic improvement was maintained over a two-months observation period. The cardiogram in one patient had partly regressed two months after cortisone was suspended.

The way in which cortisone influences the cardiogram in chronic adrenal insufficiency is unknown.

This study was aided in part by a grant from the National Heart Institute, United States Public Health Service (Grant No. H-446).

References

Hench, P. S., Slocumb, C. H., Barnes, A. R., Smith, H. L., Polley, H. F., and Kendall, E. C. (1949). *Proc. Mayo Clin.*, **24**, 277.

Perera, G. A., Pines, K. L., Hamilton, H. B., and Vislocky, K. (1949). *Amer. J. Med.*, **7**, 56.

Somerville, W., and Levine, H. D. (1950). In press.

Thorn, G. W., Bayles, T. B., Massell, B. F., Forsham, P. H., Hill, S. R., jun., Smith, S., III, and Warren, J. E. (1949). *New Engl. J. Med.*, **241**, 529.

—— Dorrance, S. S., and Day, E. (1942). *Ann. intern. Med.*, **16**, 1053.

—— Forsham, P. H., Bennett, L. L., Roche, M., Reiss, R. S., Slessor, A., Flink, E. B., and Somerville, W. (1949). *Trans. Assoc. Amer. Phys.*, **62**, 233.

—— —— Prunty, F. T. G., and Hills, A. G. (1948). *J. Amer. med. Ass.*, **137**, 1005.

—— Koepf, G. F., Lewis, R. A., and Olsen, E. F. (1940). *J. clin. Invest.*, **19**, 813.

The Ministry of Health has advised local authorities to make certain changes in the record cards for diphtheria immunization and vaccination. The Ministry suggests that the cards should be of postcard size with the address to which they are to be sent printed on the reverse. Immunization cards should be white and vaccination cards green. Some local health authorities have included on the cards a form of consent to be signed by the parent or guardian. This appears to be unnecessary where the vaccination or immunization is done by a practitioner at the instance of the parents in the ordinary course of his practice, and the Minister feels that it should be omitted. Other arrangements should be made when formal consent may be required for inoculations done at a local health authority centre. Among other changes suggested is a provision on the new card for the practitioner simply to indicate whether any unusual or general reaction or other sequelae to vaccination have occurred. Practitioners should be allowed to use rubber stamps in giving their name and address on the cards.

FURTHER OBSERVATIONS ON THE AGE OF THE MENARCHE

BY

DAGMAR C. WILSON, M.D., M.R.C.P., F.R.C.O.G. D.P.H.

(From the Laboratory of Human Nutrition, University of Oxford)

AND

IAN SUTHERLAND, M.A., D.Phil.

(From the Institute of Social Medicine, Oxford)

In an earlier paper (Wilson and Sutherland, 1949) data collected from nine secondary schools in Oxford and Oxfordshire were used to study the onset of menstruation in relation to height and weight. In the first part of the present paper an analysis similar to the earlier one is made for seven schools elsewhere in the South of England, and the two sets of findings are compared. In the second part, serial records of height and weight, kept as a routine by two schools, are studied to see what information they give of growth processes in the adolescent girl.

First Investigation

The new data were obtained from five day schools and one boarding-school in Dorset and from one day school in Essex. The information consists of the ages, heights, and weights of 1,707 girls attending these schools in the summer term of 1949, together with a record of whether or not menstrual periods had started. Similar data were available for comparative purposes for 1,284 girls attending eight schools in Oxford and Oxfordshire in the autumn term of 1948.* In the case of children whose menstrual periods had already begun, the age at the menarche was also requested. But since it is possible to determine the average age of the menarche without using this extra information (which may not be fully reliable), it has been necessary to use it in only one analysis (Table III). In both surveys, children attending day schools were excluded if they had not been resident in the area for at least three years preceding the menarche or the date of the inquiry, whichever occurred earlier.

Age of the Menarche

A criticism of most studies relating to this subject is that they depend upon the girl's memory of her age at the menarche, and experience has shown that this cannot be wholly trusted even a short while after the event. A close examination of our data for Oxford and Oxfordshire shows certain discrepancies which may well be due to faulty memory. For this reason a different method of calculating the average age of the menarche, known technically as probit analysis, has been adopted. It can be used when, as in this instance, the age-range of the girls questioned is the same as that in which menstrual periods usually begin —namely, 9 to 18 years. Only two pieces of information are required from each girl—her present age and whether or not her periods have started—and these can both be recorded with a high degree of reliability.

Table I summarizes the findings concerning the age of the menarche in five groups of schools. In the day schools in Essex and in Dorset the average age of the menarche was 13.4 years, in the Oxford and Oxfordshire schools

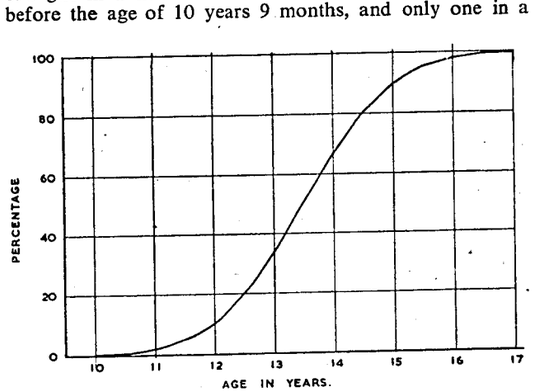
*Information from one of the nine schools previously studied had to be discarded because it related only to those girls who had attained the menarche.

TABLE I.—*Average Age of the Menarche in Four Groups of Schools (Calculated by Probit Analysis)*

Group of Schools	No. of Schools	No. of Children	Mean Age of Menarche (Years), with Standard Error	Standard Deviation of Age of Menarche (Years)
Dorset (day) ..	5	1,151	13·38 ± 0·05	1·14
Essex (day) ..	1	155	13·38 ± 0·14	1·04
Oxford and Oxon (day)	8	1,284	13·61 ± 0·05	1·26
Dorset (boarding)	1	401	13·89 ± 0·11	1·13
All day schools ..	14	2,590	13·490 ± 0·037	1·191

it was 13.6 years, and in the Dorset boarding-school 13.9 years. The differences in mean age are slight, but statistically significant. The standard deviations range from 1.04 years to 1.26 years, but these variations are unimportant. Since the girls at the boarding-school represent the children of well-to-do parents, these findings suggest that there may be a relationship between sexual maturity and social background.

It is of interest to mention also that the data from each group of schools are consistent with the hypothesis that the age of the menarche follows a "normal" frequency distribution; this finding is a by-product of the probit analysis. This is true in particular of all the day-school girls, 2,590 in number, for whom the mean age at the menarche was 13.49 years, with a standard deviation of 1.19 years. In view of the large experience upon which these figures are based, they can probably be regarded as a reliable standard for day-school girls in the South of England. This standard indicates, for example, that only one girl in a hundred will menstruate for the first time before the age of 10 years 9 months, and only one in a hundred after the age of 16 years 3 months. The Graph presents this standard experience in the form of a curve, which shows at each age the percentage of girls who have attained the menarche.



Graph showing percentage of girls who at a given age have attained the menarche (standard based on 2,590 girls).

Height and Weight

The girls were divided into those who had already passed the menarche and those who had not, and were then subdivided by age. Table II presents the mean heights and weights in the various schools for six of the resultant groups of children. Several important points emerge.

In the first place the figures for the 13-year-old girls in the middle of the table indicate that in each group of schools height and weight are substantially greater among those who have attained the menarche than among those of the same age who have not. This confirms one of the findings of the earlier paper.

Secondly, the table enables comparisons to be made between girls at the four groups of schools. Both before and after the menarche there are interesting differences in mean height and weight. The greatest values occur throughout at the boarding-school in Dorset and the lowest (with one or two minor exceptions) in the Dorsetshire day schools. These findings suggest that there may be differences, due to social factors, in adolescent height and weight as well as in the attainment of the menarche. There appear to be two possibilities to investigate. The first is that there is an inherent relation between the attainment of the menarche and absolute height and weight, which might account for the social pattern. The other is that no such relation exists, and that differences in physique between social groups arise independently of any differences in the onset of menstruation. The present study offers some further evidence on this matter.

TABLE II.—*Mean Heights and Weights of Certain Groups of Schoolgirls*

Age when Measured (Years)	Group of Schools	No. of Girls	Mean Height (in.)	Mean Weight (lb.)
Girls who had not passed the menarche				
11–	Dorset (day)	66	57·9	84·3
	Essex	18	58·1	87·3
	Oxford and Oxon	158	58·0	84·3
	Dorset (boarding)	8	60·9	93·8
12–	Dorset (day)	193	59·1	87·7
	Essex	25	60·0	94·1
	Oxford and Oxon	220	59·4	87·2
	Dorset (boarding)	33	60·3	96·1
13–	Dorset (day)	112	60·7	94·3
	Essex	16	59·7	91·6
	Oxford and Oxon	151	60·9	93·0
	Dorset (boarding)	40	62·0	104·3
Girls who had passed the menarche				
13–	Dorset (day)	151	62·3	112·8
	Essex	15	61·0	110·6
	Oxford and Oxon	132	63·0	118·3
	Dorset (boarding)	28	64·3	119·9
14–	Dorset (day)	210	63·0	115·6
	Essex	33	64·0	122·0
	Oxford and Oxon	203	63·6	116·7
	Dorset (boarding)	48	64·3	125·4
15–	Dorset (day)	186	63·9	120·9
	Essex	22	63·9	122·0
	Oxford and Oxon	165	64·3	121·7
	Dorset (boarding)	60	65·2	129·6

Metric equivalents: 1 inch = 2·54 cm.; 1 lb. = 454 g.
In order to keep the table within a reasonable compass only those groups containing the largest numbers of children were included. However, the conclusions drawn from the table apply equally to the whole body of data.

TABLE III.—*Mean Heights and Weights in Two Groups of Day Schools According to Age When Measured and Recollected Age at the Menarche*

Age at Menarche (Years)	Age when Measured (Years)	Group of Schools	No. of Girls	Mean Height (in.)	Mean Weight (lb.)
12–	13–	Dorset	78	62·3	112·5
		Oxford and Oxon	63	63·3	118·8
	14–	Dorset	46	62·9	119·0
		Oxford and Oxon	51	63·6	122·9
13–	13–	Dorset	57	62·3	110·1
		Oxford and Oxon	56	62·7	117·8
	14–	Dorset	116	63·1	115·6
		Oxford and Oxon	92	63·5	115·4
	15–	Dorset	66	63·9	119·8
		Oxford and Oxon	68	64·6	124·0
14–	15–	Dorset	59	63·4	117·8
		Oxford and Oxon	39	64·5	116·1

The age groups included in this table are those containing the largest numbers of children.

It will be noticed from a comparison of Tables I and II that in the schools with the taller and heavier girls the menarche tends to occur later than in the schools where the girls are shorter and lighter. This is just the opposite of what would be expected if girls who grow rapidly attain sexual maturity earlier—the usual suggestion. But although this correlation supports the view that there is a relation between the attainment of the menarche and absolute height and weight, the analysis in Table III indicates that there is no causative connexion between the two sets of figures. In this table are compared the height and weight of Oxford and Dorset girls who were at the same stage of sexual development—that is, who had the same recollection of their age at the menarche and were the same age at the time of study. The comparisons show that the Oxfordshire girls are superior in height and weight; these differences in physique must therefore be independent of the attainment of the menarche. In other words, the second possibility is the correct one: absolute height and weight are not determining influences upon the age of the menarche.

Second Investigation

The data for the second part of the study were recorded by the medical officers of two boarding-schools, one in Sussex and the other in Yorkshire. They consist of serial measurements of height and weight, made at the beginning and end of each school term, together with a note of the occurrence of the menarche. Records were available for 202 pupils who left the Sussex school in the years 1936 to 1948, and for 87 who left the Yorkshire school in the years 1947 to 1949.

The advantage of serial records is that they enable the changes in height and weight of the *individual* to be studied in relation to the age of the menarche. The years particularly worthy of study are those immediately preceding the menarche, during which time marked height and weight changes occur. Such a study would probably suggest a method of predicting at what age a girl will attain the menarche, and this would be of great value to parents and others concerned with education in health and sex. Unfortunately the majority of the present series of measurements are post-menarcheal because of the age range covered by the schools. It was therefore decided to study the four years after the menarche. Even over this limited period of time it was not possible to follow an unchanging set of individuals, since some girls entered school after the menarche and others left within four years of its attainment. But despite these drawbacks the data do reveal certain points of interest about growth during this period.

There are considerable differences between the girls at the two schools. The mean ages of attainment of the menarche, with their standard errors, were 13.11±0.09 years among the girls from the Sussex school and 13.82±0.14 years among the girls from the Yorkshire school. This difference is statistically significant. Further, the girls at the Sussex school were at each age taller and heavier than those at the Yorkshire school (Tables IV and V). It is worth noting in passing that these findings cast doubt upon the suggestion that the age of the menarche tends to be greater in children of the more favoured social and economic groups. At the Sussex boarding-school the average age of the menarche is in fact less than at any day school included in this study, while the social status of the girls there is certainly no lower than at either of the other boarding-schools, in each of which the average age of first menstruation is later by about nine months.

Because of the differences between the Sussex and Yorkshire schools the data for each had to be analysed separately,

TABLE IV.—*Average Weights (in lb.) of Children at Two Schools According to Age at the Menarche*

Interval Since Menarche (Years)	Age at Menarche					
	Yorkshire School			Sussex School		
	9–12	13–	14–17	9–12	13–	14–17
0 ..	*	105·2	113·3	99·5	112·9	114·2
1 ..	110·3	114·6	121·7	114·0	118·3	123·1
2 ..	117·0	121·4	127·4	121·3	126·8	129·2
3 ..	122·7	125·7	131·4	126·9	131·3	130·8
4 ..	125·8	126·7	129·1	129·7	129·8	*
Actual Age (Years)						
13– ..	112·1	105·2	98·8	116·8	112·9	102·7
14– ..	118·7	114·6	108·5	123·7	118·3	111·8
15– ..	124·5	121·4	117·3	127·8	126·8	119·1
16– ..	128·9	125·7	126·0	131·3	131·3	124·5
17– ..	132·0	126·7	131·0	131·5	129·8	131·1

* Fewer than 10 measurements—average omitted.

TABLE V.—*Average Heights (in in.) of Children at Two Schools According to Age at the Menarche*

Interval Since Menarche (Years)	Age at Menarche					
	Yorkshire School			Sussex School		
	9–12	13–	14–17	9–12	13–	14–17
0 ..	*	61·5	63·2	61·1	63·4	64·2
1 ..	62·4	62·8	63·9	62·5	64·1	64·7
2 ..	62·7	63·3	64·2	63·8	64·6	65·3
3 ..	63·0	63·8	64·9	64·2	65·0	65·4
4 ..	63·1	63·7	65·3	64·4	65·0	*
Actual Age (Years)						
13– ..	62·2	61·5	61·3	63·0	63·4	61·5
14– ..	62·8	62·8	62·4	64·0	64·1	63·5
15– ..	62·9	63·3	63·6	64·3	64 6	64·2
16– ..	63·7	63·8	64·2	64·4	65·0	65·1
17– ..	64·7	63·7	64·7	64·3	65·0	65·5

* Fewer than 10 measurements—average omitted.

despite the small numbers of pupils involved. At each school the children were divided into three "maturation" groups according to age at the birthday before the menarche (9–12, 13, or 14–17 years). The progress of each group in height and weight (and also in an index of body-build based upon these two measurements) was then followed, first, according to the interval in years from the menarche, and, secondly, according to actual age Each average was based upon as many measurements as were available in the records.

Weight

The findings on weight are summarized in Table IV. As might be expected, the mean weights for each "maturation" group rise both with increasing interval from the menarche and with increasing age, and by the end of the period of study the weights are approaching a stable level.

But the most interesting information in Table IV is obtained from a study of its rows. The upper half of the table permits a comparison of girls at the same stage of sexual maturity, but of different ages, while the lower half enables girls to be compared who are the same age but differ in sexual maturity. At the Yorkshire school, for example, the mean weights one year after the menarche were 110.3 lb. in the first maturation group, 114.6 lb. in the next, and 121.7 lb. in the last group—that is, in the girls who were measured at the oldest age. Thus weight at this stage of maturity is influenced by age. On the other hand, the comparison of girls aged 14 shows that the mean weight was 118.7 lb. in the first maturation group, 114.6 lb. in the next, and only 108.5 lb. in the last group—that is, in the girls who were measured at the earliest stage of sexual maturity. Thus weight in girls of this age is influenced by the stage of sexual maturity. These examples are typical of the experience in each school, with

slight exceptions towards the end of the period of study. Thus, so far as girls are concerned, weight in adolescence depends not only upon age but also upon the stage of sexual maturity.

Height

The mean heights are summarized in Table V. As with mean weight, the measurements tend to reach a stable level by the end of the period studied.

However, the comparisons of the three maturation groups show a rather different pattern. The measurements in the upper half of the table indicate that at each stage of maturity height is influenced by age. Those in the lower half suggest that at the beginning of the age-period 13 to 17 years there is a slight tendency for those maturing early to be tall, and at the end a slight tendency to be short, in comparison with those maturing late; but this pattern is much less clear-cut than that in the upper half of the table. Thus between the ages of 13 and 17 the height of girls is influenced almost exclusively by age; the stage of sexual maturity exerts little additional influence.

Body-build

So far height and weight have been considered in isolation, but together they can give a rough indication of body-build. The measure used here is the height (in inches) divided by the cube root of the weight (in lb.). It is accurate enough for the purposes of this study to calculate this fraction for each group of measurements from the mean height and the mean weight, and this avoids the laborious procedure of calculating the measure of build for each pair of measurements and then averaging the results. The figures are presented in Table VI.

TABLE VI.—*Body-build (Mean Height in Inches Divided by Cube Root of Mean Weight in lb.) of Children at Two Schools According to Age at the Menarche*

Interval Since Menarche (Years)	Age at Menarche					
	Yorkshire School			Sussex School		
	9–12	13–	14–17	9–12	13–	14–17
0 ..	*	13·03	13·06	13·20	13·12	13·24
1 ..	13·03	12·92	12·89	12·89	13·06	13·02
2 ..	12·82	12·80	12·76	12·89	12·84	12·93
3 ..	12·68	12·73	12·78	12·77	12·79	12·88
4 ..	12·59	12·67	12·94	12·72	12·85	*
Actual Age (Years)						
13– ..	12·91	13·03	13·25	12·88	13·12	13·11
14– ..	12·77	12·92	13·09	12·85	13·06	13·17
15– ..	12·60	12·80	13·00	12·75	12·84	13·06
16– ..	12·61	12·73	12·80	12·68	12·79	13·05
17– ..	12·72	12·67	12·74	12·63	12·85	12·89

* Fewer than 10 measurements—value omitted.

The values at the Sussex school are slightly higher than those at the Yorkshire school. For each maturation group the measure of build falls with increasing age and with increasing interval since the menarche. That is to say, girls become progressively heavier for their height during this period—a finding which would be expected from the outward physical changes in girls in the course of sexual maturation. It would be of interest to know if the same is true of boys. In the valuable study by Richey (1937), records for boys as well as girls were available, but unfortunately no analyses analogous to those in the upper half of Tables IV, V, and VI were made.

When a comparison is made as before between the three maturation groups of children in each school, a pattern different from that of height or weight is revealed. In the first two years following the menarche there is no apparent relation between build and age. For example, one year after the menarche the measure of build is approximately 12.9 or 13.0 at each school, whatever the age of the children when measured. In the third and the fourth year after the menarche there is a slight tendency for those who matured early to be shorter for their weight than those who matured late. But on the whole, body-build in the first few years after the menarche is not influenced by age. The lower half of the table confirms that the stage of sexual maturity in girls of the same age exerts a considerable influence on build. Among those observed at 14 years of age in the Yorkshire school, for example, the measure of build varied from 12.8 in those who matured early to 13.1 in those who matured late. The figures thus make it clear that at the time of the menarche build is independent of age, and that, during the following two years at least, girls become heavier for their height to an extent which is also independent of their age.

These analyses indicate that it is convenient to regard growth in the adolescent girl as being of two types. One is the normal physical growth with age, and superimposed upon it are changes specifically arising from the processes of sexual maturation. The findings of this study suggest that between the ages of 13 and 17 height is practically unaffected by the processes of sexual development as such; on the other hand, as a consequence of weight changes, body-build (as measured in this study) seems to be determined solely by the processes of maturation for at least two years after the menarche.

Summary and Conclusions

This paper describes two separate studies into the onset of menstrual periods in relation to height and weight.

In the first study data were available for nearly 3,000 school-girls within the age range 9–18 in the South of England. Using only two pieces of information from each girl—her present age and whether or not her periods have started—a standard statistical technique known as probit analysis enables the average age of the menarche to be estimated with a known degree of accuracy. It should be noted that this is a particularly suitable technique for use in surveys of this (and other) aspects of sexual maturation, as it requires a minimum of information and does not depend on the girl's memory of her age when her periods first started. It is suggested that the ages of attainment of the menarche in the 2,590 day-school girls may be regarded as a standard for the South of England. This standard indicates that only one girl in a hundred will start her periods before the age of 10 years 9 months, and only one in a hundred after the age of 16 years 3 months. One-half will menstruate by the age of 13 years 6 months. There were interesting differences in average height, weight, and age at the menarche between different groups of girls. Despite an apparent correlation, it is shown that the differences in height and weight were not a determining influence upon the age of the menarche.

In the second study serial height and weight records were available for 202 girls from one boarding-school and 87 from another, and were studied to see what light they shed upon the processes of growth. The findings show that growth in the adolescent girl may be regarded as of two superimposed types—normal physical development with age, and growth specifically related to the process of sexual maturation. In the age period 13 to 17 years height changes are practically independent of sexual maturation. But because of changes in weight, the body-build, measured as the height divided by the cube root of the weight, develops independently of age for at least two years after the menarche. During this period girls become heavier for their height. It is unfortunate that the records do not permit an analysis at younger ages; a study of the years preceding the menarche would not only give a more complete picture of growth processes but should suggest a method of predicting

when the menarche will occur in an individual. This would be of great value to parents and others concerned with education in health and sex.

We are indebted to the educational and medical authorities in Dorset, Essex, Oxford, and Oxfordshire for their help in obtaining the necessary data for the first part of this study. It is a pleasure to thank Mr. P. H. Leslie for his advice. We also wish to thank the medical officers of the boarding-schools in Sussex and Yorkshire for their readiness to make available to us the medical records of those who had left school, and for their interest in the study.

References

Richey, H. G. (1937). Monographs of the Society for Research in Child Development, 2, No. 1. National Research Council, Washington.

Wilson, D. C., and Sutherland, I. (1949). *British Medical Journal*, 2, 130.

FATAL CASE OF ACUTE PORPHYRIA IN A NEGRO

BY

C. A. WIGGINS, M.B., Ch.B.

House-physician, St. James' Hospital, Balham

Acute porphyria has been reviewed in several papers since 1945. Abbott and Evans (1946) found that nearly 300 cases had been described since Günther's first case in 1911. Pyrrole metabolism is reviewed by Dobriner and Rhoads (1940) and by Welcker (1945). The following are the main clinical points.

Porphyria is a disorder of metabolism of the respiratory pigments (haemoglobin, myoglobin, cytochrome oxydase, etc.). "Acute" porphyria is almost certainly a chronic disorder, with acute episodes superimposed (Gray, Rimington, and Thomson, 1948). Barbiturates, sulphonal, sulphonamides, "trional," arsenicals, phosphorus, or lead may precipitate an attack (Dobriner and Rhoads, 1940), but there is no hard-and-fast distinction between the toxic and idiopathic varieties (Discombe and D'Silva, 1945).

Roth (1945) states that psychic episodes may occasionally precipitate an acute attack, and that the siblings of these patients are often hysterical or psychotic. Porphyrins are excreted in abnormal quantities during attacks and often between attacks; the usual finding is uroporphyrin III or coproporphyrin III, but Gray (1950) says, "It has never been possible to correlate the varied clinical features with any definite pattern of porphyrin excretion." He had a case in which the colourless porphobilinogen was predominant. Characteristically the urine is a red or brown colour and darkens further on standing. Hare and Wilmore (1948) quote Waldenström's epithet "la petite simulatrice" and his remark that hysteria is often suspected. Davies (1949) finds that barbiturates are given to the majority of these patients.

The acute form is commoner in women—3:1 (Abbott and Evans, 1946). The age of onset is 20 to 45 (Davies, 1949). Symptoms may be mainly abdominal, or mainly nervous, or combined abdominal and nervous as in the classic type. There may be a prodromal period of lassitude and mental disorder, and the onset is with colicky abdominal pain, nausea, vomiting, constipation, leucocytosis, tachycardia, and a rise in blood pressure; while hypotension is common in the later stages. Sometimes the pain is in the form of dysmenorrhoea. Attacks of jaundice are not infrequent and may obscure the significance of dark urine, and it is worth noting that an apparently positive Ehrlich aldehyde test is given by porphobilinogen in the urine (see below).

In nearly half the cases neurological symptoms occur, which may include confusion, delirium, convulsions, or amaurosis. Characteristically there is a polyneuritis, which may fluctuate in severity, affecting the limbs, especially the proximal segments, with or without cranial nerve and sphincter involvement. Pain and paraesthesias are common, but objective sensation is usually relatively spared. With neurological involvement the mortality is about 75% (Berg, 1945; Petrie, 1948). Subsequent attacks may occur in those who survive (Gray, Rimington, and Thomson, 1948).

Case Report

The patient, a male native of Lagos, Nigeria, aged 30, had been in London for six months preparing for examinations in accountancy. He was admitted on April 13, 1950, with the history of inconstant shortness of breath for some years, related sometimes to physical and sometimes to emotional strain. He was a hard worker, conscientious, and ambitious, but lacked self-confidence. He had worn spectacles for some weeks. Seven weeks before admission he again complained of dyspnoea, and doubted his ability to pass his examinations. After a week he complained of central abdominal pain with nausea, vomiting, and constipation, and was admitted to another hospital from which he went home against advice after three weeks.

A week later a reassuring talk relieved his symptoms, but next day he had anorexia, paraesthesias, and pains in the limbs, followed by hallucinations, insomnia, and irregular behaviour. This sequence of events strongly suggested hysteria, and he was given 3 gr. (0.2 g.) of butobarbitone at night. After this he became clear mentally, but noticed a gradual onset of weakness in all limbs. He became incontinent of urine, and was admitted to this hospital. Specific inquiry later revealed that he had had red urine on occasions for some years and for most of the last six weeks. His parents, two sisters, and three brothers had always been well, and had never mentioned similar discoloration. No siblings had died. He knew of no white ancestry.

On examination he was markedly wasted and dehydrated. He was febrile, 99.6° F. (37.55° C.). There was bilateral conjunctivitis with mucopurulent exudate. His tongue was furred, his mouth was dry, and his breath foul. The buccal mucosa and teeth were normal. The abdomen was lax and retracted, and slightly tender in the right iliac fossa, with a nodule of faeces in the left iliac fossa. The liver and spleen were not palpable. The heart and lungs were normal, the pulse was 130, and the blood pressure 115/75. Although correctly orientated and otherwise rational, he thought that there was "somebody under the bed lifting it up and down." Visual fields were full by confrontation. There was slight weakness of the left fifth cranial nerve, his voice was very weak, and his speech a little slurred and difficult to understand. His neck was normal but the trunk muscles were weak. There was a flaccid tetraplegia, almost complete at the hips, shoulders, knees, and elbows, with very little power at the distal joints and with a coarse irregular tremor when movements were attempted. All tendon-jerks were present, the knee-jerks being very feeble. The plantar responses were normal. Sensation to pin-prick was slightly impaired over the forearms and hands; light touch, position sense, and vibration sense were normal. There was a burn from a hot-water bottle on the right calf; elsewhere the skin was normal. Tenderness was increased in the calves. He was incontinent of urine. The white cells numbered 6,000 (polymorphs 62%, lymphocytes 30%, monocytes 8%).

On the first day after admission his blood pressure was 140/100. Examination of the urine revealed: acid, a trace of protein, no Benedict reduction, no casts, cells, organisms, bile salts, or bile pigments. A blood count showed: red cells, 4,850,000; Hb, 97%; white cells, 21,000 (polymorphs 88%, lymphocytes 12%). On the second day the urine was seen to be brownish red and was then found to contain porphyrins. By this time his voice had sunk to a whisper. The weakness of the fifth cranial nerve had increased; both knee-jerks and

the left ankle-jerk were absent. His blood pressure was 120/80. On the fourth day the facial muscles were mildly affected. The sclerotics were a yellowish brown colour, but the serum bilirubin was 0.4 mg. per 100 ml.; the direct van den Bergh was negative.

On the sixth day he was generally weaker and there were paradoxical respiratory movements. Coarse rales appeared in the chest, and breathing became slow and irregular before he died. During the six days his pulse rate varied from 118 to 150, average 130. There was continued pyrexia, higher in the last 36 hours, average 100° F. (37.8° C.). On the day before death a blood count showed: red cells, 4,130,000; Hb, 84%; white cells, 13,800 (polymorphs 79%, eosinophils 20%, monocytes 1%). On the last day the blood urea was 156 mg. per 100 ml.; blood sugar 129 mg. per 100 ml.; Wassermann reaction and Kahn test negative; serum alkaline phosphatase 6 K.-A. units; direct van den Bergh positive; serum bilirubin 0.8 mg. per 100 ml. Total serum protein was 6.56 g.%—albumin 3.02 g., globulin 3.54 g.

Post-mortem Examination

This was carried out 20 hours after death by Dr. N. Orchard, to whom I am indebted for the following report.

"Lungs: marked congestion and oedema. Stomach: mucous gastritis and numerous petechiae in the mucosa. Spleen: deeply congested with very prominent follicles. Liver: firm, slate-blue in colour, with numerous small greyish-yellow areas. Kidneys: traces of foetal lobulation; capsule stripped easily; deeply congested, but a slate-blue colour evident. Brain and cord: oedematous.

"The following organs were of slate-grey or bluish colour: visceral and parietal pleura and peritoneum, myocardium, psoas and rectus abdominis muscles, liver, kidney, most of the jejunum, the caecum, and the proximal half of the ascending colon. The following were of an unusual yellow-orange colour: pancreas, cerebellum, omentum, peritoneal fat, and the sternal, vertebral, and iliac marrow. The following fluoresced with a pink or red colour in ultra-violet (Wood's) light: liver, kidneys, omentum, psoas and rectus abdominis muscles, myocardium, pericardium, aorta, costal cartilage, and sternal marrow.

"Histological abnormalities were as follows:—Right optic nerve: marked round-cell infiltration, the myelin sheaths being intact. Anterior horn cells: marked chromatolysis at all levels of the cord. Cerebellar Purkinje cells: severe degeneration. Liver: polygonal cells loaded with greyish, granular pigment. Kidneys: congested. Lungs: oedematous, congested, with early bronchopneumonia."

Biochemical Findings

The urine when freshly passed was a red-brown colour and darkened considerably on standing. The Watson and Schwartz modification of the Ehrlich aldehyde test was positive (see below). A quantity of urine was collected over a period of some days and sent for biochemical examination. I am greatly indebted to Dr. L. Ellis for his report, as follows.

"The urine was a deep port-wine colour and did not obviously darken further on standing. Using a direct-vision spectroscope, the urine showed two absorption bands in the green closely resembling the bands of oxyhaemoglobin and a band at the junction of the green and the blue. About 15 ml. of urine was acidified with a few drops of glacial acetic acid and shaken thoroughly with about 10 ml. of tertiary amyl alcohol. After centrifuging, the upper alcohol layer showed the same absorption bands and gave a brilliant pink fluorescence under the ultra-violet lamp. It would seem that the porphyrins were excreted as metallo-porphyrins (see Chandler, Harrison, and Rimington, 1939).

"For further differentiation a specimen of urine was acidified with a few drops of glacial acetic acid, and extracted with several quantities of ether until the ether layer showed no further spectroscopic evidence of the presence of porphyrins. This indicated that all coproporphyrin had been extracted. The urine layer was then extracted with amyl alcohol and the alcohol layer separated. This layer now contained the uroporphyrin. The ethereal extract was evaporated down to the same volume as the amyl-alcohol extract and the two extracts were compared under the ultra-violet lamp and spectroscopically. It seemed obvious that, while there appeared to be quite a fair amount of coproporphyrin, uroporphyrin was present in some excess."

Discussion

The diagnosis of acute porphyria seems to be substantiated on the sum of the findings recorded. The clinical course of the illness was in accord with the usual (albeit variable) symptomatology, and there were two further points which are not included in the introduction. Hare and Wilmore (1948) were "impressed by the degree of cachexia and debilitation" in one of their cases. Davies (1949) noted a yellow-brown tint in the sclerotics not due to bilirubinaemia.

Roth (1945) mentions the temporary or protracted attacks of amaurosis which may occur, and in his cases neither ophthalmoscopic nor post-mortem microscopical abnormalities were detected to account for the symptom. My patient made no specific complaint about his vision, and no history was obtained whether he had had intermittent amaurosis, but it may possibly be significant that he had recently worn spectacles. Equally problematical is the significance of the other early symptom—namely, the shortness of breath accompanying emotional strain.

Degeneration, pigmentation, and fluorescence of organs have been recorded. To summarize Roth (1945), the commonest central-nervous-system changes are parenchymatous degeneration in the peripheral nerves, the anterior horn cells (and to a lesser extent the posterior horn cells), the cerebellar Purkinje cells, the cerebral cortex, and the sympathetic ganglia. The changes are more marked in the peripheral nerves and lower segments of the central nervous system.

Abrahams, Gavey, and Maclagan (1947) found a striking bluish black discoloration of both rectus abdominis muscles, parts of the psoas muscle, and peritoneum, with red fluorescence under ultra-violet light in the costal cartilage, sternal marrow, rectus muscle, small intestine, and elsewhere. Prunty (1946) found ultra-violet fluorescence (microscopically) in the liver, renal tubules, costal cartilage, and parts of the central nervous system. In his case, however, the pigment granules in the liver parenchyma were of two kinds—large golden-yellow granules and small red-orange granules. It is usually agreed that acute porphyria is commoner in those of Scandinavian descent (Discombe, 1948), and there is evidence that it may be transmitted as a Mendelian dominant. If this is so, the occurrence of a case in a West African negro makes it possible that it may occur in the American negro, but, judging by the literature of both countries, it is rare. A brief survey revealed only one other case, that of Schneck (1946) in the United States, and he could find no other cases. It may be said, however, that his case, although suggestive, was not proved, for at no stage were porphyrins detected in the urine or elsewhere.

Finally, it is worth repeating a point stressed by many authors, that the diagnosis should be considered and the urine examined in any patient with obscure mental, nervous, and/or abdominal symptoms. The simplest test is that of Watson and Schwartz (1941) for porphobilinogen. Mix equal parts of urine and Ehrlich's aldehyde reagent, add a few millilitres of chloroform, and shake. Urobilinogen gives a red colour soluble in the chloroform layer, but porphobilinogen gives a red colour which remains in the aqueous layer.

Summary

A case of classical acute porphyria occurring in a West African negro is described. Post-mortem and biochemical findings are included. The literature is briefly quoted.

I am indebted to Dr. A. Kahan, under whose care the patient was admitted, for permission to publish the case and for his encouragement and advice; to Dr. N. Orchard for the post-mortem report and the preliminary detection of porphyrins; to Dr. L. Ellis, biochemist to the Lambeth Group Laboratory, for his report on the urine findings; and to Dr. J. Olu-Mabayoje, who had known the patient for many years, for his help with the history.

REFERENCES

Abbott, K. H., and Evans, H. S. (1946). *Bull. Los Angeles neurol. Soc.*, **11**, 20.
Abrahams, A., Gavey, C. J., and Maclagan, N. F. (1947). *British Medical Journal*, **2**, 327.
Berg, M. (1945). *Arch. intern. Med.*, **76**, 335.
Chandler, F. G., Harrison, G. A., and Rimington, C. (1939). *British Medical Journal*, **2**, 1176.
Davies, D. (1949). Ibid., **1**, 846.
Discombe, G. (1948). Ibid., **2**, 659.
—— and D'Silva, J. L. (1945). Ibid., **2**, 491.
Dobriner, K., and Rhoads, C. P. (1940). *Physiol. Rev.*, **20**, 416.
Gray, C. H. (1950). *Arch. intern. Med.*, **85**, 459.
—— Rimington, C., and Thomson, S. (1948). *Quart. J. Med.*, n.s. **17**, 123.
Hare, L., and Wilmore, R. (1948). *Amer. J. Med.*, **5**, 53.
Petrie, E. (1948). *British Medical Journal*, **1**, 926.
Prunty, F. T. G. (1946). *Arch. intern. Med.*, **77**, 623.
Roth, N. (1945). *Psychosom. Med.*, **7**, 291.
Schneck, J. M. (1946). *J. nerv. ment. Dis.*, **104**, 432.
Watson, C. J., and Schwartz, S. (1941). *Proc. Soc. exp. Biol., N.Y.*, **47**, 393.
Welcker, M. L. (1945). *New Engl. J. Med.*, **232**, 11.

FOLLOW-UP OF RHESUS-NEGATIVE PRIMIGRAVIDAE

DEVELOPMENT OF RHESUS IMMUNIZATION

BY

W. WEINER, M.D.

Director, Regional Blood Transfusion Service, Birmingham

AND

JEAN L. HALLUM, B.Sc., M.D., D.C.H., M.R.C.O.G.

Obstetrician, Sorrento Maternity Hospital, Birmingham

Rhesus immunization in the first pregnancy has been found only very exceptionally, apart from patients who had previously received a transfusion of rhesus-positive blood. Few authentic cases of rhesus immunization of the first-born child have been mentioned in the literature (Boorman, Daley, and Dodd, 1947).

It has been suggested that the immunizing stimulus is provided during labour by a small "blood transfusion" given to the mother by the foetus through the breakdown of the syncytial placental layer. During the second pregnancy small "booster doses" of foetal blood reaching the maternal circulation stimulate antibody formation further, and the "full-blown" picture of rhesus immunization develops. The assumption that the first pregnancy or labour provides the first antigenic stimulus seems to be necessary to explain the development of antibody formation during the next pregnancy, in which presumably identical conditions obtain with regard to the placental barrier as in the first pregnancy.

Stratton (1943) has shown that the rhesus factor can be discovered on the foetal red blood cells at the eleventh week of development, but it seems improbable that such an immature foetus could provide enough antigenic material to produce antibodies in the maternal serum. Occasionally, however, antibodies are discovered in the early weeks of a second pregnancy. The following case illustrates this point.

A married woman aged 25 had her first baby on February 23, 1948. The infant, of 30 weeks' gestation and weighing 2 lb. 15 oz. (1.33 kg.), was born spontaneously. Serological investigations were performed on the mother at the ninth and twenty-seventh weeks and eight days after delivery. The result of all three investigations was Group B rhesus-negative, the serum containing no anomalous antibodies.

The patient became pregnant again in September, 1948. The first specimen of blood investigated early in January, 1949, at 16 weeks' gestation, showed definite signs of rhesus immunization by containing blocking anti-rhesus antibodies of fairly high titre (1 : 32). Several repeat investigations gave essentially identical results, and on May 3 a baby suffering from haemolytic disease of the newborn was born. She weighed 4 lb. 7 oz. (2 kg.). Despite a blood transfusion of rhesus-negative blood, she died of kernicterus at the age of 7 days. The diagnosis was confirmed at necropsy (Dr. Baar).

It was thought advisable to follow up a number of primigravidae after delivery, for a comparatively long period, to see whether any antibody formation followed delivery and whether the antibody could be proved to be present by routine serological methods. If the assumption is correct, that the primary immunizing dose is given during labour or afterwards, one could hope to find antibodies in sera of exceptionally good reactors without a further stimulus having been applied.

The investigation was undertaken on 62 primigravidae who were all seen antenatally and delivered at Sorrento Maternity Hospital, Birmingham. They were also followed up post-natally there. The serological investigations covered determination of the blood group, rhesus type, and investigation for antibodies in the serum. The latter was done by means of saline- and albumin-suspended cells, ten of which were rhesus-positive and two rhesus-negative. All the sera were also tested by means of the indirect Coombs test. The cord blood was also investigated. This investigation included the group and rhesus type and, from 1948 onwards, the direct Coombs test. Consecutive rhesus-negative primiparae were selected, and only those excluded who produced a rhesus-negative infant. The post-natal investigations were undertaken at various intervals. In most, the second specimen was obtained about eight days after delivery, and in no case were anomalous antibodies found. Several patients were followed up further at intervals up to two years. Two patients developed anti-rhesus antibodies. Their clinical and serological details follow.

Case 1

A woman aged 24 was delivered of a healthy, normal, full-term baby on October 20, 1947. This baby showed no icterus or other sign of haemolytic disease. His blood type was Group A rhesus-positive.

Further specimens were investigated from the mother, and approximately two years later the following results were obtained: The cells were confirmed as Group O rhesus-negative, the serum agglutinated strongly rhesus-positive albumin-suspended cells and did not agglutinate rhesus-negative cells. An indirect Coombs test with rhesus-positive cells was positive. Three weeks later a further specimen gave identical results. The serum was tested with a large battery of fully typed cells and agglutinated every sample cell which contained the D antigen. The titre of the antibody was found to be fairly low (1 : 2) against CDe/CDe and cDE/cde. At the same time a specimen of blood from the patient's husband was investigated and found to be Group A rhesus-positive (most likely genotype CDe/CDe).

It was obviously important to find out whether the patient had at any time between the delivery and the follow-up investigation been pregnant. This seemed impossible. She had attended a welfare centre regularly. Husband and wife confirmed the use of birth control (by male sheath) because they did not desire a second child until they no longer had to live in the same house as a relative suffering from pulmonary tuberculosis.

The patient gave a history of regular menses and had received no injections of any kind either ante- or post-natally, and had never received a transfusion.

Case 2

A woman aged 22 was delivered of a living healthy, full-term baby on September 19, 1948. The infant showed no signs of haemolytic disease of the newborn. The infant's blood type was Group A rhesus-positive.

The maternal serology antenatally was Group A rhesus-negative, the serum containing no anomalous antibodies. A specimen of blood obtained on the eighth day after delivery gave identical results. A further specimen, however, obtained on June 22, 1949, gave definite evidence of the presence of a potent anti-rhesus antibody, again acting more strongly on albumin-suspended rhesus-positive cells. The titre was moderately high (1 : 8). The serological behaviour of the antibody was typical, no reaction occurring unless the test cells contained the D antigen.

This patient had shown no sign of a further pregnancy, her menses having been regular since the cessation of lactation three months after delivery. She had received no injections ante- or post-natally or transfusions at any time of her life. Her husband was Group O rhesus-positive and most likely genotype CDe/cde.

Discussion

The serological findings in these two cases are clear-cut and indicative of rhesus immunization. The fact that the antibody reacted better with albumin- than with saline-suspended cells might perhaps be due to its comparatively low titre. We share with several other workers the experience that sometimes an "albumin" antibody can change into a saline agglutinating antibody just before delivery. The contention, therefore, that a blocking antibody is always a sign of hyperimmunization might perhaps be open to discussion.

It is difficult to understand why antibodies in these two patients developed so late after delivery. In both, the antigenic stimulus must have been the first pregnancy, and, so far as can be established, there was no further antigenic stimulus. That antibodies can develop to a stimulus a long time after its first application is a not uncommon experience in immunology—for example, undulant fever. Further investigations are in progress to elucidate this problem in greater detail. As a practical application of our findings, if they can be confirmed on a larger series, it might perhaps be advisable to investigate for the presence of anomalous antibodies the sera of all primiparae contemplating a second pregnancy.

Summary

In a follow-up of 62 rhesus-negative primiparae with rhesus-positive babies, two were found who, after intervals of two years and of nine months respectively, had developed anti-rhesus antibodies in their serum without a further intervening pregnancy or other antigenic stimulus.

We are greatly indebted to the technical staff of the Blood Transfusion Service in Birmingham and to Sister Lyons, of Sorrento Maternity Hospital, for the valuable help they have given in testing the many specimens and in following up the patients.

REFERENCES

Boorman, K. E., Daley, D., and Dodd, R. E. (1947). *J. Obstet. Gynaec. Brit. Emp.*, **54**, 281.
Stratton, F. (1943). *Nature*, **152**, 449.

MONGOLISM IN ONE OF TWINS

BY

T. H. CROZIER, M.D., F.R.C.P.

Assistant Physician, Royal Victoria Hospital, Belfast

AND

W. A. B. CAMPBELL, M.D., M.R.C.P.Ed.

Assistant Paediatrician, Royal Belfast Hospital for Sick Children

Graham (1950), reporting a case of mongolism in one of twins, drew attention to the comparative rarity of such cases in the British literature. The largest series so far published seems to be that of Warner (1949), who collected 101 cases from the literature and recorded one further case in which an older sib was also a mongol. Of these 102 sets of twins, one child was affected in 82 cases and both children in 20.

It is well recognized that there is a considerably increased incidence of congenital cardiac defect among mongols. Wylie (1949) quotes 22 examples in a series of 138 mongols (16%); Benda (1947) states that up to 75% of mongols dying in the first two years of life have a congenital cardiac defect, as have 35% of those surviving. Post-mortem records of the Hospital for Sick Children, Great Ormond Street, yielded evidence of congenital cardiac abnormality in 28 of 63 mongols (Evans, 1950). While various malformations are encountered, persistent ostium atrio-ventriculare commune is especially apt to be associated with mongolism (Abbott, 1936). Robinson (1941), in a series of 39 cases of this defect collected from the literature, states that about one-half of these were in mongols. Taussig (1947) emphasizes the likelihood that a mongol presenting signs superficially resembling ventricular septal defect, and without cyanosis, is suffering from persistent atrioventricularis communis. There were, however, only four examples of this in Evans's series, the commonest anomaly being in fact ventricular septal defect.



Case Report

Helen B. was born on November 20, 1949, at full term, the first of twin girls. The mother was aged 35; her health was good during pregnancy, apart from a cystocele which was troublesome during the first trimester. The father's age was 36. The family and personal histories of both parents were, so far as is known, good. There are two older (normal) daughters, now aged 4 and 7 years. Helen was delivered as a vertex, and the second (normal) twin as a breech; each weighed approximately 5½ lb. (2.5 kg.) at birth. A suggestion of mongoloid physiognomy was noted in Helen at birth, but was discounted to some extent by the medical attendant because

of a strong family resemblance between the infant, the father, and the two elder children.

From birth breast-feeding was difficult, and soon became impossible; she was given expressed breast milk for four weeks, and afterwards a mixture of cows' milk and water was substituted. She never thrived so well as her twin, and on first examination weighed only 9 lb. (4.1 kg.), as against 12 lb. (5.4 kg.). The mother noticed that she was less lively than her twin, was easily made breathless, and sometimes "went blue." She vomited slightly from birth, but at the time of first attendance this was not causing any anxiety.

The child was examined in the out-patient department of the Royal Belfast Hospital for Sick Children on January 20, 1950, when the diagnosis of mongolism was confirmed and its significance explained to the mother. The accompanying photograph was then taken.

She was again brought to the out-patient department on January 28 with a history of severe vomiting of a projectile type. On examination the pylorus was easily palpable and thought to be thickened. In view of the presence of a systolic murmur to the left of the sternum a chest radiograph was taken, which showed considerable generalized enlargement of the heart. A dietetic regimen and "pylostropin" tablets were used until admission could be arranged, but at the time of admission (January 31) she was vomiting as copiously as ever. Surgical treatment of the pylorospasm was decided upon, despite the known multiple hazards present.

Mr. J. A. W. Bingham opened the abdomen by a right transverse rectus-cutting incision under "soneryl"–atropine–vinyl-ether anaesthesia on February 2. Bleeding was slight and the blood dark. Before the peritoneum could be incised the heart stopped suddenly. Cardiac massage, artificial respiration, and oxygen inhalation produced only transient response.

Post-mortem Examination

At the post-mortem examination, carried out by Dr. R. J. Marshall, a poorly nourished female infant with the typical facies of mongolism was seen. The heart was considerably enlarged: normal epicardium; ductus arteriosus closed; the great vessels entered and left the heart in normal arrangement. The right auricle was much enlarged, and the wall markedly trabeculated. The interauricular septum was thin, terminating in a crescentic free edge just proximal to the auriculoventricular ring. The septum was fenestrated, and the foramen ovale closed. Anterior and posterior valve cusps were present, but were abnormal in that they continued uninterruptedly across the septal defect, the distal halves serving as mitral cusps.

The right ventricle was also markedly enlarged, and there was gross defect of the interventricular septum, which was rudimentary and present only at the apex of the organ. The ostium between the edges of the auricular and ventricular septa measured 2 by 1.5 cm.; thus there was virtually a common ventricle, the right half of which was larger than the left.

The stomach and duodenum were essentially normal in size and shape, and, although the pylorus was somewhat thickened, no congenital hypertrophy was noted. The lungs showed patchy interstitial pneumonia with mononuclear infiltration of the alveolar walls and comparatively little alveolar exudate. The liver and spleen showed the persistence of haemopoietic tissue.

Summary

A case of mongolism with persistent ostium atrioventriculare commune in one of twins is recorded. Pylorospasm with intractable vomiting, inanition, and death under anaesthesia exemplify the precarious hold on life which is the inheritance of most mongols. The nature of the cardiac anomaly was such as to preclude lengthy survival in any event.

We are indebted to Dr. P. P. Jackson for the obstetrical details, and to Mr. D. Mehaffy, A.R.P.S., for the photograph.

References

Abbott, M. E. (1936). *Atlas of Congenital Heart Disease*. American Heart Association, New York.
Benda, C. E. (1947). *Mongolism and Cretinism*. Heinemann, London.
Evans, P. R. (1950). *Brit. Heart J.*, **12**, 258.
Graham, A. R. (1950). *British Medical Journal*, **1**, 706.
Robinson, D. W. (1941). *Arch. Path.*, **32**, 117.
Taussig, H. B. (1947). *Congenital Malformations of the Heart*. New York.
Warner, R. (1949). *Amer. J. Dis. Child.*, **78**, 573.
Wylie, W. G. (1949). In Garrod, Batten, and Thursfield's *Diseases of Children*, revised by D. Patterson and A. Moncrieff. Arnold, London.

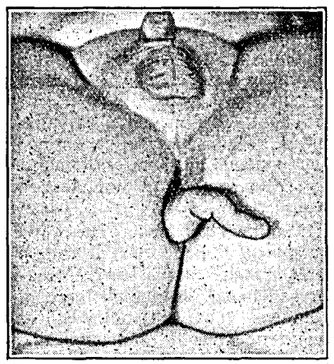
Medical Memoranda

A Vestigial Tail

Many cases of children born with a tail have been reported in the last seventy years, but very few in the English literature. The following is the description of one.

Case Report

The patient first attended hospital on May 11, 1949, at the age of 11 months. He had been born with a tail-like appendage, but his mother had not sought advice before, as she thought that nothing could be done until the child had dispensed with napkins. However, the increase in size of the tail at last made her come to hospital. There was no family history of any like anomaly. The child was a firstborn, the pregnancy and delivery had been without incident, and the child had developed normally since birth. There were no bowel or urinary symptoms. On examination he was found to be a healthy normal child, apart from his caudal appendage. The tail was attached to the right posterior anal margin (see illustration) and could be freely moved by the child. It was extensile and when fully pulled out measured just over 3 in. (7.5 cm.). When released it would contract, curl on itself, resembling the tail of a pig, and then relax and flick from side to side.



Photograph showing the vestigial tail at 11 months.

No bone or cartilage could be palpated in the tail. It was covered with normal skin. The anus freely admitted the examining finger, and the sphincter was of normal tone. *X*-ray examination of the pelvis showed no bony abnormality.

On May 26 the tail was excised by an incision encircling the base. The wound was soundly healed eight days later.

The specimen was reported on as follows: "A finger-like process 7 cm. in length and 1.5 cm. in diameter at the base. It was covered with hair-bearing skin and its core consisted mainly of fibro-fatty tissue with a small eccentric nodule of 'cartilaginous' consistency. *Microscopy*:—The external lining was of epidermis with normal skin appendages. Most of the core was formed of striated muscle bundles. Also present were fat, fibrous tissue, blood vessels, and nerves."

Comment

Bartels (1884) traced 116 recorded observations on tails in man. He found references as far back as the writings of Pliny, and stated that tailed races at one time or another had been reputed to have lived in South America, Asia, Africa, and Western Europe. Harrison (1901) reviewed the occurrence of tails in man and reported a case very similar to the one recorded here. R. J. McNeill Love (1934), in describing a case, suggested that such an abnormality might well be left in the hope that the bearer could use it later to earn his living in a circus.

In the 14–16 mm. embryo the caudal region shows a well-marked tail projecting beyond the cloaca—the proximal part containing vertebrae, the distal part without vertebrae. The latter is termed the caudal filament, and it seems that it is the persistence and growth of this structure which gives rise to a tail.

I wish to thank Mr. Charles Donald for permission to publish this case, Dr. Martin Bodian for the pathological report, and Professor J. D. Boyd for his interest.

P. J. Blaxland, M.B., B.S., F.R.C.S.,
Senior Surgical Registrar, Hospital for Sick Children, Great Ormond Street.

References

Bartels, M. (1884). *Arch. Anthropol.*, **15**, 45.
Harrison, R. G. (1901). *Johns Hopk. Hosp. Bull.*, **12**, 96.
Love, R. J. McNeill (1934). *British Medical Journal*, **1**, 666.

Chorion Carcinoma after Ectopic Gestation

The debt which diagnostic acumen owes to previous experience is too great to be assessed, and it must be accepted that he who would diagnose a condition not previously met is at a grave disadvantage; if, furthermore, he is unaware that such a condition exists, then the handicap will be so overweighted that the issue may well be decided before he can come to the aid of his patient.

That chorion epithelioma follows on hydatidiform mole is well known; that it may follow on normal pregnancy or abortion is taught, though few will have met it; therefore, that it may follow an ectopic pregnancy is a reasonable enough supposition. When, however, one estimates how extremely rarely chorion epithelioma follows normal pregnancy, and then estimates the rarity of ectopic as compared with normal pregnancy, when one adds to that the ease with which ectopic pregnancy is diagnosed, and the satisfactory extirpation which surgery achieves, one becomes prepared to accept the statement that chorion epithelioma after ectopic gestation is a very rare condition.

Rufus Thomas (1934) records a case, reviews the literature (the bibliography is appended), and states that "the number up to date would appear to be at least thirty-six." Walsh (1935) records a case and states that "Szathmary collected 1,412 cases of chorion epithelioma, of which 6.6% followed ectopic gestation"—that is, approximately 94 cases. Dafoe (1939) adds two more cases, the second of which is remarkable in that the patient survived, though metastases had occurred and the Aschheim–Zondek test was still positive one month after excision of the chorion-epitheliomatous tube. Smith and Werthessen (1941) record a case which presented with a hard nodular mass above the pubis and an exfoliative mass around the urethra nine months after an ectopic gestation.

To these few cases one more is published in the hope that a surgeon finding his patient deteriorating after the operation for ectopic gestation will not assume, as I did, that it is due to his own lack of skill or fortune until an estimation of the urinary gonadotrophins has been made and the more deadly possibility has been excluded.

Case Report

The patient, aged 41, had her last regular menstrual period from August 12 to 16, 1948. Clotted blood was passed for four days from September 26—that is, after six weeks' amenorrhoea. She had had nausea, heaviness of the breasts, and frequency of micturition, and complained of an ache in the buttocks and pains ("like labour pains") in the abdomen.

On examination on October 26 no sign of activity could be found in the breasts; the abdomen was tender. The vagina showed the heliotrope discoloration of pregnancy, the uterus was retroverted, and there was a small tender swelling in the left tube. A diagnosis of ectopic gestation was made and the patient was admitted to hospital.

Laparotomy was performed on November 1. The abdomen was opened through a transverse suprapubic incision. The left broad ligament was filled with a clotted haematoma 6 in. (15 cm.) in diameter. The uterus showed some hypertrophy. The right ovary was stuck to the floor of the pouch of Douglas. The left tube and ovary and broad ligament tumour were removed. As bleeding was troublesome the uterus was also removed, the better to secure the main vessels. Bleeding was thereby for the most part satisfactorily controlled, and the application of a piece of "oxycel" gauze produced haemostasis, whereupon the abdomen was closed. Convalescence was uneventful.

In early January, 1949, the patient stated that she had been feeling fairly well until a week previously, when she had had aching pains in the pelvis and thighs and had been sick, and complained that the bowels had become "lazy."

The findings now were: "a thickening in the pelvic floor on the left side amounting almost to a tumour (N.B., blood clot; bleeding; oxycel)." Later in the month the findings were more definite. However, in view of the extensive nature of the first operation so recently performed it was decided to palliate, and if an abscess should form to drain it through the pouch of Douglas. A month later, however, the issue was forced by the patient developing general peritonitis.

The peritoneum was opened and drained, and the haematoma opened. Stinking greenish blood clot was removed, and blood began to well up. The only way to arrest it was by packing. This was done, and on removal of the pack faecal material followed, intimately mixed with blood. Thereafter her condition was wretched indeed, but with the aid of penicillin and repeated transfusion she lived, steadily losing ground, wasting away, but never despairing.

From time to time there was a suggestion of icterus, and about three weeks before she died an intractable cough began. Occasionally frothy sputum was produced but more often nothing at all. Clinical findings in the chest were absent, and skiagrams showed no evidence of growth. A diagnosis of malignant disease, probably chorion epithelioma, was now made, and this was confirmed 48 hours later by the Friedman test. The patient was perfectly conscious to the end and not in pain. She died, unaware that she was dying, of inanition, blood loss, and exhaustion from coughing.

Necropsy revealed a necrotic mass in the pelvis which had eroded the sigmoid colon. The liver and brain were free from metastases. The lungs were very pale and the cut surfaces were uniformly stippled with bright-red dots about 1 cm. apart.

Sections taken from the uterus, tube, and ovary at the time of the original operation showed no evidence of chorion epithelioma. Sections taken at the post-mortem examination revealed the presence of actively dividing chorionic tissue in the pelvic veins and in the lungs.

Keith Vartan, F.R.C.S., F.R.C.O.G.

References

Dafoe, W. A. (1939). *Canad. med. Ass. J.*, **40**, 376.
Smith, J. T., and Werthessen, N. T. (1941). *Amer. J. Obstet. Gynec.*, **41**, 153.
Thomas, R. C. (1934). *British Medical Journal*, **2**, 590.
Walsh, C. H. (1935). *J. Obstet. Gynaec. Brit. Emp.*, **42**, 194.

Reviews

NON-GONOCOCCAL URETHRITIS

Non-Gonococcal Urethritis, including the Genital Manifestations of Local and Systemic Diseases and Infestations of the Urinary Tract with Protozoa, Metazoa, and Fungi. By A. H. Harkness, M.R.C.S., L.R.C.P. (Pp. 424; 167 illustrations, 73 in full colour. £2 12s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

It is a real pleasure to read such a scholarly book as this. It consists essentially of a full critical review of the literature together with the author's own experiences and views. Few will deny that Dr. Harkness has made a thorough investigation of this subject, and even if they do not share his opinions these must be treated with respect. Many readers will be amazed at the mass of detail contained in this book and at the multiplicity of possible causes of non-gonococcal urethritis, but there can be no doubt that this condition presents a far greater problem than gonorrhoea and is responsible for a large proportion of attendances at V.D. clinics. Perhaps the most attractive section is that on Reiter's disease, but every line of the book should be read by the venereologist who hopes to complete his education.

The author insists that keratodermia blennorrhagica is not due to the gonococcus, and he is prejudiced against the complement-fixation test for gonorrhoea. Admittedly this reaction is seldom positive nowadays in patients treated with penicillin, because all the organisms are usually destroyed before there has been time for antibody production, but there does seem to be a case for its use in such conditions as epididymitis, arthritis, and salpingitis, where it is almost always positive when the gonococcus is the causal agent.

This book is a veritable mine of information on a subject about which most practitioners know very little. There are 167 beautiful illustrations, 73 of which, in colour, could hardly be improved. There is a full bibliography set out under subjects at the end of each chapter, and an author index in addition to the general one. The book is well produced and clearly printed. Many of the opinions expressed are open to criticism, but the author writes with authority and every venereologist will profit by a careful study of its contents.

T. E. Osmond.

CORONARY DISEASES

Les Maladies des Coronaires. L'Infarctus du Myocardie; l'Insuffisance Coronarienne. By Ch. Laubry and P. Soulié. Second edition. (Pp. 618; 299 figures. 2,400 francs.) Paris: Masson. 1950.

The publication of the second edition of this book is an important event in cardiology. The seven years that have passed since the first edition came out have witnessed the new impetus given to research by the ending of the war and, in the present instance, by the Liberation. It is therefore not surprising that this treatise comprises a formidable body of new work; but what is remarkable is that, though knowledge in so many aspects of the subject has grown rapidly and there is a time-lag in all the stages between writing and final publication, the authors have succeeded in presenting so up-to-date a volume.

Comprehensiveness has its drawbacks as well as its merits. Detail may blur the vital outlines. Writing of the prodromal symptoms of cardiac infarction, the authors refer to an "intense asthenic state," to extrasystoles, to transient unexpected dyspnoea, to fleeting pains, and to palpitations. It might be better to stress the fact that such symptoms were put in their proper "functional" place some decades ago, and that it is more important for them to be kept in this perspective than to risk raising false suspicions of myocardial disease by according them a possible portentous significance.

This monograph states clearly the current concept of the cardiographic establishment of ischaemic myocardial disease. In effect, there are three recognizable phases: (1) ischaemia, (2) an ischaemic lesion short of necrosis, and (3) cardiac infarction with necrosis. Electrical analysis of the posture of the heart, of the heart in the frontal plane and the sagittal plane by standard and unipolar derivations, and by vectorcardiography and calculations of ventricular gradient complete the electrical assessment of a myocardial lesion.

While this work deals comprehensively with theory, there is a wealth of clinical material and of symptomatology critically expounded with the realism and insistence on first principles characteristic of clinical medicine in France. On the subject of treatment the authors maintain a conservative view. While accepting this, it is not easy to understand the cursory dismissal of anticoagulants in the therapy of cardiac infarction. But this is a current topic and possibly the authors should not be held to views expressed perhaps a year ago (publication date January, 1950).

Professors Laubry and Soulié have defined the current outlook on coronary syndromes in a masterly fashion. It is manifest that their own labours and researches are intimately interwoven in the fabric of modern cardiological knowledge. Moreover, since there is no other treatise on this subject of comparable value and authority in any language, it cannot be neglected by any student or practitioner of cardiology.

K. Shirley Smith.

SKETCH OF OSLER

Osler as a Gastroenterologist. By Felix Cunha, M.D. (Pp. 57. £1 5s.) San Francisco, California. Copyright by Felix Cunha. 1948.

Those fortunate enough to have met Osler find pleasure in any book which adds to their knowledge of him, or which gathers together material about a particular field of his activities. Dr. Joseph H. Pratt's *A Year with Osler*, published last year, belongs to the former category, Dr. Cunha's publication to the latter.

The probable reactions of those who never met Osler are more difficult to assess, for he was a personality as well as a great physician, teacher, and writer, and how far a personality can survive death varies with the individual and with circumstances. Perhaps with this in mind, Dr. Cunha has not confined himself to Osler as a gastroenterologist, but has, by appropriate introduction of other details, to some extent brought Osler himself back into being. He has also reprinted Osler's rare first publication, "Christmas and the Microscope," London, 1869. The combination has resulted in an interesting sketch of a past era and of a prominent person in it, and at times such a sketch can convey the atmosphere of a period more successfully than a detailed, full-scale account. The price of the book is, unfortunately, high in comparison with its length and will dissuade some would-be purchasers.

K. J. Franklin.

SOCIAL MEDICINE

Social Medicine: Its Derivations and Objectives. Edited by I. Galdston, M.D. (Pp 294. 22s.) London: Geoffrey Cumberlege. 1949.

In 1947 the New York Academy of Medicine invited a number of eminent doctors to take part in a discussion of social medicine; the papers contributed have now been edited by Dr. Iago Galdston and published by the Commonwealth Fund. After reading the book converts to this new gospel may find themselves wishing that its admirable but elusive doctrine could be formulated in more precise terms. Social medicine, it appears, embraces a very wide field, which includes for the moment epidemiology, preventive medicine, medical economics, and the social complications of illness; it leans towards psychiatry and nutrition.

The difficulty, which paradoxically is crystallized by the diffuseness of the matter in this collection of papers, is that the term social medicine is currently used in two quite different senses. In the first place many people use it in reference to a personal exposition of the humanitarian or preventive traditions: it is better to prevent than to cure; the doctor should consider patient as well as illness, family as well as patient, community as well as family. These and many other ideas are included, and it is in this general sense that most of the contributors to the conference of the New York Academy have written. Secondly, and more specifically, since 1943 social medicine has been used in Great Britain as the title of a number of university departments. It would be unrealistic to expect these departments, which must be judged by the quality, number, and uniqueness of their research publications, to give direction to all the good-natured observations which have appeared under the broad banner of social medicine.

A few words of consolation for the general reader, who by now no doubt has become reconciled to the fact that no definition of social medicine acceptable to all tastes is forthcoming: no branch of science was ever established in debate, and when questions of definition are taken too seriously research workers may find themselves merely discussing what they would be doing if they were doing anything at all

T. McKeown.

MEDICAL RESEARCH

Research in Medical Science. Edited by David E. Green, Ph.D., and W. Eugene Knox, M.D. (Pp. 492. £2 8s.) New York: The Macmillan Company. 1950.

The title of this book is not fully informative. It contains articles on growing points of medical research by 26 distinguished contributors, including among British workers Burnett on viruses, Hogben on the methodology of medical genetics, and D. D. Woods on micro-organisms and vitamin research. The range of subjects includes research on psychiatry, by Karl A. Menninger, which reads like an apologia, and biochemical problems in sanitary engineering. Material is up to date to the end of 1948 and early 1949, and the book is well printed and produced. There is no index. It is difficult to review a book of this kind or to envisage the audience to which it will appeal, an audience which is already well served by journals and reviews. The individual articles are excellent, but they will remain inaccessible to most readers. Moreover, I think many of us find that we do not get as much out of reading a variegated book of this kind as from reading a monograph or textbook confined to a single field.

L. J. Witts.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Man is a Microcosm. By J. A. V. Butler. (Pp. 152. 10s. 6d.) London: Macmillan. 1950.

Fundamentals of Physical Chemistry for Premedical Students. By H. D. Crockford and S. B. Knight. (Pp. 352. 34s.) London: Chapman and Hall 1950.

The Pathology of Internal Diseases. By W. Boyd, M.D., F.R.C.P. 5th ed. revised. (Pp. 866. 77s.) London: Henry Kimpton. 1950.

Cranioplasty. By D. L. Reeves, A.B., M.D. (Pp. 119. 22s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

The Physiology of Tissues and Organs. By D. H. K. Lee, M.D., M.Sc., D.T.M., F.R.A.C.P. (Pp. 159. 30s.) Oxford: Blackwell Scientific Publications. 1950.

Practical Biology for Medical and Intermediate Students. By C. J. Wallis, M.A. 3rd ed. (Pp. 404. 21s.) London: William Heinemann. 1950.

Types of Diabetes Mellitus and Their Treatment. By A. R. Colwell, M.D. (Pp. 97. 16s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

Essay on the Cerebral Cortex. By G. von Bonin, M.D. (Pp. 150. 27s.) Oxford: Blackwell Scientific Publications. 1950.

Asphyxia Neonatorum. By W. F. Windle, Ph.D., Sc.D. (Pp. 70. 15s.) Oxford: Blackwell Scientific Publications. 1950.

Clinical Applications of Suggestion and Hypnosis. By W. T. Heron, M.A., Ph.D. (Pp. 116. 22s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

The Diagnosis of Salmonella Types. By F. Kauffmann, M.D. (Pp. 86. 16s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

Did Adelaide Bartlett . . . ? By G. Gwynn. (Pp. 178. 9s. 6d.) London: Christopher Johnson. 1950.

The British Encyclopaedia of Medical Practice. Edited by Lord Horder, G.C.V.O., M.D., F.R.C.P. Vol. 2. 2nd ed. (Pp. 711. 60s. per volume.) London: Butterworth. 1950.

Hay-Fever: A Key to the Allergic Disorders. By J. Freeman, D.M. (Pp. 321. 42s.) London: William Heinemann. 1950.

An Atlas of Cat Anatomy. By H. E. Field and M. E. Taylor. (Pp. 75. 28s.) London: Cambridge University Press. 1950.

A Manual of Physics. By J. A. Crowther, Sc.D., F.Inst.P. 5th ed. (Pp. 594. 21s.) London: Geoffrey Cumberlege. 1950.

The Springs of Conduct. By Sir John Parsons, C.B.E., F.R.C.S., F.R.S. (Pp. 104. 7s. 6d.) London: J. and A. Churchill. 1950.

An Introduction to Personality Study. By R. B. Cattell. (Pp. 235. 7s. 6d.) London: Hutchinson's University Library. 1950.

Freud: Dictionary of Psychoanalysis. Edited by N. Fodor and F. Gaynor. (Pp. 208. $3.75.) New York: Philosophical Library. 1950.

A Symposium on Steroid Hormones. Edited by E. S. Gordon. (Pp. 396. $6.50.) Wisconsin: The University of Wisconsin Press. 1950.

Pneumoconiosis. Leroy U. Gardner Memorial Volume, by various authors. (Pp. 659. $7.50.) New York: Paul B. Hoeber. 1950.

Endometriosis. By C. Fernandez-Ruiz. (Pp. 235. No price.) Barcelona: Ediciones Byp. 1950

Die Fokale Erkrankung des Körpers. By S. G. Fudalla (Pp. 172. M. 8.50.) Stuttgart: Hippokrates-Verlag 1950.

Aktive Bewegungstherapie bei inneren Erkrankungen. By R. Trumpp. (Pp. 148. M. 11.50.) Stuttgart: Hippokrates-Verlag. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 14 1950

TREATMENT OF RHEUMATOID ARTHRITIS WITH STEROIDS

Eighteen months have elapsed since Hench and his colleagues[1] at the Mayo Clinic published their first report on the results obtained by treating cases of rheumatoid arthritis with the steroid "compound E," which was isolated by Kendall in 1936 from adrenal cortex and since named cortisone. Although the rheumatic diseases are notorious for the frequency with which dramatic successes have been claimed for various forms of treatment, it was immediately apparent that here was something really revolutionary both in its concept and in the consistency of its success.

During the past year tremendous efforts have been made in many parts of the world to find a cheaper and more plentiful substitute for cortisone, the supply of which is limited by the scarcity of raw material—namely, ox bile—and the complexity of the chemical steps by which the cholic acid of the bile is converted to cortisone. Callow[2] has recently described a search for alternative raw material among plants in Nigeria. But, despite the extreme shortage of supplies of the drug, confirmation of the Mayo Clinic results was rapidly forthcoming from many experienced clinicians in N. America. Investigators in this country had to content themselves with minute quantities adequate for animal experiments on a small scale but quite insufficient for any kind of clinical trial. It will therefore come to most as a pleasant surprise that, thanks to the kindness of Dr. Philip Hench, at least one group of investigators here—Drs. W. S. C. Copeman, Oswald Savage, P. M. F. Bishop, Professor E. C. Dodds, and Drs. B. Gottlieb, J. H. H. Glyn, A. A. Henly, and A. E. Kellie—has been able to study the therapeutic effects of cortisone at first hand. The results of this first clinical trial in Europe are published in the opening pages of this issue. Of the five patients treated—each for ten days—four responded in the same dramatic fashion as Hench's original patients, and the clinical improvement in the fifth case is described as marked.

At the outset of such an investigation as this the difficulty had to be faced of determining criteria for assessing response to treatment in a disease so variable in its manifestations and so unpredictable in its course as rheumatoid arthritis. A substance like cortisone, the therapeutic response to which is so unequivocal, is obviously invaluable as a yardstick with which to compare all other forms of therapy. Copeman and his colleagues have therefore wisely used the opportunity presented by this gift of a small quantity of cortisone to study its effects on patients and to compare them with those of several other related steroids, for some of which strong claims have already been made. Thus Davison and his colleagues[3] have described excellent results obtained with pregnenolone, and Henderson and his colleagues,[4] reviewing the conflicting results obtained with this steroid, concluded that further trials were justified. When compared with cortisone, however, it is apparent that its therapeutic effects are negligible. The London group of investigators also used androstenedione, dehydro-*iso*-androsterone, progesterone, and pregnadienolone in their comparative study, and found no evidence of clinical improvement with androstenedione, pregnenolone, or pregnadienolone in six, eight, and four patients respectively. A moderate response was seen in one of the twelve cases treated with progesterone (but this could not be repeated when the patient relapsed) and a slight response in one of the four cases treated with dehydro-*iso*-androsterone. These results are in complete agreement with those of the Mayo Clinic workers. In a recent review by Polley and Mason[5] the therapeutic activity of a large series of steroids and adrenal extracts was compared with that of cortisone. The only substances with activity comparable with that of cortisone were "compound F," adrenal extracts containing compounds E or F in adequate quantities, and pituitary adrenocorticotrophic hormone. From the large series of steroids studied it became apparent that antirheumatic activity was possessed only by steroid derivatives of corticosterone with the following attributes: a double bond between carbon atoms 4 and 5, an oxygen on carbon atoms 3 and 20, an oxygen or hydroxyl group on carbon 11, and a hydroxyl group on carbons 17 and 21. Any single deviation from this essential structure resulted in complete loss of the activity.

Of particular value in the London group's study of the steroids was the development of a method for the clinical assessment of rapidly acting agents in rheumatoid arthritis. The method of choice in such trials is for both the assessing clinicians and the patient to be ignorant of the nature of the substance under trial in the individual case—that is, whether the test substance or control material is being administered. By this means Quin, Mason, and Knowelden, whose paper was published in last week's *Journal*,[6] were able to show that the therapeutic effects of deoxycortone and ascorbic acid could be exactly matched by injections of saline, and it might reasonably be suggested that had similar controls been used by others the world-wide polemic that has arisen round this subject could have been avoided. Fortunately this first trial of cortisone in this country is free from such criticism.

Also in this issue of the *Journal* we publish the results of a different type of treatment for rheumatoid arthritis. Dr. G. D. Kersley and his colleague at Bath have attempted to stimulate endogenous adrenocortical activity by the induction of insulin hypoglycaemia in forty cases and by electric convulsion therapy in eleven cases. It is obvious that with both these types of treatment the methods of test described by Quin, Mason, and Knowelden cannot be applied. Neither insulin hypoglycaemia nor E.C.T. can be given without at least the patient being aware that something unusual has occurred. In assessing Kersley's results, therefore, allowance must be made for the psychological effect of any new therapy, whatever its real value. Nevertheless, the clinical improvement in 22 of the 40 patients treated by insulin hypoglycaemia is encouraging. From a comparison of these results with those obtained by injections of adrenaline in oil the authors conclude that hypoglycaemic stimulation of the adrenal is not mediated by adrenaline. They suggest rather a direct stimulation of the adrenal cortex, or possibly a synergistic action between insulin and endogenous cortisone as postulated by Henderson.[7]

Despite the enormous volume of work that has been directed towards solving the problem in the past year and a half we appear to be as far as ever from understanding the mechanism by which cortisone produces its truly remarkable effects upon the rheumatic and related "collagen" diseases, though Selye's[8] theory of the general adaptation syndrome has stimulated much discussion of the subject. There is no evidence of any primary failure of the adrenal cortex in these conditions, no indication from a study of the patient as a whole of any adrenal hypofunction. Should not the conclusion be, therefore, that the fault lies not in the adrenal cortex but at the peripheral sites of activity of these hormones? If that be so, greater knowledge of connective tissue metabolism may well throw light on this excessive demand for cortisone by the connective tissues of the rheumatoid subject. Equipped with this additional knowledge clinicians will be closer not only to an understanding of the true aetiology of rheumatoid arthritis but also to a more physiological type of therapy.

[1] *Proc. Mayo Clin.*, 1949, **24**, 181. See also leading article in the *British Medical Journal*, 1949, **1**, 812.
[2] *British Medical Journal*, 1950, **1**, 1484.
[3] *Arch. intern. Med.*, 1950, **85**, 365.
[4] *J. clin. Endocrinol.*, 1950, **10**, 455.
[5] *J. Amer. med. Ass.*, 1950, **143**, 1474.
[6] *British Medical Journal*, 1950, **2**, 810.
[7] *J. clin. Endocrinol.*, 1950, **10**, 800.
[8] *British Medical Journal*, 1950, **1**, 1383.

A SECRET REMEDY FOR CANCER

We publish elsewhere correspondence between the Minister of Health and Mr. D. Rees Evans, whose treatment of cancer with a secret remedy has been described for the supposed benefit of the public by *Picture Post*. This was the subject of comment in a leading article in the *Journal* of September 16. What little comment there has been in the Press generally has been singularly uninformed. One wonders what the Press would have said if a medical man claimed to have a secret remedy for the cure of tuberculosis and at the same time intimated that such a cure could be effective only in his hands.

Mr. Bevan has appointed a strong independent committee to consider Mr. Rees Evans's claims to have discovered a treatment for cancer—namely, Sir Robert Robinson, O.M., the President of the Royal Society; Sir Alexander Fleming; Sir Ernest Rock Carling; and the Secretary of the Medical Research Council, Professor H. P. Himsworth. Mr. Bevan expresses the hope that Mr. Rees Evans will accept the offer, and adds this: "I must ask that you on your part will agree to abide by any decision which they may reach and, furthermore, that you will be prepared to submit to the committee, should they require it, full details of your materials and methods and will no longer insist that these can be disclosed only during the actual treatment of patients."

Some may doubt whether the evidence presented by *Picture Post* on behalf of Mr. Rees Evans would justify a serious inquiry by eminent scientists into the effects of a secret remedy which in one form or another has been in the hands of the Evans family for something like fifty years. We think it is a pity that on behalf of the public the Minister of Health did not see fit to condemn outright the use of a *secret* remedy for the treatment of such a serious condition as cancer. Even if the remedy produced some benefit, secrecy in the treatment of a disease with such a heavy mortality is unpardonable. Whether Mr. Rees Evans is medically qualified or not is completely beside the point. The director of the most important medical research institution in this country, for example, has no medical qualification. We should have felt a little more reassured if Mr. Bevan had insisted more pointedly upon the necessity for a full disclosure of the nature of the secret remedy before making this concession to popular clamour. Mr. Evans now says: "... I am perfectly willing to submit to the committee ... whatever they may ask concerning my materials and methods." Could he not have made this offer years ago to a properly accredited research organization, and shared then with mankind the benefit, if any, of a remedy he has hitherto kept secret?

LIMITS TO S.H.M.O. GRADE

An important statement on senior hospital medical officers by the Ministry of Health, sent in the form of a circular to hospital boards, appears in the *Supplement* at page 162. It should go far to allay much of the dissatisfaction that has been felt about this grade. The decisions were taken by the Ministry after full discussion with the Joint Committee representing consultants and specialists, and the committee itself sought the views of organizations representing certain specialties before giving its opinion to the Ministry. The principal change is that the grade of S.H.M.O. has been strictly limited. In future there will be no S.H.M.O. posts in general medicine, general surgery, obstetrics and gynaecology, cardiology, dermatology, otolaryngology, neurology, neurosurgery, plastic surgery, and thoracic surgery. A large part of consultant practice has therefore been defined where only consultant posts may be offered. Only when a suitable candidate cannot be found to fill a consultant post in these specialties should the hospital board consider whether the duties can be rearranged so that the field of applicants may be extended—for example, to part-time consultants. But if this policy fails, the vacancy may be readvertised as a S.H.M.O. post.

The S.H.M.O. posts will be retained in the limited circumstances described in the circular. For instance, obstetric posts at antenatal and post-natal clinics, and in maternity departments which are under the general supervision of a consultant, may still have senior hospital medical officers appointed to them. Other posts in the same category include those in orthopaedics primarily concerned with non-operative work, paediatric posts at welfare centres and other posts chiefly concerned with child welfare, posts in geriatrics below the rank of head of a large department, and, in ophthalmology, posts primarily concerned with non-operative work, such as refraction.

In the specialty of anaesthetics the circular makes clear that hospital establishments should include an adequate complement of widely experienced anaesthetists of consultant status, but, in addition to this staff and to trainees, some hospitals may appoint assistant anaesthetists in the S.H.M.O. grade. Similarly, in departments of pathology, radiology, and radiotherapy a full complement of consultants and trainees will be required, but there may also be a need for a few senior hospital medical officers in certain circumstances. The Ministry draws attention to general practitioners' being appointed to S.H.M.O. posts in some specialties, particularly anaesthetics, geriatrics, and paediatrics. Hospital boards are specifically adjured not to establish any consultant or S.H.M.O. post in a specialty not mentioned by the Ministry without first obtaining the Ministry's approval. The circular includes detailed instructions on future appointments and revision of the present establishments.

The statement is a welcome approach to the delicate problems of the S.H.M.O. grade, and the members of the Joint Committee are to be congratulated on having impressed the profession's views so clearly on the Ministry. Much anxiety will be removed when these new arrangements are put into effect.

ROSEOLA INFANTUM

Roseola infantum is a common but little-known infectious disease of young children which has received too little attention in the past. Many medical men are unfamiliar with it, and it is usually unrecognized. The principal reasons for this regrettable state of affairs are inadequate instruction of medical students in the features of the disease and scanty references to it in medical literature. Even textbooks on infectious diseases often fail to describe it adequately and to emphasize its importance, and several recent papers[1-3] on the subject are therefore welcome. This exanthem is a relatively benign disease and seems usually to occur sporadically. In the U.S.A. the condition is generally known as exanthem subitum, and it has also been called "sixth disease." Berenberg, Wright, and Janeway[1] believe that "there is increasing evidence that exanthem subitum is probably the most common febrile exanthem under 3 years." This may seem an extravagant claim to some, but there is no doubt that roseola should always be considered in the differential diagnosis of an unexplained high fever or a morbilliform eruption occurring in early childhood.

The peak incidence is in the second year, and 95% of the patients are aged between 6 months and 3 years. It occasionally occurs in the newborn and in school-children, but rarely in adults. The incubation period is 8 to 15 days. Fever is usually the first sign to attract attention: it is remittent, and temperatures of 102° F. (38.9° C.) to 105° F. (40.6° C.) are the rule; it usually persists for three to five days and ends more often by crisis than by lysis. There is remarkably little, if any, malaise in most cases, but restlessness and irritability may be observed when there is high fever. Older patients occasionally complain of headache and abdominal pain. One of the characteristic features of the disease is the late appearance of the rash; its eruption either coincides with the end of the pyrexia or follows within a day or two. The rash is rose-pink and consists of small discrete macules which fade on pressure. It is almost indistinguishable from the rash of rubella, but its distribution is less widespread; it predominates on the trunk and neck and may appear on the proximal parts of the limbs, but the face usually escapes. The eruption usually persists for 24 to 48 hours and fades completely without residual pigmentation. Occasionally it fades within two to four hours. Its fleeting nature in some cases, and its absence from the face, account for the ease and frequency with which this clue to the diagnosis is overlooked. Slight enlargement of the posterior cervical lymph nodes is a constant feature, though it is easily missed, and catarrhal pharyngitis and mild otitis media are often found. A few of those affected are acutely ill. Febrile convulsions are the commonest complication, but they are seldom serious. No fatalities have ever been reported, but Berenberg and his colleagues believe that the patient may occasionally die in the acute stage before diagnosis is possible and that this disease may sometimes be a cause of sudden death in infancy. The blood picture is characteristic. There is a slight neutrophilic leucocytosis on the second day, but this is rapidly followed by a neutrophilic leucopenia, with a consequent relative lymphocytosis, which appears on the third day. The neutropenia is most obvious towards the end of the febrile period, when the total white-cell count may fall below 2,000 per c.mm. The white-cell count usually returns to normal within a week.

The differential diagnosis of roseola is important. The outstanding features of the disease are the age incidence and the time relation of the fever and the rash. In the acute febrile stage it is most often thought to be acute pharyngitis, otitis media, or pneumonia, and because of the height of the fever chemotherapeutic or antibiotic drugs are often unnecessarily administered. When the rash appears it is often mistaken for a toxic rash or miliaria, or, when drugs have been given in the acute stage, for a drug rash. Drug rashes may take any form but seldom resemble roseola in either distribution or appearance. Though roseola may be mistaken for rubella because of the similarity of the rash and greater familiarity with the latter disease, there are several distinguishing features. The rash in rubella is more widespread and usually involves the face, and the macules frequently coalesce. Rubella may also be distinguished by the absence of a high temperature, the early appearance of the rash during the febrile stage, the occurrence of cases in epidemics, and the higher average age incidence. Measles, scarlet fever, and infectious mononucleosis should all be considered, though they seldom cause difficulty in diagnosis.

The infectious nature of roseola is not as apparent as that of the other exanthemata, because the youth of the patients diminishes the opportunities for epidemic spread; but the occurrence of outbreaks in children's institutions,[4 5] and even in nurseries for the newborn,[5] proves its infectious nature. The causal organism is almost certainly a filterable virus, but none has yet been isolated. One attack confers permanent immunity. Berenberg and his colleagues believe that infection with the roseola virus may be almost universal in the first three years of life. They base their hypothesis on the following grounds: first, widespread dissemination of the infective agent, largely by numerous adult carriers; secondly, universal susceptibility after disappearance of the congenital passive immunity conferred by the mother's specific antibodies; and, thirdly, the presumed existence of atypical modified forms of the disease such as occur in other virus diseases. Such epidemiological features would account for the sporadic occurrence of roseola and the usual absence of known exposure to cases. Treatment is symptomatic and consists chiefly in administering antipyretic drugs and tepid sponging. Anticonvulsant drugs such as phenobarbitone should be given to children who are known to be subject to febrile convulsions.

1 *New Engl. J. Med.*, 1949, **241**, 253.
2 Jackson, D. C., *Med. J. Aust.*, 1949, **2**, 52.
3 James, U., and Freier, A., *Arch. Dis. Childh.*, 1949, **24**, 54.
4 Barenberg, L. H., and Greenspan, L., *Amer. J. Dis. Child.*, 1939, **58**, 983.
5 Cushing, H. B., *Canad. med. Ass. J.*, 1927, **17**, 905.

PREGNANCY AND PULMONARY TUBERCULOSIS

The effect of pregnancy on pulmonary tuberculosis affords a subject for perennial discussion, the most recent being at the Annual Meeting of the B.M.A. in Liverpool last July.[1] This is, of course, a serious medical and social problem, for Schaefer[2] has pointed out that, while the incidence of phthisis in pregnancy is of the same order as heart disease, it is at least four times more lethal a combination. Radiological examination of the chest should therefore be a routine practice in pregnancy. The view generally held to-day has been well summarized by Turner,[3] who states that in a minority of cases pregnancy is a direct cause of deterioration; in another and probably larger minority it exerts a beneficial effect, while in the majority it has no obvious influence on the disease. Turner, however, goes further than most when he claims that the onset of phthisis or reactivation of quiescent infection is most likely to occur in the first four months of pregnancy and in the first four weeks after labour. Obstetricians admit that the physical exertion of labour, especially if prolonged, may be harmful. In fact Schaefer advises resort to elective caesarean section in primigravidae with far-advanced disease or when labour appears likely to be prolonged. But gynaecological pathologists would not in the main support Turner's theory that aggravation in the early months might be due to the implanting ovum disturbing endometrial tuberculous follicles, thereby allowing direct entry of tubercle bacilli into the blood stream.

Turner has also suggested that oestrogen exerts a beneficial and chorionic gonadotrophin an adverse effect on tuberculosis, and that the high level of circulating chorionic gonadotrophin is responsible for the aggravation of the disease and thus for the peak incidence in early pregnancy. In support of this last point he puts forward figures showing that the survival rate is appreciably higher when early abortion occurs spontaneously than when therapeutic abortion is performed. This may be so, but the reason given—namely, that spontaneous unlike therapeutic abortion is likely to be accompanied by a diminution in the chorionic gonadotrophin and an increase in the oestrogen levels—is open to question. Most of the recent papers and discussions indicate that therapeutic abortion is becoming less widely practised and that when it is performed the deciding factor is more often social than strictly medical. Although a truism, it is worth repeating that the best results are to be obtained when the tuberculosis and the pregnancy are treated concomitantly and adequately. In this connexion it appears that neither streptomycin therapy nor thoraco-

1 *British Medical Journal*, 1950, **2**, 271.
2 *Amer. J. Obstet. Gynec.*, 1949, **58**, 503.
3 *Lancet*, 1950, **1**, 697.
4 *Brit. J. Tuberc.*, 1946, **44**, 10.
5 *J. Bone Jt Surg.*, 1950, 32-B, 307.

plasty is contraindicated in pregnancy. When well-equipped maternity units are provided in sanatoria many present difficulties will be overcome.

At Black Notley Hospital, in Essex, a maternity unit for tuberculous women was opened in 1937, and more than 300 patients have now had their confinements there. Cohen[4] has discussed the treatment of those suffering from pulmonary tuberculosis, and more recently Wilkinson[5] has investigated the effect of pregnancy on 32 married women with skeletal tuberculosis, most of whom were treated at Black Notley. He concluded that no serious harmful effects have been caused by pregnancies going to full term. Some time must elapse before additional special units can be opened, and meanwhile co-operation between obstetrician and physician should be close, and the practice of setting aside in maternity hospitals a number of beds for tuberculous pregnant women should be encouraged and extended.

DISTINCTION DENIED

An unfortunate anomaly by which certain consultants are debarred from receiving one of the distinction awards is discussed in a letter at page 887. Apparently some consultants who hold contracts with hospital boards in the Health Service to work unpaid and in an honorary capacity are not eligible for distinction awards. A ministerial ruling on the matter has been given in a document sent to members of hospital boards and others, and it states that "consultants who hold only *unpaid* appointments in the hospital service cannot be eligible for awards (with the exception of some clinical teachers and research workers). The purpose of the distinction awards system is to select consultants for the higher rates of remuneration, and it is therefore inapplicable to consultants who are not remunerated."

Though the financial harm to the consultants concerned is obvious, our correspondent indicates that these consultants are anxious on other grounds. A distinction award is from its description a hallmark of distinction. The names of those holding them are not to be published, but the secret cannot be kept long, for the administration of them is itself enough to distribute the knowledge widely. It will soon become known in a hospital, or a hospital group, that a certain consultant has not received an award; some people will know why, but others may not. Again, there is some healthy rivalry between hospitals, particularly between those renowned for the skilful and original work of their staffs. If one hospital has 20 men with distinction awards and another only 15, invidious comparisons are bound to be made. The future selection of consultants for higher awards from among those holding lower awards is apt to be vitiated if the choice is disproportionately small in a hospital where there is a high number of consultants eligible on merit for holding the lower awards, but debarred by this ruling from doing so.

Since these honorary consultants hold contracts with their hospital boards, there seems to be no administrative objection to paying them the awards and thereby conferring what they are more concerned about—the label that indicates their colleagues consider them worthy of distinction. Alternatively, they could be given the distinction, and the money could be put to other purposes.

Consultants who do part-time paid work are eligible for a fraction of the distinction awards proportionate to their paid work. It may be argued that, since the fraction of the award diminishes in accordance with the amount of paid work done, therefore a man who does no paid work is not eligible at all. But this overlooks the fact that a man doing unpaid work does so many sessions a week—work for the Health Service and sessions which can be counted. The amount of the award could be given proportionately to the amount of unpaid work done. To withhold distinction awards altogether from these people, some of whom are known to be outstanding men in the profession, is an incongruity that should be examined.

THE PATIENT'S NEEDS

"The hospital, grey, quiet, old. . . . These corridors and stairs of stone and iron, cold, naked, clean—half-workhouse and half-gaol." So William Henley wrote of the Old Infirmary, Edinburgh, in 1873. Although present-day patients have no reason to be so unflattering about their hospitals they still have some grounds for complaint about their environment and the routine to which they are subjected while undergoing treatment. This has found expression in Miss Olive Matthews's booklet *Hospital Improvements*.[1] She has studied 24 hospitals in England, Holland, Southern Rhodesia, and South Africa, and has been able to list, from the patient's viewpoint, the most irksome details of hospital life which are usually completely outside the thoughts of the medical staff.

Her critical eye strays from bedside lockers to occupational therapy, from clothes cupboards to the view from the patient's window. She finds the conventional locker ill designed, usually containing a jumbled-up mixture of food, soap, cigarettes, and books. She recommends a small open trolley like a dinner-wagon with sets of shelves which would give easier access for the patient who used it and the nurses who had to clean it. Bed-tables should be in the form of a bridge on wheels that pushes over the bed, and preferably equipped with a centre book-rack.

The author condemns the screens perpetually carried round from bed to bed by the nurses, and favours curtains on runners from the ceiling, which transform a ward in a minute into a collection of cubicles. Most patients in a hospital ward fortunately do not feel particularly unwell—they are recovering or being investigated. Their main enemy is boredom, and the hours pass like milestones to a tired walker. Miss Matthews is anxious that a library service should be available in all hospitals and that patients should have no difficulty in buying their morning newspaper, and she is ready to praise the occupational therapist. Visitors, the finest antidote to boredom, should be admitted daily, preferably in the evening, for then is more convenient for the visitors and lightens a particularly heavy few hours in the patient's day. For those who have become permanent residents in hospitals, and who have no relatives or friends to visit them or write to them regularly, she suggests a voluntary service of pen friends to write to their adopted patient not less than once a month. "The amount of satisfaction given," she says of such letters, "is out of all proportion to the effort made."

Miss Matthews particularly dislikes (and so, it appears, does the irrepressible G.B.S.) the early-morning wash, which has become good-humouredly accepted as an inescapable unpleasantness of ward routine; but why, she asks, should it be an unmovable rite? The occurrence that determines the time of washing early in the hospital day is the arrival of the medical staff between 9 and 10 a.m. There is so much work to be done in the ward before that time that washing the patients is usually the duty of the night nurses. If the doctors could be persuaded to come later or the nurses' hours of duties rearranged the patients could sleep longer. Would this reorganization be worth while? Miss Matthews is emphatic that it would.

The modern hospital has private charity and the Poor Law as its ancestors: they have left their image stamped on their descendant. Entering a hospital is to most patients a crisis in their life and an experience of great disquietude. Some of the suggestions made by Miss Matthews for making the patient more comfortable, bodily and mentally, are impossible without adding to hospital budgets. Many require simple common sense and kindness from hospital staffs, and should therefore have no obstacle to their immediate fulfilment.

[1] *Hospital Improvements.* By O. Matthews. Published by the author. 1950. (Pp. 32. 1s. 6d.)

INDUCED BACTERIAL ANTAGONISM

More than 25 years ago Schiller and others claimed to have shown that bacteria can be "induced" to form antibiotics by feeding them on the other species which these substances are to attack. Superficially the well-known work of Dubos, which led to the discovery of gramicidin, might be supposed to exemplify this process, although the mechanism concerned was almost certainly selective and not adaptive. This subject, which is clearly of great importance, has been thoroughly restudied at Oxford by Savage and Florey.[1] They copied the methods of Schiller and others as far as possible, but applied them more thoroughly and stringently, as well as devising a new method of their own. In the first place the chosen "antagonists" (*B. licheniformis* and *Proteus vulgaris*) were cultivated on agar containing no source of nutriment except cells of the "victims" (*Bact. coli* and *C. xerosis*). During repeated transfers on this medium growth improved, the antagonists having evidently learned to utilize the victims as nutriment and in some cases developed the capacity to lyse them. Nevertheless no antibiotic was developed. The living cells of the victims were unaffected, as judged by tests in streak and cylinder plates, except that *B. licheniformis* continued to form the same small amount of a substance inhibiting the growth of *C. xerosis*. Results were of the same nature when *Proteus* was cultivated serially in a suspension of tubercle bacilli containing diminishing traces of peptone as the only other source of nutriment. Finally, an ingenious mechanism was devised for making regular additions of a suspension of *Bact. coli* to a culture of *Proteus*, with the aim of keeping the latter continuously in the logarithmic phase of growth: this was equally without effect in inducing antagonism.

These experiments do not prove that there is no such thing as induced antagonism, since it may be objected that the wrong species were chosen, but they make it seem very probable that earlier work in which this phenomenon is supposed to have been demonstrated was in some way faulty. They make it clear for the first time that capacity to use bacterial cells as nutriment or to lyse them may exist or even be developed in another species unaccompanied by the formation of any substance which affects the living cell of the victim. This was perhaps to be expected. Antibiotics are not enzymes, and when they cause lysis this is a secondary and not the primary effect. What might, from a study of the older literature, have seemed a promising way of evolving new antibiotics is now less likely to engage the time of other workers unprofitably.

[1] *Brit. J. exp. Path.*, 1950, **31**, 17.

RELIEF OF MUSCLE SPASM IN POLIOMYELITIS

So-called "muscle spasm" in poliomyelitis is a complex problem. Denny-Brown[1] considers that three varieties of the condition must be considered: one is contracture, one is a response to the meningeal reaction, and yet a third type is a transient increase of stretch reflexes. Some exponents of hot-pack methods of treating muscle spasm believe that by relieving it they are minimizing the degree of paralysis and even assisting some form of regeneration of nerve to occur. There is no firm evidence in support of these views, but nevertheless the relief of spasm seems very desirable if only to alleviate pain and to facilitate the all-important early passive movements. There is of course no point in treating "spasm" when there is none, and many cases of poliomyelitis show little or none of this abnormal muscle sensitivity. Further, the muscles with prolonged spasm are those which will not be paralysed, but by their unopposed action are liable to develop shortening and contracture. Many drugs have been used in recent years for the relief of muscle spasm. Among these may be mentioned curare and neostigmine, but these have not become popular. Recently Smith and his co-workers[2] have advocated the use of sympatholytic drugs such as "priscoline" and report its use in 663 cases of acute poliomyelitis. It seems from this report that the treatment was symptomatically often beneficial, though it caused vomiting in over 500 cases. Patients with bulbar and respiratory paralysis were not included in the series. Unfortunately the method of testing the value of the drug was somewhat uncritical, and the authors made no attempt to record the duration and severity of muscle spasm in an untreated series. Their method of dosage was to push the drug until flushing was noted, and this flushing dose was then repeated every three hours during the day and every four hours at night throughout the patient's stay in hospital. This intensive method may be necessary, but a trial of different methods of administration is needed. In conclusion these workers rightly emphasize that no treatment is known to influence the effect of the virus on the nervous system. It was also a disappointment that Denny-Brown in his electromyographic studies found no reason to believe that there is regeneration of nerve fibres in poliomyelitis.

[1] *Arch. Neurol Psychiat. Chicago*, 1950, **64**, 141.
[2] *J. Amer. med. Ass.*, 1950, **144**, 213.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE CARDIOGRAM IN CLINICAL DIAGNOSIS AND PROGNOSIS

II. PRACTICAL APPLICATIONS

BY

TERENCE EAST, M.A., D.M., F.R.C.P.

Senior Physician and Physician in Charge of Cardiological Department, King's College Hospital

There are two main clinical uses of the cardiogram. The first is in the diagnosis of disorders of rhythm, and the second is in the detection of disease of the myocardium. Rhythm disorders may sometimes be due to myocardial disease.

The Patient with a Cardiac Arrhythmia

In the matter of the arrhythmias the cardiogram gives final and complete diagnosis in almost every case. For the most part the standard bipolar leads suffice, unless special study of auricular activity is called for, when the precordial lead from either edge of the sternum or the unipolar lead from the left foot (VF) will show it well. Oesophageal leads are useful in this respect too.

The common arrhythmias can usually be fairly easily diagnosed at the bedside, with unaided senses, if their nature is properly understood and a careful history is taken. This should not be outside the competence of the general practitioner.

A bradycardia may cause difficulties, but, should the vagus be the cause, there is always exercise or atropine to show it (Fig. 2). A regular tachycardia of, say, 150 may

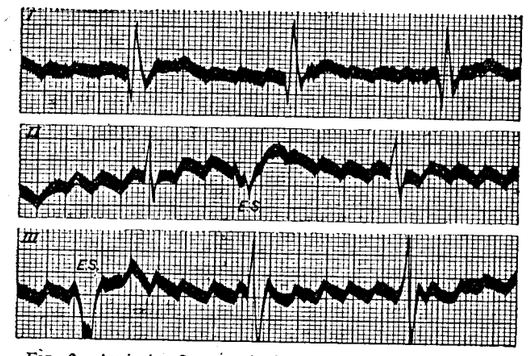


FIG. 2.—Auricular flutter. Auricular rate 250. As usual, the flutter oscillations appear only in two leads. The ventricular rate is slow, 55, owing to complete heart block, and irregular from extrasystoles (E.S.). Q_1 suggests past anterior myocardial infarction.

cause difficulties. Here, again, the vagus comes in useful owing to the increase in its tone that can be caused by pressure on the carotid sinus, a most valuable clinical procedure. The premature beat should rarely fail to be diagnosed.

Heart block may be undiagnosable in any stage in some cases. The minor grade of incomplete heart block can be detected only by measuring the P–R interval. The dropping of beats can usually be diagnosed by auscultation, but some are very difficult if many beats are dropped and the conduction times are varying. The changeless bradycardia of complete block is usually easily diagnosed, but pronounced bradycardia is not always present, and premature beats may complicate the picture.

Delay of conduction in the ventricles is usually caused by block of either branch of the bundle of His. This may be due merely to local disease or, more usually, may be an indication of widespread trouble. The defect cannot be certainly diagnosed clinically, but there may be suggestive clinical evidence of asynchronous ventricular contraction. Not that this is always due to bundle-branch block, for instead of pathological tardy activation of one ventricle it is possible to have physiological prior activation of one ventricle. But it is safe to conclude that any delay in the spread of the impulse from auricle to ventricle, or within the ventricle, is mostly due to disease.

Auricular fibrillation should rarely be missed, but if the rate is slow there may be difficulty, as the variation in spacing is so slight. If there is any doubt at all a cardiogram should be taken (Fig. 3), for mistaken diagnosis may have serious consequences. There are a number of rare and curious disturbances of function—often harmless yet of academic interest and a joy to the expert, which he would be sorry to miss—that may be stumbled on in this way.

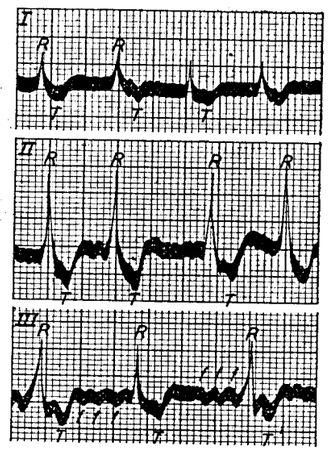


FIG. 3.—Auricular fibrillation. Note fibrillary waves in Lead III, inversion of T in all leads by digitalis, variation in the shape of the T waves.

Unfortunately, an arrhythmia may be transient and capricious, and therefore it may not be recorded because the heart's action may be normal at the time of examination. Sometimes very long records are needed for its full elucidation. But the history taken by the expert may give, or very nearly give, the diagnosis even when no disturbance of function is present.

The study of the arrhythmias depends on the fact that the cardiogram shows the site at which any impulse started, the course which it followed, and the time taken in its spread. These three pieces of evidence provide all the information available for diagnosis. If the source and the course of the impulse are abnormal, the form of wave in the cardiogram will be abnormal. The circus movements of the impulse in the auricle or ventricle are well demonstrated by suitable leads. Here systole (and its P wave) is abolished and the fibrillation or flutter waves are substituted. The prognosis will to a large extent depend on the nature of the arrhythmia. Some types are trivial and

some are grave in their significance; their importance depends to some extent on their association (the company they keep). By this I mean the question of the presence of any underlying disease in the heart. This may be apparent clinically, or the cardiogram may reveal it when hitherto unsuspected.

The solution of a curve of arrhythmia is usually simple. Occasionally it may be very difficult even to the most expert. Long study of cardiograms makes one realize that the repertoire of the tricks a heart may play is almost inexhaustible.

Myocardial Disease

Lesions of the heart muscle may provoke symptoms of inefficiency by causing undue breathlessness on exertion; the age, habits, weight, and personality of the patient, the physical efficiency of the breathing apparatus, and the possibility of anaemia must be fully considered. Clinical examination may reveal no abnormal physical signs at all, and every lead of the cardiogram may be perfectly normal, and yet the heart may not be healthy. It must be emphasized once again that normal curves do not exclude disease. On the other hand, a supposedly healthy person—for example, an elderly candidate for life assurance—may be shown cardiographically already to have silent lesions which will cause trouble in the future. The strict correlation between pathological curves and pathological states in the heart muscle is often far from close. Disease found at necropsy may not have changed the cardiogram materially, nor may examination of the myocardium reveal the cause of an abnormal curve. The microscope may show but little in a heart that has actually failed.

Probably the closest correlation is to be found in lesions of an ischaemic nature, when they are large enough. Cardiac ischaemia usually causes the clinical symptom of the typical substernal pain, and here, again, careful attention to the patient's story of his symptoms is probably 70% of the diagnosis. Indeed, I must stress that this applies to the full diagnosis in any patient supposedly suffering from heart disease.

To approach the subject more closely, a few general principles may be briefly touched on. In the auricles disease is not of great importance. The two chief disturbances of auricular function—the circus movements of fibrillation and flutter, and auricular paroxysmal tachycardia—have no constantly recognizable pathological changes associated with them. Rarely, the auricular wave may be modified by auricular enlargement (better detected by screening) or by infarction.

If it is in the ventricles that the morbid changes are to be sought. Here disease may be widespread or local. Toxic, metabolic, and biochemical causes may underlie the former, and local ischaemic changes due to vascular disease may produce the latter. The morbid process may interfere with the spread of the activating impulse for contraction, which is now regarded as a process of depolarization, or with the process of repolarization that succeeds it, restoring the cells to a condition ready for the next systolic contraction. These defects are reflected in the first part of the ventricular complex (QRS) for the former, and in the T wave or RS–T interval in the latter. But the range of the normal variations for the ventricular complex is very wide. As already stated, the position of the heart in the thorax, depending on various degrees of rotation about possibly three axes, modifies the curve a great deal, and much experience is needed to say that this or that curve is within normal limits.

The best way to proceed with this discussion seems to be to select certain clinical types of case and to show how the practitioner may be helped by the cardiogram, and also to mention, perhaps chiefly for interest, some conditions in which the abnormal cardiogram provides indication about the degree to which the heart may be involved.

It must be emphasized that the cardiograph is not a penny-in-the-slot machine which produces the diagnosis complete. The cardiogram is only one detail in the clinical picture—its importance can be assessed only by seeing the picture as a whole. The full significance of any curve is appreciated only if the complete clinical background is known. In order to make a diagnosis a thorough knowledge of the individual under investigation is necessary. The art of prognosis depends on the accurate assessment of the significance of as many relevant points in any given case as possible, viewed from experience of as many cases of that sort as possible. A prognosis that hangs on one peg will soon fall. The cardiogram is only one relevant peg, on which too much weight must not be hung.

Diagnosis of Angina Pectoris (Transient Myocardial Ischaemia)

The history is the important thing in making a diagnosis. If there are already pathological changes in the heart muscle the cardiogram may show abnormal features. A normal curve will not exclude the diagnosis. It is known that curves taken during the pain may become abnormal temporarily, so some workers have deliberately tried the effect of provoking pain by exertion to see whether the curve becomes abnormal. Another method is to make the patient breathe air with a low concentration of oxygen (these practices have not become popular in this country); even then the pain may be felt and the curve remain normal. There is also some risk. And quite healthy persons may produce abnormal curves in such conditions.

Diagnosis of Myocardial Infarction

Experimentally, the cutting off of the blood supply to some of the myocardium caused changes in the cardiogram in a few moments. These may disappear if the circulation is restored. Myocardial infarction is an irreversible process. Occlusion of a coronary artery very soon produces a change in the cardiogram. The type of abnormality which results goes through progressive phases. These may be extended over some length of time, from hours to days: as a rule they are quite typical and are easily recognized.

By means of multiple unipolar leads it is often possible, when the infarct is in the front of the left ventricle, to map out its extent. Antero-septal, anterior, and antero-lateral types can be recognized. It may be possible to determine whether the whole thickness of the wall of the ventricle is involved. To be able to gauge the degree and extent of the damaged area in this way is obviously very important. As the changes pass through progressive phases it is possible to say whether the infarct is new or old. Thus it may be determined that infarction has occurred in a patient who has given no clear history that it has happened in the past. Some infarcts develop without pain and may be overlooked in consequence. Some ischaemic changes are gradual and symptomless. The cardiogram, as already indicated, enables the site of the infarct to be located (Fig. 4). Those which form at the back of the heart are less accessible. The unipolar lead from the left foot (and, as a result, standard Leads II and III) usually shows them. Oesophageal leads may be useful in detecting these lesions, but they are not easy to employ.

More than one infarct is sometimes located. To be able to estimate fairly accurately the extent and degree of the

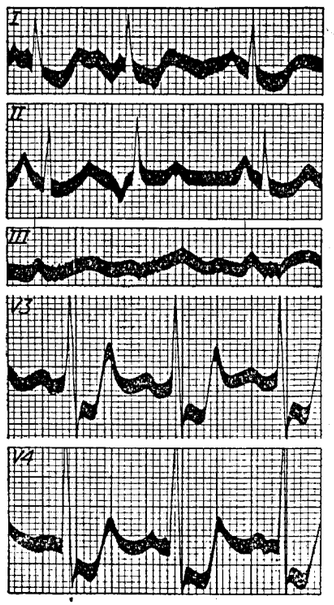


Fig. 4.—Infarction of lateral wall. There is depression of S-T interval in Leads I and II and deep depression of ST junction in V_2 and V_4. Auricular premature systoles are present in Leads I and II.

The taking of serial curves is often very useful in certain types of abnormality. In these a return to normal may be noted. The curves are not typical of infarction, and information about the transient pathological state underlying them is meagre, but there is reason to suppose that in these patients, who have suffered attacks of cardiac pain, the prognosis is much better than in those in whom irreversible disease in the form of infarcts has developed.

But in all these cases of ischaemic disease the prognosis will depend, first, on the after-effect of any one lesion on the cardiac efficiency, and, secondly, on the unknown chances of another attack. In addition, all the other pertinent factors peculiar to each individual case must be considered—his personality, body build, family history, age, and so forth. The value of the cardiogram in prognosis in most of these patients is relatively small. The cardiogram tells nothing about cardiac efficiency or the liability to failure.

Toxic and Metabolic Disorders

After an infectious illness some patients develop cardiac symptoms. These are usually of the type associated with effort syndrome—fatigue, palpitation, tachycardia, breathlessness—and may be regarded as a general lowering of ability to undertake exertion. How far a toxic myocarditis may exist as a pathological entity in such cases is open to question. But there is no doubt that in some instances there may be an abnormal appearance in the T wave of the ventricular complex, or of the RS-T interval. This is a sign of some importance. There is little doubt that in course of time the normal appearance will be resumed, but if such indications of an unhealthy state in the myocardium are discovered, there is definite need for care and restriction of activity on the part of the patient as long as they persist. In these cases a cardiogram may provide useful information.

infarct may be helpful in prognosis so far as that particular lesion is concerned, but the value is often limited. There may at times be surprisingly good recovery from large lesions.

On the other hand, small lesions may not affect the curve, or not to the extent to enable a precise diagnosis to be made. One may, in fact, find large ischaemic lesions at necropsy in cases in which cardiograms had shown very little abnormality. A negative finding, as in other instances, may not exclude pathological changes, and the clinical side of the diagnosis must predominate.

Under this heading one must also refer to diphtheritic myocarditis, in which cardiographic changes are common and conspicuous. To follow their progress is useful: fortunately a complete recovery is likely.

In acute rheumatic myocarditis the cardiogram may become abnormal, and it is worth taking in a doubtful case. But the clinical evidence of increased heart rate at rest is probably the most sensitive indication of its presence, and a normal cardiogram by no means excludes carditis. Should an abnormal feature be detected repeated curves should be done to check its persistence.

Metabolic Abnormalities.—In metabolic abnormalities such as hypothyroidism (both myxoedema and cretinism) abnormal curves may commonly be met with. What the precise change in the curve is due to is not entirely clear, but it is definite evidence of the involvement of the myocardium and a return to normal should be looked for in controlling treatment. There are many causes for change in the T wave—for example, alterations in the acid-base level and in the potassium level in the blood; such toxic states as uraemia; and deficiency states such as severe anaemia, thiamin deficiency, and possibly also lack of nicotinic acid. These should be borne in mind when curves are being interpreted, and it is useful to remember, too, how in patients suffering from such diseases the myocardium may become diseased. The alterations in the cardiogram due to digitalis are as a rule fairly obvious. However, it is better for a patient not to have had it for 10 to 12 days before the curve is taken; and if it has recently been given the information should always be passed on to the cardiologist.

Pericarditis.—This may cause definite and diagnostic changes in the cardiogram: these are easily recognized, but the clinical diagnosis will in most cases be made on the physical signs. In the constrictive type low-voltage curves are often seen, but the diagnosis depends finally on other clinical findings.

Pulmonary Circulation.—This has troubles of its own. Pathological changes in the pulmonary vessels tend to throw strain on the right ventricle and cause hypertrophy in slow chronic cases and dilatation in acute ones. The effects of pulmonary fibrosis, of whatever type, appear only relatively late; but their detection with the help of the cardiogram assists in grading the severity of the disease. The same applies to emphysema; and also to the rather uncommon disorders which affect the pulmonary vessels, in some of which a raised pressure seems primarily to play a part. Pulmonary infarction may be difficult to diagnose; when the heart is affected by it the result is acute dilatation of the right ventricle. A fairly characteristic cardiogram is seen in about a quarter of all cases, and this may help in the diagnosis when there is doubt. But a normal curve will not exclude pulmonary infarction.

Trauma.—Occasionally a severe blow on the sternum may bruise the heart. This may happen in motor accidents when the driver is thrown against the steering wheel. The cardiogram may give evidence of the damage, and it is important to detect this so that ample time is allowed for recovery. It is well known that patients may suffer from angina of effort after such bruising of the heart.

Congenital Lesions.—As these may cause predominant enlargement of one or other ventricle, the cardiogram may help in making the final accurate diagnosis.

Life Assurance.—In the case of an elderly proposer a cardiogram is useful in helping to exclude early latent disease of the myocardium. As already stated, a normal curve may not exclude it, but, on the other hand, a defect may be detected which has so far caused no symptoms. In such cases a cardiogram is well worth doing.

Prognosis

As already stated, the prognosis in any individual patient should be based on as many points as possible. The evidence of the state of the myocardium as given by the cardiogram is one of them, but is only a relatively small part of the picture. It is probably correct to say that the larger and more extensive the infarct, the more serious is the outlook. A return to normal in a curve showing ischaemic changes is a good point. At one time it was said that bundle-branch block carried a very bad prognosis, but this is by no means always the case, for the lesion causing it may be quite local. On the other hand, it usually means that there is widespread disease too. If, in following a case with serial curves at intervals, progressive deterioration is found, even when there is not much to be noted on clinical grounds, the prognostic significance is obviously bad.

The psychological effect of the cardiogram is not inconsiderable. The general public has begun to learn something about this method of investigation. To a nervous, apprehensive patient who has become heart-conscious and who may be the subject of a cardiac neurosis the demonstration of a normal curve may mean a good deal in restoring his confidence and peace of mind.

To give an account of the many and various types of curve met with nowadays is quite beyond the scope of this survey. My aim has been to give the ordinary medical man some idea of how far and in what type of case the cardiogram is likely to help in diagnosis and prognosis, with some indication of how that help is obtained. The precise details have not been touched on. These are best left to the cardiologist. The pitfalls are many, and "a little learning is a dangerous thing."

The subject at the moment is changing and complex. The interpretation of the curves is a matter of expert experience. But I believe that out of the present complexity a measure of simplicity will emerge far clearer than any that has hitherto existed.

Figs. 2, 3, and 4 were redrawn by Miss Mary Waldron from East and Bain's *Recent Advances in Cardiology* and are published by kind permission of Messrs. J. & A. Churchill, Ltd.

THE ROLE OF THE MEDICAL LIBRARY

During the annual conference of the Library Association held recently in London a meeting of the Medical Section was arranged at the Wellcome Research Institution on September 20 to discuss "The Role of Libraries in the Advance of Medicine." The chair was taken by Mr. W. R. Le Fanu, librarian of the Royal College of Surgeons.

Sir Cecil Wakeley, P.R.C.S., said that the conference celebrated the centenary of the public library movement in Great Britain. But many medical libraries, of course, were much more than a century old. They varied greatly in type and function. Some were the private working-places of the staff of a particular institute, others were freely open to the whole profession, others again provided a reference service for readers living at a distance. Many attempts had been made to co-ordinate their activities. More than 40 years ago, when he first came to Oxford, Sir William Osler founded a Medical Library Association of Great Britain, but it proved to be short-lived. Twenty years later Sir D'Arcy Power promoted a measure of co-operation among the medical libraries of London. The Royal Society of Medicine had organized, with the Rockefeller Foundation, the Central Medical Bureau, to act as a clearing-house for readers' inquiries, to obtain the necessary literature from associated libraries and pass it on to all parts of the world in photographic reproduction.

The Medical Section of the Library Association, founded in 1947, acted as a link between medical librarians and provided a forum for the discussion of common problems. Under its auspices training lectures for medical librarians had been arranged, advice had been prepared for the new hospital medical libraries which were being promoted by the regional hospital boards, and a pool for the distribution of duplicate books and periodicals had been organized.

Service to readers rather than conservation of books was the keynote of library work. The opportunity had therefore been taken of inviting a number of leading representatives of various interests within the profession to give their views on the present state of medical libraries and on the most urgent needs for their improvement.

Library Services for the Research Worker

Dr. C. H. Kellaway, director-in-chief of the Wellcome Research Institution, said that, in general, medical research was a continuous process—an accumulation of facts until the time was ripe for their co-ordination and for the making of some generalization on which further research could be based. It was rare for scientific discoveries to break entirely new ground, and it was part of the library service to make sure of the connecting links. Few scientific workers could have fully at their command all that had been done in their fields in the past, and the average worker, at all events, needed the aid to his memory which was afforded by an efficient library service. But even when such service was at hand it was the duty of the worker himself to make a critical study of the relevant literature. It was quite common to find papers describing observations and results which, unknown to the writer, had been published perhaps some years before. However, there were some advantages in the repetition of earlier work, and scarcely ever was this done by a worker of ability, with new tools at his disposal, without some new angle of truth being brought to view.

Dr. Kellaway touched on the difficulty of an efficient library service when the units of an organization were scattered over a considerable area. It was easy to provide a good service if all the workers were gathered in one building, but when they were geographically scattered and it became necessary to build up a series of libraries, none of them as efficient as the central one, the difficulty of the task became obvious.

The Role of the Librarian

Dr. Hugh Clegg, Editor of the *British Medical Journal*, said that medical librarianship was now a highly skilled profession, for which an exacting training was necessary. A library that was solely a storehouse for books and periodicals had only a limited use for those ultimately responsible for the advance of medicine. The storehouse must be converted into something dynamic, and the instrument for this purpose was the trained librarian. He would have preferred the title of the discussion to be "The Role of the Librarian in the Advance of Medicine," because it was on the ability, the character, and the industry of the librarian that the usefulness of a library depended.

The earliest libraries were in temples, and the first librarians probably priests. Later the monasteries became storehouses of learning—collecting, preserving, and cataloguing volumes. The modern library had "stemmed" from the temple and the monastery, and the idea of a jealously guarded collection had persisted into modern times. The 13th edition of the *Encyclopaedia Britannica* (1926) stated that "libraries are now coming to be regarded more and more as workshops." Just when medical libraries began to be converted from storehouses to workshops he did not know. He suspected that the most potent cause of this change had been the need of the research worker for an efficient collaborator in the library, thus compelling advances in library technique and the emergence of a new type of librarian who was something more than a mere cataloguer. One of the functions of the librarian was to teach the research worker how to make the fullest use of the resources of the medical library. The librarian must have a

wide knowledge of medical literature and a sound judgment of the trustworthiness of sources. Dr. Clegg here mentioned the danger of the overloaded bibliography. He had at one time supposed that the author of a paper had at least dipped into the authorities whose references he cited; but there were cases in which the author had done little more than ask the librarian to compile the list for him. The librarian should have the courage to say to the author, "Is your bibliography necessary?"

As a medical editor he had a strong feeling of kinship with the medical librarian. Neither of them was a research worker, but they did try to keep the party clean. A distinguished journalist had said to him that an editor had one most important duty, that of saying "No." His responsibility for exclusion was as great as, or greater than, for inclusion. The librarian, too, must be prepared to say that he would not have a certain book or periodical in his library. The selection of periodicals was a very onerous task, especially now that textbooks were out of date as soon as they were published and the periodical had become more and more important. The librarian was increasingly making his voice heard in all matters of documentation, and without efficient documentation no scientific advance was possible.

The Library User

Mr. ZACHARY COPE spoke as a library user who had received the most ungrudging help from medical librarians. Libraries could diffuse medical knowledge more quickly than any other means yet devised. Where such diffusion of knowledge was lacking, the result was marked and grievous. He had recently had the duty of reviewing some German textbooks on surgery, and had been surprised at the lack of knowledge concerning some things which were common property in this country—the use of penicillin, for example. Many German libraries had been destroyed during the war and free communication had been interrupted, and although much was now being done to remedy these evils the effect on the literature was still woefully apparent.

Unquestionably the part of the library which was most valuable to the research worker was that concerned with current periodicals. There were 1,500 or more medical journals, and it was impossible for any library to carry more than a small proportion. It saddened him sometimes to find young men depending on the librarian to look up their references for them. To look up one's own references was a valuable means of education.

Professor E. C. DODDS spoke of the library of the Royal College of Physicians, some part of which dated from before the Great Fire, and which had had an uninterrupted existence since 1670. In that library were to be found works on every subject, not only on medicine, but on astrology, theology, and Oriental philosophy. The library was now being carefully surveyed by the college authorities. It was felt that there was no point in making it a modern library; nevertheless, this extraordinary collection of books would be of very great value to research.

Mr. W. A. LEE spoke as the librarian of an old provincial library founded by a few physicians and surgeons in Liverpool about 170 years ago. In these changing days it was difficult to foresee what might happen to these old-established libraries, founded privately and depending for their income on the subscriptions of members. The question was how they could continue to play their part now that new libraries were being set up in teaching and other hospitals by the regional hospital boards. There should be some method whereby these collections made many years ago could be kept up to date and be useful for succeeding generations.

Medicine in the Public Library

Mr. GEOFFREY STEPHENS, librarian of the borough of St. Marylebone, described an important scheme whereby each of the 28 London boroughs had accepted responsibility for specializing in their libraries in one particular branch of literature. St. Marylebone, probably because it included Harley Street and about twice as many hospitals as any other borough, as well as central pharmacies and orthopaedic establishments, had been asked to specialize in medicine. He had been reluctant to undertake this, foreseeing the morbid curiosity of some lay readers. But the nucleus of a medical section had been created in the public library. Two years' experience had shown that the demand was chiefly for preclinical literature and some standard encyclopaedias, and that the requests came mainly from hospital nurses, medical students, and those working in medical auxiliary occupations. Quite 90% of the requests were from people in these categories. Whether the policy was a good one or not, it had been better received than he in his reluctance had thought possible. He did not know of any other municipal public library which specialized in medicine.

The idea of a public library specializing in medical literature was criticized from several quarters, notably by Mr. A. J. FIELDER (Staines) and Mr. W. J. BISHOP (Wellcome Historical Medical Library). It was pointed out that it would be absurd to expect library committees, unless there were medical people on them, to build up a useful section. The expense attending it would be very great, and it was well known that, in any economy "push," public libraries were the Cinderella of local authorities. Stock of this kind which a public library could carry must necessarily be inadequate for any serious purpose. Mr. STEPHENS explained that the Association of Metropolitan Chief Librarians had drawn up a scheme whereby £200 a year would be spent on each of these specialized sections, but this was not sufficient in the case of medicine; he was spending very nearly £300, and if that was not enough he would ask for more. He added that the medical books were not exposed on the public shelves.

The Microfilm Service

Mr. G. R. EDWARDS (secretary, Royal Society of Medicine) said that the establishment of libraries in hospitals, teaching or otherwise, was an excellent idea: the facilities provided all over the country were woefully inadequate. For papers appearing in less easily available sources the microfilm documentation service which the Royal Society of Medicine had sponsored might be recommended. A small non-profit-making fee was charged, and the service extended from Reykjavik to Singapore. Hardly any day of the week passed without a filmstrip being dispatched from London conveying information to medical people in distant parts of the world—information which was unobtainable in their local libraries. Mr. Edwards applauded what had been said about the necessity for special training for medical librarians. Speed in obtaining the desired information was often of great importance.

In conclusion the CHAIRMAN said that all the problems attending this subject, including the possible joining of forces of the libraries of the smaller medical societies and the regionalization of hospital libraries, were receiving the careful consideration of the Section.

CHARING CROSS HOSPITAL MEDICAL SCHOOL

The inaugural address of the winter session at Charing Cross Hospital was delivered on October 5 by Dr. Gordon M. Holmes, consulting physician to the hospital, and Mrs. Holmes presented the prizes and certificates. In the absence of Lord Inman, owing to influenza, the chair was taken by Sir John Stewart-Wallace. The new dean, Dr. E. C. Warner, gave an account of the school year.

Dr. Gordon Holmes's brief address was directed chiefly to those who had not yet been through the "mill," though he hoped seniors might profit from some of the lessons which he himself had not learnt until his later years. Students at Charing Cross were fortunate in having joined one of the smaller schools of the University of London. It was true that Charing Cross was looking forward to a larger hospital, but there were many advantages attaching to the small school.

Clinical Observation

He reminded his audience how relatively little even now was known of the phenomena presented in disease. The student might find by his careful examination of a case symptoms or signs not mentioned in the textbook; but this demanded hard work and a discipline of observation not easily acquired.

He recalled that when he was house-physician to Hughlings Jackson the latter was accustomed to give him notes with a request that he elaborate them a little more. Afterwards he would be told that he had failed to observe one detail or another—a lesson for any of them who thought they had learned all about a case after an examination lasting ten minutes or half an hour. Dr. Holmes also spoke with great appreciation of the prolonged examination which another of his teachers, Henry Head, always made of a case—sometimes more like 20 hours than 20 minutes. Casual observation assisted little. He knew how students to-day were burdened with the prospect of examinations, but he thought that if they took pains to familiarize themselves thoroughly with one definite example of a disease in a particular class they would find less difficulty in understanding the other members of that class. He did not undervalue accessory aids to diagnosis, such as radiological and biochemical methods, but for the student at least these should be supplementary to the clinical study. What was afforded by these methods could only fill in and complete the knowledge already gained at the bedside. The rule in his time was that no *x*-ray or other report should be presented until the case had been fully investigated by clinical methods. Clinical studies were not only essential for the efficient practice of medicine, but, approached in the proper spirit, they afforded an intellectual and human satisfaction and pleasure unrivalled by any other method. He wished the students happiness throughout their career, content in their work, and pleasant fellowship.

A vote of thanks to Dr. Gordon Holmes was proposed by Dr. L. R. Broster and seconded by Professor Jocelyn Patterson.

WESTMINSTER MEDICAL SCHOOL

The inaugural address at Westminster Medical School was given on October 2 by Sir Cecil Wakeley, P.R.C.S., who also presented the scholarships and prizes.

Sir Cecil Wakeley declared that surgery, as present students knew it, might perhaps be deemed a new profession when compared with the profession of medicine. After briefly sketching the history of surgery from mediaeval times, he said that three factors formerly held back its progress: a lack of knowledge of anatomy (for many years any effort to obtain bodies for dissection was frowned upon by the Church), the incidence of sepsis, and the lack of adequate anaesthesia. With the rise of surgery there had been associated a more detailed study of anatomy, physiology, and pathology. The last 30 years had seen the advent of the sulphonamides and antibiotics, great developments in radiology and biochemistry, and a rapid improvement in methods of anaesthesia such that operations which could not have been carried out 20 years ago were now performed as everyday procedures. As a result of these advances, many more old people were undergoing operations and surviving without becoming a burden to the community.

In earlier days the student was apprenticed to a surgeon, and there was a great deal to be said for that form of instruction. It was to be hoped that when the new Medical Act came into force, making a year of postgraduate experience compulsory prior to registration, the qualified student would be able to get some clinical experience with a general practitioner. There was too great a tendency to overlook clinical observation and to rely on radiological, pathological, and biochemical checks in making a diagnosis. He doubted whether for that reason the clinician to-day had the clinical acumen of the great Victorian physicians, who, without such aids, were amazingly accurate. Not that he was decrying these ancillary helps in all branches of medicine and surgery, but surely they should be used to confirm the diagnosis, not to make it.

Whole-time professorial units tended to become too academic and to lose touch with patients. It was part-time professors of surgery, who were also in consulting practice, from whom advances had come. He mentioned Lister, Macewen, Stiles, and Watson Cheyne as examples. Specialization in surgery was good up to a point, but surgeons on the staffs of teaching hospitals should remain general surgeons.

There had always been a relationship between war and surgery. Many of the famous surgeons of former times were military surgeons before they became well known in civil life. The lessons of war were of great value in civil practice. During war surgical knowledge was pooled and made available to vast numbers of surgeons. The value of blood transfusion, the use of penicillin, and early evacuation by air were lessons of the last war not easily to be forgotten. Every branch of surgery made advances during wartime. Perhaps the greatest advance had been in the treatment of nerve injuries and in the surgery of the heart and great blood vessels.

What should the surgeon disclose to the patient? Instruction in the early stages of cancer might be justifiable and important, but it would be a tragedy if they were to be responsible for creating a national cancer-phobia. When the mystery went out of surgery the patient often lost a great deal, and much of his co-operative confidence disappeared. A description of his impending operation might be stimulating to one patient and make a nervous wreck of another. Confidence was the sheet anchor.

Sir Cecil Wakeley ended his address with a tribute to the part which Westminster surgeons had played in the advance of surgery.

Sir Stanford Cade proposed a vote of thanks to the orator, and Mr. Lawrence Abel seconded.

A SECRET REMEDY FOR CANCER

We publish below correspondence which has passed between the Minister of Health and Mr. Rees Evans about the latter's treatment for cancer (see *Journal*, September 16, p. 662). The Minister's proposal is the subject of comment elsewhere (p. 875).

Dear Mr. Rees Evans,

I am writing to confirm the proposal which I placed before you at our meeting to-day.

I consider it essential that your claims to have discovered a treatment for cancer should be fully and fairly investigated. I am therefore asking the following gentlemen to act as an independent committee to consider your claims and to advise whether they warrant further investigation and, if so, the way in which any investigation should proceed. The committee would be:

Sir Robert Robinson, O.M., F.R.S., President of the Royal Society.

Sir Alexander Fleming, F.R.S., M.B., F.R.C.S., F.R.C.P., the discoverer of penicillin.

Sir Ernest Rock Carling, M.B., B.S., F.R.C.S., F.R.C.P., chairman of the Standing Advisory Committee on Cancer and Radiotherapy.

Professor Himsworth, M.D., F.R.C.P., secretary of the Medical Research Council.

I hope that you will be able to accept this offer but, in putting it forward, I must ask that you on your part will agree to abide by any decision which they may reach and, furthermore, that you will be prepared to submit to the committee, should they require it, full details of your materials and methods and will no longer insist that these can be disclosed only during the actual treatment of patients.

Yours sincerely,

September 28, 1950. ANEURIN BEVAN.

Dear Mr. Bevan,

I should like to thank you most sincerely for your letter.

I feel that this important new step towards a full investigation can only have come about as the result of your own personal interest in the matter and your wish to investigate any treatment for which a good case can be made out.

I could not ask for a committee of greater distinction than the one you have chosen, and I have, on my side, only two points which I wish to make.

The first is that I am perfectly willing to submit to the committee the fullest records I can of past cases and whatever they may ask concerning my materials and methods. My own personal feeling, however, is that my work can never be fully and finally tested unless actual treatment of patients forms part of the investigation.

The second point is that I am a simple man with no scientific background. I must ask that in putting my case before these learned men I may be allowed the constant help of Mr. Derek Wragge Morley, who knows more about my treatment and ways of working than anybody else, and who in addition has the capacity for explaining the details of my work in a way which I am unable to do.

I take it, of course, that the committee's full report will be made available to me when it is finally completed.

Yours sincerely,

September 29, 1950. D. REES EVANS.

Nova et Vetera

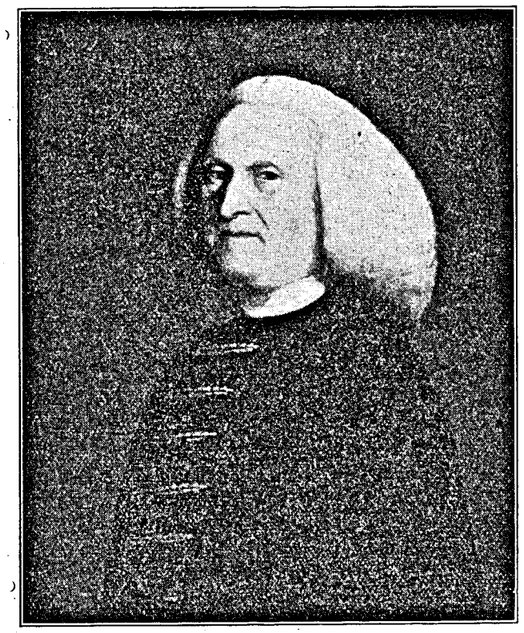


Fig. 1.—Portrait of William Hunter, painted by Sir Joshua Reynolds in 1782.

A NEW PORTRAIT OF WILLIAM HUNTER

When Dr. William Hunter, elder brother of the immortal John Hunter, died in 1783 it was found that his famous museum and library which had previously been offered to and refused by the English Government had been bequeathed, on the advice of Samuel Johnson, to Glasgow University. The university showed its gratitude for the munificent bequest by commissioning Sir Joshua Reynolds to paint the portrait of the donor which now adorns the Hunterian Museum. No other portrait of William Hunter by Sir Joshua was known to exist until a picture, which for over a hundred years had been in the possession of the family of Mr. John Liston Dalrymple, recently came to light and was acquired by the Hunterian Society (see Fig. 1).



Fig. 2.—Part of Zoffany's picture "The Life Class," showing Sir Joshua Reynolds and Dr. William Hunter in the centre.

In the past there have been many surgeons in the Dalrymple family. The daughter of Robert Liston, F.R.S. (1794–1847), married into it. There was John Dalrymple, F.R.S. (1804–52), the ophthalmic surgeon and author of *Diseases of the Eye*; and Archibald Dalrymple (1810–63) and his father William Dalrymple (1772–1847) were both well-known surgeons. It is not therefore surprising that in such a surgical environment a portrait of William Hunter should be found, and that the details of its early history should be faithfully recorded on the canvas back by some careful owner in the distant past.



Fig. 3.—William Hunter, after the portrait by M. Chamberlin (1769).

We learn thus that the portrait was painted by Sir Joshua Reynolds in 1782, a year before Hunter's death, and that it was sold after the artist's decease in 1793 with his collection of pictures. We cannot unfortunately trace it through the sale-room, as the descriptions in the catalogues are insufficient to identify it, but the style of the painting gives every indication that the date stated is correct. In 1782 Reynolds returned to England from his tour in Holland and Flanders. From the time of this visit a change took place in his painting: it acquired a new refinement, and a more direct approach derived from the influence of Rubens and the Dutch school was at once seen to replace the grand classical tradition of Italian baroque which hitherto the artist had followed. The portrait of William Hunter clearly belongs to the period of these new loyalties. There is nothing academic about this unassuming and natural portrait, shrewdly observed and sympathetically portrayed. It may perhaps represent an act of friendship on Reynolds's part rather than an official commission, a view that receives support from the fact that it remained in the studio until after the artist's death. William Hunter, as might be expected from his love of the fine arts, numbered many artists in his circle of friends. Foremost among these was Reynolds, with whom he was closely associated throughout his life.

William Hunter was the professor of anatomy and Reynolds the president of the Royal Academy from its foundation in 1768; and when George III commissioned Johann Zoffany (his favourite painter) in the same year to paint for him his Royal Academicians in full session the artist replied with the spirited "Life Class" (Fig. 2), in which William Hunter and Reynolds are placed side by side in a conspicuous position in the centre of the group. There are many other portraits of William Hunter, but the best likeness is said by Simmons, his contemporary biographer, to be a small oval print (Fig. 3) from M. Chamberlin's portrait (1769), which is now in the Diploma Gallery of the Royal Academy. The resemblance in physiognomy between this print and the newly discovered Reynolds portrait is particularly striking.

Fig. 2 is reproduced by gracious permission of His Majesty the King; Fig. 3 by permission of the Royal Academy of Art.

C. Robert Rudolf, L.D.S. R.C.S.
Honorary Librarian of the Hunterian Society.

Correspondence

Royal Medical Benevolent Fund

Sir,—Again I appeal to members of the medical profession, whether subscribers to the Royal Medical Benevolent Fund or not, to send a donation for Christmas gifts for beneficiaries of the Fund, all of whom are facing a time of special difficulty owing to the present high cost of living. Last year it was decided to send each beneficiary a gift of £10, but the donations to the Christmas Gifts Fund were not enough to meet the cost, and half of this sorely needed help had to be taken from general funds. This cannot be done this year owing to the present heavy calls on the Fund.

I hope that there will be a generous response to this special appeal for Christmas gifts, which are not only desirable but necessary and most deeply appreciated. Let us warm the hearts of the beneficiaries of the Fund by showing them that they are not forgotten by their more fortunate colleagues. Donations and subscriptions, marked "Christmas Gifts," should be sent to the secretary of the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.—I am, etc.,

Webb-Johnson,
President, Royal Medical Benevolent Fund.

London, S.W.15.

Distinction Denied

Sir,—The Ministry of Health Memorandum, B.G. 48 (2) of June, 1948, permits a practitioner to enter into an engagement (with a hospital board of governors) "on an honorary basis provided there is a clear undertaking to perform defined services." It is not widely known that a substantial number of consultants have chosen to take advantage of this provision and have accepted unpaid contracts with the Ministry of Health which allow them to continue to serve their hospitals without payment as they did before the "appointed day."

Many of these consultants have now been selected as suitable recipients for distinction awards and find that they are unable to accept them because a Ministry instruction lays down that no unpaid member of a hospital staff may receive a distinction award unless he holds a paid professorial appointment. In plain words, consultants who have been selected on their professional merits to receive distinction awards are disqualified because they are not in receipt of a salary from public funds.

Consultants who have chosen to forgo their rights to a salary have no legitimate claim to a further *douceur* which is officially described as an item of remuneration, but distinction awards mean rather more than money. In spite of the desire expressed by the Ministry that the names of recipients of distinction awards will be kept secret (apparently in order that the public may not be deluded into thinking that the receipt of such an award implies professional distinction), lists of recipients lie at this moment on the table at every hospital office and cannot fail to be public property in a very short time. In these circumstances few consultants will wish to relinquish the status implied by the distinction award, though many may find the monetary award distasteful.

Surely there should be provision for allowing those on whom a distinction award has been conferred to retain the status which is implied, even though they are debarred from accepting its cash value because they hold an honorary contract with the Ministry.

I am sorry that I must ask you to publish this letter without my name. There are too many issues now which divide the staffs of hospitals, and no one wishes to add to them by bringing to the fore the question of paid or unpaid. Those of us who have chosen to refuse payment have done so for reasons which appear good to us, but we are quite aware that they may not be valid for others. We have given up a good deal, but we should like to retain the right at least to remain on the road to distinction.—I am, etc.,

X.

Distinction Awards

Sir,—Having read Mr. R. L. Newell's letter (September 30, p. 783), I feel that it can safely be left to others to decide whether, as Mr. Newell suggests, I have clouded the issue. The main point raised by my last letter was not whether Lord Moran is right in going around the country addressing meetings of non-teaching consultants, but whether he is right in setting up subcommittees in the way he has done. In that I have been a member of the North-west Metropolitan Regional Consultants Committee since its formation I am, of course, fully aware of the nature of the discussions which have gone on in both the Central and the Regional Consultants Committees. My letter was therefore written with full knowledge of the facts.

I am somewhat surprised by Mr. Newell's letter, because, on December 9, 1948, in Minute 81 of the Central Consultants Committee, of which Mr. Newell was chairman, it was proposed "that in each region there should be established by the National Committee (i.e., the Distinction Awards Committee—my insertion) . . . a committee of distinguished medical practitioners of consultant status who are not interested personally in merit awards (i.e., practitioners already in receipt of the highest award or who are retired from practice) under the chairmanship of a layman to be chosen in agreement with the nominating bodies, and the Central Consultants and Specialists Committee." Although the point about a lay chairman was subsequently dropped (in November, 1949) the original minute has not, so far as I am aware, been rescinded, and I would like to ask Mr. Newell whether the formation of the *ad hoc* committees I have so strongly criticized is not completely contrary to the intentions of his own committee. I cannot, therefore, agree with Mr. Newell when he says "the present method has been accepted by the consultants."

Lord Moran is, of course, an accomplished and highly practised speaker, and it would be surprising if he had not given a lucid account at the meetings attended by Mr. Newell, more particularly as these followed more than a score of similar meetings elsewhere in the country. To pay homage to Lord Moran's eloquence is one thing, but to be mesmerized into accepting an irregular and unsatisfactory procedure is quite another matter.—I am, etc.,

R. S. Murley.

Radlett, Herts.

Women in Medicine

Sir,—Your leading article "Women in Medicine" (*Journal*, October 7, p. 822) contains several statements which may be misconstrued and which call for comment. In 1947 all the medical schools of the University of London became co-educational. Considerable latitude was allowed to the individual medical schools in their interpretation of what was meant by co-education, but a maximum percentage of 15% women was held to be a "reasonable" proportion in several of the schools. There were probably excellent reasons for this cautious start, but there is obviously no particular virtue in a proportion of 15% nor yet in the 20% recommended by the Goodenough Committee. The advantages of co-education are best achieved by parity, with neither sex in an undue minority.

The Royal Free Hospital School of Medicine accepted the principle of co-education, but laid down no maximum or minimum percentage of one sex or another. The founders of our school strove for equality of opportunity and the defeat of prejudice in days when the opportunities for women in medicine were practically non-existent. It was felt that their aims would best be achieved by accepting co-education wholeheartedly and by continuing to select students on ability only, regardless of sex. There were indeed some understandable misgivings expressed by the authorities of the school. Though other medical schools in London had for many years admitted a proportion of women students, in general the postgraduate opportunities offered to them had not been sufficiently good to allow them to obtain consultant appointments in their own training hospitals. The Royal Free Hospital was unique for many years in its appointment of women to its honorary staff, thus enabling them to show that, when opportunity arose, they were able to achieve the highest ranks of the profession. In

spite of these misgivings it was, however, decided that the full policy of co-education with all its implications should be adopted. For several good reasons the change has been a gradual one, but the following figures will show that the Royal Free is fulfilling its promises.

In 1948–9 the ratio of men to women was, as you state, 1:93.
In 1949–50 the ratio of men to women was 1:27.
In 1950–1 the ratio of men to women is 1:16.
In the last year, 1950–1, the actual ratio for entry was 1:6.

We may seem to hasten slowly, but the doors are opening, and the provision of equal opportunities, postgraduate as well as undergraduate, will in all likelihood be found to be in the best interests of the whole profession.—I am, etc.,

KATHARINE LLOYD-WILLIAMS,
Dean.

Royal Free Hospital,
London, W.C.1.

Protection of Laboratory Animals

SIR,—On September 23 you did me the honour of publishing (p. 724) comments by a special correspondent on my draft of a model Act for the above purpose. May I now reply to these? The draft is admittedly tentative and intended as a basis for discussion. The idea is to embody in it as much as possible of the wisdom that has been gained during seventy-five years of relevant experience in this country, and eventually to offer an improved version to overseas humanitarians. Hitherto the latter have depended mainly on the anti-vivisectionists for inspiration.

A number of holders of Home Office licences have been good enough to provide constructive criticisms of my draft, and various amendments appear to be needed. For instance, it was a mistake to try to cover experimentation and manufacture in a single Act. Again, the discretionary power to include specified invertebrates (I had chiefly the higher molluscs in mind) is too far in advance of current opinion to be retainable.

However, your special correspondent feels that the draft is so bad as not even to be "capable of amendment or revision." He would strangle it at birth. That is unfortunate, because it is based on and developed from existing British practice, less the unnecessary red tape. For instance, your correspondent pours withering scorn on my definition of the kind of experiment to which the Act would relate, but in fact the essential part of my definition is taken verbatim from the definition used at the Home Office for the guidance of inspectors. I got the wording some years ago from an authoritative source and published it on page 7 of the *UFAW Handbook* without encountering any objections. I have now proposed extending it so as to include such things as the experimental induction of neuroses, but the added words are capable of amendment or even of omission if analysis should show that they have impracticable implications.

Your special correspondent makes two other specific criticisms as examples of what he objects to. My draft suggests that if the Minister interprets "anaesthesia" as including electric anaesthesia he should specify the requisite conditions. It must be remarked, first, that electric curarization—that is to say, mere paralysis by electric stimulation—may bear a close but misleading clinical resemblance to anaesthesia; secondly, that tests used for chemical anaesthesia are not necessarily valid for electrical anaesthesia; thirdly, that a good deal of important knowledge has been gained by experimental work on this subject; and, fourthly, that further experimental work is now in hand. Your correspondent alleges as an objection to my proposal that the Minister would have to set up an advisory body to carry out the requisite experiments. It is not clear to me why the Minister should have to duplicate the work which has been or is being done, nor why it should be absurd for him to set up an advisory body if he wants to, nor why he ought to permit persons who may be unacquainted with the special risks and difficulties of electrical techniques to make a reckless use of them without knowing whether the supposed anaesthesia is genuine or spurious.

Your correspondent's other specific objection is as follows. My draft suggests in effect (though in wording that is possibly capable of amendment or revision) that experimenters' licences should be granted by a board of control whose members would between them have scientific, veterinary, and humanitarian qualifications. Your correspondent infers that persons ignorant of science might be appointed to the board, but this could happen only if no available scientists had shown themselves to be humanitarians, or, alternatively, if the Ministry which appointed the board was incompetent. Neither of these assumptions is reasonable.

Your correspondent's more general objections are a little intangible, but they seem to boil down to two. He thinks that my draft is so rigid that it could not be adapted to future changes in knowledge and opinion. What I have done is to list the points on which the Minister must make a decision, while allowing him power to revise his decisions from time to time. I cannot think of any other device for combining flexibility with effectiveness in legislation. If my critic can think of a better one I would be glad to know of it.

His second general objection, so far as I can understand it, amounts to this, that the proposed Act could be administered in such a bureaucratic way that "animal experiments would for all practical purposes be brought to an end." Of course it could; but then under the existing British statute the Home Secretary could bring pathological research to an end by cancelling all certificates A. He could bring research in endocrinology to an end by cancelling all certificates B. He could bring all experimentation on animals to an end by cancelling all licences. He could turn the lives of research workers into nightmares of litigation by granting permission, under Section 21 of the statute, for anti-vivisectionists to prosecute anybody who does any animal experiment at all. But since no Home Secretary has hitherto done any of these things—not even Mr. J. R. Clynes, who was himself an anti-vivisectionist—I am entitled to assume that an Act such as the one I propose would be administered with some approach to a semblance of common sense.

The problem of striking a balance between the claims of science and those of laboratory animals is an excessively difficult one, and perfectly decent people disagree on where the line should be drawn. The only means for reaching an ideally just conclusion is free and frank discussion among humane scientists, and it was for the purpose of eliciting such discussion that my draft was issued. There has been a most helpful response, sometimes commendatory and sometimes critical, from a number of humane vivisectors, but unfortunately some persons who are specially qualified to help have shrunk into their shells as bashfully as bachelors in a leap year or periwinkles in a storm.—I am, etc.,

C. W. HUME.

London, N.3.

SIR,—I believe there is a greater concern in the profession than is generally realized about animal experiments. I remember the master of a famous hospital describing at a public lecture an experiment which, to use his own words, was "revolting and served no useful purpose." But doctors do not care to discuss this subject for fear of being called anti-vivisectionists. I believe that anti-vivisectionists have done their cause much harm by their unscientific and emotional approach. I am not an anti-vivisectionist, but like some of my colleagues I am not satisfied that laboratory animals obtain the humane care which public opinion expects. The large majority of doctors never see the inside of a laboratory after qualification: the ordinary layman never.

I welcome Major C. W. Hume's attempt to draw up a draft for a model Act for the protection of laboratory animals (see *Journal*, September 23, p. 724). I am sure he will welcome criticism, but it is not true to say the draft is incapable of amendment or revision, as your special correspondent suggests. Moreover, I believe I am correct in saying that the definition of experiment to which he objects embodies the one at present in use by the Home Office.

I agree most emphatically with Major Hume that it is of the greatest importance to set up a board of control to advise the Minister. The composition of such a board must necessarily include physiologists, but I submit, Sir, should equally include laymen. For otherwise how can the guiding principle, "To relate the maximum amount of pain which it is permissible to inflict on animals for the acquisition of knowledge, to that which public opinion tolerates in other pursuits," be observed?

Finally, I would ask all those interested in animal welfare whether they are happy about the facilities for laboratory inspection, and whether they have never met a physiologist whom they thought would be better employed outside a laboratory.—I am, etc.,

H. ROBINSON.

London, W.2.

Bact. coli and Infantile Gastro-enteritis

SIR,—The letter from Dr. C. Giles (*Journal*, September 2, p. 577) tends to emphasize the role of *Bact. coli* in infantile gastro-enteritis, and at the same time the existing muddle in the classification of *Bact. coli* organisms. At the risk of perhaps increasing the muddle for some, and yet, I trust, of clarifying it for others, may I call attention to a classification put forward by me in 1943 of such organisms as I consider play an important role in this and like conditions (see my *Synoptical Table of Aerobic Excretal Bacteria*[1])? As a matter of passing interest the term "beta" is therein used over and over again to define serological types of *Bact. coli* belonging to differing biochemical subgroups.

That a multiplicity of phage-susceptible coliform organisms appears to be concerned in the gastro-enteritis of infants is borne out by the records of Dr. Bathia Kanievsky, who in an unpublished investigation into the use of tablets of dried phage carried out in 1943 at a child-welfare clinic in Alexandria recorded a curative response in six out of seven cases treated. Her cases ranged in age from 4 months to 2 years. The phage-preparation employed was made at the expense of 80 coliform organisms of my C_1 to C_8 subgroups (see the aforementioned table), 45 dysentery group organisms, 39 salmonella group organisms, 24 meta-dysentery group organisms, and 18 giumaiform group organisms, all phage-susceptible, which had been isolated by me from intestinal upsets ranging from simple diarrhoea to full-blown bacillary dysentery at all ages in the Alexandria area. Dr. Kanievsky's failure case, which was unaffected by sulphaguanidine, responded ultimately to "enterovioform." But as no laboratory work was done on the case it is just possible the infection may have been of a lamblial rather than of a bacterial origin, which, if so, would account for the seeming phage-therapy failure.

With the writer of your annotation (*Journal*, July 22, p. 205) I am afraid I cannot agree, that the close association between infantile diarrhoea and *Bact. coli* was first recognized in this country. If he will consult my writings of 1941–4[2] he will find abundant evidence that in Egypt we were fully aware of such connexion, and took steps to deal with it, as concerns both adults and infants.

Your annotator finishes by challenging the belief that certain *Bact. coli* cause infantile diarrhoea, and states that this "at present rests only on epidemiological evidence." The assumed epidemiological causes operating, and the specific treatment effects realized, in our work with Dr. Kanievsky constitute to my mind quite definite additional evidence of a cause and effect connexion here.—I am, etc.,

ARTHUR COMPTON.

London, W.2.

REFERENCES

1 Compton, A., *C.R. Soc. Méd. et Hyg. trop. d'Egypte*, 1943, 8, 124.
2 —— *British Medical Journal*, 1941, 2, 280; 1942, 1, 719; 1942, 2, 676; 1943, 2, 178; *Lancet*, 1944, 2, 865; 1944, 2, 192; *British Medical Journal*, 1944, 2, 641.

Cigarettes and Cancer

SIR,—I would like to be allowed to comment briefly on the able and instructive paper by Dr. R. Doll and Professor A. Bradford Hill in your issue of September 30, page 739. The spectacular sudden increase in carcinoma of the lung began about the end of the first decade of the present century. During the greater part of last century, and at least the earlier years of this one, men in debilitating climates chain-smoked strong cheroots, yet carcinoma of the lung was a rarity. During the first five years of this century there was no sign of any increase in that condition, yet I should think that arsenical sprays were by then in use. Apart from this, industrial diseases associated with working with arsenic have never included carcinoma of the lung. The new increase in the disease has not spared non-smokers and children and those who live in countries where non-urban roads are not tarred and where there is no factory contamination of the air. In these circumstances surely none of these factors can be the cause of the suddenly increased incidence. Whether they are capable of aggravating it is doubtless another question.—I am, etc.,

H. GALL,
Colonel, late R.A.M.C.

Stanmore, Middlesex.

SIR,—The article in the *Journal* (September 30, p. 739) shows that pipe smoking is less closely related to cancer of the lung than cigarette smoking. This suggests an interesting possibility—i.e., that it is the saltpetre or other substance used to make the tobacco more easily inflammable that is the carcinogen.

It is well known that manufactured cigarettes contain more of this substance than pipe-smoking tobaccos. If the "roll your own" cigarette smokers were subjected to the very interesting analysis that has been carried out under the headings of cigarette and pipe smokers, the result might well put them in the pipe-smoking liability class. Should saltpetre be definitely incriminated it would be easy to make smoking less lethal. Of course the pipe smoker does not smoke burnt paper.—I am, etc.,

ERIC J. TRIMMER.

Essex.

SIR,—In your leading article (September 30, p. 767) you state, quite correctly, that those who smoke 40 cigarettes a day are occupied with smoking for about 46 hours a week. I should like to point out, however, that the average number of inhalations per standard size cigarette is about 13, each inhalation of approximately eight seconds' duration. The person who smokes 40 cigarettes a day therefore spends most of his smoking time simply burning tobacco. His lungs will be full of smoke for about 69 minutes per day, 104 seconds per cigarette, or just over eight hours per week.—I am, etc.,

A. D. COLLEDGE.

Midlothian.

SIR,—In "A Counterblast to Tobacco" James I seems to have reached much the same conclusion as Dr. Doll and Professor Bradford Hill (*Journal*, September 30, p. 739), although admittedly on less scientific and laborious lines. "A custom loathsome to the eye, hateful to the nose, harmful to the brain, *dangerous to the lungs*, and in the black, stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless."—I am, etc.,

A. PINEY.

London, W.1.

Safety in Prams

SIR,—Following the recent letter of Dr. David Thomas (*British Medical Journal*, July 22, p. 219) a good deal of publicity has been given to the subject of accidents to children through prams tipping, but I have yet to read a really authoritative and instructive statement on the matter by anyone competent to make one. I claim to know something of this subject, having dealt with this problem many times during a period of over a quarter of a century in the retail pram trade, and I propose therefore to supply the facts of the case, which I think the public are entitled to know and which the trade will do well to study.

First let me say that in spite of all this publicity the actual number of accidents is extremely small and mothers need not fear that in buying any reputable make of pram they will be taking any undue risk. My recommendation on this point is—go to a firm of repute and on the advice given select a make of repute. No pram by any reputable maker will tip unless misused, which usually happens in one of the following ways:

(*a*) Tipping forwards through overloading at the handle end by excess weight in shopping receptacles.

(*b*) Tipping forwards through the wrong use of a single pram for two children.

(*c*) Tipping backwards through wrong use of the safety-strap.

(*a*) Requires no special explanation, as the remedy is obvious—do not carry excess shopping if it can be helped, and if it must be carried put some of it in the well and as far back in it as space will allow.

(*b*) Results from indiscriminate use for two children of a lightly balanced single pram constructed for one child only. This fault is largely encouraged by the unrestricted sale of "toddlers' seats" which are made to accommodate a second child. The unfortunate mother takes home one of these seats and fits it on her pram, which is probably quite unsuitable for such an accessory, and in spite of the claims of the makers that these seats "fit any pram" she finds that her pram is now very top-heavy. Having bought the thing, however, she tries to make do with it and in an unwary moment she lets go of the handle and down goes the pram. It is asking for trouble to buy these seats from any but firms willing to fit them and competent to "vet" the pram beforehand as to its suitability. Most prams are unsuitable without alteration. In any case, I strongly recommend that when two children are in one single pram, however accommodated, the elder child should be taken out if the pram is to be left unattended, even for a few moments, unless special modifications to the pram have been carried out to make it safe for its double load.

(*c*) Is the result of a bad trade practice, coupled with the ignorance of the average mother of the proper use of the safety-harness.

Many pram manufacturers have for very many years persisted in supplying with each pram a practically useless "safety-belt." This is usually put in merely to satisfy the public demand for completeness of specification. It is almost invariably fitted in a position much too near the hood end of the pram, which not only renders it unusable but potentially dangerous. The correct position is from 9 in. to 11 in. from the interior back of the pram according to its size. This should bring the strap fastening to a position from which a vertical line will come within the wheelbase. This safety belt has two side-pieces which are attached to the pram, and these vary from 4 in. to 7 in. in length and are fitted with a plated loop of metal to take the belt. When the average mother finds this belt is useless she discards it and buys a complete safety-harness. Unfortunately the latter is usually supplied merely as a piece of merchandise with no instructions whatever, and it is left to the mother to fit it in the pram as best she can. She invariably does this by strapping the two side straps of the new harness to the existing wrongly placed side-pieces of the original belt. She has now unwittingly fallen into the trap which the indifferent (or ignorant) manufacturer has set for her. The infant, instead of having a few inches of "play" and being restricted to a proper sitting position, has nearly a foot of play each side and without much strain can turn round and lean right over the folded hood. This is highly dangerous, as the pram is not balanced to take the infant's weight so far back, and it may easily tip over backwards. The results of this may be far more serious than in tipping forwards, as there is no handle to stop it, and the child can easily hit the ground.

The remedy for this danger is first for the makers of prams to cease fitting useless belts at all or at least to put them, or any fittings supplied in lieu, in the right place. Secondly, the mother buying a safety-strap should go to a pram specialist and either insist on it being properly fitted or receiving instructions on how to do the job at home. Thirdly, all retailers of prams should know the correct position and method of fitting the safety-strap and see that customers are not left in ignorance on this point. Under no circumstances should the new safety-harness be fitted to the two side-pieces of the original belt. These should be entirely removed. Makers of safety-straps could help by boxing them with full instructions on each box or otherwise attaching a tag to each strap with a warning on wrong use, and makers of second seats would be well advised to take a similar course.

Retailers handling safety-straps and second-seat fitments and treating them merely as merchandise are very much to blame for the ignorance of the public on these matters, and many of them should never be in the business at all, it being a highly specialized one requiring years of experience.

If these remedies for pram accidents can be publicized and the information given here circulated in clinics and all places where mothers meet I feel sure that pram tipping will rapidly become a thing of the past.—I am, etc.,

Croydon. D. L. Davies,
Chairman,
National Association of Pram Retailers, Ltd.

Medicine by Radio

Sir,—"Older people with shingles should always stay in bed for a while" (or words to that effect), says the doctor on the radio at 8.15 on a Friday morning. And so one has to scuttle off to the elderly osteoarthritic, whom on the previous day one had urged to get up despite his shingles, lest his stiff joints should become even stiffer. One has to explain—and sense his disbelief as one explains—that perhaps the doctor on the radio was not thinking about older people with osteo-arthritis *and* shingles when he issued his dictum.

I do not know how the rest of the profession feels, but I am getting a little tired of these anonymous medical voices which come booming across the breakfast table from nowhere on a Friday morning, as if with the direct authority from the highest source. A snappy five minutes on tuberculosis, or two and a half minutes on the diagnosis and treatment of infantile paralysis, and that will leave the rest of the time free to deal with schizophrenia. Enough damage has been done in the past by books of the home doctor type. I am not sure that the mischief resulting from these informal little chats is not even greater.—I am, etc.,

Perranporth, Cornwall. Douglas Robb.

Medical Items in the Popular Press

Sir,—Readers of the popular press are regularly treated to sensational news items based on gleanings from the *Journal* or one of its contemporaries, often before the publication reaches its medical subscribers. In view of the wide range of subjects covered in this way, we must wonder why the usual publicity has not so far been given to the conclusions of Dr. R. Doll and Professor A. Bradford Hill on "Smoking and Carcinoma of the Lung" (September 30, p. 739)—a topic of much more general interest than the design of perambulators, the dangers of staying in bed, or many others recently in the headlines. Do newspaper editors fear that their public may resent being disillusioned about the "harmlessness" of the tobacco habit, or are they a little unwilling to risk the displeasure of some of their major advertisers?—I am, etc.,

London, S.W.16. D. J. Parr.

Early Rising for Puerperal Women

Sir,—I was interested in Dr. D. Wheatley's reply in the *Journal* of May 13 (p. 1142) to an earlier letter by Dr. A. B. Swarbreck (April 22, p. 936). During the years 1935-42 I had charge of a fairly extensive hospital and domiciliary practice in New Guinea where one of my prime concerns was obstetrics in native women. The universal custom among New Guinea women is to treat labour as an incident in the day's work. They have a rest and sleep after labour and then proceed with their ordinary work. I was brought up to believe, as Dr. Wheatley does, that this would lead to uterine prolapse, but, to my great surprise at first, out of many thousands of women examined I can recall seeing only one case of prolapse, and that in an elderly woman who had obviously had a nearly complete perineal laceration. Seeing that no apparently harmful effects followed early rising I did not forbid it in my native patients and later extended the practice to my European patients. In the case of the latter, psychological and sociological factors among others make post-puerperal rest desirable, but for some 14 years I have encouraged early rising, and have yet to see anything but good result from it. I have recently delivered the third child of one patient all of whose puerperia have been so conducted; in this case as in others there is no suggestion of prolapse.

My practice in normal deliveries is to get the patient out of bed about 12 hours after labour and encourage her to walk about 25 yards, then immediately return to bed. This is repeated twice daily, lengthening the distance each time. From the fourth day onwards a shower is allowed, sitting out of bed from the sixth day, and home to light duties on the tenth. In an experience of many hundreds of confinements treated thus I have yet to see either femoral thrombosis or uterine prolapse, though it is admittedly early to form definite conclusions about the latter. The feeling of well-being and relief from stiffness, and the absence of depression and tiredness on returning to work at home, have been commented on by many mothers who have had previous experience of the orthodox method of rest. Is it not time that rigid post-puerperal rest along with several other obstetric shibboleths be reconsidered in our teaching schools?—I am, etc.,

Victoria, Australia. B. D. Vaughan.

A Foreign Body in the Rectum

Sir,—I was most interested to read in your correspondence (September 16, p. 680) the letter by Mr. J. B. Prendiville, particularly as in the same week I was myself confronted with a similar case. Within the last nine months I have had to deal with two cases of tumbler in the rectum; apart from the age these cases are otherwise similar.

The first one was a married man aged 58 who gave a history of having slipped in the bathroom, "accidentally" sitting on a tumbler and causing the latter to become lodged in the rectum. Removal in this case was easily accomplished without assistance, using the orthodox technique of filling the glass with plaster-of-Paris in which a piece of wood was embedded to provide a hold.

The second case was a married man of 70 years of age with exactly the same history; he had exactly the same type of tumbler in the rectum; but he admitted having had a tumbler in his rectum on a previous occasion, which he had been able to remove himself. The patient was thoughtful enough to produce an identical tumbler for our inspection. The photograph shows the tumbler removed, with a portion of the rim broken off, and a second tumbler for detail.



This second case presented more difficulty on account of the broken rim, which rendered the rectum liable to laceration when the tumbler was pulled upon as it lay *in situ* in its inverted position; plaster-of-Paris failed to fill the gap and the technique employed in the first case failed. A laparotomy through a lower paramedian incision was performed and, with the assistance of a hand in the rectum, version of the tumbler was performed within the rectum and the tumbler delivered base first. No damage was caused to the rectum and the abdomen was closed without colostomy, a rectal tube being inserted for forty-eight hours. Convalescence was uneventful.

I am indebted to Mr. J. Jemson, consulting surgeon, for his help in extracting the foreign body in the second case.—I am, etc.,

London, S.E.13. E. Moragas.

Rectal Thiopentone in Children

Sir,—Dr. Gordon M. Wyant (August 5, p. 368) is worried because Dr. J. Lorber (July 1, p. 21) does not stress the potential hazards of rectal thiopentone in children. The dosage the author recommends—1 g. per 50 lb. (22.5 kg.) body weight—was, I think, first suggested by Weinstein (Weinstein, M. L., *Curr. Res. Anesth.*, 1939, **18**, 221), and I have used it myself as a premedication for children very satisfactorily for 10 years and have never met the "considerable respiratory depression" that Dr. Wyant says may ensue. My experience has been that the children are so lightly asleep that any undue stimulus in transport from the bed to the operating table may wake them up. I believe that theoretically the rectal route is less likely to cause laryngospasm than the intravenous, because the hypnotic concentration in the blood stream is reached much more gradually—and many anaesthetists believe that laryngospasm is more likely to attend rapid induction. As practical evidence of this I offer Dr. Wyant my 10 years' experience without a single case of laryngospasm.

From this distance in space and time I am prepared to accept Dr. Lorber's own diagnosis of "severe spasm of coughing and temporary cyanosis," but even if it had been a mild attack of laryngospasm, as Dr. Wyant prefers to believe, was it so very surprising that it fortunately resolved spontaneously? I am sure that an attempt to relieve a mild attack of laryngospasm with the aid of a laryngoscope and endotracheal tubes would only aggravate the condition—to say nothing of the danger of trauma to teeth, pharynx, and larynx from attempted laryngoscopy with inadequate relaxation of the jaw.

I have no means of knowing the dosage of atropine usually employed by Dr. Wyant, but to judge from most American publications it is the custom in that country to use much smaller doses in children than usually employed in England, and it may be that the threat of laryngospasm is more real in his experience for that reason. Dr. Lorber's case which aspirated vomitus (explained in his article as due to a nursing error in feeding the child immediately before rectal hypnosis) certainly does not bear out the suggestion that there is any increased tendency to laryngospasm with rectal thiopentone. There was not in this case even enough glottic reflex to prevent aspiration.

In parts of Europe it is held that the risk involved in any anaesthetic is too high a price to pay for tonsillectomy, and therefore the routine there is to remove children's tonsils and adenoids without any anaesthetic at all—a procedure given the approval of nursing staff who have not time to spare to nurse unconscious patients. To such lengths can the desire to avoid all risks take normally humane people.—I am, etc.,

Johannesburg, S. Africa. F. W. Roberts.

Haematemesis from Leeches

Sir,—I had an experience similar to Dr. A. Cameron's (September 16, p. 679) when E.N.T. specialist at a stationary hospital at Kantara in 1917.

A private was admitted, and his brief notes were: "R.M.O.: bleeding from naso-pharynx; Field Ambulance: blood clot in naso-pharynx; C.C.S.: blood clot in naso-pharynx."

At that time my facilities for examining patients were still primitive in that I had to use the sun as my source of illumination. I had to be careful not to get the part examined at the focal point of the mirror and cause burning pain. This, however, did happen occasionally, and in this particular patient the "blood clot" wriggled. It was an enormously engorged leech, which I removed with some difficulty.

I learned later from an elderly missionary stationed for many years at Beersheba (or Hebron) that removal was easy if one first touched the region with a little weak cocaine solution.

I agree with Rokitansky's aphorism as quoted by Dr. Cameron, but suggest to him that he need not go so far back as Rhazes. He should investigate Hahnemann and his work, when he will find that he has not grasped the principle of the law of similars, and that, though the results from the application of the law are often surprising, they are not "magic" in the sense in which he uses the word.—I am, etc.,

London, W.1. A. T. Cunningham.

Histamine Desensitization

Sir,—The appearance of a new drug urges us always to revise old treatments. This must be done in a careful manner, not to discard helpful therapeutic aids for the sake of fashionable new drugs. The present status of the treatment of allergic diseases with antihistamine drugs challenges criticism of non-specific desensitization with increasing doses of histamine. Clinical and experimental literature on this matter was reviewed by Feinberg (1946). Since this time new indications have been described for this treatment (e.g., Atkinson, 1946; Paul, 1949).

Fabinyi and Szebehelyi (1949) recommended histamine desensitization and protecting the patient with antihistamines during the treatment. The following advantages may be expected from histamine desensitization over the use of antihistamines: permanent cure, or at least longer lasting effect; no side-effects peculiar to antihistamine drugs; effectiveness in conditions where antihistamines have no

effect. Besides certain diseases where the pathological role of histamine is questionable, antihistamines do not reduce histamine-induced gastric secretion (review: Loew, 1947) and do not prevent blood changes caused by histamine (Winter and Musnet, 1948).

On the other hand, histamine desensitization shows the following disadvantages as compared with antihistamines: it takes a long time to develop resistance to histamine—some authors even question whether this is possible in humans (Feinberg, 1946); side-effects of the treatment.

In recent studies we analysed experimentally the effects of histamine desensitization (Ambrus *et al.*, 1950). Gastric-secretion-inducing effect of histamine was decreased in guinea-pigs desensitized with very high doses of histamine over a long period. Spontaneous occurrence of gastric ulcers following pylorus ligation according to the method of Shay *et al.* (1945) was not significantly decreased in histamine-desensitized animals.

In further (hitherto unpublished) experiments we determined the duration of histamine desensitization in guinea-pigs. To test histamine resistance the animals were exposed in a glass chamber to a fine spray of 10% histamine solution, and the time in which symptoms of asthma developed was recorded. Protection by desensitization was maximal after the last application of histamine. It remained on this level for 24 hours, then started to decrease and disappeared completely within a few days. Protection by 2 mg./kg. "neoantergan" lasted for 2-4 hours and by "phenergan" for 9-12 hours. On the basis of these experimental data there is no reason to prefer histamine desensitization to antihistamine drugs, although the effect of the former may last somewhat longer, but there is no permanent desensitization even toward the effects of histamine itself. On the other hand, it takes a long and difficult treatment to reach resistance. The use of histamine desensitization in the therapy of gastric ulcers must be studied further.

—We are, etc.,

Philadelphia, U.S.A. JULIAN L. AMBRUS.
CLARA M. AMBRUS.

References

Ambrus, J., Ambrus, C., and Jacob, J., *Experientia, Basel*, 1950, **6**, 272.
—— —— —— *Arch. int. Pharmacodyn*, in the press.
Atkinson, M., *Proc. R. Soc. Med.*, 1946, **39**, 807.
—— *J. Amer. med. Ass.*, 1941, **116**, 1753.
Fabinyi, M., and Szebehelyi, J., *Schweiz. med. Wschr.*, 1949, **79**, 299.
Feinberg, S. M., *J. Amer. med. Ass.*, 1946, **132**, 702.
Loew, E. R., *Physiol. Rev.*, 1947, **27**, 542.
Paul, S., *British Medical Journal*, 1949, **2**, 216.
Shay, H., *et al.*, *Gastroenterology*, 1945, **5**, 43.
Winter, Ch. A., and Mushet, Ch. W., *Fed. Proc.*, 1948, **7**, 322.

Situs Inversus and Perforated Appendix

SIR,—The only reason for publishing the following case is its rarity. A search of the literature available revealed no similar case.

A schoolboy aged 17 was admitted into hospital with a three-day history of abdominal pains, generalized at first but later localized to the left iliac fossa. They were not severe and passed off with rest in bed. On the third morning of his illness the patient felt quite well and went to school, but the pain restarted two hours later and he cycled back home, a distance of about five miles. He vomited twice in the evening and his bowels opened once. During the night he felt feverish.

On admission there was tenderness over the lower abdomen, but more marked on the left side. Abdominal reflexes were sluggish in three quadrants and absent in the left inferior quadrant. The temperature was 103° F. (39.4° C.) and pulse 140. An enema resulted in the passage of some flatus only, but not faeces. The bases of both lungs were auscultated and found to be clear, but the front of the chest was not examined. The patient had never before been ill, and therefore never seen by a doctor.

If the pain had been on the right side, a diagnosis of acute appendicitis would have been made without hesitation. An inflammatory condition on the left side would have suggested diverticulitis of the sigmoid colon, but in view of the age of the patient this possibility was also ruled out. The possibility of it being a case of malaria was considered because the patient spent a night in a malarious district about one week before. An injection of quinine was consequently given and hot-water bottles were applied to the abdomen.

Next morning the patient felt slightly better, the temperature fell to 98° F. (36.7° C.) and the pulse to 100, but during the day the temperature and the pulse started to rise again. As there was no improvement in the physical signs it was decided to do an exploratory laparotomy. Under spinal analgesia a low median incision was made. On opening the peritoneal cavity some seropurulent fluid was found in the pelvic cavity. The right iliac fossa was searched, but no caecum or appendix was found. A loop of the large intestine when traced downwards was found to end in the rectum. Perforation of a left-sided appendix was immediately thought of, and therefore search was made in the left iliac fossa. There an inflamed appendix was found covered with some fibrin, but completely free without any omentum in the neighbourhood. There was a neat perforation situated about 1 in. (2.54 cm.) from the tip of the organ. The appendix was removed, the stump buried with a purse-string suture, and the pelvic cavity drained. The patient was given 100,000 units of penicillin immediately and then 50,000 three-hourly. He also received 1 g. of soluble sulphamezathine every six hours for one week, during which time the temperature was about 1° F. above normal. After one week the drain was removed. Convalescence was otherwise uneventful, and the patient was discharged twenty days after the operation.

An *x*-ray examination was made before his discharge and it was found that all his organs were normal, but his heart, liver, stomach, and duodenum were completely transposed. The lesson to be learned from the above case is that in any obscure condition a thorough examination of the patient is necessary; had the front of the chest been also examined, the heart would have been found on the right side and immediately the possibility of a left-sided appendix would have been thought of.

My thanks are due to the Director of Medical Services for permission to publish the above case.

—I am, etc.,

Mauritius. M. SHUN SHIN.

Dexedrine Poisoning

SIR,—To add to the previously recorded cases (see for instance *British Medical Journal*, 1949, 2, 1394) of acute "dexedrine" poisoning, the report of a case in a boy aged 2 years may be of interest.

The child was said to have swallowed five 5-mg. tablets from his mother's handbag. He was given a saline emetic ten minutes later, but with no effect. He appeared well 30 minutes later and was given his breakfast. One hour later he became flushed and jumpy. He repeatedly picked up and dropped objects, and then ran to his parents, calling to them as if frightened. A few minutes later twitching movements of his arms were noticed. On admission three hours after taking the tablets he was delirious and threw himself violently around the bed, and, if restrained, repeatedly tossed his head from side to side.

Examination showed his pupils were dilated and only just responded to light; his tendon reflexes were not elicited; his plantar responses were flexor; and his temperature and pulse were slightly raised. Lumbar puncture showed a clear colourless fluid with a pressure of 190 mm. of water, and the cells and chemistry were normal.

His stomach contents were aspirated and consisted of semi-digested food. He was given 2 dr. (7 ml.) of paraldehyde (through a Ryle's tub passed nasally), and this was repeated four hours later. Subsequently, five doses of 1 dr. were given as the degree of narcosis decreased and the state of excitement recurred, but eventually he fell asleep and finally awoke 46 hours after admission, when he appeared tired but otherwise well.

—I am, etc.,

Christchurch, Hants. S. T. LANGHAM.

Pernicious Anaemia and Gastric Carcinoma

SIR,—The article on gastric carcinoma and pernicious anaemia by Drs. J. Mosbech and A. Videbaek, like your editorial on the subject, appearing in the *British Medical Journal* for August 12, pp. 390 and 405, appears to me to fail to take into account one simple and obvious explanation of the fact that gastric carcinoma appears to be commoner among victims of pernicious anaemia than it should be: namely, that pernicious anaemia may be due in some instances to carcinoma of the stomach. To put it differently, not all cases of pernicious anaemia are truly cases of pernicious anaemia; some are cases of carcinoma of the stomach masquerading as instances of pernicious anaemia. If we could separate the "true" or idiopathic or agnotogenic cases of pernicious anaemia at the outset, we might find that they were no more subject to gastric carcinoma than the average person—or perchance even less so.

—I am, etc.,

Honolulu. HARRY L. ARNOLD, JUN.

Delayed Post-natal Separation of the Cord

SIR,—I thought that possibly the following case of delayed separation of the umbilical cord might be of sufficient interest to record. The mother, aged 30, is an exceptionally healthy young woman. Her pregnancy was normal throughout, and I delivered her—a simple low forceps—on July 27, 1950.

The baby, a male, weighed 7 lb. 12 oz. (3.5 kg.) at birth, and appeared healthy in every way. In particular, the cord presented a perfectly normal appearance, neither unduly thick nor thin. The child developed an hordeolum on his left lower eyelid on the sixth day. This cleared up in a few days with saline bathing and ung. hydrarg. nit. dil., but a gland in the left anterior triangle of the neck began to enlarge and subsequently an abscess formed, which I incised on the 21st day.

The cord meanwhile had remained dry throughout, but showed no signs of separating. The home conditions were excellent, and I had a most experienced resident nurse in charge. On the 27th day the cord began to separate, accompanied by a little bleeding. The final separation occurred on the 33rd day, the cord then presenting the appearance normally seen about the 6th or 7th day. The stump gave no trouble; one application of silver nitrate was made as a precautionary measure.

The baby remained healthy all through, and fed and slept well. His temperature never rose above 98.4° F. (37° C.) even while the cervical abscess was developing. He was breast-fed throughout, apart from a supplementary feed of 2 oz. of full-cream dried milk, after the 10 p.m. feed, from the 9th day. He lost 6 oz. in weight the first week, but had regained his birth weight (7 lb. 12 oz.) by the 14th day. From then on he gained steadily, and weighed 9 lb. (4 kg.) on the 31st day (two days before the separation of the cord).

I began to feel a bit perturbed when no signs of separation had shown themselves in a fortnight, and this was intensified at the end of three weeks, especially as none of the colleagues I consulted—either specialist or G.P.—had ever encountered anything comparable. The infant's general condition, however, remained so good that I decided that no active interference was called for, and I should not worry if similar conditions arose in a subsequent case.

The circumstances appear to be distinctly unusual, and it would be interesting to know what is the longest period recorded for separation of the cord.—I am, etc.,

Clitheroe, Lancs. E. R. B. MURRAY.

Gastric Ulcer after Vagotomy

SIR,—The excellent article from the pen of Mr. D. M. Morrissey (September 16, p. 651) is timely in that it calls attention to what may prove quite an important side-effect of vagotomy. Ulceration occurring in a vagotomized stomach may be entirely painless, and therein lies the menace. Not only may haemorrhage supervene, but presumably, what is worse, a developing carcinoma may be even more silent than usual. Further to the cases quoted by Mr. Morrissey, the following have come under our observation:

(1) In our own series of seventeen vagotomies, two cases had developed gastric ulcer nine months and two years after operation, respectively. The first one was in the pyloric antrum and the other high up on the lesser curve.

(2) A third case presented in out-patients recently, having had a gastro-enterostomy for a duodenal ulcer in 1928, followed by transhiatal vagotomy in 1947. This patient has now developed a gastric ulcer high on the lesser curve. He was symptom-free for two years following the vagotomy, but his indigestion returned one year ago.

(3) In Toronto last year Dr. E. B. Tovee told one of us that of 50 vagotomies done at the Toronto General Hospital three had developed gastric ulcer within a year of operation. All had an insulin-fast achlorhydria.

(*a*) Male aged 52. Large duodenal ulcer at operation; developed a gastric ulcer high up on the lesser curve, only diagnosed on barium meal.

(*b*) Male aged 21. Barium meal at one year showed a gastric ulcer on the mid-zone of lesser curve, symptom free.

(*c*) Male aged 25. Barium meal at one year showed gastric ulcer of the mid-zone infiltrating the pancreas.

In assessing these cases the normal coincidence of gastric and duodenal ulcers must, of course, be borne in mind. Drossner and Miller (*Amer. J. med. Sci.*, 1940, **199**, 90) stated that in 15% of patients with a gastric ulcer a second duodenal ulcer or duodenal cap deformity will be found. Furthermore 5% of patients with an active duodenal ulcer also have an active gastric ulcer. These figures will have to be carefully considered in an attempt to assess whether the gastric ulcer is indeed a sequela of vagotomy. It is to be hoped that the large-scale follow-up of vagotomy cases now proceeding in this country and the U.S.A. will include routine barium meals and gastroscopies in order to exclude the presence of a silent gastric ulcer.

Is it possible that the change from the hypertonic steerhorn stomach of the frank duodenal ulcer to the more atonic J-shaped stomach following vagotomy is a factor in the development of ulceration on the lesser curve?—We are, etc.,

Bristol. W. M. CAPPER.
T. J. BUTLER.

The Dangers of Mixing Domestic Cleansers

SIR,—I received an urgent call to a woman who was said to have been "gassed." On arrival I found the patient, a middle-aged woman with a tendency to asthma, in a very distressed state. She was dyspnoeic and a little cyanosed, complaining of sternal pain and an aggravating cough. Her story was this. Her usual method of cleaning the lavatory bowl was by sprinkling it with "harpic." This time she sprinkled the harpic on first, and followed it with half a bottle of "brobat." A cloud of yellow fumes arose, which nearly overcame her before she could get into the fresh air. Test-tube experiment shows harpic + brobat → chlorine gas. This reaction is not to the prejudice of either of these preparations, as they clearly are not intended for the same purpose, but a wider knowledge of the danger is perhaps desirable.—I am, etc.,

Canterbury. E. BELLAMY.

The Sprue Syndrome—A Plea for Help

SIR,—In collaboration with Dr. J. R. Fountain I published in the *Journal* (1950, 7, 1157) an aetiological study of some 2,000 cases of the sprue syndrome (tropical sprue, idiopathic steatorrhoea, and coeliac disease) who received priority rations during the period 1943–8. We produced evidence to suggest that the syndrome might be conditioned by a genetic factor which may be accentuated and brought to light by a variety of environmental agents. The rarity of the syndrome (one case of idiopathic steatorrhoea per 700,000 of a population over 15 years of age, and one case of coeliac disease per 135,000 of the population below 15 years of age) makes it unlikely that any individual will see sufficient cases to throw additional light on the aetiological importance of the genetic factor. I am therefore appealing to medical men in all parts of the world to help in this investigation by forwarding to me any information which they may possess in regard to the occurrence of two or more cases of the sprue syndrome in a single family. I would also be grateful for any information which would help to answer the question, What happens to children with coeliac disease? What percentage die, recover, or appear in adult life as cases of idiopathic steatorrhoea? Any help will be gratefully received.

—I am, etc.,

Department of Medicine, University of Edinburgh. L. S. P. DAVIDSON.

POINTS FROM LETTERS

The True Source of Colchicine

Dr. GEOFFREY E. LOXTON (London, W.1) writes: The writer of the interesting leading article entitled "Colchicine in the Chemotherapy of Cancer" (*Journal*, September 23, p. 718) is mistaken. Colchicine is not extracted from the autumn crocus (*Crocus sativus*) but from *Colchicum autumnale*, the sole official source. . . . Although the flowers of the two bear a superficial resemblance they are pharmacologically and botanically distinct. *Crocus sativus*, although of great historical interest as the source of saffron, is pharmacologically inert. With the related *Crocus vernus*, it belongs to the natural order Iridaceae, the flower having three stamens; *Colchicum autumnale* belongs to the natural order Liliaceae, its flowers having six stamens. Each bulb carries two to six delicate lilac crocus-like flowers in the autumn. The seed pods winter underground and appear in spring, making meadows poisonous to cattle. . . . *Crocus sativus* was extensively cultivated at Saffron Walden, in Essex, in Edward III's reign, and extensively used in cookery until the nineteenth century, the old crocus farmers being known as "crokers," and the name in literature is often used to signify a grumbler. The use of colchicine was introduced into regular practice in this country by Stoerck in 1763.

Obituary

Sir ERNEST GRAHAM-LITTLE, M.D., F.R.C.P.

A long career of distinguished service to his university and his profession is ended with the death, which took place suddenly at his Epsom home on October 6, of Sir Ernest Graham-Little in his eighty-fourth year. He shared his life fairly evenly between medicine, education, politics, and his family.

Ernest Gordon Graham-Little (he took the name Graham as an additional surname in 1931, the year of his knighthood) was born in 1867. His father, Mr. Michael Little, J.P., was in the Indian Civil Service; his mother came from Capetown. He was educated at South African College, Cape University, where he took his B.A. and a gold medal, and then came to London to study medicine at Guy's and St. George's, completing his medical training in Dublin and Paris. He graduated M.B. (London) with honours in 1893, and proceeded M.D. in the following year. In 1895 he became a Member of the Royal College of Physicians, and a Fellow of the College in 1906. In 1902 he succeeded Sir Malcolm Morris as physician in charge of the skin department at St. Mary's and lecturer in dermatology to the medical school, and he remained there until his retirement in 1934, resuming charge of the department in 1940–1 when the hospital staff was depleted by war. In addition to his large private consulting practice in Wimpole Street, he was consulting physician to the East London Hospital for Children, Shadwell—the appointment he most enjoyed—and consulting dermatologist to several charitable and professional organizations. Throughout his dermatological career he maintained a great interest in pathology, and he was the first to describe, in 1901, what was later termed the Waterhouse–Friderichsen's syndrome. During the first world war he was consulting dermatologist to a number of military hospitals. Graham-Little's eminence in his specialty was quickly recognized, and students found him a model teacher. He was one of the early presidents of the Dermatological Section of the Royal Society of Medicine, a corresponding member of the American Dermatological Association, and honorary or corresponding member of similar societies in half a dozen European countries. In 1935 he was elected honorary president of the International Dermatological Congress. He made many contributions to dermatological literature and was editor of the section on skin diseases in the *Medical Annual*.



In his later career his dermatological work was overshadowed by his preoccupation with university and, later still, Parliamentary affairs. His desire was to see every clever boy and girl given the chance of university education. He represented the medical graduates of London University in the Senate from 1906 until the present year. An ardent protagonist in various controversies concerning medical education, he was foremost in resisting an attempt to fasten upon the university an official co-operation in its final M.B., B.S. examinations with the Conjoint Board, a proposal which, in his view, if carried out would have lowered the standard and reputation of the London University degrees in medicine. Some may have judged him a diehard; he was certainly a strong individualist, with a pronounced dislike of Socialism in medicine as in other spheres, attested by his opposition to the National Health Service, which he thought inimical to medical freedom. But in many respects he was progressive. Largely owing to his insistence, increased provision was made for the clinical education of women in London by the recognition of the West London Hospital as an institution for the admission of women as external students of the university. This action helped to undo a serious injustice to women students, who, having completed their preclinical education in London, had found it impossible to take their clinical studies there.

His services to the university make a long catalogue. He was chairman of the Council for External Students and president of the University Graduates Association from 1922. In 1924 he was returned as Member of Parliament for the university after a memorable contest, in which he had against him representatives of the three principal parties of the day. The late Sir John Rose Bradford was the runner-up, and Graham-Little beat him by 400 votes. At the next election his majority was nearly 3,000, and on two subsequent occasions it passed 5,000, but in 1945 he came within a very few votes of being beaten by Dr. Mary Stocks, principal of Westfield College. He sat as an Independent or, during his last ten years in Parliament, as a Nationalist. He devoted himself assiduously to his Parliamentary duties, especially after his retirement from his hospital appointment in 1934. His voice was often heard resisting any insidious proposal for giving countenance to unqualified practice. He fought strenuously for granting to doctors the same privilege of professional secrecy in courts of law as was enjoyed by the legal profession. He opposed the compulsory clauses of a Bill dealing with the notification and treatment of venereal disease, and he was able to influence Government policy with regard to the more scientific use of radium. He employed his medical knowledge effectively in committee work on various measures which had a medical bearing, notably the recent Criminal Justice Act. He was chairman of the Medical Parliamentary Committee in 1943. On his retirement from the Senate of London University last May a resolution was passed placing on record the Senate's high appreciation of his services as one of its members for 44 years and as Member of Parliament for 26 years.

Sir Ernest Graham-Little was frequently in the thick of controversy, in which he did not spare his opponents; but, like many other doughty fighters, when he took off his armour he was the gentlest of men, as those can testify who accompanied him on his walking tours or met him over the chessboard or among the Knights of the Round Table. Among his other interests were his membership of the British Science Guild, the Commons and Footpaths Preservation Society, the Society of Individualists, and the League for European Freedom. He was a prolific writer of letters to the Press, but he also contributed weighty articles on medical education, hospital policy, and like subjects to the monthly and quarterly reviews. Though not a member of the B.M.A. all his professional life—he was first elected a member in 1895, but he twice resigned and was twice re-elected—he served on the Association's Parliamentary Elections Committee and on the Central Medical War Committee. He was a representative at the Annual Meeting on a number of occasions, and chairman of the Marylebone Division in 1935–6. As far back as 1908, at the Annual Meeting at Sheffield, he was president of the Section of Dermatology.

Sir Ernest was keenly interested in the liberal arts, and his house was full of many treasures: unfortunately it was completely destroyed by air attack in the last war. Of all his treasures none were so dear to him as the portraits and busts he had of his wife and children. Throughout his career Lady Graham-Little was a constant counsellor and fought by the side of her husband in all his elections. They shared bravely together the loss by drowning of their only daughter in 1932 and the death on active service in 1942 of their only son.

Dr. C. CHARLES BURLINGAME, psychiatrist-in-chief of the Institute of Living, Hartford, Conn, U.S.A., died in Leicester on July 22. He represented the American Psychiatric Association at the annual meeting of the Royal Medico-Psychological Association, and developed the acute symptoms of his illness when in this country. He was born in Rockford, Illinois, in 1885, and he graduated in medicine from the Illinois Medical College in Chicago in 1908. His early training in psychiatry was obtained in state hospitals in Massachusetts and Minnesota. Subsequently he accepted an appointment as the first full-time psychiatrist in industry, and this interest in the application of psychiatric principles to industry he retained throughout a very active career. In 1921 he was appointed executive officer of the Columbia University–Presbyterian Hospital Medical Centre, and he received credit for much of the success of that colossal structure and organization. Later he returned to private practice in New York, and it was in 1931 that he was appointed psychiatrist-in-chief of the Institute of Living. Under his guidance the activities of the institute expanded in all directions. While he offered facilities for the practice there of all recognized forms of therapy, he was dissatisfied with the adequacy of the Freudian theories to deal with the problems of abnormal behaviour and was not in sympathy with psychoanalytic methods. He was firmly of the belief that aftercare should be extended on the basis of re-education and reconstruction, and he developed an elaborate programme of educational therapy. Research facilities were lavish, and he was a stimulating chief. Research in psychiatry was encouraged in this country by his generous gifts to the Royal Medico-Psychological Association for the Burlingame Prize. At the time of his death he was president, director, and chairman of the board of managers of the institute. Burlingame was editor of the *Digest of Neurology and Psychiatry* and associate editor of the *American Journal of Psychiatry*. Not only did he edit the *Digest* but he distributed this gratis each month to 19,000 professional people and libraries in many countries. Its reception was always eagerly awaited, and it remains a monument to his organizing skill and ability. A man of unbounded energy, with a flair for the dramatic, he was a fluent speaker and always in great demand. He was a regular visitor at the annual meetings of the Royal Medico-Psychological Association, and was made an honorary member of the association the day before his illness developed. He was similarly honoured by other international psychiatric bodies and was the recipient of a number of decorations from foreign Governments. Of these he greatly prized that of Officer of the French Legion of Honour, to which he had been elevated in 1947. He married Ruth Beardsley Parsons in 1912, to whom the sympathy of his many friends in this country is extended.

Dr. ARCHIBALD MACLEAN died suddenly while on holiday on August 3 at the age of 43. He had been in practice in Hamilton since 1934. After graduating M.B., Ch.B.(Glasgow) in 1930, he held resident appointments at the Victoria Infirmary. For two years he worked as an assistant in a practice at Old Cumnock, Ayrshire, and in 1934 he moved to Hamilton as a partner to Dr. Stewart. He became senior partner in the practice in 1945, holding the appointments of factory surgeon, Treasury medical officer, and medical officer to the post office for the Hamilton district. He had a large practice and was exceptionally popular with his colleagues, patients, and friends because of his constant cheerfulness, though he had known for some time of the possibility of a sudden catastrophe. An elder of his church and a good friend to many, he will be sadly missed. He is survived by his widow and two young daughters.—N. D.

Dr. CHARLES JAMES PALMER, J.P., for many years a well-known medical practitioner in Mansfield Woodhouse, Notts, died in Nottingham on September 2. He was born in Ireland in 1871, and studied medicine at Liverpool and Birmingham, qualifying L.S.A. in 1895. After holding posts at the Royal Orthopaedic and Spinal Hospital, Birmingham, and the Doncaster Royal Infirmary, he began general practice in Mansfield Woodhouse in 1896, and he remained there until his retirement in 1947. He was honorary surgeon at the Mansfield General Hospital until 1920, when he resigned as a result of the strain of the very heavy duties he took on during the first world war. Dr. Palmer was an active member of the British Medical Association from 1896, and when the Association met in Nottingham in 1926 he was vice-president of the Section of Medical Sociology. He was a member of the Insurance Acts Committee, 1919–29, and also of its Executive Subcommittee and its General Purposes Committee. Taking a great interest in the affairs of colliery surgeons in Nottinghamshire, he was instrumental in forming the Notts Collieries Medical Service Association and the Mansfield Public Medical Service, being president from 1928 to 1943. In addition to these activities Dr. Palmer devoted much time to local government affairs, and was chairman of the Mansfield Woodhouse Urban District Council from 1907 to 1909. He was elected a county councillor and made a J.P. in 1910, and from 1940 to 1944 was chairman of the Mansfield Petty Sessional Division Bench, from which he retired in 1946. As a Freemason, Dr. Palmer lived up to his principles in every respect. He was immensely popular with his patients, who were impressed with his kind-heartedness and generosity. His widow and daughter will have the sympathy of the many who will feel his loss.—H. D. P.

Dr. THOMAS HANSON CROSSFIELD DERHAM, J.P., who died at Bexhill-on-Sea on September 14, was a native of Preston, Lancashire, and spent the whole of his professional life there. Born in 1874, he was educated at Preston Grammar School and Edinburgh University, graduating M.B., C.M. in 1894. His father, who was in medical practice in Preston, died while he was still a student, but Tom Derham returned to the house in which he had been born and rebuilt the practice in which he laboured so acceptably until his retirement in 1946. For many years he was a member of the visiting staff of the Preston Royal Infirmary and had charge of the physiotherapy department. He was a member of the Preston County Borough Council for 30 years, an alderman from 1926 to 1934, and mayor in 1932–3. In the first world war he served in the R.A.M.C., and was on active service from 1915 to 1918, attaining the rank of major. A lifelong supporter of Preston North End Football Club, he was for many years medical officer to the club and never missed a match. He was a borough magistrate for many years, and was also associated with the St. John Ambulance Brigade and with the Preston Nursing Association. Derham was a member of the Preston Insurance Committee for over 33 years and chairman in 1923–4. For many years a member of the B.M.A., he was chairman of the Preston Division from 1939 to 1944, chairman of the Preston panel committee from 1938 to 1944, and of the Preston local medical war committee from 1939 to 1946. He represented the Preston Division at the Annual Representative Meeting in Aberdeen in 1939. Compact and solid in his build, he looked a model of calm dependability, and this is just what he was, with a saving sense of humour added. He earned the gratitude and affection of his patients and townsmen and the respect and love of his colleagues. During the latter years of the war he became increasingly crippled with rheumatoid arthritis, but he continued to work until his son, who succeeded him, returned from Service. He is survived by his widow, three daughters, and one son. One son was killed in Italy during the last war.—F. M. R.

Dr. ALFRED WILLIAM MOORE, at one time Deputy Director-General of the Ministry of Pensions, died at his home at St. Albans on September 20. He was born in Norwich in 1881, and received his medical training at Emmanuel College, Cambridge, and St. George's Hospital, qualifying in 1905 and graduating M.B., B.Chir. a year later. After holding house appointments, he settled down to general practice in a partnership at Stony Stratford, Bucks. Very soon afterwards the Territorial Army was formed and Moore's senior partner, Dr. Bull, raised a cavalry field ambulance with its headquarters at Stony Stratford. In this Moore took a commission. At the outbreak of war in 1914 he was second in command, and became C.O. the next year, after the evacuation of Gallipoli, where his field ambulance served dismounted with its brigade—the Bucks, Berks, and Dorset Yeomanry. From 1916 to 1918 Moore continued to command his unit in Siniai, Palestine, and Syria in a series of campaigns which are likely to remain historic as the last in which cavalry played a decisive part. It was then that he displayed that talent for organization, the balanced judgment, and the combination of personal charm with sweet reasonableness which were to mark his subsequent career. He was mentioned in dispatches three times, and was awarded the O.B.E., the Territorial Decoration, and the Order of the Nile. After the war he joined the medical staff of the Ministry of Pensions and became a permanent Civil Servant, reaching before retirement in 1946 the position of Deputy Director-General of Medical Services. He was a member of the Central Medical War Committee from 1938 to 1944. Moore was an English gentleman of a type now becoming uncommon. His father was a canon of Norwich Cathedral, but came of an old Norfolk family of yeoman farmers, and his son retained throughout life the tastes and outlook of the countryman. A fine shot and a good oar—he was in the Cambridge trial eights of 1900—he spent nearly all his holidays on the Norfolk Broads sailing his beloved boats. He was a man of quite exceptional charm, and both his manners and his personal appearance had a rare distinction. None who were privileged to observe it will forget the warm happiness of his family life with his wife and five children. To them the sympathy of many friends will go out. —H. F. H.

We record with regret the death of Sir GEORGE ROBERTS, Bt., who was Almoner of St. Thomas's Hospital from 1926 to 1943. He was born in 1859. In 1919 he became a member of the council of the King Edward's Hospital Fund for London. Roberts made a gift of £105.000 to the Fund as a thank-offering for the recovery of King George V from his serious illness in 1929. He was created a baronet in the following year.

B. M. writes: Some there are who so identify themselves with the institution they serve that their passing leaves among colleagues a deep void. Such a man was NORMAN STUART CARRUTHERS. Success came rapidly in his specialty, for his commanding presence radiated confidence, and his surgery was marked by a craftsman's skill. Kindness and generosity were his outstanding qualities, and particularly were these shown to children, of whom he had deep understanding. Confident in his own strong will, he expressed his opinion decisively, leaving those from whom he differed under no misapprehension as to his own views. His judgment and foresight were such as to lead inevitably to involvement in hospital administration and appointment to many committees. His chief interest, however, was in the nursing committee, of which he was chairman and where his death will be most keenly felt. In addition to his professional work Carruthers had many other interests. He was skilled in carpentry and mechanics and later became interested in farming. Life was not too kind to him. Of his two sons, one died in infancy from diphtheria—in his memory was given the Jock Carruthers medal for the outstanding student nurse of her year at the Norfolk and Norwich Hospital. His other boy twelve months after qualification was accidentally killed while serving in the Army in India. To his son's widow and two young children the remainder of his days were devoted. To them, his widow, and other members of his family the sympathy of all his many and grateful friends is extended.

Universities and Colleges

UNIVERSITY OF ABERDEEN

At a graduation ceremony held on September 27 the following medical degrees were conferred:

M.D.—[1]I. A. Anderson, [1]A. D. Macrae, [1]A. Mair, I. C. Cowan, L. G. Tulloch.

M.B., CH.B.—[1 2]C. U. Webster, [1]Rosamond Beattie, [2]Elizabeth A. F. Priest, [2]J. G. Stewart, [2]D. M. McLellan, Elizabeth P. N. Bell, A. M. Blackwell, I. M. Brooker, W. R. Bruce, W. R. Buchan, J. N. Burry, D. D. Carmichael, J. P. Chadwick, S. C. Clifford, A. M. Cook, G. J. Cordice, G. G. Duncan, A. L. S. Duthie, A. T. Edwards, Jean McG. Edwards, A. L. Florence, N. G. Fraser, D. T. Gordon, Dorothy Gray (*née* Armstrong), [4]K. T. Gruer, R. T. S. Henderson, A. F. Henry, R. W. Hilton, N. B. Hopper, W. I. Horne, C. R. Innes, G. Innes, G. S. Joss, Janina E. Koperska, A. W. Laing, R. A. Laing, G. S. Laird, Zofia K. W Laszewski (*née* Kinel), Helen C. Lawson, G. Lorimer, A. D. Lyall, D. S. McConnach, D. J. McCulloch, W. G. MacDonald, Winifred W. McDonald, A. W. McIntosh, W. McIntyre, I. Mackay, J. McKay, M. Mackay, K. J. Maclean, H. N. MacPhail, R. T. Macpherson, N. Marshall, Valerie MacA. Milne, R. A. Mitchell, D. M. Moir, J. S. V. Mouat, R. R. Mowat, Muriel J. Mucha (*née* Mackie), D. R. Murray, N. T. Nicol, T. A. A. Pearce, W. J. W. Rae, Frances S. Ritchie, Margaret Robson, Helen C. de C. Roll (*née* Scott), N. Z. Sacks, H. G. Saunders, A. Sillars, L. C. Skinner, D. M. Slessor, I. W. Strachan, J. Strachan, Dorothy A. Sutherland, K. I. Sutherland, Janina Z. M. Szamocki (*née* Skroczynski), A. J. Taylor, Katharine J. Thicknesse, Isabella E. M. F. Thomas, I. D. H. Todd, Audrey M. G. Towns, E. I. Watty, Dolores F. Webster, R. D. Weir.

[1]With honours. [2]With commendation. [3]Passed Final M.B., Ch.B. degree examination with distinction in surgery, medicine, and midwifery. [4]Passed Final M.B., Ch.B. degree examination with distinction in midwifery.

UNIVERSITY OF LONDON

The Semon Lecture for 1950 entitled "The Development and the Present Use of Bronchospirometry" will be delivered by Dr. Paul Frenckner, lecturer at the Karolinska Institutet and head of the Department of Oto-rhino-larnygology, Southern Hospital, Stockholm, at the Royal Society of Medicine, 1, Wimpole Street, London, W., on Thursday, November 2, at 5 p.m.

A special university lecture on "The Circulation in Pregnancy" will be delivered by Professor R J. Kellar, Professor of Obstetrics and Gynaecology in the University of Edinburgh, at University College Hospital Medical School, University Street, London, W.C., on Friday, November 3, at 5 p.m.

Professor F. A. E. Crew, F.R.S., Bruce and John Usher Professor of Public Health and Social Medicine in the University of Edinburgh, will deliver a course of three special university lectures on "The Biological Aspects of War" at the Senate House, University of London, Bloomsbury, W.C., on Thursdays, November 16, 23, and 30, at 5.30 p.m.

The lectures are addressed to students of the University and to others interested in the subjects. Admission is free, without ticket.

Dr. W. S. Feldberg, F.R.S., will deliver a course of three lectures on "Chemical Transmitters" in the physiology theatre of University College (Gower Street, W.C.) on November 10 and 21 and December 1, at 5.15 p.m.

Professor Hamilton Hartridge, F.R.S., will deliver a course of three lectures on "Some Recent Advances in the Physiology of Vision" in the physiology theatre of University College, Gower Street, W.C., on Tuesdays October 24 and 31 and November 7, at 5.15 p.m.

Four lectures on "Aspects of Protein Structure" will be delivered by Dr. A. Elliott and Dr. W. E. Hanby in the physiology theatre of University College, Gower Street, W.C., on Mondays, November 20 and 27 and December 4 and 11, at 4.45 p.m.

UNIVERSITY OF BIRMINGHAM

Dr. Kurt Aterman has been appointed Lecturer in Biophysics in the Department of Anatomy, from October 1.

The following resignations are announced: Dr. Harold Scarborough (Reader in Medicine) from September 30 on appointment as Professor of Medicine and Director of the Medical Unit at the Welsh National School of Medicine, Cardiff; Dr. C. N. Iland (Lecturer in Bacteriology).

Professor H. F. Humphreys, Vice-Principal and Professor of Dental Surgery in the University, will deliver a lecture entitled "The Horn of the Unicorn" in the Mason Theatre, Edmund Street, Birmingham, on Tuesday, October 17, at 1.45 p.m. He will also discuss "Malthus and Modern Times" in a lecture to be given in the Union Debating Hall, Edgbaston, Birmingham, on Thursday, October 26, at 1.45 p.m.

Professor K. Mather, D.Sc., Professor of Genetics in the University, will deliver a lecture on "Genetics and its Relation to Human Affairs" in the Mason Theatre on Tuesday, November 14, at 1.45 p.m.

A lecture on "Henry VIII: A Medical Study" will be delivered by Professor J. F. D. Shrewsbury, Professor of Bacteriology in the University, in the Mason Theatre on Thursday, November 23, at 1.45 p.m.

On Friday, December 1, at 1.45 p.m., in the Union Debating Hall, Bertrand Russell, O.M., F.R.S., will deliver a lecture on "The Impact of Science on Society."

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a recent meeting of the Council of the College the President, Professor Hilda Lloyd, was appointed to represent the College on the General Medical Council.

The Honorary Fellowship of the College was conferred on Dr. George William Kosmak, of New York, editor of the *American Journal of Obstetrics and Gynecology*, in recognition of his services to obstetrics and gynaecology.

Mr. Geoffrey Keynes and Dr. R. J. Minnitt were elected to the Fellowship under the rule permitting the election annually of not more than two practitioners who are not obstetricians or gynaecologists, but who have made valuable contributions to the advancement of obstetrics and gynaecology.

It was announced that Sir Arthur Sims had made a gift of securities to the value of over £25,000 to establish the Nancy Sims and Margaret Black Travelling Professorship Fund, the income from which will enable the College to appoint a senior obstetrician-gynaecologist to visit Australia and New Zealand and the other countries of the Commonwealth in alternate years.

It was also announced that the trustees of the Bernhard Baron Charitable Trust intended to make a gift of £10,000 to found a Travelling Scholarship.

The following were admitted to the Membership of the College: G. T. Altimas, J. D. Andrew, P. R. Blahey, G T. Carson, C. J. Champ, F. L. Clark, T. R. Clarke, W. W. Coppinger, B. M. Corkill, E. D. Crichton, T. Dean, C. N. DeGaris, W. Donovan, H. P. Dunn, Isabel L. Dyke, M. W. Elliott, C. J. Farr, B. Fatima, W. R. Foote, M. B. Fox, H. H. Francis, A. C. G. Frost, W. D. Giffen, C. A. Haxton, H. A. Henderson, H. F. Hills, R. Hodkinson, R. H. Horner, D. R. Hughes, T. G. Ingram, D. J. McI. Irvine, H. A. Kelsey, D. Kutty, J. F. Leaver, J. L. MacArthur, D. C. McEwen, K. T. MacFarlane, Ishbel M. Macrae, C. M. H. Mair, W. D. Marshall, Helen M. Noble, R. H. O'Hanlon, D. G. P. Paranjothy, M. G. Pearson, E. Quehl, P. D. Rajaratnam, I. Ramamurthi, K. E. E. Read, H. A. Rowley, A. M. Rutherford, S. A. Scorer, D. R. Sheumack, E. M. Southern, D. W. Sparling, S. K. S. Roy, S. N. Upadhyay, L. G. R. Van Dongen, D. B. B. Whitehouse, J. Wilbush, E. A. Williams, M. H. V. Young.

The Services

Surgeon Rear-Admiral T. Madill, O.B.E., R.N., has been appointed Honorary Physician to the King in succession to Surgeon Rear-Admiral O. D. Brownfield, C.B., O.B.E., R.N., who has been placed on the Retired List.

A *Supplement* to the *London Gazette* has announced the following awards:

Four Clasps to the Territorial Efficiency Decoration.—Colonels J. L. Hamilton, M.C., T.D., and H. J. D. Smythe, M.C., T.D., R.A.M.C.

Three Clasps to the Territorial Efficiency Decoration.—Colonel J. Gwynne-Morgan, C.B.E., T.D., R.A.M.C.

Two Clasps to the Territorial Efficiency Decoration.—Colonel R. H. Robinson, T.D., Lieutenant-Colonels W. C. Barber, T.D., and F. A. Belam, T.D., and Major (Honorary Colonel) G. M. Frizell, T.D., R.A.M.C.

1st Clasp to the Territorial Efficiency Decoration.—Lieutenant-Colonel W. R. Blunt, T.D., R.A.M.C.

Territorial Efficiency Decoration with 1st Clasp.—Lieutenant-Colonel (Honorary Colonel) F. A. R. Stammers (T.A.R.O.), Lieutenant-Colonel C. W. Arnot, Major (Honorary Colonel) W. Barclay, M.C., and Major R. K. Reeves, R.A.M.C.

Territorial Efficiency Decoration.—Lieutenant-Colonel G. M. Komrower, Major (Honorary Lieutenant-Colonel) H. W. Featherstone, Majors J. P. W. Hughes and D. J. Wigginton, Captains (Honorary Majors) J. Kerr, D. B. Brown, L. T. Clarke, D.S.O., and D. W. Gillies, and Captain A. R. Darlow, R.A.M.C.

No. 38

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 23.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	22	3	11	2	—	35	4	17	1	1
Deaths		—	—				1	—		
Diphtheria	38	4	10	1	4	92	13	34	5	2
Deaths	1	—	—	—	—	2	—	—	—	1
Dysentery	170	14	124	1	1	78	16	76	—	—
Deaths		—			—				—	—
Encephalitis, acute	5	—	—	1	—	4	—	—	—	—
Deaths		—		—			—			
Erysipelas			21	6	4			30	9	2
Deaths							—			
Infective enteritis or diarrhoea under 2 years				26	10				136	
Deaths	14		2	1	2	30	4	7	8	5
Measles*	2,673	201	97	32	41	659	50	18	25	30
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	37	4	3		1	44	2	10	—	—
Deaths										
Paratyphoid fever	9	1	—		—	23	2	2 (B)	7 (B)	1 (B)
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	260	13	4		—	226	10	1	1	3
Deaths (from influenza)‡	5	—	2	—	—	5	1	—	—	—
Pneumonia, primary			129	¶	—			118	8	
Deaths	112	15		7	2	113	18		6	6
Poliomyelitis, acute	419	24	51	5	9	295	48	7	3	1
Deaths§	20	3		—		12	1			
Puerperal fever			6				—	6		
Deaths										
Puerperal pyrexia‖	72	4	8		1	88	5	5	—	1
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	771	52	134	53	49	1,097	78	165	73	95
Deaths†		—	—	—	—			—	1	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	1	—	2	—	8	3	1	5	1
Deaths	—	—	—		—	—	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	2,935	234	200	69	17	1,061	39	47	43	34
Deaths	1	—	—	—	—	2	—	—	1	—
Deaths (0–1 year)	205	19	25	13	9	213	25	33	20	11
Deaths (excluding stillbirths)	3,880	596	534	154	104	3,895	596	524	144	108
Annual death rate (per 1,000 persons living)			10·7					10·5	8·9	
Live births	6,894	1092	815	333	204	7,111	1061	800	382	244
Annual rate per 1,000 persons living			16·4					16·0	23·7	
Stillbirths	181	35	29			187	30	23		
Rate per 1,000 total births (including stillborn)			34					28		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending September 30 were: paralytic, 222 (268); non-paralytic, 109 (151); total, 331 (419). The figures for the previous week are in parentheses. Total uncorrected notifications for 1950 up to and including the week under review are 6,351. The corresponding figures for 1947, 1948, and 1949 were 6,665, 1,449, and 3,641 respectively. It will be noted that the total figures for 1947 for the corresponding period now exceed those for 1950.

The steady reduction in notifications is maintained in the week under review, and these were less than those for the preceding week by 46 paralytic, 42 non-paralytic—total, 88. The county areas with decreases of more than 5 compared with the preceding week were: London 8, Essex 7, Kent 6, Lancashire 11, Northumberland 10, Southampton 7, Stafford 6, Surrey 7, and Middlesex 15. Any increases which occurred were generally distributed and insignificant in number. Non-paralytic cases in the week under review comprised 32.9% of the total.

Quarterly Returns for Scotland

(Second Quarter, 1950)

The birth rate during the second quarter of this year was 19.1 per 1,000, being 0.6 below the average of the June quarters for the five preceding years. The infant mortality was 34 per 1,000 registered live births and was the lowest ever recorded in Scotland for any quarter, being 2 below the rate for the corresponding quarter of 1949 and 13 below the average of the five preceding second quarters. The stillbirth rate was 26 per 1,000 total births. The general death rate was 11.6; this rate was 0.2 less than the rate in the second quarter of 1949 and 0.3 below average of the five preceding June quarters. The death rate from all forms of tuberculosis was 56 per 100,000 and 47 from respiratory tuberculosis; both these rates were 13 below the rate for the corresponding quarter of 1949 and they were respectively 24 and 17 below the five-years' average. The marriage rate was 6.7 per 1,000 of the population, and was the lowest for any quarter since the first quarter of 1939 and lower than the pre-war average.

Discussion of Table

In *England and Wales* increases in the number of notifications were reported for measles 179 and scarlet fever 21, while decreases were recorded for whooping-cough 151, acute poliomyelitis 59, and dysentery 45.

A small rise in the incidence of measles occurred in most areas of the country; the largest increases were Lancashire 75, London 55, and Cheshire 52. The outstanding exception to the general rise was a decrease of 215 in Lincolnshire. Very small changes occurred in the local trends of scarlet fever. A rise of 3 in Glamorganshire and a fall of 3 in Lancashire were the chief features of the returns for diphtheria. The largest declines in the number of notifications of whooping-cough were Middlesex 34 and London 33.

The chief centres of dysentery were: Yorkshire West Riding 35 (Shipley U.D. 10); Wiltshire 25 (Calne and Chippenham R.D. 25); Leicestershire 19 (Leicester C.B. 19); Lancashire 19; London 14; Durham 9.

The largest returns of acute poliomyelitis were: Lancashire 41 (Liverpool C.B. 14, Manchester C.B. 12); Middlesex 25 (Harrow U.D. 5, Hayes and Harlington U.D. 5, Ealing M.B. 4); London 24 (Hackney 5, Wandsworth 4); Yorkshire West Riding 24 (Sheffield C.B. 7); Kent 23 (Chislehurst and Sidcup U.D. 4, Orpington U.D. 4); Gloucestershire 18 (Bristol C.B. 15); Staffordshire 17 (Wolverhampton C.B. 6); Durham 17; Northumberland 16 (Newcastle-upon-Tyne C.B. 5); Warwickshire 15 (Birmingham C.B. 6); Surrey 15; Devonshire 15 (Newton Abbot R.D. 4); Southampton 13; Somerset 13 (Long Ashton R.D. 4); Essex 13; Cheshire 10 (Nantwich R.D. 4).

In *Scotland* an increase was recorded in the number of notifications of dysentery 30, measles 17, whooping-cough 14, and a decrease was reported for acute poliomyelitis 26 and scarlet fever 14. The chief centres of dysentery were Glasgow 49, Edinburgh 20, Dumfries 14, Dumfries county 12, Stirling county 9. The largest returns for acute poliomyelitis were from Dundee 8, Glasgow 6, Lanark county 5, Moray and Nairn county 5, Edinburgh 3.

In *Eire* the incidence of infectious diseases was unchanged from the preceding week's level. The largest variation in the local trends was a decrease of 8 in the number of notifications of measles in Dublin C.B.

In *Northern Ireland* the chief feature of the returns was a decrease of 15 in the notifications of acute poliomyelitis. The largest returns of acute poliomyelitis were Antrim county 3 and Down county 3.

Week Ending September 30

The notifications of infectious diseases in England and Wales during the week included scarlet fever 937, whooping-cough 2,616, diphtheria 50, measles 2,963, acute pneumonia 281, acute poliomyelitis 331, dysentery 187, paratyphoid fever 11, typhoid fever 7.

Medical News

Hunterian Society

For many years the Hunterian Society has had no permanent home for its many mementoes of John and William Hunter and their friends. Now the whole collection is effectively displayed in one of the rooms of the Ciba Foundation at 41, Portland Place. On Thursday last the annual party of the Hunterian Society was held there, and Lord Horder, who was introduced by Sir Arthur Porritt, the president of the society, formally opened the museum and library. There are many interesting items in the museum. There is the gold watch which the staff of St. George's Hospital presented to John Hunter and which he bequeathed to Charles James Fox, M.P. There is a copy of the songs which Haydn dedicated to Mrs. John Hunter and for which she wrote the words. The best known of them is probably "My Mother Bids me Bind my Hair." There are many manuscript letters and lecture notes, and even snuff-boxes and spectacles find a place in the glass show-cases. Quite the most interesting exhibit, however, is a new and fine portrait of William Hunter which was painted by his friend Sir Joshua Reynolds (see p. 886).

Heberden Society Dinner

The council of the Heberden Society on October 5 gave a dinner in honour of Dr. and Mrs. Philip Hench. The other guests present were Sir William Douglas and the Editor of the *British Medical Journal*. The president of the society, Dr. W. S. C. Copeman, was in the chair, and Lord Horder, on behalf of the Society, gave a short speech of welcome to which Dr. and Mrs. Hench replied. Dr. Hench is at present in this country giving lectures on the work originated by himself and his colleagues at the Mayo Clinic on the treatment of rheumatic and other conditions with cortisone and A.C.T.H.

Rockefeller Grants

The Rockefeller Foundation has made grants totalling nearly £20,000 to assist in studies on heredity, anthropology, and anatomy in London, Cambridge, and Bristol. A grant of £10,000 to the Galton Laboratory, University of London, for work on human heredity is to be used in part to employ social workers to collect data on individuals and families. The Royal Statistical Society will receive £7,142 to develop library facilities in its new centre in London. The department of anthropology at Cambridge University will receive £1,000 to defray the cost of a field study in India. A grant of £1,250 to the anatomy department at Bristol University is to facilitate research work under the direction of Professor J. M. Yoffey.

Mass Radiography at Oxford

Freshmen arriving at Oxford University this term are being offered *x*-ray examination of the chest. The facilities are being provided by the Oxford Regional Hospitals Board.

Advancement of Radiology

The Detroit Roentgen Ray and Radium Society has elected Dr. J. F. Brailsford an honorary member in recognition of his "outstanding contribution to medicine and the advancement of the science of radiology."

Health Education

A conference on "Health Education" was held at the Institute of Education, University of London, from September 27–30. The conference was primarily for training college lecturers on hygiene, and the subjects dealt with included: health education in schools, nutrition, school meals, infection in schools, rheumatic disease in school-children, tuberculosis, and various psychological problems.

British Rheumatic Association

Lord Nuffield has accepted the presidency, to which he was unanimously elected at the annual general meeting of the association held at Friends House, London, on Thursday, September 28.

Association of Scientific Workers

Lord Haden-Guest has accepted the invitation of the executive committee of the Association of Scientific Workers to become president of the association. Lord Boyd-Orr, who was president until recently, has resigned because of increased commitments.

Manchester Medical Society

All the medical and dental societies of Manchester have amalgamated to form one society—the Manchester Medical Society. Mr. Wilson Hey has been elected first president. At the first ordinary meeting of the society on October 4, which was attended by the Vice-chancellor of the University and the Presidents of the Royal Colleges and the Royal Society of Medicine, Mr. Wilson Hey delivered his presidential address on "The Story of the Manchester Medical Societies."

British Epilepsy Association

A British Epilepsy Association has been formed with the principal object of carrying out an educational and propaganda campaign to create a proper understanding of the epileptic. Lady Cynthia Colville is chairman of the provisional council, and Miss Irene Gairdner, honorary secretary. The headquarters of the association are at 39, Queen Anne Street, W.1. The council includes five medical members—namely, Sir Charles Symonds, Dr. Russell Brain, Dr. Macdonald Critchley, Dr. Letitia Fairfield, and Dr. Denis Williams—and about 20 lay members. One of the activities of the new organization will be the establishment of an information bureau and advisory service. The association will assist in the provision of hostels and convalescent homes and will publish literature designed to promote the interests of epileptics.

Moyne Institute of Preventive Medicine

The foundation-stone of the Moyne Institute of Preventive Medicine, Trinity College, Dublin, was laid by the Honourable Grania Guinness on September 30. The Institute is the gift of Miss Guinness in memory of her father, the first Baron Moyne. Lord Moyne, who had a distinguished record of public service, was assassinated in Cairo in 1944 while acting as British Minister Resident in the Middle East. The Moyne Institute will house the departments of bacteriology and of social medicine, and will also contain a theatre to accommodate 100 students, a lecture room, a departmental library, and laboratories for large and small classes and for individual research workers. Space will be provided for diagnostic laboratories, inoculation rooms, sterile rooms, incubator rooms, a media kitchen, and rooms for washing and sterilizing, etc. One floor of one wing will be devoted to a department of social medicine, which the College authorities intend to establish when the Institute is completed, probably by the autumn of 1952. Much thought and care have gone to the planning of this new building. By the generosity of the Rockefeller Foundation and of Trinity College Professor J. W. Bigger and the architect were enabled to visit laboratories in England, Scandinavia, and the United States. The growth in size and importance of the department of bacteriology has been due in no small measure to the personality of Professor Bigger, and it is much to be regretted that ill-health has recently forced him to retire.

COMING EVENTS

Neurological Demonstrations

A series of clinical neurological demonstrations will be given at the Maida Vale Hospital Medical School, London, W., on Fridays, at 5 p.m., from October 13 to December 15. Details will be published in the "Societies and Lectures" column of the *Journal* week by week.

Annual Harveian Commemoration

Sir Leonard Parsons, F.R.S., will deliver the Harveian Oration on "The Influence of Harvey and His Contemporaries on Paediatrics" before the Royal College of Physicians of London (Pall Mall East, S.W.) on Wednesday, October 18, at 3 p.m. A dinner will be held at the College on the same day at 7.45 for 8 p.m.

Society of Medical Officers of Health

A meeting of the Society of Medical Officers of Health will be held in the Hastings Hall, B.M.A. House, Tavistock Square, London, W.C., on Thursday, October 19, at 5.30 p.m., when Dr. J. M. Gibson will be installed as president of the Society for 1950–1 and will deliver his presidential address entitled "Give Us the Tools."

Biological Hazards of Atomic Energy

The Institute of Biology and the Atomic Scientists' Association, with the support of the British Association, will hold a conference on the biological hazards of atomic energy. The conference will take place at the Royal Institution, Albemarle Street, London, W.1, on Friday and Saturday, October 20–21, and will be divided into the following sessions: I. Biological and Medical Effects of Radiation (chairman: Sir Henry Dale, O.M., F.R.S.). II. Tolerance Levels and Measures of Protection (chairman: Sir John D. Cockcroft, F.R.S.). III. Biological Implications (chairman: Sir Ernest Rock Carling). IV. Atomic Energy and the Future (chairman: Lord Boyd-Orr, F.R.S.). Discussion will follow the various papers; there will be an exhibition in connexion with the conference. Admission is by ticket, and further information can be obtained from the secretary, British Association, Burlington House, W.1.

St. George's Hospital Medical School

A series of lecture-demonstrations on neurology and psychiatry will be given in the large lecture theatre of St. George's Hospital Medical School, Hyde Park Corner, London, S.W., on Thursdays, at 4.30 p.m., from October 19 to December 21. The lecture-demonstrations are open, without fee, to all medical practitioners and senior medical students. Details will be published in the "Societies and Lectures" column of the *Journal* week by week.

Wessex Rahere Club

The autumn dinner of the Wessex Rahere Club will be held at the Spa Hotel, Clifton, Bristol, on Saturday, October 21, when Mr. John Hosford will be the guest of honour. Membership of the club is open, without subscription, to all St. Bartholomew's Hospital men resident in the West Country. All interested are invited to communicate with the honorary secretary, Mr. A. Daunt Bateman, F.R.C.S., 3, The Circus, Bath.

Nurses' and Midwives' Conference

The thirty-fifth annual Professional Nurses and Midwives Conference and Exhibition, held under the auspices of the *Nursing Mirror*, is to take place at Seymour Hall, Seymour Street, London, W.1, from October 23–27. The opening

ceremony will be performed by Countess Mountbatten of Burma. A number of conference lectures will be given by distinguished medical men and women, and in addition a full film programme has been arranged.

Public Health Administration

A Chadwick Public Lecture on "Public Health Administration in Western Union Countries: A Comparative Synthesis" will be delivered by Dr. Neville M. Goodman (Ministry of Health) in the Sir Edward Meyerstein Lecture Theatre, Westminster Medical School, 17, Horseferry Road, Westminster, London, S.W., on Tuesday, October 24, at 4.30 p.m. Admission to the lecture is free and no tickets are required.

Honyman Gillespie Lectures

A series of Honyman Gillespie Lectures has been arranged, in association with Edinburgh postgraduate courses, to take place during the autumn term in the anatomy theatre, University New Buildings, Teviot Place, Edinburgh, on Thursdays at 5 p.m., from October 26 to December 14, both dates inclusive. The lectures are open to all graduates and senior students, and details will be published in the "Societies and Lectures" column of the *Journal* week by week.

Prize Offered by American Chest Physicians

The Board of Regents of the American College of Chest Physicians offers a cash prize award of $250 to be given annually for the best original contribution, preferably by a young investigator, on any aspect of medicine relating to chest disease. The prize is open to contestants of other countries as well as those residing in the United States. The winning contribution will be selected by a board of impartial judges, and the award, together with a certificate of merit, will be made at the forthcoming annual meeting of the College to be held in Atlantic City, New Jersey, on June 7–10, 1951. The College reserves the right to invite the winner to present his contribution at the annual meeting and to publish the essay in its official publication, *Diseases of the Chest*. Contestants are advised to study the format of *Diseases of the Chest* as to the length, form, and arrangement of illustrations to guide them in the preparation of the manuscript. The following conditions must be observed:

1. Five copies of the manuscript, typewritten in English, should be submitted to the executive office of the College, 500, North Dearborn Street, Chicago 10, Illinois, not later than April 1, 1951.

2. The only means of identification of the author or authors shall be a motto or other device on the title page and a sealed envelope, bearing the same motto or device on the outside, enclosing the name of the author or authors.

SOCIETIES AND LECTURES

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

Friday

MAIDA VALE HOSPITAL MEDICAL SCHOOL, London W.—October 13, 5 p.m., clinical neurological demonstration by Dr. Samuel Nevin.

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—October 16, 5 p.m., "*Electroencephalography in Children*," by Dr. Denis Hill.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—October 16, 5.30 p.m., "*The Optic Nerve and Chronic Simple Glaucoma*," by Mr. A. G. Cross.

●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow.—October 16, 4 p.m., "*The Effect of Cortisone and A.C.T.H. on Rheumatic Diseases*," Inaugural Walker Trust Lecture by Dr. Philip S. Hench (Rochester, U.S.A.).

Tuesday

BRISTOL UNIVERSITY.—October 17, 8.15 p.m., "*Some Food Infection Problems*." Long Fox Memorial Lecture by Sir William Savage.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 17, 5.30 p.m., "*The Assessment of Nutritional Status in Population Groups*," by Dr. D. A. Smith.

EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, London, W., October 17, 5.30 p.m., "*Colonial Medical Policy in Relation to Population Growth*," by Professor T. H. Davey.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 17, 5 p.m., "*Pathology*," by Dr. J. O. Oliver.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—October 17, 5 p.m., "*The Physiology of Neuromuscular Transmission and Neuromuscular Block*," by Dr. W. Feldberg.

LONDON UNIVERSITY.—At St. Mary's Hospital Medical School (Wright-Fleming Institute Lecture Theatre), Paddington, London, W., October 17, 5 p.m., "*Hormones of the Sympathetic Nervous System and the Adrenal Medulla*," by Professor U. S. von Euler (Stockholm).

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 17, 4 p.m., "*Contact Lenses*," by Dr. C. G. Kay Sharp; 5 p.m., "*Genetics in Ophthalmology*," by Professor A. Sorsby.

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 11, Chandos Street, Cavendish Square, London, W., October 17, 4 p.m., "*Alcohol and the Motorist, with special reference to the Proceedings of the First International Conference on Alcohol and Traffic*," by Dr. W. R. Bett. A discussion will follow.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—October 17, 1.15 p.m., "*Unresting Cells*," by Mr. M. Abercrombie.

Wednesday

GLASGOW UNIVERSITY.—In Department of Ophthalmology, October 18, 8 p.m., "*Extra-foveal Perception of Form*," by Dr. Stewart Renfrew.

HARVEIAN SOCIETY OF LONDON.—At 26, Portland Place, London, W., October 18, 8.15 p.m., "*Byssinosis*." by Dr. R. E. Lane.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 18, 5 p.m., "*Medical Mycology*," lecture-demonstration by Dr. R. W. Riddell.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8, Hunter Street, London, W.C., October 18, 8.30 p.m., annual general meeting.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—October 18, 3 p.m., "*The Influence of Harvey and his Contemporaries on Paediatrics*," Harveian Oration by Sir Leonard Parsons, F.R.S.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—October 18, 3.30 p.m., "*Housing and Health—Problems in Great Britain and France*," by Mr. B. S. Townroe, M.A., D.L.

Thursday

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—October 19, 8.15 p.m., "*Opportunity Knocks at the Door*," presidential address by Dr. R. Fawcitt.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 19, 5.30 p.m., "*Nutritional Factors in Liver Disease*," by Dr. H. P. Himsworth.

EDINBURGH CLINICAL CLUB.—At B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, October 19, 8 p.m., "*The Future Status of the General Practitioner*," by Dr. W. D. D. Small.

LONDON HOSPITAL MEDICAL COLLEGE, Turner Street, E.—October 19, 4.15 p.m., "*Clinical Medicine*," Schorstein Memorial Lecture by Dr. F. M. R. Walshe, F.R.S.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 19, 5.30 p.m., "*Visual Fields: Normal and Pathological*," by Mr. C. Taylor.

ROYAL SANITARY INSTITUTE.—At Oldway Mansion, Paignton, October 19, 10 a.m., papers: "*Detection of Enteric Carriers in Towns by Means of Sewage Examination*," by Dr. B. Moore; "*A Food Hygiene Scheme in a Health Resort*," by Mr. G. J. Loveless, M.S.I.A. Afternoon: visits will be made.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, London, W., October 19, 7.30 p.m., "*Tropical Pulmonary Eosinophilia*," by Dr. Donald Ball. A discussion will follow.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—October 19, 4.30 p.m., lecture-demonstration on neurology by Dr. D. J. Williams.

Friday

BIOCHEMICAL SOCIETY.—At National Institute for Medical Research, The Ridgeway, Mill Hill, London, N.W., October 20, 11 a.m., 290th meeting. Papers will be read.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—October 20, 5 p.m., meeting of medical members; 6.30 p.m., "*The Use of Scintillating Crystals and Solutions in the Measurement of Radiation*," by Mr. E. H. Belcher, M.A.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., October 20, 2.15 p.m., diagnosis section meeting. "*The Value of Straight X-ray Examinations of the Skull in the Diagnosis of Lesions of the Central Nervous System*," by Dr. J. W. D. Bull.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—October 20, 5.30 p.m., "*Orbital Inflammation and the Ear, Nose, and Throat*," by Mr. J. Marshall.

MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—October 20, 5 p.m., clinical neurological demonstration by Dr. P. H. Sandifer.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 20, 4.30 p.m., "*Medical Ophthalmology*," by Mr. A. J. Cameron.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—October 20, 8 p.m., "*The Mechanism of Sleep*," dissertation by Mr. A. E. Meek.

Sunday

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Rose Hertz Hall, Woburn House, Upper Woburn Place, London, W.C., October 22, 3 p.m., "*Common Errors in Cardiovascular Practice*," presidential address by Dr. Geoffrey Konstam.

APPOINTMENTS

Harold Balme, O.B.E., M.D., F.R.C.S., has been appointed technical consultant on rehabilitation to the U.N. Department of Social Affairs and the World Health Organization.

CULBERT, T. D., M.B., D.A., Senior Consultant Anaesthetist, Manchester Babies' and Children's Hospital Group, with duties in Manchester Northern Hospital Group.

DONE, JANET M., M.D., D.P.H., D.R.C.O.G., Senior Assistant Medical Officer of Health for Maternity and Child Welfare, Coventry.

LOWE, MURIEL J., M.B., B.S., D.P.H., D.C.H., Assistant County Medical Officer, Goole Area Division No. 10, West Riding of Yorkshire.

PATTERSON, JOHN, M.B., B.Ch., B.A.O., D.P.H., Assistant Divisional Medical Officer, No. 1 Division (Ulverston), County of Lancashire.

ROSS, ALASTAIR IAN, M.D., D.P.H., Deputy Medical Officer of Health, City of Leicester.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—*Consulting Dermatologist in North Gloucestershire Clinical Area*, R. E. Bowers, M.D., M.R.C.P.; *Physicians in Psychiatry at Bristol Mental Hospital*, G. M. Gibb, M.B., Ch.B., D.P.M., and J. B. Phillips, M.D., D.P.M.

VICKERY, K. O. A., M.D., D.P.H., Deputy Medical Officer of Health, County Borough of Bournemouth.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Burkitt.—On October 1, 1950, at 133, Gresham Road, Staines, Middx., to Violet, wife of R. T. Burkitt, M.D., F.R.C.S.I., a daughter.

Hill.—On October 7, 1950, at Robinson Hospital, Ballymoney, to Nancy, wife of Dr. William J. C. Hill, Portrush, a daughter.

Hotchkis.—On September 29, 1950, to Jean M. Hotchkis (formerly Smout), M.B., Ch.B., wife of Mr. Alistair Hotchkis, Balgowan, Pitlochry, Perthshire, a son.

Illingworth.—On October 1, 1950, to Dr. Cynthia Illingworth, M.R.C.P. (formerly Redhead), wife of Professor R. S. Illingworth, M.D., F.R.C.P., a son.

Imray.—On September 1, 1950, to Peggy, wife of Dr. M. A. Imray, Bowden House, Market Harborough, Leics., a sister for Elizabeth and Robin—Gillian Mary.

Lawrence.—On October 8, 1950, at Redruth, to Jane (formerly Thom), wife of Dr. D. B. Lawrence, a son.

Matthews.—On September 12, 1950, at St. Luke's Hospital, Guildford, to Diana (formerly Tenby-Smith), wife of Dr. Harold W. Matthews, a daughter—Roha Elizabeth Hayden.

Merry.—On July 8, 1950, at the Point Fortin Hospital, Trinidad, to Kathleen, wife of Dr. C. H. Merry, a daughter.

Scurr.—On September 23, 1950, at Westminster Hospital, to Jean (formerly Spiller), wife of Dr. Cyril Scurr, a son.

Spicer.—On October 4, 1950, to Faith (formerly James), wife of Dr. C. C. Spicer, of 65, Beaufort Mansions, London, S.W., a son.

DEATHS

Avery.—On September 30, 1950, at 928, London Road, Leigh-on-Sea, Essex, John Avery, M.R.C.S., L.R.C.P.

Charsley.—On September 29, 1950, Gilbert William Charsley, M.R.C.S., L.R.C.P. of 6, Regina Court, 42, Fitzjohn's Avenue, Hampstead, London, N.W., formerly of Sydenham.

Fawssett.—On September 29, 1950, Francis William Fawssett, M.B., M.R.C.S., of 31, Chantry Lane, Grimsby, Lincs.

Fraser.—On September 29, 1950, at a nursing-home, Edinburgh, Robert Murray Fraser, L.R.C.P.&S.Ed., H.D.D., L.D.S.Ed., of 28, Morningside Place, Edinburgh.

Graham-Little.—On October 6, 1950, at his Epsom home, Wimpole Lodge, Sir Ernest Gordon Graham-Little, M.D., F.R.C.P.

Lowson.—On September 27, 1950, at New House, Moat Drive, Tamworth, Staffs, William Lowson, M.B., Ch.B., aged 79.

Maclean.—On August 3, 1950, Archibald Maclean, M.B., Ch.B., of Auchencairn, Union Street, Hamilton, Lanarkshire, aged 43.

McCutcheon.—On October 1, 1950, at Warren House, Mayfield, Sussex, Oliver Edward McCutcheon, M.B., B.Ch., aged 80.

McQuade.—On September 18, 1950, at Ilorin, Nigeria, Henry Gray McQuade, M.B., B.Chir., of Wyndfell, Steyning, Sussex.

Miskin.—On September 25, 1950, at the Kent and Canterbury Hospital, Canterbury, Leonard John Miskin, M.B., F.R.C.S., of Perry Farm, Wingham, near Canterbury, Kent.

Moran.—On September 25, 1950, at 1a, Winster Avenue, West Didsbury, Manchester, Peter Moran, M.D.

O'Gorman.—On September 22, 1950, at the London Hospital, Patrick Wilkins O'Gorman, C.M.G., M.D., M.R.C.P., D.P.H., Lieutenant-Colonel, I.M.S., retired, of 3, St. John's Road, Harrow-on-the-Hill, aged 92.

Plummer.—On October 6, 1950, Francis Christopher Plummer, M.D., of Hillmorton, Dunsan's Lane, Burton-in-Wirral, and Rodney Street, Liverpool, aged 62.

Purdy.—On September 20, 1950, after a long and painful illness, Margaret Mary, beloved wife of Gordon Purdy, M.B., F.R.C.S.Ed., of Ashby House, Oakham, Rutland.

Raeburn.—On September 28, 1950, at Dumfries, James Alexander Raeburn, M.D., D.P.H.

Any Questions?

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

Dispensing of P.A.S.

Q.—*Is it essential for P.A.S. powder to be dissolved freshly each day, or is it possible to make up a supply to last, say, for three days or longer?*

A.—It is unnecessary for P.A.S. to be dissolved freshly each day in water, and it is quite in order to make up a supply to last for three days, but preferably not for longer. Many patients complain of the unpleasant taste and nauseating effect of such solutions. On the other hand, if P.A.S. is dispensed in tablets of 0.5 g., it may be necessary for the patient to swallow as many as 30 a day. Some patients prefer therefore to take the drug in cachets, each containing 1.5 g. This method of prescribing P.A.S. was mentioned by Dr. Hayman Jones in the *Journal* of June 10 (p. 1375), and such cachets are now on the market. Two cachets dipped in water and taken with a draught of water are not usually found very difficult to swallow, and there is no unpleasant taste. This dose should be taken at three-hourly intervals between 9 a.m. and 9 p.m. Some patients are nauseated by the drug when therapy is first begun, so it is wise to start with a daily dose of 5 g., gradually increasing to the full quantity of 15 g.

"Infective Gingivitis"

Q.—*What is the aetiology and treatment of infective gingivitis?*

A.—The aetiology of the condition is unknown, and, although it has been suggested that the virus of herpes simplex plays some part, there is no clear evidence that the lesions are infective. In women the ulcers may arise just prior to the onset of menstruation. The tip of the tongue, the gum some little distance from the teeth, and the inner aspect of the lips are the most common sites of ulceration. More rarely the palate may be involved. There is no infallible method of treatment, but the condition often responds to administration of one or more components of the vitamin-B$_2$ complex—e.g., 2 mg. riboflavin and 100 mg. nicotinamide daily—together with local applications of 1% gentian violet. Recurrences are relatively common.

Thrombophlebitis Migrans

Q.—*A male clerk, aged 30, first came to me four months ago with a thrombophlebitis of the external saphenous vein about 4 in. (10 cm.) above the knee-joint. Despite penicillin and anticoagulants in the usual dosage, the process has since been progressive—wandering about the leg in a most haphazard fashion. Not a week has passed but a fresh patch develops, and both patient and doctor have wearied of its persistence. No septic focus has been found. (1) Can we institute any treatment now? (2) Should we have ligated long ago? (3) What is the likelihood of Buerger's disease developing here?*

A.—The case is probably one of thrombophlebitis migrans. Each outburst should be treated with "elastoplast" support and enough dicoumarol to obtain a prothrombin time increased by 120%; this increase should be maintained for about a month. Penicillin seems to be of no value in this condition, and neither is internal saphenous ligation unless the veins are grossly varicose. The possibility of Buerger's disease developing can be put at 20%. The disease eventually burns itself out, but may last as long as two years. It is usual for these cases to continue normally at work provided there is no pyrexia. If this is present, there is lassitude and malaise which prevents work for short periods.

High Morning Blood Pressure

Q.—*I am treating a woman of 49 who suffers from hypertension. She has occasional headaches and a faint albuminuria, but otherwise appears well. The curious feature of her case is that the blood pressure on awakening in the morning is about 220/130, but it steadily diminishes during the day to about 170/110 when she retires. What is the significance of this?*

A.—It is certainly unusual for the blood pressure to be higher after a night's rest than later in the day. It suggests the influence of some substance causing vasodilatation, such as alcohol; it is presumed this is not the case. Other such agents include heat and gentle exercise. It is also assumed that all pressures are taken with the patient in the horizontal position, for a drop in blood pressure on standing up is not incompatible with hypertension. This is seen typically after a Smithwick operation.

Pregnenolone

Q.—*I hear that a substance called "pregnenolone," which is said to be non-toxic and cheap to produce, has been used in America for the treatment of rheumatoid arthritis with a success approaching that of "cortisone." Can you tell me if pregnenolone has been used in this country and, if so, with what results?*

A.—Pregnenolone has been advocated for the treatment of rheumatoid arthritis in several recent papers published in America. This substance has been tested in this country under controlled conditions in at least two centres, but the English workers have been unable to reproduce these beneficial results. In one series only did improvement occur, in one patient, for a time; but a further course of this treatment failed to reproduce the benefit. It is difficult to know why the American results should differ so markedly from those of English observers; it should be noted, however, that very recently reports have been received from American physicians who have also been unable to produce permanent clinical improvement in their patients treated with pregnenolone. The report of a trial in this country of pregnenolone and other steroid compounds is given in the opening pages of this week's *Journal*.

Bogomoletz Serum

Q.—*Will you please give me some information on the treatment of degenerative diseases with Bogomoletz serum?*

A.—Bogomoletz's antireticular cytotoxic serum (A.C.S.), although originally prepared in 1924, was the subject of a note in this country first in 1943 (*British Medical Journal*, 1943, **2**, 203). It was pointed out that the resistance of the organism to bacterial infection and to neoplasm, the healing of wounds and ulcers, and the normal union of fractured bones depended on the activity of "connective tissue"; "connective tissue" in this context being probably more accurately represented by the wider term "mesenchyme." Bogomoletz devised his serum with the object of stimulating the physiological activity of the mesenchyme. It was prepared by the repeated injection into horses of the cellular elements of human spleen and bone-marrow; in large doses the resulting serum was claimed to depress, and in small doses to stimulate, mesenchymal activity.

At a conference in Ufa, Russian clinicians reported the results in 2,500 cases treated with A.C.S. It was said to promote union in fractures which were uniting slowly, to hasten wound healing, to improve suppurative states, frost-bite, and burns; it was claimed to have a beneficial effect on cerebrospinal fever, pelvic sepsis, rheumatism, pneumonia, lung abscess, tonsillitis, neuritis, meningo-encephalitis, disseminated sclerosis, and certain psychoses; some cases of peptic ulcer and of eczema were stated to have been favourably influenced. Organisms resistant to sulphonamides were said to be rendered sensitive after injection of A.C.S. (Kavetsky, 1946). The serum has been the subject of several studies in the United States. Straus and his collaborators (1946) investigated methods of producing A.C.S. and were able to show that a large dose delayed healing of fractures in rabbits, although there was no evidence that small "stimulating" doses increased the rate of union above normal. Maltz, Spain, and Molomut (1948) with a similar antisplenic-tissue serum obtained accelerated healing of non-infected wounds in mice. Controlled experiments of the therapeutic effect of A.C.S. in man have been largely negative, although Ilfeld (1948) claimed that fractured femora united more rapidly when a patient was given A.C.S. The only "degenerative" diseases in which the serum has been widely used outside Russia are various rheumatic disorders. There is general agreement that the effects in rheumatoid arthritis are slight and transient (Rogoff *et al.*, 1947; Solomon and Stecher, 1948; and Kling, 1948). The same authors have noted even less benefit in osteoarthritis and fibrositis. Abernethy *et al.* (1948) found A.C.S. without effect in Hodgkin's disease. Thus, although great benefit is claimed in Russia from the use of A.C.S. in many and varied diseases, it has been employed little elsewhere, and insufficient data are available for a critical appraisal of its value. The technique of the preparation and administration of A.C.S. is described by Marchuk (1943).

References

Abernethy, J. W., Harrell, G. T., Morris, L. M., Valk, H. L., and Cheek, K. M. (1948). *N. C. med. J.*, **9**, 341.
Ilfeld, F. W. (1948). *J. nat. med. Ass.*, **40**, 116.
Kavetsky, R. E. (1946). *Med. franç., Paris*, **6**, 285, 288.
Kling, D. H. (1948). *J. Lab. clin. Med.*, **33**, 1289.
Maltz, M., Spain, D. M., and Molomut, N. (1948). *J. Immunol.*, **60**, 303, 313.
Marchuk, P. D. (1943). *Amer. Rev. Soviet Med.*, **1**, 113.
Rogoff, B., Freyberg, R. H., Powell, H. M., and Rice, R. M. (1947). *Amer. J. med. Sci.*, **214**, 395.
Solomon, W. M., and Stecher, R. M. (1948). *J. Lab. clin. Med.*, **33**, 768.
Straus, R. (1946). *J. Immunol.*, **54**, 151.
—— Horwitz, M., Levinthal, D. H., Cohen, A. L., and Runjavac, M. (1946). Ibid., **54**, 163.
—— Runjavac, M., Zaitlin, R., Duboff, G., and Swerdlow, H. (1946). Ibid., **54**, 155.

Resistance to Streptomycin

Q.—(*a*) *What is the mechanism of development of resistance to streptomycin by the tubercle bacillus?* (*b*) *Is the change reversible?* (*c*) *In the case of bone or joint infection is the response to conservative treatment less favourable when the organism is "streptomycin-resistant"?*

A.—(*a*) The mode of action of streptomycin is not known with certainty: hence we are similarly ignorant of how bacteria escape from it. The action must consist of checking some metabolic process, and this is made all the more likely by the fact that resistance may be accompanied by "dependence"—i.e., the drug may become an essential nutrient without which the organism will not grow. It has been fully recognized for several years that other species of bacteria undergo this change, and recent evidence suggests that the same may be true of tubercle bacilli.

(*b*) In general, acquired resistance to streptomycin is permanent. In a few patients, sensitive tubercle bacilli have been recovered from sputum when a previous culture had shown resistant bacilli. This is not as encouraging as it may seem, because the bacterial population in a case under treatment is known to be highly heterogeneous, including bacilli of very varying degrees of resistance along with some which are still sensitive (and possibly some which are dependent): hence chance colony-selection may yield an anomalous result although the general trend of the change taking place is towards an increasing degree of resistance.

(*c*) So far as is known, the reaction of tubercle bacilli to streptomycin has no influence on any treatment other than the use of the drug itself.

All communications with regard to editorial business should be addressed to The Editor, British Medical Journal, B.M.A. House, Tavistock Square, London, W.C.1. Telephone: Euston 2111. Telegrams: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). Telephone: Euston 2111 Telegrams: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. Telephone: Euston 2111. Telegrams: *Medisecra, Westcent, London.*
B.M.A. Scottish Office: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 21 1950

VALUE OF GENETICS IN MEDICINE*

BY

L. S. PENROSE, M.D.

Galton Professor of Eugenics, University College, London

A routine procedure which is accepted as part of the correct technique in clinical medicine is the inquiry into family history. The student is instructed to ascertain the state of health or cause of death of the parents, brothers, sisters, and children of the patient. The facts elicited may tell him, it is alleged, whether the patient is disposed by heredity to any particular disease (Hutchison and Hunter, 1949). In spite of these injunctions, the use which is to be made of the family history remains wrapt in obscurity. From the patient's point of view, perhaps this is advantageous.

In the past there has been a tendency to look upon the family history as though it were a kind of Wassermann test, usually negative but occasionally positive and sometimes strongly positive. When the family history reaction turned out to be positive the disease was regarded as hereditary and the patient's condition would be apt to be judged incurable or even unmodifiable. In these circumstances the first thing to be done after taking a family history would be to forget all about it and to treat the case on its own merits. Indeed, the positive or negative family history is a very poor index of heritability. The recurrence of disease of a particular kind in more than one member of a family is no certain index of genetical causation. Serious mistakes were made in the past, rickets, syphilis, leprosy, and tuberculosis being classified as hereditary conditions because they were familial. Conversely, a rare recessive trait or a fresh mutant often appears without any trace of familial incidence.

It is now clear to most physicians that the interaction between hereditary constitution and environment is exceedingly subtle and complex. The course of every ailment known to medicine is influenced to a greater or lesser degree by the genetical structure of the individual patient. We are accustomed to the necessity of making exhaustive researches into environment, both physical and psychological, in order to understand the causes of disease. Infection, diet, occupation, and climate are searched for causal factors.

Similarly, it is logical to investigate the details of genetical constitution as profoundly as possible. We must, however, avoid imagining that genetical inquiry will lead us towards *the* cause of the condition except in the rarest cases. The correct interpretation of pedigree material is usually a matter of the greatest difficulty, partly because of the limited state of our knowledge of human genetics at the present time and partly on account of the inadequacy of the inquiries made at routine examinations—for example, the omission of inquiries about parental consanguinity. My first point is, then, that if family histories are to be taken as part of routine clinical procedure it is surely worth while to teach medical men and women enough of the principles of human genetics to enable them to know what use, if any, is to be made of them.

The central question for discussion is, however, the actual value of genetics in clinical medicine at the present time. It must be freely admitted that this value is very limited, and nothing would be more injurious to the proper development of human genetics than to give the impression that it will prove to be any kind of a panacea.

*Read in opening a discussion in the Section of Medical Genetics at the Annual Meeting of the British Medical Association, Liverpool, 1950.

Use in Serology and Pathological Biochemistry

There are two strictly clinical fields in which genetics has a very definite place. One of these is the study of serology. Incompatibility of donor's corpuscles with recipient's serum has been recognized as an avoidable danger in transfusion if cross-matching of bloods is carried out. Genetical knowledge is helpful here but not absolutely essential. Incompatibility of a foetus with its mother can, however, be predicted on genetical grounds and appropriate treatment planned before examination of the foetal blood is possible. The association of foetal disease with rhesus incompatibility, first recognized by Levine, Katzin, and Burnham (1941), is the most dramatic and convincing demonstration of the use of genetics in clinical medicine.

There is another field in which the value of genetics is becoming increasingly obvious—namely, the study of inborn biochemical specificities. The groundwork of the subject was well prepared by Garrod (1902), who showed that genic differences between individuals, responsible for clinical peculiarities, could be detected biochemically. The first disturbance to be fully described was alkaptonuria, which only very rarely produces any disability. This condition contrasts with phenylketonuria, first described by Fölling (1934), which is invariably associated with a subnormal level of mental functioning. There are conditions of intermediate medical significance, like hyperuricaemia, which are usually innocuous but sometimes cause severe symptoms, like gout.

The successful treatment of some cases of inborn methaemoglobinaemia with ascorbic acid or with methylene blue, and the treatment of cases of the syndrome of de Toni and Fanconi with vitamin D and alkali, have shown that knowledge of pathological biochemistry in these hereditary diseases can lead to striking practical results. The genetical part of the work enables such treatments to be accurately aimed because we know that gene differences produce sharp distinctions. If a precisely defined biochemical diathesis is

detected in a healthy relative of a known case of illness caused by the same genetical peculiarity, prophylactic measures can be confidently recommended. Bacterial genetics have latterly demonstrated that genic differences are often manifested in the loss of particular enzymes. Sometimes, however, genic effects are shown in specific peculiarities of membrane permeability or, as in some anaemias, peculiarities in the structure of the haemoglobin molecule. These discoveries, together with the advances of human biochemical genetics, have enabled the study of diathesis to be placed on a sound and logical basis, and great progress in this field may now be expected.

Eugenics in Prevention of Hereditary Disease

I now come to the negative side of the question—namely, the prevention of hereditary disease by eugenic recommendations. A view sometimes expressed is that it should be part of any efficient scheme of public health to attempt to cleanse the population of injurious genes. Such an aim, directed not towards improving the health of the existing population but that of future generations, is hardly consistent with the fundamental medical tradition of treating every individual case on its own merits. In the present state of genetical knowledge, moreover, the prospects of making any appreciable change in the genetical composition of the population by preventive eugenics are remote. Evidence is accumulating which suggests that natural selection has produced balanced genetical systems that are resistant to change, and I have attempted to apply the idea to the genetics of intelligence (Penrose, 1950).

Benefits for individual parents or prospective parents can be derived from genetical studies on rare familial diseases. If unaffected carriers of injurious genes could be diagnosed much comfort could be given to inquiring patients. Little practical help can be expected from genetical prognoses in relation to common diseases—for example, those with a frequency of the order of 1 in 100 or commoner. The belief was held by earlier workers, and is still accepted in some quarters, that many common traits, such as mental defect (Goddard, 1914), diabetes (Pincus and White, 1933), and schizophrenia (Kallmann, 1938) are inherited in simple ways, perhaps caused by common recessive genes. A careful study of the natural histories of these conditions, as exemplified in variability of clinical type, onset age, and sex incidence, at once rules out all simple genetical explanations. Furthermore, the elements in the causation due to environment can be changed but constitution cannot, so that medicine must concentrate on environment.

Besides strictly genetical problems arising in medicine, there are many of a semi-genetical kind concerned with the maternal influences on foetal development. These influences may be closely associated with maternal age, parity, health, nutrition, and so on. Advice is often requested by prospective parents on all these matters, and it might be advantageous if full use could be made in health services of the rather limited knowledge at present available.

Need for Accurate Information

Though human geneticists hope ultimately to be of practical use, at present they are contributing to the general body of scientific knowledge rather than to therapeutic medicine directly. While genetics has some contribution to make to medicine, this is far outweighed by the service which has been and will continue to be rendered by medicine to genetics. One may ask, then, what is particularly required from medical science at the present time? The question is easy to answer. Accurate information is needed about the incidence of disease in the general population. The ascertainment of really useful data on these matters is difficult. The geneticist requires to know not only the crude incidence of a condition like, say, diabetes mellitus, but the incidence in different age groups as well, classified also by sex. Moreover, degrees of severity have to be taken into account. The classification into two categories of presence and absence of disease is insufficient, because there are usually many degrees of severity.

The importance of such data in medical genetics is clearly seen in the model investigation of Doll and Buch (1950) on the familial incidence of gastric and duodenal ulcer. A population survey previously carried out gave much greater stability to their results than could have been provided even by careful analysis of a control series of families. Precise knowledge of population data is also necessary for the estimation of gene frequencies, of mutation rates, and of fertility or biological fitness of particular genotypes. Beyond this, it is essential in the study of sex influence, begun by Sedgwick (1861), and of genetical and environmental modifying agencies. Without such data the meaning of consanguinity cannot be assessed (Harris, 1949). From the point of view of future work on the genetics of relatively common conditions like cancer, diabetes, cardiovascular disease, schizophrenia, rheumatism, and so on, the ascertainment of the incidence among the population should, in my view, take precedence. Such a task might naturally be included in a programme of social medicine.

With relatively rare abnormalities the measurement of incidence is equally important. Nothing is so misleading to the geneticist as the exclusive recording in medical literature of noteworthy familial cases, neglecting sporadic or "non-familial" examples, which are usually more characteristic of the conditions concerned. Let me give an example. From time to time cases of mongolism in two sibs—two cousins or other close relatives—are reported in the literature. How do we know whether these instances imply real familial concentration? If cases were distributed at random sooner or later two would occur in the same family. Moreover, since maternal age affects the incidence of mongolism, in that young mothers are much less prone to have such offspring than older mothers, two related cases with maternal ages between, say, 20 and 30 years are much more remarkable (about twenty-five-fold) than two cases with maternal ages over 40 years.

Similar problems arise with most familial studies because in so many diseases the ages of onset are subject to wide variation. Such an example is mammary cancer. Familial cases in females aged 60 or over will often occur even if there is no hereditary influence. The population incidence, ascertainable in mortality statistics at all ages, however, enables a base-line to be drawn for examining the strength of any familial tendency there may be in this condition. It is clear from the case material collected by the Galton Laboratory staff, as well as from that collected at the Royal Cancer Hospital, that relatives of sufferers from mammary cancer are significantly more prone to the same disease than are random members of the general population; such relatives are, however, not more than normally predisposed to develop cancer at other sites (Penrose, MacKenzie, and Karn, 1948).

Summary

To summarize, then, the family history is accepted as an integral part of clinical examination. It should be properly taken and its uses and limitations appreciated. Genetical knowledge has helped treatment directly in the fields of serology and pathological chemistry. It is not likely that harmful genes will be eliminated or even appreciably reduced by eugenical measures, but some guidance can be given to parents in special cases.

Closer contact between geneticists and medical students is desirable if full advantage is to be taken of existing knowledge. Even more important is the assistance that properly directed researches in social and clinical medicine could give to the future development of human genetics. At the present time the most pressing need is the ascertainment of population frequencies of any diseases determined, to a significant degree, by genetical factors. Such ascertainment would enable the analysis of pedigree studies to be put upon a firm basis.

References

Doll, R., and Buch, J. (1950). *Ann. Eugen.*, **15**, 135.
Fölling, A. (1934). *Hoppe-Seyl. Z.*, **227**, 169.
Garrod, A. E. (1902). *Lancet*, **2**, 1616.
Goddard, H. H. (1914). *Feeble-mindedness: Its Causes and Consequences.* Macmillan, New York.
Harris, H. (1949). *Ann. Eugen.*, **14**, 293.
Hutchison, R., and Hunter, D. (1949). *Clinical Methods*, 12th ed. Cassell, London.
Kallmann, F. J. (1938). *The Genetics of Schizophrenia.* Augustin, New York.
Levine, P., Katzin, E. M., and Burnham, L. (1941). *J. Amer. med. Ass.*, **116**, 825.
Penrose, L. S. (1950). *Brit. J. Psychol.* (General Sect.), **40**, 128.
—— MacKenzie, Helen J., and Karn, Mary N. (1948). *Ann. Eugen.*, **14**, 234.
Pincus, G., and White, P. (1933). *Amer. J. med. Sci.*, **186**, 1.
Sedgwick, W. (1861). *Brit. Foreign med.-chir. Rev.*, **27**, 477; **28**, 198.

ABSORPTION OF VITAMIN B_{12} IN PERNICIOUS ANAEMIA

I. ORAL ADMINISTRATION WITHOUT A SOURCE OF INTRINSIC FACTOR

BY

C. C. UNGLEY, M.D., F.R.C.P.

Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne

There are many who find difficulty in orientating recent work on vitamin B_{12} with teaching based on Castle's original hypothesis. Following experiments in which beef and gastric juice were fed separately and together to patients with pernicious anaemia, it was suggested that an intrinsic (gastric) factor interacted with an extrinsic (food) factor to produce the anti-pernicious-anaemia factor stored in liver. Efforts to obtain from mixtures of beef and gastric juice a product as heat-stable as the liver active principle were, however, unsuccessful. Moreover, the hypothesis failed to explain why the dosage required for orally administered liver extract so vastly exceeded the amount needed for injection. Even when it was shown that the simultaneous administration of a source of intrinsic factor allowed a greatly reduced oral dose of liver (Reimann and Fritsch, 1934) or liver extract (Fouts, Helmer, and Zerfas, 1935) most of us misinterpreted this to mean that liver contained extrinsic factor in addition to liver active principle.

The problem has been clarified by the behaviour of vitamin B_{12}. This heat-stable substance isolated from liver is effective both in pernicious anaemia (West, 1948) and in subacute combined degeneration of the cord (Berk, Denny-Brown, Finland, and Castle, 1948; Ungley, 1949b). It thus fulfils all the criteria of a true "liver active principle."

When administered orally, however, vitamin B_{12} behaves like Castle's extrinsic factor in that small amounts are effective only if accompanied by a source of intrinsic factor (Berk, Castle, Welch, Heinle, Anker, and Epstein, 1948). In this case at least "extrinsic factor" appears to be identical with "liver active principle," interaction with intrinsic factor being necessary only if the material is given by mouth.

The present work is an attempt (*a*) to determine how effectively vitamin B_{12} is absorbed when given alone or with gastric juice, and (*b*) to answer the question: Does Castle's intrinsic factor directly facilitate the absorption of B_{12} or merely protect it from destruction in the gastro-intestinal tract?

The results are described in consecutive papers, with the following subtitles: I. Oral administration without a source of intrinsic factor. II. Oral administration with normal gastric juice. III. Failure of fresh milk or whey concentrate to function as Castle's intrinsic factor or to potentiate the action of orally administered vitamin B_{12} (with Mr. G. A. Childs). IV. Administration into the buccal cavity, into a washed segment of intestine, or after partial sterilization of the bowel. No. V, on the influence of gastric and intestinal juice on the availability of vitamin B_{12} determined microbiologically (with Dr. W. F. J. Cuthbertson), will be published later.

To facilitate cross-reference, the cases are numbered from 101 in Paper I, 201 in Paper II, and so on.

Methods

Haematological methods, dietary control, and selection of cases have been described (Ungley, 1949a). All patients had pernicious anaemia with megaloblastic marrow and complete achlorhydria even after histamine and alcohol. All showed at least one characteristic reticulocyte response to potent material and ultimately attained complete remission, usually after further treatment with vitamin B_{12} or liver extract. Only relevant parts of the case histories are included.

Dietary histories are summarized because of the possibility—still being explored—that even in pernicious anaemia the chance of a patient responding to orally administered vitamin B_{12} may be greater if low intake as well as deficient absorption had contributed to the development of deficiency; and because deficiency of other dietary factors such as folic acid could interfere with the response to vitamin B_{12} even if the latter were injected parenterally.

Pure vitamin B_{12} was used except in the first period of Case 101, in which vitamin B_{12o} was given, and in five cases receiving 3,000 μg. as concentrate, to be reported fully later.

The time of administration was considered in relation to the phases of digestion and the nature of foods ingested within six hours which might affect the availability of vitamin B_{12} to bacteria or to the host. The large doses of vitamin B_{12} concentrate ($\equiv$3,000 μg.) were given fasting, and no food was ingested until six hours afterwards.

Responses were assessed on the increase of red blood cells in 15 days rather than on the reticulocytosis, although the latter sometimes afforded valuable confirmation. Haemoglobin and packed-cell volume were recorded as a further check. The double reticulocyte response method of Minot and Castle (1935) was used in some cases.

To facilitate comparison and to avoid the need for ambiguous terms such as "good," "maximal," or "optimal" response, the increase of red blood cells in 15 days was expressed as equivalent to the reponse expected from a single injection of so many micrograms of vitamin B_{12} (Ungley, 1949a, Tables II and V). Oral preparations were sometimes given daily, whereas standards for parenteral therapy are based on the response to a single dose. Nevertheless the total amount could be compared with the parenteral dose which would be expected to give the same response (see Table). When subsequent tests showed that the patient's actual responsiveness to injected material was below expectation the oral-dose/injection-dose ratio was corrected accordingly.

Even the "corrected" ratios are very approximate. The expected rise of red blood cells in 15 days from a given dose (between 5 and 80 μg.) of injected material has a standard

deviation of 300,000 per c.mm. The sources of deviation are partly technical and partly individual variations in response. Similar deviations in the observed response to oral therapy—and they might be greater—could produce wide and not necessarily linear variations in the parenteral dose which would be expected to produce an equivalent response. This means that the results of any single experiment can give only a rough indication of the oral-dose/parenteral-dose ratio.

Results

Daily doses of 5 μg. were ineffective in Case 201 (see Paper II).

Daily doses of 80 μg.* had a slight effect in the following case.

Case 101

A woman aged 59 had pernicious anaemia without neurological involvement. The dietary history was satisfactory except that she took no cheese and little milk. After a satisfactory control period of 13 days red blood cells numbered 1,700,000 per c.mm., haemoglobin 6.2 g. per 100 ml., reticulocytes 1%, M.C.V. 128 μ^3, M.C.H. 36.7 $\mu\mu$g., M.C.H.C. 30.3%, white blood cells 2,400 per c.mm. The marrow was megaloblastic.

First and Second Periods.—The daily oral administration of 80 μg. of vitamin B_{12o} (Lester Smith, 1950; Ungley, 1950) led to a reticulocytosis, beginning on the third day and reaching 8.8% on the ninth day, and to a small rise of red blood cells. Substituting pure vitamin B_{12} for vitamin B_{12o} led to a secondary reticulocytosis of 7.2% on the seventh day but no further increase of red blood cells.

	First Period			Second Period			Third Period	
Days:	0	5	10	14	19	24	29	34
R.B.C. (mills./c.mm.)	1·70	1·80	1·92	2·21	1·98	2·14	2·45	3·07
Hb (g./100 ml.) ..	6·2	6·8	7·1	8·0	7·6	8·3	8·9	10·5
P.C.V. %	21·0	—	22·0	23·0	22·5	25·0	28·0	—

In the *third period* 1 μg. of vitamin B_{12} was injected daily. Reticulocytes did not exceed 3%, but red blood cells increased rapidly.

Comment.—The reticulocyte responses in the first and second periods point to some therapeutic effect from orally administered material, although equally definite responses have been observed after single injections of only 2.5 μg. Moreover, the increase in red blood cells in 24 days after a total quantity of 1,920 μg. (Fig. 1) was not significantly greater than would have been expected in 15 days from a single injection of 2.5 μg. (Ungley, 1949a, Table V). In other words, the apparent oral-dose/injection-dose ratio was several hundreds to one. The increase of red blood

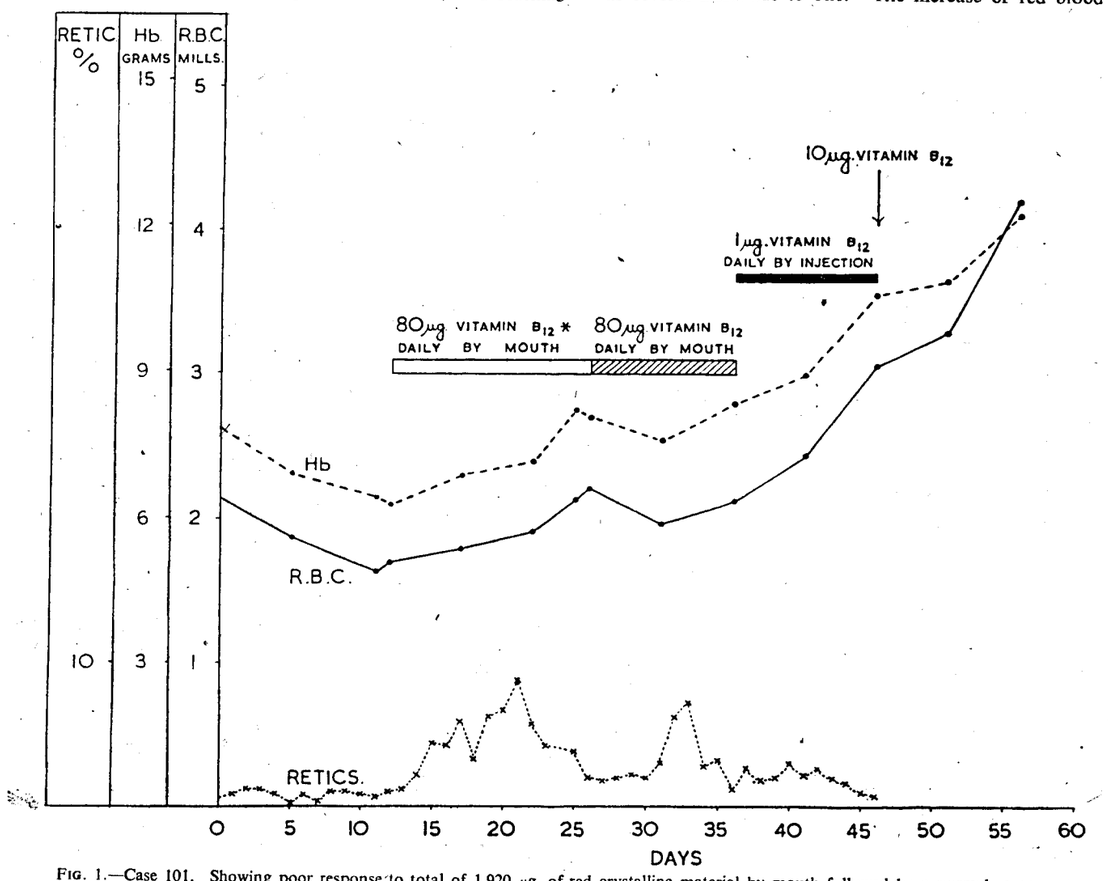


FIG. 1.—Case 101. Showing poor response to total of 1,920 μg. of red crystalline material by mouth followed by a normal response to daily injections of 1 μg.
*The variety of vitamin B_{12} used in the first period was vitamin B_{12o}.

Results Obtained by Various Workers

Author	Case	Haemopoietic Response: E_0	Retic. Peak	I_{10}	I_{15}	Oral Therapy B_{12} (μg.)	Apparent Ratio: Total Dose Given (μg.) : Parenteral Dose Expected to Give Similar Response (μg.)	Correction Based on Responsiveness to Injected B_{12}: Dose Injected (μg.) : Dose Expected to Give Similar Response (μg.)	Corrected Ratio: Oral Dose : Parenteral Dose	Presumed Absorption: Per Dose (μg.)	%
Berk *et al.*	101	1·56	5·7	0·35	—	5×10	50 : Less than 2·5	No record		Less than 0·25*/5	Less than 5*
Ungley ..	201	1·40	Nil	Nil	—	5×10	50 : Nil	40‡ : 5	—	Nil/5	Nil
Hall *et al.*	Fig. 3	1·50‖	5·9	Nil	Nil	5×7	35 : Possibly 1·25	13×5 =65‡ : 80	Possibly 30 : 1	Less than 0·2/5	?3 or 4
,,	Fig. 1	1·75‖	Nil	Nil	—	25	25 : Nil	25 : 5	—	Nil/25	Nil
Spies *et al.*	2	2·24	Nil	Nil	—	30	30 : Nil	25 : 5	—	Nil/30	Nil
,,	2	1·99	Nil	Nil	—	50	50 : Nil			Nil/50	Nil
,,	3	2·70	2·6	Negligible	—	100	100 : ?Nil	45 : Less than 5	—	Nil/100	Nil
,,	3	2·70	2·0		—	400	400 : Nil			Nil/400	Nil
Campbell *et al.*	—	No record	"Submaximal response"			75	75 : ?	No record	—	Some*/75	Some*
,,	—	,,	"Failed to respond"			1,000	1,000 : Nil	,, ,,	—	Nil*/1,000	Nil*
West ..	—	,,	"Maximal reticulocyte response"			600	600 : ?	,, ,,		Some*/600	Some*
Spies *et al.*	2	1·28	21·0	—	1·40†	800×2 =1,600	1,600 : 20	25 : 5	16 : 1	50/800	6
,,	1	2·27	35·7	—	1·04‖	450×10 =4,500	4,500 : 10	Said to have had similar response to 75 μg.	Doubtful	1*/450	0·2*
Ungley ..	101	1·70	8·8	—	0·44 in 24 days	80×24 =1,920	1,920 : More than 2·5	10×1 : 10 =10	Several : 1 hundred	0·1 or 0·2/80	Less than 0·3
,, ..	102	1·52	32·8	—	2·30	3,000	3,000 : Much over 160§	R.B.C. level too high	—	Much over 160*/3,000	5 or 10*
,, ..	103	1·67	26·8		2·00	3,000	3,000 : 160§	,, ,, ,, ,,	—	160* 3,000	5*
,, ..	104	1·80	24·6		1·72	3,000	3,000 : 80	,, ,, ,, ,,	—	80*/3,000	2 or 3*
,, ..	105	2·56	26·0		1·75	3,000	3,000 : Nearly 160§	,, ,, ,, ,,	—	Nearly 160*/3,000	5*
,, ..	106	1·91	29·6		1·72	3,000	3,000 : 80	,, ,, ,, ,,	—	80*/3,000	2 or 3*

E_0 = Initial erythrocyte count. I_{10} = Increase of erythrocytes in 10 days. I_{15} = Increase of erythrocytes in 15 days.

‖ From chart. † Calculated from I_{10}. ‡ Some of the response may have been due to previous therapy. § These are the calculated equivalents, but the dose-response curve for injected B_{12} has not yet been carried beyond 160 μg. and must flatten out sooner or later. It follows that the amounts of B_{12} actually absorbed may have been greater than those indicated in the table. * Ratios and absorption figures thus marked are uncorrected because the actual response to parenteral therapy was not observed. "Nil" = Response not measurable, but some vitamin B_{12} may have been absorbed.

cells after 10 daily injections of 1 μg. was equivalent to the rise expected from a single dose of 10 μg. Some of this increase may have been due to therapy in the preceding period, but at least there is no suggestion of "resistance" to vitamin B_{12}, and the question of correcting the ratio does not arise.

Five Other Cases

Five patients (Cases 102–106) have recently been given orally a single dose of 3,000 μg. as a concentrate. The cases are the first of a new series, and a full report will be published later. The reticulocyte response was maximal in all, and the increase of red blood cells in 15 days was equivalent to that which would have been expected from single injections of 80 μg., 80 μg., nearly 160 μg., 160 μg., and much over 160 (? 320) μg. The apparent oral-dose/parenteral-dose ratio was between 10 and 40 : 1. The red cell levels reached were so high that comparative tests with parenterally administered vitamin B_{12} were impracticable, but these large responses are perhaps enough to indicate that the patients were not resistant to vitamin B_{12} (see Table).

Indeed, these responses are as great as any observed with injected vitamin B_{12}, which has not been tested in doses over 160 μg. Up to this level there was still a straight-line relationship between mean response and logarithm of dose. Sooner or later the dose-response curve presumably flattens out—i.e., there comes a point beyond which any further increase in dose makes no difference to the rise of red blood cells in 15 days. If 160 μg. is this upper

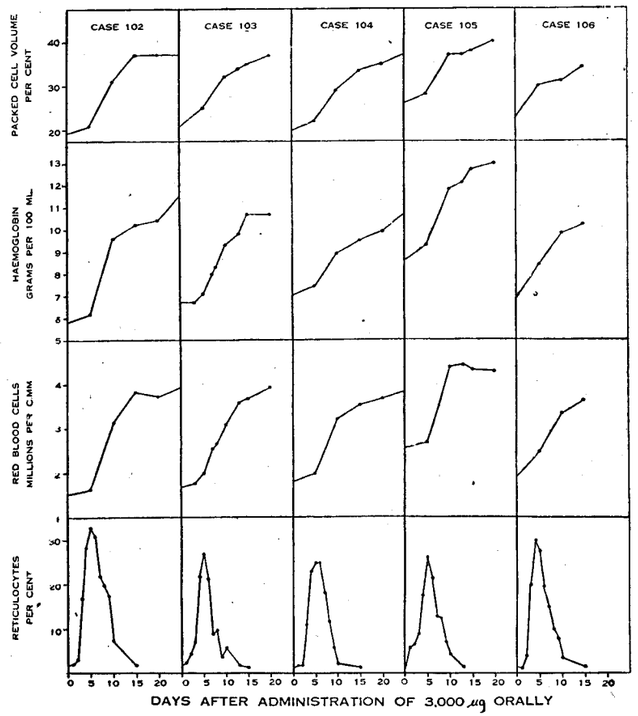


FIG. 2.—Effect in five cases of a single dose of 3,000 μg. of vitamin B_{12} as a concentrate.

limit—and it may vary from case to case—then the figures marked (§) in the Table may be too low.

Discussion

The Table includes results obtained by other workers, whose names will not necessarily be repeated in the text. Daily doses of 5 μg. produced either no response or a small reticulocytosis without rise of red blood cells. In addition to the cases in the Table, Castle (private communication, 1950) has observed 10 others, in six of which there were detectable reticulocyte responses as follows:

Initial R.B.C. in mills./c.mm.	2·25	1·25	1·65	1·60	1·58	1·55
Reticulocytes %	4·3	3·1	14·1	4·0	2·7	11·3

Although not included in the Table, some cases from other sections are worth mentioning here. Negative or trivial responses were observed in two patients receiving daily doses of 10 μg. vitamin B_{12} with fresh milk and in three others given a single or split dose of 50 μg. with whey concentrate (Paper III). A single dose of 80 μg. was ineffective in Case 404 (Paper IV).

In reported cases single doses of 25, 30, 50, 100, 400, and 1,000 μg. gave either negative or trivial results.

In one patient 75 μg. gave a "suboptimal response" and another showed a "maximal reticulocyte response" to 600 μg., but the authors do not give details.

A response to two doses of 800 μg. as concentrate was about equal to the response expected from 20 μg. by injection. The patient, however, was relatively unresponsive to injected vitamin B_{12}—25 μg. gave slightly less than the response expected from 5 μg. Thus the true oral-dose/injection-dose ratio may have been 16 : 1 rather than 80 : 1.

Ten daily doses of 450 μg. were followed by an increase of red blood cells equivalent to that expected from 10 μg. by injection.

An injection of 75 μg. in this patient is said to have given a "similar" response, which if literally true would suggest a response equivalent to 10 μg. Such a degree of unresponsiveness or "resistance" (7.5:1) would reduce the oral-dose/injection-dose ratio from an apparent 450:1 to a possible 60:1, but of course a valid correction cannot be made without fuller information.

In Case 101, given 80 μg. daily, the corrected oral-dose/parenteral-dose ratio was several hundreds to one.

Up to this point one had supposed that the occasional and usually rather poor responses were due to interaction between orally administered vitamin B_{12} and intrinsic factor, traces of which may persist in the gastric juice even in pernicious anaemia (Goldhamer, 1936).

The remarkable responses to a single dose of 3,000 μg. in five recent cases cannot easily be explained on this basis. The patients appear to have effectively absorbed amounts ranging from 80 to 160 μg. or possibly more. From results reported in Paper II it seems that at least 500 ml. of *normal* gastric juice is needed to ensure an adequate haemopoietic response from even 50 to 80 μg. of orally administered vitamin B_{12}. The equivalent volume in terms of pernicious anaemia gastric juice, even supposing traces of intrinsic factor to persist, would be enormous and far beyond the secretory capacity of the atrophic stomach. It would be surprising indeed if a patient with pernicious anaemia secreted enough intrinsic factor to combine with more than one or two micrograms, however large the dose.

These findings suggest that some vitamin B_{12} *can* be absorbed—not efficiently perhaps, but in quite considerable amounts if the dose is large enough—without first combining with the intrinsic factor.

Further speculation seems unjustified, since we do not yet know whether Castle's intrinsic factor combines stochiometrically with vitamin B_{12} or whether it acts as a catalyst. It will be interesting to determine whether a single large dose of vitamin B_{12} administered orally is more or less effective than the same amount of material given in divided doses.

Summary and Conclusions

The absorption of vitamin B_{12} was studied by comparing the effective oral dose with the parenteral dose expected to produce a similar increase of red blood cells in 15 days. The apparent oral-dose/parenteral-dose ratio was corrected if the observed response to injected material was below expectation, indicating a relative resistance to vitamin B_{12}.

In one case daily doses of 5 μg. gave no response. In another, even 80 μg. a day for 24 days produced an increase in red blood cells no greater than would have been expected in 15 days from the injection of 2.5 μg. The response to injected material was normal, so that the corrected oral-dose/parenteral-dose ratio was several hundreds to one. By contrast the oral-dose/parenteral-dose ratio in five cases given a single dose of 3,000 μg. was from 20 to 40 : 1, the increase of red blood cells in 15 days being so great as to suggest the absorption of 80 to 160 μg. or even more. Presumably very little of the vitamin absorbed can have interacted with Castle's intrinsic factor, considering the low quality and quantity of the secretion of the stomach in pernicious anaemia.

Further tests are necessary to determine whether in fact more vitamin B_{12} is absorbed after a single large dose than after the same quantity of material given in divided doses daily.

II. ORAL ADMINISTRATION WITH NORMAL GASTRIC JUICE

BY

C. C. UNGLEY, M.D., F.R.C.P.

Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne

In the preceding paper it was shown that vitamin B_{12} administered orally without a source of intrinsic factor was not efficiently absorbed, although remarkable effects could be obtained with an enormous single dose. The present study attempts to answer two questions: How effectively is vitamin B_{12} absorbed when given with gastric juice? How much gastric juice is needed per microgram of vitamin B_{12}?

Methods

A general account of methods is given in Paper I. Normal human gastric juice was obtained almost entirely from students in response to two injections of 0.5 mg. of histamine at intervals of 30 minutes. Specimens without free HCl and those containing more than a trace of bile were discarded. After filtering through nainsook to remove mucus and debris, the juice was pooled and kept at approximately 5° C. The period of storage did not exceed three days, except in Case 404 (Paper IV), in which the juice had been stored 14 days.

The highly acid juice (*p*H 1 approx.) was neutralized to *p*H 7 with a predetermined quantity of N/1 NaOH. Vitamin B_{12} was then added. In Cases 201, 202, 401, and 402 the mixture was given within two hours, while in Cases 303, 304, 305, and 404 the interval was prolonged to six hours. The mixture was incubated for one hour in Case 304, but not in others. Food was withheld for four hours before and after the mixture. In Cases 303, 304, and 305 the intervals were prolonged to eight hours.

The gastric juice used for the second period of Case 201 was passed through a Seitz filter while still acid. As the Seitz-filtered juice was inactive this procedure was not used again.

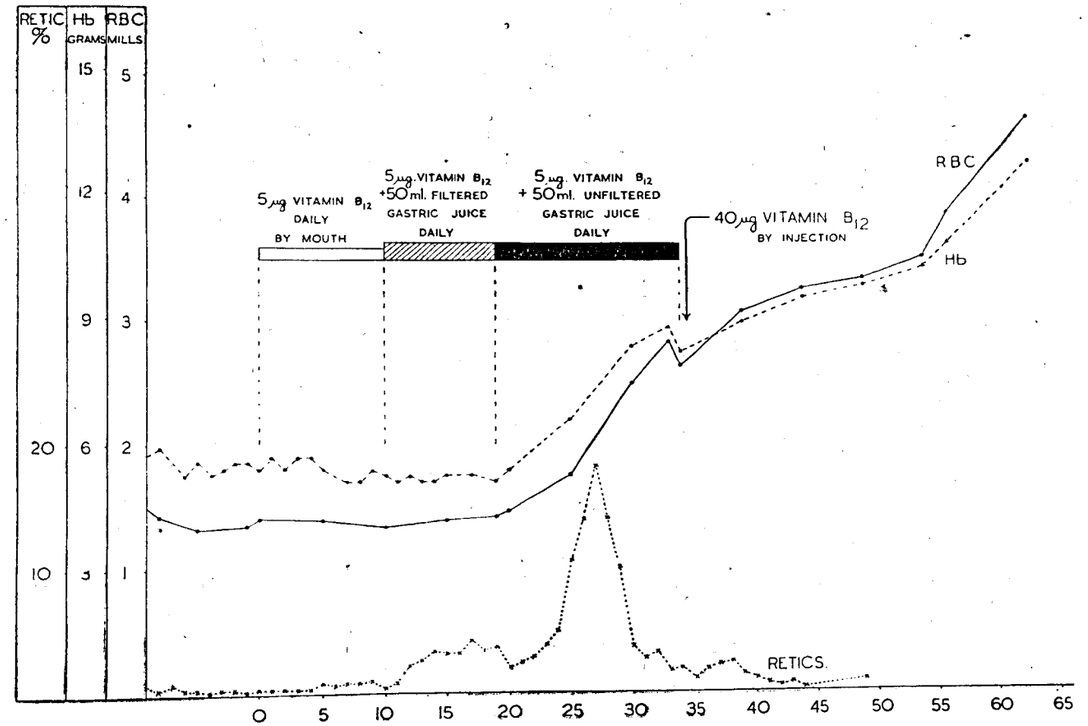


FIG. 1.—Case 201. Showing that 5 μg. of vitamin B_{12} was ineffective when given alone or with gastric juice which had been Seitz-filtered, but produced a good response when given with unfiltered gastric juice.

Results

Eight patients were treated with vitamin B_{12} and normal human gastric juice.

Case 201

A miner aged 58 had pernicious anaemia without neurological involvement. Having recently lost his teeth, he ate little meat, but otherwise his diet was satisfactory.

After 10 days' control period, during which reticulocytes remained less than 1%, the red blood cells numbered 1,400,000 per c.mm., with haemoglobin 5.3 g. per 100 ml., reticulocytes 0.4%, M.C.V. 130.6 μ^3, M.C.H. 38.2 $\mu\mu$g., M.C.H.C. 31.3%, white blood cells 1,700 per c.mm. The marrow was megaloblastic.

In the first period 5 μg. of vitamin B_{12} was given daily by mouth. There was neither reticulocytosis nor increase of red blood cells (Fig. 1).

	First Period			Second Period	
Days:	0	5	10	15	19
R.B.C. (mills./c.mm.)	1·40	1·38	1·33	1·39	1·41
Hb (g./100 ml.)	5·3	5·3	5·2	5·2	5·0
P.C.V. (%)	17·5	18·6	17·0	—	—

In the second period the same amount of vitamin B_{12} was mixed with 50 ml. of normal gastric juice neutralized just before administration. Before neutralization the gastric juice had been passed through a Seitz filter. Reticulocytes rose to only 4.2% on the seventh day and red cells did not increase.

In the third period the same amounts of vitamin B_{12} and gastric juice were administered, but this time the gastric juice was *not* Seitz-filtered. Reticulocytes rose on the fourth day and reached 18.2% on the eighth day. There was subjective improvement and red cells increased.

	Third Period			Fourth Period			
Days:	0	6	11	15	20	25	30
R.B.C. (mills./c.mm.)	1·41	1·75	2·48	2·63	3·09	3·28	3·36
Hb (g./100 ml.)	5·0	6·5	8·3	8·1	8·9	9·5	9·8
P.C.V. (%)	—	21·0	27·0	28·0	33·0	33·0	35·0

In the fourth period an injection of 40 μg. of vitamin B_{12} led to a negligible reticulocytosis of 2.4% on the fourth day. Red blood cells continued to increase.

Comment.—The daily oral administration of 5 μg. of vitamin B_{12} alone or with Seitz-filtered gastric juice was ineffective. The same quantity with unfiltered gastric juice was effective. The increase of erythrocytes in 15 days after giving a total of 75 μg. with unfiltered gastric juice was equivalent to the response expected from an injection of 10 μg. In fact, however, the patient was relatively "resistant" to injected material in that the increase of red blood cells after 40 μg. was slightly less than that expected from 5 μg. Even then some of the increase may have been due to previous therapy. Correction for this resistance reduces the oral-dose/parenteral-dose ratio from an apparent 7.5 : 1 to the region of unity.

Case 202.—Administration of 50 μg. Vitamin B_{12} with 500 ml. of Gastric Juice by Stomach Tube

A woman aged 63 had pernicious anaemia with sore smooth tongue and minor neurological involvement. The dietary history was normal.

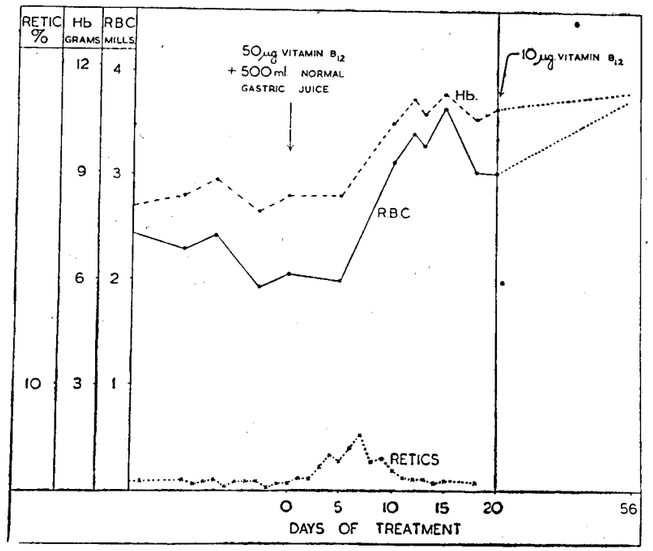


FIG. 2.—Case 202. Response to single dose of 50 μg. of vitamin B_{12} with 500 ml. of normal gastric juice given by stomach tube.

After a satisfactory control period of several weeks the red blood cells numbered 2,050,000 per c.mm., with haemoglobin 8.3 g. per 100 ml., M.C.H., 40.4 $\mu\mu$g., M.C.V. 127 μ^3, M.C.H.C. 31.9%, reticulocytes 0.6%, and white blood cells 4,400 per c.mm.

A single dose of 500 ml. of pooled normal gastric juice was neutralized and mixed with 50 μg. of vitamin B_{12} just before administration by stomach tube. Reticulocytes began to rise on the fourth day, reaching 5.2% on the seventh day (Fig. 2).

Red blood cells increased rapidly, sore tongue was relieved, appetite and well-being were restored. These effects lasted fully 15 days, but by the twentieth day the tongue was again sore and the counts were beginning to fall. Injections of vitamin B_{12} subsequently brought about complete remission.

Days:	0	5	10	15	20
R.B.C. (mills./c.mm.)	2·05	1·99	3·13	3·66	3·02
Hb (g./100 ml.)	8·3	8·3	10·4	11·3	10·8
P.C.V. (%)	26·0	27·0	35·0	37·0	31·5

Comment.—The increase of red blood cells in 15 days slightly exceeded the response expected from an injection of 40 μg. Because of this excellent result there can be no doubt about the patient's responsiveness to vitamin B_{12}, even though the actual effect of injection was not measured. Thus the apparent oral-dose/parenteral-dose ratio of near unity needs no correction for "resistance" to vitamin B_{12}.

Remaining Six Cases

These six cases are described in Papers III and IV. Case 401 was given 5 μg. daily with 50 ml. of gastric juice. Case 402 received 40 μg. with 150 ml. of gastric juice. Case 404 received 80 μg. with 500 ml. Cases 303, 304, and 305 received 50 μg. and 500 ml. of gastric juice after a preliminary trial of milk or whey as a source of intrinsic factor.

The findings in the eight patients are summarized in the accompanying Table along with other published cases.

Discussion

Differences in dietary control and in the source, filtration, storage, and time of administration of the gastric juice may account for some of the variation in the results observed (see Hall, Morgan, and Campbell, 1949).

In the first period of treatment in three of the cases described by Berk, Castle, Welch, Heinle, Anker, and Epstein (1948), vitamin B_{12} and gastric juice were given twelve hours apart and there was no haemopoietic effect.

Vitamin B_{12} given two hours before the gastric juice was effective in one case (Hall, Morgan, and Campbell, 1949). In all other cases cited in the Table the gastric juice and vitamin B_{12} were given simultaneously.

In the cases of Berk *et al.* and in mine, the diet was restricted and no food was given four hours before or after the administration of gastric juice mixtures. In the cases of Hall *et al.* the mixtures were given only one hour before the morning meal and the patients were allowed meat and eggs later in the day. Thus the effects attributed to gastric juice and vitamin B_{12} may have been partly due to the interaction of gastric juice with other extrinsic factor(s) in food.

Author	Case	Haemopoietic Response: E_0	Reticulocyte Peak	I_{10}	I_{15}	Oral Therapy: Gastric Juice Given (ml.)	B_{12} (μg.)	Apparent Ratio: Total Oral Dose Given (μg.) : Parenteral Dose Expected to Give Similar Response (μg.)	Correction Based on Responsiveness to Injected B_{12}: Dose Injected (μg.) : Dose Expected to Give Similar Response (μg.)	Corrected Ratio: Oral Dose : Parenteral Dose (approximate)	Presumed Absorption (approx.): Per Dose (μg.)	%
Berk *et al.*	101	1·82	9·3	0·90	—	150×10	5×10	50 : 10	No record	—	1†/5	20†
,,	102	1·65	16·7	0·80	—	150×10	5×10	50 : 5	,, ,,	—	0·5†/5	10†
,,	103	1·90	3·8	0·64	—	150×10	5×10	50 : 5	,, ,,	—	0·5†/5	10†
,,	104	2·14	3·8	0·04	—	125×10	5×10	50 : Possibly 1·25	5×10 : Less than 5 =50	Doubtful	Doubtful	Doubtful
Hall *et al.*	Fig. 2	1·50	31·7	—	0·86*	150×15	5×15	75 : 5	No record	—	0·3†/5	6†
,,	Fig. 4	1·63	16·5	—	1·37*	150×15	5×15	75 : 20	,,	—	1·2†/5	24†
Ungley	401	1·27	13·4	1·16	—	50×10	5×10	50 : 20	5×10 : 20" =50	1 : 1	5/5	100
,,	201	1·41	18·2	—	1·22	50×15	5×15	75 : 10	40 : 5	About 1 : 1	5/5	100
,,	202	2·05	5·2	—	1·61	500	50	50 : More than 40	R.B.C. level too high	—	Over 40†/50	Over 80†
,,	303	2·55	1·8	—	−0·11	500	50	50 : Nil	50 : More than 80	Oral therapy failed	0/50	Nil
,,	304	2·25	7·8	—	0·59	500	50	50 : Less than 5	50 : Less than 5	About 1 or 2 : 1	About 25 or 50/50	50 to 100
,,	305	1·88	7·4	—	0·95	500	50	50 : 5	50 : More than 40	10 : 1	5/50	10
,,	404	1·34	15·8	—	0·82	500	80	80 : Less than 5	80 : 40	More than 8 : 1	Less than 10/80	Less than 15
,,	402	1·68	7·0	—	−0·03	150	40	40 : Possibly 1·25	40 : 40	Possibly 30 : 1 (Insufficient gastric juice)	Possibly 1·25/40	Possibly 3

* From graph. † Ratios and absorption figures marked † are uncorrected, because the actual response to parenteral therapy was not observed.

Except in one patient (Case 404) who received juice stored for 14 days, the juice was either fresh or not more than three days old. Other workers have used pooled gastric juice which may have been stored. Campbell, Hall, and Morgan (1949) state that the intrinsic factor in gastric juice is not destroyed by storage at 5° C. for three months, but did not indicate whether there is a lessening of activity.

Hall *et al.* (1949) found that Berkefeld-filtered gastric juice was active in a proportion of 150 ml. per 5 μg. of vitamin B_{12}, but comparisons with unfiltered gastric juice are not mentioned. In our Case 201 Seitz filtration of gastric juice apparently led to loss of all or most of its intrinsic factor activity.

How Efficiently is Vitamin B_{12} Absorbed When Given Orally With Gastric Juice?

It is obvious from the Table that the results are very variable. In four out of eight of my patients the effect of vitamin B_{12} given orally with gastric juice was about as effective as if the same dose of vitamin had been injected into these patients. In two others the corrected oral-dose/parenteral-dose ratio was about 10 : 1. In one case oral therapy failed completely, and in another the amount of gastric juice was too small.

Calculations similar to those used for my cases can be applied to the first three cases reported by Berk *et al.* (1948). These patients received 5 μg. of vitamin B_{12} with 150 ml. of normal gastric juice daily for 10 days. The increase in red blood cells in 10 days was approximately equivalent to that which would have been expected from single injections of 10, 5, and 5 μg. In other words, the amounts of vitamin B_{12} given orally with gastric juice were approximately 5, 10, and 10 times as great as would probably have been needed to produce a similar response with injected material. This is assuming that the patients of Berk *et al.* would have been normally responsive to injected vitamin B_{12}. Their fourth case is excluded from discussion because of the poor response not only to orally but to parenterally administered material.

In one of Hall, Morgan, and Campbell's cases the increase of red blood cells in 15 days after a total of 75 μg. with gastric juice was less than would be expected from 5 μg. by injection. In another case the response to a total of 75 μg. with gastric juice was slightly less than would have been expected from 20 μg. by injection. The apparent oral-dose/injection-dose ratios were approximately 15 and 3.75, but the actual responsiveness of these patients to injected material was not determined.

Some of the factors which may have contributed to the difference in the results obtained by the three observers have already been discussed.

How Much Juice is Needed?

This can roughly be estimated from (*a*) the total amount of gastric juice given, and (*b*) the amount of vitamin B_{12} absorbed (judging this by the haemopoietic response and correcting for "resistance," if any).

In the cases of Berk *et al.* (1948) and Hall *et al.* (1949) a correction for responsiveness to injected vitamin B_{12} was possible in only one instance. So far as one can judge from the uncorrected oral-dose/parenteral-dose ratio each 100 ml. of gastric juice seems to have been enough for the absorption of only 1 μg. or less. In all their patients and in the first two of mine the material was given daily and not as a single dose.

In Case 401 a total of 50 μg. was adequately absorbed when administered with a total of 500 ml. of gastric juice. In other words, each 100 ml. was enough for the absorption of 10 μg. Similar calculations for all my cases in the Table suggest that 100 ml. of gastric juice was enough for the absorption of the following amounts of vitamin B_{12} (μg.): 10, 10, 10, *nil*, 5 or 10, 1, less than 2, less than 1.

It is interesting to compare these figures with those of Ternberg and Eakin (1949) for the vitamin B_{12}-binding power of samples of normal gastric juice, which were: 2, 6 (pooled sample from at least three subjects), 6, and 1.5 μg. per 100 ml. of gastric juice.

It will be even more interesting, in the future, to measure microbiologically in this way the activity of samples of gastric juice which are to be clinically tested for their power to promote absorption of vitamin B_{12} in pernicious anaemia.

Summary and Conclusions

The effect of vitamin B_{12} given with normal gastric juice was observed in eight patients with pernicious anaemia. The total amounts were usually 50 μg. + 500 ml. given as a single dose or in divided doses.

One patient failed to respond to oral therapy. In one who received 40 μg. with only 150 ml. of gastric juice the response was very poor. In two the oral-dose/parenteral-dose ratio was about 10:1, suggesting that about 10% of the vitamin had been absorbed. In the remaining four the response was about as good as would have been expected if the same dose of vitamin B_{12} had been injected. Thus small doses of vitamin B_{12} given with normal gastric juice are *sometimes* efficiently absorbed.

In these eight experiments each 100 ml. of gastric juice seemed to be enough for the absorption of 0, less than 1, 1, less than 2, 5 or 10, 10, 10, and 10 μg. of vitamin B_{12}. Thus the amount of gastric juice necessary to promote the absorption of a given amount of B_{12} varied considerably. These variations are perhaps only partly due to differences in the amount of intrinsic factor in the samples of gastric juice; differences in the recipients may have been equally important.

III. FAILURE OF FRESH MILK OR CONCENTRATED WHEY TO FUNCTION AS CASTLE'S INTRINSIC FACTOR OR TO POTENTIATE THE ACTION OF ORALLY ADMINISTERED VITAMIN B_{12}

BY

C. C. UNGLEY, M.D., F.R.C.P.

Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne

With the assistance of

G. A. CHILDS

Chemist, Research Division, Glaxo Laboratories, Greenford, Middlesex

In another paper we have confirmed the findings of Ternberg and Eakin (1949) that normal gastric juice combines with vitamin B_{12} and renders it unavailable to certain bacteria (Ungley and Cuthbertson, 1950: Paper V of this series, to be published).

The possibility that milk might have similar properties has been investigated. For this purpose microbiological tests proved useless, milk being an unsatisfactory material for the microbiological assay of vitamin B_{12}. Nevertheless, exploratory clinical tests have been made to determine whether milk would be effective as a source of Castle's intrinsic factor.

Methods

A general account of methods is given in Paper I.

For the first two tests fresh cow's milk was cooled quickly immediately after milking and kept in a vacuum flask for not more than four hours before administration.

For the first whey concentrate 7.5 litres of skimmed milk was treated at 37° C. with 455 ml. of diluted acetic acid to *p*H 4.5. The casein was filtered off to yield 6,800 ml. of crude whey. The whey was concentrated at *p*H 6.5 to 790 ml. and dialysed against distilled water overnight at 4° C. to eliminate salts and some of the lactose. During dialysis a precipitate composed mainly of lactose and lactoglobulin came down. This precipitate was combined with the concentrated supernatant fluid to make a total volume of approximately 650 ml., representing 7 litres of milk.

The second whey concentrate was prepared from 22 litres of milk. The casein was removed and the whey evaporated to small bulk at low temperature. This concentrated whey was then dialysed to remove most of the lactose.

Results

Two patients received fresh milk and three cases were given whey concentrates, in each case with added vitamin B_{12}.

Case 301

A woman aged 58 had pernicious anaemia with minor neurological involvement. The dietary history was normal. In a control period of 14 days, during which reticulocytes did not exceed 3.4%, the red blood cells fell from 1,610,000 to 1,070,000 per c.mm. After transfusion the count rose to 2,300,000 per c.mm. (Fig. 1). After a further control period of 13 days during which reticulocytes did not exceed 1.6%, the red blood cells numbered 1,480,000 per c.mm., haemoglobin 5.6 g. per 100 ml., reticulocytes 1%, M.C.V. 131.7 μ^3, M.C.H. 37.9 $\mu\mu$g., M.C.H.C. 28.2%, white blood cells 2,800 per c.mm. The marrow was megaloblastic.

In the first period she was given daily 500 ml. of preserved fresh milk to which 10 μg. of vitamin B_{12} was added before administration. There was a slight reticulocytosis, reaching 3% on the eighth and ninth days with little change in the anaemia.

In the second period she received daily 500 ml. of preserved fresh milk to which 100 μg. of folic acid was added before administration. There was no second reticulocyte response, but the anaemia improved.

Days :	First Period 0	5	10	Second Period 15	20	35
R.B.C. (mills./c.mm.)	1·48	1·54	1·62	2·39	3·03	3·23
Hb (g./100 ml.) ..	5·6	6·2	6·7	8·4	9·3	9·9
P.C.V. (%)	19·5	21·0	22·5	31·0	35·0	34·5

In the third period treatment reverted to the daily administration of 500 ml. of preserved fresh milk plus 10 μg. of vitamin B_{12}. The anaemia continued to improve.

Days :	Third Period 0	5	10	15
R.B.C. (mills./c.mm.)	3·16	4·00	4·24	4·26
Hb (g./100 ml.) ..	9·8	11·1	11·8	11·8
P.C.V. (%)	34·5	36·0	40·0	40·0

Comment.—The slight reticulocytosis in the first period might equally well have occurred from the daily oral administration of 10 μg. of vitamin B_{12} alone, without the milk. In the absence of any further reticulocyte response the improvement in the second and third periods cannot safely be attributed to treatment. Spontaneous remission is a distinct probability.

Case 302

A retired labourer aged 65 had pernicious anaemia without neurological involvement. The dietary history was normal.

After a control period of five days, during which the reticulocytes did not exceed 1%, the red blood cells numbered 2,010,000 per c.mm., haemoglobin 7.8 g. per 100 ml., reticulocytes 0.6%, M.C.V. 111.9 μ^3, M.C.H. 39.1 $\mu\mu$g., M.C.H.C. 34.7%, white blood cells 5,100 per c.mm. The marrow was megaloblastic.

In the first period he was given daily for 15 days 500 ml. of preserved fresh milk to which 10 μg. of vitamin B_{12} was added before administration. There was a slight reticulocytosis reaching 4.6% on the seventh day, but no increase of red blood cells (Fig. 2).

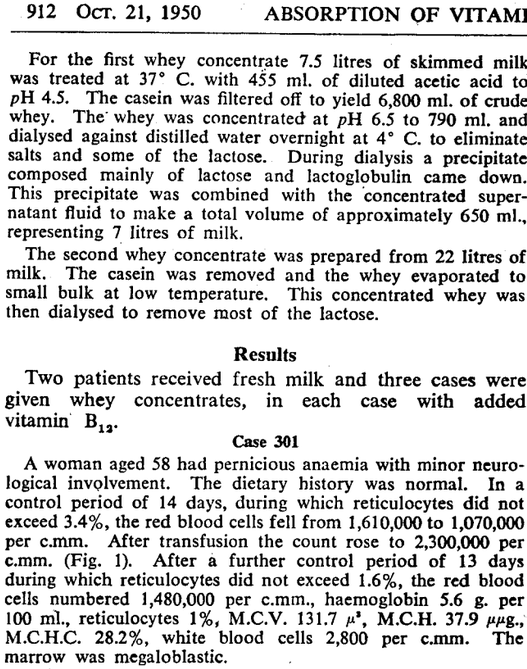


FIG. 1.—Case 301. Showing a fairly continuous increase in red blood cells during treatment, with only a slight reticulocytosis. This may have been a spontaneous remission.

Days :	First Period 0	5	10	15
R.B.C. (mills./c.mm.)	2·01	1·86	1·78	1·93
Hb (g./100 ml.) ..	7·8	7·0	6·5	7·0
P.C.V. (%)	22·5	22·0	22·5	22·5

In the second period 1 μg. of vitamin B_{12} daily was given parenterally for 15 days. There was a second reticulocytosis of 4.6% on the eighth day, followed by subjective improvement and some increase in red blood cells.

Days :	Second Period 0	5	10	15	Third Period 20	25	30
R.B.C. (mills./c.mm.)	1·93	2·18	2·31	2·33	2·87	3·28	3·36
Hb (g./100 ml.) ..	7·0	8·0	8·9	9·3	10·7	11·3	11·7
P.C.V. (%)	22·5	24·0	28·0	29·0	33·0	34·0	36·0

In the third period 0.8 μg. of vitamin B_{12} plus 100 μg. of folic acid daily was given for 15 days. There was no reticulocytosis. The red blood cells continued to increase.

Comment.—In this case fresh milk was clearly not a satisfactory source of Castle's intrinsic factor. The reticulocyte response of 4.6% was no greater than might have been expected from the vitamin B_{12} alone, and there was no increase of red blood cells in 15 days.

The remaining cases were given whey concentrate instead of fresh milk.

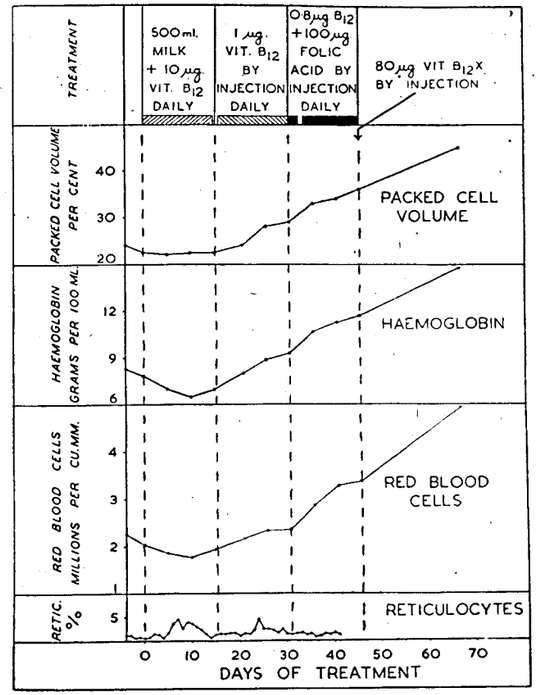


FIG. 2.—Case 302. The administration of milk and vitamin B_{12} produced only a small reticulocytosis without rise of red blood cells. Following the daily injection of 1 μg. vitamin B_{12} there was a secondary reticulocytosis, but the increase of red blood cells was below expectation. There was no further reticulocytosis when part of the vitamin B_{12} was replaced by folic acid.

Case 303

A housewife aged 73 had pernicious anaemia without neurological involvement. She ate little meat or cheese, and no eggs or tomatoes.

After a control period of 12 days, during which the reticulocytes did not exceed 3.8%, the red blood cells numbered 2,270,000 per c.mm., haemoglobin 8.6 g. per 100 ml., reticulocytes 1%, M.C.V., 121.1 μ^3, M.C.H. 37.9 $\mu\mu$g., M.C.H.C. 31.2%, white blood cells 5,100 per c.mm. The marrow was megaloblastic.

In the first period she received a whey concentrate derived from 7 litres of milk to which was added 50 μg. of vitamin B_{12}. The mixture stood at room temperature for seven hours and was then given by stomach tube approximately eight hours after the last meal and eight hours before breakfast. There was a slight variable reticulocytosis of 2.6% on the seventh day and some improvement in the anaemia (Fig. 3). The marrow remained megaloblastic.

Days :	First Period 0	5	10	15	Second Period 16	21	26	31
R.B.C. (mills./c.mm.)	2·27	2·36	2·92	2·51	2·55	2·45	2·61	2·44
Hb (g./100 ml.)	8·6	9·3	10·8	10·5	10·8	10·4	10·4	10·4
P.C.V. (%)	27·5	28·0	36·0	34·5	35·0	35·0	36·0	35·0

In the second period she received 500 ml. of normal gastric juice with 50 μg. of vitamin B_{12}; the mixture was left at room temperature for seven and a half hours and given by stomach tube in the same manner as before. There was no reticulocytosis and no rise of red blood cells in 15 days; after 12 days

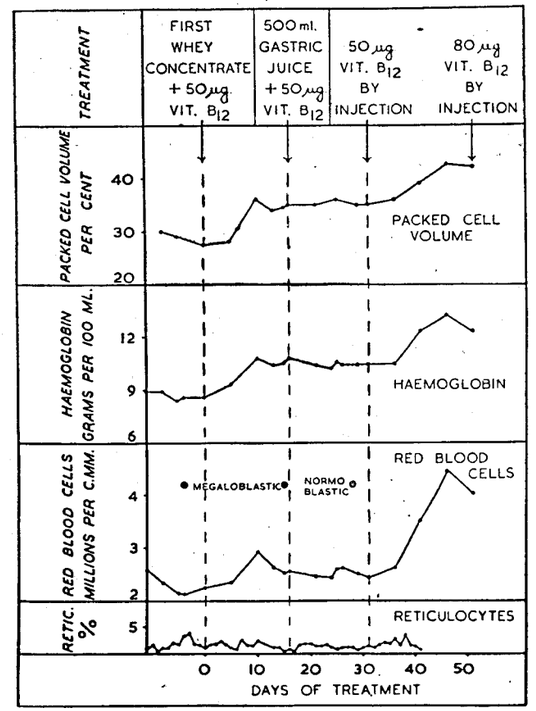


FIG. 3.—Case 303. In the control period there was a small spontaneous reticulocytosis without a rise of red blood cells. Following the administration of the whey concentrate with vitamin B_{12} there was a transient increase of red blood cells but no reticulocytosis, and the marrow remained megaloblastic. Vitamin B_{12} with gastric juice had no effect on reticulocytes or red blood cells, but the marrow became normoblastic. The response to an injection of 50 μg. of vitamin B_{12} was better than expectation.

the marrow picture was predominantly normoblastic and macronormoblastic.

In the third period 50 μg. of vitamin B_{12} was given parenterally. A slight reticulocytosis of 3.4% on the seventh day was followed by a good increase in red blood cells.

Days :	Third Period 0	5	10	15
R.B.C. (mills./c.mm.)	2·44	2·61	3·50	4·41
Hb (g./100 ml.) ..	10·4	10·4	12·3	13·2
P.C.V. (%)	35·0	36·0	39·0	42·5

Comment.—The result in the first period, when whey concentrate was given as a possible source of Castle's intrinsic factor, was probably negative, the response being no greater than might be expected from the vitamin B_{12} alone, but for some reason the patient did not respond to B_{12} and gastric juice. She was not "resistant" to vitamin B_{12}, for the increase in red blood cells after an injection of 50 μg. was greater than would be expected from an injection of 80 μg.

Case 304

A housewife aged 67 had pernicious anaemia with minor neurological involvement. She ate very little meat or vegetables.

After a control period of 11 days, during which the reticulocytes did not exceed 1.2%, the red blood cells numbered 2,460,000 per c.mm., haemoglobin 8.9 g. per 100 ml., reticulocytes 1%, M.C.V. 118 μ^3, M.C.H. 36.1 $\mu\mu$g., M.C.H.C. 30.6%,

white blood cells 3,700 per c.mm. Sternal marrow showed megaloblastic erythropoiesis.

In the first period she received the second whey concentrate derived from 3 litres of milk which was incubated for one hour with 50 μg. of vitamin B_{12} and given by stomach tube approximately eight hours after the last meal and eight hours before breakfast. In 10 days there was neither reticulocytosis nor rise of red blood cells (Fig. 4).

	First Period		
Days :	0	5	10
R.B.C. (mil'ns./c.mm.)	2·46	2·34	2·21
Hb (g./100 ml.)	8·9	9·3	8·9
P.C.V. (%)	29·0	28·0	27·0

In the second period she was given 500 ml. of normal gastric juice which was neutralized, incubated for one hour with 50 μg. of vitamin B_{12}, kept at 5° C. for seven and a half hours, and given by stomach tube in the same manner as before. Reticulocytes rose to 7.8% on the sixth day and the red blood cells increased.

	Second Period				Third Period		
Days :	0	5	10	15	20	25	30
R.B.C. (mills./c.mm.)	2·25	2·34	2·73	2·84	3·05	3·79	3·47
Hb (g./100 ml.) ..	8·7	8·9	10·4	9·9	10·8	12·1	11·1
P.C.V. (%)	27·0	27·0	33·0	29·0	32·0	36·0	36·0

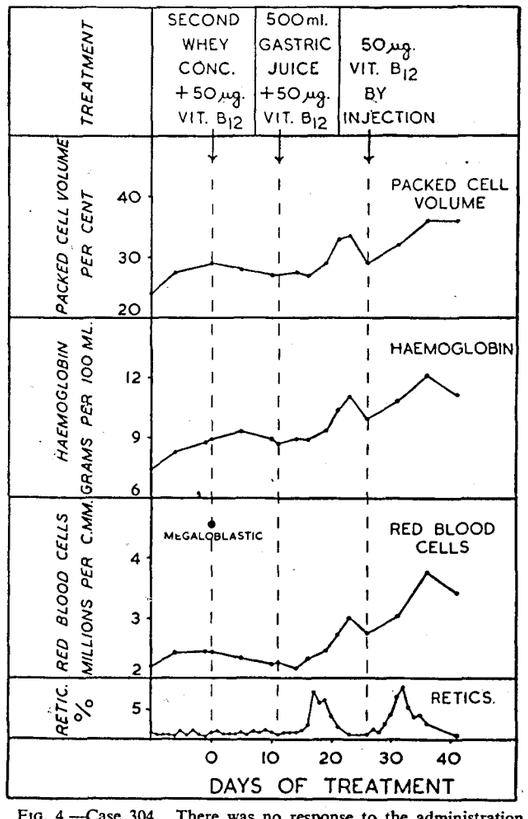


FIG. 4.—Case 304. There was no response to the administration of a whey concentrate and vitamin B_{12}. The response to 50 μg. of vitamin B_{12} with gastric juice was less than that which would be expected from an injection of 5 μg. The response to 50 μg. of vitamin B_{12} by injection was below expectation.

In the third period 50 μg. of vitamin B_{12} was administered parenterally. There was a second reticulocytosis of 8.6% on the sixth day and the red blood cells increased.

Comment.—The result in the first period when whey concentrate was given was completely negative. The rise of red blood cells after giving 50 μg. of vitamin B_{12} and 500 ml. of gastric juice was less than that expected from an injection of 5 μg. The response from the injected dose of 50 μg. was also slightly less than that expected from an injection of 5 μg. Thus the oral-dose/parenteral-dose ratio was probably 1 or 2 : 1.

Case 305

A woman aged 60 had pernicious anaemia with minor neurological involvement. She ate little meat, eggs, fish, cheese, or fruit, but plenty of milk, cereals, and vegetables.

After a control period of nine days, during which the reticulocytes did not exceed 1.6%, the red blood cells numbered 1,810,000 per c.mm., haemoglobin 6.5 g. per 100 ml., reticulocytes 0.6%, M.C.V. 116 μ^3, M.C.H. 32.8 $\mu\mu$g., M.C.H.C. 31%, white blood cells 4,000 per c.mm. The marrow was megaloblastic.

In the first period she was given on two successive nights 575 ml. of the second whey concentrate derived from 3 litres of milk which was incubated for one hour with 25 μg. of vitamin B_{12} and given by stomach tube approximately eight hours after the last meal and eight hours before breakfast. There was a slight reticulocytosis of 4.6% on the sixth day (Fig. 5). The red blood cells had increased at the tenth day.

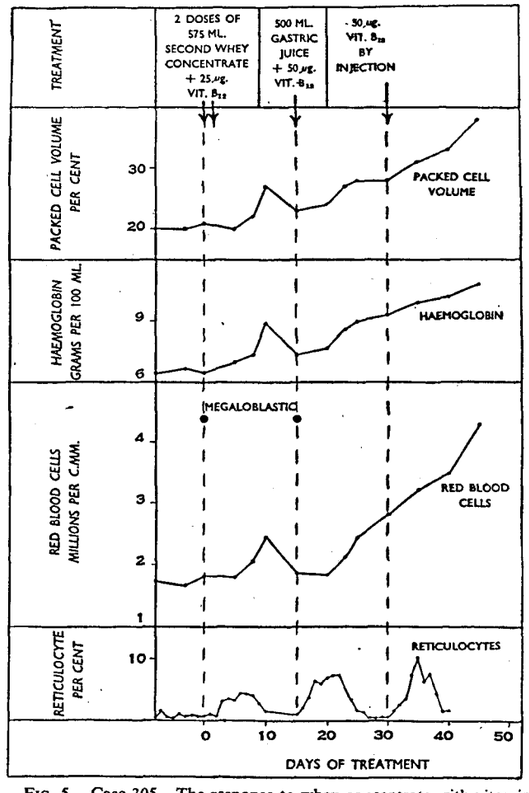


FIG. 5.—Case 305. The response to whey concentrate with vitamin B_{12} was poor and no greater than might have been obtained by giving the vitamin B_{12} by mouth alone. The response to 50 μg. of vitamin B_{12} given with gastric juice was equivalent to that which would have been expected from an injection of 5 μg. The response to an injection of 50 μg. of vitamin B_{12} was up to expectation.

but by the fifteenth were back to their former level. The marrow was still megaloblastic.

	First Period			
Days :	0	5	10	15
R.B.C. (mills./c.mm.) ..	1·81	1·80	2·46	1·88
Hb (g./100 ml.) ..	6·5	7·0	8·9	7·4
P.C.V. (%)	21·0	20·0	27·0	23·0

In the second period she received a single dose of 500 ml. of normal gastric juice which was neutralized, incubated for one hour with 50 μg. of vitamin B_{12}, kept at 5° C. for seven hours, and given by stomach tube eight hours after the last meal and eight hours before breakfast. Reticulocytes rose to a second peak of 7.4% on the sixth and seventh days, and this time the improvement in the anaemia was sustained.

	Second Period				Third Period		
Days :	0	5	10	15	20	25	30
R.B.C. (mills./c.mm.)	1·88	1·86	2·46	2·83	3·21	3·50	4·32
Hb (g./100 ml.) ..	7·4	7·7	9·0	9·3	9·9	10·2	10·8
P.C.V. (%)	23·0	24·0	28·0	28·0	31·0	33·0	38·0

In the third period 50 μg. of vitamin B_{12} was given parenterally. Reticulocytes rose to 10.2% on the fifth day. Improvement in the anaemia was accelerated.

Comment.—The result with the whey concentrate plus vitamin B_{12} was regarded as negative as there was only a slight reticulocytosis of 4.6% with no rise of red blood cells in 15 days—that is, a very slight response which might well have occurred from the oral administration of similar doses of vitamin B_{12} without the whey concentrate. In the second period the rise in red blood cells after giving 50 μg. of vitamin B_{12} plus 500 ml. of gastric juice was equivalent to that expected from an injection of 5 μg. In the third period the response to the injected dose of 50 μg. was greater than expected. The patient therefore was not "resistant," and the oral-dose/parenteral-dose ratio was probably about 10 : 1.

Conclusions

Neither fresh milk nor a whey concentrate in the doses given was an adequate substitute for normal human gastric juice as a source of Castle's intrinsic factor.

IV. ADMINISTRATION INTO BUCCAL CAVITY, INTO WASHED SEGMENT OF INTESTINE, OR AFTER PARTIAL STERILIZATION OF BOWEL

BY

C. C. UNGLEY, M.D., F.R.C.P.

Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne

The object of these experiments was to determine whether vitamin B_{12} even without intrinsic factor would be efficiently absorbed if destruction by intestinal contents could be avoided or reduced. This was attempted in three ways: (1) by the application of vitamin B_{12} to the buccal mucosa; (2) by instillation into a washed segment of the intestine; and (3) by the oral administration of vitamin B_{12} after preliminary partial sterilization of the gut.

Methods

A general account of methods is given in Paper I.

For *buccal administration*, vitamin B_{12} was applied daily to the floor of the mouth in the sulcus between the alveolar margin and the cheek. Over a period of 30 minutes a solution containing 5.5 μg. was added gradually by syringe to a pledget of cotton-wool lying on the mucous membrane which formed the base of an artificial cavity created by a dental appliance, designed to prevent leakage from the sulcus. For the next 30 minutes water alone was added. Afterwards the cotton-wool pledgets were stored for microbiological assay by Dr. W. F. J. Cuthbertson, 10 pledgets yielding 8 μg. of vitamin B_{12}.

There were four experiments in which B_{12} with or without gastric juice was *instilled into a washed segment of intestine*. In Case 402 a Miller–Abbott tube with two balloons was passed until *x*-ray examination confirmed that the end was in the small intestine. The balloons were inflated, and the intervening section of intestine was washed out with normal saline until the washings were clear. Then a solution of 40 μg. of vitamin B_{12} in 10 ml. of water was instilled, followed by water to wash through the tube. After one hour the remaining material was aspirated and the segment washed out again. A sample of the aspirate contained 0.5 μg. of vitamin B_{12} per ml.

In the second period the Miller–Abbott tube was again passed into the small intestine and the balloons were inflated as before. After washing out, the segment between the balloons was filled with 150 ml. of Seitz-filtered normal gastric juice mixed with 40 μg. of vitamin B_{12}.

In Case 403 in the first period a Miller–Abbott tube with two balloons attached 15 cm. apart was passed as in Case 402 until the end was well down the small intestine. The balloons were inflated and the intervening section of intestine was washed out with 200 ml. of normal saline until the washings were almost clear. Then 80 μg. of vitamin B_{12} in 10 ml. of normal saline was instilled, followed by 30 ml. of saline to wash through the tube (approximately 10 ml. would remain in the tube). After two hours the material remaining in the segment of intestine was aspirated, and the segment was washed again. The aspirate contained 0.45 μg. of vitamin B_{12} per ml.

In the second period a Miller–Abbott tube was passed as before but with the balloons 30 cm. apart. Intestinal juice collected on the way down contained 0.01 μg. of vitamin B_{12} per ml. The balloons were inflated and the segment was washed out with 500 ml. of distilled water, of which 300 ml. was recovered and found to contain 0.018 μg. of vitamin B_{12} per ml. Then 40 μg. of vitamin B_{12} in 250 ml. of normal gastric juice adjusted to *p*H 7 was instilled very slowly into the segment and left in place for one hour. Aspiration after one hour yielded 14 ml. of clear yellow fluid containing 0.05 μg. of vitamin B_{12} per ml. Washings yielded 35 ml. of clear pale yellow fluid containing no vitamin B_{12}. A further 40 μg. of vitamin B_{12} with 250 ml. of normal gastric juice was instilled. This caused colic, and the patient vomited 150 ml. of dark-brown fluid containing approximately 0.001 μg. or less of vitamin B_{12} per ml. Aspiration after one hour yielded 20 ml. of dark-brown fluid containing 0.025 μg. of vitamin B_{12} per ml. The segment was again washed out with 500 ml. of water, 118 ml. of which, containing 0.02 μg. of vitamin B_{12} per ml., was recovered.

An attempt to *sterilize the small intestine* is described in Case 404.

Application of Vitamin B_{12} to Buccal Mucosa

Case 401

A farm labourer aged 50 had pernicious anaemia with sore tongue but no neurological involvement. The dietary history was normal.

After a satisfactory control period of 11 days the red blood cells numbered 1,620,000 per c.mm., haemoglobin 5.9 g. per 100 ml., M.C.H. 36 $\mu\mu$g., M.C.V., 111 μ^3, M.C.H.C. 32.9%, reticulocytes 0.4%, and white blood cells 1,800 per c.mm. The marrow was megaloblastic.

After the daily instillation of approximately 5 μg. of vitamin B_{12} into the buccal cavity there was a negligible reticulocytosis of 2.8% on the tenth day and the red blood cells fell to 1,270,000 per c.mm. (Fig. 1).

In the second period the patient received 5 μg. of vitamin B_{12} daily mixed with 50 ml. of unfiltered gastric juice, neutralized

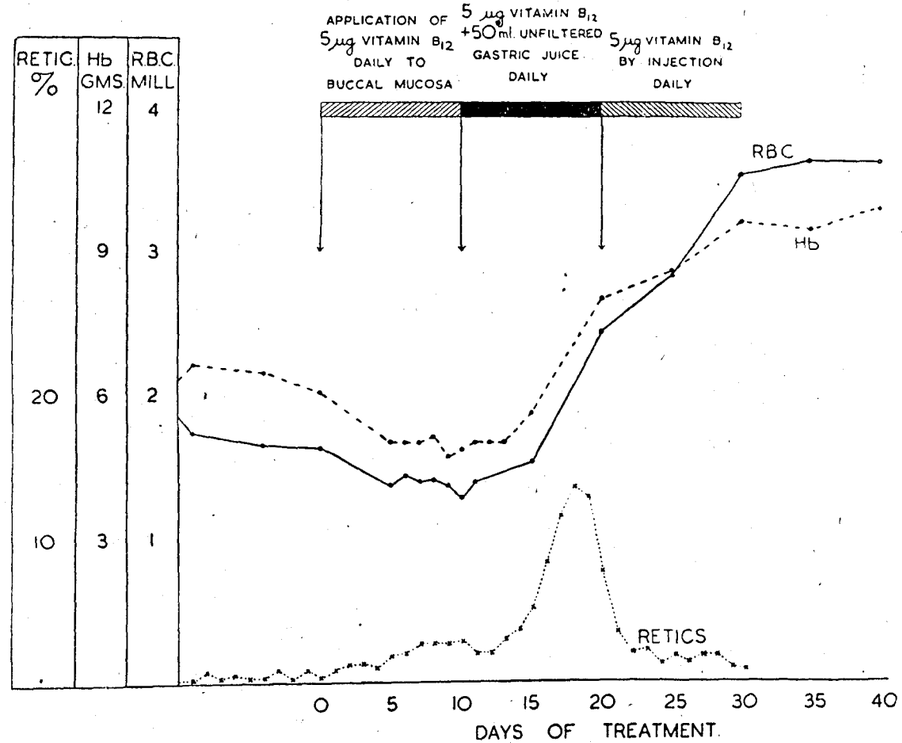


FIG. 1.—Case 401. Failure of vitamin B_{12} administered via the buccal mucosa. Good response to same dose of vitamin B_{12} given with gastric juice.

just before administration. The reticulocytes began to rise on the fourth day, reaching a peak of 13.4% on the eighth day. There was subjective improvement and the red blood cells increased.

	←Second Period→		←Third Period→		←Nil→		
Days:	0	5	10	15	20	25	30
R.B.C. (mills./c.mm.)	1·27	1·52	2·43	2·83	3·54	3·64	3·63
Hb (g./100 ml.) ..	4·7	5·5	7·8	8·4	9·5	9·3	9·8
P.C.V. (%)	14·0	—	25·0	29·1	31·0	32·5	35·0

In the third period he was given injections of 5 μg. of vitamin B_{12} daily for 10 days. There was no secondary reticulocytosis. The red blood cells continued to increase. Subsequent treatment with vitamin B_{12} brought the counts to normal.

Comment.—The absence of haemopoietic response in the first period suggested that little, if any, vitamin B_{12} was absorbed from the mouth. Disappearance of liquid from the chamber was not regarded as proof of absorption of vitamin B_{12}. The increase of red blood cells in 10 days after a total of 50 μg. of vitamin B_{12} given orally with gastric juice was equivalent to the response expected from a single injection of 20 μg. The adequacy of the response is further suggested by the absence of any secondary reticulocytosis in the third period when the same daily dose of vitamin B_{12} was given by injection. Incidentally the increase in red blood cells after a total of 50 μg. (plus any effect left over from the previous therapy) was equivalent only to the increase expected from 20 μg. Thus the true oral-dose/injection-dose ratio may have been close to unity; 50 μg. given orally with gastric juice and 50 μg given by injection both produced a response equivalent to that normally expected from a single injection of 20 μg.

Instillation of Vitamin B_{12} into an Isolated Washed Segment of Intestine

This was performed twice in each of two patients.

Case 402

A man aged 54 had pernicious anaemia with minor neurological involvement. He disliked meat except bacon, but ate plenty of eggs, milk, cheese, fruit, and vegetables.

During the control period of nine days the reticulocytes were less than 1% and red blood cells fell from 2,650,000 to 2,090,000 per c.mm., with haemoglobin 7.4 g. per 100 ml., M.C.H. 35.5 $\mu\mu$g., M.C.V. 109 μ^3, M.C.H.C. 32.6%, and white blood cells 1,800 per c.mm.

After instillation of 40 μg. of vitamin B_{12} into a washed segment of intestine there was neither reticulocytosis nor increase of red cells (Fig. 2).

In the second period 40 μg. of vitamin B_{12} was instilled with 150 ml. of normal gastric juice. Unfortunately the gastric juice had been passed through a Seitz filter, which, as we learned subsequently, may have removed most of the intrinsic factor activity (Case 201). There was no reticulocytosis or increase of red blood cells.

In the third period the patient was given by mouth 150 ml. of unfiltered normal gastric juice neutralized just before administration and mixed with 40 μg. of vitamin B_{12}. The reticulocytes began to increase on the fourth day, reaching 7% on the sixth day. There was no increase of red blood cells, and clinical improvement was transient.

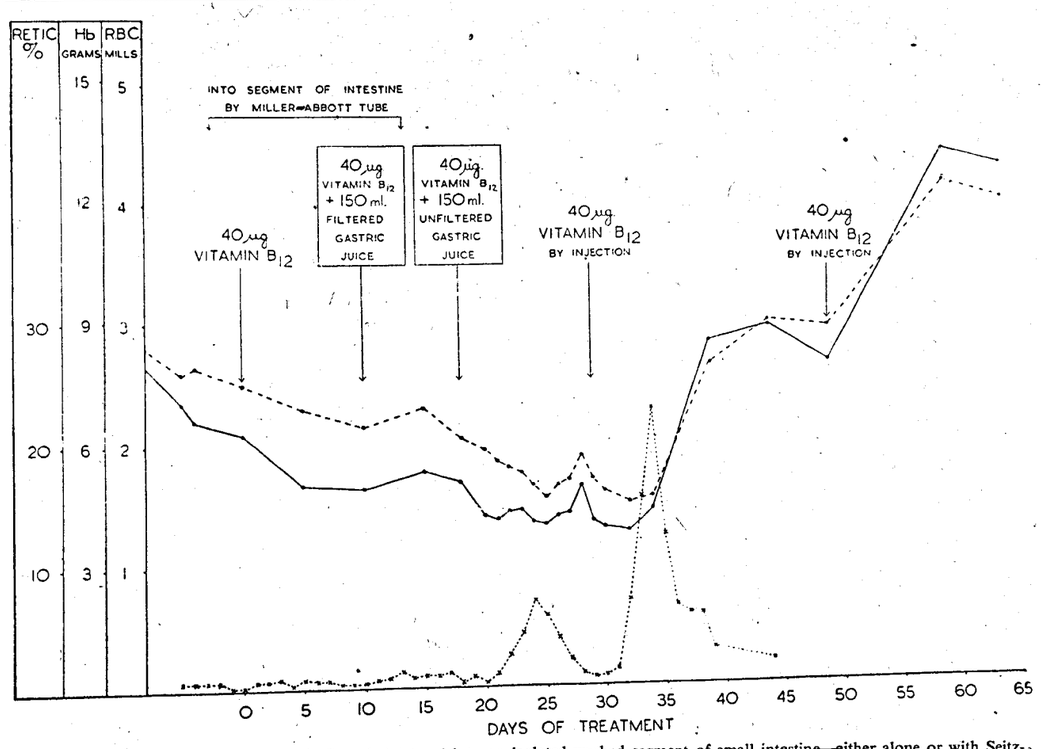


FIG. 2.—Case 402. Failure of vitamin B_{12} administered into an isolated washed segment of small intestine—either alone or with Seitz-filtered (and thus probably inactivated) gastric juice. Poor response to same dose of vitamin B_{12} given orally with 150 ml. of unfiltered gastric juice. (150 ml. is probably not enough for the absorption of 40 μg.) Normal response to injection of 40 μg.

	←Third Period→			←Fourth Period→		
Days:	0	5	11	16	21	26
R.B.C. (mills./c.mm.)	1·68	1·45	1·35	1·44	2·83	2·96
Hb (g./100 ml.) ..	6·1	5·2	5·0	4·6	7·8	8·9
P.C.V. (%)	19·0	16·5	—	18·0	30·0	31·0

In the fourth period a single injection of 40 μg. of vitamin B_{12} led to a reticulocytosis of 22.8% on the fifth day and the red blood cells increased rapidly. Further injections of vitamin B_{12} brought the counts to normal.

Comment.—Vitamin B_{12} in a dose of 40 μg. administered into a washed segment of intestine twice failed to produce a haemopoietic effect. This suggests that little or no vitamin B_{12} was absorbed. The high concentration of vitamin B_{12} in the aspirate even after one hour (see Methods) is perhaps further evidence that absorption was absent or incomplete, but one cannot be certain how efficiently the tube had been washed clear of vitamin B_{12} before the final aspiration. The poor response in the third period suggests that 150 ml. of the gastric juice used was enough for the absorption of only a small fraction of the dose of 40 μg. of vitamin B_{12}. A similar reticulocytosis without rise of red blood cells has been produced by doses as low as 1.25 or 2.5 μg. by injection. In the fourth period the increase of red blood cells in 15 days after 40 μg. by injection (plus any effect left over from previous therapy) was close to the expected increase. This suggests that there was no "resistance" to vitamin B_{12}.

Case 403

A crane-driver aged 56 had pernicious anaemia without neurological involvement. The dietary history was normal.

On admission red blood cells numbered 1,670,000 per c.mm., haemoglobin 5.9 g. per 100 ml., reticulocytes 0.4 %, P.C.V. 18%, M.C.V. 108 μ^3, M.C.H. 35.5 $\mu\mu$g., M.C.H.C. 33%, white blood cells 5,300 per c.mm. During a control period of 11 days the reticulocytes did not exceed 1.6% and the red cells did not increase. The marrow was megaloblastic.

After the instillation of 80 μg. of vitamin B_{12} into a washed segment of intestine reticulocytes rose slightly to 4.2% on the fifth day, but there was no increase of red cells (Fig. 3).

	←First Period→			←Second Period→		
Days:	0	5	10	14	19	25
R.B.C. (mills./c.mm.)	1·58	1·56	1·53	1·45	1·33	1·38
Hb (g./100 ml.) ..	6·2	6·4	5·9	5·6	5·3	5·9
P.C.V. (%)	19·0	19·0	18·0	18·0	17·0	17·0

In the second period the distance between the balloons was doubled and 80 μg. of vitamin B_{12} with 500 ml. of normal gastric juice was instilled in two lots for an hour each. Reticulocytes rose to a peak of 5.4% on the sixth day and after 11 days the red cell count was essentially unchanged. A further marrow puncture showed that, although there was some maturation compared with the control period, erythropoiesis was still predominantly megaloblastic.

In the third period the patient was given an intramuscular injection of 80 μg. of vitamin B_{12}. The reticulocytes rose on the third day and reached a peak of 27.8% on the sixth day. The red blood cells increased rapidly.

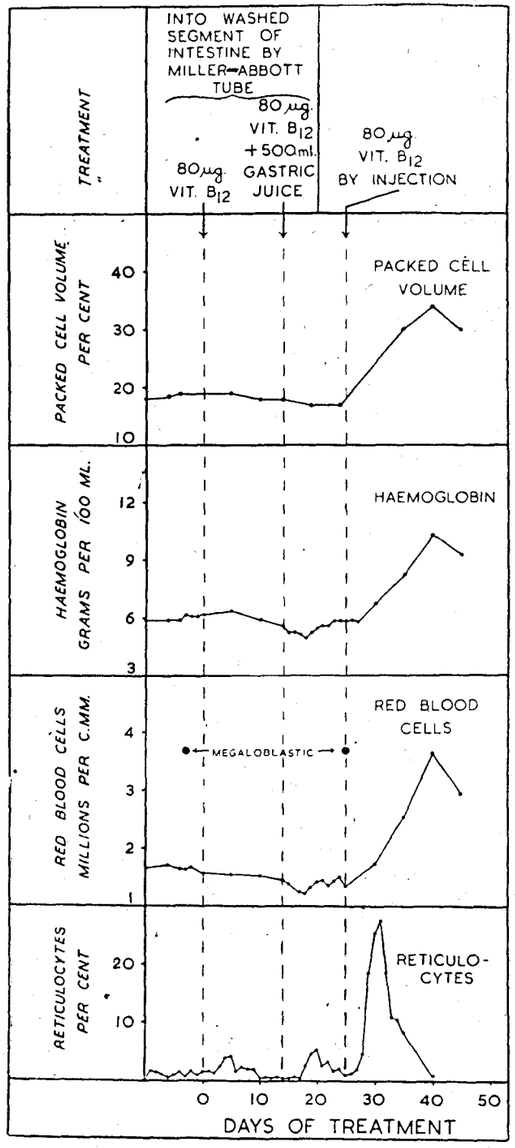


FIG. 3.—Case 403. Showing that the instillation of 80 µg. of vitamin B_{12} with or without gastric juice into a washed segment of intestine failed to produce anything more than a slight reticulocytosis. There was afterwards a good response to 80 µg. of vitamin B_{12} by injection.

Days:	Third Period				
	0	5	10	15	20
R.B.C. (mills./c.mm.)	1·38	1·76	2·58	3·69	2·95
Hb (g./100 ml.)	5·9	6·8	8·3	10·4	9·3
P.C.V. (%)	17·0	19·0	30·0	34·0	30·0

The patient ate well and had no soreness of the tongue during any of the experimental periods, but notable improvement in strength and colour was observed in the third period.

Comment.—Vitamin B_{12} instilled into a washed segment of intestine, either with or without gastric juice, was not effectively absorbed. The small reticulocytosis observed in the first and second periods was no greater than might have been observed from the oral administration of 80 µg of vitamin B_{12}. The response to injected vitamin B_{12} was better than expectation.

Not much reliance can be put on the negative results of these intubation experiments. The segment of intestine may have been too small or sited in an area unsuitable for absorption of vitamin B_{12}. Moreover, the protection against contact with intestinal contents was anything but complete.

Oral Administration of Vitamin B_{12} after Partial Sterilization of the Intestine

The object of this experiment was to determine whether vitamin B_{12} would be effectively absorbed if intestinal bacteria which might take up the vitamin were destroyed.

Case 404

A coal-screener aged 56 had pernicious anaemia without neurological involvement. His diet had been satisfactory. During a control period of 12 days the reticulocytes did not exceed 1% and the red cells fell from 1,700,000 to 1,260,000 per c.mm. He was transfused with blood of a different but compatible group so that his own cells could be enumerated. The next day the total count was 1,730,000.

In the first period intestinal antiseptics were given as follows:

1st day: Phthalylsulphathiazole 4 g., six times.
2nd day: Phthalylsulphathiazole 2 g., six times; also "aureomycin" 0.75 g., four times.
3rd day: Same as second, with dihydrostreptomycin 1 g., four times.
4th, 5th, and 6th days: All three drugs as on third day.

Bacteriological examination (Dr. C. A. Green) showed that *Bact. coli* had disappeared from the stools by the third day and cocci by the fifth day. Yeasts persisted even up to the last examination on the seventh day. On the evening of the fifth day the patient received orally 80 µg. of vitamin B_{12}. There was neither reticulocytosis nor increase of red blood cells (Fig. 4).

In the second period 80 µg. of vitamin B_{12} with 500 ml. of gastric juice was given at 7.30 p.m. No food was given for four hours before or after the mixture. The reticulocytes rose to 15.8% on the sixth day. Changes in blood counts were as follows:

Day:	Second Period			
	0	5	10	15
R.B.C. (mills./c.mm.)	1·34	1·51	2·13	2·16
Hb (g./100 ml.)	5·3	5·9	7·4	7·7
P.C.V. (%)	16·0	20·0	24·0	23·0

In the third period 80 µg. of vitamin B_{12} was injected. There was another reticulocytosis, reaching 17.2% on the fifth day. Changes in counts were as follows:

Day:	Third Period			
	0	5	10	15
R.B.C. (mills./c.mm.)	2·16	2·24	3·21	3·70
Hb (g./100 ml.)	7·7	8·0	9·3	10·8
P.C.V. (%)	23·0	24·0	33·0	37·0

Comment.—Preliminary partial sterilization of the intestine did not permit absorption of vitamin B_{12} given orally. The rise of red blood cells in 15 days after giving 80 µg. with 500 ml. of gastric juice was rather less than that expected from the injection of 5 µg. The response to the injected dose of 80 µg. was almost equal to that expected from 40 µg. Thus the oral-dose/injection-dose ratio was probably more than 8 : 1.

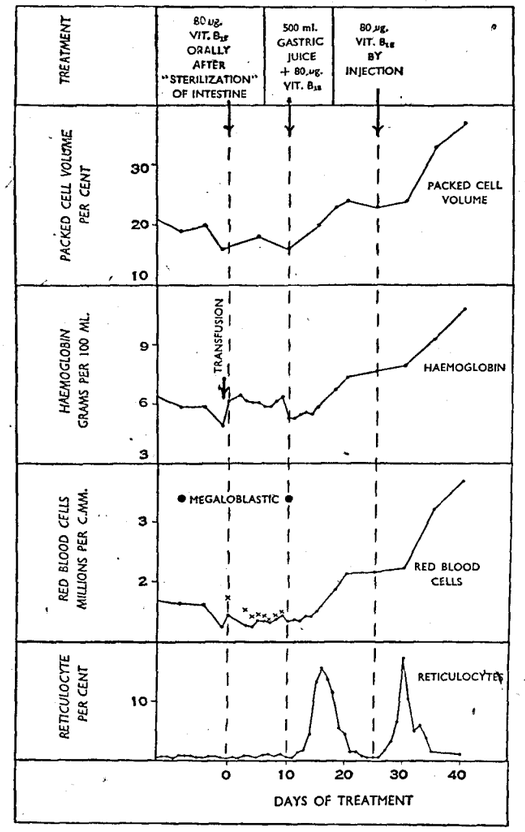


FIG. 4.—Case 404. Showing that 80 µg. of vitamin B_{12} administered orally after partial sterilization of the intestine did not lead to any reticulocytosis or increase of red blood cells. Thereafter the same dose of vitamin B_{12} given with gastric juice produced a response rather less than that expected from an injection of 5 µg. The injection of 80 µg. of vitamin B_{12} was followed by a response almost equal to that expected from 40 µg. (In the section for red blood cells the crosses represent the total count including transfused cells, whereas the continuous line represents the patient's own cells, the donor's cells have been separated by differential agglutination.)

Discussion

Results in Case 401 suggest that there was little, if any, absorption of vitamin B_{12} from the buccal mucosa. Negative results are also reported by Erf and Wimer (1949).

These negative findings and our failure on four occasions to procure effective absorption from a washed isolated segment of intestine lend no support to the idea that vitamin B_{12} given via the alimentary tract might prove effective if contact with intestinal juice were prevented.

The intubation experiments were, however, not altogether satisfactory (see Cases 402 and 403). In another type of experiment an attempt was made to destroy intestinal bacteria which might otherwise take up orally administered vitamin B_{12} and render it unavailable to the host. Using phthalylsulphathiazole, aureomycin, and dihydrostreptomycin, we succeeded in sterilizing the stools except for yeasts. The small intestine was presumably equally sterile. Even so, the administration of 80 µg of vitamin B_{12} orally was without effect.

Moreover, in microbiological tests we showed that "pernicious anaemia" intestinal juice did not destroy added vitamin B_{12}, in the presence either of "pernicious anaemia" or normal gastric juice (Ungley and Cuthbertson, 1950—Paper V of this series, to be published).

The results reported here are negative but not conclusive. They do not support, but neither do they entirely rule out, the hypothesis that Castle's intrinsic factor acts by protecting vitamin B_{12} from destruction in the alimentary tract. Further work is in progress.

Summary and Conclusions

Efforts were made to determine whether vitamin B_{12} would be effectively absorbed if the possibly destructive action of intestinal juice could be reduced or avoided.

Application of 5 µg. daily to the buccal mucosa gave a negative response in a patient who subsequently responded to the same quantity of vitamin B_{12} given with gastric juice.

In four experiments in two patients the instillation of vitamin B_{12} with or without gastric juice into a washed segment of intestine isolated between the two balloons of a Miller–Abbott tube led to negative or trivial responses. In each case the subsequent administration of vitamin B_{12} by injection or orally with gastric juice was effective.

Even after preliminary partial sterilization of the intestine with aureomycin and other drugs the oral administration of 80 µg. of vitamin B_{12} was ineffective. The patient subsequently responded to the same dose of vitamin B_{12} given with gastric juice.

These negative findings are against, but do not entirely exclude, the possibility that Castle's intrinsic factor acts by protecting vitamin B_{12} from destruction in the gastro-intestinal tract.

ADDENDUM.—Since these papers were submitted additional evidence on the effect of orally administered vitamin B_{12} and the role of Castle's intrinsic factor has been reviewed by Dr. Byron E. Hall (*British Medical Journal*, September 9, 1950, p. 585).

I am grateful to the medical, nursing, and lay staff of the hospital and medical school and to many general practitioners for their co-operation. I have to thank Dr. L. W. Carstairs for intubating the small intestine and Dr. R. B. Thompson for marrow biopsies. Special thanks are due to students and others who donated gastric juice. The dental appliance used in Case 401 was constructed with the kind co-operation of Professor John Boyes and Mr. H. G. Hanley, L.D.S., of the Dental School, King's College, University of Durham. Dr. E. Lester Smith, of the Research Division of Glaxo Laboratories, Ltd., Greenford, supplied the crystalline vitamins B_{12} and B_{12c} and also the vitamin B_{12} concentrate used in these investigations. Dr. W. F. J. Cuthbertson, also of Glaxo Laboratories, was responsible for all the microbiological assays.

BIBLIOGRAPHY

Berk, L., Castle, W. B., Welch, A. D., Heinle, R. W., Anker, R., and Epstein, M. (1948). *New Engl. J. Med.*, **239**, 911.
—— Denny-Brown, D., Finland, M., and Castle, W. B. (1948). Ibid., **239**, 328.
Bethell, F. H., Meyers, M. C., and Neligh, R. B. (1948). *J. Lab. clin. Med.*, **33**, 1477.
Callender, S. T. E., Mallett, B. J., Spray, G. H., and Shaw, G. E. (1949). *Lancet*, **2**, 57.
Campbell, D. C., Hall, B. E., and Morgan, E. H. (1949). *J. Lab. clin. Med.*, **34**, 1590.
Cuthbertson, W. F. J. (1949). *Biochem. J.*, **44**, Proc. v.
Dyke, W. J. C., Hind, H. G., Riding, D., and Shaw, G. E. (1950). *Lancet*, **1**, 486.
Erf, L. A., and Wimer, B. (1949). *Blood*, **4**, 857.
Fouts, P. J., Helmer, O. M., and Zerfas, L. G. (1935). *Ann. intern. Med.*, **8**, 790.
Girdwood, R. H. (1950). *Lancet*, **1**, 594.
Goldhamer, S. M. (1936). *Amer. J. med. Sci.*, **191**, 405.
Hall, B. E., Morgan, E. H., and Campbell, D. C. (1949). *Proc. Mayo Clin.*, **24**, 99.
Minot, G. R., and Castle, W. B. (1935). *Lancet*, **2**, 320.
Reimann, F., and Fritsch, F. (1934). *Z. klin. Med.*, **126**, 469.
Smith, E. L. (1950). *Proc. R. Soc. Med.*, **43**, 535.
Spies, T. D., Stone, R. E., Garcia Lopez, G., Milanes, F., Lopez Toca, R., and Aramburu, T. (1949). *Lancet*, **2**, 454.
Ternberg, J. L., and Eakin, R. E. (1949). *J. Amer. chem. Soc.*, **71**, 3858.
Ungley, C. C. (1949a). *British Medical Journal*, **2**, 1370.
—— (1949b). *Brain*, **72**, 382.
—— (1950). *Proc. R. Soc. Med.*, **43**, 537.
West, R. (1948). *Science*, **107**, 398.
—— (1949). Paper read at a meeting at Atlantic City, May 3, 1949. Cited by Erf and Wimer (1949).

ACUTE INTUSSUSCEPTION IN CHILDHOOD

BY

Sir JAMES SPENCE, M.D., F.R.C.P.

AND

DONALD COURT, M.D., M.R.C.P.

(From the Children's Department, Royal Victoria Infirmary, Newcastle-upon-Tyne)

This is a sequel to the account of 100 cases of acute intussusception in children given by Morrison and Court (1948). That study revealed the relationship between the delay in reaching a diagnosis and the outcome of the disease, and the parts played by the parents and the family doctor in the process. Although the risk of death increased sharply when intussusception had been present for more than two days, a considerable number of affected children failed to reach hospital within this favourable period. Yet almost every child had been seen by the family doctor before the second day was over. These facts together suggest that the illness was in most cases intense enough to alarm the parents but that in many it failed at this stage to provide the doctor with sufficient evidence for diagnosis. Knowing the difficulties of diagnosis, Morrison and Court paid special attention to the clinical events on the first and second days of the illness. They described these in detail and time-sequence, and asked practitioners to send suspected children to hospital as soon as their suspicions were aroused.

In the three years following the initial study we have seen another 139 children with acute intussusception. With this further experience we return again to the significance of early diagnosis, and comment briefly on the improvement that has occurred and the reasons for it. We attempt also to set this problem in its right perspective. During the six years of this survey the average number of children with intussusception seen by any practitioner in that period was only one, and, although a small number saw more than one in six years, many doctors saw none at all. How, then, shall a family doctor maintain his diagnostic skill with this infrequent contact? The facts and suggestions given below may help to answer these questions.

TABLE I.—*A Comparison of Mortality in 177 Infants with Intussusception Admitted Before and 62 Admitted After the 48th Hour of the Disease*

Year	All Cases			Under 48 Hours			Over 48 Hours		
	No.	Deaths	Death Rate %	No.	Deaths	Death Rate %	No.	Deaths	Death Rate %
1944 ..	29	4	14	14	1		15	3	20
1945 ..	25	2	8	18	—		7	2	28
1946 ..	46	4	9	32	2		14	2	14
1947 ..	49	2	4	38	1		11	1	9
1948 ..	40	3	7	31	—		9	3	20
1949 ..	50	2	4	44	2		6	—	
All years	239	17	7	177	6	3·4	62	11	17·8

Table I shows the mortality in the entire group of 239 children admitted to one hospital from a wide area. It reveals a number of interesting differences between those admitted before and those after 48 hours. First, a fall in the death rate from 14% in 1944 to 4% in 1949. Yet over the six years, the death rate for children admitted within 48 hours has not deviated significantly from 3–4%, and of those admitted after 48 hours from 18%. It is still, therefore, of first importance that children with this disease should be in hospital well within 48 hours of the onset of symptoms. A larger number of children were treated in the 1947–9 period, and there has been a gratifying increase in the percentage reaching hospital in the first two days of the illness. This percentage rose from 48 in 1944 to 88 in 1949—an increase which is statistically significant (Table II).

TABLE II.—*The Proportion of 239 Cases of Acute Intussusception Admitted to Hospital Within 48 Hours of Onset*

	1944	1945	1946	1947	1948	1949
% Admitted within 48 hours	48	72	70	77	78	88
	64			81		

Differences in the anatomical types of intussusception have been difficult to measure consistently owing to a lack in some cases of a precise indication of the starting-point. If there has been any change in the first three years it has been a slight increase in the small-bowel invaginations of the ileo-ileocolic variety, while the incidence of pure ileo-ileal intussusception has remained the same throughout. The general paediatric care and surgical technique, too, were unaltered in the second period. A group of surgeons have shared the work, and there has been no attempt to limit this experience to one or two people. Pre-operative resuscitation with plasma has been the rule in almost every child.

In view of these facts the fall in mortality can be primarily attributed to the increasing number reaching hospital within 48 hours, and therefore to the skill of the family doctors concerned.

We have wondered how this earlier recognition of the disease has come about, as intussusception is not common, and most doctors' memories will not be refreshed by frequent contact with the disease.

Interest in the exact incidence of the disease within a community, and in the chance of a doctor's seeing it, led us to trace every child with acute intussusception resident within the City of Newcastle-upon-Tyne during the six years covered by our review. There were 127 such children admitted for treatment to a hospital or nursing-home within the city. The average annual number of births over the period was 5,600, so the incidence of intussusception was 3.8 per 1,000 births, or about 1 in 250 births. The yearly variation was considerable and is set out in Table III.

TABLE III.—*Annual Incidence of Acute Intussusception in Newcastle-upon-Tyne, 1944 to 1949*

	1944	1945	1946	1947	1948	1949	All Years
No. ..	13	13	14	30	20	37	127

During this period the number of doctors resident and practising in Newcastle-upon-Tyne did not vary significantly from 120 in each year. The way in which the 127 children with acute intussusception were distributed among these doctors is shown in Table IV. This gives an average of one case to a single practitioner every six years. Yet during this period 42% of the practitioners did not see the disease at all and a further 36% saw it only once; at the other end of the scale a small group of 27 doctors, 22% of the total, saw 83 cases between them, or 65% of all the affected children in the city. There is therefore no constant pattern in the distribution of this disease within the experience of the urban family doctor, though the majority are not likely to see more than one affected child every six years—that is, 6 or 7 in a professional lifetime.

How, then, has this earlier recognition come about? The article by Morrison and Court may have been noticed

TABLE IV.—*Distribution of 127 Children with Acute Intussusception Among 121 Family Doctors in Newcastle-upon-Tyne, From 1944 to 1949*

Cases per Doctor	No. of Doctors	Total Cases
0	50*	0
1	44	44
2	12	24
3	8	24
4	4	16
5	1	5
6	1	6
7	0	0
8	1	8
Total ..	121	127

* Estimated from the average number of doctors practising in Newcastle-upon-Tyne during the survey period.

by some practitioners. The main facts were also presented to a well-attended local meeting of the Newcastle and Northern Counties Medical Society. But a new influence has been used in the letters to doctors when the children were discharged from hospital. These have been worded in the last few years with the need for early admission in mind. When the doctor's suspicions of the disease had been quickly aroused and the child reached hospital in good time, confirmation alone was required to complete the happy story. When, however, diagnostic hesitation lasted beyond the second day, the writers of the discharge letters have ventured to discuss those points in the history which might have suggested earlier diagnosis and have led to earlier admission if their significance had been recognized.

As a result of conferences with practitioners we feel that the discharge letter, or a telephone conversation, should usefully go beyond the mere statement of what has been done in hospital, since it is concerned with the fate of a particular person for whom the doctor is responsible. The letter (or the conversation) is an instrument of postgraduate education and commands more interest and attention among practitioners than comprehensive reviews of the subject in journals. Moreover, this exchange is a two-way process of education: it helps the hospital doctor to appreciate the difficulties of practice, from which he may learn what sort of letters to write.

Whatever the full explanation may be, we suspect that these letters, the contents of which would be extended to partners and colleagues by the inevitable discussion among doctors of the unusual or exciting case, may have assisted general practitioners in the North-east to make a notable contribution to the better management of acute intussusception. In any case we are grateful for the facts and offer our thanks to all doctors concerned, both in the home and in the hospital.

Our thanks are due to Mr. H. Campbell, of the Nuffield Department of Industrial Health, for his expert comments on the figures presented in this paper.

REFERENCE

Morrison, B., and Court, D. (1948). *British Medical Journal*, **1**, 776.

A report entitled "Towards the Better Care of the Elderly" has been issued by the Public Health Department, Salford. The report, which has an introductory note by Lord Amulree commending the care of the elderly in their own homes, is an account of two informal conferences, sponsored by the local health department, which were held at Salford this year on May 4 and 5. The first conference dealt with the medical aspects of the care of the aged, and the second with the co-operation of home and hospital in this task. A limited number of copies of the report may be obtained, free of charge, on application to the Medical Officer of Health, Health Department, 143, Regent Street, Salford, 5.

ACTIVITY IN ADVANCING YEARS*

BY

MARJORY W. WARREN, M.R.C.S., L.R.C.P.

Consulting Physician to the Geriatric Unit, and Deputy Medical Director, West Middlesex Hospital, Isleworth, Middlesex

Full health, and with it usefulness and happiness, depends upon activity of mind and body. This applies equally to all age groups, though the amount of mental and physical work which can be undertaken at different ages and by different persons must vary widely, even among healthy individuals. The elderly are no exception to this rule, and the subject of activity is closely associated with modern ideas of their treatment, which embrace psychological and physical methods. In order to strengthen my arguments for retaining or obtaining the maximum activity amongst them it may perhaps be profitable to consider briefly first the results of inactivity both to the individual and to the community, and then to discuss therapeutic measures (medical and social) against such a background.

Anatomically and physiologically, man has been designed for an active existence in the upright or vertical position, and any grave departure from such, for any appreciable length of time, inevitably brings troubles, both mental and physical. Anyone who has inherited patients who have been bedridden for a long time will readily appreciate the picture here described.

Effects of Inactivity on the Individual

Confined to bed, most patients develop rarefaction of bone, stiffness of soft tissues, and contractures. Muscles atrophy, tendons shorten, and limbs assume malpositions, varying with circumstances. The type and degree of contracture will depend upon the position in bed. When propped up for long periods of time flexion of hips and knees is almost inevitable. Feet assume a varus, valgus, or equino-varus position, according to the physical disability, the mental state, and the condition of the bedclothes. The elderly when nursed sitting in bed show a great tendency to keep the upper limbs adducted to the trunk in a position of flexion. This results in stiffness and contractures of shoulders and elbows, and is always more marked in the left upper limb with right-handed persons. Also there is a tendency towards some degree of fixed flexion of the head on the chest—often in minor degrees only and therefore not easily noticed when the person is propped up. Such contractures and stiffness lead to difficulties in changing patients' positions in bed and hence lead to the development of pressure sores.

With lowered metabolism, reduced body needs, and the absence of all exercise and voluntary movement, obesity often follows. Such obesity, which is a well-recognized feature in these conditions, is frequently aggravated by the patient's inclination to eat between meals (often of carbohydrate foods), and shows earliest in the anterior abdominal wall. This additional deposit of fat adds another factor to the difficulty of movement in bed, and indeed often prevents a patient from sitting up. It also affects the heart, as such general increases tend to infiltrate the myocardium and so reduce normal cardiac efficiency. Overweight and immobile, such patients show a reduced respiratory excursion and develop signs of

*Read in opening a discussion in the Section of Geriatrics at the Annual Meeting of the British Medical Association, Liverpool, 1950.

basal congestion which are potential sources of active pulmonary infection.

Lack of exercise produces a sluggish bowel action, with resulting constipation. In passing, I would draw attention to the fact that much of the so-called incontinence of faeces is in reality retention of faeces with overflow—a condition not sufficiently recognized. On the nervous and psychological side, such conditions soon produce a degree of mental apathy, especially among those who are less erudite or who, by reason of poor sight and/or poor hearing, are somewhat isolated from their fellows.

Such apathy produces two main results: (1) irregular sleep, with a tendency to sleep between meals by day, and a failure to sleep well at night; and (2) laziness, resulting in incontinence of urine, which further adds to the difficulty of preventing pressure sores. Occasionally, instead of incontinence of urine, retention occurs. This is usually found in men—often in those who have a mild degree of prostatic enlargement. I have, however, met a few such cases in women.

The last case was in an old woman aged 90 who developed retention of urine when put to bed at home following a fractured right humerus. On admission she was in great discomfort with a grossly distended bladder. In spite of all encouragement she could pass only a few ounces of urine normally. Catheterization undertaken slowly over a period of several hours resulted in withdrawal of 5½ pints (3.1 litres) of urine which showed no abnormal constituents and was sterile on culture. She had a small sessile urethral caruncle, which I do not think was in any way responsible. She was allowed up in a chair daily and at the end of a week normal micturition was re-established.

Effects of Inactivity on the Community

Failure to retain or obtain the fullest possible activity, independence, and useful work amongst the elderly will inevitably lower the general standard of health. With increasing numbers of elderly persons in our population it is obvious that as many as possible must be helped to remain as active members. The more invalids or bed-fast patients there are the greater the burden will be on personnel of all kinds engaged in looking after them and the greater will be the financial strain on the country.

It is obvious, then, that all must play their part in helping the elderly to remain active and retain their full independence—by providing domiciliary service as soon as it is needed, along with recreational interests—and it is certain that the first call should be to the relatives and friends.

There must, I feel, be general agreement on the advisability of maintaining or restoring activity even if there is divergence of opinion on methods, and I therefore propose to discuss the subject from three angles: (1) Conditions relating to a maintenance of personal independence, with or without useful work. (2) Therapeutic methods necessary to bring about a return of useful function and a measure of personal independence where this has been lost. (3) Conditions required for creating and maintaining optimum morale.

Maintenance of personal independence with or without useful work depends upon the attitude of mind of both the individual and those around him, and the patient's medical and social condition.

If the mental attitude of those around an elderly person favours inactivity, or they are quite unaware of the methods by which activity and interest can be maintained, then, indeed, unless help is given, he will become inactive and an unnecessary burden to himself and the community. Overindulgent relatives often persuade an elderly person to take more and more rest and to do less and less; at the other extreme we have the inattentive people who offer nothing to the aged, who in turn rebel and demand everything.

Patients who develop increasing arthritis, considerable cardiac failure, pernicious anaemia, or a mild cerebrovascular catastrophe all need treatment; but these conditions are not infrequently overlooked in the early stages and consequently result in long periods of inactivity.

Finally, an elderly person whose living conditions include an outside toilet, accommodation on the third or fourth floor, or no domestic help may well give up the unequal struggle and demand full service.

It is obvious that such psychological, medical, and social conditions call for full preventive measures. These measures include, in addition to education of the public when needed, full medical treatment when required and use of all domiciliary services which are available, and an increase where these are insufficient.

Treatment

To provide a well-run medical service for the elderly the importance of activity must be well understood, and methods must be fully implemented to ensure it.

Without due care inactivity is apt to follow any illness (medical or surgical) which necessitates a period of time in bed. It therefore behoves all those concerned to regard such a period of rest in bed as a "danger period." With considerable years of personal experience, and after reading widely on the subject, I know of no reasons *on age alone* for recommending a long stay in bed. Indeed, I would suggest that, in treating the elderly, rather than deciding how soon they may safely get up, one should consider very carefully whether it is really necessary and wise to put them to bed.

Although any elderly patient may become inactive after a long time in bed, there are certain conditions which particularly predispose to this state: painful feet from any cause; cerebro-arteriosclerosis with some added minor medical or social problem; cerebrovascular accidents; cardiac disease, in failure; arthritis; progressive nervous disease—for example, Parkinsonism; and post-traumatic and post-operative conditions.

Full activity, which must be aimed at in all cases, depends upon psychological and physical fitness, and these are closely interrelated. Without a degree of mental activity physical progress is very slow, and in the absence of physical progress mental activity wanes appreciably. It must therefore be the aim of the physician to get and to maintain a good balance.

In order to ensure the fullest activity and the most complete rehabilitation the following general methods should be adopted: (1) a detailed history of the patient's illness and earliest symptoms and signs must be obtained from him or his relatives or friends; (2) a full clinical examination, including a rectal examination and blood-pressure reading, must be made before starting treatment. Only with these prerequisites can a sound plan be made and detailed treatment arranged. Many diagnoses are missed in the elderly owing to failure to undertake such preliminaries. With as full knowledge of the patient as possible, treatment must be undertaken by a team, and the members of this team must work in complete harmony if full success is to be obtained.

Such a team will usually include:—In the home: a general practitioner; domiciliary services; relatives and friends. In the hospital: the physician and his medical staff; nursing staff; physiotherapists; occupational therapists; almoner; dietitian, etc. To complete the picture it is necessary that general practitioners and physicians should work together concerning the patient's future.

When treating sick elderly patients the following principles should be adhered to.

1. A patient must be encouraged to retain full independence for his personal needs whenever possible while under treatment—for example, he should wash and feed himself, brush his teeth, comb his hair, and assist in dressing himself. Nothing that a patient can do for himself should be done for him.

2. If his medical condition has diminished his independence or rendered him immobile, then full treatment by means of physiotherapy, occupational therapy, or speech therapy must be arranged to overcome his disabilities.

3. At all times a patient must be encouraged to persevere with treatment, to keep active in every possible way, and to interest himself in his own full recovery and in his surroundings.

4. Exercise should be frequent and for short periods of time, as the elderly tire easily and yet need repetitive treatment.

5. The time allowed up or for exercise should be laid down in detail, as only with such precision can a true assessment of progress or fatigue be measured.

6. Great care should be taken to ensure that conditions are good as regards flooring, sanitation, temperature, light, etc.; that clothes, especially shoes, are comfortable, well-fitting, and warm enough but not too heavy; and that appliances, including prostheses, are correct in every detail. Crutches and sticks particularly should be the right length or walking may be difficult, or even dangerous.

7. Equipment should be provided with a view to giving the maximum help to patients under treatment, and this includes rails overhead and bed-end pulleys, armchairs, wheel-chairs, self-propelling chairs, etc.

8. All medical conditions must be treated in order to avoid general deterioration from one disability hindering progress of another.

Exercise

In most cases well-planned treatment giving successful results does not depend on elaborate apparatus, but on the knowledge of the therapeutic principles involved. In general, massage is to be avoided, as it is time-consuming and of less value than exercise. Exercises should be undertaken by the patient after careful education, and these will give him an interest in his progress. The physiotherapist, where available, should give regular attention to such patients, partly individually and partly as group therapy. Ideally, treatments should be frequent and short—not more than 15 minutes. Where, however, physiotherapists are not able to give all the treatment necessary some members of the nursing staff—and especially, in my experience, the State-enrolled assistant nurses—can be taught to undertake valuable work in this connexion; but, whatever help is available, the overall supervision must remain with the physician and should never be handed over entirely to ancillary staff.

Exercise may be passive or active, and in many instances a combination of the two methods will prove best. All joints need exercise through a full range of movements daily.

Arthritis

In the case of arthritics, where flexion deformities are commonest, an increased range of movement must be aimed at. This can best be undertaken by a series of graded exercises against springs of varying tension with the limbs suspended in slings—Guthrie Smith frame or an improvised modification. I have found that where pain interferes with exercise it is sometimes profitable to give radiant heat immediately before treatment. This can be provided equally well by any of the recognized radiant-heat machines or by an electric heat cradle placed over the affected part. Active movements against resistance improve muscle tone. Movements between fixed points give some measure of range of movement, and should be encouraged for the sake of accuracy.

Much valuable work can be undertaken on these lines either with the patient lying on the bed with all bedclothes removed, or with him sitting on the edge of the bed swinging his legs and thus overcoming flexion deformities of the knees.

When planning suitable exercises it should be remembered that the aim of treatment is to restore full function so that the patient may be independent regarding his personal needs. It is therefore necessary that all exercises should serve this purpose.

Many patients can be more safely nursed sitting in an armchair by day than reclining in bed, where they tend to become less active. Before a patient can walk he can sometimes get about in a self-propelling wheel-chair, which greatly improves his morale.

When a number of patients can be grouped together for such exercise the natural element of competition is often most stimulating. Encouraging a patient to get into his own clothing (and this is much easier for a woman than for a man, because the clothing of the former is much looser) is in itself very good physiotherapy.

Other exercises which are useful include sitting up from a lying-down position, by any means in the first instance and later with the arms folded, contraction and relaxation of abdominal muscles while lying flat on the bed, and regular quadriceps drill. Arthritics should be told that small degrees of flexion deformity of hips and knees are in themselves no absolute bar to walking.

From bed exercises arthritics should proceed to exercises in standing and walking—in the early stages holding on to a rail, and with the help of sticks, crutches, or poles. Sticks should always be provided with a rubber ferrule, and may be ordinary one-legged sticks, or have three or four legs; the latter I have found of great use in my department when a patient feels insecure with an ordinary stick. Crutches are useful where the upper limbs are able to support them, and are sometimes preferred to sticks. When arthritis is mainly confined to the lower limbs, and is especially marked in the lumbo-sacral spine, I have found duralumin poles provided with rubber ferrules at both ends particularly helpful. Poles have a limited use, but when acceptable they are very good, as they overcome the tendency to stoop.

It is important that patients should never be allowed to try to walk until they are able to rise from a sitting position holding on to a rail, but otherwise unaided, and to maintain the erect position correctly balanced.

Hemiplegics

Patients with hemiplegia resulting from a cerebrovascular accident are from a medical point of view one of the most interesting groups to re-educate and guide—and at the same time one of the most neglected. They range from those who are very easy to those who call for the greatest experience, patience, and detailed work.

From the very moment of catastrophe these patients, if they are to do really well, need detailed care and treatment. On the one hand, it is essential to prevent development of stiffness and contractures, particularly of the affected shoulder-joint, and on the other it is necessary to give re-education as early as possible. As soon as

the patient is conscious he must be taught to play an active part in his own re-education, and his activities must be carefully supervised.

Bed exercises in the early stages are followed by exercises while learning to stand, and, later, by practice in walking with a stick and a little assistance, and, finally, by walking with a stick unaided on the flat and then on the stairs.

During the treatment of all these conditions suitable occupational therapy should be provided, and general interest be stimulated by encouraging visiting, reading, conversation with other patients, and by wireless programmes (via headphones and *not* loudspeakers, unless a room can be set aside for such purpose).

If these principles are adhered to then success in treatment will depend upon early and full treatment, attention to detail in an atmosphere of optimism, strength of the team-work, confidence of the patient in the team, and the experience and activity of the physician.

Summary

The results of inactivity both to the individual and to the community are outlined, and an argument is put forward for the maintenance of full activity and independence among the elderly and for their rehabilitation.

Inactivity may be brought about by psychological, physical, or social conditions; preventive measures against these are described.

Medical conditions which particularly predispose to inactivity are enumerated, and principles underlying their management and treatment are discussed. Warning is given that long periods of rest necessitated by illness must be regarded as "danger periods."

Points stressed are: that good results depend on a high standard of medicine, on really good team-work, and on an atmosphere of optimism and activity, combined with the patient's confidence and co-operation in his treatment.

Some suggestions are made with regard to the treatment of arthritics and hemiplegics.

USE OF INTRAVENOUS AMPHETAMINE SULPHATE IN ACUTE BARBITURATE POISONING

BY

J. D. N. NABARRO, M.D., M.R.C.P.

First Assistant, Medical Unit, University College Hospital

The possible use of intravenous amphetamine sulphate in conjunction with other remedies in cases of acute barbiturate poisoning is seldom considered in this country. When Alles (1933) was investigating the pharmacological properties of this drug in dogs under barbiturate anaesthesia he found that the animals often awoke after its injection. Myerson (1940), in a review of the rationale of amphetamine sulphate treatment, mentioned its possible value in counteracting the effects of barbiturate poisoning. Freireich and Landsberg (1946) reported 14 cases of this condition in which the drug was used; but few of these were severe, and the maximum dose employed was 400 mg. Newman and Feldman (1948) have reported a series of cases of poisoning in which massive doses of picrotoxin were used, supplemented in four by amphetamine sulphate. In the treatment of one of their patients who was 135 hours in coma, 14,190 mg. of picrotoxin and 1,950 mg. of amphetamine sulphate were given.

Pharmacological Aspects

Barbiturate poisoning may cause the death of the patient either by depression of the respiratory centre or through the development of bronchopneumonia. The former is more likely to occur with very large doses and with the short-acting derivatives, whereas the latter is associated with prolonged coma. Specific treatment is therefore directed at stimulation of the respiratory centre and hastening the recovery of consciousness. Picrotoxin has an established place in the management of these cases, principally as a stimulant of the respiratory centre. It has much less action on the cerebral cortex, but on account of its convulsant properties must be used with care.

Amphetamine is widely known as a cerebral stimulant, and its power of awakening both men and animals under the influence of various narcotics has often been reported (Reifenstein and Davidoff, 1938; Myerson *et al.*, 1939), although it has been found to increase the death rate in mice after LD50 doses of barbiturate (Chakravarti, 1939). The action of amphetamine on the respiratory centre has been the subject of conflicting reports, and no consistent stimulant action can be demonstrated. In addition to its effect on the central nervous system amphetamine is a powerful sympathomimetic agent. It produces a rise of blood pressure and should therefore be used with care in older patients and hypertensive subjects. Disturbances of cardiac rhythm following its administration have also been reported (Anderson and Scott, 1936; Waud, 1938).

The very large amounts of amphetamine used in Newman and Feldman's case and in that reported below raise the question of the fate of the drug in the body. When given by mouth in normal doses, part is excreted in the urine, in which it may be detected for some days (Beyer and Skinner, 1940; Monroe and Drell, 1947), and the remainder is probably metabolized (Beyer, 1942). There are a few reports in the literature of the results of large doses being taken by patients not under the influence of narcotics. Transient hypertension, excitement, or confusional states have followed the ingestion of amounts up to 450 mg. (Ehrich *et al.*, 1939; Monroe and Drell, 1947). A few deaths have been attributed to the drug, usually after much smaller quantities, and presumably due either to idiosyncrasy (Smith, 1939) or, as in one case, to subarachnoid haemorrhage (Gericke, 1945). The administration of large doses to monkeys has been found to produce toxic degeneration of the nerve cells and perivenous haemorrhages in the meninges (Ehrich *et al.*, 1939).

Case Reports

Over a period of 18 months intravenous amphetamine sulphate has been used, usually in conjunction with other remedies, in the treatment of seven cases of acute barbiturate poisoning. Four were mild cases with coma lasting a few hours, and in three of these picrotoxin seemed more effective in awakening the patient, although the amount of amphetamine used was probably inadequate in the light of subsequent experience. In the fourth, recovery was little accelerated by either drug. The other three cases had points of particular interest and are recorded in more detail.

Case 1

A woman aged 29 was admitted two and a half hours after taking 80 gr. (5.3 g.) of sodium amytal. The stomach was washed out and picrotoxin (100.5 mg. intramuscularly and 115.5 mg. intravenously) was administered over the next 17 hours. In spite of this the patient remained comatose, and tendon reflexes were obtainable for only a few minutes after each injection. During the next 75 minutes 70 mg. of amphetamine sulphate was given intravenously, and after this the patient woke up and spoke. After an hour without treatment she relapsed into coma and 6 mg. of picrotoxin failed to rouse her. Thirty minutes later a further intravenous injection of 10 mg. of amphetamine again woke the patient, and when this was repeated one hour later she became fully conscious and required no more treatment. (This patient was treated in collaboration with Dr. A. G. Spencer.)

This case demonstrates the superiority of amphetamine over picrotoxin as an awakening agent in the later stages of the treatment of a case of severe barbiturate poisoning. Its action in shortening the period of unconsciousness should reduce the risk of bronchopneumonia.

Case 2

An asthmatic patient, aged 54, 24 hours before admission took 2 gr. (0.13 g.) of phenobarbitone and 1½ gr. (0.1 g.) of pentobarbitone sodium, followed while in a drowsy state by a further 9 gr. (0.58 g.) of pentobarbitone sodium. He was unconscious and cyanosed on arrival at hospital, with widespread rhonchi all over his chest and a respiration rate of 25. He was given 20 mg. of amphetamine intravenously, after which he opened his eyes, and a further 10 mg. 45 minutes later restored him to full consciousness.

This was a mild case of barbiturate intoxication, but in view of the patient's pulmonary condition it was essential to terminate the coma as quickly as possible. Amphetamine sulphate in quite small doses proved effective.

Case 3

A man aged 38 took 96 gr. (6.3 g.) of phenobarbitone and was admitted to hospital 31 hours later deeply comatose, with stertorous respirations at a rate of 16 a minute and a blood pressure of 100/68. The pupils were small with poor reaction to light; the corneal and tendon reflexes were sluggish and plantar responses flexor. The stomach was washed out, but only traces of barbiturate were present in the fluid. In the first three hours 180 mg. of amphetamine was given intravenously; the pupils became dilated and fixed, and the coma and blood pressure were unchanged. During the next three hours 69 mg. of picrotoxin was given intravenously and the blood pressure rose to 120/80. For the next 32 hours picrotoxin, 12 mg., and amphetamine, 20 mg., were given every half-hour, the injections being made into a glucose-saline drip every 15 minutes. Muscular twitching appeared and the dose of picrotoxin was reduced to 6 mg.; after a further 13 hours the twitching became more marked and picrotoxin was discontinued.

Over the next five hours amphetamine only was given; the patient's condition deteriorated, his coma became more profound, and respiration was shallower. Picrotoxin was then restarted, and eight hours later the condition had improved and the amphetamine was discontinued to see if this led to any change in the patient's condition; there was no deterioration of either blood pressure or respiration. However, after another four hours vigorous muscle-twitching occurred and the picrotoxin was permanently stopped and amphetamine in 20-mg. doses recommenced. Seventeen hours later, when 116 hours had elapsed since the drug had been taken, the urine for the first time was free from barbiturates. The patient, however, remained deeply comatose; lumbar puncture was performed and a normal cerebrospinal fluid was obtained which did not contain any barbiturate. Twelve hours later the coma lightened, and after another eight hours the patient regained consciousness—137 hours after taking the tablets. Amphetamine was continued in decreasing amount and at lengthening intervals for a further 15 hours.

Over a period of 121 hours the patient received 4,230 mg. of amphetamine sulphate, 1,086 mg. of picrotoxin, and by intravenous drip 8 pints (4.5 litres) of 5% glucose in normal saline, 12 pints (6.8 litres) of 5% glucose in half-normal saline, 14 pints (8 litres) of 5% glucose, and 1 pint (570 ml.) of plasma. He was also given penicillin, vitamins of the B complex, two-hourly inhalations of 5% CO_2 in oxygen, and was frequently turned from side to side. During this prolonged coma the lungs remained completely clear, and great credit must go to the house-physician (Dr. D. A. Hodgson) and the nursing staff for their conscientious care of the patient. He was subsequently transferred to a mental hospital in which he had previously received treatment. His physician noted no change in his mental condition; the only sequelae to the poisoning and its treatment were thromboses in the leg veins into which the drip had been given. Lamson *et al.* (1949) have shown that in some animals the intravenous infusion of glucose potentiates the action of barbiturates; however, no such effect has been reported in humans, though the relationship has not apparently been specifically investigated.

Comment on the Cases

Many of the properties of amphetamine already referred to make it questionable whether the use of this drug in barbiturate poisoning is ever justified. In mice it increases the death rate from large doses of barbiturate. In man it raises the blood pressure and may produce cardiac arrhythmias; some patients show idiosyncrasy to the drug, which may be fatal. It disappears from the body very slowly, partly by an uncertain metabolic process and partly in the urine; hence with these large doses the amount accumulated must be considerable. In monkeys it produces histological changes in the brain cells.

Kempf (1946) has discussed its possible value, and points out that in mild cases there is little to be gained in the ordinary way by awakening the patient rather than letting him "sleep it off." Case 2 represents an exception to this: the patient was an asthmatic, and if his coma had persisted much longer he would probably have developed bronchopneumonia. Amphetamine in quite small doses proved effective, and there is little reason to suppose that such an amount would be dangerous. The use of larger doses in the severer cases requires more justification.

The outcome in Case 3 is unusual. The patient had taken a fatal dose of phenobarbitone, nearly all of which was probably absorbed, and he did not come under treatment until 31 hours after the drug had been ingested. He received large doses of picrotoxin and amphetamine in the course of treatment, and it is important to try to assess what part, if any, they played in his recovery. During the first three hours, when amphetamine was being administered, his condition remained poor, whereas picrotoxin at once stimulated the medullary centres and removed much of the immediate anxiety. Forty-eight hours later, when muscular twitching necessitated a break in picrotoxin therapy, there was definite deterioration despite the continued administration of amphetamine. Newman and Feldman (1948) recommend that picrotoxin should be used until preconvulsive muscular twitchings appear and amphetamine treatment then be started. It seems, however, that picrotoxin may have to be recommenced if the patient's condition is not maintained. In the early stages of this patient's treatment amphetamine had no demonstrable beneficial effect, but it is possible that subsequently it accelerated the recovery of consciousness. The progress of the first case showed this very clearly. No undesirable results seem to have followed the very large amounts of amphetamine administered.

Management of Cases of Acute Barbiturate Poisoning

These cases are not very common, and frequently first come under treatment during the night. The remedies used are often employed in a half-hearted and haphazard fashion. The following programme is outlined for the management of severe cases in deep coma.

1. If there is marked respiratory depression restorative measures should be applied at once. Intravenous picrotoxin, 6 mg., should be given, and if there is no response 12 mg. every 30 minutes. Oxygen administration may be useful, and in extreme cases the use of a mechanical respirator should be considered.

2. When respiration is restored, or in less severe cases immediately on admission, the stomach should be washed out with 16 pints (9 litres) of saline. (The stomach contents should be retained for examination.) Twenty grammes of magnesium sulphate should be left in the stomach.

3. The intravenous administration of picrotoxin, 12 mg. every 30 minutes, should be continued. A careful watch must be kept for twitching of the facial muscles; picrotoxin must be stopped if this occurs, and amphetamine, 20 mg. at similar intervals, should be given. If the coma then deepens, picrotoxin, 6 mg., every 30 minutes should be restarted; otherwise amphetamine should be continued until the patient regains consciousness and for some hours after, in decreasing doses and at lengthening intervals.

4. If the patient shows no response after the first few hours it is desirable to cut down on a leg vein and set up a drip infusion. A plaster cast should be applied to the leg, otherwise as the patient becomes restless serious damage may occur. The analeptic drugs are given into the tubing of the drip. The fluid given should be glucose (5%) in varying concentrations of saline according to the urinary chloride content. The rate of flow must be regulated to maintain a good urinary output without causing any pulmonary oedema.

5. Rectal wash-outs should be done daily in order to remove any barbiturate in the lower bowel.

6. Milk by gastric tube should be given, and probably vitamin-B complex by intramuscular injection as long as a glucose drip is running.

7. To prevent pulmonary infection prophylactic penicillin should be given, also CO_2 and oxygen inhalations every two hours, and the patient should be nursed on his side and turned frequently.

In mild cases in which the patient exhibits spontaneous movements, a stomach wash-out is in many cases all that is needed; but if for any reason rapid awakening is desirable, one or two intravenous injections of 20 mg. of amphetamine at 30-minute intervals may be given. Some patients admitted shortly after the ingestion of the drug may present a deceptive appearance and should be watched carefully, since they may sink deeper into coma.

Summary

Intravenous amphetamine sulphate is a useful ancillary drug in the treatment of acute barbiturate poisoning. In mild cases in which rapid awakening is desirable it is effective and safe. In severe cases it is of little value in the early stages, but it may shorten the duration of coma if given later, particularly when picrotoxin is producing preconvulsive muscular twitchings.

A case is described in which the patient took 96 gr. (6.3 g.) of phenobarbitone 31 hours before admission to hospital. He recovered after 137 hours in coma. Treatment included 4,230 mg. of amphetamine sulphate and 1,086 mg. of picrotoxin.

A programme for the management of cases of acute barbiturate poisoning is outlined.

I have to thank Professor H. P. Himsworth, Dr. E. E. Pochin, Dr. A. Morland, and Dr. J. F. Stokes for permission to report cases under their care, and Professor C. Rimington for examination of specimens for barbiturates.

References

Alles, G. A. (1933). *J. Pharmacol.*, **47**, 339.
Anderson, E. W., and Scott, W. C. M. (1936). *Lancet*, **2**, 1461.
Beyer, K. H. (1942). *J. Pharmacol.*, **76**, 149.
—— and Skinner, J. T. (1940). Ibid., **68**, 419.
Chakravarti, M. (1939). Ibid., **67**, 153.
Ehrich, W. E., Lewy, F. H., and Krumbhaar, E. B. (1939). *Amer. J. med. Sci.*, **198**, 785.
Freireich, A. W., and Landsberg, J. W. (1946). *J. Amer. med. Ass.*, **131**, 661.
Gericke, O. L. (1945). Ibid., **128**, 1098.
Kempf, G. F. (1946). Ibid., **131**, 1170.
Lamson, P. D., Greig, M. E., and Robbins, B. H. (1949). *Science*, **110**, 690.
Monroe, R. R., and Drell, H. J. (1947). *J. Amer. med. Ass.*, **135**, 909.
Myerson, A. (1940). *Amer. J. med. Sci.*, **199**, 729.
——, Loman, J., Rinkel, M., and Lesses, M. F. (1939). *New Engl. J. Med.*, **221**, 1015.
Newman, E. A., and Feldman, M. (1948). *Arch. intern. Med.*, **81**, 690.
Reifenstein, E. C., and Davidoff, E. (1938) *J. Amer. med. Ass.*, **110**, 1811.
Smith, L. C. (1939). Ibid., **113**, 1022.
Waud, S. P. (1938). Ibid., **110**, 206.

PREGNANCY IN A RUDIMENTARY HORN OF A BICORNUATE UTERUS

BY

DOUGLAS LATTO, M.B., Ch.B., M.R.C.O.G.

AND

RICHARD NORMAN, M.R.C.S., L.R.C.P.
D.Obst.R.C.O.G.

(From the Nuffield Department of Obstetrics and Gynaecology, Radcliffe Infirmary, Oxford)

This case of pregnancy in a rudimentary horn is discussed at some length because of the great danger there may be to the patient. Unlike tubal gestation, in which less than 50% rupture and present the classical picture, 90% of the cases of pregnancy in a rudimentary horn rupture, and as this occurs about the sixteenth week the bleeding is profuse. Very little has been written on this subject recently, and the relatively high incidence of the condition is not generally realized.

Pregnancy in a rudimentary horn was first described by Mauriceau and Vassal in 1669. Kehrer in 1900 collected 84 cases from the literature, and Beckmann in 1911 found 146 cases. DeLee and Greenhill (1947) state: "Perhaps 100 cases have been described. Mulsow found reports of only nine cases since 1911." Mulsow (1945) himself, however, said: "With the aid of the librarian of the Iowa State Medical Library at Des Moines, I have been able to review the records of nine cases which have been reported since Beckmann's review in 1911." In the *Index Medicus* for the past 25 years we have found over 40 reported cases: in all probability, therefore, well over 200 cases have now been described.

Case Report

The patient was admitted to the Radcliffe Infirmary on January 15, 1950, complaining of severe abdominal pain of four hours' duration. She had had vague pain in the right iliac fossa for the past week, and had felt sick but had not vomited. Menstruation had been regular until September 16, 1949, since when there had been amenorrhoea. There was very little else of significance in her history except that she had a normal full-term pregnancy in 1946, a spontaneous breech delivery; also she had rather severe hyperemesis in the first three months of this pregnancy.

The patient looked distressed and was obviously very ill, with restlessness and air-hunger. The skin was cold and clammy, and she had the typical pale waxy appearance indicative of sudden profuse loss of blood. The pulse was rapid and thready, and the blood pressure 70/30. The abdomen was slightly distended and there was extreme tenderness all over it. A soft mass was palpated in the pouch of Douglas. Bimanual examination was unsatisfactory because of the abdominal rigidity and distension. A provisional diagnosis of pregnancy in a ruptured rudimentary horn was made. Other conditions considered in the differential diagnosis were ruptured ectopic gestation and rupture of and haemorrhage from an ovarian cyst. Operation was decided upon soon after the patient had begun to respond to the initial shock therapy—warmth, ½ gr. (11 mg.) of morphine, and blood transfusion (Group A, Rh-negative).

Under general gas, oxygen, and ether anaesthesia the abdomen was opened through a paramedian subumbilical incision. The abdominal cavity contained about four pints (2.27 litres) of blood. The foetus could be seen inside the intact amnion and was attached to the rudimentary horn. The normal horn was about the size of a 10-weeks pregnancy. The foetus and rudimentary horn and tube were removed leaving the ovary. The round ligament and ovary were then stitched to the normal horn for support and to cover the raw area. The remainder of the blood was removed from the peritoneal cavity and one pint (570 ml.) of saline inserted. The abdomen was closed in layers. The patient's condition was satisfactory at the end of the operation and the blood pressure was 100/60. She made an uninterrupted recovery (a pyelogram showed the renal tract to be normal).

On February 27 a blood transfusion follow-up showed: Group A, Rh-negative; complete anti-D antibodies, titre 1:2; incomplete anti-D antibodies, titre 1:2; haemoglobin, 92% (13.5 g.).

Discussion

It is said that the part of the rudimentary horn attached to the normal horn usually has no canal. Piquand (1910) states that there is a canal in only 15% of cases, but this is observed only when the uterus approaches the bicornis-unicollis type.

One may read in any textbook that the spermatozoon ascends the normal horn and Fallopian tube and crosses the peritoneal cavity to fertilize the ovum. The fertilized ovum then gets into the rudimentary horn. This explanation seems untenable, and we are of the opinion that the rudimentary horn is not occluded until after pregnancy in most cases, for the following reasons:

1. It is improbable that one spermatozoon can fertilize an ovum, and it is very unlikely that a sufficient number of spermatozoa can find their way across the peritoneal cavity. A large number of spermatozoa are required to fertilize an ovum because of the hyaluronidase content required to "dissolve" off the corona radiata surrounding the ovum. A man with 10 million spermatozoa per ml. is virtually incapable of becoming a father because somewhere in the region of 50–100 million spermatozoa per ml. is thought necessary.

2. The corpus luteum is usually found on the same side as the rudimentary horn. On rare occasions it has been reported that the corpus luteum was found on the opposite side, the fertilized ovum then crossing the peritoneal cavity (internal migration of the ovum cannot always be excluded in these cases). With prolapse of the ovaries the tubes may be almost lying side by side, which may account for a few of these anomalies. It is well known that an ovum may cross the peritoneal cavity as in the cases of pregnancy reported after previous contralateral removal of tube and ovary.

3. Many cases show a canalization of the distal end of the rudimentary horn, and this canal leads into the cavity of the normal horn, as illustrated by Munro Kerr and Chassar Moir (1949). The canal was easily demonstrated in the case described.

4. The microscopical examination of the canal is almost invariably made after a pregnancy has occurred. The canal could easily have been occluded by the tissues reacting to the advancing syncytium and by the fibrin laid down in the small haemorrhages. To a less degree a similar occlusion can be found in the Fallopian tube in ectopic gestation.

5. The cervix uteri in comparison is occasionally completely occluded during pregnancy in conglutination of the cervix, which may happen after trauma and mild infection at a previous pregnancy. The canal may be so obliterated that no evidence of it can be found, but, as in the case of the rudimentary horn, the spermatozoa must have got in before the canal was occluded.

6. A case described by Banister (1937) lends further support to our contention. In this case an ovarian cyst was thought to be complicating pregnancy. At laparotomy a four-months foetus was found in a normal horn and a three-months foetus in a rudimentary horn. If this is a case of superfoetation or superfecundation it is possible that the pregnancy in the normal horn occurred first. Before the uterine cavity was completely filled the other conception took place. The rudimentary horn was attached near the cervix of the normal horn. (It is possible that the foetus in the rudimentary horn was growing more slowly because of the poor "soil.") The pregnancy in the rudimentary horn was removed and the other pregnancy went to term and resulted in a spontaneous delivery of a normal child.

7. Pregnancy in a rudimentary horn has been shown not to be extremely rare, and if the horn were not canalized one would expect to see more cases of haematometra. Of course it must be admitted that they occasionally do occur, and, furthermore, it has been said that the endometrium in the rudimentary horn is infantile and refractory to hormonal stimulation.

Summary and Conclusions

A case of pregnancy in a rudimentary horn is described and its aetiology discussed.

Pregnancy in a rudimentary horn is more frequently encountered than one is led to believe by many textbooks. We are of the opinion that the theory of transabdominal migration of a spermatozoon is untenable, and that if a patient gets a pregnancy in a rudimentary horn the canal of that horn is patent before pregnancy in almost every case.

References

Banister, J. B. (1937). *Proc. R. Soc. Med.*, **30**, 562.
DeLee, J. B., and Greenhill, J. P. (1947). *Principles and Practice of Obstetrics*, p. 474. Saunders, Philadelphia and London.
Kerr, J. M. M., and Moir, J. C. (1949). *Operative Obstetrics*, p. 446. Baillière, Tindall and Cox, London.
Mauriceau and Vassal. Quoted by Mulsow (1945).
Mulsow, F. W. (1945). *Amer. J. Obstet. Gynec.*, **49**, 773.
Piquand, G. (1910). *Rev. Gynéc. Chir. abdom.*, **15**, 401.

The Society for the Rehabilitation of Disabled and Crippled Children (of India) has issued its first annual report, covering the period March, 1947, to December, 1948, with a postscript on 1949. It is the first time in India that something is being done to provide organized physiotherapy and orthopaedic treatment for children after poliomyelitis, or with spastic paralysis. The Society's out-patient clinic in Bombay is housed in a military hut loaned by the Government of Bombay and equipped by private donors; it is staffed by a number of ex-Army physiotherapeutic technicians and voluntary social workers. Up to the end of September, 1949, about a thousand patients had registered for treatment, over 800 of them poliomyelitis cases.

Medical Memoranda

Larval Conjunctivitis

Although larval conjunctivitis is well recognized in hot climates, it is rarely encountered among white patients. It is of interest, therefore, to describe three cases which occurred among British Service men in Egypt.

Case Reports

Case 1.—An aircraftman was referred to the ophthalmic department with a history that while cleaning a 20-mm. cannon three days previously he felt something enter his left eye. Immediate examination by his colleagues revealed no foreign body. The eye became red and irritable, and watered. On examination the conjunctiva was seen to be inflamed and oedematous. With a loupe several tiny larvae were seen moving in the upper and lower conjunctival fornices and wriggling across the cornea. The larvae were less than 1 mm. long and owing to their small size and transparency were almost invisible to the naked eye. After cocainization seven larvae were removed with pointed conjunctival forceps. The larvae were identified as those of *Oestrus ovis.* Two days later, following irrigations with bland lotions, the patient was symptom-free and the eye normal.

Case 2.—A healthy young soldier was referred to the ophthalmic department complaining of a sudden stabbing pain in the right eye, as if there was a foreign body in it. He had been cleaning an air cleaner from a tank with a mixture of petrol and oil, and he thought that some had entered his eye. On examination conjunctival injection was present and several larvae were seen crawling across the tarsal conjunctiva and moving further into the fornices. The cornea was criss-crossed with multiple superficial abrasions, a result of the larvae being rubbed across the corneal epithelium. Eleven larvae of *Oestrus ovis* were removed. The conjunctival irritation settled down the following day, and the patient was returned to his unit free from symptoms.

Case 3.—An aircraftman felt something fly into and out of his right eye while he was removing an aircraft propeller. The eye became painful and was irrigated several times. He was seen eight hours later, when the upper lid was oedematous, the conjunctiva injected, and the cornea showed superficial abrasions. Several worms were seen moving across the cornea, and thirteen were removed from the conjunctival sac. They were identified as larvae of *Oestrus ovis.* Three days later the conjunctiva was white and the abrasions healed.

Comment

In these cases it may be assumed that the fly deposited its young directly on the conjunctival surface, though *Oestrus ovis* is said to lay its eggs at times while flying, without alighting (Strong, 1942).

Oestrus (bot-fly) is one of the genera of the Oestridae. It is parasitic normally in the nasal passages and sinuses of sheep, and also infects man. Oestridae possess penetrating organs known as ovipositors and can lay their eggs beneath the conjunctiva (Duke-Elder, 1938). Most of the recorded cases have been infections by *Hypoderma bovis,* the larvae of which may penetrate the globe.

Robinson (1949) reported a case of larval conjunctivitis in a naval officer at Malta in whom three larvae of *Oestrus ovis* were found. The greatest number recorded is 77.

Prompt treatment of the condition is advised in order to prevent the serious complications of corneal ulceration and intraocular invasion.

I wish to express my thanks to the Director-General of Medical Services, Royal Air Force, for permission to publish this paper.

J. S. Conway, D.O.M.S.,
Squadron-Leader; Late
Ophthalmic Specialist, Middle East Air Force.

References

Duke-Elder, W. S. (1938). *Textbook of Ophthalmology,* **2**, 1676. London.
Robinson, G. E. (1949). *Brit. J. Ophthal.,* **33**, 259.
Strong, R. P. (1942). *Stitt's Diagnosis, Prevention, and Treatment of Tropical Diseases,* p. 1517. Philadelphia.

Arteriovenous Fistula Complicating an Amputation Stump

The occurrence of an arteriovenous fistula is an unusual complication of an amputation, and was thought to be a sufficient rarity to warrant publication.

Case Report

On December 9, 1948, a man was referred to the Bradford Royal Infirmary complaining of pain in an amputation stump. The following history was obtained.

In 1936, when aged 17, he was involved in a road accident, a heavy vehicle passing over his left leg. An above-knee amputation was performed on the same day. He was subsequently fitted with an artificial limb, which he stated was never very comfortable but did not cause any pain. The stump was quite satisfactory until about a year ago, when he experienced pain accompanied by a throbbing sensation. The pain had increased during the past three months to such a degree that he had to discard his prosthesis for long periods, with resultant loss of earnings. He stated that he had no dyspnoea or palpitation.

On examination the amputation stump was satisfactory in shape and length. Posterior to the scar one could feel a distinct thrill over a pulsatile ill-defined mass coinciding with the heart beat. A loud bruit with systolic accentuation could be heard on auscultation over the mass. The B.P. was 140/98 mm. Hg. The pulse rate was 82, this slowing to 68 on pressure over the femoral artery in the groin. Release of the compression caused the pulse rate to rise to 80. A skiagram of the chest showed the transverse diameter of the heart to be increased, with prominence of the right ventricle. An arteriovenous fistula between the femoral vessels was diagnosed. An arteriogram was attempted with a view to revealing the type of connexion between the affected vessels. This was of little value, but it revealed a tortuous dilated vein in the stump.

He was admitted to the Infirmary on December 30. An incision was made along the medial aspect of the lower end of the stump, curving posteriorly to end below the mass. An irregular saccular pulsatile mass was exposed, the femoral artery entering this proximally. The femoral vein was grossly dilated and was seen to emerge from the mass, while numerous small vessels entered it. The main trunks and smaller vessels were ligated, the fistula excised, and the wound closed with drainage. Recovery was uneventful.

Attempts to demonstrate the vascular communication in the excised mass by radiology failed, but on dissection a well-marked arteriovenous fistula was demonstrated 2½ cm. from the cut ends of the vessels.

Comment

The fistula probably either originated as the result of a mass ligation of the damaged femoral vein and artery or developed from damage to the arterial and venous walls at the time of the original injury. The latter is the probable explanation, in view of the late onset of symptoms.

A. Naylor, Ch.M., M.Sc., F.R.C.S.,
Consultant in Orthopaedic Surgery to the Bradford Royal Infirmary.

In *British Health Resorts,* the official handbook of the British Health Resorts Association, information is given on the climate and special features of health resorts in Britain and the British Commonwealth. The particular conditions for which patients may be sent to a resort are listed under each one, and full meteorological data are included. The eighth edition of the handbook is obtainable for 4s. 6d. from the association at Bourdon Street, Berkeley Square, London, W.1.

Reviews

HAEMATOLOGY EXPANDS

Disorders of the Blood. Diagnosis: Pathology: Treatment: Technique. By Sir Lionel E. H. Whitby, C.V.O., *M.C.,* M.A., M.D.(Cantab), F.R.C.P., D.P.H., and C. J. C. Britton, M.D.(N.Z.), D.P.H. Sixth edition. (Pp. 759; 12 colour plates and 94 text-figures. £2 2s.) London: J. and A. Churchill. 1950.

Practical Haematology. By J. V. Dacie, M.B., B.S.(Lond.), M.R.C.P.(Lond.). (Pp. 172; 13 illustrations. 10s. 6d.) London: J. and A. Churchill. 1950.

The sixth edition of Whitby and Britton's *Disorders of the Blood* will be sure of a welcome, and haematologists in this country in particular will be grateful to the authors for coping successfully with the Sisyphean task of keeping the book and its readers up to date and maintaining the high reputation of this standard British text. In the present edition the literature is surveyed to the end of 1949. Vitamin B_{12} is adequately treated, but A.C.T.H. is a cloud no bigger than a man's hand, and the names of Hench, Kendall, and Selye are not mentioned. The main changes have been in the fields of coagulation, blood grouping, and haemolytic anaemia, where considerable progress, not to say complication, has occurred. The book now has 759 pages, of which the index occupies over 40. The production is excellent. Some coloured photomicrographs have been added; these are commonly regarded as being more objective than paintings, but they are not so illustrative, and owing to difficulties in focusing rarely reveal all that the observer can see in the cell.

Some five hundred people from all over the world attended the recent international congress on haematology at Cambridge. Although the famous names were a big draw, different topics attracted rather different audiences, and it seems that the subject of blood coagulation and also that of blood grouping, with which is associated the serological study of the haemolytic diseases, have already developed into separate entities. The importance of the former depends on the frequency of thrombosis and embolism, that of the latter on the world-wide development of blood-transfusion services, and neither of them is the exclusive concern of haematologists in the narrow sense. Leukaemia and allied conditions have an enormous literature which merges with that of cancer as a whole. One cannot help wondering how long it is going to be possible to write textbooks of haematology which deal in detail with all these subjects, and whether they will not have to give place to the primer, the separate monograph, and the encyclopaedia. Meantime we are grateful to Whitby and Britton for having made so much learning so easily available to us.

Dr. Dacie's little book is sure of a welcome by haematologists and directors of laboratories. It is based on lectures to students taking the course for the London University Diploma in Clinical Pathology, and it contains descriptions of the routine haematological techniques—including some for the haemolytic and haemorrhagic diseases and for blood grouping, which are relatively new, but which are being increasingly demanded. Methods of staining films are given, but there are no pictures of blood cells. The book should therefore be used in conjunction with a textbook or an atlas. This is an advantage, as it means that the book has been produced at a low price and no one need be afraid of using it on the working bench. A great virtue is that it emphasizes the errors made and the time lost in certain classical haematological procedures. Another writer (Jennings, D., *Lancet,* 1950, **2**, 234) has recently asked:

> "Does any haematologist who knows the clinical history, the haemoglobin and the haematocrit reading, and who has a stained blood film in front of him, get any further aid in diagnosis from a red-blood-cell count which is likely to be more than 10% out in a third of cases and more than 20% out in one of twenty cases? Have our patients derived any benefits from these counts, or have millions of hours during the last 30 years been squandered?"

The classification of anaemias by the diameter, volume, and shape of the red cells has made the profession too red-cell conscious, and it is not sufficiently realized that a Price-Jones curve is a research procedure and that an accurate red-cell count is difficult to obtain. Estimation of the haemoglobin and a glance at the film, supplemented if necessary by the haematocrit and E.S.R., are quick and accurate guides which tell us all we need to know about most cases of anaemia. Elaborate procedures such as counting red cells, platelets, and differential white cells should probably be centralized in laboratories where special apparatus and mechanical aids can be installed. There will always be individual preferences over technique, but it is surprising that Dr. Dacie devotes so much space to the estimation of haemoglobin by the methods of Haldane, Sahli, alkaline haematin, and cyanhaematin. Most haematologists now prefer to estimate haemoglobin as oxyhaemoglobin in a grey-wedge visual photometer or a photo-electric colorimeter. Measurement of clot retraction is of no value in diagnosis and should be replaced by measurement of platelets and fibrinogen. Dr. Dacie does not mention the help obtained from a simple hand tally in most forms of counting.

L. J. Witts.

DIAGNOSTIC RADIOLOGY

Lehrbuch der Röntgendiagnostik. By H. R. Schinz, W. E. Baensch, E. Friedl, and E. Lehlinger. Vol. 1, Skelett. Fifth edition. (Pp. 426; 507 illustrations. M. 66.) Stuttgart: Georg Thieme. 1950.

To many diagnostic radiologists Schinz's textbook is a bible, and it is therefore a great pleasure to see this new edition appear after a lapse of twelve years since the last one. It is almost inevitable that some of the contributors should have died during this period. Lysholm, Holz, and Ulrich have gone, and the rest of the old team has been strengthened by the addition of ten new contributors. Nearly all, both old and new, are Swiss and Swedes, mostly from Zurich and Stockholm.

This first part, entitled "Skelett," deals only with some aspects of the skeleton. None the less one gains a fair impression of what is yet to come. The most striking change from the last edition is the greatly increased size of the work. The new edition promises to be over twice as large and will probably be completed in about ten parts. The basic structure of the book remains unchanged; some illustrations have been removed and many new pictures, diagrams, and tables added.

The first 100 pages are on the physical properties of *x* rays as applied to diagnostic radiology, and a new chapter by Brandenberger on structure analysis has been added. The chapter on bone growth and epiphysial development is excellent; it has been much enlarged and new work on this subject has been incorporated. No fewer than 155 well-chosen references are appended to this chapter alone. Although the bibliography has a Continental bias, the main British and American papers are quoted.

The last chapter—on fractures—has been increased from 40 to 200 pages and many good line diagrams have been added. The remaining parts are expected to be published at intervals of roughly six months.

Until now the reader who has no German (or Spanish, for the last edition was translated into that language) has been denied access to this bible of much of the European continent. It is indeed good news to learn that a New York publisher has undertaken the translation into English and that the volume under review will appear in English before the end of the year.

J. W. D. BULL.

ACTINOMYCETES

The Actinomycetes. Their Nature, Occurrence, Activities, and Importance. By Selman A. Waksman, Ph.D. (Pp. 230; 39 figures. $5.) Waltham, Mass.: Chronica Botanica Company. London: Wm. Dawson and Sons. 1950.

Waksman, the discoverer of streptomycin, is a soil microbiologist, and he cultivated *Streptomyces griseus*, the source of this antibiotic, from a sample of soil so long ago as 1916. In a sense we owe to him not only this discovery but that of the newer antibiotics, since they too are derived from organisms of the same genus, and it was he who opened the gate to this fruitful field of exploration. A delightful and apposite quotation from Walt Whitman which prefaces this volume reminds us of the author's primary interest, and of the fact that the soil is the main habitat of the actinomycetes. Indeed, they may form as much as 40% of its total microbial population and play a large part in the breakdown of plant and animal residues. To this beneficent activity may be added on their credit side the formation of antibiotics and at least one useful vitamin (B_{12}) and enzyme (superbiolase). On the other hand, two genera (not, it is now believed, soil inhabitants) are pathogenic to man and animals, and one to plants.

The only chapter in this book having direct application to medicine is that on actinomycosis and related diseases, and this is of interest rather as a historical account and as a guide to classification of pathogenic species than from any clinical point of view. To the microbiologist, on the other hand, the whole book will be of great value as a systematic and authoritative account of these organisms, for the author describes in detail their classification, distribution, morphology, metabolism, and functions. It is well illustrated, largely by photographs, and thoroughly documented.

L. P. GARROD.

MEDICAL PHOTOGRAPHY

An Introduction to Medical Photography. By Josephine Hunt, S.R.N., S.R.C.N., F.I.B.P., F.R.P.S. With a foreword by Sir Cecil Wakeley, K.B.E., C.B., D.Sc., F.R.C.S., F.R.S.Ed., F.R.P.S. (Pp. 243; 87 illustrations, 4 in colour. £1 10s.) London: Staples Press. 1950.

Advanced manuals of photography on the one hand and elementary handbooks on the other are freely—the latter perhaps too freely—available. In her book Miss Hunt has set out to bridge the intervening gap for the student medical photographer, who, it is assumed, will already have a basic knowledge of photography but will know nothing of hospitals.

The author has thirty years of practical experience: the book is a rather conversational distillate of that experience, and it will be of great value to the neophyte. It is not a textbook of medical photography, nor is it intended to be. But it does contain a wealth of good advice on the relations of the photographer (and for that matter any medical auxiliary) with the medical and administrative staff. The chapter on "The Patient" reveals a humanity which is refreshing in these days of centralization.

The book ends with a chapter on cardiography, on which the author is an authority, with many years' experience at King's College Hospital. In the present context it is misplaced; the medical photographer is rarely associated with the subject, and his field to-day is wide enough without it.

ROBERT OLLERENSHAW.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Chemistry and Therapeutics of Synthetic Drugs. By J. W. Keyser, M.Sc., A.R.I.C. (Pp. 458. 42s.) London: George Newnes. 1950.

D.D.T. and Newer Persistent Insecticides. By T. F. West, D.Sc., Ph.D., F.R.I.C., and G. A. Campbell, M.Sc., F.R.I.C. 2nd ed. revised. (Pp. 632. 50s.) London: Chapman and Hall. 1950.

Dental Anatomy and Physiology for Students. By J. Aitchison, B.Sc., L.D.S. 2nd ed. (Pp. 418. 25s.) London: Staples Press. 1950.

Character Analysis. By W. Reich. (Pp. 516. 35s.) London: Vision Press and Peter Nevill. 1950.

Savill's System of Clinical Medicine. Edited by E. C. Warner, M.D., F.R.C.P. 13th ed. (Pp. 1,198. 35s.) London: Edward Arnold. 1950.

Florence Nightingale. By C. Woodham-Smith. (Pp. 615. 15s.) London: Constable. 1950.

The Slender Thread. By D. Baber. (Pp. 256. 9s. 6d.) London: William Heinemann. 1950.

The Sanitary Inspector's Handbook. By H. H. Clay, F.R.San.I., F.I.S.E. 7th ed. (Pp. 565. 25s.) London: H. K. Lewis. 1950.

The Nutritional Improvement of Life. By H. C. Sherman. (Pp. 270. 24s.) London: Geoffrey Cumberlege. 1950.

Brompton Hospital Reports. Volume 18, 1949. (Pp. 221. 12s. 6d.) London: Brompton Hospital. 1950.

Injuries to the Ankle. By J. G. Bonnin, M.B., B.S., F.R.C.S. (Pp. 412. 63s.) London: William Heinemann. 1950.

Technique of Analytical Psychotherapy. By W. Stekel. (Pp. 403. 21s.) Revised edition. London: The Bodley Head. 1950.

Industrial Lung Diseases of Iron and Steel Foundry Workers. An investigation by the Factory Department of the Ministry of Labour and National Service. (Pp. 282. 21s.) London: H.M.S.O. 1950.

New and Nonofficial Remedies. Issued under the direction and supervision of the Council of Pharmacy and Chemistry of the American Medical Association. (Pp. 800. 27s.) London: J. B. Lippincott. 1950.

Electrophysiological Technique. By C. J. Dickinson, B.A., B.Sc. (Pp. 141. 12s. 6d.) London: Electronic Engineering. 1950.

Plant Viruses and Virus Diseases. By F. C. Bawden, M.A., F.R.S. 3rd revised edition. (Pp. 335. $6.) London: William Dawson and Sons, Ltd. Waltham, Mass.: The Chronica Botanica Co. 1950.

Les Dermatoses Allergiques. Edited by A. Tzanck and E. Sidi. (Pp. 438. 1,800 francs.) Paris: Masson. 1950.

Gliedmassenamputationen und Gliederersatz. By W. Marquardt, M.D. (Pp. 192. M. 28.50.) Stuttgart: Wissenschaftliche. 1950.

Bronchus et Pulmo in ihren Klinischen Beziehungen. Edited by A. Wernli-Hässig, M.D. (Pp. 176. 15 Swiss francs unbound, 19 Swiss francs bound.) Basle: S. Karger. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 21 1950

EUGENICS AND HEREDITY

The first two occupants of the Galton Chair of Eugenics at University College, London, Karl Pearson and R. A. Fisher, started their careers as mathematicians. The present professor, L. S. Penrose, is the first to be medically qualified; and it is inevitable that his outlook should differ from that of his predecessors. A mathematician will tend to concentrate on the problem of how the numbers of congenitally handicapped members of a population can be diminished in future generations and the numbers of congenitally superior members increased. A physician, while not neglecting this problem, is likely to be at least equally interested in the therapeutics of inborn diseases and abnormalities; and in the paper which Professor Penrose read at the Annual Meeting of the B.M.A. in Liverpool last July, and which is reproduced in the opening pages of this issue, he emphasized this point.

Many readers will think that he has underestimated the possibilities of preventive eugenics—that is to say, the elimination of injurious genes. But a careful perusal of his article will show that his statement is correct. There are abnormalities in which about half the children of affected persons resemble their parents. But, on the one hand, such clear-cut dominance is quite rare, and, on the other, such injurious genes are constantly reappearing by mutation. For example, in Sjögren's recent study of blindness due to congenital microphthalmia in Sweden, only 12 of the 65 children investigated had one parent similarly affected. Had these parents been prevented from breeding, these 12 children, and 18 normal ones, would not have been born. While preventive eugenics could prevent the birth of a few thousand abnormals in each generation, the conditions to which it could be effectively applied are all rare; and such measures, even if rigorously carried out, would not succeed, in Professor Penrose's words, in "making any appreciable change in the genetical composition of the population." There is certainly, as he points out, a genetical element in the causation of such common diseases as diabetes and mammary cancer; and unfortunately the number of patients with either of these two diseases is much larger than the number suffering from all the comparatively rare complaints with straightforward dominant inheritance. This does not mean that preventive eugenics are worthless. It does mean that, with our present knowledge, they cannot achieve very much.

On the other hand, Professor Penrose was, if anything, over-cautious in his claims for the therapeutic importance of human genetics. In very many cases, including diabetes and gout, there is good evidence that what is genetically determined is not the disease but the diathesis. The rapid progress of biochemical genetics makes it entirely possible that such inborn diatheses may be detectable long before the appearance of overt symptoms, and that dietary moderation, and perhaps therapeutic measures as yet unexplored, may postpone, or even completely prevent, the onset of manifest disease. We all have our weak points: it may be that the main function of medical genetics will be to reveal them before they have betrayed us. But Professor Penrose has done a service in emphasizing that because a disease is congenital or hereditary it is not incurable. In some cases, as with neonatal jaundice, the cure may be permanent. In others, such as methaemoglobinaemia and the de Toni-Fanconi syndrome, treatment may have to be continued indefinitely. Those who regard the treatment of such conditions as weakening the human stock should logically deprive congenital myopics of their spectacles and trust to their selective elimination by motor traffic.

It is, however, conceivable that one of the main contributions of human genetics to medical progress will be its influence on the development of physiology and biochemistry. It is not perhaps always remembered that cystine was first produced by a congenital cystinuric, and that this unfortunate victim of stone in the bladder played a substantial if indirect part in saving the lives of sufferers from arsenic poisoning treated with British anti-lewisite a century after his death. At the present time a study of what can fairly be called the congenital diseases of the mould *Neurospora* is elucidating the intermediary metabolism of the amino-acids. It is almost certain that when we understand why phenylketonuria—which is due to a block in phenyl-alanine metabolism affecting the whole body—profoundly disturbs brain function without affecting that of other organs, we shall have enough clues to the peculiarities of brain metabolism to open a new chapter in pharmacology. When we understand just what has gone wrong with bone metabolism in the osteopsathyrosis associated with blue sclerotics, we may be able to speed up the healing of fractures. A genetically determined disease, like any other, may be regarded as an experiment performed by nature on a patient. But it differs from most infectious diseases in being a far more precise experiment. Whereas tuberculosis can kill by damaging almost any organ in the body, a disease of the type studied by geneticists is due to an abnormality of one

or two genes in each cell nucleus, the genes playing the same sort of parts in the physiology of the cell as organs do in that of the body as a whole. Each such disease is a disturbance of a particular function, and may be compared with a malady such as Graves's or Addison's disease which has not only demonstrated the function of a particular organ but led to the discoveries of substances as valuable as thyroxine and "cortisone."

The close connexion between genetics and obstetrics was mentioned by Professor Penrose. Strictly speaking, the influence of the mother on the foetus during pregnancy should be regarded as environmental rather than hereditary. Nevertheless, the geneticist must study it very carefully, and can give invaluable aid to the human embryologist in distinguishing between congenital effects which can properly be ascribed to heredity and those which are more correctly regarded as due to prenatal environment and therefore likely to be more easily preventable. Professor Penrose finished his address with a plea on behalf of geneticists for more medical information, and particularly for accurate data on the frequency of congenital abnormalities in the population. Without such data pedigree studies may often be meaningless, since until we know the frequency of a condition we do not know whether its occasional presence in two relatives means anything: this will come about only with the diffusion of genetical notions in the medical profession. But had Professor Penrose been speaking to a different audience he might equally well have stressed the need for a clinical point of view among geneticists, including animal and plant geneticists. For medicine is not merely a useful art: it is a science which can and should influence all other branches of biology, including genetics.

VITAMIN-A DEPRIVATION IN MAN

Some anxiety about the adequacy of the wartime diet to maintain the health of the population was inevitable, and as a means of increasing the consumption of vitamin A in the form of carotene the Ministry of Food made strenuous efforts in advertising campaigns to popularize carrots. An insurance against severe deficiency was also provided by the compulsory addition to margarine of vitamin-A concentrates, which were mostly obtained from whale livers. Doubts still remained, however, about the exact amount of vitamin A required by human beings, and in 1942 the Medical Research Council was requested to undertake experiments to obtain definite information on this point. The report of the investigation, which was organized by the Vitamin-A Subcommittee of the Accessory Food Factors Committee, was given the title "Vitamin-A Requirements of Human Adults—A Study of Vitamin-A Deprivation in Man."[1]

The volunteers who acted as experimental subjects for these prolonged experiments were 20 young male conscientious objectors and three women. They were housed at the Sorby Research Institute, Sheffield, a large villa with some rooms converted for use as laboratories. At first the organization of the investigation was in the hands of Dr. Kenneth Mellanby, and subsequently of Professor H. A. Krebs. Most of the volunteers had already proved their reliability and patience in experiments on the transmission of scabies, and they tolerated without protest a monotonous diet made deficient in vitamin A and carotene by exclusion of foods such as butter, whole milk and its products, liver and other animal organs, fat fish, and all green and yellow vegetables and fruits. With the co-operation of laboratories at Cambridge, Liverpool, Oxford, and Reading numerous routine tests for vitamin A and carotene were carried out, both on the blood and faeces of the volunteers and on the foodstuffs which they were allowed to consume. Measurements of the capacity for dark-adaptation were made at the institute mainly by means of an apparatus designed by Mr. W. Bartley, one of the volunteers, or by rod scotometry. The scope of the investigation can be judged from the fact that the research team consisted of about 25 doctors, scientists, and senior technicians. Many commercial firms assisted by providing specially prepared foodstuffs or in other ways. The heavy task of co-ordinating the efforts of the various groups of workers was undertaken by Miss E. M. Hume.

In 16 of the volunteers who subsisted on the diet without supplements and in two who were dosed with preformed vitamin A, carotenoid pigments disappeared almost completely from the blood plasma during the first few weeks of the experiment. The decline in the plasma vitamin A, which at first ranged from 65 to about 120 i.u. per 100 ml., was less rapid, and in one subject the original level was maintained for no less than 22 months. The mean figure of 88 i.u. obtained from tests made shortly after the experiment had started fell only to 74 i.u. in nine months, and in seven subjects who remained in the experiment for 14 months the mean was still as high as 61 i.u. The decline in both plasma carotenoids and vitamin A was prevented or reduced in control subjects by daily doses of 2,500–6,700 i.u. of carotene in various forms, while the fall in the plasma vitamin A, but not in carotenoids, was prevented by doses of 2,500 i.u. of a distilled concentrate of vitamin-A esters. In the parallel dark-adaptation tests some evidence of a seasonal variation was found in all subjects, the final-rod-threshold values reflecting the variations in the monthly averages of

[1] *Spec. Rep. Ser. med. Res. Coun., Lond.*, No. 264, 1949, London: H.M.S.O.
[2] *Biochem J.*, 1937, **31**, 155.

daily minimum temperatures. Considerable deterioration in capacity for dark-adaptation not related to the season of the year was observed in only three of the volunteers who received no supplements; all three had plasma-vitamin-A values of 40 i.u. or less. Only in these cases was it possible to carry out satisfactory therapeutic tests. Preformed vitamin A, in a daily dose of 1,300 i.u. given over a prolonged period, was found both to improve the dark-adaptation and to restore the plasma vitamin A to about its original level. With a daily dose of 1,250 i.u. of carotene in oily solution the amounts of vitamin A and carotenoids in the plasma were slightly increased, but dark-adaptation was improved only when the dose was raised to 2,500 i.u. Studies of the efficiency of absorption of carotene from carrots and green vegetables were made by finding the difference between the amounts eaten and those excreted in the faeces. With allowances for a safety margin and for wastage during absorption the daily requirement of an adult male may be assessed as 2,500 i.u. of preformed vitamin A, 4,000 i.u. of carotene in oil, 7,500 i.u. of carotene in green vegetables, or 12,000 i.u. of boiled sliced carrots. With ordinary diets, of course, the daily requirement will not be derived from a single item but will be contributed by foods containing both preformed vitamin A and carotene. Larger amounts may be needed by pregnant or lactating women and by children.

Apart from the changes mentioned the volunteers had no symptoms which could be ascribed to deficiency of vitamin A, though two of them were found during the course of the experiment to be suffering from tuberculosis. While it may seem surprising that a diet containing only traces of the vitamin should have caused no symptoms of deficiency in most of the subjects, it has long been known that the human liver normally contains large reserves of vitamin A. In this country before the war Moore[2] found that the reserves present in the liver of persons who died as a result of accidents usually appeared to be sufficient to meet the body's requirements for several months, and there is nothing in the M.R.C. report to indicate that wartime dietary changes have had the effect of decreasing reserves. Nevertheless it is surprising that some of the volunteers were able to subsist on this restricted diet for 1½–2 years, and the conclusion must be that the reserves in the liver are mobilized and expended with great economy. The clear evidence of incipient vitamin-A deficiency found in three out of 16 subjects was perhaps as much as could be expected from an experiment which could not be prolonged indefinitely. Both the research team and the volunteers must be commended for their patience and perseverance in completing one of the longest and most laborious nutritional experiments yet to be undertaken in this country.

ABSORPTION OF VITAMIN B_{12}

A few weeks ago in this *Journal* Dr. Byron E. Hall[1] reviewed recent work on the intrinsic factor of Castle and described some of his own experiments which shed light on the interaction between the intrinsic factor and vitamin B_{12}. In a series of papers in this issue Dr. C. C. Ungley reports the results of carefully devised therapeutic experiments to test the absorption of vitamin B_{12} administered orally to patients with pernicious anaemia. Briefly, the investigation was concerned with the effect of normal gastric juice in promoting absorption of the vitamin, with absorption of massive doses of vitamin B_{12} alone, and with the demonstration that milk or concentrated whey does not serve as an alternative source of intrinsic factor or of protein capable of affecting vitamin B_{12} in such a way as to lead to its absorption. In addition Ungley tested the absorbability of vitamin B_{12} alone from the buccal cavity and from the intestine, absorption from the latter site being considered in relation to such possible destructive agents as the intestinal juice and bacteria.

Some investigators, using small doses or even fairly large single doses of up to 1,000 μg. of orally administered vitamin B_{12}, have obtained either no response or variable and inadequate responses in patients with pernicious anaemia,[1] though Spies and his colleagues[2] found that about 50 times the smallest parenteral dose was slowly effective when given by mouth. Goldhamer[3] has shown that the quantitatively reduced gastric juice in patients with pernicious anaemia may contain a very small amount of intrinsic factor, so that some slight absorption might be expected. Ungley has now obtained evidence that the absorption of vitamin B_{12} when administered orally in small daily doses is very poor: no response was observed in a patient given 5 μg. daily for 10 days, and in another patient receiving 80 μg. daily for 24 days a rise in erythrocytes occurred which was no greater than would be expected after a single injection of only 2.5 μg. When filtered and neutralized normal gastric juice was given with vitamin B_{12} to eight patients with pernicious anaemia the responses were variable, but indicated that each 100 ml. of juice may potentiate the absorption of from 1 to 10 μg. of the vitamin. One of these patients failed completely to respond, and another, receiving only 150 ml. of juice with 40 μg. of vitamin, responded unsatisfactorily. A remarkable result, however, was obtained in five patients receiving a single massive dose of vitamin B_{12}

[1] *British Medical Journal*, 1950, **2**, 585.
[2] *Lancet*, 1949, **2**, 454.
[3] *Amer. J. med. Sci.*, 1936, **191**, 405.
[4] *J. Amer. chem. Soc.*, 1949, **71**, 3858.
[5] Ross, G. I. M., *Nature, Lond.*, 1950, **166**, 270.
[6] Meyer, C. E., Epstein, S. H., Bethel, F. H., and Hall, B. E., *Fed. Proc.*, 1950, **9**, 205.
[7] Brink, N. G., Kuehl, Jr., Folkers, Karl, *Science*, 1950, **112**, 354.
[8] Veer, W. L. C., Edelhausen, J. H., Wijmenga, H. J., and Lens, J., *Biochim. biophys. Act, Amst.* 1950, **6**. 225.
[9] Ellis, B., Petrow, V., Beaven, J. H., Holiday, E. R., and Johnson, E. A., *J. Pharmacol.*, 1950. In the press.

concentrate by mouth—3,000 μg. without added gastric juice. All responded, and, by computation from the expected response to parenteral treatment, it was considered that in no case was less than one-fortieth of the dose absorbed. Such a large dose of vitamin B_{12} is of course greatly in excess of what would normally be ingested in the diet, and it appears very unlikely that the gastric juice in these achlorhydric patients can have contained enough intrinsic factor to potentiate absorption of the vitamin in the amounts necessary to bring about such a result. The probability is, therefore, that the vitamin was directly absorbed.

Ungley's experiments on absorption of vitamin B_{12} from the intestine are of great interest, though the unavoidable difficulties render interpretation less easy. In two patients a segment of the small intestine was isolated after the passage of a Miller–Abbott tube with two balloons: the balloons were inflated and the intervening section of intestine was washed out with normal saline. Vitamin B_{12} was then instilled into the isolated segments and its absorption studied. No response occurred in either case, and microbiological tests showed that wash-fluids recovered from the segments contained the vitamin.

In both cases intubation was performed again, and this time vitamin B_{12} was instilled together with normal gastric juice. Again there was practically no response. In one case, however, the juice had been Seitz-filtered—a process which was afterwards shown to remove much intrinsic-factor activity. In the other case 500 ml. of gastric juice was given with 80 μg. of vitamin B_{12}, and the small reticulocyte response indicated only very slight absorption. This patient later responded well to parenteral therapy. There is thus no evidence for the absorption of free vitamin B_{12} from a segment of intestine protected from contact with general intestinal contents. Positive evidence for absorption of vitamin B_{12} from this site (the exact position of which is not known) in the presence of intrinsic factor is also lacking.

Perhaps a more informative experiment was that in which the bowel of a patient with pernicious anaemia was partially sterilized by oral doses of chemotherapeutic agents before he was given 80 μg. of vitamin B_{12}. No response occurred, though later, when the vitamin was given with normal gastric juice, the reticulocytes rose to 15.8% on the sixth day. Later still the injection of 80 μg. further greatly increased the rise in erythrocytes. This would seem to indicate that failure of absorption of vitamin B_{12} when unprotected by the intrinsic factor is not due to avidity of coliform organisms for it, though Hall[1] quotes an experiment by Lichtman and his colleagues with the opposite result. This problem requires further exploration, for Ternberg and Eakin[4] have observed that union of vitamin B_{12} with intrinsic factor renders it unavailable microbiologically, and Ungley and Cuthbertson have confirmed this. It is important to note, however, that, although vitamin B_{12} appears to unite with several proteins and lose microbiological activity,[5,6] Hall found the vitamin in the lysozyme complex was not absorbed when given by mouth, whereas absorption occurred when it combined with intrinsic factor in human gastric juice or swine gastric and duodenal mucosae.

The evidence to date perhaps favours the view that failure of absorption occurs in pernicious anaemia, rather than destruction of vitamin B_{12} in the intestine or its deviation to micro-organisms. In any case, union with the intrinsic factor appears to be of prime importance when vitamin B_{12} is ingested in physiological amounts, though it is of great interest that ingestion of huge amounts of the vitamin may lead—perhaps by a mass action—to by-passing of this normally essential mechanism and to direct absorption. Growing knowledge of the chemical and physical nature of the B_{12} molecule may allow the problem of its absorption to be studied in model systems. It is not yet known whether the interaction with the intrinsic factor is of the nature of an enzyme reaction, with the properties and limitations of such a system, or whether the intrinsic factor is a highly specific protein, union with which is normally necessary for active transfer of vitamin B_{12} across the barrier of the intestinal epithelium—as opposed to passive transfer of the vitamin by diffusion through what is sometimes likened to a sieve-like membrane. If the protein takes part in the absorption, it may well be a very exceptional case. But from the picture which is emerging of the vitamin B_{12} molecule, which is perhaps built up somewhat on the porphyrin model and which must be absorbed intact, its steric and other characteristics may well render its absorption a special biological problem. Also, in view of recent evidence for the fairly ready interconvertibility between vitamin B_{12} and the more chemically reactive vitamin B_{12b},[7-9] the results of complex therapeutic experiments must be interpreted with caution.

TREATMENT OF NEUROSYPHILIS

In the pre-penicillin era the treatment of neurosyphilis presented many difficult problems. Meningeal and meningovascular forms reacted reasonably well to arsenicals and bismuth, but parenchymatous forms were more resistant; and general paralysis of the insane was nearly always fatal until malaria treatment was introduced by Wagner-Jauregg. Penicillin, however, completely altered the picture, and most forms of neurosyphilis have been found to react remarkably well to it, though it is clear that even penicillin cannot restore dead nerve cells and nerve fibres. There has been some discussion recently about whether penicillin alone can accomplish as much as penicillin combined with malaria. At a meeting of the Society for Investigative Dermatology in the U.S.A. Spiller and his colleagues[1] reported on 170 cases of neurosyphilis, 105 of which were treated with penicillin alone and 65 with penicillin combined with malaria. These patients were observed for from six months to four years or more, and the authors found that so far as the cerebrospinal fluid was concerned response was about equal with the two methods of treatment, but that clinical results were slightly better with combined treatment. Most of those who spoke at the discussion which followed this paper were in favour of using penicillin alone, and other American opinion seems to be swinging in the same direction[2,3] (as it is in other forms of syphilis). A number of workers, however, still think that fever therapy aids the action of penicillin.[4-7] In Great Britain the tendency is to assume that it is useful to have two strings to one's bow. Thus Nicol,[8] who probably has more experience of neurosyphilis, and particularly G.P.I., than anyone in this country, found that malaria plus tryparsamide gave better results than malaria alone in G.P.I., and that the best results are now obtained with penicillin and malaria. Admittedly malaria and other forms of pyrexial treatment carry a certain risk to life, but a careful technique and suitable selection of patients will reduce this to very small proportions. No doubt it is this risk, due largely to lack of experience and adequate facilities, which has led so many to give up or omit a form of treatment which has accomplished much in the past. It seems to be fairly generally agreed that in optic atrophy and perhaps active tabes dorsalis results are better with combined treatment than with penicillin alone.[9-11]

It certainly seems logical that when two forms of treatment, each of which has been shown to be effective, are available both should be employed unless there are definite contraindications. However, it may be advisable to try penicillin alone at first and if that is not successful to resort to pyrexial treatment as well. In this connexion several authors have stated that increasing the amount of penicillin beyond a certain point—4 mega units, according to Callaway and his colleagues[12]—did not improve results. The effectiveness of the treatment of neurosyphilis is judged by examination of the cerebrospinal fluid and by clinical progress, though the two do not necessarily go hand-in-hand. Admittedly it is often difficult to measure clinical improvement, but this is what the patient looks for, and the wise syphilologist will adopt that form of treatment which in his experience is most likely to restore the patient to normal or render him a useful member of the community.

1 *J. Invest. Derm.*, 1950, **14**, 121.
2 Curtis, A. C., Kruse, W. T., and Norton, D. H., *Amer. J. Syph.*, 1949, **33**, 527.
3 Wong, Y. T., and Packer, H., ibid., 1948, **32**, 212.
4 Kierland, R. R., O'Leary, P., and Underwood, L. J., in *Recent Advances in the Study of Venereal Diseases*, 1948, U.S. Public Health Service, 1948, Washington, p. 180.
5 Landau, D., Kopp, I., Rose, A. S., and Soloman, H. C., *Amer. J. Syph.*, 1949, **33**, 357.
6 Epstein, N. N., and Key, J. M., *Arch. Derm. Syph., Chicago*, 1949, **60**, 543.
7 Nichols, F. T., and Heyman, A., *Amer. J. Syph.*, 1949, **33**, 561.
8 *Med. Illustr.*, 1949, **3**, 402.
9 Benton, C. D., and Heyman, A., *Arch. Ophthal., Chicago*, 1948, **40**, 302.
10 Packer, H., and Wong, Y. T., *Ann. Intern. Med.*, 1949, **31**, 96.
11 Fetterman, J. L., *Arch. Derm. Syph., Chicago*, 1946, **54**, 566.
12 *Sth. med. J., Nashville*, 1950, **43**, 412.

R.S.M. SECTION OF GENERAL PRACTICE

In response to a petition promoted by two general practitioners, Drs. G. M. Kerr and G. O. Barber, the Royal Society of Medicine has formed a Section of General Practice, and its inaugural meeting will be held on November 22 at 8.15 p.m. Future meetings will be held on the third Wednesday in each month during the winter. The petition was signed by 74 specialists (Fellows of the Society) and 78 general practitioners (13 of them Fellows). This promises to be an excellent departure from tradition, and will no doubt be welcome to the many general practitioners who will be able to take advantage of it.

The objects of the Section are "to narrow the widening gap between specialists and general practitioners, to provide for the general practitioner an active link with currently accepted ideas, and to keep alive the academic or scientific attitude to medicine and its allied branches, which is so readily lost in general practice." These thoroughly desirable aims have been expressed in various ways recently, and with increasing urgency, as medicine has followed the pure sciences in developing highly specialized techniques for attacking its problems. The difficulty of keeping up to date, and of understanding the relevance to everyday clinical work of much of the research carried out in hospitals and laboratories, are sources of anxiety to general practitioners that barely afflicted their forebears fifty years ago. At the R.S.M. general practitioners will be able to hear the latest views on subjects related to their daily work expressed by the leading specialists in those subjects, and the Society provides that encouraging atmosphere where discussion can range freely over the science and practice of medicine.

There is great need for closer collaboration between these two branches of the profession than circumstances make possible at present. The sponsors of this venture and the R.S.M. are to be congratulated on starting what should be a most interesting and educative Section. It is to be hoped that similar enterprise will be shown by those medical schools and universities where the problems of general practice still receive too little attention in the curricula.

ANTI-CALCIFYING ACTION OF PHYTATE

Some thirty years ago Mellanby recognized that rickets in dogs was caused not only by the absence of a fat-soluble vitamin from their diets but also by the presence of harmful factors, which he first termed "antivitamins" and later "toxamins." A clue to the nature of these substances was subsequently given by Bruce and Callow,[1] who found that the absorption of calcium from the intestines was inhibited by phytic acid, a phosphorylated form of inositol which is present in cereals in substantial quantities. Harrison and Mellanby[2] established that phytic acid could in fact account for the rachitogenic properties of cereals when fed to dogs. Since adequate dosing with vitamin D prevented rickets even when the food contained phytate it

1 *Biochem. J.*, 1934, **28**, 517.
2 Ibid., 1939, **33**, 1660.
3 *J. Physiol.*, 1949, **109**, 488.
4 *Brit. J. Nutrit.* 1948, **2**, 373.
5 *J. Physiol.*, 1926, **61**, P xxiv.

seemed logical to assume that the vitamin counteracted the action of the phytate in preventing the absorption of calcium.

Further painstaking experiments by Mellanby,[3] carried out over many years, have now shown that the problem is less simple than it had seemed. Comparisons of the rachitogenic actions of phytate with those of corresponding amounts of inorganic phosphorus have given divergent results in different experiments, and the cause of the variation has been traced to irregularities in the vitamin-D reserves of the animals at the commencement of the experiment. When reserves of vitamin could be called on it was invariably found that phosphorus in the form of phytate caused more severe rickets than the same amount as inorganic phosphate, but in the absence of reserves the difference was largely obscured. Moreover, even with high doses of vitamin D phytate still reduced the amount of calcium absorbed from the intestines, with the result that bones were less well calcified and more osteoporotic than when it was absent from the diet or was replaced by inorganic phosphate. A diet high in phytate must therefore be supplemented with both calcium and vitamin D if bone formation is to be perfect. Some evidence was obtained that vitamin D may destroy phytate, and, conversely, phytate appeared to increase the rate of expenditure of the vitamin-D reserves. The main anti-calcifying action of phytate, however, presumably depends on its competition in the intestines with its structural analogue, inorganic phosphorus, for combination with calcium. According to the definition adopted by Kodicek,[4] the term antivitamin may conveniently be reserved for substances capable of interfering with the action of a vitamin by reason of their chemical resemblance to it, which allows them to compete with it in its essential reactions. Clearly the action of phytate is not covered by this definition, and its description by Mellanby[5] as a "toxamin" is therefore perhaps more appropriate.

INHALATION DURING DENTAL EXTRACTION

In a study of 316 non-malignant lung abscesses Brock[1] found that 7% occurred after the removal of teeth. He suggested four main causes for this sequel: multiple extractions under deep anaesthesia; the extraction of septic teeth with tartar masses; the upright position of the patient in a dental chair; and inexpert anaesthesia. Fry and Earl[2] have now published a preliminary report of their attempts to assess the importance of each of these factors in encouraging the inhalation of blood and other debris during dental extraction. They investigated two small series of patients by injecting 2–3 ml. of radio-opaque oil into the buccal sulcus before or during the extractions and radiographing the chest within 30 minutes of the patients' return to consciousness. In their first series of 24 unselected patients undergoing extractions under nitrous-oxide anaesthesia none inhaled a demonstrable quantity of oil. The second group was of 14 patients subjected to multiple extractions, two of whom were anaesthetized with trichlorethylene and the remainder with nitrous oxide. The oil was injected midway through the operation, when the throat-pack was soaked in blood. Only one patient—a man who had seven teeth extracted—was found to have inhaled the oil, which was seen in the right lower-lobe bronchus. The number of patients studied by Fry and Earl is too small to allow firm conclusions to be drawn. The radio-opaque oil used was not miscible with blood and was usually about one-tenth of the volume of blood in the mouth. That no oil was inhaled is therefore no indication that blood was not. This work has, however, demonstrated that inhalation can occur during dental extraction without the knowledge of the operator, and it justifies similar investigations on a larger number of patients, preferably with a radio-opaque substance that mixes freely with blood.

[1] *Guy's Hosp. Rep.*, 1947, **96**, 141.
[2] Ibid., 1950, **99**, 41.

CARDIAC DISEASE AND PREGNANCY

Two recent papers have added to the voluminous literature about cardiac disease and pregnancy. Vander Veer and Kuo[1] studied the records of 409 pregnant women with heart disease—324 with rheumatic, 51 with hypertensive, 18 with congenital heart disease, and 16 with miscellaneous cardiac abnormalities. The mortality was 3.4%, and death was due to congestive failure, apart from one case of ruptured aorta (coarctation), two of bacterial endocarditis, and one of acute exacerbation of rheumatic endocarditis, though this presumably also caused death through cardiac failure. According to some British cardiologists acute rheumatic carditis is an important cause of breakdown in pregnancy, and it may be that this infection is more frequently responsible for failure than is suspected. Pneumonia occurred in four of the patients, though it might be questioned whether this was the cause or the result of the failure. In seven of the ten fatal cases in which congestive failure occurred death took place between the seventh and eighth months of pregnancy. The other three patients died from pulmonary oedema within two days of delivery. The authors state that the reason for this post-partum failure is obscure; certainly their suggestion that it may be caused by blood loss is not acceptable, since venesection gives relief in acute pulmonary oedema. They do not advise abdominal delivery, except perhaps for patients with hypertensive disease. Their recommendations for preventing heart failure are based on well-known principles, according to the severity of the case: first, pregnancy may have to be avoided; secondly, it may have to be terminated in the early months; and, thirdly, close watch must be kept for the earliest signs of failure or other complications. That several pregnancies in women with rheumatic heart disease are quite compatible with the attainment of middle age has been shown by Correll and Rosenbaum,[2] who looked into the records of 53 women who each had from four to sixteen pregnancies. Fifty-two had rheumatic and one congenital heart disease. Out of this total 34 patients had died, the average age at death being 49.5 years. It is quite possible that a number of pregnancies may not occasion any symptoms in a woman with heart disease, and in fact the disease may not be discovered until her children are grown up. It is very different, however, where symptoms have already made their appearance, and in such cases it must be remembered that pregnancy, labour, and, not least, the upbringing of children are additional burdens.

[1] *Amer. Heart J.*, 1950, **39**, 2.
[2] Ibid., 1950, **39**, 283.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE TREATMENT OF ULCERATIVE COLITIS

BY

G. E. BEAUMONT, D.M., F.R.C.P.
Physician, Middlesex Hospital

One of the most eminent teachers of clinical medicine at the Middlesex Hospital is reputed to have said to his students, "The most important thing you have to learn while in the wards is to diagnose the nature of a patient's illness. Once the diagnosis is made the treatment can be looked up in a book."

Like so many epigrammatic statements this is only a half-truth. One of the differences between a newly qualified practitioner and an experienced doctor is that the latter has himself tried various treatments for various diseases, and has found out which are the most successful. There is no doubt that the best way of learning therapeutics is by treating a series of cases oneself; the second best way, perhaps, is by reading detailed accounts of cases treated by others. And so readers of the Refresher Course who still continue to treat at home, or in nursing-homes, the patients who are seriously ill, and do not send them all into hospital, may be interested to read about one or two patients suffering from ulcerative colitis whom I have treated, and to see how they have fared.

One afternoon, when I was teaching on such a case in my ward, I asked a postgraduate student what treatment he would advise. He replied, "Forty treatments have been recommended, but none of them are any good." When I suggested that he might unmuzzle his wisdom he reeled off the following list: vaccines, sera, special diets, sulphonamides, penicillin, bacteriophage, pneumoperitoneum, psychotherapy, vitamins, blood transfusion, oxygen per rectum, astringents and antiseptics per rectum, and various operations such as ileostomy and high colostomy, appendicostomy and caecostomy, and colectomy or hemicolectomy.

Recognizing that he had read a recent article on ulcerative colitis in a medical journal, and not wishing to be outdone, I added to the list ileal extracts taken by mouth, protein hydrolysates, ionization, artificial-fever therapy, and vagotomy.

If we are to adopt this nihilistic view about the treatment of ulcerative colitis I may as well close my article now; but I am not so pessimistic, though I know that in this disease relapses are apt to occur after apparent cure. I propose to give some details about two cases that I treated.

Illustrative Case 1

A married woman aged 31 was admitted to hospital on July 29, 1946. She looked very ill, was pale and thin, and had lost over 2 st. (12.7 kg.) in weight during the last 15 months, weighing now only just over 6 st. (38.1 kg.). She lived in a damp cottage in the country with a concrete floor; there were four children at home under the age of 9 years; and her husband, who worked as a nursery gardener, had a partially paralysed left arm resulting from war wounds. The house-physician described her as being "of a worrying type and rather introverted." In addition to household cares the patient was concerned about the reduction of her husband's war pension. It was difficult to get an accurate history of the illness, but it appeared that blood was first noticed in the stools in August, 1944, during pregnancy. The bleeding was attributed to piles, though at this time the patient also suffered from abdominal pain and diarrhoea. After parturition the diarrhoea stopped. In September, 1945, there was a recurrence of diarrhoea with blood in the motions, and severe griping abdominal pains, which the patient described as "worse than having a baby." This continued until admission to hospital.

Further examination showed that the mucous membranes were very pale, the teeth carious, and the blood pressure low—100/70 mm. Hg. Her temperature was raised to about 102° F. (38.9° C.) in the evening, falling to 99 or 100° F. (37.2 or 37.8° C.) in the morning. The abdomen was distended owing to flatulence; the transverse and descending colon was palpable and very tender. The urine was normal. The bowels were opened on an average six times by day and six times by night.

The first steps in the treatment of such a case were to exclude other causes of diarrhoea, to determine the degree of anaemia, and to establish the diagnosis of ulcerative colitis. The agglutination tests on the blood serum were negative for the typhoid and paratyphoid, and the dysentery and para-dysentery groups of organisms. The stools showed no amoebae or cysts, no ova, and no pathogenic organisms. There were numerous degenerate pus cells, red corpuscles, and macrophages. On culture only *Bact. coli* types of organisms were grown. The blood count indicated a severe hypochromic anaemia, with haemoglobin 55%, red corpuscles 2,000,000 per c.mm., colour index 0.65, white cells 6,600 per c.mm. (polymorphs 53%, lymphyocytes 43%, monocytes 4%). The corrected sedimentation rate of the red cells was 13 mm. % plasma at one hour. Sigmoidoscopic examination showed numerous bleeding ulcers about 5 in. (12.7 cm.) from the anus, with mucosal polypus formation.

Looking back on the cases of ulcerative colitis which I have treated during the last 30 years, I think that the greatest advance has been in the use of blood transfusions in severely anaemic patients. It is impossible to raise the blood count to normal by giving iron by mouth when the blood is steadily dripping away below. Further, the blood transfusions help to restore the plasma albumin, which is always likely to be low, and also aid in effecting an adequate mineral concentration in the blood.

In this case we found the plasma albumin to be 2.3 g. % instead of the normal 4.5 to 5.2 g.%. The figures for the plasma globulin and fibrinogen were normal. The patient was first given ½ gr. (32 mg.) of phenobarbitone three times a day to calm her generally, and 1/200 gr. (0.32 mg.) of atropine sulphate in water by mouth three times a day to cut down vagal and sacro-pelvic parasympathetic nervous impulses to the colon. Bismuth and kaolin preparations must not be given, as they may cause caking of the intestinal contents and pressure necrosis of the intestine. When the abdominal pain was very severe in the early stages, relief was obtained from 15 min. (0.9 ml.) of tincture of opium in water. The patient's blood was found to belong to Group O, and 3 pints (1.7 litres) of compatible blood was given by drip transfusion intravenously.

Ten days or so later, on August 23, the patient said that she was feeling much better; the diarrhoea had almost ceased, the bowels now being opened on an average three

times in the 24 hours. The temperature, however, was still raised to 100 or 101° F. (37.8 or 38.3° C.) in the evenings. In addition to this treatment, a high-protein, high-calorie, and low-residue diet was ordered, the septic teeth were removed under a penicillin "screen," and sulphaguanidine, 1 g. every six hours, was given by mouth for two weeks. Vitamin B complex was administered, two capsules daily, and 4 ml. of "hepastab" was injected intramuscularly every four days. The diet was of necessity subject to wartime restrictions, but a more varied one, which can be obtained now, is given below.

The haemoglobin rose to 66% on August 26 and remained at this level for another four weeks. By the end of September there was no diarrhoea, no blood in the motions, no abdominal pain, but also no gain in weight.

Relapses

During October there was a relapse. The temperature, which had been normal for a week, rose again, with recurrence of diarrhoea, the bowels being opened five times in the 24 hours and the motions containing blood. On October 18 a further blood transfusion was given of 2 pints (1.1 litres), with good results. The temperature fell to normal, the diarrhoea ceased, and the haemoglobin rose to 77%. In a week or so the patient was able to walk around the ward, and she returned home at the end of November. She was now feeling well, had a good appetite, was satisfied with her treatment, and was gaining weight at the rate of 3½ lb. (1.6 kg.) a week.

But this happy state of affairs did not, unfortunately, last long. Two weeks after returning home she relapsed, and her doctor wrote, "The circumstances of her home are absolutely shocking and her idea of diet hopeless." I recommended her to come into hospital again, but she was unwilling to do so, saying that she must look after her home. She remained partly in bed at home, and by the end of March, 1947, was much better. She was very fit during the summer, being able to walk four to five miles (6.4 to 8 km.) a day, and her weight increased to 10 st. 9 lb. (4.8 kg.). One day in September, while carrying a pail of water from the well in her garden to her house, the diarrhoea recurred, with the passage of blood in the motions. The patient, however, kept on with her household work until December 24, 1947, when suddenly there occurred a shivering attack, high temperature, severe abdominal pain aggravated by any movement, diarrhoea, and at times incontinence of faeces. Various opium preparations were administered, but she continued to lose weight, and finally was again admitted under my care in hospital on March 9, 1948.

When I saw the patient I could tell at once that, although very pale, she was not nearly so ill as on the first admission. Her temperature was normal; her weight, however, was very low—6 st. 8 lb. (2.9 kg.). She said she could feel "hard lumps" running across the abdomen from right to left, which resolved themselves into the passage of mucus and wind. The motions were loose, containing mucus but no blood, and the bowels were opened about once by day and six times by night.

This preponderance of night motions is interesting, and is probably due to an exaggeration of the normal predominant activity of the parasympathetic over the sympathetic during sleep. The haemoglobin was lower than it had been before, 32%, and the red cells numbered 3,200,000 per c.mm. A drip transfusion of 3 pints (1.7 litres) of blood was given on March 14, the haemoglobin rising to 60% and the red cells to 3,900,000 by March 18. During the next two weeks the diarrhoea ceased and there was a gain of 8 lb. (3.6 kg.) in weight. In addition to the transfusion, phthalylsulphathiazole was given by mouth in doses of 1 g. three times a day for two weeks, and "trasentin" tablets, 75 mg., one or two a day, as required for abdominal pain. A mixture containing 30 gr. (2 g.) of ferric ammonium citrate was taken three times a day, and 200 mg. of ascorbic acid daily.

On April 3 the patient returned home again, feeling and looking very much better. I had not heard any more about her, and so, before completing this article, I wrote to her doctor, and he replied, "She does not suffer from diarrhoea so much, but has tenesmus and is continually passing some mucus and blood. She says she is too ill to go outside. The anaemia is not so obvious, but the tongue is very pale. Though the legs are not swollen the abdomen has enlarged considerably. I cannot feel anything. Her periods occur every three weeks." I suggested the advisability of another blood transfusion and protein hydrolysate, two teaspoonfuls three times a day with meals.

Diet

The following diet contains approximately 385 g. of carbohydrate, 145 g. of protein, 115 g. of fat: 3,155 calories.

Breakfast.—Milk 8 oz. (230 ml.), porridge (strained) 1 oz. (28 ml.), crustless bread 3 oz. (90 g.), sugar ¼ oz. (8 g.), 1 egg, and bacon 1 oz. (30 g.), or fish 4 oz. (120 g.), butter ¼ oz., pipless jam or honey or syrup ¼ oz.

Lunch.—Cream soup (canned) 10 oz. (280 ml.), meat (minced) 2 oz. (60 g.) or fish 4 oz. or cheese 2 oz., mashed potatoes 6 oz. (180 g.), purée of vegetables 4 oz. (120 g.), pudding made from milk 8 oz., semolina or other cereal ½ oz., fruit purée as desired, sugar ¼ oz.

Tea.—Milk 2 oz., crustless bread 2 oz., butter ¼ oz., sponge cake or plain cake without fruit 2 oz., pipless jam or honey or syrup ¼ oz.

Supper.—As for lunch.

On Waking, at 11 a.m., and Last Thing at Night.—Milk 2 oz., cocoa ½ oz.

The cream soups may be thickened with dry potato powder. Syrup may be used as desired in sweets. The sweet ration should be taken as chocolate. Yoghurt and fruit juices, such as blackcurrant juice and rosehip syrup, make a useful change from the usual pudding. Very ripe bananas, if available, may be taken, as may be sweetbreads, brains, or kidneys.

Some doctors prefer that their patients should not be ordered a low-residue diet, and consider that a certain amount of roughage is beneficial. I do not agree with this. I think it is of importance to avoid raw fruit. I have known an orange, or one or two grapes, brought in by visitors, cause a relapse in a patient who was doing well.

Illustrative Case 2

In December, 1947, I was asked to see a married man aged 45, suffering from the same complaint, in whom the nervous or psychological symptoms were more in evidence. The doctor told me that the patient had suffered from digestive trouble all his married life, chiefly nervous symptoms, nausea, fainting, and appendix pains. He belonged to a more educated class than the first patient, being employed in one of the Ministries, and he was afraid that he would not "make the grade" for establishment. In addition to the anxiety thus produced, he was worried about financial commitments on a house into which he had just moved.

We are all familiar with the literature during recent years dealing with the psychiatric aspects of ulcerative colitis, and

the emphasis placed by some writers on what is termed the "grief response." Stress has also been laid on the dependent personality of many victims of this disease and the close physician–patient relationship which develops during treatment. The cause of ulcerative colitis is not known. It is described as a psychosomatic illness, which means, I believe, that a disorder of the mind produces a disease of the body, and as Sir Toby Belch said, "I am sure care's an enemy to life." The treatment recommended by some seems rather unfair—to cut out the innermost portion of the body which is the victim of the disorder of the mind, rather than to cure the diseased mind by psychological treatment. The latter, however, is found to be of little value. I have not been able to discover convincing evidence in my cases to support the view that a disturbed mind produces a diseased colon, rather than vice versa, and one of my patients told me recently that the diarrhoea resulted in "frayed nerves."

The patient said that he considered another factor in the production of his illness was overwork, both during and after the war. During 1944 he suffered from mild diarrhoea for four weeks, followed by an attack lasting for six weeks in 1945. In 1946 there was a severe attack of lichen planus, perhaps due to nervous disturbances.

When I was consulted on December 7, 1947, the diarrhoea had already lasted for five weeks, accompanied by the passage of blood and mucus. The patient suffered from colicky abdominal pain, intermittent fever, loss of weight, and was confined to bed. His own doctor had prescribed a course of sulphaguanidine followed by phthalylsulphathiazole, without beneficial results, and ten days before my visit had called in a surgeon, who advised a permanent transverse colostomy, saying that medical treatment would be of no avail. A barium enema examination had shown absence of the normal haustrations in the transverse and descending colon. The haemoglobin had fallen to 77% on November 27; the faeces contained much pus and yielded a growth of Morgan No. 1 bacillus.

Question of Operative Treatment

I was asked my opinion: should the patient submit to this operation with its unpleasant aftermath, or could I suggest an alternative form of treatment?

I should like to say a few words here about the operative treatment of ulcerative colitis. We are all agreed that if an operation is to be performed it should not be delayed until the patient is so debilitated that the chance of recovery is slight. The object of any operation is to give complete rest to the affected colon, and this can be most efficiently done by ileostomy, unless a colostomy can be performed in a healthy area of the colon. The ileostomy will have to be permanent in most cases, but a special bag can be worn—the Koenig–Rutzen bag—which is illustrated in the paper by Hardy and his colleagues (1949). McKittrick and Moore (1949), in America, record their experience of 149 cases of ileostomy, with a mortality rate of 22% and about 70% of the patients expressed themselves subsequently as well satisfied with the operation. In others the operation was a failure; one patient committed suicide; another wrote, "the whole thing is a mess, whatever I do." Is a permanent ileostomy too high a price to pay for health?—that is the question.

My answer in this case can be guessed with little difficulty. The patient came into hospital on December 13. The bowels were now opened three to four times during the day and four times during the night. The motions contained mucus and blood, but no abnormal organisms were found on culture. There was a moderate degree of anaemia, the blood count showing: haemoglobin, 79%; red cells, 4,300,000 per c.mm.; C.I., 0.9; white cells, 12,900 per c.mm., with a normal differential count. The corrected sedimentation rate of the red cells was 18 mm. % plasma at one hour. The temperature was normal. This did not appear to be a very severe case of ulcerative colitis, and the psychological factor was a much more prominent feature than in the case previously described. The patient was given a course of phthalylsulphathiazole, 1 g. three times a day for 14 days together with a high-calorie, high-protein diet, 200 mg. of ascorbic acid daily, and 6 gr. (0.4 g.) tab. ferrous sulphate thrice daily.

By December 26 the motions were reduced to four in the twenty-four hours, and they were more formed. Three days later no blood was seen in the motions. On January 1, 1948, the bowels were opened once by day and once by night and the motions were formed. A week later the patient said he felt very well and was pleased with his progress and hopeful of recovery. On January 15 the bowels were opened only once in the twenty-four hours, and sigmoidoscopy showed a healing mucosa, with some residual infection. There was excess of mucus in the bowel lumen, but no blood. The patient soon returned home, having gained 2 lb. (0.9 kg.) in weight.

On March 1, 1948, a further examination was made at hospital. There had been a gain of 18 lb. (8.2 kg.) in weight in the past six weeks and the patient had been working for two weeks. He was completely free from intestinal symptoms, but was still anxious about his work, though every effort had been made to encourage self-confidence.

In this case the degree of anaemia and the condition of the patient did not indicate the necessity for a blood transfusion.

In 1950 I wrote to the patient's doctor inquiring about further progress, but he told me that the patient had now left him. I then wrote to the patient, and he replied that he was very well.

Conclusion

The cause of ulcerative colitis being unknown, treatment must be symptomatic, and repeated blood transfusions are of the greatest value. The ultimate results, however, are very unsatisfactory. In the series of Hardy *et al.* (1949) ileostomy was performed on 21 patients, with six deaths, but half of these deaths were said to be avoidable. Of the last nine patients operated on, however, only one died.

Comanduras, in America, wrote that the word "cure" must not be used; "arrested stage" is preferable, and two-thirds of those who have been operated on will be dead after a few years. Rice-Oxley and Truelove (1950) investigated the records of 72 new cases treated at the Radcliffe Infirmary, Oxford, from 1938 to 1948; of these, 22 died within a year of onset, and one-third of the remainder had succumbed at the end of five years. Recurrences were frequent, and emergency ileostomies did not seem to be justified.

REFERENCES

Hardy, T. L., Brooke, B. N., and Hawkins, C. F. (1949). *Lancet*, **2**, 5.
McKittrick, L. S., and Moore, F. D. (1949). *J. Amer. med. Ass.*, **139**, 201.
Rice-Oxley, J. M., and Truelove, S. (1950). *Lancet*, **1**, 663.

A special advisory committee has been formed by the American Heart Association in order to develop public-health work in the field of cardiovascular diseases. The committee will provide detailed practical plans which can be carried out by local heart associations for the benefit of cardiac patients in their areas. The chairman of the committee is Dr. William A. Brumfield, jun., deputy commissioner of the New York State Department of Health.

Tropical Diseases

Shortt (London) reviewed recent knowledge of malarial parasites with special reference to the exo-erythrocytic cycle. The treatment of amoebiasis with "chloroquine" and with aureomycin was discussed by Conan (Beirut) and Bossa (Naples) respectively.

Haematology

In this section Hall (U.S.A.) reported his work on the intrinsic factor of Castle (see *British Medical Journal*, September 9, p. 585). Bornsdorff (Helsinki) had found that pernicious-anaemia patients fell into two groups, those that reacted to oral B_{12} without the addition of gastric juice and those that did not react even with gastric juice. Kristensen (Stockholm), by attaching a pendulum to clotting blood, could more readily measure the rate of coagulation. Gullberg (Stockholm) recommended urethane as an adjunct rather than a substitute for *x*-ray therapy in leukaemia. Urethane may produce a longer remission in myeloma. Bernard (Paris) had treated acute leukaemias with aminopterin, but had found that the results were better if this was combined with replacement transfusions. Hetenyi (Hungary) showed that in animals injections of venous blood or cyanide into the nutrient artery of a bone stimulated erythropoiesis. Christiaens and Goudemand (Lille) believed that neonatal jaundice may be influenced by maternal antibodies transmitted by the mother's milk. Bacq and Deronaux (Liége) described the pharmacology of a drug, adrenochrome semicarbazone, which has a lasting effect on the bleeding-time and is neither toxic nor sympathomimetic.

Rheumatic Diseases

This section was opened by Nanna Svartz (Stockholm), who had found that, when all agglutinins against normal sheep-cells are absorbed from rheumatoid arthritis serum, there remains in 90% of such sera an agglutinin to sensitized sheep-cells which is not present in normal serum. This agglutinin is also found in rheumatic joint exudates. She believed a special polysaccharide is involved which is abundant in rheumatic nodules. Layani and his colleagues (Paris) had studied the plasma proteins in Paget's disease without finding any constant abnormality. Layani also discussed sarcomatous degeneration in Paget's disease. Séze, Ordonneau, and Robin (Paris) reviewed the limitations of cortisone in treating rheumatic cases.

Miscellaneous Subjects

The Infectious Diseases Section reviewed ornithosis (Lepine, Paris), typhoid carriers (Knittelfeld, Austria), brucellosis (Maldonado-Allende, Argentina), and gonorrhoea (Durel, Paris). The papers on gastroenterology tended to be more general and historical, but Wiebenga, Jansen, and Verdonck (Leiden) described their gastric biopsy results, and Albot and Bernard-Bruker (Paris) reported their belief that treatment with an emulsion of *B. subtilis* had value in some types of diarrhoea. Neurologists were presented with an exhaustive study of the nervous manifestations of porphyria by Garcin and Lapresle (Paris), with a review of the value and limitations of phenylacetylurea in epilepsy by Euziere and his colleagues (Montpellier), a study of muscular cramps by Roger and Schachter (Marseilles), and with other subjects.

In the Nutrition Section, Markees (Basle) claimed value for the use of cocarboxylase in diabetic coma and other conditions in which blood pyruvic acid is raised; this was doubted by Gilliland (London). Salmon-Malebranche (Paris) stressed again the psychological factor in the aetiology of obesity.

Films

Several good films were shown during the Congress, and among these "The Radiography of the Spine" (Séze, Paris), "The Surgical Treatment of Portal High Blood Pressure" (Santy, Lyons), and "Thrombosis and Embolism" (Waterville, Geneva, and Jurgens, Basle) were notable. These were in a sense documentaries, but the film by Mote (Chicago) broke new ground, showing the great value of A.C.T.H. in controlling recovery from severe burns. Pain, infection, and electrolyte disturbance are all minimized and healing and epithelization hastened.

PRESENT STATUS OF CORTISONE AND A.C.T.H.

DR. PHILIP HENCH IN LONDON

Dr. Philip S. Hench, of the Mayo Clinic, has recently delivered two lectures in London. The first, entitled "Cortisone and A.C.T.H. in Rheumatic Diseases," he gave on October 5 to the Department of Rheumatic Diseases of the West London Hospital. Dr. W. S. C. Copeman was in the chair and members of the Heberden Society attended. Dr. Hench also showed a film illustrating the effects of those hormones on patients with rheumatoid arthritis treated at the Mayo Clinic.

Dr. Hench's second lecture was given at the Royal Society of Medicine, where the attendance was so great—the Barnes Hall being packed and the proceedings relayed to another hall—that the chairman, Professor R. A. McCance, decided that to have a discussion after the lecture was impracticable.

In describing the action of cortisone as used by himself and his colleagues—Drs. E. C. Kendall, C. H. Slocumb, and Howard F. Polley—Dr. Hench said that the hormone did not kill any micro-organism or remove any unknown irritant; what it did was to provide susceptible tissues with a shield-like buffer. It did not, so to speak, put out the fire nor even repair the fire damage, but it did provide a kind of asbestos suit by which the patient was protected. When the suit was removed prematurely the tissues were again subjected to the flame. But once the inflammation was suppressed it could remain suppressed by simple maintenance doses.

Individual tolerance to cortisone and A.C.T.H., said Dr. Hench, varied greatly. Males tolerated the hormone better than females, especially adolescent and menopausal females. Such effects as acneiform eruptions or "round face" might be endured temporarily in view of the need of the patient. Fairly common side-effects were minor alterations of psyche, restlessness, and insomnia. Occasional ones were retention of fluid, hypertrichosis, folliculitis, and transient amenorrhoea. More rare were hypoglycaemic alkalosis, altered libido, retrocervical fat ("buffalo hump"), and increased blood pressure. Spontaneous fractures were rare. There were now more than 3,000 rheumatoid patients in the United States who had received cortisone, and he knew of only four cases of spontaneous fracture in elderly osteoporotic persons. To prevent adverse effects, if prolonged administration was necessary after initial suppressive doses, only the smallest effective maintenance dose should be used. The administrator should be content to suppress symptoms and not necessarily to reduce sedimentation rates.

Some 50 steroids, said Dr. Hench, had been studied with a view to finding substitutes for cortisone. These were all more or less related to cortisone, but apart from "compound F" (which had not yet been synthesized, so far as he knew, though it probably would be in the near future) none of them produced significant effects. Dr. Hench added that cortisone was now priced at 50 dollars a gramme. Supplies were now sufficient to make cortisone available in limited amounts to all approved American hospitals, with growing supplies for foreign medical centres. He had recently seen the first specimen of A.C.T.H. from the pituitary of the Norwegian whale.

In May, 1949, a special preparation—a mixture of compound E and compound F—was given to a severely rheumatoid patient by mouth, and the patient became symptom-free. From this and certain animal experiments it was concluded that cortisone was effective when given by mouth. Cortisone tablets had since been given by Dr. Richard Freyberg, of New York, and by Dr. Hench and his associates in 25 rheumatoid cases, with satisfactory results. To their pleasant surprise they found that no larger quantity was needed than when given by intramuscular injection.

After describing the effects of cortisone on rheumatoid arthritis, Dr. Hench turned to some other conditions. Renal lesions were usually not affected, though temporary remission might be afforded. A few cases of chronic ulcerative colitis had been treated; in one of them—arthritis also being present—cortisone was given for 35 days: it brought about complete articular remission, with symptomatic remission of the colitis, which remission had continued for seven months or more after the end of the treatment. Cases of pulmonary tuberculosis had been treated, with subjective improvement, reduction of sedimentation rates, and improvement of *x*-ray picture of the lungs in some but not in other cases. In cases of tubercular arthritis the sedimentation rates had decreased and the articular symptoms cleared up. But because of the possible inhibiting effect of cortisone and A.C.T.H. on fibroblasts these hormones should be used only as an investigative procedure in the presence of tuberculosis.

A few patients with osteoarthritis had been treated (cortisone was so precious that it was not considered advisable to use it on a relatively benign disease), and considerable relief had been obtained in about half. Cases of acute gouty arthritis had been relieved, sometimes after a single large dose. Remissions in cases of asthma had lasted from one week to five months after discontinuance of the hormone. One important use was in inflammatory diseases of the eye—subacute uveitis, iridocyclitis, and other conditions.

Dr. Hench ended his lecture by saying that, although some of the clinical effects recorded were non-specific, the ability of the hormone to influence markedly a disease process, or even to reverse it, appeared to be group-specific. These hormones had furnished a powerful weapon with which to investigate many problems relating to the aetiology and treatment of a wide variety of diseases. Research workers were at the beginning rather than the end of the road.

Correspondence

Psychology and Science

Sir,—I imagine few scientists, and hardly any psychologists, would accept the definition of science which Dr. Clifford Allen has proposed in his recent letter (*Journal*, September 30, p. 783). "Science," he says, "is only a collection of facts and an attempt to explain them so that we can predict what will occur in certain circumstances." This leaves out what is most distinctive of all science—namely, proof. The attempt to predict what may occur in certain circumstances is more characteristic of the practical applications of science (as in medicine or navigation) than of pure science as such. Certainly, if by adopting a given explanatory theory we succeed in increasing the accuracy of our predictions, that may serve as an additional confirmation of the theory; but not every form of proof, nor even every inductive proof, rests on the verification of predictions. In Kepler's demonstration of the laws of planetary motion and in Harvey's demonstration of the circulation of the blood there is no reference (except as an incidental corollary) to any practical prediction.

It ought perhaps to be added that by proof I mean, not the demonstration of a certainty, but the estimation and comparison of probabilities. Dr. Allen contends that "the theories of Freud are no more fantastic than the theories of Hughlings Jackson" or those of the mathematical physicists. But whether a theory seems fantastic or not has little to do with its final validity. Certainly the more fantastic a theory appears—that is, the more the *a priori* probabilities are against it, and the less readily it can be integrated with conclusions already established—the stronger is the need for high *a posteriori* probabilities in its favour: that at least would be my own view. But many scientists have contended that the role of *a priori* probabilities in empirical proof is so small and dubious that it is safer to neglect them.

An almost perfect model of scientific method (as the psychologist would understand it) is contained in the article by Professor Bradford Hill and Dr. Doll in the same issue of your *Journal* (September 30, p. 739). The psychologist's objection to psychiatric theories, like those cited by Dr. Allen, arises mainly from the fact that, so far, little or no attempt has been made to test them by any rigorous experimental or statistical procedure, such as that which Professor Hill adopts. Of course, many psychiatrists would argue, with Dr. F. Cort (p. 785), that it is better to trust to clinical experience or personal impression than to "cold mathematics." Dr. Allen thinks that we should all be content to regard ourselves as "ignoramuses trying to help our sick fellows." But when an ignoramus tries to help them, he is very apt, like the psychiatrists of an earlier generation, to diagnose mental deficiency by stigmata and head measurements, and to recommend craniotomy for its relief, or, like psychiatrists of the present day, to diagnose neuroticism by paper-and-pencil tests and propose leucotomy or convulsion therapy for a type of patient who, for all the existing evidence has shown, is quite as likely to be injured as alleviated. After all, it was "cold mathematics" that demonstrated the failure of craniotomy and the value and limitations of psychological tests.

But, when all is said, clinical experience and statistical comparisons are by no means incompatible; so why not combine them?—I am, etc.,

London, W.C.1. Cyril Burt.

Sir,—Dr. F. M. R. Walshe in his distinguished Linacre lecture (*Journal*, August 12, p. 379) has raised criticisms of a fundamental nature for psychology which cannot simply be ignored but call for a reasoned rebuttal if a convincing case is to be made for psychological medicine to take its place as a branch of science. I put it down to the fact that the lecture appeared during the holiday season that his challenge has not been taken up more seriously.

Dr. Walshe has set forth, eloquently and persuasively, two main theses: that psychology is not, and cannot be, a part of "natural science"; and, secondly, that it properly comes under the discipline of historical science as propounded by R. G. Collingwood—and I would like to emphasize the use of the term "science" in this connexion. He makes a distinction between the data of natural science and those of history. The prime method, he says, of natural science is the observation of events, including controlled experiment. History, on the other hand, is concerned with human actions that lie in the past, which have not the quality of sense-data as these are understood in natural science.

If one of Dr. Walshe's patients has an epileptic fit in his consulting-room he has all the sense-data present for an observation according to natural science. Must we assume that a week later, or, for that matter, half an hour later, when the event has passed into history, it has completely changed its character? In considering the occurrence after a lapse of time he will be concerned with "human actions that lie in the past . . . which have not the quality of sense-data as these are understood in natural science." If the answer is that the event, being observed by himself, remains for him a part of natural science, suppose then he is describing the incident to a colleague, is the latter precluded from accepting it as properly scientific but must perforce consider it merely as historical? One can visualize the colleague, weeping, perhaps, like the Walrus and regretting that, while he believed every word Dr. Walshe said, he could not accept his story as scientific but only as history.

The thesis clearly introduces a number of complications, and I would like to ask at this stage if Dr. Walshe considers that psychological events and processes are less "factual" than the events and processes of the external world which make up the data of natural science. He will, I know, be aware that the "facts" or sense-data of the physical world have been subjected to such a nihilistic analysis of late years by philosophers that they could hardly be made more tenuous and abstract. Bertrand Russell, for example, is compelled to go so far as to maintain that when he sees his friend Jones he knows he is only looking at a bundle of "light quanta."[1] On the other hand, to make the distinction less distinct it almost seems as if certain philosophers tend to endow the sense-data of physical science with psychological attributes. It is not so long ago that Eddington, a "natural" scientist, puzzled at the capricious behaviour of the electrons, decided that they must be endowed with free will—a very mysterious mystery indeed, as Damon Runyon would say.

Collingwood's theory of historical method displays, it seems to me, mainly his naivety and bias against psychology, the

latter manifesting itself quite strongly in his autobiography.[2] As Dr. Walshe mentions, Collingwood teaches that "the historian investigating any event in the past makes a distinction between what may be called the outside and the inside of an event. By the outside of the event I mean everything belonging to it which can be described in terms of bodies and their movements. . . . By the inside of an event I mean that in it which can only be described in terms of thought."[3] What does this mean if not that every historical event has a psychological aspect? But Collingwood evidently did not appreciate this even when he emphasized that the cause of an event to a historian means the thought in the mind of the person by whose agency the event came about. He did not proceed beyond "thought" and, in fact, made the incredible affirmation that those actions which are determined by what may be called a man's animal nature, his impulses and appetites, are not properly the subject-matter for history.[4]

It is clear, in fact, that Collingwood's method is not so much a historical science in which psychology should be included but is a psychological method in which history should be comprehended. To consider, for instance, the example quoted by Dr. Walshe from Collingwood: Why did Brutus stab Caesar? Was it from the highest patriotic motives (the "noblest Roman of them all"), was it from mean personal envy, or was it, perhaps, from a combination of both? Who is the right person to answer these questions? Is it the archaeologist or the decipherer of ancient documents? Or is it the trained psychologist experienced in assessing motives from the available evidence?

Dr. Walshe criticizes Bernard Hart's lucid and convincing exposition of psychological medicine as part of natural science on the ground that "the essential data in psychology, as we find it in medicine, are the mental processes behind the façade of the so-called 'observed facts.' It is surely a *non sequitur* to invoke the canons of natural science in this situation." In the name of all the atoms and celestial bodies, why? Is it unscientific of the astronomer to try to get behind the façade of the stars in the heavens or of the physicist to try to penetrate into the processes behind the particles of material things? It is a matter of inference in each case, and accurate inference is an essential element in the scientific method.

When Dr. Walshe declares that it is impossible to generalize about psychology to-day because it has no unity of method or of concept he is stating something that is, unhappily, true. Psychology has not even yet shaken itself free from superstition, theology, and personal predilection, and neither, I regret to say, have many medical psychologists. To maintain, however, that the data of psychology—the events and processes of the mind—are not facts equally with the admitted facts of the natural sciences seems to me to be merely mysticism. If they are admitted to be facts they will be capable of being collated and manipulated according to the true scientific method.

With great respect I suggest that Dr. Walshe has been led off the straight, narrow, and slippery path of valid scientific thinking largely by falling a victim to Collingwood's fallacious teaching on historical "science," based as it is upon a naive and uninformed attitude to psychology. I must add, again with great respect, that I consider it is a fantasy to think that there can be different kinds of sciences, "natural," "historical," and possibly others. There is only one method of science, and accuracy is its watchword.—I am, etc.,

London, W.1. FREDERICK DILLON.

References
1 *The Scientific Outlook*, chap. 3.
2 *An Autobiography*, chap. 9.
3 *The Idea of History*, p. 213.
4 Ibid., p. 216.

Distinction Awards

SIR,—Surely Mr. R. L. Newell has misinterpreted (September 30, p. 783) the main gravamen of Mr. R. S. Murley's letter of September 23, p. 726. I was myself chairman of a meeting of specialists addressed by Lord Moran. The letter convening the meeting gave its object as an opportunity for informal discussion. Only a small minority of consultants attended. Lord Moran after a review of the steps taken regarding distinction awards asked for the immediate formation of a small committee to put forward names for these awards. He indicated that delay in appointing such a committee might be prejudicial to potential recipients. The meeting then proceeded to appoint a committee.

I have since been taken to task by certain of my fellow consultants for my acceptance of this procedure. They say that, while there are many consultants who would not feel justified in giving up time for informal discussion of a subject which has already been very fully discussed formally and informally since the report of the Spens Committee was made public, there is not one who would not wish to be present to register a vote in the appointment of this very important selection committee.

Assuming that the conveners of the meeting knew that this important step was to be taken, they ask why there was no mention of it on the agenda of business.

There has been no question of "whether Lord Moran is right in going round the country addressing meetings of non-teaching consultants," but only whether it is right to press for the immediate appointment of a committee to forward names for awards at badly attended meetings, called ostensibly for the purpose of informal discussion.—I am, etc.,

Sudbury, Suffolk. H. BATHURST NORMAN.

Distinction Declined

SIR,—I find myself unmoved by the pathetic appeal by X in your issue of October 4 (p. 887), and I suggest that he is the victim of confused thinking. As one who declined to complete the questionary submitted to consultants by the Distinction Awards Committee, and who said explicitly that he did not wish to be graded for an award, I received a reply from the secretary to the committee informing me that the committee's terms of reference required it to grade me whether I wished it or not. In due course I was notified that I had been graded for an "A" class distinction award, and thereupon replied that I declined to accept it. It would seem, therefore, that I am still on what X calls "the road to distinction."

My own view has always been that this is no road to distinction, but only the road to a very different thing—namely, the road to a "distinction award." No committee can confer distinction on me, except in the neutral sense that it can "distinguish" me from my brethren by placing me in a salary category. Further, if X has declined to accept the basic sessional payment for which he is eligible, how can he reasonably ask to be allowed to accept what is only a pensionable increment to the basic salary? Can there be an increment to nothing?

I agree with X, however, in thinking that the secrecy which purports to surround the award is a pious figment. Already a patient has asked me whether I know Mr. Y, the brother of the general practitioner who referred him to me, adding that Dr. Y has told him that his surgical brother has just received "the very highest distinction award."—I am, etc.,

Z.

St. Luke's Day

SIR,—On October 18 members of the Christian Church remember with gratitude the work of the most famous member of the medical profession. At this season it is fitting to call attention to the remedies prescribed by Luke for the soul of a sick world. Many of us to-day are willing to admit that the world is sick. There is a growing consensus of opinion that the disease is selfishness complicated by materialism. But proceeding to therapeutics we find wide divergence of views.

All down the centuries of our Christian era men and women have been proving the value of the prescriptions left us by Luke and Paul. To-day thousands are learning that by accepting Christ's standards of truth and love human nature can be changed. Is there any other remedy for the world's sickness?

To-day we may share the optimism of Luke and Paul. Never perfect, but always aiming at Christ's standards, we can be confident of final victory.—I am, etc.,

Banstead. HERBERT CAIGER.

Child Health and the Future

SIR,—As one of those who have been interested in child health for over 40 years—I inaugurated a clinic at the Liverpool Maternity Hospital in December, 1907, after reading Budin's book *Le Nourrisson*—I welcome the interest that paediatrics is now taking in preventive work. Professor Alan Moncrieff in his review (*Journal*, October 7, p. 795) is critical of the present and briefly alludes to the past. In 1904 there occurred in Liverpool in a single week of the year many more deaths, twice as many, from gastro-enteritis as now occur in a whole year. The infantile mortality rate has been reduced to one-fifth; it was, as Professor Moncrieff states, to combat this frightful mortality that the first health visitors were appointed by the local authority, and then infant-welfare clinics were set up. Professor Moncrieff criticizes, and rightly, our present efforts against tuberculosis in childhood. It may, however, be pointed out that in this city deaths from tuberculous meningitis under 15 years of age have fallen from 126 in 1915 to 19 in 1949. Most of this reduction occurred before the introduction of streptomycin. Child mortality—i.e., at ages between 1 and 5 years of age—has been reduced to one-tenth of the 1920 figure.

The improvements in child health, as apart from mortality, have been no less striking. At the beginning of the century the out-patient departments swarmed with cases of rickets, tubercular glands in the neck, congenital syphilis, blepharitis, etc., which are now but rarely seen. As recently as 1941 there were in city hospitals as many as 800 cases of diphtheria; now there are but a dozen or less. Deaths classified as from "external causes" are but one-twelfth of what they were in 1900.

These results constitute an outstanding achievement. Compared with them any defects in present-day practice, such as the doubts expressed, *vide* Professor Moncrieff, by one unnamed M.O.H. concerning the value of breast-feeding, are relatively trivial. That there is still room for improvement is true. Leaders in public health are well aware of that.

Nevertheless the resistant hard core of infant mortality, namely prematurity, has been attacked by local authorities even in the midst of wartime difficulties. The death rate under the heading "congenital defects, prematurity, etc.," of which prematurity is the possibly preventable fraction, is but two-fifths of the 1900 figure. The still-birth rate has also fallen, an occurrence associated with better antenatal care and feeding. A year or so ago on visiting a famous maternity hospital I enquired of the paediatrician what arrangements were made for continuity of care of premature babies after discharge from hospital, and was astonished to find not only that there were none, but that they did not appear even to have been considered. At that time in all the four Liverpool municipal hospitals with maternity units there were prematurity sections; these notified the health visitor in whose area the baby's home lay and she, in return, furnished a report on the home conditions *before* the baby's discharge home. Certainly there may be room for more co-operation of this sort between the hospitals on the one hand and the infant-welfare departments and general practitioners on the other.

As regards breast-feeding, I am unaware of any health visitors who discourage or are lukewarm about it; it would be contrary to all their training. The harm is often done before she calls. Such discouragement may indirectly take place in hospitals; the over-segregation of the mother and infant may have psychological consequences, one of which is the—often voluntary—failure of breast-milk. The ready availability of dried milk may make it easy for the mother, either because she wishes to, or more often because she considers her breast milk is inadequate, in quality or quantity, for her child. In this matter popular views have often to be opposed. I hope that those who teach will continue to emphasize the great advantages of breast-feeding.

The achievements related above were not accidental; they were a well-planned co-ordinated effort. Immunization against diphtheria resulted from the combined work of health visitors, infant-welfare departments and clinics, and school doctors and teachers, under unified direction and greatly helped by Sir Wilson Jameson's broadcasts. We have recently seen the unhappy results of disorganization of the tuberculosis services. The pre-eminence of tuberculosis over other infective conditions as a cause of child deaths is largely due to our national failure to use B.C.G.—only this year available and in limited amount. I welcome the aid of all in combating tuberculosis. Many paediatricians, I know, are keenly interested in its use. If we all pull together we may see results comparable to those achieved in relation to diphtheria. I hope nothing further will be done to disintegrate the preventive services. They are at the moment gravely hampered by inadequate salary scales and a great shortage of health visitors. I welcome Professor Moncrieff's observations on family life as all-important in the life and health of the nation. For a number of years I have lectured to health visitors, D.P.H. students, and others on the possibility of improving the basis of mother–child and family relationships by antenatal and post-natal instruction in the clinics. The basis of knowledge of mental health,[1] which I discussed in 1948, should be laid down in the senior medical student years. This is not adequately done now.

One of the causes of neurosis and delinquency in childhood is parental marital disharmony, and this is what those of us who are engaged in marriage guidance are endeavouring not only to heal but also to prevent. We believe that much of the present breakdown of marriages is preventable. A good family life is the main basis of mental health, and the moments when the woman is most open to advice are before marriage and before the birth of the first, and perhaps second, child. There is as wide a field of useful endeavour in the preservation of mental health opening before us as was given to us at the beginning of this century in relation to physical health. If the health services are to be disintegrated into separate over-specialized services I fear that prevention will gravely suffer.

Professor Moncrieff touches also on problem families. These social problems have been illuminated by the researches of M.O.H.s and their staffs—e.g., Savage, Wofinden, Tomlinson, and others—and the Blacker Committee will shortly produce a report. In about one-third of these families the mother is mentally defective and with them infant mortalities of treble that prevalent in the area often occur. I personally have tried the method of case conferences with the other family social workers, statutory and voluntary, involved. I do not think there is any easy answer to this problem in infant mortality and child ill-health. Does anyone know the answer to this?—I am, etc.,

Liverpool. C. O. STALLYBRASS.

Reference
1 *Publ. Hlth, Lond.*, 1948, 61, 123.

SIR,—I had the great pleasure of hearing Professor Alan Moncrieff deliver his Dawson Williams Prize lecture (*Journal*, October 7, p. 795). His delivery was superb, and the text as published in your issue shows him to be a true master of the English language. As a general practitioner I would like to comment upon what he terms a paradox. He says that it is hard to explain a decline in breast-feeding which has been accompanied by a sensational drop in infant mortality figures. He goes on to say that it is acute respiratory disorders which now present the major difficulties after the newborn period.

Even in 1935 Grulee, Sanford, and Schwartz[1] in a study of morbidity and mortality in 20,000 breast and artificially fed infants found that it was the respiratory disorders which were the most prevalent. Both breast and artificially fed infants became susceptible at 5 months, but the artificially fed infants remained highly susceptible up to 9 months, giving a morbidity rate at that age of twice as much as in the breast-fed, and a mortality rate six times as high. This survey was based on the incidence of such infections as elicited by case histories taken in a welfare centre and refer only to the attack and not to its severity or length.

I have been studying this problem also and find that not only is the incidence of respiratory infections higher in the artificially fed, but that they recover more slowly. For all infections during the first year of life I found that the artificially fed infants required five times as many visits from the family doctor.[2] This surely has great significance and is a reason why we should all pay much *more* than lip-service to breast-

feeding. The common cold, with its dangerous sequelae, spreads, as Professor Moncrieff points out, by contact with the family group. Unfortunately, however, the common cold carries no immunity. On the contrary the immunity seems to work in reverse, and the more times a child catches a cold the more likely he is to catch another soon. If the baby is also slow to recover, then the second infection may come along before the first has entirely cleared up. I can see in this a very strong argument for the encouragement of breast-feeding.

One other comment. It has been stated that dried milks are not *displayed* to the public, but only distributed on the orders of the doctors at the clinics. Recently, when on holiday, I had occasion to call at a food office. As I waited for my emergency card I was forced to look upon a veritable pyramid of dried-milk tins displayed along with orange juice and cod-liver oil in bottles. I am sure that this type of display has the same effect upon the mother as the advertisement upon the hoardings has on the public.—I am, etc.,

York. F. Charlotte Naish.

References

[1] Grulee, C. G., Sanford, H. N., and Schwartz, H., *J. Amer. med. Ass.*, 1935, **104**, 1986.
[2] Naish, F. C., *Lancet*, 1949, **1**, 146.

Sir,—The description of the school health service as given in Professor Moncrieff's paper (*Journal*, October 7, p. 795) is far different from that known to myself. I have been some eighteen years in this service with three different authorities, and also have a more or less intimate knowledge of the systems of many other authorities. The conception that a school medical officer need spend most of his time carrying out routine medical inspections is entirely erroneous. In Liverpool only about 25% of the total of the school medical officers' services is occupied with this work. I quite agree that time would be wasted by such inspections. All that is required is a rapid screening, and then provision made for selected cases to be seen at special clinic sessions. The importance of health education is rightly stressed, and there is surely no better means than the giving of advice to individual parents during the course of these routine examinations.

In consideration of the above, together with actual experience of such a system, I would not endorse the carrying out of these inspections by health visitors. This is not work for which health visitors are qualified, and in consequence their selecting of cases is either on such a wide basis that there is no saving in the time of medical officers or else cases of importance are missed. The field of interest in the school health service is much wider than that of clinical paediatrics, and morbidity and mortality statistics are not adequate yardsticks with which to measure the results. I would recommend to those interested in the work of the school health service the Annual Reports of the Chief Medical Officer of the Ministry of Health: "The Health of the School Child." A study of these reports will reveal that the school health service has steadily progressed and is indeed very different from what it was in 1907-8.—I am, etc.,

Liverpool. G. Stuart Robertson.

Sir,—I very much admire the courage of Professor Alan Moncrieff, and I found his Dawson Williams Prize lecture (*Journal*, October 7, p. 795) most stimulating, as many others must have done. I do feel, however, that I would like to defend the principle of routine examinations, as this seems to be coming in for very heavy criticism at this time. Three years ago I started routine annual examinations of my child patients in order to investigate the value of such a procedure. At the beginning I accepted the conventional theory that the main purpose was to bring to light occult and minor ailments the treatment of which would prevent major disease in the future. If this were the only reason for carrying out physical examinations I would be very inclined to agree with Professor Moncrieff that, although some defects are undoubtedly discovered in this way, and quite a lot of good is done, the immense amount of labour produces only a small harvest. There are, however, other reasons for seeing the growing child at fixed intervals. A routine examination can be regarded as the taking of a cross-section of the child's development, a milestone which in practice gives one a very valuable standard of comparison. In other words, the routine examination can be used not only to discover ailments in the past, but as an instrument to discover ailments in the future.

For example, if a mother brings a child and says that he is not getting on well, is off his food and losing weight, reference to the records of the last routine examination will provide a standard by which to judge the child in his alleged illness. If this same child should provide a positive tuberculin reaction, reference to the records will again show whether there has been fairly recent Mantoux-conversion or whether he has been tuberculin-positive for years. It is to be noted that, if routine examinations are carried out for their possible value in the future, then even the obviously healthy children must be included in the scheme.

The value of the routine examination in providing a standard by which to judge the child in the future does not seem to have received much comment, and I would suggest that the reason for this is because the person who normally carries out routine examinations in our child-health services to-day is a different doctor from the one who is consulted when the child is ill. Having had some experience in the school medical service, I have no hesitation in asserting that the value of a routine examination both to the child, his parents, and the doctor himself is very much greater when that doctor is clinically responsible for the child in health and sickness. The natural corollary of this, of course, is that if routine examinations are to remain, some means must be found whereby they can be performed by the child's own doctor.

There is yet another reason why routine examinations are useful, particularly at the present time when normal practice is carried on at rather a fast tempo. Provided that adequate time is allowed, a routine examination is a very convenient time for discussion with the parent on the child's physical and mental development and any other problems that may occur to the mother. It would be difficult to summon a child and parent to an interview for the purpose of health education, but the routine examination provides a very valuable opportunity for such instruction and advice.

I rather wonder if the present reaction against medical examinations for routine purposes is not largely due to the unsatisfactory way in which school medical examinations are normally carried out. The hopelessly inadequate amount of time available for each child, the frequent lack of privacy, and the fact that the doctor is there to "do" so many units, most of whom he will never see again, are all factors tending towards superficiality and the avoidance of long discussion with the parent. Many parents, aware of these deficiencies, are afraid of holding up the moving belt and so keep valuable information about the child to themselves.

There is one further argument in favour of routine examinations that may be valid in the future, if not to-day. Whilst routine examinations may demonstrate very little disease in children, they also show that only a minority have really perfect physique. It must be admitted that for the most part we are ignorant of the factors preventing perfect health. There are a few obvious cases where an underweight, flabby child is obviously mismanaged at home, but we are all too familiar with the substandard child from the perfect home and the perfect child from a poor home to pretend that we know very much about the neglected study of the *health* of the child. Perhaps in the future it will be possible to measure the degree by which a child falls short of perfection and to prescribe appropriate remedies, in which case routine examinations will be of importance again.—I am, etc.,

Bristol. Norman J. Cook.

"Dramamine" and Sea-sickness

Sir,—In view of Professor J. H. Burn's comments on the use of antihistamine compounds in sea-sickness (*Journal*, September 23, p. 692), some observations of mine on their use in a fleet destroyer may be of interest. About a year ago I became aware of the inadequacy of hyoscine in this condition. Its usefulness appears to be confined to the mild cases, and then only if taken before rough weather is encountered. As a sailor usually believes he will be all right next time, he seldom asks for his pills until he is feeling really ill, by which time they are of little help to him. The result is they fall into disrepute and few bother to take them. There being no "dramamine" available, I tried the effect of "benadryl." Its superiority over hyoscine was at once apparent and it became very popular, though again no one applied for it until feeling really ill. Many who were completely incapacitated were able to carry on their work as usual, though some complained of drowsiness.

Recently a small supply of dramamine came into my hands, and I was able to compare its effects with benadryl. Here, again, the pills were not taken until the patient was actually feeling ill.

The results were as follows:

Antihistaminic	No. of Cases	Complete Relief	Partial Relief	No Effect
Dramamine	30	10	9	11
Benadryl	30	19	6	5
Total ..	60	29	15	16

Of 17 cases who have tried both compounds at different times, five preferred dramamine, nine benadryl, and three found them equally effective. Drowsiness was complained of by two with dramamine and five with benadryl. No toxic effects were noticed, but it has never been necessary to continue treatment for longer than three days at six-hourly intervals, owing to improvement in the weather.

This is admittedly a small series of cases, but it would appear that benadryl is at least as effective as dramamine, if not more so, which is interesting in view of the ready availability of the former and scarcity of the latter.—I am, etc.,

J. M. Palmer,
Surgeon Lieutenant, R.N.V.R.

Sir,—I have been a very poor sailor all my life, during which time circumstances have taken me across the North Sea twenty times or more. I was invariably sea-sick unless the sea was dead calm. About fifteen years ago I tried hyoscine hydrobromide to help the sea-sickness. It certainly improved matters, as on comparable seas without it I would have been actually sick. As it was, provided I lay still and quite flat the journeys were endurable on a slight sea. If really rough, it appeared to make no difference, and the nausea continued on land up to 48 hours afterwards.

This summer I started the sea journey on hyoscine and went up to breakfast, where I toyed queasily with a grape-fruit; later I was sick. The stewardess provided me with "dramamine," which sent me to sleep for four hours. Then, although the sea was rougher, I got up perfectly well, and enjoyed a dinner of roast duck, ice with whipped cream, and blue cheese. After the holiday the sea was worse on the return journey, but, thanks to dramamine, I was up and present at all meals the entire journey, and next day on shore I was perfectly well.

Personally, I cannot praise dramamine too highly as a sea-sick cure.—I am, etc.,

Birmingham. Enid Houghton.

Sir,—As an inveterate sufferer from sea-sickness, and, like my friend Dr. M. F. Bethell (October 7, p. 836), a recent ship doctor, I would disagree with his conviction that "dramamine" is superior to the hyoscine preparations.

I was asked by the medical superintendent of a shipping line to carry out a trial of this drug, at that time in short supply. In cases of severe sea-sickness I could not repeat the spectacular results claimed by the Americans despite the usual methods to make the sufferers retain the drug. I often found it ineffective or definitely inferior to hyoscine in warding off impending attacks.

In my own case the recommended dose of dramamine was very alarming; a sense of impending doom convinced me that the proof of this pudding lay in the individual. I would agree with Dr. C. Grantham-Hill that there are many individual types of sea-sickness.—I am, etc.,

Chertsey, Surrey. John C. L. Adams.

Objective Assessment of Symptoms in Rheumatoid Arthritis

Sir,—Progress in rheumatoid arthritis is difficult to assess, and it is not surprising that clinicians relatively inexperienced in the rheumatic diseases have reported results of treatment with such agents as desoxycorticosterone acetate (D.C.A.) and ascorbic acid that conflict with the findings of specialized rheumatism units.

Steinbrocker's system of defining the stage of disease, the functional class of the patient, and his method of assessing the progress made, have been used with success in following a group of patients at the rheumatism clinics of the Leeds General Infirmary and the Royal Bath Hospital at Harrogate. This system is of use only in assessing clinical change over a period of months, and it is quite unsuitable for assessing such rapid change as may follow the administration of such therapeutic agents as cortisone and A.C.T.H.

Any objective test which will measure clinical change or improvement is of importance. C. E. Quin, R. M. Mason, and J. Knowelden (*Journal*, October 7, p. 810) describe four so-called objective tests. A series of cases of rheumatoid arthritis treated with D.C.A. and ascorbic acid, in which similar tests were performed, was reported last year with negative results.[1] I feel that it is necessary to point out that none of the tests performed are entirely objective, and all with the exception of the "walking test" are difficult to measure accurately. Considering these tests in turn, it will be seen that none are entirely objective.

Joint Tenderness.—This is, of course, a subjective test. Even with the use of the analgesiometer (Kellgren), variable results can be obtained. In performing such a test it is essential that preliminary examination of the patient should show that the tenderness is not varying from day to day or at different times of the day.

Grip Test.—I have used this test on more than a hundred patients, and, if the method of gripping the bag is always the same, consistent results can be obtained in the normal and rheumatoid subject. However, a slight variation in the method of holding the bag produces a considerable alteration in the level of mercury. This can be demonstrated easily by anyone wishing to try it. Again, too, the co-operation of the patient is necessary. It is important that such measurements are taken at the same time of the day and at approximately the same room temperature.

Range of Joint Movement.—I have measured the range of movement of joints in rheumatoid patients who are not receiving active therapy, and a variation of ten degrees was often found from day to day. The range through which a patient will move a joint within the limits of fixed deformity will depend upon muscle spasm and local pain—again, subjective. Temperature has a great influence on muscle spasm, and I have on several occasions seen a joint which was clinically fixed move through forty-five degrees following local heating.

The shoulder-joint is one of the most unsatisfactory joints in the body for accurate measurement. From the article it appears that the angle was measured by one observer before the injection and by a different observer after the injection. Even using skin markings and instrumental aids, the readings of different observers measuring the same joint will show a considerable variation.

Using joint movement as a help in assessing clinical change in rheumatoid arthritis, it is essential to use a joint with a simple movement—e.g., the knee or elbow. Preliminary skin marking and the use of a long-armed goniometer are essential. Comparisons should be made between the range of movement measured, and not the actual limit figures. I cannot see how differences of five or six degrees in the range of shoulder movement can be measured without instrumental aid.

Walking Test.—The key sentence here is, "Walk as quickly as possible," and this functional test must have a subjective element. In discussing this and other similar tests at the spring meeting of the Heberden Society, at Manchester, 1950, I mentioned that the walking test was the one I had found most valuable in practice.

There are certain objective tests available, and I am surprised that Quin and his colleagues have been unable to establish a satisfactory method of measuring joint swelling. The method I employed (again limited to accessible joints like the knee and wrist) was to mark out with silver nitrate the maximal circumference of the joint. This line must completely encircle the limb. Parallel to this line, and at a distance governed by the size of the limb and joint—e.g., 2 in. (5 cm.) for the knee-joint—are drawn two other circumferences, one distal and one proximal. The use of these three measurements gives a satisfactory estimation of joint swelling.

As Lewin and Wassén[2] described joint redness and heat accompanying clinical improvement with D.C.A. and ascorbic acid, skin thermometry was performed on a series of cases,[1] with entirely negative results. This is certainly an objective measurement. Kellgren and Janus, at the Heberden Society meeting, 1950, showed a method of measuring joint blood flow, and this is also completely objective.

I am making no attempt to discuss the pathological findings, such as eosinophil counts, which are valuable in such investigations. No criticism is offered of the experimental method used, nor of the actual results obtained.—I am, etc.,

London, W.C.1. R. HARRIS.

REFERENCES

[1] Hartfall, S. J., and Harris, R., *Lancet*, 1949, **2**, 1202.
[2] Lewin, E., and Wassén, E., ibid., **2**, 993.

Osteoarthritis and Occupation

SIR,—I would like to support Dr. C. W. Buckley's contention (September 23, p. 728) that trauma, especially minor trauma, is an important cause of osteoarthritis. An analysis of the relative occupational incidence, and its effects on knee- and hip-joints in clinics which I attend, tends to confirm this view. In the Sunderland clinic we have a large proportion of miners who work in fairly low coal seams, mostly on their knees or "hunkers," while at the Darlington clinic a considerable number of agricultural workers attend who, as one farmer put it, are "clod-hopping all day." Among the miners osteoarthritis of the knee as against the same condition in the hip occurred in the proportion of twelve to one, while among the agricultural workers the ratio was reversed and there were 14 hip-joint cases as against one knee case. Other trades showed the following figures:

	Hip Cases	*Knee Cases*
Pneumatic tool workers (other than miners) ..	6	4
Policemen, postmen, gamekeepers	7	3
Tram, bus, and lorry drivers	2	8

This investigation was made in 209 cases. I believe a much wider survey would be of considerable use, especially if shoulder- and elbow-joint cases were included. Most orthopaedic surgeons are impressed by a steady increase of arthritis of these joints following the widespread use of pneumatic tool machinery.—I am, etc.,

Sunderland. W. GRANT WAUGH.

SIR,—It seems to me that Dr. C. W. Buckley (September 23, p. 728) and Mr. Franklyn Stonham (September 9, p. 629) are at cross purposes. In his paper Dr. Buckley states quite clearly that major trauma is less often a cause of osteoarthritis than microtrauma, which is often of occupational origin. This is perfectly true, but Dr. Buckley's natural habit of understatement has not, on this occasion, had the desired effect and has led Mr. Stonham into battle. The fact of the matter is, in my opinion, that there are two types of osteoarthritis, one of which might be called simply "osteoarthritis" and the other termed "traumatic osteoarthritis."

Simple osteoarthritis is, as Dr. Buckley says, a matter principally of age and stress. It is sometimes found initially in one joint, and is fully described in textbooks (Fletcher, 1947). It gradually spreads to involve other joints, or it may initially appear in several joints at the same time in the same way as it does in osteoarthritis of the spine, which, although it bears the same name, is not the same disease.

Traumatic or monarticular osteoarthritis is a different condition. It is uncommon, and in 500 cases of osteoarthritis was found only 60 times. So far as I know, it is confined to one joint for all time. I have a case of traumatic osteoarthritis of the left knee (due to a motor accident) which I first saw over nineteen years ago in 1931, and the condition is still confined to that one joint; the *x*-ray changes have gradually advanced over the years. Those unusual cases of traumatic osteoarthritis due to meniscectomy have this same characteristic, and may occur in patients of any age. The youngest case in my experience was operated on for a cartilage in 1943 and was then 23 years of age. I lost sight of the patient in 1946, but the condition was unaltered then, so far as clinical and radiological examination could tell.

Mr. Stonham's view that muscle spasm should call for a revision of the diagnosis is not, to me, understandable and is probably brought about by the fact that prostigmin sometimes relieves the muscle spasm in rheumatoid arthritis.

I think it should be mentioned here that the causation of simple osteoarthritis, although unknown, is closely linked with the incidence of obesity and hypertension. Obesity occurs eight times as commonly and hypertension four times as commonly in connexion with osteoarthritis as in an average cross-section of the sick population. It seems that obesity can only really have an effect through increased stress and strain, which amount to the infliction of multiple microtraumata; hypertension is nearly always associated with arteriosclerosis, and the joints are affected in this way. I certainly agree with Mr. Stonham that patients are justified in objecting to wearing callipers and Marsh knee cages.—I am, etc.,

London, W.1. ERNEST FLETCHER.

REFERENCE

Fletcher, Ernest (1947). *Medical Disorders of the Locomotor System.*

Medical Students in Prague

SIR,—As one of the participants in the second congress of the I.U.S. I feel that Mr. Diggory (*Journal*, September 30, p. 780) has been somewhat ungracious in his attitude to our Czech hosts. It is unjust to compare the *Hitlerjugend* with the Czech Youth, who suffered horribly under Nazi oppression for six years. These Czech youths extended to us, and to all other students regardless of nationality, creed, or race, a hospitality unrivalled in its warmth. Whatever may be the political inclinations of the student, it is always in the true spirit of British tolerance to listen and discuss with those who hold opposing views. From these discussions we all learned much, and made many friends among the students of 75 nations. For this reason alone the congress has been worth while.

Mr. Diggory has stressed the earnest desire of Czech students for peace. Would it not be a good thing that we British should show them that we are just as anxious in this pursuit, and may not this common desire for peace become a bond of friendship uniting us ?—I am, etc.,

London, W.C.1. A. HERDAN.

SIR,—As a participant at the I.U.S. Congress in August I was interested in the account of it by Mr. P. L. C. Diggory (*Journal*, September 30, p. 780). There are some factual inaccuracies in his article on which I wish to comment.

The health services in Czechoslovakia differ in several respects from those in this country, but not in the ways Mr. Diggory suggests. Thus the cost of the scheme is borne almost entirely by contributions, assessed in proportion to income from those within the scheme. It is unfortunate that Mr. Diggory did not quote his sources of information. The Czechoslovak National Insurance Act is available in an English translation (Orbis, Prague); it was submitted for consideration at the International Labour Organization (U.N.O.) conference at San Francisco (June, 1948), and the 1949 yearbook of I.L.O. compares the wider benefits of the scheme favourably with our own. Although self-employed persons are still excluded from the sickness insurance part of the scheme, and do not get entirely free treatment, their financial state does not influence the nature of treatment available.

It is hardly surprising that politics should enter into a discussion of the health service, especially if one considers the realms in which conspicuous progress can be readily observed in Czechoslovakia. What we in this country tend to regard as chronic problems in social medicine (notably tuberculosis) are being rapidly solved, new hospitals and health centres are being built, and group practices are encouraged. Compare this with Britain, where not one new sanatorium or health centre will be built in the coming year. I agree with most of Mr. Diggory's actual observations, none of which contradict this assertion, though I saw nothing to suggest that politics enters into medical treatment in the way he implied. I happened, uninvited, to visit two British students being treated as in-patients for a few days

in the Bulovka hospital; the medical and nursing treatment seemed fully comparable with that in this country; in none of the wards did I see any portraits of Stalin (though there was one of Masaryk).

I disagree with Mr. Diggory's allegation that the high living standards and increased educational amenities he describes were achieved at the expense of political discrimination. We saw that the proposals on such things as grants and fees, student sanatoria, wider university entrance and curriculum reform—which our own student organizations N.U.S. and B.M.S.A. have fruitlessly demanded for a number of years—have been achieved in Czechoslovakia, and I think the heavy Marxist trend we observed among students is a result of, rather than a pretext for, the achievements we saw.

The fact that Mr. Diggory omits from his article all reference to the medical faculty conference, which he attended as B.M.S.A. representative, and to the actual policy put forward by the leaders of our own N.U.S. (far less the very objective replies it provoked) leads me to conclude that he is making a purely emotional appeal instead of presenting the facts on the Congress discussions and work of the I.U.S. Throughout his article there is a constant misrepresentation of the feelings and behaviour of the majority of British students present. Thus the gift of £50 worth of medical supplies to the Korean students is referred to as penicillin from the Communist students present; but in fact nearly every British student contributed towards this gift as a token of genuine indignation over the needless destruction of schools and hospitals, of defenceless women and children, from the mass bombing of towns in both North and South Korea. There is little doubt of how the people of Asia regard this feature of the conflict; as a medical student I extend compassion to all who are needlessly giving their lives and blood in Korea.—I am, etc.,

London, W.C.1. S. A. HALL.

Jaundice and Para-aminosalicylic Acid

SIR,—In your issue of September 23 (p. 729) Dr. G. Hurrell reports the occurrence of jaundice in a young woman under treatment with P.A.S., and concludes that it was probably a toxic effect due to the drug. He presumably excluded infective hepatitis as a possible cause because the usual incubation period of that disease was exceeded by the duration of his patient's isolation in hospital—i.e., 35 days before the symptoms of jaundice first appeared.

In this connexion, however, I think it is relevant to refer to an epidemic of 50 cases of infective hepatitis (to be fully reported in due course) that occurred recently in an Oxford college. Here it was fortunately possible to ascertain the two consecutive days on which all the victims almost certainly became infected; and their incubation periods, determined in this way, varied between 24 and 43 days. It seems possible, therefore, that Dr. Hurrell's case was really one of infective hepatitis with a comparatively long incubation period, and that P.A.S. may be exonerated from being the cause of his patient's unpleasant intercurrent illness.

Incidentally, several of my cases also had albuminuria, which was usually slight; and one case during the pre-icteric stage produced an urticarial rash similar to, though not so severe as, the one Dr. Hurrell describes.—I am, etc.,

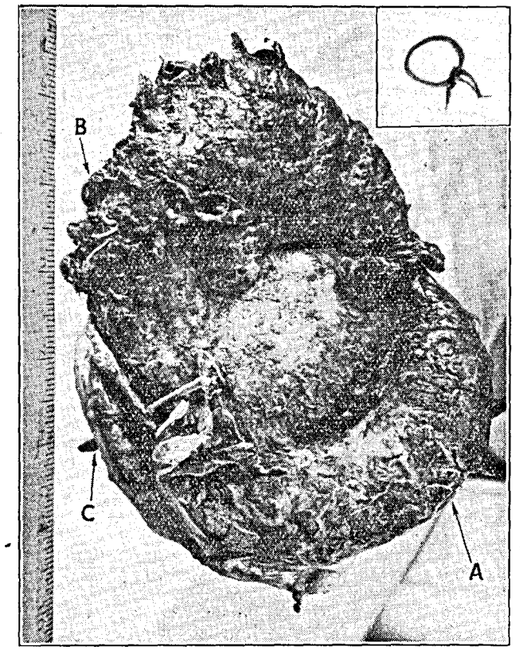
Oxford. G. A. BALLANCE.

Unabsorbable Sutures

SIR,—Mr. John Howkins (*Journal*, September 16, p. 659) reports a case of uterine sepsis from unabsorbable ligatures used during caesarean section. The following report of the persistence of suture material in the uterus for eight years may be of interest.

A woman, aged 39, was admitted on August 30, 1950, in the 36th week of her third pregnancy. Classical caesarean section was performed for ante-partum haemorrhage in July, 1942, and a lower-segment caesarean section (before the onset of labour) in February, 1945.

She was not in labour on admission, but was complaining of continuous abdominal pain. Foetal parts were easily palpable. A diagnosis of rupture of the uterus was made, and a laparotomy was performed. Both the foetus, in the intact bag of membranes, and the placenta were lying in the peritoneal cavity in front of the uterus, which had ruptured. The rupture had taken place along the whole length of the anterior wall down to the lower segment, and, after the escape of its contents, the uterus contracted, causing wide separation of the torn edges, as can be seen in the illustration. The foetus, which was stillborn, was removed and subtotal hysterectomy performed.



The uterus as it appeared immediately after removal, showing the marked separation of the torn edges. Strands of suture material are seen at A and B. The probe C is lying in the cervical canal. *Inset.*—A loop of the suture material removed from the uterine wall.

Inspection of the uterus showed several strands of suture material along the whole length of both the torn edges. An interesting feature is that the loops were intact, demonstrating that they had cut through the uterine tissues. It has not been possible to confirm the nature of this material, but it looks, however, like silkworm gut or nylon.

—I am, etc.,

Salford, Lancs. E. E. RAWLINGS.

Indications for Globin Insulin

SIR,—The interesting article by Dr. D. W. Pugh (*Journal*, September 16, p. 657) confirms the opinion that globin insulin is successful in mild cases and in older patients. Since the majority of diabetics are over 40 years of age (over 75%) and since about 65% of ambulant patients need 40 units of insulin or less, it is useful in a wide field where its main advantage over other insulins is its simplicity. Dr. Pugh, however, appears to imply that it is not suitable for patients who need more than 40 units of insulin. A high insulin dosage which is more common in, though not confined to, younger patients is, in my experience, not a contraindication to its use, and over 25% of those using G.I. under my supervision do take more than 40 units with success; some indeed have taken quite large doses (80–120 units) for many years.

The "failed globin syndrome" is that of a maladjusted balance between the carbohydrate intake and the absorption of insulin, which causes hypoglycaemia during one part of the 24 hours with diabetic symptoms at another; it is not confined to globin insulin and is typical of P.Z.I. when given alone in ordinary cases. Here there is "diabetes" after breakfast, which may last till mid-afternoon, while insulin reactions occur at night. In the case of globin it is due, I believe, to an idiosyncrasy of certain patients who absorb insulin unusually rapidly so that the insulin acts strongly in the morning and afternoon and has shot its bolt by the evening. Many of these quick absorbers do well on P.Z.I. alone, which brings the blood sugar to normal limits before the midday meal and maintains a steady balance for the rest of the 24 hours. It is always worth trying before reverting to the more complicated method of using a mixture or combination of P.Z.I. and S.I.

One more point: Dr. Pugh gives a dose of G.I. only two-thirds that of the former total dosage of other insulins; in my experience this is not enough, and may account for the greater incidence of the "failed globin syndrome" in his cases.—I am, etc.,

Hove, Sussex. G. M. Wauchope.

Gastric Ulcer and Vagotomy

Sir,—Mr. D. M. Morrissey's finding of two cases of gastric ulceration six months after vagotomy (*Journal*, September 16, p. 651) is interesting and important. However, there is no doubt that palpation of the stomach at the time of the vagotomy, particularly through a transthoracic transphrenic wound, is not a reliable means of excluding gastric ulceration. I see that these two occurred out of seventy-nine cases of vagotomy. Out of seventy-nine cases of partial gastrectomy for duodenal ulcer I would expect to find on carefully examining the specimens one or two stomachs with small gastric ulcers or scars. I believe, therefore, that these two ulcers may have been present as small quiescent impalpable ulcers at the time of vagotomy.

It is important to avoid vagotomy for gastric ulcer. A careful pre-operative gastroscopy is the best safeguard in suitable cases. At operation careful and close inspection of both anterior and posterior surfaces of the lesser curve of the whole stomach is an even better guide to the presence of a small ulcer or scar than palpation.

Despite the possibility that these ulcers may not have developed since the vagotomy, I would still strongly support Mr. Morrissey's contention that vagal section provides no protection against gastric ulceration developing.—I am, etc.,

London, S.W.12. Norman C. Tanner.

Foreign Body in the Rectum

Sir,—A male, aged 50, a sexual pervert, was admitted to hospital with a round-ended bottle, 2¼ in. (6.3 cm.) diameter, presenting above the deep anal sphincter. As in the case recorded in the *Journal* (September 16, p. 680), the bottle was impacted between the bones of the lower pelvis, and could not be moved in any direction.

A vertical incision was made through the sphincters, and extraction was effected without difficulty by short midwifery forceps. The sphincter was then repaired, and convalescence was uneventful.—I am, etc.,

Downpatrick, N. Ireland. J. C. Robb.

Sir,—The recent correspondence (*Journal*, September 30, p. 785) on this matter reminds me of an interesting case when I was a young house-surgeon in the out-patient department at the Royal Infirmary, Edinburgh.

A patient came to the department and on being asked his requirements announced that he had "glass in his bottom." A careful survey of that part of his anatomy revealed no wounds, cuts, or abrasions, and on being pressed for further information he announced that it was "inside." I made a rectal examination and found in the rectum a tumbler, inverted and apparently immovable. How to deal with this situation was outside the scope of my knowledge, and I called in my chief, the late Mr. J. W. Dowden, who under a general anaesthetic endeavoured to remove the tumbler by means of various types of forceps, the tips being protected by rubber tubing. He failed completely to move it. Eventually he had to excise the coccyx, and, having done this, was able with great difficulty to remove the tumbler. I remember that after the whole affair was over the patient was asked to explain how this somewhat unusual occurrence had come about. His reply, for what it was worth, was that he had "sat on it in mistake." The tumbler, I recollect, was one about 3 in. (7.6 cm.) in depth by 2½ in. (6.3 cm.) in diameter, and was a medium for advertising a popular brand of table waters.

I remember feeling some gratitude to the unfortunate patient because this occurrence, and one or two other similar cases very much "off the pattern," enabled me to collect a small surgical prize which my surgical knowledge in no way merited.—I am, etc.,

Carlisle. Kenneth Fraser.

Chlorinated Swimming-baths

Sir,—I agree with Dr. A. D. Symons (*Journal*, September 23, p. 728). In my area I instituted a hypochlorite plant and supplied the public baths and the schools with the hypochlorite fluid, and in addition it was available to the public as a disinfectant. During my period as M.O.H. and school medical officer no school was closed on account of epidemics of infectious diseases. I would point out that the dangers of public swimming-baths are more likely to arise from human pollution from all the orifices and spray infection.—I am, etc.,

Southport. S. T. Beggs.

Sir,—Unfortunately views are usually more colourful than facts and consequently get more publicity than they merit. Mr. R. Ogier Ward (*Journal*, September 9, p. 625; see also September 23, p. 728) thinks it is fair to say that to wash out the nose with water of a chlorinated swimming-pool is to invite disaster simply, it seems, because on the three or four occasions he has been swimming in chlorinated water it has given him nasal irritation. Since then, he says, "I have always believed that this is probably one important factor which encourages the spread of poliomyelitis." Of course anyone can believe the earth is flat or anything else, but contributors to scientific journals whose opinions are apt to be mistaken for truths by the lay press and public should surely give more substantial evidence in support of their beliefs than Mr. Ward has done.

In Gosport (population 59,380), where we have had a chlorinated swimming-pool for the past fifteen years, we have only had 18 cases of poliomyelitis during the same period. Perhaps this is just luck, but certainly lends no support to Mr. Ward's belief. It would be interesting and useful if the Ministry of Health would collect and collate the experience of other towns and cities in this respect and publish their findings. It is unwise to let unsubstantiated opinions go unchallenged, particularly when they tend to discredit what we believe are valuable public health precautions.—I am, etc.,

Gosport. G. W. Fleming, Medical Officer of Health.

Poliomyelitis: Age Incidence

Sir,—One of the most outstanding and puzzling features of the epidemiology of poliomyelitis is the gradual change in age incidence during the last twenty-five years from the first half-decade of life to school age and later. So striking and consistent has this age precession been in all countries that one can confidently predict that nearly half the cases of poliomyelitis in the present epidemic will be in adults. Dr. Simpson Smith's series (September 30, p. 786) showing 60% of cases in children under 6 would seem to be an exception.

There are, however, two factors which tend to lower the age distribution of poliomyelitis in local outbreaks, both of which are probably applicable to this series:

It has been observed many times during outbreaks of poliomyelitis that the age incidence varies with the concentration of populations. This is, of course, true of many other infective diseases, particularly measles, scarlet fever, and whooping-cough, cases being more concentrated in the younger ages in proportion as aggregation of population increases. It is probable that most of Dr. Simpson Smith's cases are drawn from industrial and overcrowded areas.

A change in the age distribution of cases has been noted during the course of practically all epidemics that have been sufficiently well investigated, the younger ages showing a relatively greater proportion of cases early in the epidemic, the older groups later. This series of cases all occurred before September 1, at which date notifications were probably at their peak.

The high proportion of cases in infants (6½%) in this series is most unusual, particularly as the majority of these cases appear to have had severe attacks.—I am, etc.,

Manchester. W. P. Sweetnam.

Chloralose as Antihistamine

Sir,—I have read with interest Professor J. H. Burn's article (September 23, p. 691). Professor Burn and his co-workers have proved experimentally that a number of drugs—e.g., local anaesthetics, analgesics, and spasmolytics—can exert an antihistamine action. These findings are analogous to my own experimental observations dating back to 1927–8. The aim of these investigations was to study the effect of chloralose on the histamine action on gastric secretion in dogs and on the isolated gut of guinea-pigs. Chloralose is a compound of chloral and glucose and has been widely used as a general anaesthetic in animal experiments and is also known to have a local anaesthetic action. In these experiments it was shown that the spasmodic effect of histamine on the excised gut of guinea-pigs in Ringer's solution could be suppressed by adding chloralose (1:1,000). These experiments were extended to investigate the influence of chloralose on the anaphylactic reaction of the isolated gut of guinea-pigs previously sensitized to horse serum. No anaphylactic response of the excised gut could be obtained in chloralose Ringer's solution. However, after repeated rinsing in Ringer's solution the same piece of gut reacted strongly to renewed addition of 0.5 ml. of horse serum. The antagonistic action of chloralose was confined to histamine and to the anaphylactic reaction. The spasmodic effect of pituitrin and acetylcholine on the isolated gut could not be appreciably suppressed by chloralose.

Since so far none of the known antihistamines is capable of counteracting the gastric secretagogue action of histamine, my above-mentioned experiments on dogs may be of interest. In two dogs with gastric pouch (Pavlov) and in one dog with a permanent gastric fistula, 1.5 g. chloralose in 60 ml. of water was given by stomach tube. Thirty-five minutes later 1 mg. histamine was injected subcutaneously. The experiments revealed the uniform result that histamine gastric secretion can be almost completely suppressed by chloralose. When chloralose was administered by rectum, only the volume of histamine gastric secretion was reduced, but free acid concentration and total acidity were not appreciably influenced. Again the antagonistic action of chloralose was confined to histamine, for neither gastric secretion produced by 200 ml. of 5% alcohol nor the action of pilocarpine on the salivary glands was influenced by chloralose.

From these experiments I concluded that chloralose is a potent antagonist to histamine and is therefore, so far as could be ascertained, the first "antihistamine" described in the literature.—I am, etc.,

London, W.1. A. Elkeles.

References

Elkeles, A. *Arch. VerdauKr.*, 1927, **40**, 380.
——— *Z. ImmunForsch.*, 1928, **54**, 471.

Radiology and the Diagnosis of Miliary Tuberculosis

Sir,—I am concerned about the informative article (September 23, p. 702) by Drs. J. L. Emery and J. Lorber. I was amazed to note that out of the 52 cases of miliary tuberculosis, with the diagnosis established at necropsy, only 18 of these showed any radiological evidence. The editorial comment, "It is clear that *x*-ray examination cannot be relied upon for the early diagnosis of miliary tuberculosis," is very disturbing to those of us who in the past have implicitly relied on the radiological diagnosis of this disease.

Frequently, and I feel other observers will agree, these closely packed pin-point foci do not show on the radiograph on account of certain technical *x*-ray factors which are difficult to control. It requires only the very minimum of respiratory movement on the part of the child to blot out the foci completely and show clear and normal lung fields. On many occasions I have found a normal chest in these cases, where an immediate repeat of one or more radiographs with attention to minimal respiratory or other movements have shown the foci clearly. This is a snag which should be brought to the notice of all workers in this field. It is of equal importance that the radiograph should be of the best technical quality, preferably taken with a fine focus, rotating anode tube, and the appropriate kilovoltage and distance. We must be prepared to accept these percentage figures and the skilled interpretation of the radiographs by Dr. Grout, but I should feel more at ease if evidence was forthcoming that such precautions were taken before this method of diagnosis tends to fall into disrepute.—I am, etc.,

Hull. J. E. Bannen.

Protection of Laboratory Animals

Sir,—I have read with great interest the article by your special correspondent (September 23, p. 724) on Major C. W. Hume's document. Surely the Minister would have power to choose for his board of control persons who would represent with equal fairness the claims of science and the humane treatment of animals.

Is not a more comprehensive Act called for after a lapse of so many years? The numbers of medical students have increased greatly, and is it not advisable to remind all members of the medical profession that there are ethics to be observed towards animals as well as towards each other?—I am, etc.,

Low Fell, Co. Durham. May Raw.

Hydrops Foetalis and Rhesus Incompatibility

Sir,—The interesting letter of Dr. R. T. D. Franklin and his colleagues (September 16, p. 680) describes a case of foetal hydrops due to erythroblastosis foetalis which had been produced by incompatibility of the ABO blood groups. Certain features of this case deserve comment since they are at variance with those usually encountered in haemolytic disease due to the rhesus factor.

In the first place the patient was a primigravida, and gave no history of previous transfusion or injection of blood. Secondly, the autopsy report made no mention of splenic abnormality or enlargement; in fact, apart from the liver all the organs appeared to be normal. Thirdly, the degree of tissue oedema was such that a 26-weeks foetus was distended to a size equivalent to that of a full-term infant, the scalp floated on the skull, and the ascites was so marked that the abdomen had to be punctured before the child could be delivered. All these factors are unusual in hydrops due to the rhesus factor.

In my own limited experience, I have twice encountered dystocia due to the size of a hydroptic baby, and in both these cases there was no rhesus incompatibility. On the first occasion I was called to a confinement where the child's head had been delivered with forceps and the shoulders could not be extracted. I found a tense foetal ascites as the cause of the obstruction, and after puncture of the abdomen across the diaphragm an oedematous foetus was delivered. There was no autopsy. The mother, who had had one previous abortion, was found to be blood group A, rhesus positive, with no agglutinins, and W.R. negative. She has subsequently had a normal confinement of a healthy baby. On the other occasion the patient had been booked for her second confinement in hospital on account of hydramnios. A large infant became impacted in the pelvis as an extended breech and embryotomy was necessary before it could be extracted. There was gross oedema, the scalp floated on the cranium, the serous cavities were all distended with effusions, and the placenta was large and pale. The mother was W.R. negative, group O, rhesus negative, without demonstrable antibodies, and the foetus and also the father were rhesus negative.

There is little available information about those cases of hydrops foetalis in which rhesus incompatibility is not to blame, but Potter (1943) has given an excellent clinical description without throwing any light on the aetiology. She records 17 cases of hydrops without erythroblastosis and without splenic enlargement; six of the mothers were primiparas, and six

subsequent pregnancies produced seven normal babies. The blood groups of the parents are not recorded in these cases, but it is unlikely that serological tests were made in an effort to incriminate ABO incompatibility.

Two interesting speculations emerge. Has Dr. Franklin discovered the cause of a significant number of the unexplained cases of foetal hydrops; and is the gloomy prognosis for his patient entirely justified on the evidence?—I am, etc.,

Birmingham. W. G. Mills.

Reference

Potter, E. L., *Amer. J. Obstet. Gynec.*, 1943, **46**, 130.

Should Pregnant Women receive Streptomycin?

Sir,—I read with interest Dr. P. N. Swift's account (*Journal*, September 30, p. 787) of the successful delivery of a live baby to a woman under treatment for tuberculous meningitis. He states that the progress of the infant has been very satisfactory. However, it is too early to be confident that there will be no latent toxic effects from streptomycin. The effects on the vestibular apparatus after large doses of streptomycin are likely to be permanent, and it is obviously impossible to assess these satisfactorily in an infant until at least the stage of walking is reached. In this case the concentration of streptomycin in the placental cord blood was as high as that of the mother, so it would be reasonable to expect considerable toxic effects on the vestibular apparatus of the infant.

This raises the question of the advisability of treating pregnant women with streptomycin. In tuberculous meningitis death would otherwise ensue, so there is definite justification; however, in pulmonary tuberculosis, where there may be alternative methods of treatment, judgment of the advisability of streptomycin therapy should be withheld until it is certain that there will be no delayed toxic effects on the child.—I am, etc.,

Manchester. M. J. Greenberg.

POINTS FROM LETTERS

The Common Cold

Dr. E. Wrigley Braithwaite (Leeds) writes: In 1943 (*Journal*, **2**, 433) you published a letter from me in which I made a number of statements about the pathology of the common cold. . . . It only develops when the individual is in a particular emotional state, which can be clearly defined during the course of psycho-analytic treatment. Cold and wet do not cause a common cold. Cold "proneness" disappears completely as a result of successful psychological treatment. The specific factor is psychological; the microbic secondary. I am glad to see that the Common Cold Research Unit has proved by experiment on a large scale that cold and wet do not cause colds. . . . Last year you reported a speaker at the International Congress of Otolaryngology as saying, "The occurrence of the honeymoon cold, that following a domestic row, and that occurring before or during an examination are well known." He gave it as his view that the best prophylactic against the common cold is a state of emotional balance. In your issue of September 16 (p. 662) the reviewer of a book by Dr. T. H. Holmes under the title "The Sensitive Nose" regarded the evidence that emotional states affect the nasal mucous membrane (and the gastric) as beyond dispute.

Treatment of Sea-sickness

Dr. J. H. D. Webster (London, W.1) writes: In the *Aquitania* in the spring of 1926 leaving New York it was quite rough for a few days, and, though sceptical of all remedies then used, I was able to see the most striking effects of the ship surgeon's remedy, which he found cured or prevented sickness in about 99% of all cases. . . . Dr. B. S. Jones's and Dr. Marmaduke Fawkes's letters on the subject, with acidosis as the cause and alkalis as the remedy, are to be found in the *Journal* (1925) **1**, 139, 240. No remedies can be simpler or cheaper. In many North Sea crossings I have found 20 gr. of sodium bicarbonate and 10 gr. of sodium citrate taken before the boat sails, and hourly or two-hourly for two or three times, and on the second day, say, thrice (unless it is very rough), are sufficient to give a comfortable crossing, taking all meals. . . . On a recent trip back from Paris a passenger in the same compartment was quite incapacitated and in a daze, unable to take food, and we found his wife had "doped" him in view of what she thought would be a four hours' crossing from Calais to Dover. They were non-Europeans on a first visit to England. It seems a pity that nervous theories of sickness should now almost obliterate a proved chemical theory, with a simple and almost invariably effective remedy,

Obituary

Sir ERNEST GRAHAM-LITTLE, M.D., F.R.C.P.

Sir Alexander Fleming writes: By the death of Sir Ernest Graham-Little we have lost a great citizen. For 50 years he was in the forefront of dermatology, and there must be very many students of St. Mary's Hospital, like myself, who have blessed him for his straightforward and sensible teaching of skin diseases. In his own field he had few equals in the healing art. But that was only one of his many activities which have been detailed in the obituary notices (*Journal*, October 14). Here I would like to pay tribute to his kindliness. The student or the recently qualified man never went to him in vain for help and advice, and his wide range of interests made his counsel worth while. Everyone who was intimately associated with him will sorrow at his passing. He was a great character, a likeable character, and one who would go to great lengths to uphold what he considered to be right.

Sir JOHN McINTYRE, K.B.E., C.B., M.C., M.B.

Air Vice-Marshal Sir John McIntyre, who was Director of Medical Services, R.A.F., from 1930 to 1935, died in Tunbridge Wells on October 7, aged 70 years.

McIntyre came of Northumbrian stock, his father being in the shipping business in Newcastle. He was educated at Clifton College, and studied medicine at Cambridge University, where he won the Vintner Exhibition to King's College, and St. Mary's Hospital. He graduated B.Ch. in 1906 and M.B. in 1908. After holding a number of resident appointments at St. Mary's Hospital he went into general practice for some years. He joined the R.A.M.C. in 1915 and was awarded the M.C. a year afterwards while on active service. He transferred to the Royal Air Force when it was formed in 1918 and took a permanent commission in 1919. He devoted the rest of his professional career to the new Service.

We are indebted to Sir David Munro, K.C.B., for the following appreciation: John McIntyre became Director of Medical Services, R.A.F., in 1930 (the title is now Director-General of R.A.F. Medical Services). At the time when he came into office the Air Force Medical Service was still in a formative stage. A false move in the relations already established between two older—centuries older—medical services of the Navy and Army, or, even more important, between the leaders of the medical profession, might have meant a loss of ground patiently won by his two predecessors—in particular by Lieutenant-General Sir Matthew Fell. A failure to co-operate successfully with the rank and file of the R.A.F., especially the high-ranking officers in the Air Ministry and the senior Civil Servants, would have had the same effect. John McIntyre made no such false move: the progress of the infant service remained steady under his direction. Before the 1914–18 war McIntyre had been a general practitioner in Croydon, and a very successful one. He was unlikely, therefore, in his administration to be influenced by customs or traditions handed down from the two older Services. Nor was he. His outlook remained fresh, and he was a born administrator. To common sense he added knowledge, a level head, and an even temperament. If anything, he was too coldly logical. Seldom, I imagine, was he ever bested in verbal or written argument, for he was a careful listener, and, having once grasped the essentials of a problem, his judgment was seldom at fault. Had he

chosen to study law rather than medicine, and had he been able to overcome his natural North-country reserve, he might, I believe, have made a notable career at the Bar. If these remarks seem to present John McIntyre as slightly inhuman, the reverse is the truth. He was a staunch friend, and one of the best and most amusing of hosts—until his wife died. They had no children, and after a long and happy married life he was left a lonely man just about the time when he had reached another unhappy landmark, retiring age.

S. ROODHOUSE GLOYNE, M.D.

Dr. Cecilia Shiskin writes: I should like to add to what has already been published (October 7, p. 841) my tribute to the memory of the late Dr. Stephen Roodhouse Gloyne, whose passing has saddened all who were privileged to know him. I had the good fortune to work in his department at the London Chest Hospital for a number of years. He was not only the expert pathologist who taught and guided his staff, but he also stimulated them in their work. He radiated a warmth and friendliness that made working with him a real pleasure. He took a fatherly interest in each one of us and our personal affairs, so that we felt we were members of one happy family. His kindliness embraced all connected with the hospital—the nurses, the domestic staff, and the patients. When the hospital was bombed in 1941 Dr. Gloyne transported some of the patients to their homes in his own car and saw that they were comfortably placed. He maintained contacts with many former residents of the hospital who came from the Dominions. All sought his guidance and appreciated his advice. The morning-coffee interval afforded a pleasant break, during which Dr. Gloyne would expatiate expertly on a wide range of subjects—music, archaeology, history, and even the culinary art. He enriched the lives of those who were privileged to be associated with him. Our heartfelt sympathy goes out to his widow, his daughter, and his son and family.

Dr. Francis Kenneth Kerr, who was in general practice in Leith for 46 years, died in Edinburgh on August 15 in his 73rd year. He was educated at Daniel Stewart's College, and he spent two years in a merchant's office before taking up the study of medicine at Edinburgh University. He graduated M.B., Ch.B. in 1900. His enterprising and adventurous nature was exemplified by his volunteering for service in the South African War as a civil surgeon. For his services in that campaign he received the Queen's Medal with four bars. On returning to civilian life he practised in Cumberland for two years and then moved to Leith in 1904. He was appointed clinical assistant in the *x*-ray department of the Edinburgh Royal Infirmary, and later he took charge of the *x*-ray and electrical department of the Leith Hospital for seven years. In the first world war he served with great distinction in France—where he was awarded the M.C. for conspicuous gallantry in "steadying troops under heavy and accurate hostile fire"—Gallipoli and Salonika. In 1919 he was made consulting physician to troops in Turkey and in the Army of the Black Sea. He attained the rank of lieutenant-colonel and was elected an esquire of the Order of St. John of Jerusalem for his work in the Near East. He resumed practice in Leith after he was demobilized, and in the course of time held many local medical appointments, including membership of the board of management of the Leith Hospital, in the work of which he took an active and lifelong interest. He was a keen member of the British Medical Association and took a leading part in the activities of the local division, both in connexion with the introduction of the National Health Insurance Act and the National Health Service Act. In spite of an inherently modest disposition he was an incisive speaker, with a definite gift of getting down to essentials. Many members of the Edinburgh and South-east of Scotland Branch of the B.M.A. have happy memories of the day when, as president of the Branch, he entertained the members to an excursion to the Island of Inchcolm in the Firth of Forth. He was a representative of the City of Edinburgh Division at a number of Annual Meetings, and a member of the Insurance Acts Committee for some years. He was also a member of the Edinburgh Insurance Committee and of the Panel Committee. He found relaxation from his professional work in amateur acting, football, and swimming. As a practitioner his conscientiousness, ability, and kindness endeared him to his patients, and their sympathy, with those of his colleagues and friends in Edinburgh, will be extended to his widow.—R. W. C.

Dr. Arthur Williamson Brodribb, for many years physician to the Royal East Sussex Hospital, died at St. Leonards-on-Sea on September 16 at the age of 71. He studied medicine at Oxford and St. Bartholomew's Hospital, and graduated M.B., B.Chir. in 1905. He joined his father in general practice in Hastings a year later, and remained in this practice all his life, except for a time in the first world war when he was a captain in the R.A.M.C. Arthur Brodribb came of a line of doctors, traceable from about 1800 (and still continuing in his eldest son). He was held in high esteem by his colleagues, and was for 38 years physician to the Royal East Sussex Hospital, being a senior member of the staff for much of this time. He took an active part in the affairs of the town, having been at one time a town councillor and later a J.P. It might be suspected that this was due to pressure from without rather than love of office, since he disliked publicity. His hobbies were gardening and carpentry; and in his active days he was a keen footballer and golfer, being chairman of local clubs in both these branches of sport. It was, however, as a family doctor that Brodribb was supreme, and here he had a touch all his own. He did not appear ambitious to amass a very large practice, but to his patients he gave all that he had of skill, care, and friendship, and they repaid him with their devotion. Thus was established a bond which made him, in their eyes, irreplaceable. He had a quiet voice and courtly bearing—the right sort of bedside manner. The last war came at a time when he might otherwise have thought of easing off: instead, his work was much increased, in conditions which were difficult and often dangerous. The National Health Service also was most uncongenial to one cast in his mould, and after a brief trial he withdrew from it. So he was latterly a tired man; but those who knew him at his best saw something which is not taught in the schools and is now seldom found anywhere.—C. M. C.

Dr. Andrew Edgar Struthers, of Paisley, died suddenly on September 16 while on holiday in Arran. It was known to all his colleagues that, since a coronary thrombosis fifteen years ago, he was sensibly and realistically carrying on his daily round and a full and active public life with characteristic fortitude and good humour. Struthers graduated M.B., Ch.B. at Glasgow University in 1910, and started practice in Paisley in 1919 after service in the Navy in the first world war. Before that war he had a short but intensive experience of practice in Coatbridge. Throughout all his years in Paisley he was associated with the Royal Alexandra Infirmary, and he applied his scientific and well-ordered mind diligently and earnestly to his work as physician there. In the public life of the town he was an enthusiastic member of the learned societies and was a past president of the Paisley Burns Club. He was much in demand as an after-dinner speaker, and his original and independent habit of thought made him a most entertaining and provocative raconteur. He was from 1922–45 secretary of the Renfrewshire and Buteshire Division of the B.M.A. He was also a representative on the Scottish Committee. He held many public appointments, including that of honorary secretary of the local medical committee, and he was the area medical officer under the Factory Acts. His pleasing nature and cultivated mind endeared him to a large and appreciative number of patients. Paisley has lost a sound physician and an independent and outstanding personality. His wife predeceased him a few years ago. Sincere sympathy is extended to his only daughter.—J. W. H.

Dr. DANIEL CHARLES EDINGTON died at his home in Penrith on September 23. He was born in 1865, and received his education at the Edinburgh Royal Academy. He commenced his career as a chemist at the Edinburgh Royal Infirmary, but later he decided to study medicine and graduated M.B., C.M. in 1892, proceeding M.D. in 1901. After holding posts at the Royal Infirmary, including that of assistant to the professor of clinical medicine, he was for a short time in practice in Bridge of Allan and also Clackmannanshire before moving to Penrith in 1895, where he continued in active practice till his retirement in 1945. In his earlier years he was a man of catholic tastes and wide interests in sport, music, the theatre, and masonry. He was immersed in medical politics from the days of the heated controversy in the profession over the first National Health Insurance Act, and his level-headedness and clear vision helped to smooth over some of the local difficulties which occurred throughout Cumberland at that time. During the 1914–18 war, despite the departure of his partner to war service, he took on the additional work of medical officer to the Red Cross hospitals in Penrith with enthusiasm and zest. In recognition of his services he was made a life member of the B.R.C.S. His wise counsel was greatly appreciated by his colleagues in this area, and he was for many years chairman of the Cumberland Panel Committee and a member of the Cumberland Insurance Committee. A keen member of the B.M.A. from the outset of his career, he was president of the Border Counties Branch in 1922–3, chairman of the English Division in 1926–7, and chairman of the Cumberland Division in 1938–9. He will be remembered, however, for his fine clinical skill, an eager, receptive mind, a kindly heart, a fund of common sense, and a clear appreciation of his patient as a personality. He will long be mourned by a multitude of Cumbrians, to whom for over 50 years he rendered service tinged with humanity, and by his widow and two sons, to whom we render our sympathy.—J. S.

Dr. WILLIAM LOWSON, who practised in Tamworth for over forty years, died on September 27 at Tamworth aged 78 years. Lowson studied medicine at University College, Dundee, and University College, London, graduating M.B., Ch.B. (St. Andrews) in 1902. After holding a number of resident hospital appointments he came to Tamworth in 1909 as partner to the late Dr. Fausset. He was largely responsible for the formation in 1911 of the public medical service for Tamworth, and acted as its secretary and treasurer until 1947. For many years he was medical officer of health to the Tamworth Rural District Council and the medical superintendent of the Tamworth Isolation Hospital. He was also police surgeon and, during the last war, medical superintendent of Tamworth Infirmary. He was a member of the panel committees for both Staffordshire and Warwickshire, and served on the general and house committees of the Tamworth Hospital until the introduction of the Health Service in 1948. Lowson joined the B.M.A. in 1904, and represented the Nuneaton and Tamworth Division at the Annual Representative meetings for most years from 1923 until 1939. He was chairman of the Division for the 1925–6 session. A keen golfer, he was the captain of the Tamworth Golf Club, and was subsequently elected its president. The sympathy of all who knew Dr. Lowson goes to his widow in her bereavement.—D. S. P.

P. A. V. B. writes: The passing of William Lowson has brought a great sense of loss to his medical and lay friends. He had gained a reputation for his competence, integrity, and his dislike of the sham and meretricious. To those who did not know him well his austere manner was often awe-inspiring, but to those of us who were privileged to be his colleagues that manner was only a very thin disguise worn by a somewhat shy man who possessed a large store of human kindliness and a great sense of quiet humour. He was a staunch friend, and his advice, born of sound common sense, allied to a clear head and keen vision—whether given privately or at a conference—was always proved by time to be right. These qualities endeared him to his patients, and there are many who will mourn him.

Dr. Harold Balme writes: Absence from England during the past month has prevented me from hearing sooner of the death of my friend and former colleague, Edward Gillespie, but I would like to add my tribute to the fine appreciation by Dr. Hadfield which appeared in the *Journal* (September 16, p. 684). At the outbreak of the last war it fell to my lot to become medical superintendent of the Haymeads E.M.S. Hospital at Bishop's Stortford, the medical and surgical staff of which was largely drawn from the Prince of Wales Hospital, Tottenham. The buildings had previously been used as a poor law institution, and the task of converting it into an acute general hospital, capable of receiving all types of medical and surgical cases and of providing teaching facilities for the keen staff of young residents transferred from the London Hospital, demanded detailed preparation, careful organization, and expert hospital practice. In all these matters Gillespie made a notable contribution. His rugged individualism, independence of thought and expression, and fine surgical judgment and technique made an impression on every member of the staff, and I, personally, can never forget the splendid loyalty and wise counsel which I always received from him during those early, difficult years of the war. It was thanks to his influence and that of his confrères that the Haymeads medical staff became welded together into so happy and united a group, and it is a melancholy fact that already three of the most outstanding of them—Burton Wood, Robert Klaber, and Edward Gillespie—have now passed over to the great majority.

Medico-Legal

CLAIMS AGAINST HOSPITALS: A DIFFERENCE OF LAW

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Three recent actions against hospitals illustrate the difference between the Scots and the English law in regard to the liability of a hospital. In the first of these[1] a girl of 5 was having her tonsils removed at the Glasgow Victoria Infirmary, and by some mishap sustained a burn of the cheek which left a disfiguring scar. The cause alleged by the father[1] was a hot gag. The board of management pleaded that they had provided a proper, sufficient, and adequately trained staff, and that under the Public Health (Scotland) Act, 1897, they were not liable for any irregularity committed by their officers in the execution of that Act. Lord Strachan, dismissing the action as irrelevant, held that the board was not liable for the actions of a nurse in her professional capacity, and that the National Health Service (Scotland) Act had made no difference in the common law.

In the second case,[2] also in Scotland, a father claimed damages for injuries to a newborn infant whose feet and legs, it was alleged, had been badly burnt in front of an open fire by the negligence of a nurse at the Henderson Memorial Nursing Home, Wick. The board maintained that the nurse had performed her duties competently, and also that it had acted in the bona-fide execution of its duties under the National Health Service (Scotland) Act. Lord Strachan held on the facts of this case also that the board was exempt from liability for any negligence of its own.

In the third case,[3] an English one heard at Leeds Assizes, a girl of 12, a promising pianist, was treated by radium for a birthmark on her right arm and developed a contracture during the after-treatment, so that her forearm was grossly and permanently disfigured. Mr. Justice Croom-Johnson dismissed the action against the radiologist, Dr. Frank Ellis, but was satisfied that the house-surgeon had been negligent, and held that the Ministry of Health was liable as that officer's principal. He awarded £5,000 damages to the girl and £51 4s. special damages to her father.

The reason for the divergence between Scots and English law is that the liability of hospital authorities is based on the common law and not on statute. Both the Scottish and the English National Health Service Acts provide that the regional boards shall be liable in cases in which hospital governors would have been liable before, and that liability has been transferred to the Minister in England and the Secretary of State for Scotland by the Crown Proceedings Act, 1947. But neither Act has altered the common law as to the liability of the responsible authority. The divergence dates from certain *obiter dicta* in Hillyer's case[4] in England in 1904 to the effect that hospital governors were not liable for the negligence of their staff in matters of professional skill. These *dicta* were in England taken to state the law correctly until the decision of the Court of Appeal in the Essex radiographer case.[5] In that case it was held that hospital governors were liable for the negligence of medical auxiliaries and probably for that of medically qualified employees also. This has been confirmed by later English decisions. However, as Scottish judges have been at pains to emphasize, the development of the English common law does not bind the Scottish courts, which have continued to follow Hillyer's case ever since.

[1] *Scotsman*, May 5, June 10, 1950.
[2] Ibid., June 16, 1950.
[3] *Yorkshire Post*, July 5, 1950.
[4] *Hillyer* v. *Governors of St. Bartholomew's Hospital*, 1904, 2 K.B. 602.
[5] *Gold* v. *Essex County Council*, 1942, 2 K.B. 293.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Horace Basil Barlow, M.B., B.Chir., has been elected to a Research Fellowship at Trinity College for research in physiology.

UNIVERSITY OF DURHAM

At a Congregation held on September 30 the Diploma in Public Health was granted to W. B. A. Smyth.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—*Part I*: E. D. Falla, M. N. Harrison, F. B. Hartley, H. Holden, J. Hosker, G. Ingram, E. M. Jackson-Moore, D. E. Phillips, W. A. Weston.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow held on October 2, with the President, Dr. W. R. Snodgrass, in the chair, the following were admitted Fellows of Faculty *qua* Physician: J. D. H. Bankier, A. Meiklejohn, M. Mousiquddin.

A new 16-mm. sound film entitled "Oxygen Therapy" has been produced for medical, nursing, and other professional audiences by Kinocrat Films Ltd. for Oxygenaire Ltd. The film runs for 35 minutes and is in two parts. Part I covers the history of the clinical use of oxygen, depicts the physiological aspects of oxygen in the lungs, blood stream, and blood plasma, and explains the symptoms and classifies the main types of anoxia. Part II demonstrates the techniques of oxygen administration by face-masks, oxygen tents, etc., to infants, children, and adults, and shows in detail the construction of the latest forms of oxygen therapy equipment. Other essential factors in oxygen therapy, such as various fire precautions to take, are also included in this section. Many sequences were filmed at the Westminster and Queen Charlotte's Hospitals and the Hospital for Sick Children, Great Ormond Street, with the assistance of the medical staff. Arrangements for borrowing the film can be made by communicating with Oxygenaire (London), Ltd., 8, Duke Street, Wigmore Street, London, W.1.

No. '39

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 30.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	25	—	17	1	—	25	3	14	1	—
Deaths		—	1				1	—		
Diphtheria	50	4	16	2	3	76	8	21	2	7
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	187	8	127	1	2	163	24	68	1	6
Deaths		—			—				—	—
Encephalitis, acute	8	1	—		—	1	—	—	—	—
Deaths		—		1			1			
Erysipelas			23	8	2			22	3	2
Deaths							—			
Infective enteritis or diarrhoea under 2 years				22	14				120	
Deaths	5		8	—	2	34	3	8	7	6
Measles*	2,963	217	146	43	43	780	40	27	51	45
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	44	7	8		—	39	5	6	—	—
Deaths										
Paratyphoid fever	11	2	—	1 (B)	1	24	1	1 (A), 10 (B)	3 (B)	1 (B)
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	281	13	7		1	313	16	1	3	2
Deaths (from influenza)‡	6	—	2	—	—	4	—	—	—	1
Pneumonia, primary	120	13	126	¶	8	94	15	139	15	7
Deaths			4						5	
Poliomyelitis, acute	331	16	56	5	10	357	44	7	—	1
Deaths§	17	—		—		23	4			
Puerperal fever			4		—		—	8		
Deaths										
Puerperal pyrexia‖	88	7	8		—	104	8	7	—	5
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	937	47	209	40	54	1,305	112	204	96	104
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—			—	—	—
Typhoid fever	7	1	1	1	—	12	4	1	2	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	2,616	225	201	69	29	956	43	52	66	65
Deaths	2	—	1	1	—	2	—	1	1	2
Deaths (0–1 year)	218	30	42	14	5	230	27	41	27	16
Deaths (excluding stillbirths)	4,282	680	589	160	114	3,972	602	524	166	107
Annual death rate (per 1,000 persons living)			11·8					10·5	10·3	
Live births	7,414	1205	876	446	213	7,738	1213	899	347	236
Annual rate per 1,000 persons living			17·6					18·0	21·5	
Stillbirths	180	25	23			184	25	20		
Rate per 1,000 total births (including stillborn)			26					22		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending October 7 were: paralytic, 241 (222); non-paralytic, 112 (109); total, 353 (331). The figures for the previous week are in parentheses.

Total uncorrected notifications for 1950 up to and including the week under review were 6,704. The corresponding figures for 1947, 1948, and 1949 were 7,094, 1,735, and 4,015 respectively.

The chief increases compared with the preceding week were in Devon 6, Gloucester 10, and Stafford 11. Decreases were generally distributed in small numbers. Non-paralytic cases in the week under review formed 23.5% of the total.

Compared with the week before, there was an increase in total notifications of 22—all except 3 of the paralytic type. This small rise in incidence is disappointing in view of the decreases in previous weeks, but there is reason to expect that the incidence will decline normally in the weeks to come to the lower levels of winter.

Discussion of Table

In *England and Wales* there were increases in the number of notifications of measles 290, scarlet fever 166; decreases were recorded for whooping-cough 319 and acute poliomyelitis 88.

A small rise in the incidence of scarlet fever occurred in all regions of the country. The largest rises in the number of notifications of measles were Lancashire 54 and Derbyshire 49. The notifications of diphtheria were 12 more than in the preceding week, the largest rises being Yorkshire West Riding 7, Durham 6, and Warwickshire 4. The largest falls in the incidence of whooping-cough were: Essex 74, Surrey 47, Yorkshire West Riding 39, and Gloucestershire 36.

A rise of 17 was recorded in the number of notifications of dysentery. The chief centres of infection were: Lancashire 61 (Bury C.B. 15); Leicestershire 25 (Leicester C.B. 25); Yorkshire West Riding 21; Surrey 13 (Surbiton M.B. 12).

The largest returns for acute poliomyelitis were: Lancashire 30 (Liverpool C.B. 10, Manchester C.B. 9); Yorkshire West Riding 29 (Leeds C.B. 6, Sheffield C.B. 6); Gloucestershire 21 (Bristol C.B. 18); Kent 17; London 16; Lincolnshire 16; Warwickshire 15 (Birmingham C.B. 13); Devonshire 13; Durham 12; Staffordshire 11 (Wolverhampton C.B. 5); Middlesex 10.

In *Scotland* the chief variations in the trends of infectious diseases were increases of scarlet fever 75 and measles 49. The rise in the incidence of scarlet fever occurred mainly in the western area, where the notifications were 60 more than in the preceding week, and an increase of 27 was reported from Glasgow. The largest number of notifications of dysentery were those from the cities of Glasgow 61, Dumfries 22, Edinburgh 11, and from Stirling county 11. The largest returns of acute poliomyelitis were: Glasgow 10, Dundee 6, Fife county 5, and Ayr county 4.

In *Eire* there was a decrease of 13 in the number of notifications of scarlet fever. A decrease of 14 occurred in the number of notifications of whooping-cough in Dublin C.B., but a slight rise occurred in the remainder of the country.

In *Northern Ireland* the chief feature of the returns was a rise of 12 in the notifications of whooping-cough. The largest returns of acute poliomyelitis were Armagh county 3, Antrim county 2, and Down county 2.

Quarterly Returns for England and Wales

The birth rate for the second quarter of this year was 16.7 per 1,000 total population; this was 2.1 below the average rate for the five preceding second quarters. The infant mortality rate, 28 per 1,000 live births, and the stillbirth rate, 22.5 per 1,000 total live and stillbirths, were the lowest rates ever recorded for a June quarter. The general death rate was 11.1 per 1,000, being 0.1 above the rate for the corresponding quarter of last year and 0.5 above the average for the second quarters of 1944–8. There were 71 deaths attributed to acute poliomyelitis. People married numbered 161,082. This number was 38,084 below the average of the second quarters of the five preceding years.

Week Ending October 7

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,064, whooping-cough 2,445, diphtheria 40, measles 3,914, acute pneumonia 351, acute poliomyelitis 353, dysentery 187, paratyphoid fever 11, and typhoid fever 10.

Medical News

Visitor to Copenhagen

Dr. W. W. Mushin, of the Department of Anaesthetics, Welsh National School of Medicine, is soon to visit Copenhagen for three weeks to take charge of the anaesthesiology centre there. The invitation comes from the World Health Organization. There are about 20 W.H.O. Fellows from various European countries attending the centre. Until now the centre has been in the charge of anaesthetists from the U.S.A.

Honorary Medal

At a meeting of the council of the Royal College of Surgeons on October 12, with Sir Cecil Wakeley, president, in the chair, the Honorary Medal of the College was presented to Lord Webb-Johnson "in recognition of his many generous acts and continued labours in the interest of the College during his eight years of presidency."

Chelsea Clinical Society

The first ordinary meeting of the fifty-fourth session was held on October 10 at the South Kensington Hotel, with the new president, Mr. Geoffrey Parker, in the chair. There was a discussion on "Plastic Surgery and the Arts," which was opened by Mr. Henry Blake, F.R.C.S., followed by Mr. Adrian Hill, R.O.I.

Register of Speech Therapists

The names, addresses, and qualifications of speech therapists are listed in the *National Register of Medical Auxiliary Services (Speech Therapists)*, the eighth edition of which has recently been published. Medical practitioners may obtain a copy free on application to the Registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

Mountain Air for Asthma

Twelve London school-children suffering from asthma left on October 10 to spend six months in Switzerland as the guests of the Swiss Economic Council. The whole cost is borne by the council, which hopes later to send children from other parts of Britain.

32nd British General Hospital

A successful reunion dinner of the 32nd British General Hospital was held at Birmingham on September 30. Dr. J. F. Wilde presiding. Next year this reunion dinner will be held at the same time and place on the last Saturday in September. Inquiries should be addressed to Mr. W. C. Marsh, 126, Cob Lane, Bournville, Birmingham, 30.

Death Certificates

Under regulations that come into operation on November 1 certain notices of death have been altered to bring them into conformity with the death certificate in general use. The notices are those given under the Mental Deficiency Regulations, 1948, the National Health Service (Emergency Treatment) Regulations, 1948, and the Mental Treatment Rules, 1948.

International Course in Audiology

A course of instruction in audiology was held in Stockholm under the chairmanship of Professor Gunnar Holmgren on September 11–20. The first of its kind ever to be held, this "International Course in Audiology" was opened by H.R.H. Princess Sibylla of Sweden in the presence of 258 participants, of whom 34 came from Great Britain. On the opening morning there were introductory lectures by Professor Holmgren, Dr. Julius Lempert, and Mr. Terence Cawthorne. In all, 24 countries were represented, and the 258 doctors attending included 41 teachers from 13 countries. The course of instruction was divided into lectures in four parallel series, there being some 80 lectures in all, and five practical courses or seminars. These were on audiometry and hearing-aids, hard-of-hearing children, basic audiology, and temporal bone surgery, with special reference to the fenestration operation. They were so arranged that each participant could attend two practical courses each day in addition to three lectures. Films, demonstrations at the Royal Institute of Technology, and demonstrations of operations by Professor Torsten Skoog and Dr. Paul Frenckner at the Karolinska and the Southern Hospitals were also arranged. There was also a visit to the new ear, nose, and throat clinic at Uppsala, which is under the direction of Professor C. O. Nylen. Both teachers and pupils gained much from the course, which proved to be very popular, and plans for another are already being considered.

Royal Academy of Medicine in Ireland

The following officers of the Royal Academy of Medicine in Ireland were elected at the annual general meeting of the Academy: president, Dr. E. T. Freeman; general secretary and treasurer, Professor T. Percy C. Kirkpatrick; secretary for foreign correspondence, Mr. William Doolin.

Chartered Society of Physiotherapy

Professor J. Whillis has been elected to the chairmanship of the council of the Chartered Society of Physiotherapy, in succession to Dr. W. S. C. Copeman, who, owing to pressure of work, has retired from the office after serving for five years.

Dr. Philip Hench's Visit to Britain

Dr. Philip Hench and Mrs. Hench have been visiting Britain at the invitation of the Royal Society of Medicine, the Nuffield Foundation, and the Ciba Foundation. The purpose of the visit is to enable Dr. Hench to discuss the development of cortisone and A.C.T.H. therapy with doctors in this country. On October 10, when Dr. Hench addressed a crowded meeting of the Royal Society of Medicine (see p. 942), the president of the Society, Lord Webb-Johnson, and Lady Webb-Johnson entertained Dr. and Mrs. Hench and other distinguished guests to dinner in the council room. The dinner was informal, but a speech of welcome was given by the president. Sir Henry Dale proposed the health of Dr. Hench, who replied.

Wills

Dr. Ronald Grey Gordon, physician to the Royal United Hospital, Bath, and formerly chairman of the Journal Committee of the B.M.A., left £13,587. Professor Harold John Hutchens, formerly Heath professor of comparative pathology and bacteriology, University of Durham, left £18,621. Dr. Sydney Henning Belfrage, formerly medical inspector of the Divorce Registry, left £11,911. Dr. John Lindsay, of Hebburn, Co. Durham, left £25,612.

COMING EVENTS

West Midlands Physicians' Association

A meeting will be held on Saturday, October 21, to inaugurate the West Midlands Physicians' Association. The Clinical Section will be held at Selly Oak Hospital, Birmingham, at 11 a.m., and the afternoon session will be devoted to general and scientific business and will be held in the medical school of the University of Birmingham at 2.15 p.m.

Professional Nurses and Midwives Conference

The 35th Annual Professional Nurses and Midwives Conference will be held at the Seymour Hall, London, W.1, from October 23 to 27 under the presidency of the Viscount Addison, with, as his vice-presidents, the President of the Royal College of Surgeons, Surgeon Rear-Admiral Sir Cecil Wakeley, and the Right Hon. Walter Elliot, M.P. On the first day Professor Hilda Lloyd, President of the Royal College of Obstetricians and Gynaecologists, will deliver the principal lecture, and on the succeeding days other well-known authorities will be speaking.

Renal Association

The third general meeting of the Renal Association will be held at the Ciba Foundation, 41, Portland Place, London, W.1, on Thursday, October 26, at 4.30 p.m. The subject will be "Renal Innervation"; the speakers will be Dr. de Muylder and Dr. El Asfoury. The opening papers will be followed by a discussion. The meeting will be preceded by a demonstration of slides starting at 3 p.m.

British Orthopaedic Association

The annual meeting of the British Orthopaedic Association will be held on October 26–28 under the presidency of Mr. S. L. Higgs at Friends House, Euston Road, London, N.W.1.

Edinburgh Lectures

In connexion with the postgraduate courses in internal medicine and surgery the Edinburgh Postgraduate Board for Medicine has arranged a series of open lectures starting on Friday, October 27, in the Anatomy Lecture Theatre, Edinburgh University, New Buildings. All students and graduates are invited to attend. Details will be published under "Societies and Lectures" in the *Journal*.

Pneumoconiosis Research Unit

The Lord President of the Council, the Rt. Hon. Herbert Morrison, M.P., will open the new laboratories of the Pneumoconiosis Research Unit of the Medical Research Council at Llandough Hospital, near Cardiff, on Saturday, October 28, at 2.45 p.m.

Royal College of Obstetricians and Gynaecologists

A postgraduate course of advanced lectures for those studying the special practice of obstetrics and gynaecology will be held at the Royal College of Obstetricians and Gynaecologists, 58, Queen Anne Street, London, W., the first session on November 3 and 4, and the second session on November 17 and 18. The fees are £3 3s. for the two sessions; £2 2s. for one session; and 10s. 6d. for single lectures. Admission is by ticket only, obtainable from the secretary of the college. Details of the lectures will be published in the "Societies and Lectures" column of the *Journal*.

Westminster Hospital Students' Union

The annual ball of the Westminster Hospital Students' Union will be held at Dorchester Hotel, Park Lane, London, W., on Friday, November 3, with dancing from 9 p.m. until 2 a.m.

Manchester Ball

The Manchester Medical Students' Representative Council is organizing a Winter Medical Ball to be held in the Whitworth Hall of the University of Manchester on Friday, November 10. This function has the support of the Manchester Medical Society and the Medical Board of the Manchester Royal Infirmary. It is hoped that this social occasion will become again an annual feature in the medical life of Manchester. Dancing: 8.30 p.m. to 2 a.m. Buffet: 10 p.m. to 12.30 a.m. Double ticket: one guinea. Further information and tickets may be obtained from the Dance Secretary, the Medical School, Manchester, 13.

SOCIETIES AND LECTURES

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

Monday

●HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, London, E.C., October 23, 7 for 7.30 p.m., dinner meeting. "*A Gastric Gossip*," presidential address by Sir Arthur Porritt.

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—October 23, 5 p.m., "*Poliomyelitis*," by Dr. F. M. R. Walshe.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—October 23, 4.30 p.m., lecture-demonstration for postgraduates by Dr. E. Stengel.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—October 23, 8.30 p.m., "*Pancreatitis*," discussion to be introduced by Professor Ian Aird and Dr. H. T. Howat.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 23, 3.45 p.m., "*General Pathology of the Central Nervous System*," by Professor T. Crawford; 5 p.m., "*Surgical Treatment of Some Types of Urinary Incontinence*," by Dr. Terence Millin.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 24, 5.30 p.m., "*Renal Function in Early Life*," by Professor R. A. McCance, F.R.S.

CHADWICK TRUST.—At Westminster Medical School (Sir Edward Meyerstein Lecture Theatre), 17, Horseferry Road, Westminster, London, S.W., October 24, 4.30 p.m., "*Public Health Administration in Western Union Countries: A Comparative Synthesis*," by Dr. Neville M. Goodman (Ministry of Health).

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 24, 5 p.m., "*Newer Antibiotics in Dermatology*," by Dr. F. R. Bettley.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 24, 5 p.m., "*Genetics in Ophthalmology*," by Professor Arnold Sorsby.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—October 24, 5.15 p.m., "*Some Recent Advances in the Physiology of Vision*," by Professor Hamilton Hartridge, F.R.S.

Wednesday

GLASGOW UNIVERSITY.—In Department of Ophthalmology, October 25, 8 p.m., "*Biological Action of Radiation*," by Dr. J. M. A. Lenihan.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 25, 5 p.m., "*Medical Mycology*," lecture-demonstration by Dr. R. W. Riddell.

●INSTITUTE OF PHYSICS: EDUCATION GROUP.—At Fyvie Hall, The Polytechnic, Regent Street, London, W., October 25, 3 p.m., "*Technical Universities*," by Lord Eustace Percy.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 25, 3.45 p.m., "*Anatomy of the Mouth and Pharynx*," by Professor J. Whillis.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 25, 5.30 p.m., "*Ophthalmic Neurology*," by Mr. L. H. Savin.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—October 25, 3.30 p.m., "*Modern Methods of Refuse Disposal*" (illustrated), by Mr. H. Ardern, A.M.I.Mech.E., F.Inst.P.C.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP: NUTRITION PANEL.—At Chemical Society's rooms, Burlington House, Piccadilly, London, W., October 25, 6.15 p.m., "*Factors in Distribution Affecting the Quality and Nutritional Value of Foodstuffs: Fish and Meat*." Speakers, Drs. G. A. Reay, E. H. Callow, and M. A. Pyke.

Thursday

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, Cavendish Square, London, W., October 26, 8 p.m., "*The Influence of Adlerian Principles on Modern Psychiatry*," by Professor R. Dreikurs (Chicago Medical School). Discussion to be opened by Drs. E. B. Strauss and E. Weissmann.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 26, 5.30 p.m., "*Experimental Research in Chemotherapy*," by Sir Charles Harington, Ph.D., F.R.S.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, October 26, 5 p.m., "*Filariasis*," by Dr. John M. Bowie.

MEDICO-LEGAL SOCIETY.—At 26, Portland Place, London, W., October 26, 8.15 p.m., "*Doctors and the Law*," by Rt. Hon. Sir Travers Humphreys.

ROYAL ARMY MEDICAL COLLEGE.—At Lecture Theatre, John Islip Street, London, S.W., October 26, 5 p.m., "*The Maintenance of Fluid Balance*," by Dr. H. L. Marriott.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 26, 3.45 p.m., "*Arteries and Veins*," by Professor H. A. Harris.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 26, 5.30 p.m., "*Visual Fields: Normal and Pathological*," by Mr. C. Taylor.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—October 26, 4.30 p.m., lecture-demonstration on psychiatry by Dr. M. A. Partridge.

TORQUAY AND DISTRICT MEDICAL SOCIETY.—October 26 (1) at Torbay Hospital, 4.30 p.m., "*Tuberculous Lymphadenitis*," by Sir James Paterson Ross; (2) at Palace Hotel, Torquay, 7.30 for 8 p.m., dinner and dance.

WINGFIELD-MORRIS ORTHOPAEDIC HOSPITAL; NUFFIELD ORTHOPAEDIC CENTRE, Oxford.—October 26, 8.30 p.m., "*Personal Experience of Tuberculosis of Hip*," by Mr. J. Agerholm.

Friday

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, October 27, 5 p.m., "*Some Aspects of Heart Surgery*," by Mr. R. C. Brock.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—October 27, 4.30 p.m., "*Otitic Baratrauma*," by Air Commodore E. D. D. Dickson.

KENT AND CANTERBURY HOSPITAL, Canterbury.—October 27, 5 p.m., clinical meeting.

MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—October 27, 5 p.m., clinical neurological demonstration by Dr. W. Russell Brain, F.R.C.P.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W.—October 27, 8 p.m., "*A Survey of Radiological Changes Encountered in Venereal Disease*," by Dr. K. H. Gaskell. A discussion will follow.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 27, 5 p.m., "*Surgical Aspects of Tabes Dorsalis*," by Dr. R. Lees.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 27, 4.30 p.m., "*Medical Ophthalmology*," by Mr. A. J. Cameron.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—October 27, 8 p.m., "*The Surgery of the Heart*," address by Mr. R. C. Brock.

APPOINTMENTS

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE.—*General Hospital:* J. C. Tainsh, M.B., Ch.B., D.R., Full-time Radiologist, and to carry out part-time duties at Purley and District War Memorial Hospital: L. R. Spencer, M.B., B.Chir., Casualty Officer. *Mayday Hospital:* S. Oram, M.D., F.R.C.P., Cardiologist, with sessions at Mayday and General Hospitals.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—*Senior Casualty Physician* (*Senior Registrar Grade*), D. J. Conway, M.D., D.C.H., D.T.M.&H. *Assistant Radiologist* (*Senior Hospital Medical Officer*), John Sutcliffe, M.B., B.Ch., M.R.C.P., D.M.R.D. *House-physicians* (*Junior Registrar Grade*), L. C. Harris, M.D., M.R.C.P., S. N. Nabarro, M.B., Ch.B., M.R.C.P., R. G. Welch, M.B., B.S., M.R.C.P. *House-surgeon to the Orthopaedic and Plastic Departments* (*Junior Registrar Grade*), D. Duncan, M.B., Ch.B. *Assistant Resident Medical Officer, Tadworth Court* (*Junior Registrar Grade*), M. G. Martin, M.B., Ch.B.

MAW, T. STAFFORD, M.B., Ch.B., D.O.M.S., Senior Registrar, Ophthalmic Department, Royal Victoria Infirmary, Newcastle-upon-Tyne.

RATNER, EDWIN, M.D., D.P.H., Consultant Chest Physician, Oldham and Ashton Area, Manchester Regional Hospital Board.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Cooper.—On October 2, 1950, at Queen Charlotte's Hospital, Hammersmith, to Frieda (formerly Bell), wife of Dr. J. R. Cooper, a daughter—Monica Frieda.

Fallon.—On October 7, 1950, at Royal Infirmary, Edinburgh, to Hazel (formerly Spink), wife of Martin Fallon, O.B.E., M.Ch., F.R.C.S.I., a son.

Gwynne Williams.—On October 5, 1950, at The Infirmary, Denbigh, to Peg, the wife of Dr. T. Gwynne Williams, a brother for Ann.

May.—On September 13, 1950, at Newbury House Nursing Home, to Sylvia, wife of Surgeon Lieutenant C. R. May, R.N., a son—Nigel.

Morrison.—On October 8, 1950, at Bankhall Hospital, Burnley, to Dr. Agnes, wife of Dr. A. B. Morrison, a son.

MARRIAGES

Mathers—Mould.—On September 16, 1950, at Stroud, George Crosthwaite Mathers, M.B., D.R.C.O.G., of Lezayre, Whitehaven Road, Workington, Cumberland, to Diana Mary Mould, S.R.N., of Rowcroft House, Stroud, Gloucestershire.

DEATHS

Binns.—On October 12, 1950, at Little Holland, Ludham, Norfolk, John Braybrooke Binns, M.R.C.S., L.R.C.P.

McIntyre.—On October 7, 1950, at the Kent and Sussex Hospital, Tunbridge Wells, Sir John McIntyre, K.B.E., C.B., M.C., M.B., B.Ch., Air Vice-Marshal, R.A.F., retired.

Rowling.—On October 12, 1950, at 15, Blenheim Terrace, Leeds, Samuel Thompson Rowling, M.D., D.A.

Scoresby-Jackson.—On October 3, 1950, at East Hill Lodge, Dunsford, Exeter, Thomas Scoresby-Jackson, M.B., Ch.B., D.P.H.

Simmons.—On October 8, 1950, at Monxton, Andover, Hants, Stewart Septimus Simmons, M.R.C.S., L.R.C.P., late of South Norwood, London, S.E., aged 80.

Tait.—On October 9, 1950, at the Royal Infirmary, Edinburgh, Robert Horsburgh Tait, M.D., D.P.H., of 55, Argyle Crescent, Portobello, Midlothian.

Thomson.—On October 3, 1950, at 1, Newlands Road, Horsham, Sussex, William Thomson, M.B., C.M., late of Waltham Abbey, Essex.

Webber.—On October 4, 1950, at Headington Hospital, Oxford, Henry Woolmington Webber, M.D., M.S., F.R.C.S.Ed.

White.—On October 11, 1950, at the Royal Infirmary, Edinburgh, James Hunter White, M.B., C.M., aged 81.

Any Questions?

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

Familial Incidence of Mongolism

Q.—*What is known about the mechanism of the inheritance of mongolism? The history of the family with whom I am concerned is as follows:*

Grandmother.—Normal, but with a bad family history of mental and nervous troubles.

First generation.—Two sons and four daughters, the youngest a mongol, the other five normal.

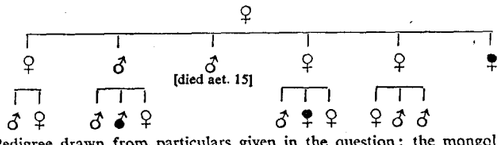
Second generation.—Eldest son: three children, one a mongol. Eldest daughter: two normal children. Second daughter: three children, two normal, one a mongol. Third daughter: three normal children.

The diagnosis in all three cases has been confirmed by experts.

The mothers of the mongol children were respectively aged 44, 40, and 39 when their mongol children were born. The maternal ages at which the unaffected children of the second generation were born were, in order, 35, 37; 38, 43; 34, 42; 31, 33, 38.

What are the probabilities of the normal children of the second generation, when they marry, producing a mongol child? Two mental specialists whom the parents of these children consulted before their marriage told them that mongolism was not inherited—an opinion which does not seem to be borne out by the above facts.

A.—The role of heredity in the production of mongolism is still obscure. A few writers deny that hereditary constitution is involved at all, but this seems too extreme a view. Large collections of data show that amongst the sibs of mongols the occurrence of similar cases is slightly but definitely higher than would be expected by chance, given the incidence of the condition in the general population. Familial incidence, however, is not necessarily a proof of the existence of a genetic mechanism; it might conceivably be due to some non-genetic abnormality in the mother. Much more convincing evidence is the raised incidence amongst more distant relatives of mongols. The practical importance of genetic constitution must be relatively small compared with that of other factors. One could imagine a dominant gene whose possession is necessary before the subject suffers from mongolism, but of the possessors of the gene only a small proportion would actually be mongols.



Pedigree drawn from particulars given in the question: the mongol children are shown in black.

The only other aetiological factor identified with certainty is the age of the mother; the incidence of mongolism rather more than doubles with each advance of five years after the age of 25, and in the oldest age groups may reach quite a high figure.

The pedigree described in the question is highly unusual. The specialists who were consulted were perfectly correct in advising that the risk was negligible that the brothers and sisters of a mongol might themselves have mongol children. The experience in this family does emphasize, however, that it is wise to guard oneself by explaining that the risk, though very small indeed, is nevertheless somewhat greater than for the ordinary person with no close mongol relative. In spite of what has happened the chances for the children of the normal persons of the last generation are probably still good and the risk, though definitely increased as against the chance of 1 in 700 or so that any random pregnancy will end with a mongol child, is likely to be quite small. In all probability it is less likely that one of these persons having a child when the mother is 25 will produce a mongol than that any random woman of 40 or over will do so.

Fibrocystic Disease of the Pancreas

Q.—*The first and third children of a healthy woman have fibrocystic disease of the pancreas. What are the chances of further children being affected?*

A.—The evidence has now become very strong that fibrocystic disease of the pancreas is due to a recessive gene. At all events once the condition has appeared in a sibship the empirical chance of any subsequent child being affected is close to the theoretical figure of one-quarter. Should this mother become pregnant again, the chance is one in four that the child will suffer from the disease.

Prefrontal Leucotomy

Q.—*(a) What are the indications for prefrontal leucotomy, and what is the prognosis? (b) Has the operation been used to alleviate craving in drug addiction?*

A.—*(a)* Prefrontal leucotomy is a symptomatic treatment used in a wide variety of conditions ranging from major forms of insanity, through chronic neurotic illnesses involving tension and distress of mind, to the states of demoralization that can be induced even in normal personalities by intractable pain. It is therefore impossible to state the operative indications succinctly, but (1) the patient should be severely incapacitated before the operation is contemplated, (2) other appropriate treatments, if any, should have been tried, and (3) the best results occur in conditions specially characterized by emotional excess in the form of agitation with tension and distress. The outcome depends on the nature, severity, and duration of the underlying condition, and on the personality of the patient. The better the patient's personality the better is the outcome likely to be. At best after the operation the patient may be a normal person without appreciable handicaps. But where the pre-operative condition has become so fixedly established as to show variation neither spontaneously nor in relation to circumstances, it will persist after operation, though usually in a modified and less distressing form so that the symptoms will be more easily tolerated. It is advisable to seek a second, and preferably expert, opinion before recommending the operation, and in the present state of our knowledge the prognosis should be guarded rather than confident.

(b) Yes, with variable results. The prevailing opinion is that there is some hope of success where the addiction has been more rather than less symptomatic in the sense that it has arisen from attempts to meet undue stress (whether psychic, as in drinking to alleviate depression, or somatic for intractable pain). The less obvious the cause and the less excuse for the addiction, the less good are the operative results. Indeed, where a personality is essentially an unsatisfactory one and the patient has taken to drugs apparently for little reason, the post-operative state is, if anything, liable to be worse, since the post-operative reduction of worry and of restraint is liable to encourage the search for even more immediate gratification of the desires. On the other hand, where drug addiction has arisen more excusably from intolerable pain or even in the hope of quieting a genuine psychic turbulence, the outlook is more hopeful. Quite a number of addicts subject to intolerable pain have been enabled to dispense with drugs altogether after this operation, and so have a few who drifted into the habit through genuine psychic stress.

The Hymen

Q.—*What is the origin of the human hymen?*

A.—The hymen is functional only in female mammals possessing a urogenital sinus (such as the sow), and in these it constitutes a barrier to the flow of urine into the vagina. The human female has no urogenital sinus, but the hymen persists, just as the male nipple persists, because it is part of the hereditary make-up of the mammalian body.

Anoxia and Liver Damage

Q.—*Is it true that the anoxia accompanying severe anaemia can cause liver damage?*

A.—It is important not to confuse anoxic anoxia—i.e., anoxia associated with low oxygen tension—with that due to anaemia, in which the oxygen tension is usually normal. The former cannot be compensated by an increased blood flow, whereas in the latter increased cardiac output may largely make good the deficiency. That anoxic anoxia may lead to liver damage has been undoubtedly established both in men and animals (Buchner, H., *Klin. Wschr.*, 1942, **21**, 721), severe cases resulting in extensive centrilobular necrosis. Uncomplicated anaemia, however, does not generally lead to necrosis: the more usual finding is some degree of fatty infiltration, as, for example, in inadequately treated cases of pernicious anaemia. On the other hand, a degree of circulatory impairment which might be innocuous in a subject with a normal haemoglobin level may well lead to anoxic liver damage in a severely anaemic subject whose liver cells have been dependent for adequate oxygenation upon an increased blood flow. Any increased metabolic activity of the liver in these circumstances may also upset the balance between supply and demand. Such an increased demand may well result from the metabolic disturbance engendered by major surgery and its accompanying anaesthetizing agents.

Vitamin D and Bronchitis

Q.—*An otherwise healthy boy of 9 years living under first-class conditions suffers from recurrent attacks of bronchitis during the winter. Would vitamin D be beneficial and; if so, has an ultra-violet lamp any advantages over direct administration? What, besides burns, are the dangers of such a lamp?*

A.—Scientifically conducted experiments with groups of children in Great Britain have so far failed to show that ultra-violet light externally or vitamin administration has any beneficial effect in reducing the incidence of respiratory tract infections. This does not exclude the possibility of an individual child receiving some benefit, but it makes it unlikely. The main danger of ultra-violet light, apart from burns, is the well-recognized risk of lighting up a tuberculous infection in the lungs—an unlikely event, however, in a boy of 9. There is also the point that the warming of the skin which occurs, if followed by exposure to colder conditions, may be succeeded by the sort of "chilling" which seems to precede some of the respiratory tract infections.

It may be permitted to follow this largely negative answer with some comments on the condition described. There are three possibilities which might be usefully considered: First, where is the infection coming from? If the child is "otherwise healthy" the question of infection from some other member of the household should be investigated. A sinus infection, a throat infection in mother or father with whom the children are living so to speak in symbiosis may spread to a child. Does the term "otherwise healthy" exclude the chance that the child has infection of an antrum, of the tonsils, or even a small area of collapsed and infected lung only to be recognized on *x*-ray examination? Secondly, has the possibility of allergy been excluded? Some cases of recurrent bronchitis in the young are in effect really asthma. Thirdly, it is fair to ask what the "first-class conditions" really mean. Overheated rooms, lack of fresh air, too many clothes, lack of exercise, or absence of precautions to keep warm after exercise may all occur at the best economic levels. Over-protection may result in lack of immunity.

Bleeding Gums

Q.—*An otherwise healthy man suffers from bleeding gums. Every morning his teeth and gums are covered with a brown nasty smelling deposit. What is the best treatment?*

A.—There are numerous forms of gingivitis due to many causes, and any treatment prescribed without investigation of possible causes is bound to be empirical. In general, local scaling and cleaning are indicated to keep the teeth clean and polished, thereby preventing food sticking to them, with finger-massage to restore tone in the gums. If the pockets round the teeth are deep, gingivectomy—i.e., trimming away superfluous and swollen gums—may be undertaken. Local penicillin in the mouth is of use in acute cases, but it is not much good in long-standing cases.

Treatment of Leucopenia

Q.—*A woman aged 55 has been taking "tridione" for several months for petit mal. In four months her total leucocyte count has fallen from 5,000 per c.mm. to 3,500 per c.mm. The tridione has now been stopped. What other measures should be adopted to increase the number of leucocytes to normal?*

A.—It is questionable whether a fall of the total leucocytes from 5,000 per c.mm. to 3,500 per c.mm. is of any significance, unless repeated counts showed the second figure to be constant. The range for 95% of normal individuals is 4,000–11,000 per c.mm.; thus it is possible that the count of 3,500 is a solitary low reading. If it is established that there is persistent leucopenia, tridione should be stopped and the patient kept under observation. The count will almost certainly rise spontaneously after withdrawal of the toxic agent. Folic acid, pyridoxine, and crude liver extract have all been thought at one time or another to stimulate leucopoiesis; it is more than doubtful whether they exert any such action, but they are worth a trial. There is, in fact, no drug known which increases the formation of leucocytes. The most important part of treatment is the immediate control of any infection should evidence of such occur.

NOTES AND COMMENTS

Splenomegaly in Thrombocytopenic Purpura.—Dr. BERNARD MYERS (London) writes: In your reply ("Any Questions?" September 30, p. 793) you state that "palpable enlargement of the spleen occurs in about one-third of patients with primary or idiopathic thrombocytopenic purpura." In a series of cases which Mr. Rodney Maingot and I had together which from the tests and clinical observation were essential thrombocytopenic purpura, there was not a single case, clinically or at the operation of splenectomy, in which the spleen was in any degree enlarged. I found when I made this statement to medical societies in the United States that the same was the experience of the profession there.

"Hospital Improvements."—This booklet by Miss Olive Matthews, which was referred to in an annotation last week (p. 878), is obtainable only from the author at 22, Harrington Gardens, London, S.W.7 (1s. 6d., post free).

Correction.—Dr. BYRON E. HALL (Rochester, Minnesota, U.S.A.) writes: In the *British Medical Journal* of September 9 (p. 585) a paper bearing the title "Studies on the Nature of the Intrinsic Factor of Castle" was published with my name as sole author. When the manuscript was submitted to Professor Justin Besançon, secretary-general for the First International Congress of Internal Medicine, last July, I was not cognizant of the fact that it would be published, especially prior to the meeting of the Congress. The manuscript was incomplete to the extent that the names of associates who had worked with me on this project and acknowledgments to certain pharmaceutical firms had been omitted. Dr. E. H. Morgan, formerly a fellow in medicine, Mayo Foundation, and Dr. D. C. Campbell, consultant in medicine, Mayo Clinic, should have been co-authors. Moreover, acknowledgments to Merck and Company, Rahway, New Jersey, for supplying crystalline vitamin B_{12}; to the Abbott Laboratories, North Chicago, Illinois, for extracts of hog gastric mucosa; and to the Upjohn Company, Kalamazoo, Michigan, for vitamin B_{12} concentrate and extracts of hog duodenum should have been included.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 28 1950

"VERITIES YET IN THEIR CHAOS"*

BY

CHARLES McNEIL, M.A., M.D., F.R.C.P., F.R.C.P.Ed.

Professor Emeritus in Child Life and Health, University of Edinburgh

Thomas Hobbes, the philosopher, was a contemporary and familiar friend of William Harvey. Hobbes has described the life of man as "nasty, brutish, and short." He knew something both of life and of medicine. He had studied anatomy and read Vesalius in Paris; and he lived to the age of 90 by a health system of his own, and by keeping clear of doctors. A strong point in his system was exercise, and a favourite exercise was singing. This is described by Aubrey (*Lives of Eminent Men*): "At night when he was abed and the doors made fast, and was sure nobody heard him, he sang aloud (not that he had a good voice) but for his health's sake: he did believe it did his lungs good, and conduced much to prolong his life." Aubrey adds: "He seldom used any physique. He was wont to say that he had rather have the advice or take physique from an experienced old woman who had been at many sick people's bedsides, than from the most learned but unexperienced physician."

This story suggests the low state and repute of medical practice in 1602, when Harvey came back to London from Padua, like Portia, "a young and learned doctor." Yet he brought back with him from Padua the best medical science of that time. It was the system of Galen brought up to date: Galen's anatomy revised and added to by Vesalius and Fabricius; his physiology, hardly modified but brilliantly expounded by Fernel in his *Physiologia*. It was the physiology that specially interested the young Harvey, and that was to be his life-long study. There were the four elements and temperaments; the four humours; the three coctions; the three spirits derived from the three great organs—liver, heart, and brain. The blood, carrying nutriment to every part, flowed out and came back by the same vessels—veins and arteries: and the blood was also charged with innate heat. But almost nothing was known of the true function of the heart, lungs, brain and nerves, muscles, and digestion.

Although the human body with its great organs had been dissected for sixty years by the accurate standards of Vesalius, there was confusion and almost complete ignorance of how these organs worked. These humours and spirits and innate heat and the rest had truth in them; but they were dim shapes, "without form and void"; they were "medical verities yet in their chaos." And so pestilence raged, disease prevailed, and humanity suffered. Medicine was a learned science, but it was impotent in practice.

Harvey's Two Masterpieces

Harvey's life-work lay before him, a stretch of more than fifty years. His professional success as hospital physician, trusted official in his college, and physician to the Royal Court was rapid and distinguished. But what was extraordinary and immortal was his work as a thinker and discoverer; and the fruits of his genius were given to us in his two books, *De Motu Cordis et Sanguinis in Animalibus* (1628), and *De Generatione Animalium* (1651), the one appearing in the middle, the other towards the end, of his working life.

In both books the subject of study was physiology, the working of the human and animal body; and Harvey's general aim was a revision of the physiology of Galen. He wished, in fact, to bring out a new edition of this part of Galen's vast encyclopaedia of medicine, and for this immense task he chose his methods carefully. His first object was to bring data to "the cognizance of the senses": and he got these *sense*-data by anatomy—human anatomy, comparative anatomy in many kinds of animals, and experimental anatomy in living animals. Then, having got and verified his *sense*-data, he reasoned from them and tried to reach a physiological conclusion.

These famous Harveian methods seem to be paraphrased by Sir Thomas Browne, physician of Norwich and contemporary of Harvey, in a passage from his *Christian Morals*, the passage ending with the title of this address. "Fly not only on the wings of Imagination: join Sense unto Reason, and Experiment unto Speculation, and so give life unto Embryon Truths and Verities yet in their Chaos." Reading Browne's lovely prose and admiring the beauty and antique charm of the words, one can miss the depth and truth of his thought. For this passage exactly describes the methods used by Harvey in his *De Motu*. There is the evidence of *sense* given by anatomy and experiment; the use of inductive reason and the element of speculation as to the missing link of the capillaries. These four mental instruments used together in *De Motu* drew out of chaos into clear form the verity of the circular motion of the blood.

De Motu is a masterpiece, announcing a great discovery, and showing a method applicable to every field of medicine

*Oration given at the 155th Festival, Harveian Society of Edinburgh, on June 2.

and science. His second book, *De Generatione*, takes a lower rank in physiology. Here Harvey was dealing with more complex problems where his instrument of anatomy was not fine enough to give him the necessary *sense*-data (he needed the microscope); he overloaded his argument with speculation, and, flying "only on the wings of Imagination," he often went astray. But it is a classic, and in some ways is a greater book; it deals with bigger problems, and shows Harvey in a wider range as biologist and metaphysician.

Harvey's Unwritten Books

In the closing chapters of *De Motu* Harvey shows that he had in mind other problems than the motion of the blood and heart; these other problems covered the whole range of Galen's physiology. Years before *De Motu* was written he was studying the function of the lungs and the whole problem of generation. He had now shown by carefully chosen methods that the motion of the blood was a circulation. This discovery opened a wide range of new problems which he could examine and might solve in the same way. Harvey, impatient and irritable in the ordinary intercourse of life, showed in the writing of *De Motu* a firm mind disciplined and calm. But in the second last chapter the thought of his discovery raises him to an unusual excitement: "Finally reflecting upon every part of medicine, physiology, pathology, semeiotics, and therapeutics, when I see how many questions can be answered, how many doubts resolved, and how much obscurity illustrated, by the truth we have declared, the light we have made to shine, I see a field of such vast extent in which I might proceed so far and expatiate so widely that this my tractate might swell out into a volume which was beyond my purpose, but my whole life would not suffice for its completion." This was only a dream, and the great enterprise does not seem to have been seriously taken up.

But in *De Motu*, in the Two Letters to Riolan, and in *De Generatione*, he gives a list and names the titles of seven treatises which he proposes to write and for which he has already made experiments and collected observations. The list is: (1) On the Causes, Uses and Organs of Respiration; (2) On the Formation of the Foetus; (3) The Organs of Motion (Heart and other Muscles); (4) Medical Observations and Pathology; (5) The Loves, Lusts, and Sexual Acts of Animals; (6) Physiology and Particular Treatise on the Blood; (7) On the Soul and its Affections. The only one of the list to be completed was "The Formation of the Foetus," published as *De Generatione*. The other six unwritten books of Harvey's may be called his hyperaemic (unprolific) eggs, conceived in his brain, undergoing some gestation there, but never brought to birth. The one most nearly completed was his "Medical Observations and Pathology," which, he says in his First Letter to Riolan (1649), "I intend putting to the press," and which in *De Generatione* (1651) he hopes to complete, "if God grants me longer life."

This grand review of medicine and physiology which Harvey planned in these unwritten books was beyond his powers, because the means of acquiring the new knowledge were not available in his time. This rewriting of Galen's system of medicine and surgery was to be done not by one but by many men, written slowly page by page not in a single generation but over three hundred years; and the great volume is not finished yet. But about Christmas, 1650, Harvey handed over, rather reluctantly, to his friend, Dr. George Ent, the manuscript of *De Generatione*, and this great and strange book was published in 1651.

Harvey's Doctrine of the Soul

De Generatione contains seventy-two exercises on conception and development; and added essays on parturition, the uterine membranes and fluids, and his final theory of conception. But, mingled throughout, there is also much general biology, and, what is strange and disappointing to modern biologists, much metaphysical argument dealing with the soul. The book contains many references to his planned but unwritten treatises, and many passages showing his fine sense of poetry. It is an extraordinary book, interesting to read but not easy to understand, and it shows the range and depth of Harvey's mind. Even its mistakes, the mistakes of a great mind, are worth consideration. It made no substantial contribution to the physiology of development. But it firmly stated the doctrine of epigenesis as opposed to metamorphosis—a doctrine which was amply confirmed much later by Wolff and von Baer; and its influence upon the improvement of midwifery practice has been made clear by Professor R. W. Johnstone in his Oration to our Society two years ago. It again shows Harvey, as in *De Motu*, a great and accurate anatomist and a tireless and ingenious experimenter.

In it he reaches his full stature as a general biologist, dealing with all living creatures, man and animals, birds, fishes, insects, and plants—as Newton said of himself, "gazing at the ocean of being that lay before him." And for Harvey, in his study of being, there was something beyond biology, although joined with it. With this mysterious *beyond* Harvey's mind wrestled, and so in *De Generatione* Harvey passes from biology into metaphysics, and states his doctrine of the soul and the blood, of the soul in man and animals, and of the Soul of the Universe.

Harvey's mind and outlook were formed at Padua. Here he was trained in anatomy by Fabricius; he may well have heard the new teaching in physics by Galileo; and he came into deep contact with the towering mind of Aristotle ("master of them that know"), and read the Aristotelian treatises on biology, generation, and metaphysics. According to Aristotle and most of the great thinkers up to Harvey, there was in the living body something more than physical structure and physical process; and so alongside physics as a subject of study there lay metaphysics. Harvey had no shadow of doubt about this; and so he shows himself in *De Generatione* both as biologist and as metaphysician, and discourses again and again of the soul, how it is joined to the body, and how together they make up the lives of man and animals.

The Soul and the Blood

Harvey's final position was that the immediate link between soul and body was the blood. Throughout his life his mind was fascinated by the blood. In *De Motu* he had taken up and solved the path of the blood and the action of the heart in maintaining its circular course: and, following Aristotle, he at first gave primacy in the whole body to the heart, saying: "It is the heart by whose virtue and pulse the blood is moved, perfected, made apt to nourish, and preserved from coagulation and corruption . . .: [it] is indeed the foundation of life, the source of all action." But in *De Generatione* he has changed the emphasis from the heart to the blood, and he now puts the blood in the first place. He did this because, in his study of the early development of the hen's egg, he was satisfied that the blood appeared before the heart and every other organ and part. This appearance was the famous punctum saliens of Aristotle. This first sign of animal life

in the 4-day-old chick as a red "leaping point" had been seen nearly two thousand years before by Aristotle, who named it punctum saliens and proclaimed it to be the heart of the embryo chick.

Harvey confirmed the observation of Aristotle, but with a significant difference. This is Harvey's vivid description, given in the first English translation of *De Generatione* (1653). "If therefore you observe on the fourth day, you will meet a great metamorphosis and wonderful alteration, which are more evident almost every hour that day long: about which time the Egg beginneth to step from the life of a Plant to the life of an Animal. For now the Limbus or hemme of the colliquamentum beginneth to blush and purple, being encompassed by a slender bloody line: and in the centre almost of it, there leapeth a capering bloody point [Aristotle's punctum saliens] which is yet so exceeding small that in its diastole or dilatation it flasheth only like the most obscure and undiscernable spark of fire, and presently upon its systole or contraction it is too subtile for the eye and quite disappeareth." After careful and repeated observation Harvey was convinced that the red line (the embryonic blood) appeared *before* the red leaping point, and he therefore now transferred to the blood the primacy in the life of the body. He puts his new view plainly: "The blood is the prime part engendered, and the heart the mere organ destined for its circulation."

Continuing his study of the blood, he next takes up the old doctrines of Galen of humours and many kinds of spirits working in the blood, and of the innate heat; and dismisses them all with scorn: "Nothing is more uncertain and questionable than the doctrine of the spirits . . . we have found none of all these spirits by dissection. . . . There is in fact no occasion for searching after spirits foreign to or distinct from the blood, to evoke heat from another source, to bring gods upon the scene, and to encumber philosophy with fanciful conceits; what we are wont to derive from the stars is in fact engendered at home; the blood is the only innate heat." With the ground cleared, he goes on to describe the powers and properties of the blood in relation to the soul and the processes of animal life. "It [the blood] is the common bond between soul and body: it is the immediate instrument and principal seat of the soul . . . it is the instrument of the Great Workman . . . it is to be regarded as the substance whose act is the soul or the life . . . it therefore comes to the same thing whether we say the soul and the blood, or the soul with the blood, or the blood with the soul, performs all the acts in the animal organism."

This is Harvey's doctrine of the soul and the blood. It replaces the many spirits and innate heat of Galen with one spirit, the soul, which performs through the blood all the acts of life. It does not tell how the acts of life are performed; elsewhere he says that these operations "are carried out with such foresight and divine intelligence which indeed surpasses our understanding, and are in no way to be penetrated by the dull edge of our apprehension." With him physiology has now ended and metaphysics has begun; unable to search out physiological *process* any further, he goes on to speak of *cause* in man and in the universe. The soul of man, interfused through his blood and body, is linked with and dependent on "the first cause of all things, by whatever name this has been designated—the Divine Mind of Aristotle, the Soul of the Universe by Plato, the Natura Naturans by others." In the same argument he turns to and quotes his beloved Virgil—"in the same way as in the greater world we are told, 'All things are full of Jove—Omnia plena Jovis,' so in the slender body of the pullet, and in every one of its actions, the finger of God or Nature obviously appears."

This last sentence and many like it have the feeling if not the form of poetry, and show Harvey as poet as well as metaphysician. He did not express his thought in verse, but when he rises to the height of his argument he shows the true sense and quality of poetry. He combined anatomy and poetry—a strange combination. Anatomy divides, dissects, and looks at parts. Poetry looks at things undivided and whole, and, however small the thing is, in its widest relations. And poetry is also and essentially metaphysical. Its language is not that of metaphysics, for it uses words that are understood by all men, even the unlettered. In poetry deep is speaking unto deep; and this deep is the soul in man. The universal range and poetical quality of Harvey's thought are shown in this passage where he is speaking of the nesting of birds: "And it is indeed a thing most worthy of admiration to see these creatures selecting and preparing their nests with so much foresight fashioning and furnishing, and concealing them with such inimitable art and ingenuity, so that it seems imperative on us to admit in them a certain spark of the divine flame (as the poet says of bees)."

Fulfilment in Physiology and the Liquidation of the Soul

Three hundred years have gone since *De Generatione* was published. Harvey brought no more unfinished books to press, and died in 1657. In this long march of time, the medical *comoedia* has moved upwards, slowly but very far, from the inferno of unknown and uncontrolled disease in which it lay in Harvey's day; and this progress has been mainly due to the building up of physiology. The effort and achievement of one man are of little account compared with this gigantic task and the many who have helped to complete it. But Harvey was a Titan among men, both in his power of mind and in what he set himself to do. He gave the new physiology a splendid start in his discovery of the circulation, but beyond that he added little. Looking back, we can see the reason for his failure. He had to hand the two instruments of anatomy and the experimental method; and his anatomy, consisting of dissection, his trained eyes, and the occasional use of the magnifying glass, was not fine enough. But the range and penetrating power of anatomy were to be prodigiously increased by the gradual perfection of physics and chemistry. Optical physics soon produced the microscope, and much later the *x* ray; electrical physics; and the fine filter: all these inventions gave really a finer and deeper anatomy, put at the disposal of physiology. So also the perfection of chemistry, essentially a sublime anatomy, revealed the intimate and ultimate structure of cells and fluids and their components.

In the closing years of Harvey's life anatomy was becoming microscopical, and three years after his death Malpighi with his microscope saw blood flowing in the capillaries, and supplied the missing link in the circular chain of the blood. A few years later the microscope showed red corpuscles in the blood and spermatozoa in the seminal fluid. These were only the first fruits of a rich harvest to be reaped by the microscope: but these three discoveries all touched on, adding to or correcting, Harvey's work on the blood and generation.

About the same time, and in London, the new physics attacked the baffling problem of respiration. Boyle, Hooke, Lower, and Mayow demonstrated a new kind of "spirit" in the blood derived from the in-breathed air. This was called "igneo-aerial spirit," and after two hundred years

of further search it was isolated and named oxygen by *Lavoisier*. Innate heat and igneo-aerial spirit are akin in name and in nature: the one is the "embryon truth" of Galen; the other its further development, coming to maturity in the modern doctrine of oxidation and combustion. As for Galen's humours and spirits, the new chemistry has found the blood and body fluids to be teeming with humours, ferments, hormones, and spirits in greater numbers and complexity than Galen and Fernel imagined.

Harvey, you will remember, dismissed the doctrines of the spirits and innate heat, saying that *his* "dissection could show nothing of the sort." He emptied the old chaos of shadowy spirits, and into the void that was left he introduced the metaphysics of the soul, carrying out, through the blood, all the processes of life. The more perfect *dissection* of the microscope and of physics and chemistry has shown Harvey to have been wrong, and that Hippocrates and Galen have been justified by their modern children in physiology. The old Greeks were men of genius, and their guesses, vague and without form, were a dim foreshadowing of truth. Their doctrines, rejected by Harvey, were "verities yet in their chaos"; they have now come out of their chaos and stand in clear and delicate outline as chemical and physical processes. It is not beyond the mark to say that modern physiology is a new edition of the old Galen, revised, rewritten, and greatly enlarged.

Biology and Metaphysics

And how has it fared with Harvey's doctrine of the soul and the blood, and of the soul generally? We can see what happened to Harvey in his study of the blood. He was a profound student both of biology and of metaphysics. His instruments for the study of the blood and of biology in general were anatomy and experiment. But his instrument of anatomy was not fine enough; and, having got from it all that it could do, he took up metaphysics. This combination of biologist and metaphysician was now becoming dangerous.

Descartes, philosopher, brilliant amateur of physiology, and contemporary of Harvey, gave in his writings a firm warning that, in the study of man, the soul and the body, metaphysics and biology, should be kept apart. Since this warning was given most biologists have taken the lesson to heart and have fought shy of metaphysics. In their study of living bodies they have done what Descartes advised, and have used only physical methods, and have stated their results in strictly physical terms. In this concentration on physics and exclusion of metaphysics they have in three hundred years filled the void of Galen's physiology with a labyrinth of living processes, working under physical and chemical laws, and in so doing they have made the practice of medicine powerful and beneficent.

Indeed, biologists have gone beyond the lesson of the master. Finding the most intimate processes of life to be explained by chemistry and physics, and finding nothing else in life but chemical operations, they see no place in the living body for metaphysical spirit. They might well use Harvey's own words: "There is no occasion for searching after spirits . . . to bring gods upon the scene . . . to derive from the stars what is in truth engendered at home." Life, we are told, is a form of matter; and living matter is chemistry in action. The biologists have gained the whole world in physiology, and have lost the soul. Sir Charles Sherrington, in his deep, scholarly, and humane study, *The Endeavour of Jean Fernel* (1946), has concluded a fine commentary on the old physiology thus: "To-day physiology *is* chemistry and physics," and he calls for "the liquidation" of the life-soul and the other forms of spirit on Fernel's list.

It seems a hard and severe sentence; but the biologists have an old-standing grievance against the metaphysicians, and are not prepared to show mercy on their doctrines. They say that the metaphysicians, meddling with biology, have retarded its progress. Harvey's activities as a metaphysician they pass over in silence, or with an expression of mild regret, because in his case there are extenuating circumstances in his great physiological discovery of the circulation. And it must be granted that Harvey in his studies of the blood and male seminal fluid was in serious error, and allowed his doctrine of the soul to usurp the place of physiology. But he made fundamental statements about the rational soul in man and the Soul of the Universe—statements which in this general form have been held by the great majority of mankind in all recorded time and which have been the mainstay of their thought and action. Is this great doctrine of soul or spirit now to go into liquidation?

This great question cannot be dealt with now; but, with Harvey's affirmations about the soul in our mind, it can be looked at in its broad significance and implications. It is more than a question of doctrine for debate between biologists and metaphysicians; it is of deep concern for all men in their daily lives.

Life Without Soul

This new, or rather old-new, theory of life without soul promises great benefits, but it seems to carry practical losses and risks. The biologist tells the ordinary plain simple man to forget the old fairy-tales about spirit and to accept the new and true chemical story about life, and the dialogue goes on:

Biologist: "The world, yourself, even your thoughts, all are a marvellous chemistry which has been operating the whole universe of things alive and dead, and for thousands of years past until now."

The Plain Man interrupts with a question: "Must there not be a great Chemist, who has made all this chemical stuff, and who directs this tremendous chemical operation?"

The Biologist: "That question raises the old hare of the First Cause, and I am not going to chase it. Such a question is beyond chemistry. In any case, you don't *need* a First Cause; and I can give you all you do need. As yet I can't make the stuff; but my power of destroying it gets greater and greater. I have come to know most of the secrets of the chemistry. So far as you are concerned, I am the manager; and if you do what I tell you I shall give you in abundance everything necessary for your life—every chemical need. But all this nonsense about spirit, you must cut it out of your life—to use a good chemical term, you must liquidate it."

The Plain Man: "About music; must I give up the spirit in my music?"

The Biologist: "There is a good story about an old man, Thomas Hobbes, who sang himself to sleep every night, singing out of tune and without spirit. His music was mainly chemical—noise and exercise, and for a chemical end—the promotion of his health, and yet his music without spirit helped him to live till the age of 90. Isn't that good enough?"

The Plain Man: "The loss of soul in music would be a heavy one for me. Another question: What about poetry, which means a great deal to me?"

The Biologist: "Poetry is full of soul-stuff too: its essence is spirit. Poetry would keep alive the false doctrine of spirit, and would have to be repressed or severely controlled."

The Plain Man: "This would be a dreadful loss. One more question: What about religion in the new chemical world?"

The Biologist: "Religion is a fairy tale which must be told no more, not even to your children. You are a grown man now; and you can and must do without it. Religion must go: it has done you grievous harm."

At this the plain man drops his head and is silent.

The Biologist (continuing): "Only look at what I have to offer you in exchange for your soul. In the language of an old book which you seldom read and which is now obsolete, I will pull down your old barns and build you bigger and better ones; and I will fill them to the roof with 'goods' that our newest chemistry will provide—food, clothing, health, long life, ease, and pleasure. The loss of your soul is nothing to what you will gain."

The Plain Man: "What you offer tempts me. Many of us plain folk need these chemical goods badly. But the idea of life without soul frightens me; it would be so flat and cold and dreary, and it might be dangerous. We have always been told that our souls are the best part of us. And yet your best chemists have searched every corner of us, and have found no chemical trace of soul. Could it not be that soul is of different and non-chemical stuff, that if you used other long-tried non-chemical methods of search, at once and everywhere, within our bodies and without, you would find soul?"

Conclusion

To sum up: Harvey's discovery of the circulation of the blood was the beginning of a new chapter in physiology. It may be compared to the appearance of the punctum saliens in the 4-day-old chick; "like a spark darting from a cloud" (his own words), it was the first sign of new life in European physiology, and was followed in a kind of epigenesis by a succession of other discoveries. Much of what he wished to do he left undone; but his unfinished work has been brought to fulfilment by others, and the verities of physiology are now no more in their chaos.

As to his teaching on the soul, both his particular doctrine of the soul and the blood, and his general statement of the soul in man and in animals, and the Soul of the Universe—all this has been rejected by modern biology. But biology has not said its last word, and is struggling even now to find its own metaphysic on the question of cause. Meantime Harvey's general statement on the soul is worth setting alongside those of other great minds in ancient times. *The Book of Wisdom*: "The Spirit of the Lord hath filled the whole earth." Aristotle: "All things are full of Soul." Virgil: "All things are full of Jove." Last, Harvey, speaking as a biologist: "For, as the same intelligence or spirit which incessantly actuates the mighty mass of the Universe . . . so also is there a *vis enthea*, a divine principle, inherent in our common poultry."

At the third annual general meeting of the British Rheumatic Association held on September 28 it was reported that the association is now established as a national organization and a registered charity. It maintains helpful connexions with the Ministry of Health and regional hospital boards. As the result of these, spa treatment can now be authorized under the National Health Service by a consultant in rheumatism, and those who can find their own accommodation can be treated as out-patients in any hospital rheumatic unit, subject to the recommendation of their own doctor and a recognized consultant. To meet the difficulties of rheumatics in finding accommodation close to centres where they can get urgently needed treatment, the association has promoted the formation of a housing society with charitable status under the title of B.R.A. Homes Limited to provide accommodation on a voluntary basis. Another of its activities is to provide flatlets for the old and disabled rheumatics within a certain income group. This will make it possible to combine geriatric with rheumatic treatment, which recent experience shows can relieve pressure on hospital beds.

ANTICOAGULANTS IN TREATMENT OF CORONARY THROMBOSIS

BY

JOHN A. TULLOCH, M.C., M.D., M.R.C.P.Ed.*
Registrar, Department of Cardiology, Royal Infirmary, Edinburgh

AND

A. RAE GILCHRIST, M.D., F.R.C.P., F.R.C.P.Ed.
Physician, Royal Infirmary, Edinburgh; Reader in Clinical Cardiology, Edinburgh University

Adequate care for the patient suffering from acute coronary occlusion is one of the most urgent problems in present-day therapeutics. A disease which statistics prove to be on the increase, which is afflicting younger lives (Ryle and Russell, 1949), and which after 25 years' study can still be shown to have a mortality rate of 40% among hospital patients within the first six weeks, is a challenge that for too long has been neglected.

Myocardial infarction, the result of coronary artery occlusion, now constitutes a large part of cardiological practice. The exact incidence of the condition throughout the general population is difficult to assess. All grades of severity are encountered, from the most severe cases dying immediately or within a few minutes or hours from the onset, to the very mild which experience little upset and have no ensuing disability. It is therefore the moderately severe or the complicated cases which provide the greater part of hospital experience. Statistics gathered from the hospitals cannot be applied to the population as a whole, but in this disease they certainly indicate the course followed by the moderately severe case treated, as we believe, under the best available conditions.

A study of the literature indicates that the immediate mortality following myocardial infarction varies widely in different centres and perhaps in different hospitals in the same city. In Table I the mortality rate ranges from the 78% of Newman (1946) to the 16% of Conner and Holt (1930). Our current Edinburgh experience has been assessed from two series of hospital patients, the first being composed of 100 consecutive cases of coronary thrombosis observed during the period 1939–46, before the introduction of anticoagulants; their mortality rate was 43%. A second series of 84 consecutive patients, forming the present control group and observed concurrently with a similar number receiving anticoagulants, had a mortality rate of 41%. Through the courtesy of physicians elsewhere in

TABLE I.—*Showing how the Mortality Rate Varies in Different Series of Patients in the First Few Weeks After the Acute Occlusion*

Author	No. of Cases	Mortality %	Remarks
Levine and Brown (1928) ..	145	53	
Conner and Holt (1930) ..	284	16	First attacks only
Harrington and Wright (1933) ..	148	54	
Master *et al.* (1936)	267	17	
" " (1937)	140	21	
Bland and White (1941) ..	200	19	4-weeks period
Levine and Rosenbaum (1941) ..	208	33	
Woods and Barnes (1941) ..	128	47	
Newman (1946)	50	78	Young adults
Katz and Mintz (1947) ..	572	22	
Yater *et al.* (1948)	866	52	Young adults; 4-weeks period
Wright *et al.* (1948)	368	24	

*Work done during the tenure of a Grocers' Company Research Scholarship, 1947–9.

this country—Dr. Boyd Campbell, Dr. J. H. Wright, and Professor Crighton Bramwell in personal communications—we are able to report hitherto unpublished mortality rates for hospital-treated cases of coronary thrombosis in Belfast, Glasgow, and Manchester. The findings, presented in Table II, indicate that, in the absence of any specific

TABLE II.—*Presenting Recent Experience of Mortality Rates After Coronary Thrombosis at Four Centres in this Country. Anticoagulants were Not Employed in the Treatment of These Patients. The Figures Indicate that Among Hospital-treated Patients 33% is an Average Mortality Rate During the First Six Weeks*

Locality	No. of Patients	No. of Deaths	Mortality %
Belfast (Boyd Campbell)	169	50	30
Glasgow (Wright, J. H.)	100	25	25
Manchester (Bramwell, C.)	50	13	26
Edinburgh: This series (*a*)	100	43	43
" " (*b*)	84	34	41
Total	503	165	33

therapeutic measures, coronary thrombosis has a mortality rate in the neighbourhood of 33% among hospital patients in this country.

Embolic and thrombotic episodes, which may handicap a convalescent patient or prove immediately fatal, are common after myocardial infarction. Such episodes comprise: (1) the sudden occlusion of a systemic artery; (2) the development of a fresh myocardial infarct or the spread of the occlusive process to adjoining branches of the affected artery, and hence an extension of the original damage; (3) peripheral phlebothrombosis, notably in the calf veins; and (4) pulmonary infarction. In recent years a much higher clinical incidence for thrombo-embolic phenomena after coronary occlusion has been recorded, suggesting that in earlier reports minor episodes had been overlooked. This is demonstrated in Table III. Mural thrombus formation

TABLE III.—*Showing that the Frequency with Which Thrombo-embolic Incidents after Coronary Thrombosis are Recognized has Apparently Increased in Recent Years*

	Authors	No. of Cases	No. with Thrombo-embolic Episodes
A. Early series	Gordinier (1924)	13	3
	Anderson (1928)	9	1
	Parkinson and Bedford (1928) ..	100	8
	Levine and Brown (1928) ..	145	17
	Conner and Holt (1930)	287	42
	Hyman and Parsonnet (1931) ..	51	17
	Howard (1934)	165	17
	Blumer (1937)	175	27
	Master *et al.* (1939)	500	29
		1,445	161 = 11·1%
B. Recent series	Nay and Barnes (1945)	100	37
	Peters *et al.* (1946)	60	10
	Glueck *et al.* (1948)	44	27
	Greisman and Marcus (1948) ..	100	21
	Wright *et al.* (1948)	368	92
		672	187 = 27·8%

on the endocardial surface of the infarcted area of the ventricle is present in 44% of necropsy cases, but all peripheral arterial occlusions are not necessarily embolic in origin (Hellerstein and Martin, 1947). It is during the first three weeks after the acute occlusion that thrombo-embolic incidents are most apt to occur (Nay and Barnes, 1945), and it is during this same period that an upset in the control of intravascular blood-clotting has been demonstrated (Ogura *et al.*, 1946). Using the Waugh–Ruddick (1944) heparin-retarded clotting test, Ogura and his colleagues observed the development of an enhanced clotting tendency in 75% of cases of recent myocardial infarction. An increased coagulability of the blood appeared during the first week, reached a maximum towards the end of the second week, and disappeared during the third week. Our own experience has been that there is considerable individual variation in the time of onset, duration, and degree of this change.

In the treatment of myocardial infarction the possibility of controlling this enhanced clotting tendency and preventing thrombo-embolic complications appeared attractive. The introduction of the anticoagulant dicoumarol made this supposition a practical measure. The earliest reports on anticoagulant therapy by Wright (1946) and Peters *et al* (1946) indicated that not only was the incidence of thrombo-embolic complications greatly lessened, but the immediate mortality rate was strikingly reduced. With the accumulation of further reports in the American literature, supplemented by the large-scale investigation at 16 leading hospital centres sponsored by the American Heart Association, the evidence is overwhelmingly in favour of this method of treatment. Table IV, constructed from American statistics, suggests that anticoagulants are capable of reducing the mortality rate by one-half.

TABLE IV.—*Constructed from Reports in Recent American Literature. Contrasts Mortality Rates in Cases Treated With and Without Anticoagulants. The Mortality Rate is Apparently Halved by the Use of these Drugs*

Author	Anticoagulant Cases		Control Cases	
	Total	Deaths	Total	Deaths
Wright (1946)	76	15	—	—
*Peters *et al.* (1946)	50	2	60	13
Nichol (1947)	68	11	—	—
Parker and Barker (1947) ..	50	5	—	—
*Greisman and Marcus (1948)	75	7	100	35
Glueck *et al.* (1948)	44	9	44	20
Reich and Eisenmenger (1948) ..	30	4	—	—
*McCall (1948)	71	9	—	—
Wright *et al.* (1948)	432	65	368	88
Hilton *et al.* (1949)	38	5	76	18
Loewe and Eiber (1949) ..	20	1	—	—
	954	133	648	174
Mortality rate ..	13·8%		26·8%	

* Cases dying within 48 hours of admission are not included.

Whether all cases derive equal benefit has not been adequately investigated. Wright *et al.* (1948) indicated that males aged 60 years and over showed greatest improvement, and Greisman and Marcus (1948) in a small series reported a greater improvement among males than among females. The present investigation, now to be reported, was begun in 1947 with the object of assessing the value of anticoagulant therapy in myocardial infarction and of determining, if possible, the type of case most likely to benefit from this form of treatment.

Material

During the past three years 154 cases of myocardial infarction have been observed and treated. These comprise two series of cases: one series, consisting of 84 cases, was treated by conventional conservative measures and constitutes the "control" series; the second series, consisting of 70 cases, received anticoagulant therapy during the first three weeks after admission in addition to the standard forms of treatment, and constitutes the "treated" series. All cases were unselected, their inclusion in one or other series being determined by the day of their admission to hospital. All cases admitted to one medical block were treated conservatively, whereas all cases admitted to a second block received anticoagulants—unless some contraindication to their use existed. Both series comprise, therefore, the everyday emergency admissions to a medical ward. No case was admitted specifically for anticoagulant therapy. All cases admitted and dying within six hours of admission have been excluded from both series, as insufficient time had elapsed for any benefit to result from the treatment given.

Diagnosis was based on the history and the usual signs, supported by positive electrocardiograms in 134 of 136 patients thus examined, and by the course of the illness. Cases in which a doubt existed regarding the presence of a recent myocardial infarct have been rigorously excluded from the series under review.

Treatment

The routine treatment adopted for all cases consisted in rest in bed for five to six weeks, morphine for relief of pain, sedation with phenobarbitone, low calorie intake, graduated exercises from the fourth week, and treatment of complications as and when they arose. The "treated" series received in addition heparin and dicoumarol (64 cases) or dicoumarol alone (6 cases). Heparin was given by the interrupted intravenous injection method, the interval between injections being 8 hours in 62 cases and 6 hours in two cases, the later two cases having both experienced thrombo-embolic complications before their admission to the ward. Except in the first few cases, each injection consisted of 10,000 units of heparin. Adequacy of dosage was assessed by estimation of the clotting time one hour after the injection, using the Lee–White (1913) method. A time of 20 minutes, three or four times the normal value, was regarded as satisfactory. The injections of heparin were stopped as soon as a therapeutic reduction in prothrombin content had been achieved with dicoumarol. The object in using the latter drug was to obtain a prothrombin content less than 30% of normal (Allen, 1947). This level was seldom attained before the fourth or fifth day of treatment. Dicoumarol was therefore started on the day of admission, the dose being 300 mg. on the first day, 200 mg. on the second day, and 100–200 mg. on the third day. All subsequent doses of dicoumarol were determined in relation to the daily estimation of the prothrombin time. The Fullerton (1940) modification of the Quick method, using venom as the source of thrombokinase, was the technique employed. It was appreciated that at low concentrations of prothrombin this method is less sensitive than the original Quick method in detecting minor variations in prothrombin content, but the same technique was used throughout this series.

The daily dose of dicoumarol was regulated approximately by the following guide: using a control prothrombin time of 19 seconds, 100–200 mg. of dicoumarol was given if the patient's prothrombin time was under 28 seconds, but if the prothrombin time was over 28 seconds a dose of 0–100 mg. was given. In regulating the dicoumarol dosage, Wright (1950) commends the Sterling Nichol formula whereby the ideal prothrombin therapeutic level is maintained between two and two-and-a-half times the control prothrombin-time for that day in the laboratory (Nichol and Borg, 1950). It is important to note that, unfortunately, there is no clinical guide to the regulation of dosage with this drug. Individuals vary greatly in their susceptibility to it, and the appropriate dose on any one day can be ordered only when the laboratory has reported on the prothrombin-time existing on that date. Patients given dicoumarol without laboratory control may bleed heavily. Even 150 mg. daily may lead to serious haemorrhage in a short period of time.

A minimum period of three weeks of dicoumarol therapy was decided upon for three reasons: (1) the great majority of thrombo-embolic phenomena occur during that period; (2) the clotting tendency previously mentioned tends to disappear towards the end of the third week; and (3) the effect of dicoumarol persists for several days after administration of the drug has ceased.

In this series the total dicoumarol dosage in the three weeks of treatment ranged from 1,100 mg. to 4,200 mg., the majority of cases receiving 2,000 to 3,000 mg. Haemorrhagic complications were treated by stopping the drug, and, if severe, by administration of vitamin K, 50 mg. intravenously as a single dose, with 100 to 150 mg. daily by mouth.

Comparison of Two Groups

Before drawing any conclusions regarding the efficacy of anticoagulant therapy it is necessary to compare the two series of cases in respect of similarity in important details. The immediate prognosis in myocardial infarction depends on a number of factors, which should be equally distributed between the two groups. Both series have therefore been analysed in respect of (1) age, (2) sex, (3) pre-existing hypertension, (4) pre-existing angina pectoris, (5) number of previous myocardial infarcts, (6) obesity, (7) myocardial state prior to the infarct, (8) duration from onset of symptoms to admission to hospital, (9) degree of shock at the onset, (10) incidence of heart failure, thrombo-embolic phenomena, and arrhythmias after the infarct, and (11) mortality rate within the first six weeks after the infarct.

Details of the age and sex incidence are given in Table V.

TABLE V.—*Presenting Details of the Age and Sex Incidence of the 154 Cases of Coronary Thrombosis Comprising the Present Series. The "Control" Series Consisted of 84 Patients and the "Treated" of 70 Patients Receiving Anticoagulants*

Age	Male				Female			
	Total		Died in Ward		Total		Died in Ward	
	Control	Treated	Control	Treated	Control	Treated	Control	Treated
35– ..	1	1	1	—	—	—	—	—
40– ..	—	2	—	—	—	—	—	—
45– ..	9	4	1	—	1	—	—	—
50– ..	5	11	1	1	1	2	—	—
55– ..	8	8	2	1	6	1	4	2
60– ..	15	13	4	3	8	10	5	2
65– ..	9	3	3	1	7	9	4	3
70– ..	6	4	5	1	4	2	1	—
75+ ..	1	—	1	—	3	—	2	—
Total	54	46	18	7	30	24	16	9

In the control series the males averaged 60 and the females 64 years of age, while in the treated series the males averaged 57 and the females 64 years. So far as sex and age distributions are concerned, it appears that the two samples—control and treated—are sufficiently homogeneous to warrant comparison. As shown in Table VI, the incidence of hypertension and previous angina pectoris did not differ widely in the two groups, though the incidence of obesity

TABLE VI.—*Showing that the Incidence of Hypertension and Previous Angina Pectoris did Not Differ Widely Between the Two Groups, Though the Incidence of Obesity was Almost Twice as Great in the "Treated" Series*

	Male		Female	
	Control	Treated	Control	Treated
Previous hypertension	33 (61%)	24 (52%)	16 (53%)	19 (79%)
Previous angina ..	16 (30%)	20 (43%)	14 (47%)	15 (62%)
Obesity	12 (22%)	19 (41%)	12 (40%)	18 (75%)

Table VII.—*Showing that Multiple Attacks of Coronary Thrombosis had been More Commonly Experienced in Those Receiving Anticoagulants*

	Male				Female			
	Total		Died in Ward		Total		Died in Ward	
	Control	Treated	Control	Treated	Control	Treated	Control	Treated
First..	48	32	16	3	27	16	14	7
Second	6	10	2	3	2	3	1	1
Third	—	3	—	—	1	3	1	1
Fourth	—	1	—	1	—	1	—	—
Fifth..	—	—	—	—	—	1	—	—

was almost twice as common in the treated series. Table VII demonstrates that multiple attacks of coronary thrombosis had been more commonly experienced in the treated series. One remarkable woman among those receiving anticoagulants had survived five myocardial infarcts.

In all cases in which a satisfactory history was obtained an attempt was made to gauge the state of the myocardium before the onset of the acute coronary occlusion. In some patients the attack was preceded for months or years by definite angina of effort; others had had no exertional pain but were restricted by dyspnoea; others again admitted to no cardiac symptoms previous to the occlusion. By applying the standards of functional capacity adopted by the New York Heart Association (1939) we placed our patients in the following broad categories:

Grade I patients are symptom-free, ordinary physical activity causing no discomfort.

Grade II A patients experience a slight-to-moderate limitation of physical activity. Walking on the flat out of doors at an average pace constantly reproduces ischaemic pain or dyspnoea after a few hundred yards.

Grade II B patients have a moderate-to-great limitation of activity. Less than ordinary activity causes discomfort. In this group we include those people who experience angina on light household activity or walking 20 to 50 yards out of doors, and those who have recurrent spontaneous attacks at rest, perhaps awakening them from sleep.

Grade III patients are those unable to carry on any physical activity without discomfort. As a rule they are confined to bed, congestive failure in some form being already present.

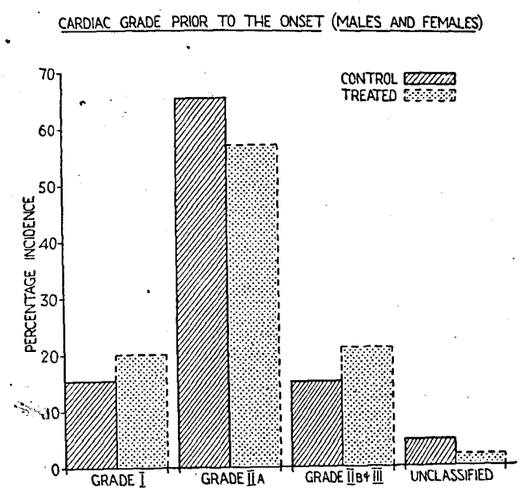


Fig. 1.—Incidence of various grades of functional capacity of the heart existing in the two series of cases of coronary thrombosis, previous to the onset of the acute occlusion. There is little difference between the "control" and the "treated" cases.

In applying this rough-and-ready measure of cardiac efficiency, we regarded symptoms developing comparatively suddenly during the two weeks immediately preceding the infarction as premonitory in nature and have not taken them into account in assessing the cardiac grade. The incidence of the various grades, which are evenly distributed between the two series, is shown in Fig. 1. Only in the treated series were there patients actually in congestive heart failure prior to the infarct.

For statistical purposes it is difficult to grade cases of myocardial infarction according to their severity. Clinically, the actual size of the infarct cannot be determined with much precision, nor does its extent determine the degree of shock. In an admittedly arbitrary fashion, the grade of shock, expressed according to clinical experience as severe, moderate, and mild or absent, may be taken as a measure of the severity of the illness. In a number of patients admitted some days after the onset the degree of shock could not be estimated, but Fig. 2 shows that the

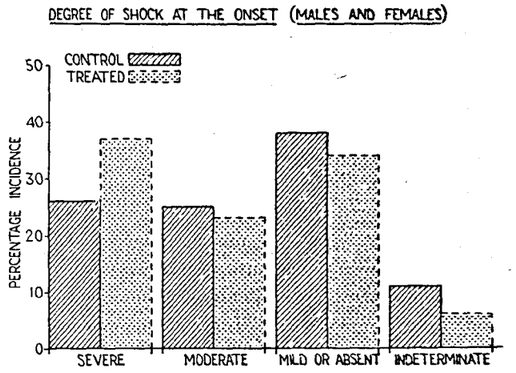


Fig. 2.—When the degree of shock is taken as a rough-and-ready measure of the severity of the attack of coronary thrombosis, the three grades—severe, moderate, and mild—were fairly evenly distributed between the two groups of patients.

three grades were fairly evenly distributed between the two series, with a preponderance of more severe cases in the treated group.

Finally, in the estimation of comparative mortality rates a further and commonly neglected factor has to be taken into consideration. A moment's reflection indicates that the mortality rate in a hospital series of cases of coronary thrombosis will be all the less the greater the delay in securing admission. It is known that the mortality rate in coronary thrombosis is highest in the first few days, and therefore the longer patients are excluded from the hospital the lower will be the death rate for the series, the more severe cases dying before admission. When the duration of illness before admission to hospital is compared, the two series—control and treated—are strikingly similar, 32% of the former and 34% of the latter arriving in hospital within 24 hours of the onset of the coronary occlusion (Fig. 3). Our two groups bear a close resemblance in this respect.

We may therefore conclude that the two samples—control and treated—in respect of sex and age distribution, pre-existing state of the heart muscle, severity of the acute attack, and duration of the illness before hospital treatment, are sufficiently homogeneous to warrant comparison.

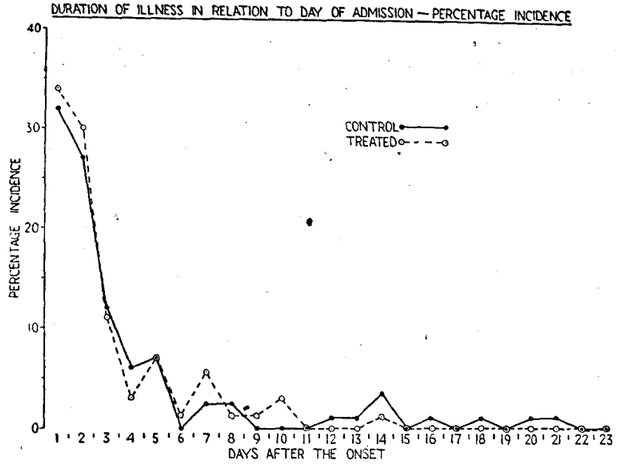


Fig. 3.—The duration of the illness as measured from the time of onset until admission to the ward is strikingly similar in the two groups, 32% of the "controls" and 34% of the "treated" arriving in hospital within the first 24 hours.

Results of Anticoagulant Therapy

In as severe an illness as coronary thrombosis it is natural to assess the results of treatment on the basis of (1) mortality rates and (2) incidence of thrombo-embolic complications.

Our experience is that 34 of the control group of 84 persons died within six weeks of the onset, giving a mortality of 40.5%. This contrasts with the 16 deaths among 70 persons in the treated series, with a mortality rate of 22.8%. It would appear that by efficient anticoagulant therapy during the first three weeks after the myocardial infarct the mortality rate in the first six weeks may be almost halved. Our experience confirms the American conclusions to which reference has already been made.

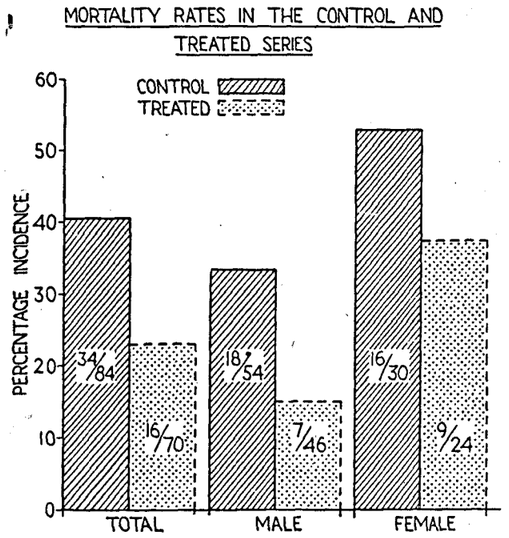


Fig. 4.—Efficient anticoagulant therapy reduces the total mortality rate by half. The difference is statistically significant among men. The smaller experience, based on 30 "control" and 24 "treated" females, does not justify similar conclusions among women.

When the sexes are considered separately it is apparent that the males show a greater improvement than do the females. The reduction in male mortality rate is of statistical significance, the degree of probability (P) being less than 0.05. In the control group of males the death rate was 33.3%—18 deaths among 54 men. In the treated group, composed of 46 males, 7 died, giving a mortality rate of 15.2% (Fig. 4). This is a striking difference, and, being of statistical significance, we conclude that in males, during the first six weeks after a myocardial infarct, the death rate can be reduced by half. Analysis of the figures for females does not allow similar deductions, largely owing to the smaller number of cases observed. In the control series 16 of the 30 females died, giving a mortality rate of 53.3%; whereas 9 deaths occurred among the 24 females in the treated series, the mortality rate being 37.5%. Such a difference is not of statistical significance.

In estimating the prognosis after myocardial infarction, one factor of great importance is the state of the heart muscle at the time when the acute coronary occlusion was sustained. By using the method of functional grading to which reference has already been made, it becomes apparent that those patients referred for treatment in the hospital who have been in Grade I immediately prior to their coronary occlusion seldom die, provided they survive the immediate effects of the occlusion long enough to be admitted to the ward. In contrast to this, patients in cardiac Grade II B when the infarct is sustained seldom recover. Grade III cases, already seriously handicapped, never recover. Fortunately, the majority of victims fall into the Grade II A capacity, and it is in this grade that every aspect of the case must be carefully considered.

Our patients classified as Grade II A prior to the infarct total 55 in the control group and 40 in the treated group, including 38 and 23 males respectively. The most striking difference is observed in the mortality of these Grade II A males. Among the control group the mortality was 31.6%, whereas among the treated males 1 of 23 died—a mortality of 4.4%. This improvement is of statistical significance, P being almost 0.01. We make no claim for any betterment in the other groups, male or female, but we suggest that when a larger series of some hundred cases is presented for statistical analysis it would be advantageous to have these patients assessed in regard to their functional capacity before the myocardial infarct was sustained. We have proof that it is possible to influence the course of events favourably in regard to males classified in Grade II A. Our figures do not suggest that one particular age group in either sex derives greater benefit than any other age group.

As a further test of the efficacy of anticoagulant therapy, the incidence of thrombo-embolic episodes in the two groups has been analysed (Fig. 5). No fewer than 24 patients (28.6%) in the control series developed thrombo-embolic complications of one kind or another while under observation, and 13 of these died. Ten deaths were the outcome of the thrombo-embolic complication, while in three cases death was unrelated to the complication. On the other hand, 9 (13%) of the 70 patients in the treated group developed thrombo-embolic complications, and of these 4 died. No death followed immediately on any such

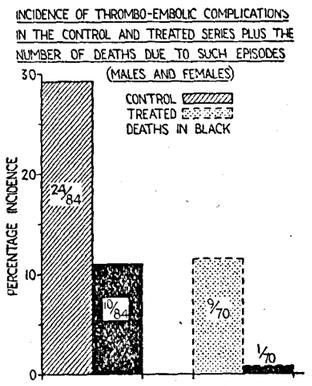


FIG. 5.—The incidence of thrombo-embolic complications was reduced from 28.6% in the "controls" to 13% in the anticoagulant "treated" group. In the "control" group 10 deaths were attributable to these complications, in contrast with one death in the "treated" series.

complication, but in one patient death was related to an embolic incident. The incidence of complications was 13% in the treated group—less than half that observed amongst the controls. Taking the incidence of complications separately between males and females, no significant reduction is observed statistically. However, as the data show no significant difference in the incidence of complications as between males and females, they may reasonably be taken together as one group, and if this is done there is then a significant difference in the incidence of complications between the treated and control groups (P being 0.01). We can therefore confirm the observation of Wright *et al.* (1948) that the incidence of thrombo-embolic complications in myocardial infarction can be reduced by half by the proper use of anticoagulants.

Marple and Wright (1948) have drawn attention to the possible relationship of a lapse in dicoumarol therapy to the occurrence of thrombo-embolic episodes. In this series seven patients sustained thrombo-embolic complications during the first four to five days of treatment, either while heparin was being given or during the 24 hours after the heparin had been stopped. The two episodes occurring at a later date developed in adequately treated males.

Other Complications

Other complications of significance occurring during the period of treatment in hospital were the development of heart failure and the occurrence of arrhythmias. Heart failure developed in 23 cases in each series—an incidence of 27% in the control series and 33% in the treated series. In the control series 17 of the 23 patients died—a death rate of 74%, but in the treated series only 13 died—a death rate of 56.5%. Arrhythmias occurred in seven cases of each series; four deaths occurred in the control group and five in the treated series.

The causes of death in the two series are listed in Table VIII. It will be seen that in the control series death resulted from a variety of causes, while in the treated series the great majority of patients died in heart failure. One patient in each series died suddenly from rupture of the infarcted area. Our necropsy experience in both series is small and unsuited for statistical analysis. In the control series 12 cases came to necropsy. Six showed mural thrombus formation; of these, four had had thrombo-embolic complications. In the treated group there were nine post-mortem examinations. Mural thrombus was found in the ventricles in two patients and thrombo-embolic phenomena were limited to one of these—the first female to be treated—in whom the anticoagulant therapy then employed would now be regarded as inadequate.

TABLE VIII.—*Causes of Death in the Two Series of Patients*

	Control	Treated
Heart failure	7	8
Persistent shock	2	—
Recurrence of myocardial infarct	5	—
Cerebral embolus	3	1
Sudden death	10	7
Coma	1	—
Death within 24 hours of onset	6	—

General Considerations

All the reports in the literature substantiate the claim that anticoagulants are at the present day a remedy of outstanding value in the treatment of coronary thrombosis By their proper use the death rate and the incidence of thrombo-embolic complications can each be reduced by half—a very substantial contribution to the treatment of this serious disease.

Unfortunately, with the anticoagulants at present available, it is a tedious and difficult form of therapy, depending upon laboratory facilities, a reliable technique, and trustworthy technicians in whose hands is the life of the patient. More laboratory assistants require to be trained for this work so that this particular treatment can be made available to larger sections of the community, even outside the walls of the hospital. Until a domiciliary service can be arranged, the only alternative is to refer such cases of coronary occlusion as are fit to be moved, to those institutions where appropriate laboratory facilities exist for the control of anticoagulant therapy. The practitioner can always begin treatment with heparin in the patient's home, but at present the coumarol compounds cannot be used without daily estimations of prothrombin time. The mortality rate for coronary thrombosis throughout the general population will fall when a larger number of hospital beds are made available for its treatment and when a domiciliary laboratory service provides the practitioner with technical help, without which this particular treatment cannot be undertaken.

No doubt the use of anticoagulants may be simplified in the future. At the present time they are difficult to handle A painless, inexpensive, slow-acting but reliable substitute for intravenous heparin would be a great advantage. We have been disappointed in depot-heparin and heparin-retard, partly on account of the intense and persistent local pain after the intramuscular injection and partly on account of irregular absorption. "Heparin-Evans" (25,000 units per ml.) has proved more satisfactory when given at eight-hour intervals intramuscularly in doses of 20,000 units. This amount will usually maintain a clotting time in excess of 20 minutes throughout an eight-hour period. We have no personal experience of new synthetic heparin-like substances, such as "paritol," which have the virtue of cheapness and are now under clinical trial (Sorenson *et al.*, 1949). "Tromexan" (Burt, Wright, and Kubik, 1949) possesses certain advantages over dicoumarol in that it comes into action more quickly and is less cumulative The oral dose being larger, it can be more easily adjusted from day to day. It should be given in divided amounts at 6-hour to 12-hour intervals according to the morning prothrombin-time.

Finally, it is worth emphasizing that there are definite contraindications to dicoumarol and tromexan. In view of the risk of serious haemorrhage, they should not be used in the presence of hepatic or renal disease, or the severer anaemias, pregnancy, or vitamin deficiencies. Any ulcerated surface, particularly of mucous membranes, such as a peptic ulcer or a diverticulitis, may bleed profusely when these drugs are used.

Conclusions

Anticoagulant therapy, suitably controlled by specialized techniques, reduces by one-half the mortality rate during the first six weeks after myocardial infarction. Our experience is that it appears to benefit males to a greater extent than females, particularly men whose myocardial efficiency was only slightly impaired before the acute damage was sustained.

Thrombo-embolic complications are reduced by half, and, when they do occur, fatalities are lessened.

Anticoagulant therapy cannot succeed in the absence of strict attention to the established methods of treatment. It does not shorten the stay in bed.

It should be considered for every sufferer from myocardial infarction. This implies an extension of laboratory facilities for the regulation of treatment and a greater number of hospital beds set aside for this purpose. A scheme for domiciliary laboratory control is desirable if the practitioner is to continue to care for these patients.

For the purposes of this investigation Professor Stanley Davidson, Dr. W. D. D. Small, and Dr. W. A. Alexander have kindly given us access to patients suffering from coronary thrombosis under their immediate charge in the Royal Infirmary. We are also indebted to Mr. George Waugh, F.F.A., of the Scottish Statistical Research Bureau, for help in the statistical analysis of our findings.

References

Allen, E. V. (1947). *J. Amer. med. Ass.*, **134**, 323.
Anderson, J. P. (1928). *Ann. intern. Med.*, **2**, 248.
Bland, E. F., and White, P. D. (1941). *J. Amer. med. Ass.*, **117**, 1171.
Blumer, G. (1937). *Ann. intern Med.*, **11**, 499.
Bramwell, C. (1950). Personal communication.
Burt, C. C., Wright, H. P., and Kubik, M. (1949). *British Medical Journal*, **2**, 1250.
Campbell, S. B. B. (1950). Personal communication.
Conner, L. A., and Holt, E. (1930). *Amer. Heart J.*, **5**, 705.
Fullerton, H. W. (1940). *Lancet*, **2**, 195.
Glueck, H. I., Strauss, V., Pearson, J. S., and McGuire, J. (1948). *Amer. Heart J.*, **35**, 269.
Gordinier, H. C. (1924). *Amer. J. med. Sci.*, **168**, 181.
Greisman, H., and Marcus, R. M. (1948). *Amer. Heart J.*, **36**, 600.
Harrington, A. W., and Wright, J. H. (1933). *Glasgow med. J.*, **119**, 1.
Hellerstein, H. K., and Martin, J. W. (1947). *Amer. Heart J.*, **33**, 443.
Hilton, J. H. B., Cameron, W. M., Townsend, S. R., and Mills, E. S. (1949). *Canad. med. Ass. J.*, **60**, 134.
Howard, T. (1934). *Med. Times and Long Island med. J.*, **62**, 337.
Hyman, A. S., and Parsonnet, A. E. (1931). *J. med. Soc. N.J.*, **28**, 831.
Katz, L. N., and Mintz, S. S. (1947). *Arch. intern. Med.*, **80**, 205.
Lee, R. I., and White, P. D. (1913). *Amer. J. med., Sci.*, **145**, 495.
Levine, S. A., and Brown, C. L. (1928). *Medicine*, **8**, 245.
—— and Rosenbaum, F. F. (1941). *Arch. intern. Med.*, **68**, 913.
Loewe, L., and Eiber, H. B. (1949). *Amer. Heart J.*, **37**, 701.
McCall, M. (1948). *Amer. J. med. Sci.*, **215**, 612.
Marple, C. D., and Wright, I. S. (1948). *Stanford med. Bull.*, **6**, 447.
Master, A. M., Dack, S., and Jaffe, H. L. (1936). *Amer. Heart J.*, **12**, 549.
—— —— —— (1937). Ibid., **13**, 330.
—— —— —— (1939). *Arch. intern. Med.*, **64**, 767.
Nay, R. M., and Barnes, A. R. (1945). *Amer. Heart J.*, **30**, 65.
Newman, M. (1946). *Lancet*, **2**, 409.
New York Heart Association (1939). *Nomenclature and Criteria for Diagnosis of Diseases of the Heart*, 4th ed. New York.
Nichol, E. S. (1947). *Amer. Heart J.*, **33**, 722.
—— and Borg, J. F. (1950). *Circulation*, **1**, 1097.
Ogura, J. H., Fetter, H. R., Blankenhorn, M. A., and Glueck, H. I. (1946). *J. clin. Invest.*, **25**, 586.
Parker, R. L., and Barker, N. W. (1947). *Proc. Mayo Clin.*, **22**, 185.
Parkinson, J., and Bedford, D. E. (1928). *Lancet*, **1**, 4.
Peters, H. R., Guyther, J. R., and Brambell, C. E. (1946). *J. Amer. med. Ass.*, **130**, 398.
Reich, C., and Eisenmenger, W. (1948). *Amer. J. med. Sci.*, **215**, 618.
Ryle, J. A., and Russell, W. T. (1949). *Brit. Heart J.*, **11**, 370.
Sorenson, C. W., Seifter, J., and Wright, I. S. (1949). *Bull. N.Y. Acad. Med.*, **25**, 448.
Waugh, T. R., and Ruddick, D. W. (1944). *Canad. med. Ass. J.*, **50**, 547.
Woods, R. M., and Barnes, A. R. (1941). *Proc. Mayo Clin.*, **16**, 341.
Wright, I. S. (1946). *Amer. Heart J.*, **32**, 20.
—— Marple, C. D., and Beck, D. F. (1948). Ibid., **36**, 801.
—— (1950). *Postgrad. Med.*, **7**, 161.
Wright, J. H. (1950). Personal communication.
Yater, W. M., Traum, A. H., Brown, W. G., Fitzgerald, R. P., Geisler, M. A., and Wilcox, B. E. (1948). *Amer. Heart J.*, **36**, 334, 481, 683.

CAPILLARY RESISTANCE AND ADRENO-CORTICAL ACTIVITY

BY

H. N. ROBSON, M.B., M.R.C.P.Ed.

AND

J. J. R. DUTHIE, M.B., F.R.C.P.Ed.

(From the Department of Medicine, University of Edinburgh; Rheumatic Unit, Northern General Hospital; and the Eastern General Hospital, Edinburgh)

The starting-point of the present investigation was the observation that the resistance of skin capillaries to rupture by negative pressure rises sharply after many types of surgical operation (Scarborough, 1944). It was decided to study the effects on capillary resistance of other types of tissue damage. The variety of such types of damage which produced increased capillary resistance led to the possibility that this rise might be produced by any form of non-specific stress. Positive results were obtained after the application of various forms of stress. Interest was then stimulated by recent work on the physiology of the pituitary – adrenal axis, and it seemed possible that all the conditions which had been investigated were such as would lead to activation of this axis through the release of endogenous adrenaline or through some other pathway as yet unknown. This paper describes the investigations outlined above, leading to the study of the effects of the injection of adrenocorticotrophic hormone (A.C.T.H.) on capillary resistance.

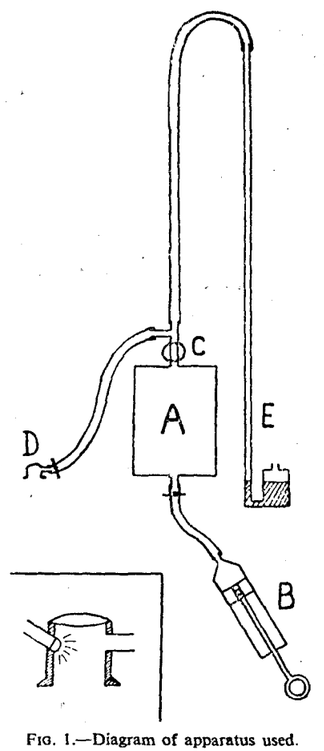


FIG. 1.—Diagram of apparatus used.

Methods

Capillary resistance has been measured throughout these studies by a negative pressure method. The apparatus (Fig. 1) was the same as that used by

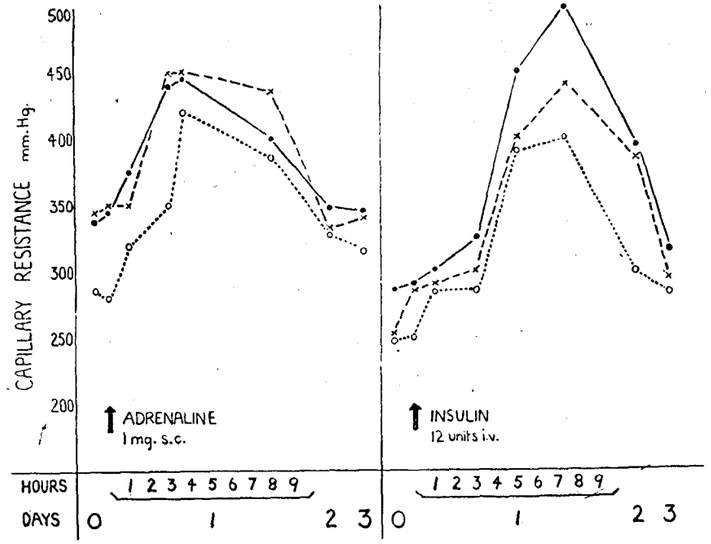


FIG. 2.—Changes in capillary resistance following (*a*) the injection of adrenaline, and (*b*) the production of insulin hypoglycaemia.
×----× Medial elbow region. O.....O Lateral elbow region.
●——● Wrist region.

Scarborough (1941). Negative pressure is created in the reservoir (A) by means of a suction pump (B). The control valve (C) allows suction to be applied to the skin in the test area through the cup (D). The degree of negative pressure is recorded on the mercury manometer (E). The suction cup used has an internal diameter of 20 mm. A lens of ×10 is incorporated in the roof of the cup. Standard illumination is obtained from an endoscope bulb which projects from the wall of the cup and is lit by a 2-volt dry battery.

The principle employed in using this apparatus was the determination of the "critical petechial pressure"—that is, that negative pressure which when applied for 30 seconds would produce one or two petechiae only in the test area. At each estimation three standard areas on the volar aspect of the forearm were tested (Scarborough, 1941), the same arm being used throughout studies on any one patient, and, when recorded daily, readings were taken at approximately the same hour. In order to reduce the number of trial readings at any one estimation, alterations in pressure were usually made at intervals of 500 mm. Hg. It has been found by experience that when any given pressure produces up to but not more than 10 petechiae it is usually unnecessary to make further trial, since a pressure of 50 mm. less will not produce any petechiae. If more than 10 petechiae are produced, then it is necessary to repeat the observation at a lower pressure in an immediately adjacent area. For the purposes of graphing results only, it has been assumed that between the intervals of 50 mm. of pressure the "critical petechial pressure" is proportional to the number of petechiae produced.

With the technique described here the average range of normal capillary resistance is 250 to 350 mm. Hg, but occasional wide variation in normal individuals is encountered within a range of 200 to 450 mm. Hg (Bell, Lazarus, Munro, and Scarborough 1942).

Factors Influencing Capillary Resistance

Physical Agents—Heat, Cold, and Ultra-violet Light.—The environmental temperature is known to affect capillary resistance. Von Borbély (1930) showed that immersion of the body in a warm bath caused a fall in resistance, while a cold bath gave rise to increased resistance. Rossman (1940–1) showed that heating of the whole body in an inductotherm caused lowering of resistance during the period of heating, followed by a rapid rise to supranormal levels when heating was discontinued. Patients undergoing inductotherm treatment have been studied here. No observations were possible during the period of heating.

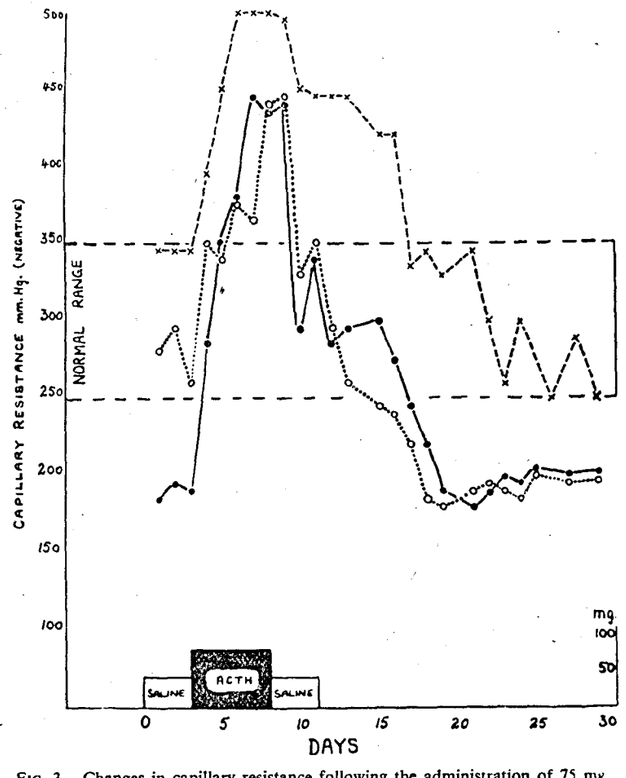


FIG. 3.—Changes in capillary resistance following the administration of 75 mg. A.C.T.H. daily for five days in a case of rheumatoid arthritis.

Table Showing Results in Cases of Rheumatoid Arthritis

Case No.	Area	Range of Readings in Control Period		Readings at 4 hr. after 25 mg. A.C.T.H.		Readings at 8 hr. after 25 mg. A.C.T.H.		Maximum Resistance Attained (mm.Hg)	Time to Reach Maximum (hr.)	Time Taken to return to Control Levels (days)	Total Dose of A.C.T.H. (mg.)
		Capillary Resistance (mm.Hg)	Eosins. (c.mm.)	Capillary Resistance (mm.Hg)	Eosins. (c.mm.)	Capillary Resistance (mm.Hg)	Eosins. (c.mm.)				
1	M.E. L.E. W.	240–275 100–250 190–290	141–225	—	52	—	—	400 350 500	72	10	1,050
2	M.E. L.E. W.	325–350 200–250 225–250	166–255	400 250 350	92	360 240 300	114	500 390 400	26	2	75
3	M.E. L.E. W.	340–350 260–300 190–200	152–184	400 375 300	88	350 290 250	109	500 450 450	84	10	375
4	M.E. L.E. W.	320–350 250–300 200–300	66–145	400 400 270	26	450 400 270	50	500 500 420	72	14 (2 areas only)	375
5	M.E. L.E. W.	250–290 200–230 275–290	330–386	300 220 300	120	350 275 380	—	400 350 500	72	12	375
6	M.E. L.E. W.	300–340 250–340 300–340	602–881	380 370 450	266	370 360 400		500 470 500	72	40	375

M.E., medial elbow region. L.E. lateral elbow region. W., wrist region.

but readings taken after removal of the patient from the inductotherm confirmed Rossman's observation that a marked increase in resistance occurs. Franke (19) reported that exposure to ultra-violet light gave rise to diminished resistance during the period of skin erythema, but that if exposure was continued resistance rose to supranormal levels.

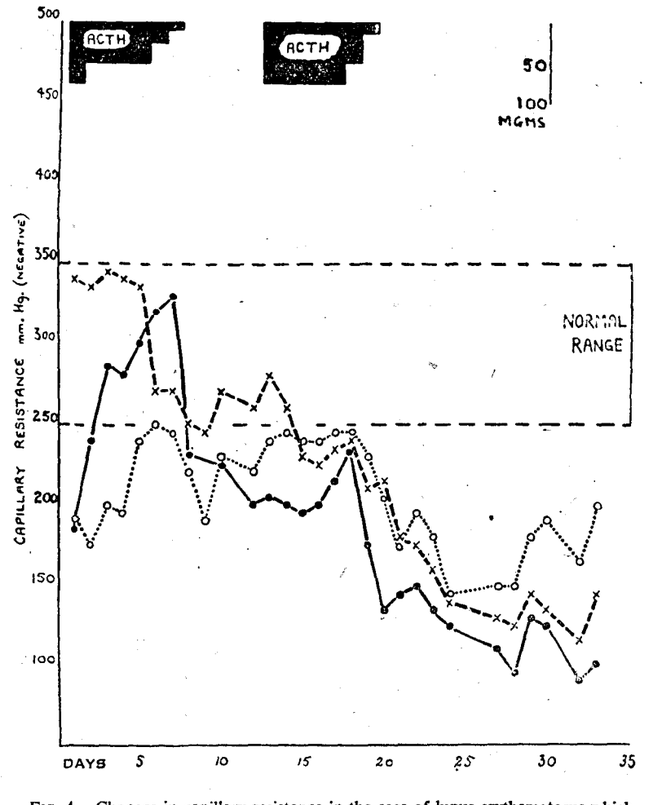


FIG. 4.—Changes in capillary resistance in the case of lupus erythematosus which showed a poor clinical response to A.C.T.H., and in which there was a fatal termination.

X-ray Irradiation.—Capillary resistance has been measured in patients having radiotherapy for various types of malignant disease. In most cases a marked rise in capillary resistance occurred within three to four days of the beginning of therapy and was maintained during the course. These findings are to be fully described elsewhere (Robson and Court Brown, to be published).

Mitotic Poisons: Nitrogen Mustard.—The intravenous injection of nitrogen mustard in cases of reticulosis has also been found to cause a sharp rise in capillary resistance, sustained for some days after completion of the course of injections.

It seemed possible that, since the agents described above caused some degree of tissue damage, their effects on capillary resistance might be due to the action of histamine or histamine-like substances released by tissue breakdown.

Histamine.—Franke (1943) reported that 1 mg. of histamine injected subcutaneously caused an initial fall in capillary resistance, which was maximal in about 20 minutes, with a return to basic readings in about 45 minutes. He did not record observations beyond that point. Wyss and Gianoli (1946) confirmed these findings. The technique employed in the present investigation was the intravenous infusion of 3 mg. of histamine in a saline drip over a period of one to two hours, usually in cases of rheumatoid arthritis. Capillary resistance was found to fall during the period of infusion of the drug, returning to basic levels in about two hours, and rising thereafter to supranormal levels, the increase being sustained for about 24 hours. The pattern of change in capillary resistance following the infusion of histamine, while bearing some resemblance to the effects of heating and burning, was not the same as that produced by cold, or by surgical operations, irradiation, or mitotic poisons.

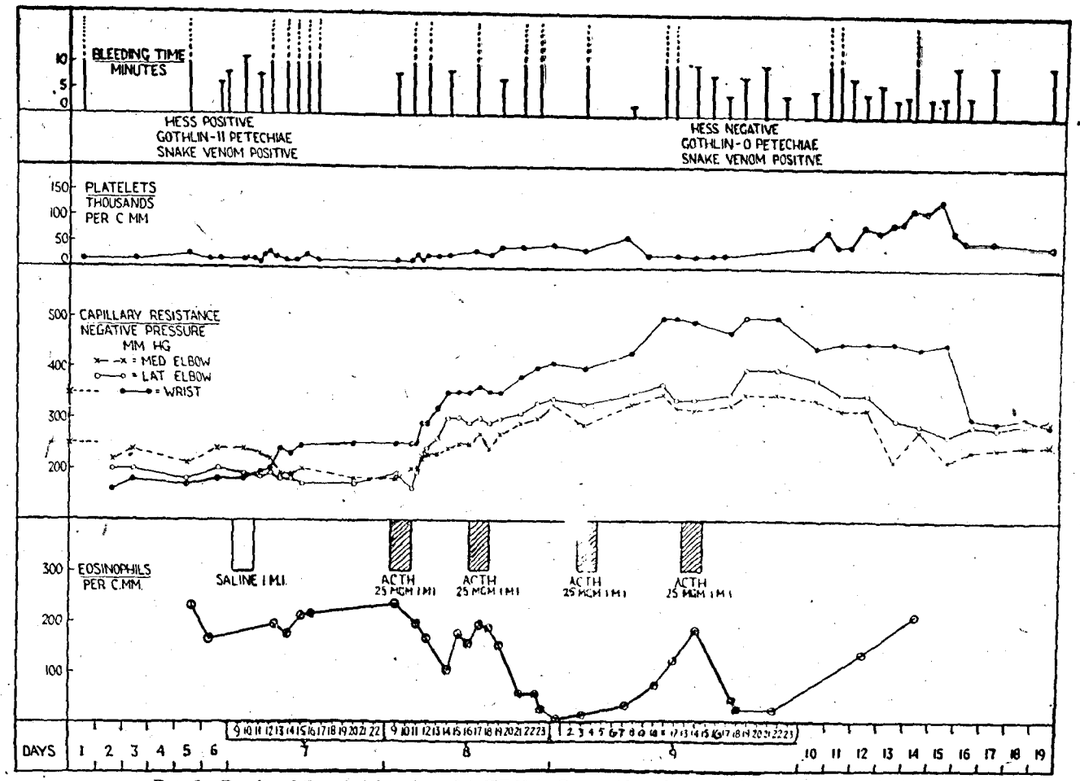


Fig. 5.—Results of the administration of A.C.T.H. in Case A (thrombocytopenic purpura)—first course.

Protein Shock by T.A.B. Vaccine.—Protein shock produced by the injection of T.A.B. vaccine was studied. A fall in resistance was generally recorded during the period of mounting pyrexia, but this was followed by a rapid rise to supranormal levels, reaching a maximum in three to four hours and thereafter slowly returning to the baseline in 36 to 48 hours.

Adrenaline.—It was decided to observe the effects of the injection of adrenaline, since the "alarm reaction" of Cannon is produced by the endogenous release of this substance. Observations were made following the injection of 1 mg. of adrenaline intravenously or 1 to 2 mg. subcutaneously. With either route a rise in capillary resistance has constantly been found, detectable within two hours of the injection, reaching a maximum in four to six hours, and thereafter returning to base levels in 24 to 36 hours. An example is shown in Fig. 2. Similar results have been described by Parrot, Lavollay, and Galmiche (1944) and by Lavollay (1944).

Insulin Hypoglycaemia.—The results obtained by the injection of adrenaline prompted the study of the effects of hypoglycaemia, since this is known to be an effective stimulus to the endogenous release of adrenaline. Observations were made following the injection of soluble insulin, either intravenously in doses of 10 to 15 units, or subcutaneously in doses of 30 to 50 units. One example of the result is shown in Fig. 2. An increase in capillary resistance is usually detectable about one to two hours after the hypoglycaemia is manifest, reaching a maximum in four to six hours, and returning to control levels in about 48 hours.

The observations, when considered in the light of recent work which suggests that adrenaline stimulates the production of A.C.T.H. from the anterior pituitary, led to the idea that increased capillary resistance might be a manifestation of increased adrenocortical activity.

A.C.T.H. and Capillary Resistance

In the course of wider clinical investigations an opportunity arose to study the effects of A.C.T.H. on capillary resistance. Among the cases which have been studied were six examples of rheumatoid arthritis, two of ankylosing spondylitis, two of disseminated lupus erythematosus, and two of idiopathic thrombocytopenic purpura.

Rheumatoid Arthritis

Six patients suffering from this condition have been studied. Fig. 3 illustrates the changes in capillary resistance resulting from the administration of 75 mg. A.C.T.H daily for five days in one of these cases. The accompanying Table gives brief details of the findings in the six cases. Illustrated are the changes in response to the first dose (25 mg.), the time taken to reach maximum resistance on a dosage of 25 mg. eight-hourly, and the time taken for capillary resistance to return to control levels after the course was completed. It may be seen that a single dose of 25 mg. of A.C.T.H. produced a significant rise in one or more areas within four hours in all except one case, in which the response was delayed. In this latter case resistance was raised at eight hours after the injection, by which time the others had in general shown a tendency to return to base levels. In all cases, continued administration of A.C.T.H. in doses of 25 mg. eight-hourly resulted in a marked elevation of capillary resistance, reaching a maximum in about 72 hours. Resistance was maintained at this high level for the remainder of the period of administration. When A.C.T.H. was stopped the resistance fell at varying speeds, reaching base levels again in 10 to 14 days. (In Cases 4 and 6 the return was much slower.) No case has been encountered in which a significant fall in eosinophils has not been accompanied by a definite rise in capillary resistance. The extent and speed of the increase in resistance, however, have not necessarily corresponded exactly with the percentage fall in eosinophils. The extent and duration of the increased resistance have borne only a rough correspondence to the clinical effects achieved by the A.C.T.H.

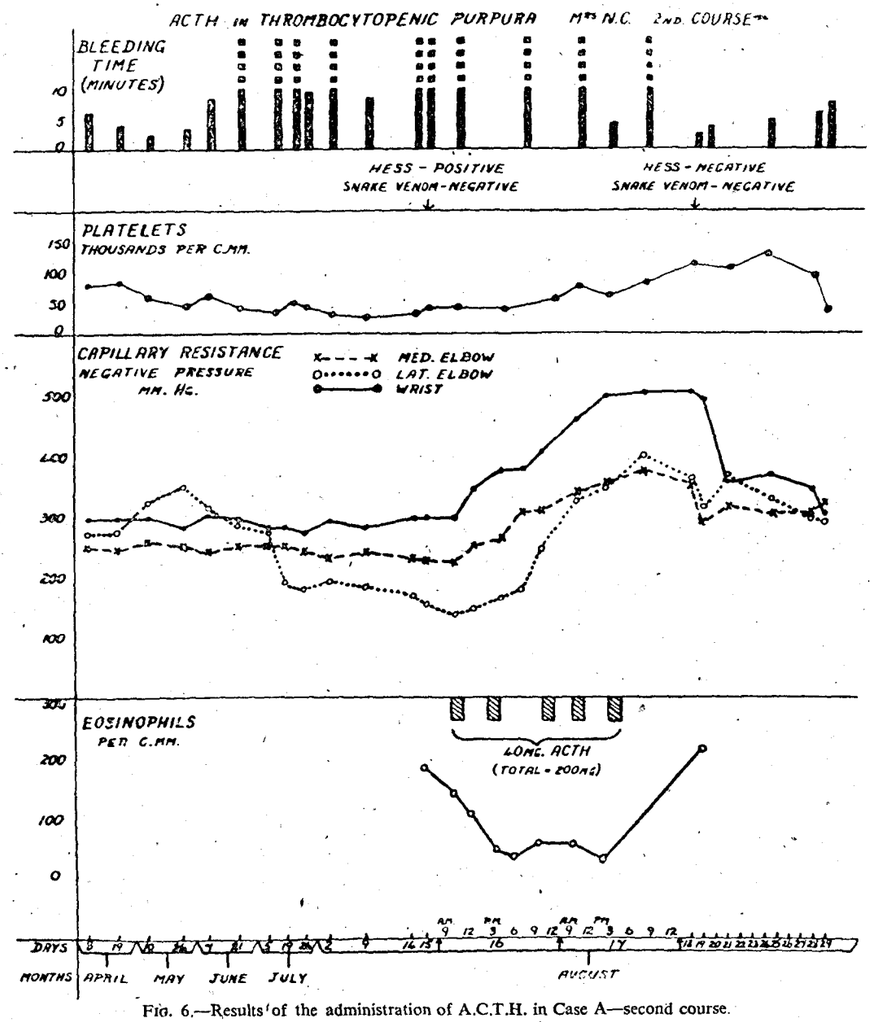


Fig. 6.—Results of the administration of A.C.T.H. in Case A—second course.

Spondylitis Ankylopoletica

Two patients suffering from this condition have been studied. In both a marked increase in capillary resistance was observed following the administration of 75 mg. daily. Resistance reached maximum level in both about 48 hours after the first injection. In both cases resistance fell quickly on completion of the five-day course of A.C.T.H.

Disseminated Lupus Erythematosus

Two patients suffering from this condition have been studied. In both cases capillary resistance was low in the observation period. In one case, eosinophils, which had been entirely absent from the peripheral blood, reappeared before A.C.T.H. was given. A course of A.C.T.H. lasting seven days (total dose 340 mg.) resulted in a marked clinical improvement, a reduction in circulating eosinophils, and a definite increase in capillary resistance. This increase was not long sustained after A.C.T.H. was discontinued, and resistance returned to base levels in four days. Clinical relapse was also quickly evident. The findings in the second case are illustrated in Fig. 4, where it may be seen that the expected increase in resistance did not take place. The patient showed a poor clinical response to A.C.T.H.; her condition steadily deteriorated and death occurred. Eosinophils were absent from the peripheral blood in this case throughout the entire period of observation, before, during, and after the administration of A.C.T.H. At necropsy both adrenals were found to be small, and on section it was noted that lipoid was extremely scanty in the zona fasciculata.

Idiopathic Thrombocytopenic Purpura

Since low capillary resistance is generally regarded as one of the principal features of idiopathic thrombocytopenic purpura, it seemed of interest to ascertain the effect of giving A.C.T.H. in this condition. Reports of two cases follow.

Case A.—A woman aged 33 had had a prolonged episode, starting in 1946 and continuing until spontaneous remission occurred in 1948. During this time she had suffered from ecchymoses and recurrent petechial rashes, but no haemorrhagic incidents had occurred. In December, 1949, on the twelfth day of the puerperium of a normal pregnancy and delivery, ecchymoses and petechiae reappeared. These, together with thrombocytopenia, continued without remission up to the time of the present investigation. The results of the initial administration of 100 mg. of A.C.T.H. in four divided doses are shown in Fig. 5. It may be seen that a definite rise in capillary resistance occurred, reaching a maximum after 75 mg. had been given. When the drug was discontinued, capillary resistance returned slowly towards the control levels in approximately seven days. During the period of elevated resistance the Hess test became negative, but the snake-venom test remained positive; no significant change occurred in platelet counts and the bleeding-time was little altered. It must be noted, however, that a moderate increase in platelets was recorded (maximum about the seventh day) after A.C.T.H. had been given, and that a tendency towards reduction in bleeding-time had become apparent about this period. Clinically, a definite remission resulted, and this persisted for three months, though platelet counts and capillary resistance had returned to low levels. Ecchymoses and petechiae then reappeared and the clinical condition rapidly reverted to that found before the first course of A.C.T.H. As shown in Fig. 6 a second course of A.C.T.H., totalling 200 mg., was given in 40-mg. doses over a period of 48 hours. This resulted in changes similar to those observed previously in capillary resistance, bleeding-time (more definitely reduced on this occasion), and platelets (again a delayed slight increase). Clinical remission has again been produced, although at the time of writing this had been followed for only three weeks. It must be noted that, although the amount of A.C.T.H. given was doubled in the second course, the effects produced were no greater than, if indeed as great as, in the first course.

Case B.—A man aged 32 presented with a history of bruising and petechial haemorrhages for three months, and of bleeding from the gums for one week. The clinical and haematological findings conformed to the diagnosis, and during observation over a period of three weeks there was no sign of remission. As shown in Fig. 7, A.C.T.H. was given in doses of 40 mg. eight-hourly to a total of 340 mg. This resulted in a marked increase in capillary resistance, a definite reduction in bleeding-time, conversion of both the positive-pressure and the snake-venom tests to negative, and a moderate thrombocytosis which was maximal about nine days later. Bleeding from the gums stopped on the second day of A.C.T.H. administration, no further bruises or petechiae appeared, and the patient has remained in complete clinical remission for five weeks. In contrast to Case A, capillary resistance and platelets have remained above the pre-A.C.T.H. levels and the bleeding-time has been maintained within the normal range.

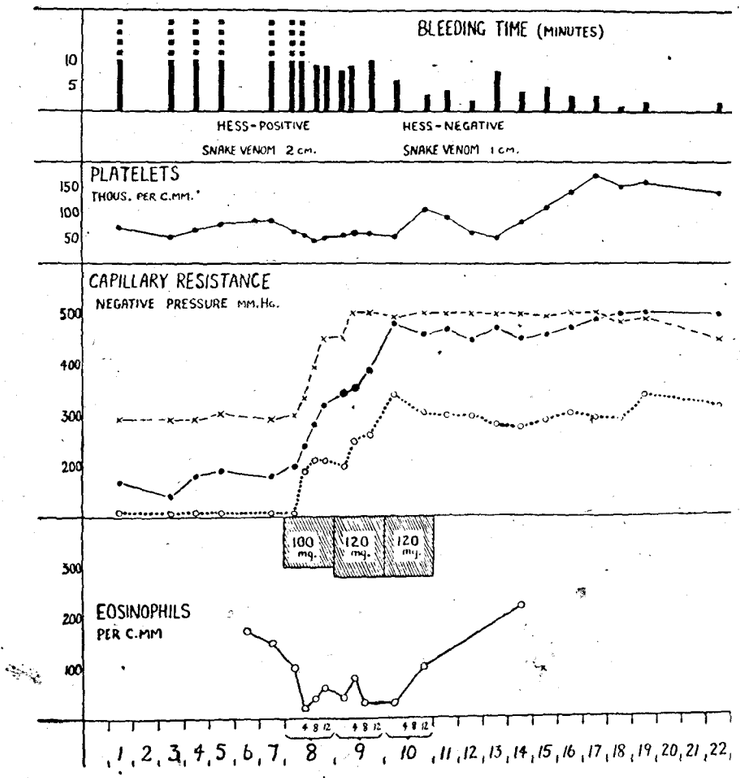


FIG. 7.—Results of the administration of A.C.T.H. in Case B (idiopathic thrombocytopenic purpura).

Discussion

The negative-pressure method of estimating capillary resistance has not been so widely employed as have positive-pressure methods such as the Hess, Rumpel-Leede, or Göthlin tests. First suggested by Hecht in 1907, the suction method has been used by such authors as da Silva-Mello (1929, 1930), Mengler (1930), Von Borbély (1930), Adant (1936, 1938), Franke (1943), and Parrot, Lavollay, and Galmiche (1944) on the Continent; by Dalldorf (1933), Dalldorf and Russell (1935), Cutter and Johnson (1935), and Elliott (1938) in America; and by Scarborough (1941, 1943, 1944) and Robson (1949) in this country. The merits and demerits of the method are reviewed by Munro, Lazarus, and Bell (1947).

In the present study, the use of the negative-pressure method has permitted the detection of an increase in capillary resistance, often to markedly supranormal levels, occurring as a result of several different stimuli. These preliminary observations suggest strongly that this rise in resistance is mediated by adrenocortical activity. The number of cases treated with A.C.T.H. is not great, but it seems probable that the extent and duration of the increase in resistance are roughly proportional to the degree of adrenocortical stimulation. In the cases of rheumatoid arthritis, however, the capillary changes did not necessarily reflect accurately the clinical response of the patients to A.C.T.H. In the sixth case of rheumatoid arthritis (see Table), a dramatic clinical remission was produced by A.C.T.H., but this was short-lived. The capillary resistance, however, which was raised to high levels, remained elevated for a considerable period, though complete clinical relapse had occurred. In the fifth case, on the other hand, a prolonged clinical remission was produced by A.C.T.H., but capillary resistance returned quickly to previous levels after the course was completed. In these six cases of rheumatoid arthritis, and in two cases of ankylosing spondylitis, the correlation between capillary resistance and eosinophil counts was fairly close.

The two cases of disseminated lupus erythematosus provide an instructive comparison. In one case a definite rise in capillary resistance was recorded after the administration of A.C.T.H. in a dosage which resulted in a decided clinical remission and a depression of eosinophils. In the second case, however, no such increase in resistance was recorded, clinical response to A.C.T.H. was poor, and the progressive deterioration was reflected by the falling capillary resistance. Since no eosinophils were found at any time in the peripheral blood in this case, the capillary resistance findings were of great value as an index of the lack of response to A.C.T.H.

The results in the two cases of thrombocytopenic purpura are of interest. It is noteworthy that capillary resistance rises in response to A.C.T.H. in this condition where the capillaries are believed to be abnormal. The moderate increase in platelets which was found to follow this increased resistance occurred at about the same time interval as the maximum thrombocytosis observed after splenectomy. While it would be unwise to draw more than tentative conclusions from such limited experience, definite clinical remission was induced by A.C.T.H. on three occasions in these two cases. Further study of the effects of A.C.T.H. in this and similar conditions would appear to be indicated.

It seems likely that the increase in capillary resistance which has been found to follow the administration of A.C.T.H., adrenaline, and insulin is due to adrenocortical activity. Such activity would account also for the changes in resistance which follow tissue damage and bodily stress. It is suggested that the measurement of capillary resistance provides a fairly simple and rapid method of following the response to A.C.T.H. or to substances which might be expected to have a similar effect.

Summary

It has been observed that an increase in capillary resistance, as measured by a negative-pressure method, occurs after the infliction of various types of tissue damage and after the application of various forms of bodily stress.

The results obtained suggest that this rise in resistance might be due to adrenocortical stimulation by the release of endogenous adrenaline or some similar mechanism.

Patients receiving adrenocorticotrophic hormone (A.C.T.H.) have been studied and the predicted increase in capillary resistance observed. The features of this response are described.

These observations led to the study of the effects of A.C.T.H. in two cases of idiopathic thrombocytopenic purpura; the results are described. Definite clinical remission was induced on three occasions.

It is suggested that capillary resistance estimations may be used in the measurement of the response to stimulation of the adrenal cortex.

Gratitude is expressed to Drs. E. B. French and A. G. S. Hill for much valuable assistance. We wish to thank Professor L. S. P. Davidson for helpful criticism and advice.

References

Adant, M. (1936). *C. R. Soc. Biol., Paris*, **123**, 130.
—— (1938). *Rev. belge Sci. méd.*, **10**, 126.
Bell, G. H., Lazarus, S., Munro, H. N., and Scarborough, H. (1942). *Lancet*, **2**, 536.
Cutter, I. S., and Johnson, C. A. (1935). *J. Amer. med. Ass.*, **105**, 505.
Dalldorf, G. (1933). *Amer. J. Dis. Child.*, **46**, 794.
—— and Russell, H. (1935). *J. Amer. med. Ass.*, **104**, 1701.

da Silva-Mello, A. (1929). *Münch. med. Wschr.*, **76**, 1717.
—— (1930). *J. Physiol. Path. gén.*, **28**, 377.
Elliott, R. H. E. (1938). *J. Amer. med. Ass.*, **110**, 1177.
Franke, H. (1943). *Z. klin. Med.*, **142**, 316.
Hecht, A. F. (1907). *Jahr. Kinderheilk.*, **65**, 113.
Lavollay, J. (1944). *C. R. Soc. Biol., Paris*, **138**, 801.
Mengler, O. (1930). *Klin. Wschr.*, **9**, 1301.
Munro, H. N., Lazarus, S., and Bell, G. H. (1947). *Nutr. Abstr. Rev.*, **17**, 291.
Parrot, J. L., Lavollay, J., and Galmiche, P. (1944). *C. R. Soc. Biol., Paris*, **138**, 330.
Robson, H. N. (1949). *Quart. J. Med.*, **18**, 279.
Rossman, L. (1940-1). *Ann. intern. Med.*, **14**, 281.
Scarborough, H. (1941). *Edinb. med. J.*, **48**, 555.
—— (1943). Ibid., **50**, 85.
—— (1944). Ibid., **51**, 381.
Von Borbély, F. (1930). *Münch. med. Wschr.*, **77**, 886.
Wyss, F., and Gianoli, A. (1946). *Schweiz. med. Wschr.*, **76**, 626.

THREE CASES OF SEVERE BURN TREATED WITH CORTISONE*

BY

P. O. CRASSWELLER, M.D.

A. W. FARMER, M.D.

W. R. FRANKS, M.D.

(From the Royal Canadian Air Force Institute of Aviation Medicine and the Department of Surgery, Hospital for Sick Children, Toronto)

AND

A. D. McLACHLIN, M.D.

Professor of Surgery, University of Western Ontario, London, Canada

In a former study (Crassweller, Farmer, and Franks, 1950), experimental evidence was presented suggesting that the mortality of experimentally burned mice was reduced by the administration of urinary extract fractions such as are known to contain the cortisone-active material. It thus seemed justifiable to consider giving cortisone in the treatment of severe clinical burns. In this paper three cases of severe burn are presented in which routine burn-therapy was supplemented by the administration of cortisone acetate in varying amounts. One case of 70% burn in an adult has done well. The other two patients (both children) died—one, however, 24 days after the burn and following a most promising early clinical response.

In reporting surface area of burns the modification of Berkow's formula (Lund and Browder, 1944) was used. Simple erythema has not been included.

As routine treatment all received occlusive pressure-dressings with light plaster casts. In Case 1 the burned surface was covered with aluminium foil (Brown, Farmer, and Franks, 1948), while in the other two vaselined gauze was used. Fluid requirements were maintained intravenously and by mouth in all cases.

Case 1

A well-nourished male child aged 23 months was admitted to the Hospital for Sick Children, Toronto, on June 8, 1950, in a moribund condition. He had suffered second-degree burns due to scalding, involving approximately 55% of his body-surface, including the legs, thighs, genitalia, and lower two-thirds of the trunk.

Treatment was started within one hour after the accident. To combat severe shock, 250 ml. of plasma was syringed at once into the radial artery. This resulted in an immediate return

*This work was carried out through a grant-in-aid supplied through the Defence Research Board of Canada.

to consciousness. 150 mg. cortisone acetate was administered intramuscularly at this time. In addition to the immediate shock therapy, plasma and normal saline were given intravenously to control haemoconcentration throughout the next few days. The haemoglobin fell on the third day to 7.2 g. per 100 ml., after which 500 ml. of whole blood was given. Daily injections of cortisone were continued to a total of 450 mg. (Fig. 3). In addition, 400,000 units of penicillin were given intramuscularly daily.

Considering his severe burn the child appeared to be doing well clinically, although his urinary output was small and bloody for the first 36 hours. On reduction of protein intake while fluids (glucose and saline) were maintained, his output suddenly increased and his urine became clear. Despite this turn and a normal non-protein nitrogen, he became comatose, with generalized twitchings and mounting fever at the end of the second day. On the third day his condition improved, with return of consciousness and good voluntary oral intake. However, at the end of the fifth day he lapsed into coma and died in respiratory failure with twitchings and hyperpyrexia.

Necropsy failed to reveal any significant findings apart from the burn. The adrenal glands contained adequate sudanophilic material.

Case 2

A girl aged 7 years was admitted to the Hospital for Sick Children, Toronto, on May 28, 1950, showing no evidence of shock other than rapid pulse and thirst. She had suffered flame burns to the extent of 30% of her body surface, involving the dorsum and left side of the trunk, the left arm, and left thigh. About one-third of the damaged area had second-degree burns and the remainder third-degree burns.

Treatment was begun 45 minutes after the accident. Haemoconcentration was controlled by the administration of 5,420 ml. of plasma in the first three days. Oral fluid intake was good throughout, as was also the calorie intake. She received penicillin, 400,000 units daily, beginning on admission.

On the first day the patient was bright and co-operative, but on the second day she began to appear ill, with a rising temperature and increasing pulse and respiratory rates (Fig. 1). Cortisone acetate 100 mg. was administered intramuscularly at this time and continued daily until the eighth day (Fig. 3). The temperature dropped and she remained remarkably well clinically. Dressings were changed on the tenth day. There was complete healing of the second-degree areas. Separation of slough was progressing normally. The dressings were heavily contaminated with *Ps. pyocyanea*. From the eleventh day her condition deteriorated; she had a slowly rising and swinging temperature and showed signs of toxicity suggestive of a septicaemia. Blood cultures were negative. From the twelfth to twenty-second days sulphadiazine and streptomycin were given, with no apparent benefit. Her burned surfaces were examined with the hope of finding a localized focus of infection, but none was found. Granulations were well formed and appeared healthy. She received aureomycin from the twenty-third day. She became comatose and cyanotic, with a rising temperature which terminally reached 107° F. (41.7° C.). Death ensued with respiratory failure on the twenty-fourth day.

On removal of the dressings at necropsy a red macular rash was found over the abdomen and buttocks which had not been present 24 hours previously. The burned surface and dressings were heavily contaminated with *Ps. pyocyanea*, and this organism grew profusely in the culture of heart blood collected at necropsy. Since no other focus of infection was found, it is presumed that she died with a *Ps. pyocyanea* infection.

Case 3

A strong wiry man aged 21 was admitted to Victoria Hospital, London, Ontario, on May 8, 1950, suffering from severe flash burns sustained while working with high-tension wires. There were burns of most of the trunk, face, and neck, most of the left arm, and of the right arm to the elbow. The pubic hair and all the hair of the legs were singed, and there were burns of less intensity over these areas. The overall area of burn, excluding simple erythema, was estimated to be 70%. The total area of third-degree burn was estimated to be 15% of the body surface.

The face and neck were excluded from the occlusive pressure-dressings and were treated with penicillin cream. During the first 90 hours the patient required 24,750 ml. of plasma (Fig. 2) to maintain normal haemoglobin concentration. In addition he received 900 ml. of whole blood and 2,000 ml. of Ringer-lactate solution. He took fluids well by mouth throughout and received high-protein drinks from the second day on.

The patient was seen in consultation on the third day and cortisone therapy was suggested. This phase of the treatment was supervised by Dr. H. McAlpine. Daily cortisone injections were started on the fourth day (Fig. 3) and discontinued on the twenty-seventh day, following a total dose of 2,750 mg. 50,000 units of penicillin were administered intramuscularly every three hours. The patient remained well throughout and showed none of the stigmata of the so-called toxic phase.

Skin grafts were performed on the twenty-sixth, thirty-third, and fortieth days; all of these were successful. Because of the limited undamaged skin available, stamp grafts were used so as to cover a greater area. At the time of writing (seventieth day) the patient is still in hospital awaiting grafting of residual areas.

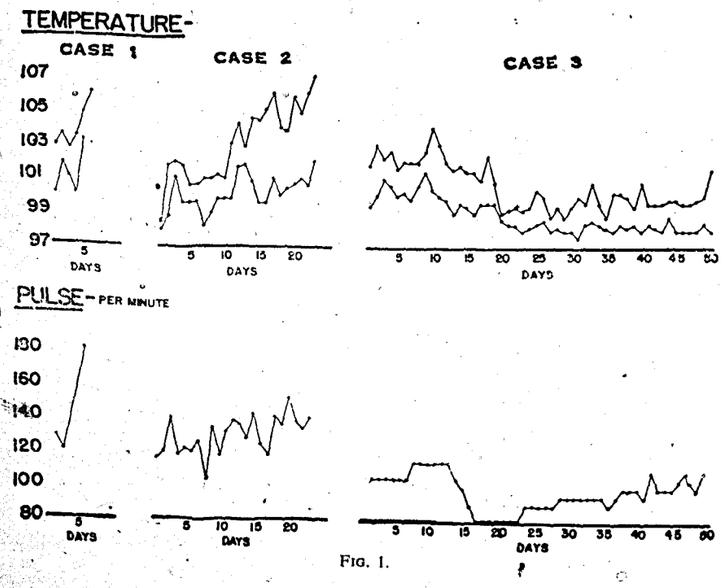


FIG. 1.

Discussion

The first patient (Case 1), according to the tables of mortality probabilities in burns prepared by Bull and Squire (1949), had less than a 40% chance of survival. He received a total of 450 mg. of cortisone over a five-day period. Temperature, pulse, and respiration recordings followed the usual pattern for burns of this severity (Fig. 1). The initial marked depression in the eosinophil count (Fig. 3) was consistent with the severity of the burn (Crassweller, Farmer, and Franks, 1950). With cortisone therapy the initial rise was followed by a return to low levels.

Because of the oliguria, protein restriction seemed indicated and whole-blood transfusion was withheld at this time. Under this treatment an anaemia developed rapidly. The fluid intake, while adequate, was not excessive, so that dilution was not the cause of the low haemoglobin levels. The peripheral-blood smear showed large numbers of microspherocytes, as has been described in severe burns by Brown (1946). The depressed haemoglobin levels may thus have been secondary to haemolysis. Following the return of renal function, 500 ml. of whole-blood transfused on the third day failed to restore the haemoglobin level. Fear of renal complications prevented further transfusion, although it is evident, in retrospect, that transfusions were probably indicated. The anticipated drop in total plasma protein levels did not occur (Fig. 4), and the non-protein nitrogen values remained within normal limits throughout. It is difficult to account for the low total-urinary-nitrogen excretion (Fig. 5) in the face of the usual burn response, coupled with adequate fluid intake and cortisone therapy. As reviewed by Crassweller, Farmer, and Franks (1950), all of these might be expected to result in increased nitrogen excretion. Early hyperglycaemia did not occur, but rising non-fasting blood-sugar levels (Fig. 5), unaccompanied by ketonuria, and in the presence of a relatively constant glucose intake, are perhaps associated with the cortisone therapy. A rising 17-ketosteroid excretion level also suggests a cortisone effect. At necropsy the normal quantity and distribution of sudanophilic material found histologically in the adrenal cortices probably indicates that death was not secondary to adrenal exhaustion (Sayers and Sayers, 1949; Cain and Harrison, 1950).

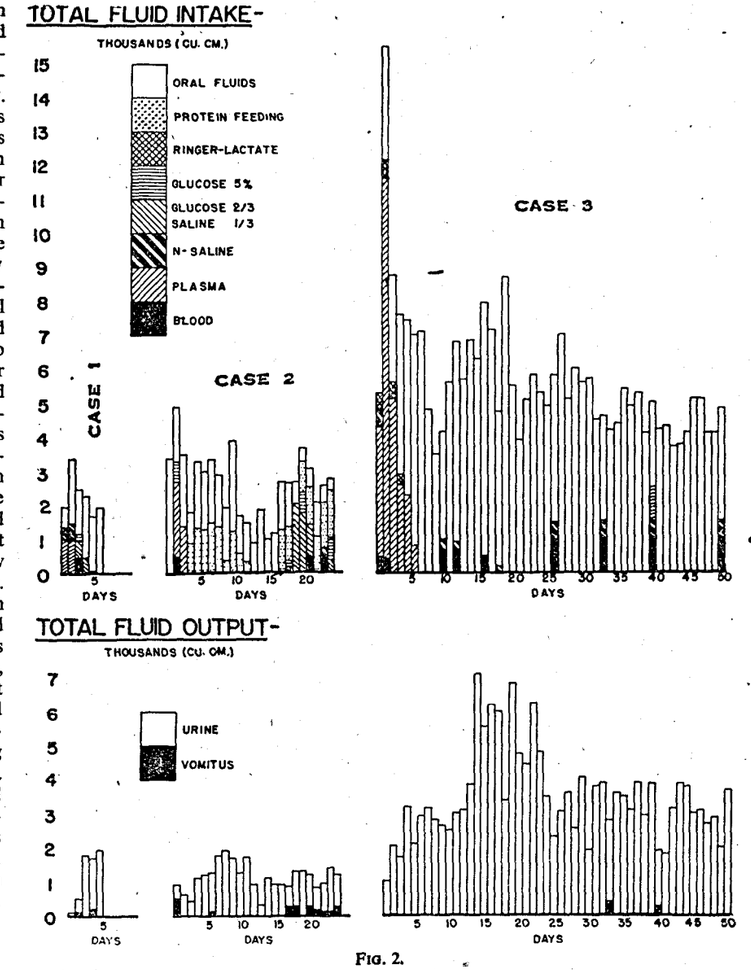


FIG. 2.

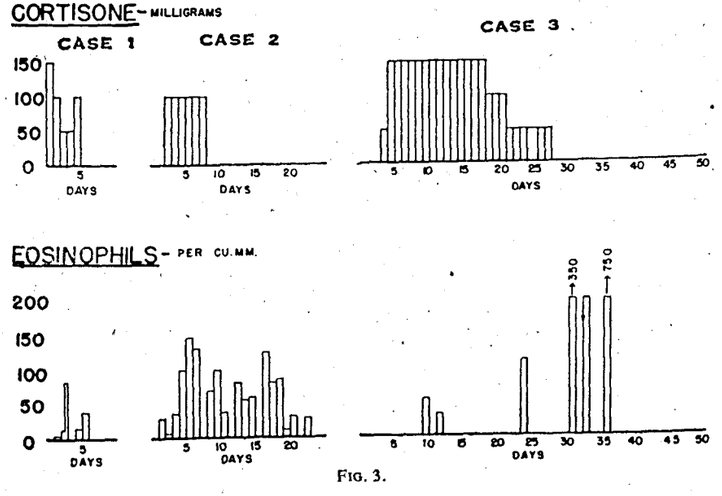


FIG. 3.

The second case received cortisone 100 mg. daily, beginning on the third day (Fig. 3), following which she improved, and her clinical course was most encouraging. The temperature dropped almost immediately. She was bright and cheerful and displayed a keen appetite. Cortisone was stopped on the eighth day after a total dose of 600 mg. had been given.

After the first change of dressings on the tenth day there followed a slow progressive clinical deterioration. The appetite vanished and it became necessary to feed through a stomach-tube. The temperature

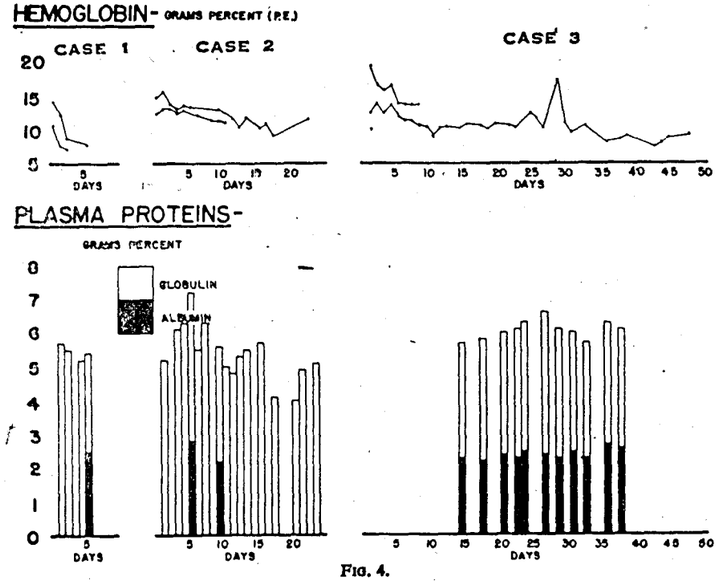


Fig. 4.

assumed a typical septic course and this was reflected in the pulse (Fig. 1) and respirations. A retrograde urinary infection was feared and the catheter was removed. The white blood count reached a level of 32,500 per c.mm. on the eleventh day. Repeated blood cultures were sterile.

During the period of cortisone therapy the eosinophils increased somewhat over the initial depression secondary to the burn (Fig. 3) but remained below the lower limit of normal, suggesting to us at the time that adequate cortisone was being used. However, a steady drop in the daily excretion of 17-ketosteroids in the urine from the third to the tenth day would suggest, from this criterion (Sprague *et al.*, 1950), that the total cortisone dosage was inadequate. A further drop from the eighth to the twelfth day suggests that the production of endogenous corticoids was depressed and remained so during this period. Unfortunately, owing to withdrawal of the catheter, 17-ketosteroid determinations were not available after the tenth day. (Because of the involved nature of the urinary 17-ketosteroid determination (McGill University Clinic modification of the Zimmermann reaction—Hawk *et al.*, 1947), the results were not available to us on a day-to-day basis. Eosinophil counts were therefore followed as the immediate criterion of cortisone therapy (Sayers, 1950). We are now attempting to apply the skin test described by Shuman and Finestone (1950) as a rough measure of corticoids in the circulation.) Continued depression of the eosinophil counts between the eleventh and fifteenth days suggested that the patient was able to respond to the increased stress associated with the onset of infection. Eosinophil counts from the twentieth day onwards led us to believe that the patient was producing adequate corticoids. However, despite the trend of the eosinophil count, post-mortem sections of the adrenal cortices showed a marked decrease in sudanophilic material in the fasciculata and reticularis, and to a smaller extent in the glomerulosa. This suggests adrenal exhaustion (Sayers and Sayers, 1949; Cain and Harrison, 1950) and possibly indicates that 17-ketosteroid excretion estimations are a more reliable guide to adrenal function than the eosinophil count.

The question arises whether or not the administration of cortisone bore any relation to the development of the subsequent infection in the burn. With this in mind, a fractionation of the plasma proteins from a post-mortem sample of heart blood was carried out through the kindness of Dr. A. G. Gournall, Department of Pathological Chemistry, University of Toronto. Using solutions of sodium sulphate of varying percentage as precipitant, the total plasma protein was found to be 4.85 g. per 100 ml. With a 26% solution of sodium sulphate the yield was 2.55 g. of globulin and 2.30 g. of albumin per 100 ml. Using 15% sodium sulphate, the total globulin fraction amounted to only 0.25 g. per 100 ml. Further work is required to determine the significance of this apparently low value. The clinical course in this case, however, was fairly typical of

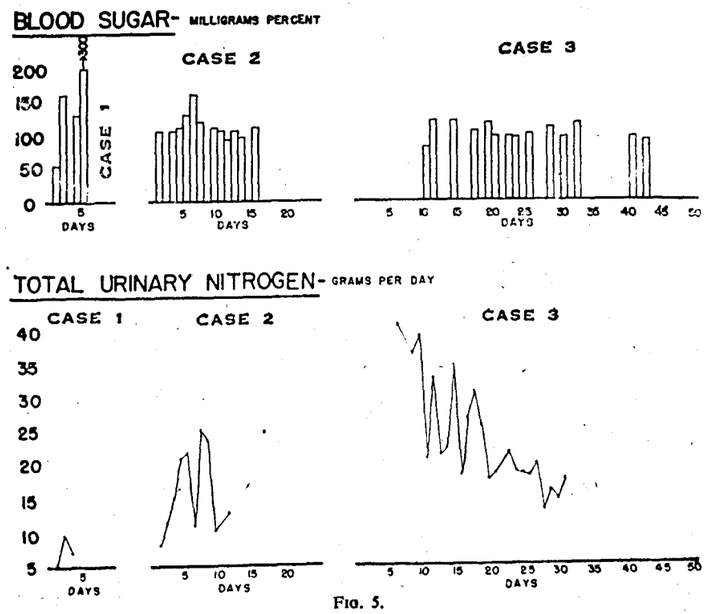


Fig. 5.

Ps. pyocyanea infection as reviewed by Stanley (1947).

According to the tables of mortality probabilities in burns, Case 3 had less than a 5% chance of survival under modern burn therapy. He responded well from the start, even before the administration of cortisone. He did not develop any evidence of pulmonary oedema, despite the fact that on the second day he received 15,500 ml. of fluid (Fig. 2). He did, however, develop marked peripheral oedema, making it necessary by the third day to split the body cast. This oedema probably accounts for the marked positive fluid-balance at this time. Cortisone therapy was begun on the fourth day and continued to the twenty-seventh day. Eosinophil counts were found to be depressed on the tenth, twelfth, and twenty-fourth days (Fig. 3). The cortisone dosage was tapered off on the nineteenth and finally stopped on the twenty-seventh day. The very high counts on the following days may indicate that the endogenous production of corticoids was somewhat depressed. The patient experienced a remarkable state of well-being, almost euphoria, during the period of cortisone administration and after its cessation. Also, he managed a sizeable calorie intake, averaging over 4,000 calories daily and on three occasions reaching 7,000 calories. Although it has been reported (Ragan *et al.*, 1950) that too much cortisone may delay wound-healing, no such difficulty was encountered in this case, despite the fact that the first graft was made during the period of cortisone administration.

Summary

Three cases of severe burn are presented in which routine burn therapy was supplemented by the administration of cortisone acetate.

The first patient, who suffered a 55% burn, died despite cortisone therapy. He had a normal histological distribution of lipoid material in the adrenal cortices at necropsy.

The second patient, who suffered a 30% burn, received cortisone from the third to eighth days, during which period she was remarkably well. Her condition deteriorated clinically after the initial change of burn dressings on the tenth day. She died on the twenty-fourth day, death apparently being due to sepsis. The finding of markedly decreased sudanophilic material in her adrenal cortices suggests adrenal exhaustion at the time of death.

The third patient, who suffered a 70% burn, has done well. He received cortisone from the fourth to twenty-seventh days and displayed a remarkable state of well-being and a keen appetite. This unusual recovery may be related to the cortisone therapy.

We wish to acknowledge the assistance of M. D. Maxmen and A. G. Stocks in the preparation of this paper.

REFERENCES

Brown, A. (1946). *J. Path. Bact.*, **58**, 367.
Brown, W. A., Farmer, A. W., and Franks, W. R. (1948). *Amer. J. Surg.*, **76**, 594.
Bull, J. P., and Squire, J. R. (1949). *Ann. Surg.*, **130**, 160.
Cain, A. J., and Harrison, R. G. (1950). *J. Anat.*, **84**, 196.
Crassweller, P. O., Farmer, A. W., and Franks, W. R. (1950). *British Medical Journal*, **2**, 242.
Hawk, P. B., Oser, B. L., and Summerson, W. H. (1947). *Practical Physiological Chemistry*, 12th ed., p. 699. London.
Lund, C. C., and Browder, N. C. (1944). *Surg. Gynec. Obstet.*, **79**, 352.
Ragan, C., Howes, E. L., Plotz, C. M., Meyer, K., Blunt, J. W., and Lattes, R. (1950). *Bull. N.Y. Acad. Med.*, **26**, 251.
Sayers, G. (1950). *Physiol. Rev.*, **30**, 253.
—— and Sayers, M. A. (1949). *Ann. N.Y. Acad. Sci.*, **50**, 522.
Shuman, C. R., and Finestone, A. J. (1950). *Proc. Soc. exp. Biol., N.Y.*, **73**, 248
Sprague, R. G., Power, M. H., Mason, H. L., Albert, A., Mathieson, D. R., Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1950). *Arch. intern. Med.*, **85**, 199.
Stanley, M. M. (1947). *Amer. J. Med.*, **2**, 253, 347.

AN UNUSUAL COMPLICATION OF MYANESIN THERAPY IN THE TREATMENT OF TETANUS

BY

M. L. NEWHOUSE, M.B., M.R.C.P.
Assistant Physician, Barnet General Hospital

J. D. ROCHFORD, M.B., B.S., D.A.
Anaesthetist, Barnet General Hospital

AND

G. RIDDELL ROYSTON, M.D., M.R.C.P., D.C.H.
Physician, Barnet General Hospital

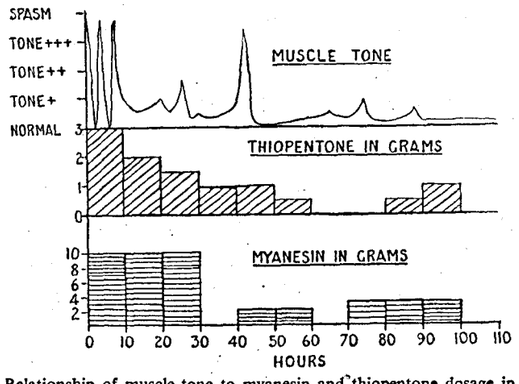
"Myanesin" (α-β-dihydroxy-γ-(2-methylphenoxy)-propane; mephenesin) was introduced into clinical use by Berger and Bradley (1947), and was first used for relief of spasm in two cases of tetanus by Belfrage (1947), with encouraging results. Torrens, Edwards, and Wood (1948) treated a moderately severe case of tetanus with a combination of intramuscular and intravenous injections of myanesin, giving 22 g. in nine days, with considerable benefit to the patient. Davison, Ward, and Pask (1949) also treated two cases. The first case, after a period of treatment with curare and sedatives, was given intermittent intravenous injections of myanesin and recovered. The second was more seriously affected, and myanesin was used from the beginning of treatment. When it was found that a single intravenous injection controlled the spasms for only about 30 minutes, an intravenous glucose-saline drip was set up and myanesin added in varying amounts according to the condition of the patient. After 26½ hours of continuous myanesin treatment haemoglobinuria was observed and the myanesin was discontinued, but the patient immediately relapsed and died from violent spasms two hours later. Macdonald (1949) combined intravenous myanesin with intravenous thiopentone, giving 1–1.5 g. myanesin and 0.5–0.75 g. thiopentone in each 600 ml. of glucose-saline. In 23 days he gave a total of 40 g. myanesin and 32.75 g. sodium thiopentone. No haemoglobinuria occurred, and the patient, a child aged 8, recovered. Godman and Adriani (1949) used the American oral preparation "tolserol" in eight cases of tetanus; all but one of their cases were mild. They found that in doses ranging from 62.5 to 750 mg. in children, and up to 3,500 mg. in adults, it was an extremely satisfactory relaxing agent.

Case Reports

The following are reports of two cases of tetanus in which oral myanesin was used. Rectal thiopentone was also given in the first case.

Case 1.—A man aged 38, an inmate of a colony for mental defectives but of fairly high mental grade, was employed as an agricultural labourer. He gave no history of recent injury. On March 12, 1950, he complained of a painful stiff neck, which was thought to be due to fibrositis; he remained in bed but had no special treatment. The pain increased in severity and spread from the neck to the trunk and legs, and on the morning of March 16 he had a generalized convulsion. He was admitted to hospital, under the care of M. L. N. and J. D. R., at 2.30 p.m. on that day. On examination he was seen to be a well-built muscular man; there was no external injury, and he was fully conscious, flushed, and sweating profusely. There was rigidity of the neck and shoulder muscles with trismus and risus sardonicus. The erector spinae, the anterior abdominal muscles, and all muscles of the legs were in persistent spasm, and clonic contractions of the legs occurred on attempts to flex the knees. The arms were unaffected. No abnormalities were found in the heart, lungs, or central nervous system.

It was decided to treat the patient with a combination of myanesin and rectal thiopentone. At 3.50 p.m. 1 g. of myanesin dissolved in 10 ml. sterile water was given intravenously. Within two or three minutes complete relaxation had occurred, and the change in expression of the patient was most striking as his anxious frown and "risus" relaxed. The patient was given 250,000 units of tetanus antitoxin intramuscularly, and appeared to be comfortable, but by 5 p.m. generalized rigidity had recurred and a further 1 g. myanesin was given intravenously and 2 g. myanesin in tablet form by mouth. Again the intravenous myanesin had a rapid effect, but within half an hour spasms had recurred. At 5.50 p.m. the first dose of 2 g. sodium thiopentone was given per rectum; within 10 minutes the patient had completely relaxed and fallen asleep, but he was disturbed by several sneezing attacks (which are not unknown under light thiopentone narcosis), though these did not precipitate any tetanic spasms. At 8 p.m. there was again generalized rigidity, and the patient was given a further 1 g. myanesin intravenously. He was now ordered 2 g. myanesin by mouth and 0.5 g. sodium thiopentone per rectum, both every two hours. These were given regularly between 11.30 p.m. and 9.30 a.m. the next morning. At 8.50 p.m., about two hours after his third injection of myanesin, he passed



Relationship of muscle tone to myanesin and thiopentone dosage in Case 1.

"port-wine" urine, and the next two specimens of urine, passed at 3.30 a.m. and 4.30 a.m., were also heavily stained. Spectroscopic examination confirmed the presence of haemoglobin, but the specimen passed at 9 a.m. was clear both to the naked eye and on spectroscopy; there was no recurrence of haemoglobinuria.

The following day there was only moderate neck stiffness and the patient was able to speak and swallow without difficulty; he had, however, developed a cough with purulent sputum and there were scattered rales and rhonchi on both sides of the chest. The same dosage of myanesin and rectal thiopentone was continued, but the myanesin elixir was substituted for the tablets. During the day there were only two spasms, both affecting the right leg. The chest condition worsened. Through a misunderstanding the myanesin was omitted during the second night in hospital, though three doses of rectal thiopentone were given. At 7.30 a.m. on the third day the patient had a severe generalized spasm with opisthotonos. Rectal thiopentone was given, followed by oral myanesin, and complete relaxation was obtained within 10 minutes. After this there was no return of major spasms, though rigidity of the neck and abdominal muscles recurred from time to time; this was easily controlled by oral myanesin. The accompanying Graph shows the time-relationship between the spasms and muscular rigidity and the dosage of myanesin and sodium thiopentone

In spite of decreased dosage of sedatives, the chest condition deteriorated rapidly and the patient died on the evening of his fifth day in hospital. The total dosage of myanesin was 3 g. intravenously and 40 g. by mouth. Altogether 11 g. sodium thiopentone was given per rectum.

At necropsy the body was reported to be that of a well-nourished male. A healing abrasion was present over the left scapula, and there were several splinters in the hands—one 4 mm. long with a surrounding inflammatory reaction and deeply embedded. Anaerobic cultures from this splinter were negative for *Cl. tetani*. No abnormalities were noted in the heart, the central nervous system, or the alimentary system. The lungs showed suppurative bronchitis with early hypostatic pneumonia. The kidneys showed some evidence of old-standing chronic nephritis; otherwise the urinary tract was normal.

Case 2.—A man aged 45 was admitted under the care of G. R. R. on June 7, 1950, at 8.45 p.m. Six days previously while pushing a wooden tomato-stake into the ground he drove a splinter into his left antecubital fossa. He immediately boiled a pair of forceps, pulled out the splinter, dressed the small puncture wound with "dettol," and applied a bandage. Four days later, in the morning, while driving his bus, his back became stiff. The following day, 36 hours before admission, he noticed that his "gums were stiff"; there was some difficulty in chewing. On the day of admission he complained that while walking "something seems to run up and down my spine, and every now and then everything seems to stiffen up—throat, jaws, and back." For the last 12 hours he had been unable to swallow anything.

He was a well-built muscular man, alert and euphoric. He was lying quietly on his back with a stiff neck. There was no neck retraction. His spine was rigid and he was unable to sit up. He was edentulous and could separate his gums by only ¼ in. (1.58 cm.). There were no other abnormal signs, except for the presence of a small unhealed puncture-wound in the left antecubital fossa which appeared moist and unhealthy. There was no lymphangitis nor were there palpable lymph nodes.

A diagnosis of tetanus was made and treatment instituted as follows: Antitetanic serum, 100,000 units intravenously and 50,000 units intramuscularly, was given and sodium penicillin. 250,000 units six-hourly, begun. Myanesin, 1 g. in 20 ml. distilled water, was then given intravenously at 11.10 p.m. Within 30 seconds the patient smiled, said he had not felt so well for days, and asked for a drink. He sat up in bed and could bend his neck so that his chin almost reached his chest. His trismus disappeared and he could separate his gums by about 1½ in. (3.75 cm.). He was then given 2 g. of myanesin in 2 oz. (57 ml.) of the elixir by mouth. He took one sip and complained of a burning sensation in the mouth; the elixir was therefore diluted with an equal quantity of water. He still found it rather hot and sipped it slowly. At the fifth sip he clutched his throat, had a violent attack of coughing, and, with his eyes bulging and tears streaming down his cheeks, rapidly became greatly distressed. The paroxysm lasted about two minutes, and on his recovery he said, "It went down the wrong way, doctor." It was noticed that though he had stopped coughing a rattling noise was coming from the trachea. From then on until his death signs in the chest became progressively more prominent. The patient was encouraged to finish his elixir and was given a further 2 oz. half an hour later. With this second dose there was again a paroxysm of coughing. With neither of these paroxysms was there any return of spasticity. At 12.30 a.m. he was taken to the theatre and his wound excised under nitrous oxide, oxygen, and "trilene" anaesthesia. A swab from the wound failed to yield any *Cl. tetani* on culture. Unfortunately the tissue removed was not examined. More myanesin was then given—2 oz. of the elixir at 2 a.m. and 4 a.m., the latter dose being swallowed slowly and with difficulty. At 5.15 a.m. abdominal cramps and dysphagia necessitated a further 1 g. myanesin in 20 ml. distilled water intravenously. Relaxation was immediate, and at 6 a.m. the patient managed to drink a further 2 oz. of the elixir. At 9 a.m. he objected to the elixir, so crushed tablets (2 g.) were substituted. At 9.15 a.m. he tried to cough up some mucus, became intensely cyanosed, and had a generalized clonic convulsion with loss of consciousness. Mucus was sucked from his pharynx, and after artificial respiration and the administration of oxygen with 5% carbon dioxide he

recovered. Postural drainage then produced a good deal of thick mucopus. Numerous rales could now be heard at both bases and in the left axilla. At this stage lumbar puncture yielded normal fluid. The urine was clear. At 11.15 a.m. a further 2 g. crushed tablets of myanesin was prescribed, but he was unable to swallow the powder, and it was noticed that some of the previous dose was still adhering to the tongue and the pillars of the fauces. It was therefore decided to give 1 g. myanesin intravenously and then pass a stomach tube. However, every effort to pass a Ryle's tube or an oesophageal catheter (12E) resulted only in tracheal intubation. It is noteworthy that this caused no distress or cough. The attempt was then abandoned. A further 1 g. myanesin was given intravenously at 3 p.m., and soluble phenobarbitone 3 gr. (0.2 g.) intramuscularly as he had not slept since admission. A quarter of an hour later he again started to cough, became cyanosed, and had clonic convulsions. Resuscitation failed, and he died.

At necropsy the brain was intensely congested, but apart from this appeared normal. The trachea and bronchi contained a moderate amount of mucopurulent fluid, and there was marked congestion of both lungs with bronchopneumonia at the bases. The heart showed no macroscopic abnormality. The liver was congested. The spleen and kidneys appeared normal.

Discussion

Cole and Spooner (1935) describe four degrees of severity of tetanus. In the second degree there is generalized tonic rigidity; in the third the tonic rigidity passes on to the stage of reflex spasms. Our Case 1 corresponds to the third category, and according to those authors this bears a poor prognosis. Case 2 corresponds to the second category, in which the prognosis is better; but the short incubation period in this case indicates a severe attack. Both patients responded extremely well to intravenous myanesin, and in the first case the oral myanesin was of considerable value in controlling spasm.

In the first patient it appeared that during the last three days of his illness the tetanic symptoms were under control and required only small doses of antispasmodics and sedative, but he had already developed signs of bronchitis by the second day in hospital, and it seems likely that he was too heavily sedated during his first 15 hours of treatment. It is not thought that the myanesin was responsible for the development of the chest complication, as even when given intravenously it did not depress respiration. The two drugs appeared to have a synergistic action, as when both drugs were given the patient was easily controlled; but when, as during the second night in hospital, the myanesin was withheld, a very violent spasm occurred (see Graph). Both drugs were easily administered. The sodium thiopentone was given rectally in 10% solution. The patient could swallow freely, or the elixir could easily have been given by tube.

With the second patient, although the elixir was diluted with an equal quantity of water after the initial sip, it still burnt his throat and he was unable to swallow it as a draught. After a few minutes he found that the solution no longer burnt him. This we now believe to have been due to the local analgesic action of the elixir on the pharynx. It was at this stage that there was the first violent fit of coughing: quite clearly some of the elixir entered the trachea. From this point a rapidly progressive purulent bronchitis developed. With the second dose further elixir was inhaled. The substitution of powdered tablets for the elixir, coming at a time when swallowing was again difficult, resulted in the powder adhering to the tongue and the mucous membrane of the mouth and fauces, where it exerted its local analgesic action. It was this analgesia that accounted for the stomach tube passing straight into the trachea at every attempt without producing any cough or distress. It is probable that during this period saliva containing dissolved and undissolved myanesin was trickling down the trachea. This would account for the very rapid development of the severe bronchitis in a man with no previous chest history who was receiving penicillin and was nursed sitting upright throughout his illness.

The asphyxial attacks seemed to be due to mucopus being coughed up and accumulating at the back of the pharynx. The presence or absence of laryngeal spasm could not be determined, but it was noticed that there was no trismus or neck stiffness. The convulsions followed the intense cyanosis and were presumably anoxaemic in nature rather than tetanic.

Myanesin has two properties. It causes muscle relaxation by an action on the central nervous system: this may be a depressant action on the reflex excitability of the spinal cord. Its second property, on which no emphasis has been placed in the literature to date, is its local analgesic action. This we believe to be important, and indeed consider it to be directly responsible for the fatal outcome in Case 2. In view of this local analgesic property we feel that myanesin should not be given by mouth to patients with tetanus, in which dysphagia is a common occurrence.

A suggested scheme of treatment would be to begin with an intravenous injection of myanesin, 1 g. in 20 ml. distilled water. This should cause relaxation and enable a Ryle's tube to be passed into the stomach. Two ounces of myanesin elixir could then be given via the tube and repeated half an hour later. In the early stages two-hourly doses of 2 oz. (57 ml.) myanesin elixir by stomach tube would probably be needed, and it might be necessary also to give 0.5 g. thiopentone per rectum. Later the dose of myanesin could cautiously be reduced and the time interval between doses increased. It is felt that the intravenous preparation is of considerable value in the rapid control of severe spasms. The risk of haemoglobinuria after oral myanesin appears to be remote, as it did not recur in our patient after a further 40 g. by mouth, nor did Godman and Adriani (1949) report it in any of their eight cases. In those cases in which oral intubation is difficult or poorly tolerated myanesin could be given in doses of 1 g. intramuscularly.

It is stressed that myanesin should be used solely as an adjunct to treatment with antitetanic serum, penicillin, and local wound excision. The patient should be sedated as little as possible and nursed in the sitting position.

Summary and Conclusions

Two fatal cases of tetanus treated with myanesin are described. The first case also received rectal thiopentone.

Investigation showed that myanesin, given intravenously and orally, is a useful relaxant and controls tetanic spasms satisfactorily; and that when used in therapeutic doses it does not depress respiration.

Myanesin has a local analgesic action and should never be given in powder form by mouth. The elixir should not be given when there is dysphagia. When administered intravenously the risk of haemoglobinuria is diminished by adequate dilution, and may be ignored.

In the second case death occurred from lung complications due to the inhalation of myanesin elixir.

We wish to thank Dr. A. Lisle Punch for permission to treat and publish the first case.

References

Belfrage, D. H. (1947). *Lancet*, **2**, 889.
Berger, F. M., and Bradley, W. (1947). Ibid., **1**, 97.
Cole, L., and Spooner, E. T. C. (1935). *Quart. J. Med.*, **1**, 295.
Davison, M. H. A., Ward, A. B., and Pask, E. A. (1949). *British Medical Journal*, **1**, 616.
Godman, H. E., and Adriani, J. (1949). *J. Amer. med. Ass.*, **141**, 754.
Macdonald, W. B. (1949). *Med. J. Aust.*, **2**, 538.
Torrens, J. A., Edwards, P. M., and Wood, M. W. W. (1948). *Lancet*, **2**, 807.

CASE OF TETANUS TREATED WITH DECAMETHONIUM IODIDE

BY

R. McD. S. KEIR, M.B., D.A.

Anaesthetist to the Belfast City Hospital and the Samaritan Hospital

In the treatment of tetanus the efficacy of muscle relaxants in preventing exhaustion of the patient from excessive muscular activity has already been shown. Curare has been used by several workers (Hoche, 1894; Cole, 1934; Mitchell, 1935; West, 1936; Cullen and Quinn, 1943; Adriani and Ochsner, 1947; Ory and Grossman, 1948); more recently the use of "myanesin" (mephenesin) has been reported (Belfrage, 1947; Davison, 1949; Davison *et al.*, 1949). It may be of interest to report a case of tetanus in which the relaxant used was the much discussed bistrimethylammonium decane di-iodide (decamethonium iodide, or C10). There were four main reasons for the choice of C10: (1) Both D-tubocurarine chloride and "flaxedil" had been tried by the physicians in charge of the case, with the production of marked respiratory depression and profuse salivation. (2) Myanesin was considered, but, in view of its tendency to produce haemoglobinuria, was rejected. (3) Experience with C10 in anaesthesia has shown that adequate relaxation of the larger skeletal muscles could be achieved without profoundly depressing respiration, and without relaxing the pharyngeal muscles. (4) C10 has less power to liberate histamine than D-tubocurarine chloride and therefore to produce bronchospasm.

Case Report

A girl aged 19 was admitted to the Belfast City Hospital on April 28, 1950, with a history of trismus and severe backache for four days, and opisthotonos and spasms, with very severe pain since the previous day. Two weeks previously she had got a wooden splinter under her finger-nail.

On examination she was seen to be a healthy, well-nourished girl, with a typical risus sardonicus, moderate opisthotonos, and marked trismus—being unable to put out her tongue, and spasms lasting 20 seconds occurring every two minutes; between spasms the muscles were rigid. A clinical diagnosis of tetanus was made (unfortunately the splinter was thrown out with the soiled dressings and a piece of loose nail which separated), and the patient was treated with massive intravenous doses of A.T.S., penicillin, and sedatives. This treatment was successful at first, but spasms returned as soon as the effect of sedation lightened and she became restless.

On the third day small injections of curare in oil were tried, with no effect. Intravenous D-tubocurarine chloride was then tried in 10-mg. doses, and flaxedil in 40-mg. doses, both achieving profound relaxation with respiratory depression for periods of about 30 minutes, after which rigidity and spasms returned as before. The pulse rate and temperature remained high, and the patient's general condition was poor. The physicians in charge of the case decided to seek my opinion as an anaesthetist, and the following treatment was carried out.

On examination the patient was distressed, crying out with the pain of the spasms, flushed, and sweating profusely, and the muscles of the trunk and limbs were rigid. It was decided to try the effect of C10. At 11.45 a.m. on May 2 a slow intravenous injection of C10 was started, 1 mg. at a time. During half an hour 5 mg. was given, producing some relaxation and no respiratory depression. A further 3 mg. was given over the next 15 minutes. The respirations became shallow and cyanosis developed. The injection was stopped and the patient was turned on to her side with her head over the side of the bed, and oxygen was administered by mask. The pharynx filled with sticky mucus, which was periodically swabbed out. She remained unconscious for one hour. The breathing then became noticeably deeper, and she opened her eyes. Fifteen minutes later she was sitting propped up, coughing, and blowing out mucus. After another 15 minutes 1 mg. of C10 was given intramuscularly with 50 mg. of pethidine intravenously and 50 mg. intramuscularly. She was then put in an oxygen tent at 2 p.m.

Small intramuscular doses of C10 and pethidine were given at 7 p.m. and the patient remained comfortable until 9.45 p.m., apart from slight tremors which were seen mainly on effort. Spasms then returned, and a further intravenous injection of 2 mg. of C10 with 50 mg. of pethidine was given, followed by the same dose intramuscularly. An extract from the notes summarizes the effect of these injections. "10 p.m.: Patient restless, crying out, tearful, and frightened. After injection: Quiet, rational, grateful."

In 48 hours 50 mg. of C10 and 950 mg. of pethidine were given. Spasms returned as the effect of the injections wore off, but were easily controlled, and the patient's general condition was much improved. On the evening of the third day of treatment her temperature rose and coarse crepitations were heard at the left lung base. C10 was withheld and a course of streptomycin started. She was encouraged to cough, and postural drainage, with deep percussion, was instituted. With the energetic co-operation of patient and nursing staff the chest was cleared in less than 24 hours. During this time it was necessary to increase the dosage of pethidine to 600 mg. a day. Pain was fairly well controlled, but spasms were troublesome and sleep was disturbed.

After this incident 1/100 gr. (0.65 mg.) of atropine was given six-hourly to cut down secretions. Treatment with C10 was restarted and continued for a further five days, dosage and frequency being judged by the response of the patient. The usual requirement was 2–3 mg. every four to five hours. It was found that, even with the large amounts of pethidine being given, a soporific was necessary at night. The chest remained clear, the spasms became less frequent and less severe, and her general condition improved.

On the evening of the tenth day of the treatment (the fourteenth day since admission) it was noticed that the occasional spasms now coincided with the appearance of the medical attendants. We came to the conclusion that the patient had probably

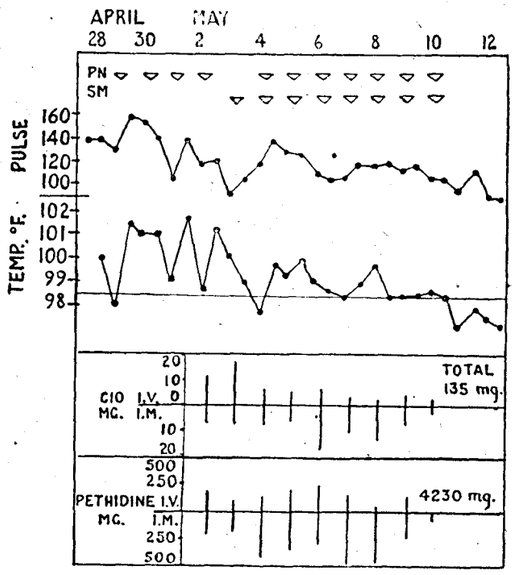


Chart showing dosage. PN = Penicillin. SM = Streptomycin.

developed a mild addiction to pethidine. Paraldehyde, 4 mg., was given intramuscularly. This raised a storm of tearful protest, but the patient slept soundly and no further spasms were seen. On May 15 she was up in a chair, and on May 23 walked with assistance. The muscles were still sore and stiff, but recovery was helped by physiotherapy. She was discharged on June 8.

The total dose of C10 was 135 mg., representing a daily average of 15 mg., and of pethidine 4,230 mg., with a daily average of 470 mg. The distribution is shown in the Chart.

Discussion

The treatment of tetanus with relaxants is not curative. It is still necessary to give A.T.S. and penicillin in massive doses and to build up the patient's general resistance. The experience gained in the treatment of this case, together with a study of the literature, enables certain general principles to be stated.

Sleep.—Even when painful spasms are abolished there may be a fair amount of residual pain from aching and torn muscles, so that an analgesic must be prescribed as well as sedatives to ensure sufficient sleep.

Secretions.—It is futile to abolish the spasms of tetanus, only to let the patient drown in his own secretions. Atropine is useful to cut down secretion. The cough reflex must not be dulled by sedatives, and the patient must be encouraged to cough. If necessary, curarization must be lessened to enable the patient to cough.

Oxygen.—Adequate oxygenation must be ensured. Anoxaemia increases the permeability of the capillaries in the lungs, allowing fluid to escape into the alveoli. If respiratory depression is present, oxygen must be administered. It is suggested that if adequate ventilation cannot be maintained by other means the patient might be nursed in an iron lung.

Nutrition.—Feeding presents no difficulty, since with C10 the patient is usually able to swallow. If, however, the effort proves exhausting, a fine plastic tube, as recommended by Bull *et al.* (1949), can be passed into the stomach with remarkable ease.

Fluids.—Fluid intake and output should be checked and an adequate balance maintained. If the temperature is high, much fluid may be lost by sweating and through the lungs. Haemoconcentration should be watched for by repeated haemoglobin estimations. Urinary chlorides should be estimated and any deficiency made good.

There should always be available a supply of oxygen, with a facepiece and reservoir bag, a mouth gag, tongue forceps, a sucker, and a supply of gauze wipes, a laryngoscope, and endotracheal tubes.

Comparison with Other Relaxants

The causes of failure with curare in the treatment of tetanus are the inadequate margin between the lissive dose and that causing respiratory paralysis, bronchial spasm, and accumulation of secretions.

Myanesin seems to have none of the disadvantages of curare. It has, however, two of its own: a tendency to cause venous thrombosis at the site of injection, and the production of haemoglobinuria. Davison (1949) makes out a very good case for the use of this drug in tetanus. He points out that proof of haemoglobinuria is lacking, since the breakdown products of the drug may produce a positive reaction to the benzidine and guaiac tests, and, further, that in no case has the so-called haemoglobinuria been shown to have any adverse effect on the patient.

C10 has the disadvantages of neither curare nor myanesin. In the above case, on only one occasion was respiration depressed to such an extent as to require inflation of the lungs with oxygen. This occurred with a very large dose —9 mg.—given initially. It is of interest to note that this amount was required to produce relaxation after two intravenous injections of 5 mg. of D-tubocurarine chloride had been given 50 minutes and 1 hour previously. This confirms the experimental finding of Paton and Zaimis (1948) that, although the potency of D-tubocurarine is not affected by the previous administration of C10, twice as much C10 is required after a previous dose of D-tubocurarine. Subsequently, the dosage averaged 2–4 mg. at three- to four-hourly intervals. On one occasion 5 mg. was given, but this dose paralysed the intercostals, and, though no cyanosis was seen, the patient was put in the oxygen tent.

West (1936) expressed the opinion that the development of bronchial spasm was a very real danger in the use of curare. The occurrence of this complication is probably less likely with the pure D-tubocurarine chloride now available, but even with this material it is still seen fairly often. Paton and Zaimis (1948) found that the power of C10 to liberate histamine was one-quarter that of an equivalent dose of D-tubocurarine. This leaves an adequate margin of safety.

Accumulation of mucus was seen after the first dose of C10, and on the third day there were signs of fluid at the base of the left lung. Otherwise there was no trouble with excessive secretion. Coughing and swallowing were possible throughout the treatment. I feel that the choice of analgesic helped to achieve this result.

Pethidine is structurally related to atropine, and has mild atropine-like properties (Batterman and Himmelsbach, 1943). In addition to its analgesic and sedative action, it has, in contrast to morphine, an antispasmodic effect on smooth muscle, including bronchial musculature, and causes very little depression of respiration or of the cough reflex. Despite the enormous amount given, no ill effects were seen, and there were no withdrawal symptoms.

Summary

A case of tetanus treated with C10 and pethidine is presented.

It was found possible with these two drugs to control the spasms, abolish the rigidity, and relieve the pain of tetanus without unduly depressing either respiration or the cough reflex.

The advantages of pethidine as an adjuvant to the relaxant treatment are commented on.

The case is reported in the hope that others may be encouraged to give C10 a further trial. I should be interested to hear of any other cases.

I wish to thank Dr. T. Howard Crozier and Dr. F. Pantridge for allowing me to co-operate in the treatment of this case, and for their help and encouragement; Dr. T. Leitch for his help in carrying out the treatment; and the sisters and nursing staff of ward 15 for their invaluable assistance.

References

Adriani, J., and Ochsner, A. (1947). *Surgery*, **22**, 509.
Batterman, R. C., and Himmelsbach, C. K. (1943). *J. Amer. med. Ass.*, **122**, 222.
Belfrage, D. H. (1947). *Lancet*, **2**, 889.
Bull, G. M., *et al.* (1949). Ibid., **2**, 229.
Cole, L. (1934). Ibid., **2**, 475.
Cullen, S. C., and Quinn, C. S. (1943). *Surgery*, **14**, 256.
Davison, M. H. A. (1949). *Lancet*, **2**, 1110.
—— Ward, A. B., and Pask, E. A. (1949). *British Medical Journal*, **1**, 616.
Hoche, E. (1894). *Neurol. Zbl.*, **13**, 289.
Mitchell, J. S. (1935). *Lancet*, **1**, 262.
Ory, E. M., and Grossman, L. A. (1948). *Amer. J. med. Sci.*, **215**, 448.
Paton, W. D. M., and Zaimis, E. J. (1948). *Nature, Lond.*, **162**, 810.
West, R. (1936). *Lancet*, **1**, 12.

PROLONGED INTERCOSTAL PARALYSIS DUE TO A RELAXANT

BY

H. BARRIE FAIRLEY, M.B., B.S.

Junior Registrar, Department of Anaesthetics, Westminster Hospital

The following case may be of interest to anaesthetists. As relaxants are only a recent addition to the anaesthetist's armamentarium, any complication following their administration is worthy of record.

Case Report

A woman aged 33 was recently admitted to hospital for hysterotomy and sterilization. Seven years ago, following lobar pneumonia, she contracted acute nephritis, which has since become chronic. Three years ago a pregnancy was artificially terminated owing to the onset of incapacitating symptoms related to her nephritis; and for the past two years she has been subject to intermittent attacks of blurred vision.

Six weeks before admission investigations made at another hospital were reported to her doctor as follows: blood urea, 60 mg. per 100 ml.; urea concentration, less than 2 g.% on all readings; urea clearance test, "very low percentage"; renal function "very poor."

On admission the patient looked well. She had oedema of the ankles; albuminuria ++; her blood pressure was 180/110 and haemoglobin 55%. There was no evidence of cardiac failure or respiratory disease. Pre-operatively, 1 pint (570 ml.) of whole blood was given.

Anaesthesia was induced with sodium thiopentone, 0.4 g. The nose was sprayed with cocaine 15%. Hyperventilation was achieved with nitrous oxide, oxygen, and carbon dioxide, and a No. 8 nasal tube was passed blind. "Flaxedil," 100 mg., was then given, anaesthesia being maintained with a mixture of nitrous oxide and oxygen with minimal cyclopropane. After half an hour the abdominal muscles were beginning to tighten; a further dose of flaxedil, 40 mg., was therefore given. After each dose of relaxant the respirations returned in approximately two minutes. The patient being in the Trendelenburg position, assisted respiration was continued throughout.

After 55 minutes the operation was completed. The patient appeared to be maintaining a good colour, though the respirations were only diaphragmatic. She coughed slightly on extubation and was returned to the ward with an oral airway.

About 10 minutes post-operatively she appeared cyanosed. The colour improved immediately on reintubation and administration of oxygen.

About 1½ hours post-operatively, and shortly after extubation, consciousness returned and the patient asked for a drink. Shortly after this she became unconscious and was breathing "very shallowly." Breath sounds were present in all areas. She was slightly cyanosed. Pulse 130 a minute. Her colour improved with oxygen.

2 Hours Post-operatively.—Blood pressure 260/150. Eyes directed upwards (pupils equal and reacting minimally to light). A provisional diagnosis of hypertensive encephalopathy was made. Respirations diaphragmatic; chest wall sucked in on inspiration. Owing to the presence of moist sounds in the trachea and main bronchi, blind intubation and tracheo-bronchial suction were carried out. Oxygen was given. Magnesium sulphate was introduced rectally and hypertonic sucrose intravenously.

3¼ Hours Post-operatively.—Consciousness returned. Blood pressure 180/110. Patient a little distressed by tube.

3¾ Hours Post-operatively.—Extubated, as good colour was being maintained. Respirations still only diaphragmatic.

5 Hours Post-operatively.—Slightly cyanosed. No improvement in respiratory excursions. Chest wall still indrawn on inspiration. Accessory muscles still active. Conscious. No. 6 tube passed blind after cocainization of nose and pharynx. Tracheo-bronchial tree again sucked out. Patient indicated immediate subjective improvement. From this point onwards the nasal tube was left *in situ* and intermittent tracheo-bronchial suction performed, mucoid material always reaccumulating. The patient's condition appeared to be gradually deteriorating.

9¼ Hours Post-operatively.—Blood pressure 220/150. Patient very distressed. Otherwise no change.

10¾ Hours Post-operatively.—E.C.G. showed sinus tachycardia only. Lumbar puncture revealed normal pressure.

12¼ Hours Post-operatively.—Bronchoscopy performed: small amount of mucoid material removed.

13 Hours Post-operatively.—Atropine, 1/100 gr. (0.43 mg.) and neostigmine, 1.25 mg., given. Immediate improvement. Intercostal muscles came into action. Patient quickly returned to "normal." No further post-operative complications.

Comment

Whilst one would not presume to dogmatize about the reason for this occurrence, the following points of interest emerge: (1) Even excessive doses of flaxedil are known (in animals) to be excreted unchanged in the urine—30–100% in two hours (Mushin *et al.*, 1949). (2) The dosage of relaxant, though generous, was not excessive. (3) This patient has very poor renal function. (4) It would appear that the return of diaphragmatic respirations after the administration of flaxedil is not necessarily followed soon by the return of intercostal muscular tone. (5) Further confirmation is given of the fact that inadequate respiratory excursions are not detrimental to the patient provided adequate oxygenation is maintained.

The giving of neostigmine was delayed for two reasons: (*a*) The uncertainty whether it was indicated. Initially, the recovery of consciousness followed by a period of coma with concomitant increase in hypertension confused the picture from the anaesthetic aspect. (*b*) Following this, one was hesitant to administer neostigmine in view of its possible effects on the cardiovascular system.

We await the results of further renal-function tests.

Summary

A case is reported of prolonged loss of respiratory muscular tone following intravenous injection of 140 mg. of flaxedil in a woman with severe renal damage.

The picture is complicated by symptoms suggestive of hypertensive encephalopathy.

I wish to thank Mr. A. Briant Evans and Dr. J. B. Wyman for permission to publish this case.

Reference

Mushin, W. W., *et al.* (1949). *Lancet*, **1**, 726.

In consultation with the Invalid Children's Aid Association, the British Rheumatic Association is now determining how much it should be responsible for the care of children with rheumatic hearts. Local authorities in most areas operate a scheme providing for the medical and educational needs of these children, and, while most can return to their own homes after treatment and convalescence, there remain a small and at present unknown number of children who have either unsuitable homes or none at all. These sufferers, together with mothers of several young children, one of whom may need continuous care, need domestic help to prevent the suffering of either the invalid or the rest of the family. This problem is being taken up by the British Rheumatic Association's local branches. A threefold line of sociological inquiry is now being conducted: one forms part of the research by the Medical Research Council at the London Hospital; another will be based on information provided by the Registrar-General.

Medical Memoranda

Hypertrophy of the Little Finger

In these days, when "compensationitis" is so prevalent and when the examination of patients for insurance claims tends to give the surgeon a somewhat disillusioned opinion about the recovery powers of the average person following trauma, it is refreshing to meet a case such as is described here.

Case Report

A man aged 54 came to the Leith Hospital surgical out-patient department on June 17, 1949. He had fallen off his cycle and bruised his right hand. A radiograph showed a small crack in the metacarpal surface of the right trapezium bone. The injury was of a minor nature, and he made a good recovery with no special treatment beyond supporting strapping for a fortnight.



Radiograph of the patient's hands. Note the thickness of the fifth right metacarpal and the increase in size of the fifth right finger compared with the left.

Attention was drawn, however, to the deformed condition of the right hand, from which the fingers and thumb were absent with the exception of the fifth finger. The patient said that this was the result of a shrapnel wound in France in September, 1918. He had been treated in a field hospital, had had one operation, and had been discharged within a month. When the wound had healed he started work as a miner, and had been employed in the pits for over three years. The scar had not been painful, and he had been able to grip the handle of a shovel firmly between his little finger and the remaining portion of his right hand. After leaving the mines he had continued at various forms of labouring, and had been able to work without difficulty; his present job is lifting bales of paper, etc., in a stationery office. Examination of the right hand showed the little finger to be almost as long as, and actually thicker than, the middle finger of the left hand; it was much larger in every dimension than the left little finger. The patient demonstrated the surprising strength of the grip of his right hand, in spite of the tenderness due to the recent injury. This power was largely owing to the great development of the "opposition" element in the movements of the fifth finger. The fifth metacarpal segment had become hypermobile, with excessive development of the muscles of the hypothenar eminence, so that the fifth finger could be swung across the palm to the first metacarpal, which was relatively fixed.

The scars of the traumatic amputation had healed cleanly without becoming adherent to the stumps of the third and fourth metacarpals, and there had been no development of stump neuromata. The patient had therefore been able to use the hand vigorously from the start without pain. Shorn of all its members save the weakest, the hand nevertheless had been used unsparingly in the one way it could—namely, gripping—and it had responded. The bones of the fifth finger could not grow in length, as the epiphyses were already ossified, but they became thicker and stronger, especially the metacarpal, to which the opponens muscle is attached. The right hand, though only a remnant, is to-day the hand of a strong labouring man. The accompanying radiograph demonstrates the features noted above, particularly the hypertrophy of the soft tissues of the fifth right finger.

This case illustrates the truth of the old adage, "Where there's a will there's a way." It shows how well Nature responds to the demands of a determined man in overcoming gross mutilations. It makes one more than ever sceptical of those patients who come for examination on compensation claims, months after some comparatively minor injury, holding their fingers stiff and useless and their healed scars still swathed in bandages.

James A. Ross, M.D., F.R.C.S.Ed.,
Assistant Surgeon, Edinburgh Royal Infirmary and Leith Hospital.

Status Epilepticus: A Symptom Complex of African Trypanosomiasis

The following case, in which the cerebral stage with meningo-encephalitis was complicated by an attack of status epilepticus, is of interest. Few patients present themselves for treatment during the incubation or febrile stage.

Case Report

The patient, a married man aged 33 with two children, was a native of Georgetown, which is in the tryanosomiasis endemic area (138 cases in the first eight months of 1949). He had been a ferryman at the southern crossing of the river at Sankuli Kunda for ten years. He had been in fairly good health, with only irregular attacks of some of the more common diseases—malaria, yaws, etc. The present illness started on June 1, 1949. He had attended the funeral of a friend, and on his return home he suddenly became confused, exhibiting abnormal behaviour and a tendency to sleepiness. Later he grimaced, became apathetic, more confused, rambling in his speech, and difficult to manage at home. He also complained of headache and fever. After an unstable recovery on native methods of treatment, he was admitted to Bansang Hospital on June 20.

On admission he was in a state of acute maniacal excitement. His temperature was 99° F. (37.2° C.), pulse 80, and respirations 20. A general physical examination revealed nothing grossly abnormal in the vital systems. Laboratory investigations showed that malaria parasites were not present in the blood, and that trypanosomes were present in the cerebrospinal fluid and gland juice. His excitement was controlled by 1 g. of hexobarbitone, and a course of "antrypol" and tryparsamide injections was started.

Six days later his condition had greatly improved. After the first injection of 1 g. of antrypol he became sensible, co-operative, well orientated in place, took his food, became interested in his condition, and expressed his gratitude for the care that was taken in his case. This improvement continued for another nine days, until July 5. On the morning of this date he had his third injection (2 g. of tryparsamide). At about 1 a.m. next day he had an epileptic fit which continued for two hours with only a few seconds between the attacks. This status epilepticus was controlled by 1 g. of hexobarbitone intramuscularly. He became somnolent and continued in this state for 36 hours. On recovery he was garrulous, incoherent in his speech, restless, untidy in his habits, refused his food, and was a danger to himself. Another physical examination disclosed no abnormality. The plantar response was flexor.

The excitement continued until July 15. During that time he was agitated, aggressive, noisy, restless, difficult with his food, and cantankerous. He slept for long hours between attacks, which lasted on the average about 20 minutes. On July 18 laboratory investigation revealed that trypanosomes were present in the gland juice and cerebrospinal fluid.

He entered into an apparently lucid period on July 16 and continued fairly well behaved and co-operative till August 8, when he again became noisy and confused and exhibited grotesque behaviour. He was auditorily and visually hallucinated. He spoke to imaginary people around him and complained that they said they were going to kill him. During the relapse on August 8 he had another attack of status epilepticus, and this recurred the following day. The cerebrospinal fluid was again examined, but this time trypanosomes were not present. This relapse lasted only two days, after which he became normal with only an occasional outburst of shouting and delusional displays.

He maintained his improvement and on August 16 inquired whether the man in his place had been informed that he was "well" and would soon go home. He became preoccupied with his discharge from hospital and continually inquired when he would be allowed out. This unstable recovery he maintained until his discharge on September 16. He was facile, childish, mentally retarded, stereotyped in behaviour, but easy to manage. He was discharged to the care of his relatives.

Comment

Trypanosomiasis with epilepsy has already been reported. This case had an additional symptom complex—namely, that of status epilepticus. It is to be noted that these epileptic episodes had no relation to the presence or absence of trypanosomes in the cerebrospinal fluid. It is possible that the attacks were due to a structural damage to the brain itself.

Medical practice in the Tropics is prejudiced by the delay before hospital facilities are sought. This is sometimes due to ignorance and sometimes to fear. It is possible that cases of this nature may not be brought to hospital until an attack of status has begun, or during the post-epileptic somnolent stage, which in the above case lasted for thirty-six hours. In trypanosomiasis endemic areas all patients brought to hospital in epileptic fits or seemingly unconscious must be suspected of having trypanosomiasis in addition to the other more common causes—cerebrospinal meningitis, cerebral malaria, and hysteria.

I wish to thank the Acting Director of Medical Services, Dr. T. P. Eddy, for permission to publish this case, and Dresser-dispenser Wilson for his invaluable assistance in the compilation of the record and for translating the patient's Mandinka.

Edward F. B. Forster, M.D.,
Medical Officer in Charge, Bansang Hospital.

Case of Double-headed Monster

This is a case of twins united by the trunk (thoracopagus and dicephalus).

Case Report

A 3-para aged 25 was at full term. Her first delivery was a breech, the second a vertex, both children being alive and normal. At the antenatal examination the presentation was diagnosed as breech. An unsuccessful attempt at external version was made at 34 weeks, but no further efforts were made as the patient was a multipara and had had a previous successful breech delivery.

Labour started at 4.30 a.m. and she was admitted at 5.30 a.m., when the cervix was near full dilatation. The membranes were intact and both feet could be felt. Labour was allowed to proceed normally. The membranes ruptured at 6.40 a.m. and the first foot was delivered in five minutes, followed by the second with the next pain. The descent of the foetus was slow, but nothing was suspected until a third foot presented at the vulva. On examination another foot was felt and a second pelvis. The patient was fully anaesthetized and a hand was inserted to push up the posterior foetus in order to deliver the anterior twin. This was found to be impossible, and the correct diagnosis was made only after thorough palpation with the whole hand inserted.

As the two pelves were causing obstruction, one was amputated at the level of the superior crest of the ilium. Traction even then failed to effect any progress owing to the size of the trunk, and the second pelvis was also amputated at the same level. This allowed for the compression of the body, and all the four hands were brought down one after the other. The next problem was the delivery of the two heads. I decided to cut off one of them with a hook, and in order to reach it asked my assistant to exert steady traction on the trunk upwards towards the mother's abdomen while I inserted my hand from behind to reach the posterior neck to insert the hook round it.



This manœuvre resulted in an unexpected delivery of both heads one after the other. The convexity of the anterior head fitted in the concavity of the posterior neck, and the posterior head was first delivered over the perineum followed rapidly by the anterior head, thus making the amputation of one of the heads unnecessary.

The third stage was quite normal: the placenta was delivered complete after 10 minutes at 8.10 a.m. There was only one umbilical cord. The perineum was not torn, though there was a good deal of bruising. Penicillin and sulphonamides were given as a prophylactic measure, and the patient made an uneventful recovery.

The Foetus.—Permission to preserve the specimen and for further post-mortem examination was refused. The combined trunk was very big, and the line of fusion of the two trunks is oblique and can be seen clearly in the accompanying photograph. The umbilical cord was inserted between the two pelves. The left anterior hand and the right posterior hand belonged to one of the twins and vice versa owing to the oblique plane in which the two trunks had joined. Both foetuses were female and completely separate from the neck upwards and from the pelvis downwards. The parts were fairly well developed, the total weight being 11 lb. (5 kg.). The heads were also of normal size, and I was surprised at their normal delivery, though the mother's pelvis was roomy.

S. D. Karve, M.B.,
Chief Medical Officer, Pandya Memorial Clinic, Mombasa.

Reviews

WEIR MITCHELL

S. Weir Mitchell: Novelist and Physician. By Ernest Earnest. (Pp. 279. £1 8s.) London: Geoffrey Cumberlege. 1950.

We have waited a long time for an adequate biography of Silas Weir Mitchell, America's foremost and first neurologist. Born in Philadelphia in 1829, four years after Charcot, six years before Hughlings Jackson, and sixteen years before Gowers, Weir Mitchell was blessed with robust health and vitality despite the handicap of an essential tremor of his upper limbs. His vigour thus enabled him to endure a long life and a full one, glorying in his achievements as a pioneer in medicine, a novelist, a poet, and a *bon viveur*. Perusal of his life story teaches us that, albeit difficult, it is possible for a neurologist to be a man of culture and sensitivity; that he can live to the advanced age of 84 continuing in a busy consulting practice, and, what is more, continue to be a valuable hospital physician.

The biographer is not himself a medical man, and perhaps the purely technical aspects of Weir Mitchell's career are subordinated so as not to dismay a general reader. We are left in ignorance of many things we should like to know. The first year of postgraduate study was in Paris, but we are not told where. His work abroad must have been a powerful stimulus, for Weir Mitchell was one of the early few who introduced into American medicine the European conception of research. A most competent physician with an overpowering presence, he made a considerable impression, especially upon his large circle of adoring female patients. He was not a good teacher; for his faulty memory compelled him to relearn his material, and he consequently disliked lecturing. His mind was original, suggestive, fertile—"yeasty," as his friend L. Keen put it. He was unlucky in his successive application for professorships in Philadelphia, but no doubt mankind benefited therefrom, for, as Oliver Wendell Holmes said of him, "Perhaps it is hardly desirable that an active man of science should obtain a chair too early, for I have noticed . . . that the wood of which academic fauteuils are made has a narcotic quality which occasionally renders its occupant somnolent, lethargic, or even comatose!"

Although Weir Mitchell was a close friend of Osler, he seems to have been no great admirer of England. Perhaps it is the biographer who is responsible for the acidulated remarks on British weather, which we cannot help, on British cooking, which is fair enough, on the British attitude towards the American Civil War, which is understandable, and on the huge feet of British women, which is absurd.

Weir Mitchell's hospital clinic for nervous disorders was founded in 1861, and hence was the oldest in the States and one of the oldest in the world. His career as a novelist did not begin until he was 51, and he wrote until the time of his death at the brink of 85. His fiction was always of a psychological genre, and he has been compared to Henry James and to O. W Holmes. Though his novels are often problem-studies in human affairs, they are marked by a certain primness—an attitude which the biographer sums up by emphasizing that he was a Philadelphian. His verse, we are told, was undistinguished. Weir Mitchell is associated with the successful treatment of certain neurotic states, a success which is probably due as much to his domineering personality as to his methods. Freud shocked him. After reading a library book on psycho-analytic beliefs Mitchell threw it in the fire, with the protest, "Where did this filthy thing come from?" Weir Mitchell was always a clubman, a socialite, and an assiduous attendant at boards of management. The last-named chore became more and more irksome to him, and eventually he expostulated to his wife that she should engrave upon his tombstone: "Committee'd to Death." This is a warning which modern physicians and surgeons might well take to heart.

Macdonald Critchley.

THE BREAST

The Breast. Structure: Function: Disease. Edited by F. D. Saner, M.B., Ch.B.(Camb.), F.R.C.S. (Pp. 316; 193 illustrations. £2 5s.) Bristol: John Wright and Sons. 1950.

Many books, large and small, have been written on diseases of the breast, but this symposium seems to strike a happy medium between bare sufficiency and such prolixity as is suitable only for the extreme specialist. Here within the compass of some 300 pages we find all the essentials of the subject attractively discussed in a manner which is well balanced despite the multiple authorship. Indeed, it may be described as a very competent book of really useful size.

There is a good section on pathology, illustrated by excellent photomicrographs which do not appear to have lost much detail in reproduction. A particularly interesting chapter is that on the importance of spread of carcinoma along the internal mammary lymphatic chain. The author of it recommends that in early cases without extensive axillary involvement an intercostal biopsy should be performed at an early stage of the operation; if the immediate section report is negative a radical operation is carried out, but if the result is positive a simple mastectomy is done, the treatment of the secondary deposits being by radiotherapy.

The whole question of the relationship of surgery to radiotherapy is fully discussed and the final opinion is thus expressed: "The extent and timing of the respective use of surgery and radiotherapy is dependent on the state of the disease and will be subject to adjustment as experience increases, but the merit of a combination of the two methods is undoubted." There is a very useful appendix giving a summary of the statistical data relating to certain aspects of incidence, diagnosis, and outcome of treatment.

The only small criticism which we have to make is that the coloured illustrations, except the colour photographs, should have been omitted. They fail to give a recognizable impression of the conditions they set out to illustrate and in this way are misleading. No doubt they are good art, but a scientific subject like surgery does not allow of any artistic licence.

Norman C. Lake.

VENEREAL DISEASES

A Textbook of Venereal Diseases. By R. R. Willcox. (Pp. 439; 154 figures. £1 12s. 6d.) London: William Heinemann Medical Books. 1950.

The list of appointments, past and present, held by the author of this book is a guarantee that he knows what he is writing about; few, if any, venereologists can have studied venereal diseases in so many parts of the world. The book is admirably put together and the illustrations are excellent, showing what they are meant to show; the coloured plates are exceptionally clear. It will appeal to

venereologists all over the world and can be strongly recommended both for its sound teaching and for its wise advice.

The author ranges over the whole subject and includes accounts of those diseases of the Tropics and subtropics which closely resemble syphilis. He discusses also a number of para-venereal conditions seen commonly in V.D. clinics. The risks and nursing attention required when pyrexia is produced by T.A.B. given intravenously might with advantage have been set out more fully, for the reaction caused may on occasion be alarming to patient, doctor, and nurse. Unfortunately the literary standard of the book falls short of the technical, and more than a hundred errors, many of a minor nature, were noted; for some of these the proof reader must be held responsible.

T. E. Osmond.

DEFECTIVE CHILDREN

Children with Mental and Physical Handicaps. By J. E. Wallace Wallin, Ph.D. (Pp. 549; illustrated. £2 2s.) London and New York: Staples Press. 1950.

This book is intended to supply professional workers in the fields of special education with a modern reference book descriptive of mental and physical disease in children. The author has been for nearly forty years a specialist in the United States in the education of handicapped children, and if he had written only of matters within his special field he might have produced a first-class book.

The first part of the book is concerned with a description of mentally defective children—their types, classification, degrees of educability, and so on. So far as I can judge, these chapters constitute an admirable review, informed by special knowledge and wide experience.

It is impossible to write favourably of the part of the book on physical handicaps. It is composed without expert knowledge, it is peppered with references from old and modern authors indiscriminately selected and to whose papers the author in his preface ingenuously explains that he has not always had personal access, and he is equally undiscriminating in his selection of relevant subjects. For example, he describes such rare diseases as Wilson's disease, gargoylism, the Hand–Schüller–Christian syndrome, epiloia, Tay–Sachs disease, pituitary dwarfism, pubertas praecox, and so on, and yet he does not mention rheumatic heart disease or congenital cardiac disorders. In writing of mongolism the author devotes three pages to some fourteen described causes of mongolism, nearly all of them entirely speculative. In short, any worker who is concerned with handicapped children and who wants information about physical disease in children is advised to consult a standard textbook of paediatrics, whether English or American, rather than rely on the information provided in this book.

D. V. Hubble.

The Medical Annual, 1950 (John Wright and Sons, Ltd., 25s.), is the 68th of the series, and once again the many contributors, under the experienced editorship of Sir Henry Tidy and Mr. A. Rendle Short, have surveyed recent progress in medical science. The aim of the *Medical Annual* is to help the practitioner, and emphasis is of course on the practical aspects of recent developments; but even so this volume is remarkably comprehensive. Cortisone and the new antibiotic drugs are obvious subjects, but space has also been found for, among other things, a full description of the Pulheems system of medical classification and for a brief discussion of the discovery of oestrogen-like substances in clover and grasses. The usefulness of this volume is enhanced by excellent plates (some in colour), a comprehensive index, and a classified list of new books published in Britain and America.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

The Child and the Magistrate. By J. A. F. Watson. (Pp. 367. 12s. 6d.) Revised edition. London: Jonathan Cape. 1950.

A Dictionary of Dairying. By J. G. Davis, D.Sc., Ph.D., F.R.I.C. (Pp. 856. No price.) London: Leonard Hill. 1950.

Principles of Pathology. By R. A. Willis, D.Sc., M.D., F.R.C.P. (Pp. 667. 50s.) London: Butterworth. 1950.

Essentials of Ophthalmology. By R. I. Pritikin, M.D., F.A.C.S., F.I.C.S. (Pp. 561. 60s.) London: J. B. Lippincott. 1950.

The Heights and Weights of Boys and Girls. By A. Sutcliffe, M.A., B.Sc., and J. W. Canham, M.A. (Pp. 80. 10s. 6d.) London: John Murray. 1950.

World Surgery 1950. By S. A. Zieman, M.A., M.D., F.A.C.S., F.I.C.S. (Pp. 177. 50s.) London: J. B. Lippincott. 1950.

Dawson of Penn. By F. Watson. (Pp. 344. 18s.) London: Chatto and Windus. 1950.

Adler's Place in Psychology. By L. Way. (Pp. 334. 18s.) London: George Allen and Unwin. 1950.

The Art of Scientific Investigation. By W. I. B. Beveridge. (Pp. 171. 10s. 6d.) London: William Heinemann. 1950.

The Velpke Baby Home Trial. War Crimes Trials. Edited by G. Brand, LL.B. Vol. 7. (Pp. 356. 18s.) London: William Hodge. 1950.

The Diary of Sylas Neville, 1767-1788. Edited by B. Cozens-Hardy, D.L., M.A., F.S.A. (Pp. 357. 21s.) London: Geoffrey Cumberlege. 1950.

A History of Biology. By C. Singer. 2nd ed. (Pp. 579. 35s.) London: H. K. Lewis. 1950.

Outwitting Your Years. By C. W. Lieb, M.D. (Pp. 318. 9s. 6d.) Kingswood, Surrey: The Windmill Press. 1950.

Thank God for My Heart Attack. By C. Yale Harrison. (Pp. 156. 7s. 6d.) Kingswood, Surrey: The Windmill Press. 1950.

Healing Hands. By E. M. Anderson. (Pp. 72. 2s. 6d.) London: Church Missionary Society. 1950.

One Nation: A Tory Approach to Social Problems. Edited by I. Macleod and A. Maude. (Pp. 96. 1s.) London: Conservative Political Centre. 1950.

Man and His Environment. By A. L. Banks, M.A., M.D., F.R.C.P., D.P.H. (Pp. 16. 1s. 6d.) London: Cambridge University Press. 1950.

New Biology, 9. Edited by M. L. Johnson and M. Abercrombie. (Pp. 128. 1s. 6d.) Harmondsworth: Penguin Books. 1950.

Blindness: Modern Approaches to the Unseen Environment. Edited by P. A. Zahl. (Pp. 576. 48s.) Princeton, New Jersey: Princeton University Press. 1950.

Medicinal and Food Plants of British Columbia. By I. Bastow Hudson, M.B., B.S., M.R.C.S., L.R.C.P., L.M.C. (Pp. 70. 10s.) Victoria, B.C.: I. Bastow Hudson. 1950.

Factors Regulating Blood Pressure. Edited by B. W. Zweifach and E. Shorr. (Pp. 280. No price.) New York: Josiah Macy, jun., Foundation. 1950.

Child Care in Israel. Edited by C. Frankenstein. (Pp. 324. No price.) Jerusalem: The Henrietta Szold Foundation for Child and Youth Welfare. 1950.

Allergie und Praxis. By G. A. Rost, M.D. (Pp. 191. M. 15.60.) Berlin: Springer. 1950.

Das Magen-Zwölffingerdarmgeschwür und seine Behandlung. By M. Friedemann, M.D. Completed and edited by H. Schloessman. (Pp. 218. M. 16.50.) Jena: Gustav Fischer. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 28 1950

ANTICOAGULANT THERAPY OF ACUTE MYOCARDIAL INFARCTION

In assessing the value of any form of treatment for acute myocardial infarction it is essential to be closely familiar with all the details of the natural course of the disease. Failing this, the treated series must be compared with a like series of untreated controls. This platitude will be forgiven by those who realize the great difficulty in obtaining so simple a thing as the natural mortality rate for acute myocardial infarction and the many uncertainties that surround controls. Mortality figures given in the literature are mostly based on hospital experience, and vary from 8% for first attacks treated by means of rest and a low-calorie diet[1] to 78% in young adults.[2] Unless details are known, crude mortality figures mean little. For example, the largest series quoted by Drs. J. A. Tulloch and A. Rae Gilchrist in their article at page 965 is that reported by Yater and his colleagues,[3] in which the crude mortality rate was 50% of 866 cases. These patients were all under 40 years of age and all men. They were collected by the U.S. Army Institute of Pathology and the Veterans Administration. In 450 cases the diagnosis was established by necropsy; of these, 223 died abruptly or within 15 minutes, and another 45 died between 16 minutes and 2 hours. Thus more than half of the fatal cases would have been reported to the coroner in civil life. If all the immediate survivors had been sent to hospital, the mortality rate calculated by the hospital staff could not have exceeded 30%. Then, of the total of 866 patients, only 75 (8.6%) died after the first 24 hours. Again, while most fatal cases must have been included in the series, owing to the manner in which the material was collected "cases of many living patients were excluded because of inadequate data." The details of this large series therefore indicate that in American soldiers under 40 years of age acute myocardial infarction causes instant death in 16%, almost immediate death (within 15 minutes) in an additional 10%, and death within two hours in a further 5%. Of the remaining 598 patients who would have had a chance of reaching hospital and obtaining treatment, 107 or 18% died within 24 hours and 12.5% died afterwards of the acute illness. This gives a very different impression from the 50% mortality figure originally quoted. Similar data are needed about older men and women in civil life.

Anticoagulant therapy for acute myocardial infarction is now widely practised, and since it is an expensive and troublesome form of treatment there should be general agreement about its value. Tulloch and Gilchrist describe the treatment of 70 patients and compare the results obtained with the behaviour of the disease in 84 control subjects. Their claim that anticoagulant drugs reduce the mortality rate of acute myocardial infarction by one-half, and the incidence of thrombo-embolic complications also by one-half, must receive very close attention. Their conclusions are based on careful and well-presented work, and their controls appear to fulfil all requirements. Moreover, the same conclusions may be drawn from data which they have collected from the literature. Yet there may still be some who are not quite satisfied, or who feel that anticoagulants should be reserved for particular cases rather than used routinely. By far the largest treated series in the literature is that collected and reported by a special committee set up by the American Heart Association.[4] This series comprised 432 cases, and results were compared with those obtained in 368 controls. The mortality rate was 24% in the controls and 15% in the treated group. The difference was attributed chiefly to a reduction in thrombo-embolic deaths—3% in the treated patients and 10% in the controls. The incidence of thrombo-embolic manifestations was 25% in the control group and 11% in the treated group. Comparisons between the two series for each week of the disease were equally impressive up to the end of one month. An important finding was that the mortality rate was reduced by anticoagulants only in patients over 60 years of age. But thrombo-embolic complications were greatly reduced in all patients.

These results look impressive, and the controls seem strictly comparable; moreover, it is just the kind of result that would be expected. Yet there are one or two disturbing features. Independent studies do not put the death rate from pulmonary embolism as high as these figures suggest. Eppinger and Kennedy,[5] for instance, found it was 6.5% in 200 fatal cases of acute myocardial infarction, and Hellerstein and Martin[6] 12% in their series of 160 necropsies. If the total mortality rate was around 25%, then pulmonary embolism could have caused death in only 2–3% of all cases encountered.

---

1 Master, A. M., *Amer. Heart J.*, 1936, **12**, 549.
2 Newman, M., *Lancet*, 1946, **2**, 409.
3 *Amer. Heart J.*, 1948, **36**, 334.
4 Wright, I. S., *et al.*, ibid., 1948, **36**, 801.
5 *Amer. J. med. Sci.*, 1938, **195**, 104.
6 *Amer. Heart J.*, 1947, **33**, 443.
7 *Amer. J. med. Sci.*, 1948, **216**, 172.

This does not tally with the 10% incidence quoted above. Again, Hellerstein and Martin found clinically detectable thrombo-embolic lesions in 11.5% of 1,605 cases of acute myocardial infarction collected from the literature. This makes an interesting comparison with the incidence of 11% found in Irving Wright's series treated with anticoagulants.

Tulloch and Gilchrist calculated the crude mortality rate in their control patients to be 40%. In the series reported by Wright and his colleagues it was as high as this only in persons over 70 years old, being 30% in those between 60 and 70 and only 10% in those under 60. The mortality rate was nearly 50% in Tulloch and Gilchrist's 53 controls over 60 years old, and 28% in their 32 controls under 60. The difference between the two series is probably explained by the large number of admissions within the first 24 hours in the Edinburgh group (33%). Immediate admission to hospital was almost certainly uncommon in the American series; otherwise the mortality rate in the first week would have been appreciably higher than that in the second, whereas they were practically the same. One of the most impressive features of the Edinburgh series is the close similarity of the treated and untreated groups in duration of the illness prior to admission. The chief difficulty about accepting Tulloch and Gilchrist's conclusions arises from a study of the causes of death in their series. It will be seen that 20% of the controls and 21% of the treated patients died suddenly or from heart failure. This is the expected incidence, and it must be generally agreed that these are the chief causes of death in acute myocardial infarction among those not dying from shock, and that anticoagulants would not prevent the last. The higher mortality among the controls was caused by three deaths from persistent shock or coma, five from a recurrence of myocardial infarction, and six who died in the first 24 hours. Could these have been prevented by anticoagulant therapy? Clearly dicoumarol could not have prevented the six immediate deaths, but heparin might have done. A detailed analysis of the early mortality rate in those treated with heparin and in matched controls is required. Could dicoumarol have prevented "recurrent myocardial infarction"? According to Selzer[7] only 2% or 3% of patients with acute myocardial infarction die from secondary coronary thrombosis.

In the light of present evidence it is by no means certain that anticoagulants should be used as a routine in all cases of acute myocardial infarction, and it would be a pity if no further comparisons with controls were made. That anticoagulant therapy may be of great value can scarcely be doubted, but future work may well show that, like any other drug, it is indicated only in certain well-defined circumstances.

PAY IN THE SALARIED SERVICES

During its struggle to obtain fair remuneration for general practitioners the B.M.A. has not neglected the claims of other branches of the profession. Earlier this year we referred to the unsatisfactory outcome of discussions with the Defence Departments[1] about the pay of medical officers in the armed Forces, but the Minister of Defence has since received a deputation from the B.M.A. and stated that he and the other Service ministers were sympathetic with the Association's case, though they were not convinced that improvement of pay was necessarily the only answer to the problem of recruitment of medical officers.[2] Last week the Government's readiness to face the facts became still more apparent during the debate in the House of Lords on the subject of man-power in the medical services (reported on page 1005). Lord Haden-Guest pointed out the difficulty of efficiently maintaining the health services in the armed Forces and the Colonies when 90% of the doctors in the country were working in the N.H.S. He suggested that every doctor, wherever he was employed, should be eligible for the same rates of pay and the same pensions. Lord Moran, continuing the argument on behalf of the specialists, said that the natural remedy for the scarcity of specialists in the R.A.M.C. was to make conditions such that they would attract specialists in the open market—in other words, to pay them more. Lord Webb-Johnson thought that secondment of doctors in the N.H.S. to the Forces and Colonial Medical Service should be possible, and also secondment in the opposite direction. Lord Shepherd, who replied for the Government, said it was now realized that there must be a movement of wages and salaries, and he was hopeful that among the claims that would be met would be that for medical men in the Services, not merely because the cost of living had increased, but because it was right that they ought not to be worse off than medical men in civilian life. This is an important admission from a Government spokesman, for it implies that the rates of pay in the N.H.S. are to be the yardstick by which rates in other medical services should be calculated.

Members of another salaried service—the public health service—have also for long been dissatisfied with their remuneration, and here again scarcity of recruits has been causing concern. In their claims for better pay medical officers of health and their assistants have had the full support of the profession. Among doctors there should be no argument about the relative importance of prevention and treatment—both are vital for human welfare. When the staff and management sides of Committee C of the Medical Functional Whitley Council failed to agree on revised salary scales the case was taken to the Industrial Court, which is still sitting. The evidence for the staff side has been collected by the B.M.A., working, of course, in close association with the Society of Medical Officers of Health. Medical men and women in the public health service are not the only ones who will eagerly await the Court's findings. No one wishes to see the various branches of the profession graded in descending stages of public regard.

[1] *British Medical Journal*, 1950, 1, 1184.
[2] Ibid., *Supplement*, 1950, 2, 29.

TECHNIQUE IN B.C.G. VACCINATION

Many have tried to obtain statistical evidence of the efficacy of B.C.G. vaccination, but few have succeeded. The number of factors that influence the susceptibility of the individual to tuberculous infection is large, yet all these variables must be taken into account if the figures are to pass the statistician. Race, age, degree of exposure, intercurrent infections, housing conditions, predisposing occupations, and nutrition are unavoidable extraneous factors in any investigation. If differences of technique of individual vaccinators have also to be considered, statistical analysis of the results becomes impossible. Such differences, however, can be eliminated by standardization. The difficulties faced by those who have the task of evaluating the results of B.C.G. vaccination have been well summed up by Ustvedt,[1] in commenting in a recent issue of the *Bulletin of the World Health Organization* on the work of what is known as the Joint Enterprise. This organization, manned by Scandinavian teams, financed by Unicef, and advised by W.H.O., has been fighting to check the spread of tuberculosis in war-devastated Europe during the past two years. It plans to carry out tuberculin tests on over 30,000,000 children and young adults and to vaccinate all negative reactors. In spite of great difficulties the work of the organization has made rapid progress, but it is not surprising that records generally, and details of technique in particular, should be incomplete. Ustvedt writes:

> Of course, no conclusive answer to any of these complicated questions can be given from the experience so far gathered within the Joint Enterprise. On the whole, I would rather say that the very fragmentary information which has been collected up to now, and which is mostly of limited value, has pointed to a series of problems, and has given some evidence in certain directions, so that a more systematic exploration of this subject can be planned and carried out.

In the next phase of the campaign the W.H.O. Tuberculosis Research Office in Copenhagen is planning an investigation of these problems, under controlled conditions.

In the same issue of the *Bulletin* Van Deinse and Sénéchal[2] draw attention to another variable factor in B.C.G. vaccination. The vaccine, when maintained on Sauton-potato as advised by the Institut Pasteur in Paris, has an average length on the tenth day of subculture of 3 μ. At the State Serum Institute in Copenhagen, where the vaccine for the Joint Enterprise and for this country is prepared, the stock culture is maintained throughout on Sauton's liquid medium, and some difficulty has been found in regulating its speed of growth and maintaining the constancy of its allergizing properties. Van Deinse and Sénéchal found that the average length of the Danish bacillus on the tenth day is only 2 μ. It would appear from this that if the decrease is only in the length of the bacillus the Danish vaccine contains one and a half times as many bacilli as the same weight of the French; if the decrease occurs uniformly in its other two dimensions as well there would be over three times as many organisms in an equal weight of the Danish vaccine. In any standardization of technique this fact must be borne in mind.

About a year ago we pointed out[3] the urgent need for controlled B.C.G. trials, for the introduction of B.C.G. vaccination into this country gives a new opportunity to collect evidence which will stand statistical scrutiny. The Ministry of Health has decided to issue B.C.G. in the first instance only to selected vaccinators for use on contacts, nurses, and medical students, and detailed records are to be kept. Much of the technique has been standardized, for the vaccine is obtained from only one source and is suitable only for intracutaneous vaccination. But, though the Ministry's memorandum[4] lays down the criterion for a positive reaction in each test, it leaves the individual vaccinator free to decide whether he will vaccinate those in whom negative results are obtained to any of the following tests: the jelly patch test, the adrenaline-Pirquet, the Mantoux 10 TU (1 TU=0.01 mg. O.T.), or the Mantoux 100 TU (using P.P.D. or standard Old Tuberculin). In at least one hospital region (Oxford) a scheme has been evolved to follow the Ministry's recommendations, but with a stricter standard of technique. It has been mutually agreed throughout this region that a person shall not be classified as a negative reactor, whatever his age, until he has failed to show a positive reaction to a Mantoux test with 1 in 100 standard Old Tuberculin, read after 72 hours. The dosage and time intervals for conversion tests and the revaccination of those who remain tuberculin-negative have also been standardized. Though the enforcement of a rigid regime would be contrary to the traditional freedom of the medical profession in this country, a detailed model scheme would be welcomed by vaccinators new to B.C.G., and would help them in the planning of their work. Moreover, unless we learn from the mistakes of others and exclude all unnecessary variables, we too, in this country, may fail to demonstrate convincing statistical results.

[1] *Bull. World Hlth Org.*, 1950, 2, 355, 441, and 469.
[2] Ibid., 1950, 2, 347.
[3] *British Medical Journal*, 1949, 2, 1278.
[4] Ministry of Health Memorandum 322/B.C.G. (revised).

TREATMENT OF TETANUS

The necessity for giving tetanus antitoxin and penicillin in the treatment of tetanus is fully established, but the best method of controlling the severe and generalized muscle spasms is still debatable. The two possibilities are the use of sedatives and hypnotics, which have a general depressant action on the central nervous system, or the use of substances which have the power of causing muscular relaxation without a general sedative effect. The sedative which is chosen must act rapidly, must not be cumulative, and must not cause undesirable side-effects when given over a period of days or even weeks. For a time "avertin"[1] was the most-favoured sedative, but thiopentone now seems more suitable, and repeated intravenous injections, supplemented if necessary by intramuscular paraldehyde, will control the muscular spasms in many cases. Harris and her colleagues[2] continued with this form of sedation for 15 days in a patient who finally recovered. These authors advocate tracheotomy at the first stage of respiratory embarrassment —an operation which was first suggested by Curling[3] in 1836 and first used by Humphrey[4] in 1856. Laryngospasm and accumulation of viscid bronchial secretions are a real danger in tetanus, and there may be difficulty in keeping the airway free. Suction of the bronchial secretions can be carried out through a soft rubber catheter passed through the tracheotomy tube, and in this way repeated intubation of the larynx can be avoided.

If it were possible to control the muscular spasms by the use of a drug with a specific action without causing cortical depression there would be obvious advantages, since prolonged sedation enhances the danger of the pulmonary complications, which are referred to above. Curare is said to have been first used in this disease by Spencer Wells[5] in 1859, but little further interest in its use was taken till the work of West[6] and Cole[7] in the nineteen-thirties. The preparations of curare at that time were not reliable, and in 1936 Cole felt that prolonged sedation with avertin was safer than the use of curare. Since then more reliable curare preparations have become available, and a number of cases of tetanus have been reported in which its use has been of real value in controlling the muscle spasm. Curare is best given intramuscularly in the form of D-tubocurarine chloride in wax and peanut oil, for in this form it is slowly absorbed and acts for 18 to 24 hours.[8] The most obvious action of curare is its peripheral blocking action at the myoneural junction, but it may also have a local histamine-like action at the site of injection. When given over a long period curare is said to have caused symptoms resembling those of shock in some patients.

The action of tetanus toxin is a central one on the synapses of the spinal cord,[9] while the action of curare is peripheral. This suggested that "myanesin" (α-β-dihydroxy-γ-(2-methylphenoxy)-propane), which is thought to have a central depressant action on the cord synapses, might be preferable to curare, and it was first used in two cases of tetanus by Belfrage.[10] Further reports[11 12] have confirmed its value, but there is some doubt about the most suitable method of administration. Myanesin acts best when given intravenously, but there is some danger of venous thrombosis—though this can usually be avoided with adequate dilution—and of the production of haemoglobinuria, which is usually transient. Myanesin will act when given by mouth in large enough doses, and in this issue of the *Journal* Drs. M. L. Newhouse, J. D. Rochford, and G. Riddell Royston describe two cases of tetanus in which the oral method was used with satisfactory muscle relaxation. They are careful to point out the danger of oral administration if the myanesin is not adequately diluted. The drug has a local analgesic effect in addition to its central action, and in one of their patients pharyngeal analgesia resulted, with an aspiration pneumonia as a consequence. Also in this issue Dr. R. McD. S. Keir describes the use of yet another muscle relaxant in the treatment of tetanus—decamethonium iodide, or C10. This drug appears to depress respiration less than does curare, and also has less of a histamine-like action. In this one patient C10 together with pethidine controlled the spasms, abolished the rigidity, and relieved the pain without unduly depressing respiration or the cough reflex, and it certainly merits further trials in tetanus. There is no doubt that combined treatment with one of these muscle relaxants together with a sedative is the most suitable method of controlling the muscle spasms, for in this way much smaller doses of sedative are effective than if no muscle relaxant is used.

1 Cole, L., *British Medical Journal*, 1942, **2**, 550.
2 *Pediatrics*, 1948, **2**, 175
3 *Treatise on Tetanus*. London, 1836.
4 *Ass. med. J. London*, 1856, **4**, 158.
5 Beaven, D. W., and Dobson, D. J., *N.Z. med. J.*, 1950, **49**, 24.
6 *Lancet*, 1936, **1**, 12.
7 *British Medical Journal*, 1936, **1**, 1191.
8 Weed, M. R., Purvis, D. F., and Warnke, R. D., *J. Amer. med. Ass.*, 1948, **138**, 1087.
9 Sherrington, C. S., *Integrative Action of the Nervous System*. New York, 1906.
10 *Lancet*, 1947, **2**, 889.
11 Torrens, J. A., Edwards, P. M., and Wood, M. W. W., *Lancet*, 1948, **2**, 807.
12 Davison, M. H. A., Ward, A. B., and Pask, E. A., *British Medical Journal*, 1949, **1**, 616.

SMOKING AND PEPTIC ULCER

While it has never been proved, many believe that excessive smoking is a cause of peptic ulcer. The late Sir Arthur Hurst[1] pointed out that "a large majority of patients with duodenal ulcer have smoked excessively for years." There is, however, more general agreement that smoking delays the healing of ulcers, and some physicians forbid smoking during treatment. Support for this comes from the work of Batterman and Ehrenfeld,[2] who have studied the effect of antacid therapy in 108 patients, comparing its success in non-smokers and smokers. They divided the results of antacid therapy into four groups, ranging from those whose symptoms were completely alleviated and who had no acute exacerbations, to those who obtained no relief and who had frequent exacerbations. Among 43 smokers there was an excellent response to antacids in only 47%, while among 52 who were either non-smokers or who did not smoke during treatment an excellent response was observed in 85%. There were 13 patients who resumed smoking when clinical improvement occurred, and of these 11 immediately became worse when they began to smoke again. Further evidence was obtained by giving 28 patients who were smokers cigarettes containing tobacco from which much of the nicotine was removed. These patients had been studied for long periods previously, and only six of them were improved by antacid therapy when they continued to smoke ordinary cigarettes. But when they changed to the processed cigarettes 22 of the 28 immediately improved, and in 11 all symptoms were arrested. A final experiment was made in which 18 of the 22 patients who had improved were given ordinary cigarettes once more, though these were prepared to look like processed cigarettes: eight of these patients then became worse. These results suggest that smoking neutralizes the effect of antacid therapy and that it does so in proportion to the amount of nicotine in the tobacco.

1 *Gastric and Duodenal Ulcer*, 1929, London.
2 *Gastroenterology*, 1949, **12**, 575.
3 *J. Lab. clin. Med.*, 1941, **26**, 1322.
4 *J. Pharmacol.*, 1949, **95**, 145.
5 *Brit. J. Pharmacol.*, 1949, **4**, 313.
6 *British Medical Journal*, 1945, **1**, 403.

There is much difference of opinion about the amount of nicotine which enters the blood when cigarettes are smoked. Pierce,[3] using a chemical method of estimating the nicotine in the smoke, gives the figures of 2.3 to 3.6 mg. for the amount of nicotine absorbed after deep inhalation of one cigarette, this being about 90% of the nicotine entering the mouth. Even without deep inhalation he estimated that 2.9 mg. is absorbed. Wolff, Hawkins, and Giles[4] measured the nicotine present in the blood of 15 students after they smoked 20 cigarettes in seven hours: they found an amount equal to 0.14 mg. per litre. If the conclusions of Pierce were correct each subject would have absorbed about 60 mg., and this, if distributed through all the body water, would have amounted to 1.0–1.5 mg. per litre. Wolff and his colleagues conclude that there is a rapid destruction of nicotine during smoking. If, however, the destruction is not rapid, the finding of 0.14 mg. per litre indicates that 20 cigarettes have provided 8–12 mg. of nicotine; this agrees well with figures obtained by Ling and Wynn Parry,[5] who found that the amount of nicotine entering the mouth from one cigarette is about 1 mg. Their estimates were made by tests on the blood pressure of the spinal cat and were specific for nicotine. In two investigations undertaken at an interval of 13 years very similar results were obtained. Some experiments by Burn, Truelove, and Burn[6] give guidance about the proportion of nicotine actually absorbed. They observed that the antidiuretic effect of one cigarette in a man, smoked at the height of a water diuresis, was about the same as that of the intravenous injection of 0.5 mg. of nicotine given on another occasion to the same subject. These results suggest that 1 mg. of nicotine enters the mouth from one cigarette and that about half is absorbed when the smoke is inhaled.

MULTIPLE PRIMARY NEOPLASMS

Several examples of multiple carcinoma have been reported in recent correspondence in the *Journal*.[1] The subject has attracted attention for many years as much because of its supposed bearing on the problems of susceptibility and resistance to cancer as because of its interest to the practising surgeon. Further, several substances are now known which will regularly induce multiple tumours in experimental animals: such are acetylaminofluorene and the aminostilbenes.

Estimates differ on whether multiple malignancy occurs more or less often than expected on the basis of chance coincidence alone. The incidence in large series of cases of malignant disease has been variously assessed as between 0.3% and 7.8%, the wide range reflecting differences in the composition of the material. The higher estimate suggests an inherited or acquired susceptibility to cancer, the lower that a primary tumour may confer resistance against the development of fresh primaries. To increase accuracy many writers have included only post-mortem cases of all combinations of multiple malignancy which have been proved histologically, and have estimated the overall incidence among all patients with cancer coming to necropsy within the period under review. There are two objections to this approach—the first concerned with the collection and interpretation of the figures, the second with the validity of the method.

Any estimate of the chance incidence of multiple malignancy in a given population should be based on accurate morbidity figures for each kind of single cancer included in the survey. Such estimates are still of only approximate accuracy, even for the commoner forms in which morbidity figures closely approach mortality figures. Post-mortem series, in spite of increased diagnostic reliability, are of limited value because they are selected fractions of hospital populations, rarely representative in a statistical sense of the geographical populations from which the patients come.

The varied composition of series of multiple malignancies also introduces a source of confusion. Thus some include multiple lesions arising in the same tissue, such as skin, stomach, or large bowel; others exclude these as differing in kind from multiple lesions arising in distinct tissues such as tongue and prostate.[2] Multiple malignancy arising in paired organs such as breasts, gonads, and kidneys is accepted by some, rejected by others. In Slaughter's series[3] of 1,868 cases of multiple malignancy, 54.4% occurred in the same or paired organs, whereas Burke[4] excluded these, as well as Hodgkin's disease, lymphosarcoma, and leukaemias. In all series tumours of low or doubtful malignancy are omitted, yet in a biological problem involving questions of predisposition or resistance the utilitarian clinical concept of "benign" or "malignant" growth is artificial, and common "benign" tumours, though practically of little consequence, might be highly relevant for a full understanding of cancer pathogenesis. But they are unrecorded, and their true incidence is unknown.

Apart from such errors, it is doubtful whether knowledge of the bulk frequency of multiple neoplasms would be of value. Tumours vary greatly in their habits of growth and spread, and in their age, sex, social, geographical, and occupational incidence, and there seems little justification for thinking in terms of susceptibility or resistance to neoplasia in general. The strong hereditary influence present in retinoblastoma, and apparently in a few families with a high incidence of mammary carcinoma and of alimentary neoplasms[5] other than those associated with polyposis coli, is notably absent in the majority of neoplasms. Occupational factors are more prominent in some neoplasms than in others, and the same may be said of hormonal factors. Perhaps some forms of primary tumours will be found to coexist more often than would be expected by chance alone, and other combinations may occur less frequently. In other words, to be biologically valid the statistical analysis of multiple primary neoplasms must be carried out separately for every combination of types, the morbidity of each of which will need to be more accurately known than at present.

1 *British Medical Journal*, 1950, **1**, 648, 905, 1318, 1430; **2**, 107, 297
2 *Lancet*, 1950, **1**, 405.
3 *Surg. Gynec. Obstet.*, 1944, **79**, 89.
4 *Amer. J. Cancer*, 1936, **27**, 316.
5 Ibid., 1936, **27**, 434.

3 Pierce, J. A., *Amer. J. Physiol.*, 1938, **123**, 749.
4 Wolff, H. G., Hawkins, J. E., and Giles, H. G., *J. Amer. med. Ass.*, 1942, **118**, 1462.
5 Ling, S. M., and Wynn Parry, C. B., *Brit. J. Pharmacol.*, 1949, **4**, 162.
6 Burn, J. H., Truelove, S. C., and Burn, G. P., *Brit. J. Pharmacol.*, 1949, **4**, 173.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MIGRAINE

BY

MACDONALD CRITCHLEY, M.D., F.R.C.P.

Neurologist, King's College Hospital; Physician, National Hospital, Queen Square, London

What is migraine? Neurologists are apt to differ in their ideas upon this point. Some physicians would restrict this term to recurring unilateral headaches preceded by visual phenomena and associated with vomiting. Nowadays most would incline to a more catholic conception. More accurately one might define migraine as "a habit of recurring headaches, often one-sided, but not necessarily so; constitutional in nature, inherited, and bearing a vague association with personal or family 'allergic' tendencies and a still vaguer one with epilepsy." Taking an even broader viewpoint, however, we recall that in later life a migrainous sufferer may lose his headache; but recurring visual phenomena may betray the continuance of attacks, or attacks of headache may be replaced by bouts of Ménière-like vertigo. Thus it is that migraine without headache may occur.

Some neurologists isolate a type which might be called "symptomatic migraine." Here the patient develops migrainous attacks in middle life, associated with some morbid anatomical peculiarity, often of a vascular nature. In this connexion a cerebral aneurysm is important, but still more so a cortical angioma. For this reason some cases of migraine should be suspect, and demand special methods of study, if their true nature is to be revealed and the appropriate treatment instituted.

"Symptomatic Migraine"

What are the features which suggest a "symptomatic" as opposed to an idiopathic or constitutional migraine? In the first place, migraine-like headaches starting in the middle-aged or the elderly are not usual, and special scrutiny is advisable. Secondly, headache which is always strictly localized to one area of the skull (and does not change from one side to the other, as is so often the case in simple migraine) should be suspect. Thirdly, migrainous headaches associated with a pulsatile type of tinnitus suggest an angioma. Fourthly, migraine coupled with cranial nerve palsies, whether transient or persistent, should make one think of an aneurysm.

In all such cases there should be a particularly thorough examination of the nervous system, preferably repeated. The fundus oculi may show no abnormality at the first interview, but the wise physician will repeat his ophthalmoscopic examination from time to time. To the routine neurological testing should always be added a careful auscultation of the skull in an effort to pick up a cranial bruit. Still seeking to exclude or confirm the diagnosis of a vascular anomaly of the brain, one has recourse to various technical aids. Electro-encephalography may help by revealing a focus of abnormal cortical activity. Air-studies will occasionally prove informative. Most promising, however, is the result of percutaneous cerebral arteriography. These last two investigations will necessitate the patient entering a special neurological clinic for a few days.

The Migrainous Constitution

The belief is widespread that migraine represents an inborn type of reaction to a number of stresses, both psychological and physical. Just as some rare persons seem to be immune from headache and may survive a long life without experiencing this particular affliction, so there are others—considerably many more—who belong to the category of "headachy subjects" like others in their family. Such persons are apt to develop their headache on every slight occasion; but in addition they may also experience a headache periodically, as it were, and without demonstrable cause. It is probable that the majority of these "headachy" subjects are victims of migraine in more or less outspoken fashion.

There have been various attempts to identify a migrainous habitus and a migrainous personality. None of these can be said to be altogether satisfying, and some of the descriptions indeed are mutually contradictory. Some would correlate migraine with a psychosomatic affection. There can be no doubt whatever that psychological factors may be effective in precipitating an attack of migraine in a migrainous subject. It is possible, too, that migrainous persons have certain identifiable psychological traits which distinguish them from the common herd. But neither of these arguments, singly or together, can justify the doctrine of migraine as a straightforward psychogenic affection, curable by psychotherapy.

Migraine as a Minor Malady

Some patients are fortunate, so far as their migraine is concerned, in that their symptoms scarcely warrant medical attention. Here belong those patients whose headache is mild in intensity and is not incapacitating. If the patient is able to continue his work with little if any falling off in efficiency, then the headache must be rated as mild. Where the headache is relieved by small doses of mild analgesics (e.g., aspirin 10 gr.—0.65 g.) the migraine must be regarded as trivial. When the attack is unaccompanied by vomiting the degree of incapacity is reduced, and unless the headache is intense the migraine may perhaps be regarded as minor in character. Very infrequent attacks—attacks which are promptly relieved by some simple common-sense measure such as the correction of refractive error—also belong within the cadre of minor migraine. Finally one may mention those cases in which the attack is represented by nothing more than short-lived attacks of teichopsia (without headache, dizziness, nausea, or vomiting).

Unfortunately, these foregoing cases would seem to be in a minority, unless it is that they exist without coming to the notice of the family doctor.

Migraine as a Major Malady

The other extreme may be considered—namely, where the migraine threatens the mental or physical health of the victim, upsets the tranquillity of the household, and interferes with working efficiency. Such cases may be spoken of as "migraine major," and they include:

(*a*) Cases where each attack causes much incapacity, by reason of intense and long-continued pain, loss of sleep, intractable vomiting, and anorexia.

(*b*) Cases of "status hemicranicus," where one attack follows another over the course of weeks.

(*c*) Cases of "migraine-epilepsy," in which a syncopal attack, or even an epileptiform seizure, arises in the course of the migraine.

(*d*) "Chronic migrainous debility," where severe attacks recur at frequent intervals and lead to a state of ill-health. The syndrome, which comprises loss of weight, poor appetite, anaemia, debility, lassitude, and depression, is perhaps most often seen in middle-aged women. It is a form of ill-health which may have far-reaching personal, domestic, and social repercussions, and the medical attendant often despairs of affording relief.

There is possibly some relationship between long-standing and severe migraine and a late development of cerebral arterial changes. This doctrine has been put forward, but so far no statistical evidence can be adduced either in support or in refutation.

When a middle-aged sufferer from migraine begins to show an increase in the severity or frequency of the attacks, or if the headache alters in quality and becomes more persistent even though perhaps milder, it is well to suspect an incipient hypertension complicating the picture.

Treatment

In the article on "Headache" contributed to this series by Dr. J. Purdon Martin the treatment of migraine was discussed. Only a few remarks are therefore necessary here. As regards the relief of an attack, one can state that in some mild cases acetylsalicylic acid will suffice. In more severe cases one will need recourse to tab. codein. co.—up to 10 tablets a day. High doses of this sort may dull the severe pain and allow the victim to continue at work. The resulting constipation and flatulency will also need palliative treatment.

The most efficacious measure is an intramuscular injection of ergotamine tartrate, given very early in the attack. It has certain drawbacks in that by reason of the natural history of the disease the first symptoms usually wake the patient unduly early—that is, at an hour when the medical attendant should still be in his bed. If the injection is delayed too long it may be relatively ineffectual. In many patients a good deal of malaise results, and vomiting is frequent. The attack of migraine may be curtailed—at least so far as headache is concerned—but the victim may have to lose a morning's work because of the drug-effect. Ergotamine tartrate by mouth, in hourly doses up to six, is often advocated, but rarely, I have found, with any great benefit. In my experience the same disappointing results have followed the oral use of drops of dihydro-ergotamine tartrate.

The patient with an acute attack of migraine will probably wish to rest in bed in a quiet and darkened room, but unfortunately sleep does not necessarily bring relief. Alcohol and smoking should be shunned during an attack, and indeed most sufferers will do their best to avoid a smoking compartment or any atmosphere tainted with tobacco smoke.

Prevention of attacks of migraine by medicinal means is often most disappointing. The total situation (including type of work, psychological stresses, visual strain) is the most potent adverse factor, which, if it cannot be avoided or suitable adjustments cannot be made, can rarely be neutralized by artificial—i.e., pharmacological—means.

Perhaps phenobarbitone is the safest bet. It should be prescribed in the form of 1 gr. (65 mg.) regularly each night on retiring. Little, if any, benefit results from the administration of this drug at the time of an attack. The patient should persevere for two or three months before concluding that the drug is without avail. If "dopiness" is complained of in the morning, the tablet can be given a little earlier.

A large number of other preparations have been advocated for long-term treatment—thyroid, ovarian and pituitary hormones; urea; carbachol; liquor trinitrini; ergotamine tartrate; bile salts; antihistamine preparations; peptone injections; and so on. At times one or other of these seems to be beneficial, but only exceptionally. It is almost axiomatic that if a patient with migraine fails to respond dramatically to common-sense rules of hygiene, the correction of refractive errors, and phenobarbitone at night, then the doctor and the patient are both in for trouble: the case will probably prove most intractable.

Mention should, however, be made of autohaemotherapy, which is worth a trial in severe cases not responding to medicinal treatment. In some instances the benefit therefrom has been dramatic.

We are still not certain whether the so-called "histamine headache" represents a variety of migraine or not. In any case, for periodic headaches of the type described by Eszenyi-Halasy in the *British Medical Journal* of June 25, 1949 (p. 1121), a regime of desensitization with graded intramuscular doses of histamine is worth while. The patient needs to lie up during this time.

PAEDIATRICS IN THE HARVEIAN AGE

SIR LEONARD PARSONS'S HARVEIAN ORATION

Sir Leonard Parsons, F.R.S., delivered the Harveian Oration at the Royal College of Physicians on St. Luke's Day, October 18.

In taking as his subject "The Influence of Harvey and his Contemporaries on Paediatrics," Sir LEONARD PARSONS said that there was nothing he could add to the known details of Harvey's life, nor would he attempt to prove that Harvey was a paediatrician. Nevertheless, Harvey and certain of his contemporaries by their contributions to the study of children in health and disease had helped to further paediatrics. Harvey lived in a time of enormous outpouring of intellectual energy. He saw the last years of Shakespeare and the rise of Milton. A scientific revolution was in progress which overthrew mediaeval authority. The chief agents in the revolution were Galileo, Descartes, and Bacon, all of them Harvey's contemporaries. The base of the scientific revolution was Padua, which was in the sixteenth and seventeenth centuries the most famous university in the world—

> "... the great desire I had
> To see fair Padua, nursery of the arts."
> (*Taming of the Shrew*)

It was from Padua, whose traditions had been carried on in this country by the Royal Society, that Harvey drew his inspiration.

Some idea of the state of paediatrics in the early part of the seventeenth century might be obtained from the writings of Shakespeare. Thus the mother of Coriolanus said to him: "Thy valiantness was mine; thou suck'dst it from me." Originally paediatrics formed part of obstetrics. The majority of children's diseases in the nineteenth and early part of the present century were, however, approached from the standpoint of the adult. It was true that a wide knowledge of general medicine was essential to the paediatrician, but the child was not an immature adult and required special study. When he (Sir Leonard Parsons) began the study of paediatrics at Great Ormond Street Hospital the number of babies admitted to the wards was extremely limited, and the great problems of infant morbidity and mortality were largely untouched. Within recent years it had been increasingly realized that mother and baby formed, before and after the birth, one biological unit. The trend was now towards the study of the premature child and the effect of antenatal conditions on the unborn and the newborn.

The close association of paediatrics with obstetrics had thus been again brought about. Paediatrics had returned to the position held in Harvey's day.

The Orator confessed that he found Harvey's *Exercitationes de Generatione*[1] . . . (1651) obscure and difficult to understand. Harvey himself seemed to realize this, and invited his readers to weigh what he had put forward in the light of experiment. It had been said that the book revealed the last infirmity of noble minds, the degeneration of old age, but that was unjust, and indeed there were numerous similar observations on the formation of the foetus in his *De Motu Cordis* (1628). Within recent years authorities had studied *De Generatione* afresh and passed a new judgment on it. While *De Motu Cordis* was the crowning glory, *De Generatione* might have been Harvey's chief interest. In it he anticipated some ideas of the twentieth century, and he set his predecessors right on many points, such as the question of the placenta. Harvey said that Nature, like the painter, first sketched the outlines and then filled in the colour. It might be said of Harvey himself that he made the outline and the colour was filled in by his successors. If it was claimed that there was too much speculation in his work, speculation, after all, took its place as part of the scientific method. Observation and experiment were not methods initiated by Harvey; indeed, they were known to Galen, and at Padua Harvey learnt the importance of studying anatomy not from books but from dissections.

Of Harvey's contemporaries the orator spoke first of Francis Glisson (1597–1677), the first man of distinction to accept Harvey's work on the circulation. He discussed some of Glisson's important contributions to experimental physiology, and also his work on rickets (*De Rachitide*, 1650).

The history of rickets was a fascinating one. Almost nothing was heard of the disease until the seventeenth century, although it must have existed from the earliest times, especially in such areas as the Low Countries. There was in the National Gallery a picture dated 1490 which showed conclusive evidence of rickets in the subject. At the end of the sixteenth and beginning of the seventeenth century there was evidence that rickets was common, but Glisson spoke of it as an entirely new disease, originating some little while before the publication of his work in 1650. In 1655 James Cook, of Warwick, published his "supplementum" on the use of herb beer in the treatment of rickets. A book by Sir Thomas Browne, published posthumously in 1690, though written many years earlier, referred to many people who in childhood had suffered from rickets but afterwards became strong and active men.

Rickets was not mentioned in the London bills of mortality until 1634, but all the evidence suggested that it was prevalent in England before the seventeenth century, though first generally recognized between 1620 and 1630. With the drift of population to the towns and the industrial revolution, its incidence continued to increase, and except for the empirical discovery of the virtues of cod-liver oil at the beginning of the nineteenth century little was done about it until the work on fat-soluble vitamins. In 1928 the Orator had prophesied that by the middle of this century rickets would present no terrors—a prophecy which had come true. Exogenous rickets had been practically abolished in the United Kingdom, and the interest had now shifted to those endogenous forms which might arise through defect of renal function.

In his treatise Glisson referred to the theory that the disease might actually break out before the birth of the child. Maxwell's view was that foetal rickets did not occur unless the mother had osteomalacia. Another observation of the time was that scurvy might sometimes join with rickets, though it was not caused by that disease. It was remarkable that previously there had been so little mention of infantile scurvy, though full descriptions of the characteristics and cure of a disease of that name were given by writers in the middle of the sixteenth century. One explanation might be the change in the conception of scurvy. At that time a variety of disorders were included under the title of scurvy, but not the disease itself.

In 1642 James Cooke, who was in attendance on the Parliamentary army, obtained from the widow of Dr. Hall, of Stratford-on-Avon, certain of his observations on his treatment of scurvy and other conditions by herbs and drinks among other remedies, but the majority of the patients did not suffer from true scurvy. After Glisson's death infantile scurvy again lapsed into obscurity.

In the middle years of the seventeenth century John Mayow, of Oxford, made important contributions to paediatrics, chiefly connected with respiration. Eleven years after Harvey's death Mayow gave a description of the mechanics of respiration which might almost be accepted to-day, and he corrected Harvey in some respects. Mayow did not believe that the foetus breathed through the mouth, and he held that the placenta should no longer be regarded as a uterine liver, as Harvey regarded it, but as a uterine lung. The placenta at first did play a part as the uterine liver, and it was interesting that many years after Harvey's death Claude Bernard spoke of the placenta as the liver of the foetus. There was some suggestion that Mayow received credit for other people's work and was guilty of plagiarism, but it was significant that he was elected Fellow of the Royal Society four years after his last published work and on the proposition of Robert Hooke. He should be allowed some originality at least for his work on rickets, and in the Orator's view Mayow had been too harshly criticized.

Sir Thomas Browne, who was interested in various paediatric problems, said in his *Religio Medici* that we "are subject to the actions of the elements and the malice of diseases in that other world, the truest microcosm, the womb of our mother."

Coming to the last of Harvey's contemporaries, Thomas Sydenham, Sir Leonard Parsons said that Sydenham on the whole ignored the results obtained by experiments; he believed in observation at the bedside, and he had little in common with Harvey; it was doubtful, indeed, whether they ever met. Nevertheless, Sydenham might have been indebted to Harvey's experiments to a greater extent than he knew. Experiment was actually one form of observation, and clinical examination was a close-knit pattern of observation. Harvey had one great advantage over Sydenham—namely, that as a young man he had been to Padua and had come under the influence of Galileo. When Sydenham went to Montpellier he had already graduated at Oxford and by that time his ideas might have been somewhat fixed.

But the combination of the method of Harvey and of Sydenham had given to British medicine its greatest glory. Sydenham was the first to give a description of rheumatic fever, which he regarded as a fever in its own right and not a happening incidental to some other condition. He had almost been canonized as the patron saint of clinical medicine. Nevertheless his description of chorea did not compare with those given in the early years of this century, based on the same method of clinical observation. In his account of scarlet fever, which was said to be the first account of the disease under that name, he had failed to mention its most important manifestation—namely, sore throat. It was true that children might not complain of sore throat even when it existed, but Sydenham could not have examined the throat. It was encouraging to find chinks in the armour of this great man, because it made him seem more human.

Sir Leonard Parsons concluded with a picture of Harvey at the battle of Worcester, when he was said to be reading a book. He suggested from a little indirect evidence that the book was the Gospel of St. Luke, and he concluded by urging in that College which had found such inspiration in the work of Harvey that they should take to heart the words of St. Luke's great contemporary: "Seeing we are compassed about with so great a cloud of witnesses . . ."

BISSETT HAWKINS MEDAL

AWARDED TO SIR WILSON JAMESON

On the occasion of the Harveian Oration at the Royal College of Physicians on October 18, the Bissett Hawkins Medal was presented by the President, Dr. Russell Brain, to Sir Wilson Jameson, lately Chief Medical Officer to the Ministries of Health and Education. The medal is awarded by the College to a British medical practitioner who during the preceding ten years has done outstanding work in advancing sanitary science

or in the promotion of the public health. Sir Harold Boldero read the following citation:

"Sir William Wilson Jameson, G.B.E., K.C.B., M.D., F.R.C.P., retired from the post of Chief Medical Officer of the Ministries of Health and Education in May, 1950, having been concerned during his ten years' tenure of those offices with outstanding advances in the promotion and conservation of the public health.

"The impact of the second world war upon this country produced in unprecedented degree problems in hygienic control, in epidemiology, and in nutrition. Jameson was largely instrumental in setting on foot inquiries into those matters, and in organizing the measures of regulation and remedy which research had indicated as necessary. It will be remembered that he was appointed to these high offices after the Emergency Medical Service had been instituted; but the National Health Service Act was introduced during his tenure.

"There is no need to stress the measure of these great responsibilities. The mere recital of certain of the earlier concomitants of the war will be a sufficient reminder of the subsequent achievements of medical knowledge and sanitary organization—the conditions of life in air-raid shelters, the epidemiological problems arising therefrom, and the incidence of scabies.

"In the wider fields of practical epidemiology three major projects will always be associated with Jameson's name—the intensified attack upon diphtheria by immunization, the realistic approach to the control of venereal disease through contact-tracing and other social measures, and the institution of that survey of groups of the population particularly susceptible to respiratory tuberculosis, which is known as mass radiography.

"Another contribution in this same field, but of a somewhat different character, was the firm establishment under the Medical Research Council of a national Public Health Laboratory Service.

"Again, from 1940 onwards, Jameson, together with the committee of which he was chairman, was in great part responsible for advising the Government on nutritional policy, and for obtaining the introduction of those schemes under which the priority classes of expectant and nursing mothers, and children, were enabled to enjoy a dietary enlarged and sometimes fortified to meet their respective needs.

"In other directions also his enthusiasm and determination were influential in achieving results. The large-scale development of penicillin, the institution of streptomycin trials, and the introduction of B.C.G. all owed something to his efforts.

"To round out but not to complete the record, and to mark his interest in fields less related to the public health but nevertheless not so removed as to be disregarded, were his work on the Goodenough Committee and in the Councils of the World Health Organization. 'Nullum quod tetigit non ornavit.'"

BIOLOGICAL ASPECTS OF ATOMIC ENERGY

TWO-DAY CONFERENCE AT THE ROYAL INSTITUTION

A conference attended by over 500 scientific workers was held at the Royal Institution, London, on October 20 and 21 under the auspices of the Institute of Biology and the Atomic Scientists Association, with the support of the British Association. The chairmen of the four sessions were Sir HENRY DALE, O.M., F.R.S., Sir JOHN D. COCKCROFT, F.R.S., Sir ERNEST ROCK CARLING, and Lord BOYD-ORR, F.R.S., and the discussions ranged over biological and medical effects of nuclear radiations, tolerance levels and measures of protection, genetical hazards, and the future of atomic energy. The proceedings were private, but the Press were invited to a conference with the chairmen and authors after each session.

The Responsibility of Scientists

Lord BOYD-ORR, at the final session, said that the new powers which were being revealed by physics and biology might be used either to usher in a new golden age or to devastate the world. In view of this tremendous issue, some scientists, among whom he ranged himself, felt that science should be completely free and independent. Frank statements should be made to the public about what could be done, and thus world-wide public opinion might be created among the common people of all countries, including those behind the Iron Curtain, which would direct science towards beneficial ends. The public, which was going either to suffer or to benefit, ought to be allowed to form its own judgment. Everybody, Lord Boyd-Orr continued, was scared by the thought of the atom bomb, but it was the biological side, to his mind, which was now more important.

Professor C. A. COULSON, F.R.S., said that the issues with which scientists were now confronted were not merely scientific but moral. The scientific movement, at least in the West, had been founded on certain basic convictions—integrity, respect for the opinions of others, standards of personal judgment, and a sense of responsibility not only for the publication of work but for the foreseeable consequences of it. The scientist was not just a scientist, he was also the guardian of some of the most precious values of civilization. He hated secrecy and would take no part in it. Scientists would be untrue to their convictions if they allowed moral obligation to be forfeited.

Professor KATHLEEN LONSDALE, F.R.S., also spoke of the unfortunate effects of secrecy. This was illustrated, she said, by an effort which she and others had made recently to find out what were the health hazards in uranium mining and what protection was afforded to the workers. Every possible source had been consulted in vain. The only information available related to the period 1930–9 in Czechoslovakia, which showed that the number of deaths from lung tumours in uranium mines among men above the age of 35 was thirty times that of the ordinary male population of Vienna. A similar high incidence of liver tumours was found among native miners in gold mines in South Africa, where almost certainly there was deleterious radioactivity.

Radiation and Heredity

In the session on the biological implications of atomic energy Sir ERNEST ROCK CARLING said that the various papers had emphasized what had been known for a long time, that all effects of radiation on heredity were harmful. Dr. C. D. DARLINGTON, F.R.S., while acknowledging that the occurrence of mutations in plants and animals had been the basis of evolutionary change, said that after exposure to ionizing radiations the rate of mutation was multiplied so that a far greater number of misfits were produced. Dr. D. G. CATCHESIDE pointed out that these effects had been studied in organisms as diverse as *Drosophila* (in which the phenomenon of *x*-ray-induced mutation had been discovered), moulds, fungi, bacteria, green plants, and mice. All that could be done from the point of view of predicting the effect on human beings was to extrapolate what was known in other organisms.

Control of Hazards

Dr. E. E. POCHIN addressed the conference on the control of hazards in the clinical use of radioactive iodine. In ordinary use in hospitals, he said, any hazard could be successfully met by the protective measures available. Such protection for the patient and those with whom he came in contact was rather a matter of scrupulous attention to detail than the application of any difficult or complicated methods. Hazards, at least with radioactive iodine, were not difficult to control, though there were other elements not at present used on account of their hazards.

Dr. JANET VAUGHAN, who with other workers from the University of Oxford produced a paper on hazards arising from radiostrontium, based on experiments with rabbits, emphasized the need for exact statement in all work on radiation. It should clearly be stated in dealing with isotopes what animal was used, its age, its diet, and so forth. In other words, it must not be assumed that the same effects would be seen in the young as in the old, or in the well-nourished as in the ill-fed. Standardization of working conditions was important, or at least a statement of what the conditions were.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

PRESIDENTIAL ADDRESS BY DR. J. M. GIBSON

At a meeting of the Society of Medical Officers of Health at B.M.A. House on October 19 Dr. J. M. GIBSON, of Huddersfield, was installed as president of the society for the year 1950–1. In his presidential address, entitled "Give Us the Tools," Dr. Gibson dealt with the difficulties and frustrations of medical officers of health since the inception of the National Health Service.

Administrative Responsibilities

Dr. Gibson prefaced his address by stating what he felt would be undisputed, that the most urgent need in the field of public health was for the erection of more up-to-date houses to combat the evils of present-day overcrowding. He could not cover all aspects of public health, and so proposed to concentrate on the most outstanding difficulties encountered since the National Health Service Act of 1946 came into operation. The greatest good to the greatest number could be achieved only when all branches of medicine were working together in harmony, and it was nothing short of a tragedy that the Act had completely failed to secure this. There was urgent need for medical officers of health to be restored to their former position of close administrative and clinical touch with the hospitals in their areas. It had been said that a wise lay administrator concerned himself with the business side of administration and that in dealing with medical matters he relied upon the advice given by his medical advisory committee. But, when all the experts had submitted their proposals for new expenditure, who could be expected to hold a fair balance? Not one of the specialists themselves, not the lay administrator—for he could not assess the urgency of any particular proposal—and certainly not the chairman of the house committee. The medical officer of health, if he was to perform his duties satisfactorily, could not remain divorced from hospital work. His voice must be heard not only at house committee meetings and hospital management committee meetings, but also on hospital boards. The Minister of Health had mentioned on several occasions that he regarded the medical officer of health as the connecting link between the three administrative bodies responsible for the Health Services—the local health authority, the executive council, and the hospital board—and it had been thought at first that medical officers of health could exercise this function with the hospital board by means of a liaison committee. Experience had shown that this arrangement was unworkable, and it was essential that the medical officer of health should be represented on the committees at all levels.

Isolation Hospitals and Sanatoria

The medical officer of health must be given the fullest measure of responsibility in the management of the isolation hospital. The most important role of these hospitals was still in the prevention of disease, and for this the medical officer of health of a district was the only person who could say what particular case should, or should not, be admitted to the isolation hospitals.

Next in importance to the isolation hospital came the sanatorium. The medical officer of health was not so much concerned here with the clinical side, but, since isolation of infectious cases played such an important part in reducing the incidence of tuberculosis, he could not allow the admission and discharge of patients to and from sanatoria to be placed in other hands without protest. Another type of hospital over which medical officers of health wished to retain some measure of control was the maternity home. These had not been regarded as hospitals in the past. They had been erected by local authorities so that mothers at the time of their confinement could have better facilities than were available in their own homes; cases in which difficulty could be foreseen were not as a rule admitted to maternity homes but dealt with in hospitals. The medical officer of health, from his intimate knowledge of the home circumstances of patients, was in the best position for deciding what priority should be given to applicants for admission to maternity homes.

Care of Children

Another effect of the National Health Service Act which was causing anxiety was the tendency to remove the specialist examination and treatment of school-children from school clinics to hospital precincts. This change had not been widely applied up to date mainly because the out-patient accommodation available at hospitals was already taxed to its utmost capacity, but the policy was there and must be resisted.

Dr. Gibson then reviewed the effects of three new legislative measures which had a direct bearing on the work of the medical officer of health—namely, the National Assistance Act, 1948; the Children Act, 1948; and the Milk and Dairies Regulations, 1949.

With regard to the first, the president ended his analysis by affirming that in the interests of economy and efficiency all social services for the sick, aged, and the handicapped, and for the prevention of illness and the provision of aftercare, should be co-ordinated through the health department. The same applied, though perhaps with even greater force, to the care of deprived children. In the panicky legislation which had followed the publication of the Curtis Report, responsibility for the care of these children had been transferred by the Children Act from the Ministry of Health to the Home Office, from maternity and child-welfare committees of local authorities to children's committees, and, in most cases, from the medical officer of health to a newly appointed officer, the children's officer.

The care of deprived children was so much a medical problem, and the children themselves were so often problem children, that in their interests the work should be closely linked with the work of child welfare generally and of the school health service. This could be done only through the medical officer of health's department. A children's officer could do much to help these children, but she should operate as a member of a team in the health department, being assisted by the health visitors and school nurses.

Cleanliness of Milk

The president then referred to the Milk and Dairies Regulations, 1949, which had transferred the supervision of the production and handling of milk at the farm from the Ministry of Health to the Ministry of Agriculture and Fisheries, and so from the staff of the health department to officials of the newly formed milk and dairies committees. Local authorities were still responsible for the supervision of all sanitary matters affecting the farmer's residence, and it was their duty to see that the farmer and his family had a satisfactory water supply, but they were no longer concerned with the condition of the shippons or of the purity of the water used in the dairy. In the past, sanitary inspectors had succeeded in many areas in raising considerably the standard of cleanliness of milk supplies by visiting farms and giving advice on the spot. Now they were debarred from this service and no one else appeared to be doing it.

Milk was a most important article of diet, particularly for the young, and of all foodstuffs was probably the most subject to contamination by pathogenic bacteria. The Food and Drugs Act, 1938, gave very wide powers to the public-health staff to supervise the preparation and storage of all food for sale. It was strange, then, that milk had been singled out by the new regulations as the one article to be removed from this supervision, just at the very point in the course of its handling where contamination was likely to occur.

In concluding his address, Dr. Gibson mentioned two further "wants" of medical officers of health. They desired for their preventive work to be linked more closely with the industrial medical services.

Lastly, there was the question of increased remuneration. They had submitted claims which they thought were reasonable, taking into account the training and qualifications necessary for medical officers of health and bearing in mind the salaries obtainable in other medical fields. Believing in the justice of these claims, they must await with every confidence the decision of the arbitration tribunal now considering the matter.

Correspondence

Useless Routine Medical Examinations

SIR,—I have read with much interest the recent Dawson Williams lecture by Professor Alan Moncrieff (October 7, p. 795). In his lecture Professor Moncrieff, *inter alia*, criticizes the system of medical inspection of school-children employed in this country for the past 42 years, and makes suggestions for its improvement. As one who has been engaged in school medical work for nearly the whole of that period, and indeed for two years before medical inspection became compulsory, I should like to say that I largely agree with his remarks on the subject as well as with your editorial comments. I have long been impressed with the wastage of man-power and money involved in carrying out the present system, and I heartily support Professor Moncrieff in his plea for a drastic change.

The present procedure is far too rigid, and involves far too much time in detailed examination of normal children and filling up record cards with bare negatives. To add to the doctor's and nurse's clerical work, the Ministry of Education has issued a new record card, replacing the simpler but sufficient record cards of many local authorities. I am told that this card was drawn up by a committee of experts, and it certainly has every appearance of having been designed by a committee. And along with this extraordinary card is a large graph card on which to record heights and weights, instead of simply writing the figures down. Here again more time is wasted and not seldom a good deal of exasperation experienced. And all that the finished card will generally show is three or four dots for height and three or four dots for weight, with intervals of years between them, and meaning simply nothing. One might very well go further and ask whether the weighing and measuring of all children are themselves really necessary. There are tall and short children, heavy and light children in any age group, and all may be equally normal. Certainly weigh the children that need weighing, and weigh them sufficiently often to make the figures significant, but I am convinced that this wholesale weighing is quite unnecessary. This and a lot more could be scrapped without loss of efficiency and probably with gain, even though many nice statistical tables will disappear from the school doctor's reports. It may be desirable to retain a routine inspection for school entrants, but after that the "screening" system mentioned by Professor Moncrieff would suffice and allow more time to be devoted to the children who really need medical investigation. In support of this, may I give an early experience of my own? As I mentioned above, I carried out school medical work for the two years prior to 1908. I had been appointed M.O.H. to a Yorkshire town in 1903, and, keen to extend my sphere of work, I prevailed on the education committee to appoint me their school medical officer in 1905. I had to devise my own system of inspection of the school-children, and as I had no nurse to assist me I sought the co-operation and help of the school teachers. They responded extraordinarily well, and to make their help as efficient as possible I gave them a course of lectures on the health of school-children and on school hygiene. The surprising thing was that most of the teachers attended these lectures, and most of them became enthusiastic coadjutors in this new work. I also got a leaflet printed summarizing the main points in my talks, and had these distributed among the teachers. I visited each school as often as I could, and first of all I examined any children picked out by the teachers as possibly having some physical or mental defect. I then had a general look over the children doing their class work, and finally I had them marched slowly past me. By this apparently cursory inspection, I was able to detect many children who, *prima facie*, called for a detailed medical examination, which I did then or later. In the case of those requiring treatment, advisory notes were sent to the parents, but, seeing that there was no school clinic and private medical treatment had to be paid for, the results were somewhat meagre. But, with the knowledge resulting from these inspections, the teachers were often able to help the children in school. It was something to know which out of a group of backward children was deaf, which had bad eyesight, and which was mentally defective. However, the point I want to make here is that by this simple procedure a remarkably high degree of ascertainment was achieved, as I was able to check later when the official routine system came into force. My experience here also indicates that in any system of "screening" the assistance of the teachers would be of the very first importance.—I am, etc.,

Langport, Somerset. THOMAS GIBSON.

Child Health and the Future

SIR,—As administrators we must be grateful to Professor A. Moncrieff (October 7, p. 795) for demonstrating some of our shortcomings, such as hesitancy in health education and our lack of initiative in prevention of tuberculosis in infant-welfare centres. What might, however, be called logistics does enter into some of his suggestions, such as the one that infant-welfare centres should be conducted by the family doctor.

In Ilford we have 15 such centres per week, and there are approximately 75 general practitioners. If 15 doctors are chosen to do these centres the other 60 will be just as badly off as they are now, except that the centres will be run by their competitors. If each doctor is given a chance, a different one will be in attendance at any one clinic each week, to the great detriment of the mother and child, who will have no continuity of treatment. Perhaps it is suggested that we run 75 clinics a week, one for each doctor, but then the ratepayers will have something to say, and the staffing problem would be intolerable.

Perhaps, however, the idea is that the practitioners do this work in their present surgeries. In most cities this will mean collecting children in overcrowded premises with full opportunities for cross-infection, or even a wait in a queue outside, maybe in the rain—that is, if the doctor concerned encourages mothers to bring their healthy babies. No doubt the idea will be practicable when there are enough doctors, adequately imbued with the idea of prevention, to serve the community, and when they work in adequately staffed and equipped health centres. However, then, Sir, there will be no need for administrative action as suggested by Professor Moncrieff, for mothers will, of their own accord, prefer their family practitioner to local authority centres. These centres exist only because they meet a need which cannot otherwise be satisfied.

With respect to the suggestion that nurses and teachers pick out children for reference to a doctor in lieu of routine medical inspections, I would like to know the proportion of cases of nocturnal enuresis, cryptorchidism, tinea pedis and cruris, constipation, haemorrhoids, and menstrual difficulties that will be disclosed by such methods. This point is, however, not as important as the fundamental ignorance of most of us, including doctors, about what is a disorder. Almost all of us suffer from physical imperfections, and it is the most difficult task in medicine to decide which of these imperfections are of significance and which not, and our teachers have not helped us much in the past. I refer to enlarged tonsils, knock-knees, flat feet, constipation, etc., that vast border-line between health and disease. To decide this problem is the most delicate task that that can be required of a doctor, and it must be decided in the vast mass of school-children and not in a few selected by teachers and nurses.

In our natural revolt against too frequent and unnecessary inspections, such as twice a year or yearly, we must not go to the other extreme and have no routine examinations at all.—I am, etc.,

Ilford. I. GORDON.

SIR,—Professor A. Moncrieff in his [illegible] (October 7, p. 795) decries the waste of [illegible] routine medical inspections of schools. [illegible] however, afford the school doctor the opportunity of spreading health education to large numbers of mothers, who are willing in many cases to sacrifice half a day's work with pay to attend these sessions. Many problems which the mother would hesitate to place before her overworked general practitioner are discussed at leisure with the school doctor. Surely this is an ideal

method of educating the child, through the mother, in matters of health hygiene or sex, and may possibly be of more value than direct teaching in schools. It is doubtful whether a nurse, however competent, has the authority or breadth of outlook to fulfil this function.

The present system of school medical inspections also provides a competitive stimulus which is of some value in maintaining a standard of cleanliness.

"In New York . . . where only entrants now have a complete examination" the problem is somewhat different. In America there is a widespread preoccupation with matters of health and disease, and almost too great a wealth of popular literature devoted to medical matters. Social standards are also considerably higher than in Britain. It would be untimely to terminate routine inspections among the poorer sections of the community at least—even though they be monotonous—until our social conditions improve.—I am, etc.,

London, N.4. CECILIA GALTON.

Safety in Prams

SIR,—Mr. D. L. Davies's somewhat disingenuous letter (October 14, p. 889) suggests that mothers who buy a pram which they would imagine should, at present prices, be complete should then take the pram to a member of his association to have it altered in order to make it safe. My baby, who is as active as any other baby of nearly a year, has now tipped a variety of prams backwards and has had at least three serious falls. I have never attached the side-pieces of a harness to the side-pieces on the pram; the fault has always lain in the initial position of the fixed side straps, whose ends when stretched straight out forwards are barely within the wheelbase. It seems wholly unreasonable to expect the mother to go to the trouble and expense of having the straps removed and replaced. Is it quite impossible for the manufacturers to place the straps in a safe position in the first instance, or, better, to arrange that the straps can be put in different positions for babies of different ages and activities?

Another point which Mr. Davies does not cover is that in these days when very few mothers have nannies to wheel babies morning and afternoon the pram is increasingly needed as a safe container in which to leave the baby in the fresh air. The springing of prams continues to be adjusted primarily to ease pushing, and not to maintain safety. I should like to add that I hope a fellow-suffering mother will be a member of the committee that I understand the Royal Society for the Prevention of Accidents is considering setting up.—I am, etc.,

London, W.6. JOAN MARSH.

Safety on Cycles

SIR,—Every country doctor sees from time to time a frightened mother carrying into his surgery a no less frightened child suffering from a badly bruised ankle and lacerated foot. At such times one wonders when some enterprising manufacturer of pedal-cycle accessories will prevent children who are being conveyed on carrier-seats from catching their feet between the bicycle's rear wheel spokes. All that is required is a pair of simple metal shields to bolt on between the back stays. The potential market for such a product must, in rural areas, be very great, and appears to be untapped.

It is to be hoped that someone in the cycle trade will devote the same thought and attention to this problem as Mr. D. L. Davies in his letter (October 14, p. 890) so obviously has to the prevention of accidents to children in prams.—I am, etc.,

Mattishall, Norfolk. CHARLES S. THOMSON.

Acute Liver Disease

SIR,—I have read with interest the article of Dr. A. L. Latner entitled "Regime for the Treatment of Severe and Acute Liver Disease" (*Journal*, September 30, p. 748) in which he treated five cases of hepatic coma with glucose, vitamin supplements, and plasma. Four cases recovered and the fifth showed marked temporary improvement. I feel that this series is too small to warrant his conclusion that this satisfactory outcome is a direct result of therapy. As long ago as 1879, Mossé described six cases of "ictère grave" with four recoveries and attributed these results, at least in part, to a therapeutic regime of milk, quinine, and julep.

We have for some time been treating acute liver coma by a method very similar to that described by Dr. Latner; the principal difference being that somewhat larger doses of plasma were administered than in Dr. Latner's series. While nine cases died, the diagnosis of massive hepatic necrosis being confirmed in all histologically, a further two cases who received treatment that was little more than symptomatic both recovered. One was in coma for five days, the other for a week.

I feel therefore that, with the possible exception of the use of "aureomycin" in these cases as described by Farquhar and others (1950), there is still no satisfactory therapy for hepatic coma.—I am, etc.,

London, W.C.1. J. M. WALSHE.

REFERENCES

Farquhar, J. D., Stokes, J. jun., Whitlock, C. M., Bluemle, L. W., and Gambescia J. M. (1950) *Amer. J. med. Sci.*, **220** 166

Mossé, A. (1879). *Étude sur l'Ictère Grave*. Thèse de Paris. No. 495.

Abnormalities in Developing Chickens

SIR,—I read with great interest Mr. W. P. Blount's letter in the *Journal* (September 30, p. 785). Mr. T. Barton Mann, of the biological research laboratory of Messrs. J. Bibby and Sons, Ltd., Wirral, reassures me that the riboflavin and manganese contents of the eggs supplied for my experiments were known to be adequate from routine testing at regular intervals. Riboflavin was tested by the method described by Mr. Mann himself in *Analyst*, 1946, **71**, 166, and manganese was estimated spectrographically.

In view of the very nature of my experiments it is perhaps superfluous to point out that special care was taken throughout to ensure that eggs were taken from flocks not showing any similar abnormalities, and due attention was paid to eliminate as far as possible known teratogenous factors such as fluctuations of temperature during incubation. Physical conditions of incubation may be accepted as satisfactory, as hatches averaged 85% of fertile "uninjected" eggs. In every experiment an equal number of control eggs were put in the same incubator in which insulin-treated eggs were incubated.

As I have mentioned in my article on insulin-induced skeletal abnormalities in developing chickens (*Journal*, August 12, p. 386), both the incidence and severity of the deformities increased with the dose of insulin—e.g., the occurrence of limb deformities resulting from injection of 2.5 units of insulin on the fifth day of incubation was 46%, whereas with 5 units of insulin, injected also on the fifth day, it rose to 85%. I would be very interested to know if Mr. Blount noticed such a high percentage of abnormalities among the "so-called normal embryos" he has examined, and, again, if those abnormalities presented the same radiological and histological features as I have described in the case of insulin-induced deformities. As Landauer has pointed out on page 97 of the Storrs Agricultural Experiment Station *Bulletin No. 236* (referred to by Mr. Blount in his letter), the term "chondrodystrophy" (achondroplasia) has often been loosely applied in poultry science to different pathological conditions without histological confirmation, and *not* to a single clinical and pathological entity, as in medicine. In any case, if Mr. Blount believes that the deformities he had observed were linked with nutritional deficiencies—e.g., of riboflavin and other members of the vitamin-B complex, I am indeed gratified to note that he lends further support to my statement: "One can therefore anticipate that deficiency of phosphorylating enzymes, produced by lack of vitamin-B complex, may induce malformations in the same way as insulin hypoglycaemia can, by causing disturbances to cellular carbohydrate metabolism at critical periods during development" (*Journal*, August 12, p. 389).

I have read the two books suggested by Mr. Blount—viz., Storrs Agricultural Experiment Station *Bulletin No. 236*, on "Hatchability and Environment," and Mr. W. Marshall's paper to the Eighth World Poultry Congress, entitled "The Relationship of *Visceral* Anomalies of Full-term, Dead-in-Shell to Embryonic Malposition" (my italics), which, though interesting in itself, seems, to me at any rate, irrelevant in the present context.

Finally, I am not at all sure if the congenital anomalies induced by rubella during pregnancy are the result of "fluctuations of temperature," presumably caused by pyrexia during the infection, as has been naively suggested by Mr. Blount. As far as I know, it has not been clearly demonstrated that other febrile conditions during pregnancy, apart from rubella, can give rise to congenital defects in the foetus.—I am, etc.,

Liverpool. P. K. DURAISWAMI.

Modification of Boyle's Apparatus

SIR,—In reply to Dr. D. Zuck's letter (*Journal*, September 30, p. 787) I would state that the principle of using the patient's breath plus basal oxygen for induction of anaesthesia demands the arrangements found in the special absorbers. I have always tried to reduce to a minimum the weight and bulk of my own apparatus, as so much of my practice has called for portability. The principle of the modification described is induction by the established method of N_2O and O_2, which evaporate the ether to full anaesthesia. CO_2 absorption is then used and maintained by the necessary oxygen, with small accessions of ether as required. There is no claim other than this. The difficult case still arises, but this is now often met by muscle relaxants and the use of the newer methyl-N-propyl ether, which is so much less irritating and is suitable for CO_2 absorption.—I am, etc.,

Glasgow, C.3. W. B. PRIMROSE.

SIR,—The criticism by Dr. D. Zuck (*Journal*, September 30, p. 787) of Dr. W. B. Primrose's account of his modified Boyle's apparatus (September 16, p. 676) is a very fair one. He makes no suggestion, however, on how the question of ether vaporization may be overcome. Dr. Primrose in his account utilizes the ether bottle as an absorber, the chloroform or "trilene" bottle being by-passed when the circle absorber is in use. If, however, the positions of the chloroform and soda-lime bottles be transposed, then by putting ether into the second bottle a simple "draw-over" vaporizer can be incorporated into the circuit on the inspiratory side of the absorber. The concentration of ether achieved with this type of vaporizer would not be as high as when baffles or wicks are incorporated, but would nevertheless be considerably in excess of any concentration which could be obtained where the only vehicle available is the basal oxygen flow. It would, in all probability, be necessary to enlarge both the inlet and the outlet apertures to this ether vaporizer in order to reduce the resistance to inspiration, but this should not prove to be an insuperable difficulty.—I am, etc.,

Coventry. JAMES MCNAUGHT INGLIS.

SIR,—Dr. W. B. Primrose has described (September 16, p. 676) a most ingenious way to convert a standard Boyle's machine into a closed circuit system and is to be congratulated on the simplicity of the modification. I cannot but feel, however, that the weak spot is the glass bottle for the soda lime. I am sure that in general use this will get broken more readily than previously because of the tube entering from below. Surely it would be simple to have an adaptor to screw on to the top of a standard M.I.E. absorber, which could then be screwed into the normal position for the bottle. The whole apparatus could thus be modified by the owner who has bought the necessary parts.

Dr. D. Zuck (September 30, p. 787) rightly pointed out that the strength of ether vaporized will be low when using the closed circuit. In times when curare is given to produce relaxation I would have thought that deep ether was no longer used for this purpose, or alternatively that those who used deep ether would not also be using a closed circuit system. Ether in an open circuit bottle is a useful adjunct to intravenous medicaments when only using the basal flow of gases: I frequently do this myself and the setting is usually at minimum.—I am, etc.,

Southsea, Hants. H. B. C. SANDIFORD.

Treatment of Pink Disease

SIR,—The article by Professor W. S. Craig (*Journal*, September 30, p. 773) on this disease, which through its long duration can be most exasperating and tantalizing for both patients and doctors alike, will be most welcome to all general practitioners in this country. I would, however, like to add a point of interest.

In an article of the January edition (1950) of the *Medical Journal of Australia*, Dr. Donald B. Cheek makes a most interesting and possibly revolutionary contribution to the treatment of this disease. Supported by clinical and biochemical investigations he found in babies and young children a depletion of NaCl in the blood serum (which partly accounts for most stubborn attacks of diarrhoea) and a lowered activity of the suprarenal cortex. The treatment he accordingly suggests is two teaspoonfuls of salt (NaCl) per day until improvement occurs, and in more severe cases additional injections of desoxycorticosterone, 5 mg. for four days. His results with this therapy appear to be most successful and certainly worth a trial.—I am, etc.,

Spennymoor, Co. Durham. E. BRAUER.

Observations on Cervical Erosion

SIR,—I was particularly interested in Dr. Jean R. W. Ross's article (September 16, p. 647), for I have recently re-examined 94 patients previously suffering from cervicitis and erosion and treated by dilatation and cautery, or dilatation and "conization" of the cervix during the past five years in the Nuffield Department of Obstetrics and Gynaecology, Radcliffe Infirmary, Oxford. Unlike Dr. Ross, I have not included puerperal patients, for I have been able to show that many erosions seen within three months of delivery are "involuting" erosions which heal without treatment. Undoubtedly, the inclusion of cases of this nature partly explains the cure rate of 4.7% achieved by cautery without concomitant dilatation of the cervix reported by her. She describes 109 parous patients suffering from abdominal pain (60%), menorrhagia (19%), leucorrhoea (80%), dyspareunia (9%), frequency (25%), and dysmenorrhoea (11%), and ascribes these symptoms to the presence of a cervical erosion. This apparently reduces the problem of treatment to the simple remedy of cauterizing the epithelium of the lower cervical canal and erosion with electric thermo-cautery.

I submit that many of the cases described were suffering from "cervicitis," of which an erosion may or may not be an outward manifestation; and it is my belief that it is illogical to treat a mere solitary sign (an erosion) and some of the symptoms, and yet ignore the remainder of the pathology in these patients. The procedure of preliminary dilatation of the cervical canal to promote drainage of the glands is as important as the subsequent cautery, and moreover it prevents the complication of cervical stenosis and haematometra which marred the results in 1.9% of the patients.

It has been my experience, substantiated by analysed results, that the more severe cases associated with hypertrophy of the cervix are better treated by dilatation and "conization" of the cervix. Even with this treatment recalcitrant cases occur in which only hysterectomy (abdominal or vaginal) can cure. Inspection of cervices previously treated unsuccessfully by local measures and subsequently removed by hysterectomy has impressed me with the frequency with which the external os appears relatively normal, but numerous nabothian follicles are seen extending up the cervix as high as the level of the internal os.—I am, etc.,

Oxford. DERK CRICHTON.

Medical Students in Prague

SIR,—I was most interested to read P. L. C. Diggory's article (September 30, p. 780). Having been a medical student in Prague myself and having returned to that town for several months after World War II, I admire how much and how correctly Mr. Diggory has seen. There is, however, one important point with which I must disagree and which I think will be of some interest. Mr. Diggory says he admires the close and cordial relations existing between the medical staffs of Czech hospitals. Even the humblest laundry maid was regarded, and regarded herself as, an integral member of the hospital

team, and was assured that her opinions and suggestions would be welcomed at regular meetings where all of the staff were present. I wonder what Mr. Diggory's opinion would have been had he been present with me at one of these staff meetings in a Czech general hospital in the winter of 1946? In this "democratic" circle the hospital porter happened to be the chairman, or president as it was called, and all the laundry maids and other maids were present just as Mr. Diggory mentions, and had their say. In that particular hospital, visiting hours happened to be every day. I proposed that there should be a reduction in visiting days, and suggested that on the two operating days there ought to be no visits, as patients who had just been operated upon ought not to be disturbed and drips and transfusions, etc., had to be fixed. The laundry maids were all for it—I mean for reduction of visiting hours—the chairman, the porter, was against, and my proposed change fell through. It was afterwards explained to me by the superintendent that the maids were in favour of reduction of visiting hours because they would have less cleaning to do through less dirt being carried into the wards and corridors by the visitors. The porter was against reduction because that would have meant for him reduction in tips. Needless to say, the lady in charge of the cloakroom was also against. I wonder which institution is the more democratic one, the one just described or the one in which doctors do not have to explain the necessity of intravenous drips to laundry maids, just as these do not have to justify to the doctors their washing technique?—I am, etc.,

Billingham, Co. Durham. J. Abels.

Smoking and Carcinoma of the Lung

Sir,—I should like to comment on certain points raised in this most interesting and important communication (*Journal*, September 30, p. 739). A possible explanation of the finding that the increase in deaths from carcinoma of the lung during the past 25 years is greater than the increase in tobacco consumption is that the number of *heavy* smokers may have increased much more during this period than the increase in tobacco consumption would suggest. There has certainly been a remarkable increase in very light smokers—women. I suspect, however, that there has also been a steady increase in the smoking of men. Twenty-five years ago anyone who smoked 20 cigarettes a day was regarded as a heavy smoker. To-day he is just an ordinary smoker.

In 1936–7 I investigated the smoking of a random sample of 804 males in a wage-earning urban community. There were 445 "heavy smokers"—smokers of 10 or more cigarettes per day—i.e., 55%.[1] If we compare this with Table V of the present investigation, which showed the most recent amount of tobacco smoked regularly by 622 male control patients, and assume that half the smokers of 5 to 15 cigarettes per day smoked 10 to 15, we find that 68% were "heavy smokers" according to my definition, an increase of 13% in 11 years.

With regard to the anomalous finding that there was no distinct association between inhaling and the development of carcinoma of the lung, the suspicion mentioned by the investigators—viz., that patients might not have been aware of what is meant by inhaling—is probably well founded. Many smokers, including doctors, I have found did not understand the term. I have often required a patient to light up to settle the matter and have often found that patients who thought they were inhalers were mistaken. The most useful check is to ascertain whether or not the smoker retains the cigarette between his lips during most of the smoke. If he does, he is almost certainly not an inhaler.

I take the investigators to task for their 36 references to the habit factor in smoking whilst completely ignoring the much more important craving factor. Both craving and habit are of course subjective and cannot therefore be measured. The fact, however, that satisfaction can be obtained from administering tobacco in ways other than by smoking—by chewing and snuffing, and also by the administration of nicotine by various routes[2]—shows that it is the action of the tobacco that matters and not the actions associated with its administration, which become largely habitual. If the carrying out of habitual actions were all-important, as calling smoking a habit implies, this could be done without lighting the tobacco, at great saving to the habitué but with virtually no satisfaction. It is clearly therefore a violent euphemism to refer to smoking as a habit. Tobacco smoking is a drug addiction (to be quite precise, a means of administering a drug of addiction, nicotine), and the drug addictions are specific diseases—specific intermittent intoxications. Nicotinism is clearly no less a specific disease than, say, plumbism, although addicts are, for obvious reasons, much more at pains to conceal their symptoms. Since tobacco smoking is a disease and a preventable one, it is our plain duty to prevent it.

The possibility that not only the interviewers but the investigators themselves may have been biased by their own smoking does not appear to have been taken into account. The fact that such harsh words as drug-craving, drug addict, drug intoxication or addiction, etc., have been scrupulously avoided suggests, to my mind, that the investigators are addicted to tobacco. (I may say that I do not know and have not tried to ascertain whether this is so or not.) Smokers, I have observed, often speak of smoking matters with an air of judicial detachment, yet it has often been obvious to me, an ex-inhaler of tobacco smoke, that their expressions of opinion on such matters were profoundly influenced by their craving for the drug. What is craving but "a fervent wish" (*O.E.D.*), and it cannot be doubted that such a wish often fathers thoughts on smoking matters. Admittedly non-smokers may be prejudiced against smoking, but just as non-addicts of morphine usually take a detached view of that affection and are far better able to do so than addicts, so also, in my view, can non-addicts of tobacco.—I am, etc.,

Wallasey. Lennox Johnston.

References

1 Johnston, L., *British Medical Journal*, 1945, 2, 98.
2 —— *Lancet*, 1942, 2, 742.

A Secret Remedy for Cancer

Sir,—There are many points at issue between *Picture Post* and the *British Medical Journal*, but there is none which is not best answered by the action of the Minister of Health in setting up the independent committee of inquiry for which we asked. But there is one point on which Mr. Rees Evans deserves to have his case made clear, once again. For no less than 26 years Mr. Rees Evans's offer has in fact been open under the conditions now accepted. He always felt that he should submit his treatment to this type of investigation in order that it might, if approved, be backed by some greater authority than his own. This is the first time that any such inquiry has been offered.—I am, etc.,

London, E.C.4. Derek Wragge Morley.

*** Mr. Rees Evans has agreed to submit to a Ministry of Health Committee "whatever they may ask concerning my materials and methods." Twenty-seven years ago (Mr. Morley has chosen the figure 26 with care) he refused to disclose the constituents of his secret remedy to an earlier cancer committee of the Ministry of Health.—Ed., *B.M.J.*

Johann Mikulicz-Radecki

Sir,—I feel sure that no one will be more interested in the story of Mikulicz-Radecki than my friend Sir Gordon Gordon-Taylor, and those of us who are inquiring about the history of our art must be grateful to Dr. S. Galewski (September 9, p. 630; see also October 7, p. 839) for his vivid picture of the life-story of Mikulicz. I have to confess that ever since I knew anything about Mikulicz I have regarded him as a German and have always heard him spoken of as belonging to the old regime in that country. There is no doubt that he was at least of the German school and that his surgical upbringing was in that tradition. Whatever his country of origin he was universally recognized as a great surgeon, and the respect and esteem in which he was held during his lifetime continue to the present day. Surely mere country of origin had little to do with his reputation as an outstanding figure or his position in the surgical world.

When I first visited Vienna in 1899 many of the leaders there were nationals of some other country than Austria, but so far as surgery was concerned they belonged to the Viennese School. So it certainly was in 1906 when I first visited the United States, and so it is to-day where many notable men who have added to the lustre of American surgical achievement were natives of other lands. Names like Christian Fenger, Albert Ochsner, the brothers Beck, Willy Meyer, and hosts of others at once come to mind, and so it is undoubtedly in other countries. Surely what really counts is not nationality or even knowledge and skill in surgery but those things which go to make leaders and above all else character and conduct. These attributes were present in a marked degree in Mikulicz, and, although I never had the privilege of meeting him in person or of seeing him operate, I feel I have an intimate knowledge of his work, because throughout the whole of my surgical career I have always heard so much of his characteristics and often at first hand from those who had been associated with him, like the late Professor Archibald Young, of Glasgow. He seems to have made a great impression on all who worked about him. Lord Moynihan stated that in 1903 Mikulicz told him that he had operated upon 35 cases of perforated gastric ulcer with 34 deaths as evidence of his conviction that it was the duty of the surgeon confronted with this catastrophe to give the patient the chance that only operation provided. There is also the quite touching story of his last illness and the way he faced the inevitable.

In a profession like ours nationality counts less than deeper things, and that truism is expressed in the simple motto "Without Frontiers" adopted by the Moynihan Club, that association of travelling surgeons which was started by the late Lord Moynihan and which is regarded by many who knew him best as his greatest accomplishment. In our efforts to practise and improve the healing art we need take no stock of where a man originates but only of what he is. In penning these few lines I cannot but be reminded of the words of the great Scottish poet, Robert Burns, who expressed this idea so vividly when he wrote:

"The rank is but the guinea stamp,
The man's the gowd for a' that."

None the less those of us who know the tradition and reputation of Johann Mikulicz-Radecki can assure Dr. Galewski of our great interest in his communication and of our sympathy for his point of view, especially at this time in the world's history; but I would like to emphasize those other aspects which I have tried to express in these few halting words.—I am, etc.,

Taplow, Bucks. G. Grey Turner.

Male Toads Croak when Tickled

Sir,—The paper by Drs. J. F. D. Frazer and F. X. Wohlzogen (*Journal*, August 5, p. 330) is of great importance for small laboratories because of the general availability of toads. However, having considerable experience in the use of our local toad (*Bufo arenatus*), I know that anyone trying to perform the test runs into the great difficulty of distinguishing male from female toads. None of the papers on the subject mentions this important point. After consulting a zoologist we now know that only male toads croak when tickled on the throat. A secondary characteristic of male toads is the black thumb on the forelegs. For the tropical climate the toads are preferable not only because of the very high price of *Xenopus* but also because of its poor resistance to temperatures over 85° F. (30° C.).—I am, etc.,

Almirante, Panama. Gustav Engler.

A Vestigial Tail

Sir,—I was interested to read (*Journal*, October 14, p. 870) the account by Mr. P. J. Blaxland in which reference is made to a similar case which I described in the *Journal* in 1934. It is stated that I suggested that the tail should be left, in the hope that the bearer could subsequently earn his living in a circus. This is incorrect, as the suggestion was offered by one of the relatives, and the advice given to the parents was that "the presence of such an abnormality would affect the child psychically." The parents agreed, and I removed the tail before they changed their minds.—I am, etc.,

London, W.1. R. J. McNeill Love.

Medical Notes in Parliament

DOCTORS FOR THE FORCES

Man-power, Pay, and Isolation

In the House of Lords on October 18 Lord Haden-Guest moved a motion urging greater integration of the National Health Service, the medical services of the Army, Navy, and Air Force, and the medical services of the Colonies. He said that even with the utmost economy and most careful arrangements the country had not enough doctors to do all the work that was necessary. The National Health Service employed over 90% of the available doctors in England and Wales, but the Colonial Medical Service was inadequately supplied with doctors, and the medical branches of the Forces had difficulty in keeping abreast of their requirements. In any sudden emergency partial or complete mobilization could be fully met by calling up doctors who were reservists of the Regular Army, doctors who were in the Territorial Army, and doctors with Class Z liability as having served in the last war. As the result of personal visits which he had paid to commands in this country and overseas he assured the House that the necessary work in the Services was being done despite the difficulties, but it was being done under great strain. Conditions were not fair to the Services at present, and he believed it necessary to bring the civilian and military medical services closer together. The N.H.S. contained about 19,000 general practitioners, about 5,500 consultants, and about 3,500 senior hospital medical officers and senior registrars—a total of 28,000. Doctors in the armed Forces numbered about 2,500, and the number in the Colonial Service was about 1,900.

There was much co-operation between the Services: abroad the sick of all could be admitted to a common hospital. In York a hospital was shared by the Army and the National Health Service, and the latter would accept Service patients in the same way as it accepted anyone else.

Many young doctors now qualified or about to qualify had served in the second world war before their medical studies began, and were therefore no longer liable to conscription. The terms offered for short-service commissions for both men and women were not regarded as attractive at present by either, and the response was poor. In the Colonial Medical Service the situation was also serious, and to secure an inflow of doctors to that Service it had been necessary for the Medical Priority Committee to recommend that doctors who accepted certain Colonial Office posts should be regarded as discharging liability to military service. That arrangement operated in Hong Kong and West Africa. In this country the deficiency in the number of Service doctors could partly be made up by employment of civilian medical practitioners. It had even been found necessary to employ full-time civil surgical and medical consultants in the Services. These men served and dressed as civilians. They received civilian rates of pay which were higher than those of the officers in the unit in which they served, and in some cases higher than that of the Director of Medical Services of the Army formation of which the unit was part. That could not be described as satisfactory, and invalidated any arguments which the D.M.S. might put forward to a junior medical officer in trying to persuade him to take a short-service commission. The situation resulted in officers in Service hospitals being divided into two groups, a top group of regular officers and a lower group of junior officers, with nobody between. The junior group was composed exclusively of National Service doctors. The top group was composed of doctors with regular commissions. This threw an unfair strain on senior officers and ought to be ended as soon as possible. Service pay compared unfavourably with that obtainable in civil life, and Service life cut the man off from his profession, limited his medical experience, and took him abroad. Much the same objections applied to recruitment for the Colonial Medical Service.

Suggested Changes

He suggested that conditions of entry to the medical services of the armed Forces and of the Colonial Medical Service should

be changed and put on an equality with the National Health Service. Every qualified doctor, unless he opted out, should from the time of his qualification and registration be on an equal footing, eligible for the same pension and other rights on the terms and conditions applicable to the National Health Service. He wished to keep the medical services of the Navy, Army, and Air Force separate, as also the Colonial Medical Service, but to make the financial basis the same for all of them, and to allow the young doctor to apply for any of these branches of service but to maintain his pension and other rights, just as he did now if he applied to go to a hospital in another town. Some steps in this direction had been taken by the Ministry of Health. A doctor in the National Health Service who was called up to the Forces could maintain his N.H.S. superannuation by payment of contributions, and a doctor taking a short-service commission in the Forces might do the same. So could a doctor on a short-service commission who took employment in the Colonial Medical Service for six years or less. Such arrangements were not enough to deal with the situation. Unless the pay received by medical officers in the three Services and in the Colonial Medical Service was equal to that received by doctors in the National Health Service, the recruitment required would not be obtained.

At present military service was too often regarded as an interruption in a medical career. Integration of the medical services of the Forces and Colonies with the National Health Service would bring all more closely together. He had been unfavourably impressed at discovering a wide gap in this country between the doctors in the National Health Service and those in the Forces. In one important city which he had recently visited with colleagues of the Medical Priority Committee a leading local practitioner did not know that two Service hospitals existed in it. In another city he and his colleagues visited a hospital which was shared between one of the Services and the regional hospital board. Both parties were enthusiastic about the value of this co-operation, but the existence of the hospital was unknown to some of the leading local civilian medical authorities. In two university towns the Army medical authorities of important areas had only the most distant relations with the medical side of the universities. He suggested a formal link should be created by the Ministry of Health between chief representatives of the medical branches of the Services in the commands, the chief representatives of the National Health Service, and the chief representatives of the medical side of any universities in the areas.

The Specialist Position

Lord MORAN said shortage was the fundamental fact. In the Colonial Service 1,500 specialists were necessary, but it was about 200 short. The R.A.M.C. required 455 specialists, but had only 197. It also had 157 who were known as "graded specialists," but these were not specialists at all and would be called junior registrars in the National Health Service, where they would work under supervision. In June, 1949, when reinforcements were needed for the garrison of Hong Kong, three large military hospitals in England had to be closed to provide the necessary specialists.

The remedy was to make conditions in the R.A.M.C. such as would attract specialists in the open market—in other words to pay them more. The Treasury or the Cabinet had sat long over that question. They had recently raised the pay of everyone in the Army except the doctors. That was because the scarcity of consultants in the R.A.M.C. was concealed by men serving as specialists who were not specialists at all. That state of affairs lowered the morale of the R.A.M.C. and lowered the standard of treatment given to men in the Army.

The other remedy was to second for two years to the R.A.M.C. specialists from the National Health Service who had spent five years in a specialty and had senior degrees. The Medical Priority Committee would decide how many men should be so seconded, but it was no use transferring specialists from the National Health Service if there was a shortage in that Service itself. He asked whether there was a shortage of specialists in the National Health Service. The Ministry of Health report which was concerned with the development of consultant services had estimated that 7,000 whole-time specialists were needed. Actually there were in England and Wales 5,200 part-time specialists. That meant that the Service had only 56% of the number aimed at. It was only fair to the Minister of Health to say that the figure of 7,000 was the ultimate aim, but nevertheless a shortage was evident.

Distinction Awards

Lord Moran said he had recently visited the North to ask help in recommendations for his Awards Committee for specialists. When the recommendations came in he was surprised to find the name of only three physicians outside the teaching hospital in that region. The public had been educated to think that surgery was safe only when performed by a surgeon with surgical training. It had not been so educated about medicine. In many parts of England a patient could not get a physician's opinion. He was fobbed off with a doctor who might not be familiar with the weapons which had been placed in physicians' hands in the last 20 years. One of the greatest administrative needs in health matters was that everyone who needed a consultant physician should be able to get one.

If the House accepted his assumption that there was a shortage of specialists in the National Health Service, the whole situation altered. It was little use then in seconding a man from the National Health Service except in an emergency. In an acute shortage in an area it might be sensible to transfer the person from Region A to Region B, but as a long-term policy that was no use at all. The fundamental task of the House that afternoon was to say how the country could get sufficient specialists so that there would be enough for every service.

What did they ask a man to do if they asked him to be a specialist? For five or six years before he qualified he would compete with others, and for five years after qualifying he would compete for registrar posts, and finally for the hospital staff itself. If he left school at 18 and became a specialist at the age of 32—which was the usual age—he would have passed through a course of intensive application, concentration, and will-power spread over 14 years. No other members of the profession were required to spend those years in training. What inducements was Parliament able to give them to make this effort to climb the ladder? In medicine, perhaps more than in other callings, men who had a vocation were not obsessed by material reward, but in these days of penal taxation it was necessary for men to think of their dependants. He said bluntly that the country would not get the specialists required unless it was prepared to give adequate material rewards. He therefore intended to discuss the remuneration of specialists.

The Spens Committee, which had advised the Government on the remuneration of specialists, had begun by inviting Professor Bradford Hill, a statistician, to investigate the income-tax returns of a large number of specialists before the Act had come into force. His report had great influence with the committee. That committee's report on remuneration was a compromise between the merits of seniority and the merits of distinction. Beginning at the age of 32 the specialist, if he devoted all his time to the Service, was paid £1,700 per annum. The specialist was about one-tenth of the whole profession. By gradually increasing increments he rose until at the age of 40 he would receive £2,750 per annum. Thereafter he would receive no rise whatsoever for the next 25 years unless he was chosen for a distinction award. The profession would be one in which a man reached his peak of remuneration at the age of 40 and thereafter received no rise for the rest of his working life. With affairs in that condition they would not get into medicine the men they sought. He thought, therefore, that the awards (which were the other part of the system of remuneration) were of fundamental importance.

Unless the House understood the scope of these awards it was impossible to grasp the problems which were faced to-day. The Government had decided that as there were 5,200 specialists in England and Wales awards should be given to one-third of them, which was roughly 1,700. Of these, 200 should get A awards, 500 B awards, and 1,000 C awards. Those who got the maximum income, which meant they must be whole-time specialists, were a mere fraction of the 200 in the top group, and that fraction was out of 50,000 doctors. When an award was given to a man it was given only in proportion to the time he devoted to the Service. If half-time were given to the Service, half the award was received. A central committee of 14 acted in a judicial capacity gathering evidence, examining it, and then pronouncing on the awards. The evidence might be provided by the three Royal Colleges and the 14 faculties. That evidence concerned what a man wrote, his contributions to medical meetings, and his technical excellence. The Royal College of Physicians had spent weeks grading more than 3,000 physicians.

Importance of Local Consultation

But it was obvious that many specialists did not write much, were not regular attenders at meetings, and yet were valuable members of the profession. Therefore the central committee required peripheral evidence. That evidence was concerned with how the man pulled his weight, and whether he discharged hospital duties faithfully. It was obtained partly from the regional hospital boards, but that was not sufficient. If it was suggested to Bradford that the regional centre in Leeds should judge for Bradford, they would have a riot. It was necessary to get the pronouncements by the man's own colleagues. The central committee had held 58 meetings all over the kingdom, with an average attendance of between 30 and 40. These meetings had elected committees of three to help in grading specialists who were not attached to teaching hospitals but worked outside great university centres. In spite of all this care the committee felt the danger of error and constantly took, as it were, insurances against error. A London surgeon, for example, might easily have eight different gradings. The committee liked to wait for the time when all those gradings pointed in one direction. It then knew that it was doing what the judgment of the profession would consider right.

Again, the committee knew the number of specialists in the region and so could work out what would be the expectation of that region in awards if they were given by arithmetic. If it then found that one region had done badly, the committee would say there was a call to go over the facts again from the beginning. The committee went through the same process with each specialty in each region, and if one specialty had done badly it went through the evidence again. In that way it tried to establish a degree of exactitude in the awards. He felt that these awards were important in retaining the efficiency of the whole Service. If they were abolished, it would adversely affect the quality of men seeking admission to medical schools, because medicine, like other professions, must appeal competitively to the man of promise. As a man who had been dean at a medical school for 25 years, he said that but for these awards medicine could not compete successfully with other professions for the man of promise. He reminded the House that as far back as they could remember almost every addition to medical knowledge had come from specialists attached to hospitals. If the awards were abolished, men in medical schools would be discouraged from specialism, and there would be scarcity of specialists and a fall in hospital standards.

He did not believe any Government would scrap the award system without first giving it a trial. If the financial circumstances of the country made it necessary to have a percentage reduction in the salaries of every profession, medicine would gladly bear its share, but to take a fraction of a single profession and confiscate a considerable proportion of the income of that fraction was not in accordance with justice.

Before the Health Service Act there had been many grades of hospitals. One of the first purposes of the Service was that there should be one grade of hospital. Up-grading of backward hospitals could be done only by strengthening the staffs, and the only way to do that was by decentralization of specialists. These had tended in the past to congregate in great centres of population, and the awards would help decentralization by making a man less dependent on private practice. He had spent the last three months going through England and Wales talking to specialists, and could say that these, with a few noisy exceptions, not only favoured these awards but would be shocked if they were withdrawn. The Ministry of Health saw clearly that the specialist in the past had been accustomed to the stimulus of a competitive profession, but that he felt a weakening of that impulse, and that another incentive was necessary.

Opposition to the awards did not come from the desire for economy. Such hostility as there was came largely from an old feud. In 1918 recommendations of a Royal Commission had been implemented, and professors of medicine and surgery were for the first time paid salaries in England. These salaries were in excess of those of professors of non-medical faculties. For more than 30 years successive governments had accepted this. Unfortunately when the awards were introduced vice-chancellors of universities, urged on by non-medical faculties, had renewed the attack, although only a mere handful of specialists was concerned—a few professors of medicine and surgery, and a few pathologists, and the like. Medicine had seemed to him two years ago like a great tree uprooted in a storm. If someone now wished once more to tear up that tree by its roots, then he, who had no politics, would despair of that folly.

Medical Services and War

Lord BOYD-ORR said he proposed to speak on the integration of the medical service as an essential part for the preparation of war. Almost until the second world war deaths, injuries, and diseases caused by war so differed from those that befell the civil population that medical officers had to receive a special training to deal with them. If war came now the whole nation would have to prepare not only to face atomic bombs but also biological weapons, which according to Dr. Chisholm, who had been a major-general in the Canadian Army in the first world war and in charge of research in the recent war, would kill more people than the atomic bomb. Civilians and soldiers would suffer the same injuries or diseases, and there was therefore every reason to co-ordinate all branches of the medical services. Co-ordination of home industries, supply and production of food, of hospitals, and of the treatment of diseases were all interlocked. He suggested an even closer integration of the medical services than that proposed by Lord Haden-Guest.

Links With the Colonies

Lord AMULREE emphasized the advantage of joining the medical services in the Colonies with those in Great Britain. He asserted that the general standard of medicine in this country was probably higher than in any other country in the world, and it was desirable to spread among the Colonies the same high standard. He would like to see many more exchange visits by doctors from Great Britain to the Colonies. He knew what a great encouragement it was to a doctor in some out-of-the-way Colony if someone came out there for six months or a year, someone of considerable fame in his own specialized work. It was also of great value to medical men who worked in these Colonies if they could come back to Britain at more regular intervals than they did now and could obtain some kind of employment, not merely a refresher course. In 1947, when he went to China on a parliamentary visit, he met a Chinese doctor aged about 50 who had been trained in Great Britain and had done extremely well as a surgeon. Since returning to China he had never been back to Britain and felt that he was losing his grip and was being dragged down into something he certainly had not been. Various doctors of the British community who had been in China for a long time said that for the first ten or fifteen years they had got on quite well, but thereafter, because they had no one to discuss things with and could gather no more experience, they felt they were falling back. Lord Amulree said he would like to see more patients brought from the Colonies to Britain for specialized and difficult treatment, particularly of cancer. It was extremely costly to provide x-ray machines and radium installations all over the world, and moreover these needed to be used by people of great skill and experience. He would like to see more people brought from the Mediterranean Colonies and African Colonies, not only European members of the populations but natives also, for treatment of these diseases. If one or two were persuaded to come and return home successfully treated that might be the start of a large temporary immigration of the sort he suggested.

Lord MARLEY said that financial payment for both home and Colonial work must finally rest on the productive capacity of

workers in the United Kingdom. At present on the average one million workers were away from industry all the time through sickness, representing an annual loss of production of something like £400m. Therefore it was vital that the National Health Service should be at least on a par with the overseas service. Yet general practitioners complained that they were overworked and that their incomes were inadequate, and there were suggestions that they might withdraw from the National Health Service. If that happened it would have a disastrous effect on the work of eliminating sickness among the working population. There must be not fewer than 2,500,000 in this country requiring medical attention. It behoved Parliament to make certain that all the medical services were adequately remunerated and that equally attractive conditions existed in each. Lord Marley went on to draw attention to the condition of radiographers, who were deprived of what was called the London weighting for those employed in London. These people had high qualifications and were engaged in a dangerous occupation. In other not dissimilar services, such as that of electroencephalographer, the London weighting payment was available. Such things were likely to discourage the best medical students and the best of other scientific workers from joining in the National Health Service, the Colonial Service, or the fighting Services.

Secondment and Redistribution

Lord WEBB-JOHNSON recalled that he had spoken on the same subject in December, 1948, when the Government representative had promised to see that his remarks were conveyed to the Minister of Defence. He had spoken again last April, when he had pointed out that there was a 37% deficiency in the R.A.M.C., and Lord Alexander had said that he would have every opportunity of casting stones if nothing had been done in the matter by the next time it was debated. Lord Webb-Johnson felt that the peers should support a demand that terms and conditions of service for the medical branches of the Forces should be dealt with immediately. There was no excuse for further delay. There was no basis for an integration of the various medical services until the rates of pay were settled. He thought that secondment not only from N.H.S. to the Forces and Colonial Service but also in the other direction would be of great value. Two distinguished officers of the R.A.M.C. had been seconded, one to the Iraq Government and the other to the Saudi-Arabian Government, and they would return to the seniority in pay and rank which they would have reached if they had stayed with their corps the whole time. Within the last fortnight the Colonial Office had issued a document arranging for superannuation pensions to be carried on if a medical officer left the National Health Service and within twelve months entered the Colonial Medical Service.

The MARQUESS OF SALISBURY recalled that he had been for some time during the war chairman of a committee of Ministers set up to allocate the supply of doctors between the armed Services and the civil population. As a result he formed the opinion that there must be some permanent scheme to operate in peace and war if the needs of military and civilians and also of the Colonial Empire were to be met. When war broke out in 1939 doctors with complete patriotism agreed that some should be diverted to the assistance of the armed Forces. By the later part of the war the civilian population was served by only a residue of elderly doctors and a few who had not been passed fit for military service. The Government had then had to face the necessity of withdrawing some doctors from the armed Services. With demobilization the balance swung back, and the position at the moment was comparable to that in 1939. Such violent fluctuations were not satisfactory in peace or in war. It might be, as Lord Moran had said, that there were not enough doctors to go round, but that did not seem to be a reason for failing to strike the best practicable balance. It seemed to be vital for the Government and the medical profession to devise some scheme to ensure a fair flow of medical practitioners to where they were needed. What was required was closer integration between the medical services by way of secondment from one to the other. He did not know whether it was practicable to assimilate the rates of pay in the three branches of medical work, but they ought to be brought as near as possible to each other. That applied equally to the specialist, about whom Lord Moran had spoken. Let the Government if necessary set up a Cabinet committee and let it make one Minister responsible for the problem.

Government Reply

Lord SHEPHERD replied for the Government. He said the work of the medical priority committee had considerably helped to ease the difficulty in the staffing of the branches of the medical services and to alleviate the problems of the Colonial Medical Service. In the Forces there was a shortage of 400 specialists and of 100 general-duty doctors. In the Colonial Service the shortage was 200. These figures need not cause alarm provided that the Government of the day and the medical profession were concerned about the situation. He was sure that with better organization and conditions Parliament would be able to change the deficit into a sufficiency.

In 1930 the number of registered doctors was 54,537, of whom 9,000 resided abroad. In the present year the number on the *Register* was 77,730 and the number resident abroad was 12,000. Was this an increase upon which they could depend for feeding the Forces with their extra requirements? They had to think of the large number of women now registered as doctors. Lord Haden-Guest pointed out that of these women 50% did not practise. The second thing to remember was age. Only younger members of the profession could be attracted into the Services. National Health Service demands were so large that they must have reduced the availability of doctors for the Services. He believed they not only had to think of transferring men and women into the Forces or into the Colonial Empire but of how they could recruit more doctors, both men and women, into the profession. In 1946 of men who became qualified only 44% were prima facie available for military service. The rest had completed their military service before they qualified. In 1947 the proportion was 53%, in 1948 54%, and in 1949 58%. The Minister of Labour had compiled figures for the period 1950–4 indicating that the proportion of men available would again drop. In those years, of 9,653 men who expected to qualify no more than 4,900 would be available for service, a ratio of 50%. Of these probably 20% would be considered to be militarily unfit. It therefore seemed that the intake under conscription might not be sufficiently large to cover the deficiency in the Forces.

Since 1939, 20,000 doctors had done military service and had gone into private practice or hospital service. They were unlikely to be disturbed, although in times of emergency they would answer the call. Some of these men were still on the reserve, but their period of reserve service would soon be finished. Nobody had suggested that for the rest of the medical population there should be compulsion, although he was not clear what Lord Moran and Lord Webb-Johnson had meant when they spoke of seconded people for service. He gathered that Lord Webb-Johnson had not advocated compulsion.

Inducements for Specialists

Lord Moran had suggested that greater inducements should be offered to specialists. At this moment a number of medical men, at the request of Mr. Bevan, were inquiring into the circumstances of medical students. There seemed to be a preponderance of men and women who desired to be trained as specialists and not as ordinary medical practitioners. It seemed therefore that the inducements already given were sufficient. The Minister of Health wanted to use his influence and that of hospital and university authorities to persuade some of these would-be specialists to reconsider their position and to take early service in the Army as general medical men. Men could now be transferred, or might transfer, from the ordinary health services into the other Services at home or abroad, and could arrange with the authorities to continue their pension rights without losing seniority. Hospital authorities had been advised, or were about to be advised, that it would be good if part of their own medical staffs had experience of the Colonies or of the Forces.

Future Co-ordination

The Government was satisfied that it had not gone far enough and desired to meet the case put forward by Lord Haden-Guest. An interdepartmental committee was considering co-ordination of medical services within the Forces and within the Health Service. He hoped that something good would result from this inquiry.

Lord SWINTON said it was desirable that, where there were Service Ministers and civil Ministers on an inquiry, each of them with a Department, there should be an independent Minister in the chair. He thought a similar arrangement would be wise if the committee consisted of senior officials.

Lord SHEPHERD replied that the interdepartmental committee did consist of senior officials but that he would see that the suggestion made by Lord Swinton was brought forward. Continuing, Lord Shepherd said the Government had recently considered the position of the Medical Priority Committee and of the Committee of Reference which had similar functions in relation to hospitals in the London area. A meeting was to take place that week between the Government and those concerned to consider the future of these bodies. If it was possible to get friendly co-operation between the bodies, or to integrate them, the advice given to the Government would be more concentrated.

Integration with the Services had the blessing of the Government, which would see it through. Dealing with payment for services in the Forces and in the Colonial Service, Lord Shepherd said it was now realized that there must be restrained movement both of wages and of salaries, and the utmost consideration would be given to the claim of medical men in the Forces. Medical men in the Forces ought not to be worse off than medical men in civil life or than men employed on general military duty in the Forces. He was unable at present, however, to make an announcement. That announcement should be made either by the Chancellor of the Exchequer or by the Ministers concerned. The subject had been pressed by the Ministries upon the Treasury. It was not too much to hope that this would be the last time the House of Lords would be bothered about it.

Lord HADEN-GUEST hoped that the last words spoken by Lord Shepherd would be duly implemented in a suitable statement. He then withdrew his motion.

Invalid Port

Mr. J. A. BOYD-CARPENTER moved on October 17 that the Labelling of Food Order, 1950, be annulled. This provided, *inter alia*, that no one should have in his possession for sale any liquor the label on which was

> by any name or words calculated to indicate, either directly or by ambiguity, omission, or inference, that the liquor had properties which made it beneficial to invalids, or had tonic, restorative, or medicinal properties unless the liquor contained a substance or substances other than alcohol added in such quantity as to confer such properties.

Mr. Boyd-Carpenter understood that this rendered illegal the use of the expression "invalid port."

Mr. F. T. WILLEY, Parliamentary Secretary to the Ministry of Food, said there was no difference in substance between invalid port and other port. Medical advice had always been that such misleading descriptions should be prohibited.

Dr. CHARLES HILL said nothing in the Order precluded the most fantastic claims which an advertising genius could make for fluids containing alcohol, on the assumption that these fluids did not purport to be foods. A great deal of the publicity which was intended to suggest a nutritional quality in alcoholic beverages was based on a fantastic conception of what such food could do to sustain the human frame. The fact that alcoholic drinks did not contain building or other nutritional elements need not necessarily condemn them. He was not overlooking the effect which such properties had on the higher centres of energy and on human worries and sense of fatigue. If the purpose of the Order was to prevent the making of false claims it would be desirable to address attention to the falseness of the claims which were made for the food value and building value of such liquids as had on other grounds much to commend them to many in the House. He would rather see these excellent fluids properly described, without the pretence that they were of particular value to expectant and nursing mothers, or that they had any nutritional value worth considering.

After further discussion, Mr. Boyd-Carpenter's motion was rejected.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following degrees were conferred on October 14:

M.A.—D. M. T. Gairdner, D.M.

M.D.—A. Lyell, Mary Farquharson.

M.B., B.CHIR.—*J. F. Hort, *J. F. Lees, *G. Holden, *J. D. Jackson, R. P. Ross.

* By proxy.

UNIVERSITY OF EDINBURGH

Professor R. A. Peters, F.R.S., Whitley Professor of Biochemistry in the University of Oxford, will deliver the Cameron Prize Lecture on "Applications of Chemical Defence Research in Medicine" in the Anatomy Lecture Theatre, University New Buildings, Teviot Place, Edinburgh, on Monday, November 6, at 5 p.m. Students and graduates are invited to attend the lecture.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—D. Baidya, I. A. Blackmore, V. St. E. D'Abrera, Phyllis Dagnall, J. L. Holme, A. Husain, O. G. Jones, Endre Kertész, F. Kurrein, M. Millard, G. P. Mohanty, H. Prasad, W. D. Ratnavale, Rosemary J. S. Sichel, M. L. Sur, A. Tay, L. Vogel.

EXTERNAL DIPLOMA IN CLINICAL PATHOLOGY.—G. T. Barnes, K. S. Daber, N. P. Jain, J. K. F. Mason, J. B. Neal.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

Professor F. R. G. Heaf will deliver an inaugural address on "Infection and Disease, with Special Reference to Tuberculosis" in the Reardon Smith Lecture Theatre, Park Place, Cardiff, on Thursday, November 9, at 8 p.m.

UNIVERSITY OF LEEDS

At a meeting of the Council of the University held on October 18 the title of Emeritus Professor was conferred upon Professor M. J. Stewart, LL.D., M.B., Ch.B., F.R.C.P., on the occasion of his retirement from the Chair of Pathology. The Council expressed the wish to be joined in the Senate's resolution of warm appreciation of his work. Professor Stewart was a member of the Senate for thirty-two years. He served also for long periods in many posts of administrative responsibility in the School of Medicine, and as Pro-Vice-Chancellor.

Other appointments were made as follows: R. E. Coupland, M.B., Ch.B., as Lecturer in Anatomy (from October 1); G. Watkinson, M.D., M.R.C.P., as Lecturer in Medicine (from October 1); J. A. L. Vaughan-Jones, M.B., Ch.B., J.P., as part-time Lecturer in Public Health for the session 1950–1.

The Council recorded its congratulations to C. W. Dixon, M.D., D.L.O., D.C.H., D.P.H., Lecturer and Chief Assistant in the Department of Preventive Medicine and Public Health, on the award of a Leverhulme Research Grant for 1950–1 to enable him to carry out research in the epidemiology of smallpox and control of variola minor.

UNIVERSITY OF SHEFFIELD

Dr. Lorna H. Heslop has been appointed assistant medical officer to the Student Health Service of the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The Frederick Hewitt Lecture will be delivered by Dr. George Edwards before the Faculty of Anaesthetists of the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., on Wednesday, November 1, at 5 p.m. His subject is, "Frederick William Hewitt."

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

On October 18 Dr. Leonard Abrahamson was elected President of the College and Dr. G. T. O'Brien Vice-President.

Dr. R. S. F. Hennessey was admitted, *in absentia*, to the Fellowship of the College on October 6.

No. 40

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 7.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	30	3	13		2	37	4	16	2	1
Deaths		—	2				—	—		
Diphtheria	40	6	11	5	6	84	11	22	4	5
Deaths	—	—	—	—	1	—	—	—	—	—
Dysentery	187	14	149	2	1	290	16	78	—	2
Deaths		—			—				—	—
Encephalitis, acute	4	—	—		—	1	—	—	—	—
Deaths		—		—			—			
Erysipelas			19	12	2			17	8	3
Deaths							—			
Infective enteritis or diarrhoea under 2 years				19	17				107	
Deaths	8		1	4	—	36	2	7	9	5
Measles*	3,914	289	197	87	66	926	28	43	75	35
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	32	2	5		—	31	4	3	—	1
Deaths	—		—		—	—	—	—	—	—
Paratyphoid fever	11	2	1 (B)		1	18	—	1 (A) 6 (B)	2 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	351	10	3		6	312	15	1	—	6
Deaths (from influenza)‡	8	—	—	1	—	7	—	—	—	—
Pneumonia, primary			134	¶				133	21	
Deaths	131	18		4	12	137	18		7	5
Poliomyelitis, acute	353	20	49	6	4	374	53	6	3	2
Deaths§	25	1		1		17	—			
Puerperal fever			6				—	12		
Deaths										
Puerperal pyrexia‖	74	3	10	2	2	114	19	6	1	1
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,064	90	162	70	61	1,624	114	232	99	163
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	10	2	2	—	1	18	2	3	1	1
Deaths	1	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	2,445	255	222	53	21	908	31	47	26	41
Deaths	4	1	—	—	—	5	—	—	—	—
Deaths (0–1 year)	203	22	32	10	12	293	23	39	22	16
Deaths (excluding stillbirths)	4,529	681	546	145	105	4,124	567	529	147	112
Annual death rate (per 1,000 persons living)			11·0					10·6	9·1	
Live births	7,546	1217	930	368	259	7,993	1293	976	394	235
Annual rate per 1,000 persons living			18·7					19·6	24·4	
Stillbirths	147	15	20			177	13	28		
Rate per 1,000 total births (including stillborn)			21					28		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

The notifications of poliomyelitis in the week ending October 14 were: paralytic, 223 (241); non-paralytic, 85 (112); total, 308 (353). The figures for the previous week are in parentheses. Those for the corresponding week in 1947 and 1949 were 364 and 463.

Total uncorrected notifications for 1950 up to and including the week under review are 7,012. The corresponding figures for 1947, 1948, and 1949 were 7,454, 1,825, and 4,478 respectively.

The only county area in which there was any considerable increase was Hertford, with 7 cases more than in the preceding week. Comparatively large decreases occurred in Devon (8), Gloucester (7), Stafford (16), with smaller decreases in many other counties. Total notifications for the week were fewer than in the preceding week by the following: paralytic, 18; non-paralytic, 27; total, 45.

Discussion of Table

In *England and Wales* increases were recorded in the number of notifications of measles 951, scarlet fever 127, acute pneumonia 70, acute poliomyelitis 22, and decreases were reported for whooping-cough 171 and diphtheria 10.

The largest rises in the incidence of measles were Yorkshire West Riding 147, Lancashire 92, Gloucestershire 86, London 72, and Middlesex 69. The only rise of any size in the local trends of scarlet fever was 43 in London. The chief feature of the returns for diphtheria was a decrease of 5 in Durham. The largest variations in the trends of whooping-cough were decreases in Yorkshire West Riding 70, Lancashire 46, and a rise of 39 in Middlesex.

The largest centres of dysentery were Lancashire 59 (Manchester C.B. 20, Oldham C.B. 10); Yorkshire West Riding 25 (Batley M.B. 13); Leicestershire 23 (Leicester C.B. 22); London 14 (Paddington 5); Surrey 14 (Surbiton M.B. 10); Durham 12. Two large outbreaks of food-poisoning were reported from Yorkshire West Riding—Wortley U.D. 220 and Bradford C.B. 58.

The largest returns of acute poliomyelitis were Lancashire 32 (Manchester C.B. 13, Liverpool C.B. 5); Gloucestershire 31 (Bristol C.B. 22); Yorkshire West Riding 29 (Sheffield C.B. 6); Staffordshire 22; London 20; Devonshire 19 (Newton Abbot R.D. 9); Kent 18 (Orpington U.D. 10); Warwickshire 16 (Birmingham C.B. 12); Durham 13; Surrey 12 (Croydon C.B. 4); Middlesex 10; Glamorganshire 10.

In *Scotland* increases were recorded in the number of notifications of measles 51, dysentery 22, and whooping-cough 21, while the only fall of any size was 47 for scarlet fever. The largest returns of dysentery were those of the cities of Glasgow 70, Edinburgh 21, Dumfries 17, Stirling county 12, and Lanark county 11. The notifications of acute poliomyelitis were 7 fewer than in the preceding week; the chief centres of infection were Glasgow 9, Angus county 8, Dundee 6, Motherwell and Wishaw 4.

In *Eire* increases in the number of notifications of measles 44 and scarlet fever 30 were recorded. The rise in the incidence of scarlet fever was mainly contributed by Dublin C.B., where a rise of 18 was recorded. The increase in measles was due to outbreaks in Dublin, Balrothery R.D. 19, Meath, Painestown R.D. 12, and Tipperary, Nenagh R.D. 10.

In *Northern Ireland* a rise of 23 was reported in the number of notifications of measles. The largest increase in the incidence of measles was 22 in Antrim county. Only 4 cases of acute poliomyelitis were notified, a decrease of 6 from the preceding week.

Week Ending October 14

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,193, whooping-cough 2,461, diphtheria 40, measles 5,009, acute pneumonia 382, acute poliomyelitis 308, dysentery 180, paratyphoid fever 8, and typhoid fever 7.

Medical News

Presentation to Dr. E. A. Gregg

Dr. E. A. Gregg, Chairman of Council of the B.M.A., was on October 24 presented by the London Local Medical Committee with a wallet containing a cheque, in recognition of his many years of devoted service in the interests of the general practitioners of London. Dr. Gregg joined the London Local Medical and Panel Committee in 1919. He was chairman of it from 1936 to 1949, and among his other duties represented the committee on the Insurance Acts Committee, of which he was also chairman. After the presentation Dr. Gregg, expressing his gratitude for the gift, emphasized the importance of the work of local medical committees.

Harveian Dinner

A Commemorative Feast, which William Harvey ordained should take place yearly on St. Luke's Day, was held on October 18 at the Royal College of Physicians of London. The Fellows of the College entertained the following guests: Lord Addison, Professor Lillian Penson, Sir Edward Peacock, Sir Wilson Jameson, Sir Cecil Wakeley, P.R.C.S., Sir Henry Hake, Sir Leonard Parsons, F.R.S., Professor Hilda Lloyd, P.R.C.O.G., Professor B. W. Windeyer, and Mr. Geoffrey Keynes. The toast of "The Immortal Memory of William Harvey" was proposed by the President and replied to by Sir Leonard Parsons, the Harveian Orator.

Colney Hatch Centenary

Friern Hospital, formerly known as Colney Hatch Asylum, celebrated its centenary on October 27. In 1847 a committee was appointed by the Middlesex Justices of the Peace to find a suitable site for a building to accommodate 1,000 patients. In May, 1849, the Prince Consort laid the foundation stone, and the Queen subscribed £100 to open the "Victoria Fund" to assist those discharged as cured. This fund was merged later with the Queen Adelaide Fund. When the building was ready for occupation in October, 1850, it was described as being "unrivalled as a lunatic asylum, unique in size, elevation, and accommodation in this country or perhaps any other." The cost amounted to £138,000, to which was added the cost of equipment, a further £110,000. At that time the treatment of mental troubles was primitive. The first thing that happened when a patient was brought to Colney Hatch was the removal of strait-jackets and other restraints. The only "seclusion" practised was the confinement for their own safety of patients who became violent; and even the padded cells had half-doors to reduce actual seclusion to a minimum. By the third year there were 1,250 patients at Colney Hatch. During 1852, 17 patients escaped, all of whom were traced and brought back. Within five years it had become necessary to raise the accommodation to over 2,000. Later, additional wards were erected apart from the main building, and when these were destroyed in 1903 by a fire, in which 51 women lost their lives, they were replaced by brick villas. These in turn suffered very severely from enemy action in the second world war. More recently, new admission wards and a nurses' home have been erected. To-day there is accommodation for some 2,500 patients and 800 staff.

London Hospital Dinner

The London Hospital Old Students' Dinner was held on October 19 at the Trocadero, with Sir James Walton in the chair. The guests included the regius professors of medicine of the Universities of Oxford and Cambridge, the Directors-General of the Royal Navy and the Army Medical Services, Sir John Charles, Sir Gordon Covell, and Dr. F. M. R. Walshe, who earlier in the day had delivered the Schorstein Lecture at the London Hospital. In proposing the toast of the London Hospital, the chairman referred to the guests, the activities of the year, and the changes that had occurred in medicine in his time, concluding with wise counsel for the retired and those near the retiring age. Sir Henry Tidy proposed the health of the chairman.

An Early Radiologist

A delightful address was given from the chair of the British Institute of Radiology by Dr. R. Fawcitt, its new president, on October 19. It was a description of the life of a country doctor in Cumberland who combined with general practice the work of a radiologist. Dr. Fawcitt inherited his practice from his father, who carried on his work in the fells in a gig, on a bicycle, or on foot, and only in the last few months of his life—he died in 1913—would look at a motor-car. Most of the early radiologists, said Dr. Fawcitt, started life as general practitioners. His own interest in the subject dated from 1910. Many of them had little training in radiology at all. In the early days some of these practitioners got the D.M.R.E. without any examination. It was sometimes said that they came in by the back door. But it was not the back door nor even the side door by which they entered radiology, it was the front door, because their best equipment was a general knowledge of medicine and surgery, which made them consultants in the truest sense of the word when they had acquired a reputation in the specialty of their choice. The country doctor, said Dr. Fawcitt, was perhaps less likely than others to forget that every patient was an individual. He had sometimes been told in his radiological department that a "chest" was coming at ten o'clock or an "arm" at ten-thirty, and he always inquired whether the chest was coming by itself or the arm did not belong to somebody. Those who chose radiology, he said, had chosen the most exacting specialty in the profession. He spoke of the need for the country doctor to keep himself up to date. "When the doctor ceases to read journals and books of reference something is wrong; either he is hopelessly overworked or he is a sick man. It is time for him to slow down or change his occupation."

Guide to London Hospitals

The King Edward's Hospital Fund for London has prepared an excellent map showing the hospitals and convalescent homes in the Metropolitan Police District. It is on a large scale (1 in. to the mile), and marks the hospitals by different symbols to show whether they are teaching or non-teaching hospitals, what cases they specialize in, and in which hospital board area they are situated. Clearly set out cross-indexes make it easy to find any hospital on the map. The map and indexes, which are bound together, are obtainable for 15s., post free, from the King Edward's Hospital Fund, 10, Old Jewry, London, E.C.2.

Occupational Diseases

The Ministry of National Insurance has produced a booklet, *Notes on the Diagnosis of Occupational Diseases* (H.M.S.O., 1s. 6d.), for the guidance of medical practitioners who are asked by the Ministry to examine and report on claimants for benefits under the Industrial Injuries Acts for prescribed diseases. The booklet gives guidance on the diagnosis of the commoner diseases, symptoms of poisoning, and other disorders met with in industry.

Gift to R.S.M. for Library

At the first meeting, on October 17, of the council of the Royal Society of Medicine for the session 1950–1, with Lord Webb-Johnson, president, in the chair, Sir Henry Dale, O.M., F.R.S., immediate past president of the Society and chairman of the trustees of the Wellcome Foundation, submitted an offer of £80,000 by the Foundation to the Royal Society of Medicine for the purpose of establishing within the Society a medical research library bearing the name of Wellcome which shall be effectively part of the library of the Society. The gift, with the conditions attached, was accepted with enthusiasm and gratitude, and the following resolution was passed:

The council of the Royal Society of Medicine wish to express their deep gratitude to the Wellcome Trustees for their offer of a gift of £80,000 for the purpose of adding to the Society's house an additional library to be known as the Wellcome Library. The council are gratified and proud to add the distinguished name of Sir Henry Wellcome to those memorialized in the Society's house. The council accept the gift, with all the conditions attached, with great relief as well as gratitude, for the need of this extension of their resources has been clear to them for some years and is now a matter of great urgency.

Postgraduate Travelling Fellowships

The British Postgraduate Medical Federation (University of London) is offering a limited number of postgraduate travelling fellowships, tenable for one year, to registered medical practitioners training as specialists in one of the preclinical or clinical branches of medicine or surgery at one of the medical schools or teaching hospitals and postgraduate institutes of the University of London. Further information about these Fellowships will be found in the advertisement columns.

Gift to Ophthalmological Laboratory

The National Council to Combat Blindness, an American charitable organization whose purpose is to finance and stimulate ophthalmological research, has presented a Beckman spectrophotometer to the Nuffield Laboratory of Ophthalmology at Oxford.

"Journal of Neuropathology and Experimental Neurology"

Dr. Joseph H. Globus, 960, Park Avenue, New York, 28, N.Y., has been appointed chief editor in place of Dr. George B. Hassin, who has resigned. Dr. Armando Feraro and Dr. Arthur Weil have been appointed associate and assistant editors respectively, and it is intended to widen the advisory board by including representatives of more research centres, both in the U.S.A. and abroad.

COMING EVENTS

Bradshaw Lecture

The Bradshaw Lecture will be delivered by Dr. E. R. Cullinan, F.R.C.P., before the Royal College of Physicians of London (Pall Mall East, London, S.W.) on Thursday, November 16, at 5 p.m. His subject is "The Clinical Interpretation of Jaundice."

Leeuwenhoek Lecture

Sir Paul Fildes, F.R.S., will deliver the Leeuwenhoek Lecture before the Royal Society (Burlington House, Piccadilly, London, W.) on Thursday, November 9, at 4.30 p.m. His subject is "The Development of Microbiology."

Empire Rheumatism Council

The Empire Rheumatism Council has arranged an autumn week-end postgraduate course to be held at the Apothecaries' Hall, Blackfriars Lane, Queen Victoria Street, London, E.C., on Friday, Saturday, and Sunday, November 17, 18, and 19, with the following programme: November 17, 4.30 p.m., Dr. W. S. C. Copeman, "Fibrositis"; 5.30 p.m., Dr. Oswald Savage, "Cortisone and A.C.T.H. in the Rheumatic Diseases." November 18, 10 a.m., Dr. E. G. L. Bywaters, "Juvenile Rheumatism"; 11.15 a.m., Dr. G. D. Kersley, "Gout"; 2 p.m., Dr. H. J. Gibson, "Pathology of the Rheumatic Diseases"; 3 p.m., Dr. H. F. West, "Rheumatoid Arthritis"; 4.30 p.m., Dr. F. Dudley Hart, "Ankylosing Spondylitis." November 19, 10 a.m., Dr. H. A. Burt, "The Aims of Physical Medicine in the Treatment of Rheumatism"; 11.15 a.m., Mr. W. D. Coltart, "Orthopaedic Aspects of the Rheumatic Diseases." The fee for the course is £2 2s., and entries (limited to 100) must reach the general secretary of the council, Tavistock House North, Tavistock Square, London, W.C.1, at least one week before the course opens.

Kettle Memorial Lecture

Professor L. P. Garrod will deliver the Kettle Memorial Lecture on "The Reactions of Bacteria to Chemotherapeutic Agents" in the Anatomy Lecture Theatre, St. Bartholomew's Hospital Medical College, Charterhouse Square, London, E.C., on Wednesday, November 22, at 5 p.m. Medical practitioners and medical undergraduates are invited to attend the lecture.

Leeds School of Medicine

The 60th annual dinner of past and present men students of the Leeds School of Medicine will be held at the Great Northern Hotel, Leeds, on Friday, November 24, at 7 for 7.30 p.m. All graduates of the school will receive official notification of the dinner, with information regarding tickets, at the beginning of November.

SOCIETIES AND LECTURES

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

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—October 30, 5 p.m., *"Pathological Classification of Cerebral Tumours in Children,"* by Dr. M. Bodian.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—October 30, 5.30 p.m., *"Chiasmal Arachnoiditis,"* by Mr. A. J. B. Goldsmith.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 30, 3.45 p.m., *"Tissue Spaces and Synovial Sheaths of the Hand,"* by Professor John Kirk.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., October 31, 5.30 p.m., *"The Nutritional Requirements of Bacteria,"* by Sir Paul Fildes, Sc.D., F.R.S.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—October 31, 5 p.m., *"Abnormalities of the Cutaneous Circulation in the Lower Limb,"* by Mr. A. K. Monro.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C.—October 31, 5 p.m., *"Aetiology, Pathology, and Symptoms of Benign Enlargement of the Prostate,"* by Mr. H. K. Vernon.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—October 31, 3.45 p.m., *"Kidneys and Bladder,"* by Professor T. Nicol.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—October 31, 4 p.m., *"Contact Lenses,"* by Mr. C. G. Kay Sharp; 5 p.m., *"Genetics in Ophthalmology,"* by Professor Arnold Sorsby.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—October 31, 5.15 p.m., *"Some Recent Advances in the Physiology of Vision,"* by Professor Hamilton Hartridge, F.R.S.

Wednesday

EDINBURGH CLINICAL CLUB.—At Industrial Rehabilitation Unit (West Granton Road), Edinburgh, November 1, 3.30 p.m., clinical meeting by Dr. Hugh Miller.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—November 1, 5.30 p.m., *"Radiotherapy and Diseases of the Cornea,"* by Dr. M. Lederman.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C.—November 1, (1) 3.30 p.m., demonstration of endoscopic instruments by Mr. A. R. C. Higham; (2) 5 p.m., *"A Survey of the Different Methods of Treatment of Benign Enlargement of the Prostate,"* by Mr. R. Ogier Ward.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W. C.—November 1, 5 p.m., *"Frederick William Hewitt,"* Frederick Hewitt Lecture by Dr. George Edwards.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 1, 4 p.m., *"Clinical Ophthalmology"* (Revision), by Mr. R. A. Burn and Mr. R. P. Crick; 5.30 p.m., *"Ophthalmic Neurology,"* by Mr. L. H. Savin.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 1, 3.30 p.m., *"The Contribution of the Blind to the Community,"* by Mr. W. G. Askew.

SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS.—At Chemical Society, Burlington House, Piccadilly, London, W., November 1, 7 p.m., *"Chemical Determination of Magnesium in Cast Iron,"* by Messrs. W. Westwood and R. Presser; *"The Determination of Sodium in Aluminium and its Alloys by Vacuum Distillation,"* by Messrs. W. McCamley, T. E. L. Scott, and R. Smart; *"The Determination of Lead Oxide in the Presence of Lead,"* by Mr. R. M. Black.

Thursday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 2, 5.30 p.m., *"Tissue Defences in the Early Stages of Infection,"* by Dr. A. A. Miles.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, November 2, 5 p.m., *"The Place of Chemotherapy in the Treatment of Pulmonary Tuberculosis,"* by Dr. C. W. Clayson.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 2, 5 p.m., *"Bullous Eruptions,"* by Dr. H. J. Wallace.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 2, 3 p.m., *"The Nature of the Electroencephalogram,"* by Dr. Denis Hill.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 2, (1) 3 p.m., ward round by Mr. H. G. Hanley; (2) 5 p.m., *"Malignant Disease of the Prostate,"* by Mr. J. D. Fergusson.

LONDON UNIVERSITY.—At Royal Society of Medicine, 1, Wimpole Street, London, W., November 2, 5 p.m., *"The Development and the Present Use of Bronchospirometry,"* Semon Lecture by Dr. Paul Frenckner (Stockholm).

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 2, 5.30 p.m., *"Operative Surgery,"* by Miss J. M. Dollar.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 2, 4.30 p.m., lecture-demonstration on neurology by Dr. A. Feiling.

Friday

LONDON UNIVERSITY.—At University College Hospital Medical School, University Street, London, W.C., November 3, 5 p.m., *"The Circulation in Pregnancy,"* by Professor R. J. Kellar (Edinburgh).

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—November 3, 5 p.m., clinical neurological demonstration by Dr. Redvers Ironside.

●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—November 3, 12 noon, *"Tumours in the Pouch of Douglas,"* by Mr. R. B. K. Rickford; 3 p.m., *"Controversial Procedures in Obstetric Practice,"* by Mr. D. Fyfe Anderson; 5 p.m., *"Any Questions?"* Mr. J. E. Stacy (chairman), Dr. G. Gordon Lennon, Dr. D. Fyfe Anderson, Mr. W. J. H. M. Beattie, and Mr. J. V. O'Sullivan.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 3, 3.45 p.m., *"The Application of Biochemistry to Clinical Problems,"* by Dr. N. Martin.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—November 3, 8 p.m., *"Headache,"* dissertation by Mr. J. R. A. Harvey.

ROYAL SANITARY INSTITUTE.—At Council Chamber, Town Hall, Leicester, November 3, 10 a.m., Leicester Sessional Meeting. Papers: *"The Development of Main Drainage in Leicester,"* by Mr. H. Bird, A.M.I.Mun.E.; *"Current Problems in Tuberculosis,"* by Dr. J. Cuthbert.

Saturday

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—November 4, 11 a.m., *"A New Form of Surgical Treatment for Ménière's Disease,"* by Dr. Paul Frenckner.

●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—November 4, 9.45 a.m., *"The Long First Stage,"* by Dr. Gladys Hill; 11.30 a.m., *"Vaginal Hysterectomy,"* by Dr. G. Gordon Lennon.

APPOINTMENTS

LIVERPOOL REGIONAL HOSPITAL BOARD.—The following senior medical staff appointments are announced: *Consultant Ophthalmologist to Sefton General Hospital*, D. A. Barton, M.B., Ch.B., D.O.M.S. *Consultant Otorhinolaryngologist to Children's Hospital, Birkenhead*, G. A. Moulden, M.B., Ch.B., D.L.O. *Whole-time Consultant Radiotherapist to Liverpool Radium Institute*, M. S. Milln, M.D., D.M.R.T. *Consultant Obstetrician and Gynaecologist to hospitals in Warrington*, G. Millington, M.B., Ch.B., M.R.C.O.G. *Whole-time Consultant Physician to Walton Hospital*, C. J. Williams, M.D., M.R.C.P. *Consultant Paediatrician to Hospitals in Warrington area*, H. Angelman, M.D., M.R.C.P., D.C.H. *Tuberculosis Medical Officer (whole-time) for South and Central Liverpool areas*, S. Keidan, M.B., Ch.B., C.P.H. *Assistant Ophthalmologist to Bootle General Hospital*, D. Black, M.B., Ch.B., B.A.O., D.O.M.S. *Assistant Radiologist (whole-time) for North Liverpool area*, J. Winter, M.B., Ch.B., D.M.R.D., M.Rad. *Assistant Radiologist (whole-time) to Warrington and St. Helens areas*, A. M. Frazer, M.R.C.S., L.R.C.P., D.M.R.D., M.Rad.

O'BRIEN, GERALD, M.B., Ch.B., D.P.H., Medical Officer of Health and School Medical Officer, County Borough of St. Helens.

WALLACE, E. J. GORDON, M.B., Ch.B., D.P.H., Medical Officer of Health, Portland, Dorset. (In addition to appointments already held.)

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Lewis.—On October 9, 1950, to Evelyn R. Lewis, M.B., Ch.B., wife of Charles L. Lewis, M.B., Ch.B., D.M.R.T., a daughter.

Mansour.—On October 12, 1950, at Liverpool Maternity Hospital, to Enid Eileen (formerly Huston), wife of Dr. Joseph Mansour, a daughter.

Webster.—On October 13, 1950, at the Central Middlesex Hospital, London, N.W., to Jean M. Webster (formerly Gilbert), M.B., B.S., wife of Mr. T. J. Webster, B.Sc., A.R.I.C., a daughter—Clare.

Wright.—On September 29, 1950, at Lincoln, to Margaret, wife of Dr. Trevor Wright, a daughter.

DEATHS

Bainbridge.—On October 10, 1950, at Sedbro House, Brough, Westmorland, Isaac Bainbridge, M.D.

Caird.—On October 12, 1950, at 25 Musters Road, West Bridgford, Nottingham, Karl Francis Caird, M.B., F.R.C.S.Ed.

Davison.—On October 11, 1950, at 1, Arthington Avenue, Harrogate, Robert Collinson Davison, M.B., B.S.

Foggo.—On October 6, 1950, at Pinelands, Capetown, South Africa, Cecil Gordon Foggo, L.R.C.P.&S.Ed., aged 82.

Goldmann.—On October 17, 1950, Arthur Goldmann, M.D., of London, N.W., aged 77.

Greig.—On October 18, 1950, at Kensington, London, Janet Lindsay Greig, M.B., of Melbourne, Australia.

Liston.—On October 18, 1950, at Garramore, Morar, Inverness-shire, William Glen Liston, C.I.E., M.D., F.R.C.P.Ed., F.R.S.Ed., Lieutenant-Colonel, I.M.S., retired, aged 78.

Newman.—On October 15, 1950, at his home, 34, Eagle Lane, Snaresbrook, London, E., Edmund James Newman, M.R.C.S., L.R.C.P.

Robertson.—On October 14, 1950, at Kenilworth Lodge, Clarendon Road, Southsea, Hants, Claude Robertson, M.B., Ch.B.

Wolfsohn.—On October 2, 1950, at Hampstead General Hospital, Else Wolfsohn, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of 49, Belsize Park Gardens, London, N.W.

Any Questions?

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

Vaccination

Q.—*My daughter, who is 2 years old, has not been vaccinated. If she is done now, is she likely to have a more severe reaction than, say, at 6 months of age?*

A.—While primary vaccination is usually recommended at the age of 4 to 6 months, when any passive immunity derived from the mother will have disappeared, there is no likelihood that a child vaccinated at the age of 2 years will have a more severe reaction than would have occurred at 6 months. The multiple pressure technique should be used. In many countries primary vaccination is done just before school entry. The very small risk of post-vaccinal encephalitis occurs mostly with school-children and adolescents.

Immunization and Poliomyelitis

Q.—*Is there any evidence that T.A.F. immunizing agent is less likely to precipitate paralysis in a child suffering from a subclinical attack of poliomyelitis than A.P.T.?*

A.—There is probably no evidence that immunization with T.A.F. is less likely to be followed by paralysis than is the case with A.P.T., since T.A.F. is not used on any large scale for the immunization of young children. The data produced in this country and in Australia indicate that the combined diphtheria-pertussis vaccine and A.P.T., both of them alum-containing reagents, have been associated with paralysis in poliomyelitis, whereas in Canada, where formol toxoid (F.T.) only is used, no evidence of this phenomenon has so far been found. It is only fair to say, however, that in many areas in Britain no association between poliomyelitis and injections of A.P.T. has been detected by analysis of immunization records. On the other hand, paralysis following inoculation of other reagents, such as penicillin, has occasionally been reported, although it is difficult to say what significance to attach to these rare happenings.

The medical officer of health in any area must decide in what circumstances he should cease immunization against diphtheria, or modify the procedure, in order to avoid any added risk of paralytic poliomyelitis. Such expedients as avoiding intramuscular injections, immunizing only infants under 1 year of age, and the use of F.T. or T.A.F. have all been recommended. As an alternative to A.P.T. for large-scale immunization, F.T. would probably be preferable to T.A.F., but, again, three instead of two inoculations are required. This procedure should not create any administrative difficulties where children are being inoculated at child-welfare clinics.

Teething

Q.—*Can any infant ailments, beyond local reaction, be justly ascribed to "teething"?*

A.—Teething may be a physiological process, but, as the late Sir Frederic Still used to remark, so is labour, and yet it may be painful and associated with various disorders. The pain of teething may lead to restlessness and sleeplessness, and possibly, in the child otherwise predisposed—potentially epileptic (?); rickety, with low blood calcium (?)—to convulsions. The "local reaction" resulting in a stomatitis may spread and result in a pharyngitis, otitis media, cervical adenitis, bronchitis, and even pneumonia. Absorption of toxins may result in a parenteral "diarrhoea and vomiting" disturbance. A rash of the lichen urticaria type may be attributed to the same cause. The pain and tenderness also produce a dislike for food and therefore to loss of appetite and weight. The healthy baby is much less likely to be upset by teething than the weakly infant, and it is difficult therefore to sort out which ailments are directly

attributable to teething and which are due to associated conditions at the teething age when feeding changes are in progress. Sore buttocks, for example, may occur at this time, and it is almost impossible to say whether this can be "justly ascribed" to teething or not.

The Vegetable Marrow

Q.—*My wife and I have independently noticed that our nights have been disturbed after eating vegetable marrow for supper. Is marrow known to contain a diuretic principle?*

A.—While there is no reference to the vegetable marrow, *Cucurbita ovifera*, as containing a diuretic principle, other members of the *Cucurbitaceae* are said to contain one. The white gourd melon and the bottle gourd are diuretic according to K. M. Nadkarni's *Indian Materia Medica* (Bombay, 1927), and the *United States Dispensatory* (1943) says that bottle gourd is a native remedy for dropsy in the Sandwich Islands.

Vesical Calculus

Q.—*A male patient has recurrent attacks of backache, sometimes radiating to the legs. X-ray shows a stone, the size of a lentil, at the neck of the bladder. Is surgical removal of the stone advised?*

A.—It appears probable that the pain is due to the calculus impacted at the vesical neck. There should be no difficulty about removing it by perurethral methods through a cystourethroscope; it can either be withdrawn or pushed back into the bladder and crushed. These are surgical measures, of course, but it is unlikely that without some such treatment the stone can be got rid of, although there is always a chance of spontaneous expulsion. It certainly should not be left where it is, otherwise a whole host of troubles, such as chronic prostatitis, which may be very serious, are likely to result.

Dangers of Detergents

Q.—(*a*) *Have modern detergents any tendency to produce dermatitis of the hands?* (*b*) *Are they harmful to the bacterial flora of a domestic septic tank?* (*c*) *Do they help prevent the soakaway pit of a domestic sewage disposal system from "greasing up"?*

A.—(*a*) Most modern detergents even when used in the strength recommended by the makers are alkaline, though less so than soaps and household powders. They are therefore capable of producing a traumatic dermatitis as a result of damage to the natural fatty and keratin protection of the skin surface. This may be avoided by the subsequent use of emollients. Dermatitis from specific sensitization may arise, but is rare.

(*b*) The use of detergents has created new problems in sewage purification. Research on this subject is at present going on in various parts of the country, but the results are as yet inconclusive. This is to some extent because detergents vary quite widely in their composition, and conclusions which are valid for one do not necessarily apply to the others. The results so far obtained by experiment would seem to show that detergents are not deleterious to a sewage purification plant in the quantities at present used, and it is probable that this conclusion applies also to domestic septic tanks.

(*c*) The tendency of detergents will be to prevent the greasing up of the soakaway pit, but we doubt if the quantities normally used will in practice make any appreciable difference.

"Gammexane"

Q.—*What are the symptoms and signs of "gammexane" poisoning? Is it possible that effects noticed after the use of crude commercial powder, which contains impurities with a markedly unpleasant smell, are due to these impurities?*

A.—Gammexane is the trade name for a preparation containing as its main ingredient the gamma isomer of hexachlorcyclo-hexane, sometimes called benzene hexachloride.

There are no reports of accidental poisoning in man, so that the symptoms to be described are those found in experimental animals. Cameron and Burgess (unpublished) describe the following symptoms in guinea-pigs and rabbits after a single poisonous dose given by mouth: "Increased respiration, restlessness, increased micturition, intermittent spasms, salivation, grinding of the teeth, backward movements, loss of balance, head retraction, and convulsions (at first intermittent and then sustained with limbs outstretched), ending in collapse and death. In large single doses the gamma isomer causes death from functional disturbance of the central nervous system, especially of the respiratory centre, and this often results in cardiac failure and lung oedema." In chronic poisoning the animals exhibit constant muscular tremors culminating in convulsions of increasing severity until death. The fur of white rats often becomes markedly discoloured. There are no striking pathological changes in chronically poisoned animals.

The question mentions "effects" (presumably on man), but does not state their nature. The impurities in the commercial preparations are responsible for the smell and also for the unpleasant taint given to food by some preparations of hexachlor-cyclo-hexane. In experimental animals the symptoms produced by feeding commercial preparations or a mixture of the pure isomers are similar, so that there is no reason for supposing that these impurities have any special toxic properties.

NOTES AND COMMENTS

Thrombophlebitis Migrans.—Dr. JOHN GIBBENS (London) writes: As a postscript to your answer to the question on thrombophlebitis migrans in "Any Questions?" (October 14, p. 901), I think your questioner ought to be told that this disease is often associated with carcinoma. I have personally seen three such cases, the first two associated with carcinoma of the stomach, the third with carcinoma of the head of the pancreas. The first case was unsuspected during life, and it was only when a second case also proved to have carcinoma of the stomach that I made a search through the literature, to find that there are plenty of cases reported with this curious association. With the third case I guessed that the patient had carcinoma, but x rays of the stomach showed nothing, though there could be no doubt about the malignant cachexia. The carcinoma was discovered post mortem. After this experience I should certainly be in favour of a thorough investigation for latent carcinoma.

Corrections

In the item of "Medical News" entitled "Visitor to Copenhagen" (October 21, p. 956) we stated that the anaesthesiology centre in Copenhagen has until now been in charge of anaesthetists from the U.S.A. This was incorrect, for in fact Dr. T. C. Gray, of Liverpool, is at the centre now, and will remain in Copenhagen for two months.

Dr. C. C. UNGLEY (Newcastle-upon-Tyne) writes: Your excellent leading article (October 21, p. 933) on the absorption of vitamin B_{12} is incorrect in one particular. It is true that Ternberg and Eakin (*J. Amer. chem. Soc.*, 1949, **71**, 3858) showed that a constituent of normal gastric juice combines with vitamin B_{12} to render it microbiologically unavailable, and that Cuthbertson and I have confirmed this. On the other hand, we have not assumed—neither did Ternberg and Eakin—that the vitamin B_{12}-combining factor was identical with Castle's intrinsic factor. Indeed there is already some evidence to the contrary (Prusoff, *Amer. Chem. Soc.*, 1950, 118th meeting). I entirely agree that caution is needed in interpreting complex therapeutic experiments. I have already mentioned some of the difficulties involved in judging the absorption of vitamin B_{12} from the oral-dose/parenteral-dose ratio. An additional difficulty is the variable excretion of vitamin B_{12} in the urine, which is likely to be greater after parenteral than after oral administration.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London*.

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 4 1950

RARE FORMS OF PAROXYSMAL TRIGEMINAL NEURALGIA, AND THEIR RELATION TO DISSEMINATED SCLEROSIS

BY

WILFRED HARRIS, M.D.

Consulting Physician, St. Mary's and Maida Vale Hospitals

Fifteen years ago I published in this *Journal* (Harris, 1935) an account of three cases of "Paroxysmal Neuralgic Tic as a Sequel of Trigeminal Neuritis," which were similar in their mode of onset and course but of very doubtful origin. I have since seen two similar cases, but as one of them became complicated later by the development of disseminated sclerosis the question arises whether this disease can have been the essential cause in the remainder or whether this complication was merely a coincidence. The fact that disseminated sclerosis is so frequently a complication of the common form of paroxysmal trigeminal neuralgia, or trigeminal tic as I prefer to call it, is an important reason for reconsidering the possibility of this disease being the essential cause in the five cases I have met with in which a paroxysmal facial neuralgia has later developed, perhaps several years after a complete temporary numbness with anaesthesia of the whole of one side of the face and tongue, usually with loss of the sense of taste on that side of the tongue. These five cases were seen in 1914, 1927, 1935, 1942, and 1945, and their rarity will be apparent when their number is compared with the total of 1,622 cases of trigeminal tic that I have met with in private practice alone, excluding hospital cases whose notes are unavailable. Of these, 64 were complicated by disseminated sclerosis, or nearly 4%.

In 1940 I published an analysis of 1,433 of my cases, including 377 hospital cases (Harris, 1940). Since then I have seen 566 fresh cases, the two series consisting of 1,318 women and 681 men, or very nearly twice as many women as men. These figures should be large enough to prove the much greater liability of the female sex to trigeminal tic.

Three Earlier Cases Recalled

The three cases of trigeminal neuritis which I described in 1935 may be briefly recalled regarding their essential features. They varied a good deal in their ages—two men, aged 65 and 75, and a woman of 42. In none of these three cases was there any symptom of disseminated sclerosis, though this was specially looked for. The first symptom in all was the sudden onset of numbness of the whole of one side of the face, including the tongue, with anaesthesia so complete that the cheek or lip was bitten; in one case loss of taste on that side was also noted. This numbness lasted in the two men, Cases 1 and 3, for six weeks and six months, followed after three years and seven years respectively by the onset of violent pain in the eye and cheek, in one of the men spreading into the lower jaw. The pain was described as "a jumping pain, as quick as a flash of lightning—feels like a flaring fire," the pain gradually increasing in intensity until I saw them, when there was no trace of anaesthesia remaining. Case 1, whom I injected in 1914, required a second injection in 1919, and then remained free of all pain, with complete numbness and loss of taste on that side, until his death in 1930, aged 81. Case 3 was injected in March, 1935, and was still free of all pain, with numbness unaltered, when last heard from in August, 1939, aged 80. Case 2, the woman aged 42, was seen in 1932, when her trigeminal numbness gradually faded after lasting four years, and was then replaced by violent trigeminal tic. She was completely cured by Gasserian injection in August, 1932. She lives in Kenya, and to-day is still quite fit and well, 18 years afterwards, and has no sign of disseminated sclerosis, as her doctor brother wrote in August, 1950.

Later Cases

The two cases I have since met with of this curious type were both in women.

Case 4.—A married woman aged 47, whom I saw in March, 1942, gave the history that in 1916, when she was 21, she lost her husband and two brothers in the first world war, and almost at once "began to sleep on her feet," and would walk home in sleep from the village to her home. Within a few months sudden numbness developed over the whole of the right half of the face and tongue, with complete loss of taste on that side. This state lasted for a year, the numbness then passing off. Seven years later a sudden onset of violent neuralgia attacked the whole of the right side of the face "like needles, or a white-hot iron applied to the face." This varied at first so that she might be free for a year, but gradually the pain recurred more frequently until I saw her in 1942. For the previous six or seven years she had had increasing ataxia of the right arm and leg, with bladder weakness, which examination showed to be undoubtedly due to disseminated sclerosis. This disease therefore showed no clinical signs until 19 years after the commencement of the numbness of the face and 11 years after the onset of the trigeminal tic. I injected her right Gasserian ganglion the same day, producing total trigeminal anaesthesia, which was unchanged five days later, with cessation of the pain. A follow-up letter brought the reply, July 3, 1950: "No pain in the face; right limbs more useless; cannot get about."

Case 5.—An unmarried woman aged 62 saw me in September, 1945, on account of violent paroxysmal left facial neuralgia for the past three months, occurring frequently daily and mainly affecting the left lower jaw; she could scarcely eat or talk, or wash her face. She had been edentulous for the past 32 years. Twelve years previously, when aged 50, the whole

of the left side of her face became numbed one day in the summer, so that she could not feel her sister slap her face. This condition lasted for six weeks, and rather more than a year later trigeminal tic started in the left lower jaw and tongue, "like a needle in my face." This neuralgia lasted for two months, and then more or less disappeared, but not completely, for 11 years, when the severe type of tic returned. There was no anaesthesia of the face when I saw her, nor any sign of disseminated sclerosis. Gasserian injection, as in the previous four cases, completely cured her, producing total anaesthesia of the whole of the left trigeminal area. A follow-up letter in June, 1950, brought the reply that she was perfectly well, the numbness remained unaltered, and her limbs were strong, with no unsteadiness. In her case, therefore, disseminated sclerosis can be excluded.

Of these five cases of what I have called trigeminal neuritis one developed disseminated sclerosis 19 years after the appearance of the facial numbness and 11 years after the onset of the trigeminal tic. None of the remaining four cases have shown any sign of spinal disease, and in all of them numbness and anaesthesia of the face on one side was the initial symptom, and lasted a variable time from six weeks to four years, when trigeminal tic appeared after an interval varying from a few weeks to seven years. In every case the trigeminal tic was cured by Gasserian alcohol injection, just as in the common variety of trigeminal neuralgia or in those complicated by disseminated sclerosis.

The Question of Latent Disseminated Sclerosis

It is not uncommon for numbness and anaesthesia of one side of the face and tongue, including loss of taste, to develop as a transient phenomenon in the early stages of disseminated sclerosis (see Cases IV, V, VI in my paper: Harris, 1935), lasting a few weeks or even months, but none of these in my experience has afterwards developed the complication of trigeminal neuralgia; Cases IV and VI died in 1934 and 1947, and neither developed facial neuralgia. It is especially interesting that loss of taste occurred in these cases in addition to loss of pain and tactile sensation, the latter indicating a lesion of the nerve root, which has tactile and pressure fibres running to the principal sensory nucleus and the pain and temperature fibres which turn downwards into the spinal root of the fifth nerve. Such a lesion has been demonstrated post mortem in cases of disseminated sclerosis by Oppenheim (1911) and by Parker (1928), though clinical tests in their cases failed to demonstrate anaesthesia.

The path of the fibres carrying taste sensation is usually now agreed to be via the chorda tympani and the great superficial petrosal nerves, for the tongue and palate respectively, to the geniculate ganglion, and thence by the pars intermedia to join the glosso-pharyngeal fibres in the gustatory nucleus. Yet that this is not the whole story is proved by the demonstration of loss of taste in many clinical cases of fifth-nerve paralysis by competent observers (Gowers *et al.*, 1893), and I have been able to demonstrate immediate loss of taste on the front half of the tongue in dozens of cases of alcohol injection at the foramen ovale (Harris, 1926). Some of these recover the sense of taste after a few weeks or earlier; in others, even with total anaesthesia of the tongue, there may be no loss of taste whatever; and in others, again, in whom there is total and permanent anaesthesia from ganglion injection, the loss of taste may be permanent, as I have seen several times—in one case 24 years after the Gasserian injection.

That this gustatory loss is not produced by spread of the alcohol from the foramen ovale to the great superficial petrosal nerve and geniculate ganglion is shown by the loss of taste noticed by the patients themselves in several cases of the spontaneous trigeminal anaesthesia met with in cases of disseminated sclerosis. For further discussion on this difficult subject of the gustatory pathway, see Harris (1921).

The close similarity in the attacks of unilateral numbness and anaesthesia of the face and tongue, with loss of taste, in cases which subsequently develop trigeminal tic (trigeminal neuritis), and other cases with precisely similar facial anaesthesia with loss of taste which may precede but usually follow the onset of clinical signs of disseminated sclerosis, but which may not develop trigeminal tic subsequently, is strikingly suggestive of a similar origin in both groups. In neither form is there any motor fifth palsy, and the sensory loss is very suggestive of a lesion of the trigeminal root comparable to the well-known retrobulbar ocular neuritis in disseminated sclerosis, in which the large scotomata may disappear completely in certain cases after many weeks or months, or, as the motor pareses of the limbs may do, for many months or even years.

I have met with a few cases in which the trigeminal tic developed several years before any clinical signs of disseminated sclerosis appeared. In my paper on trigeminal neuritis I described Case VI, a man of 44 who developed temporary numbness of the right half of the face and of the left leg 18 years before the onset of symptoms of spinal disease suggestive of disseminated sclerosis. No trigeminal tic appeared in his case, and the crossed anaesthesia points almost certainly to a pontine lesion at the level of the sensory nucleus of the right fifth nerve, involving part of the median fillet on that side. He died completely paralysed in 1947, never having had facial neuralgia.

Of the two fresh cases I have described in this paper, it may be suggested that in Case 4 the sclerosis was already present but latent, a view which has been put forward by more than one writer. It raises the question whether in the remaining four of my cases disseminated sclerosis might be lying latent and originated the initial facial numbness and the subsequent neuralgia, in spite of the absence of any signs of spinal disease. I think it must be agreed that the histories of these four cases completely negative this supposition:

Case 1.—This man developed, at the age of 57, complete left facial anaesthesia lasting six weeks and followed two years later by left trigeminal tic. Final relief was given by Gasserian injection in 1919, when aged 70, and he died aged 81, having had no recurrence of pain or any sign of paralysis.

Case 2.—A woman aged 37 developed facial numbness which lasted four years, then trigeminal tic, for which she had Gasserian injection, in 1932, when aged 42. She is still quite well and strong 18 years after.

Case 3.—A man who developed right facial numbness at age 65. Trigeminal tic started seven years later, the numbness having lasted six months. Cured by Gasserian injection, aged 75. Still well and hearty five years later, aged 80.

Case 5.—A woman at the age of 50 developed left facial numbness, lasting six weeks, followed about a year later by trigeminal tic. This was cured at age 62 by Gasserian injection, in 1945. She is still (1950) perfectly well and strong, and the numbness is unaltered.

Disseminated sclerosis may surely be excluded in all these four cases. In Case 4, in which disseminated sclerosis developed 19 years after the onset of the facial numbness and 11 years after the trigeminal tic appeared, it is possible that the spinal disease may be coincidental, and that it has no connexion with the antecedent attack of trigeminal neuritis and subsequent tic.

Classification

The cases of trigeminal neuritis and other cases of neuritis and neuralgia complicating disseminated sclerosis may be divided into six groups:

1. Trigeminal neuritis, a rare form in which paroxysmal trigeminal neuralgia follows weeks, months, or years after a sudden development of temporary numbness and anaesthesia of one side of the face, with no complication of disseminated sclerosis.

2. Cases of disseminated sclerosis which develop trigeminal tic without antecedent numbness. This is the common type, of which I have met with 64 examples. Usually the spinal symptoms antedate the neuralgia, but occasionally the neuralgic tic may precede the spinal symptoms by several years.

3. Cases apparently similar to Group 1—trigeminal neuritis—but in which disseminated sclerosis develops years later, as in Case 4. Is the spinal disease merely coincidental, or is the antecedent trigeminal neuritis dependent on a latent sclerotic patch of disseminated sclerosis?

4. Cases of disseminated sclerosis in which numbness and facial anaesthesia may appear for weeks or months, with loss of taste on the same side, but no subsequent development of trigeminal tic, as in cases IV, V, and VI in my 1935 paper.

5. Cases of disseminated sclerosis in which numbness and facial anaesthesia on one side may be accompanied by numbness or paresis of the opposite arm or leg, suggestive of a lesion of the median fillet at the same time as of the sensory fifth nucleus.

6. Bilateral trigeminal tic is much commoner in proportion in cases of disseminated sclerosis than in uncomplicated cases of the neuralgia. This is suggestive of the scattered pontine patches of sclerosis being apt to irritate the spinal trigeminal roots on both sides.

The type of facial numbness, often with loss of taste, and its subsequent disappearance, appears to be identical in all these cases, and it seems highly probable that the lesion producing the numbness and facial anaesthesia is similar in all. It is probably a patch of neuritis on the root of the fifth nerve at its junction with the pons, a lesion which has been demonstrated at necropsy. This may leave the nerve fibres in an irritable state when the congestion and the anaesthesia disappear. This irritability, combined with sensory pain stimuli from the peripheral nerve branches in the jaws, may precipitate the onset of trigeminal tic (cases of trigeminal neuritis). In cases of disseminated sclerosis the sclerotic pontine patches may similarly act as an irritant to the pain fibres in the spinal root, and, aided by peripheral jaw painful stimuli, trigeminal tic may start. That the source of the stimuli is peripheral, not central, is definitely shown by the fact that in cases of trigeminal neuritis the pain does not begin until the anaesthetic block completely disappears. I have for many years maintained that in the common form of paroxysmal trigeminal neuralgia the source of the pain is in the peripheral nerve fibres in the jaws. There are many arguments to prove this thesis. (1) The anatomical distribution of the pain, and the absence of any anaesthesia or other evidence of lesion of the nerve trunks or Gasserian ganglion. (2) The frequency of cases of severe damage to a jaw by trauma, fracture, or severe dental extractions, followed shortly after by typical trigeminal tic. For example, a woman had a severe molar extraction, the dentist breaking his forceps and leaving a piece of steel in the jaw. Trigeminal tic started within three weeks. Fifteen years afterwards radiographs showed the piece of steel in the jaw. The following is perhaps a better argument: (3) The fact that an anaesthetic block by injection or nerve section instantly arrests the neuralgia, though neuralgic pain due to irritation of the fifth nerve intracranially by a basal tumour will continue in spite of posterior-nerve-root section in front of the lesion.

Anaesthesia of the Third Division

I would like to record here a curious fact that I have noticed during the 40 years or so that I have practised alcoholic trigeminal injection at the foramen ovale. It is that occasionally I have found it exceedingly difficult, and sometimes impossible, to obtain satisfactory anaesthesia of the third division, supplying the lower jaw and gum, tongue, and lower lip. In some of these cases it has been easy to obtain total anaesthesia of the ophthalmic and maxillary divisions of the Gasserian ganglion, and yet repeated attempts to inject the mandibular division may completely or partially fail, and the neuralgia may continue. Were it not that I have known this same difficulty confront six first-class neurosurgeons when operating for posterior-sensory-root resection, I might be content to ascribe my few failures to my own incompetence. One such case was operated on many years ago by the late Sir Percy Sargent and also by Mr. Wilfred Trotter, after I had failed with injection; but the neuralgia continued, and the lower lip, chin, tongue, and lower gum remained sensitive.

The following case is perhaps even more instructive:

A married woman aged 38 was seen by me in April, 1928, with the following history. In 1919, when aged 29, four teeth were extracted from the left lower jaw under a general anaesthetic, the jaw being fractured, as shown by radiographs, and the left inferior dental nerve damaged. Pain continued as a constant ache, and then sharp sudden jabs shooting along the mandible, brought on by eating or by moving the tongue or jaw—clearly a development of true trigeminal tic. Small sequestra continued to come away from the wound in the gum, and as the neuralgia continued she was injected with alcohol by the late James Collier, but no increase of the partial anaesthesia of the lip or gum was produced. She felt better afterwards, and the spasms of pain became less violent; they gradually disappeared during 1920, and she was free for 18 months, as is common in the early history of trigeminal tic. In 1922 she had a recurrence of pain for three months, and was free for six years until 1928, when I saw her. There was then very slight anaesthesia of the chin, lip, and tongue, and I injected her Gasserian ganglion through the foramen ovale in July, getting total anaesthesia of the two upper divisions but no alteration of V3, and the pain persisted. I then sent her to Mr. Hugh Cairns, at the London Hospital (he was not then Sir Hugh). He told me afterwards that at the operation he found the dural sheath adherent, and could not open the arachnoid sheath, but he divided the sensory root so far as possible. Probably the adhesions were the result of the alcohol injections. No further anaesthesia resulted, however, and the pain continued for a time, but she had a long intermission of freedom for 14 years from 1929 to 1943, when in December the neuralgia again became severe. I admitted her to Maida Vale Hospital in March, 1944, and again tried to inject the third division through the foramen ovale, by both lateral and anterior routes, but entirely failed to increase the slight anaesthesia. I then sent her to Mr. Wylie McKissock, at the Atkinson Morley Hospital. He operated through the posterior fossa, dividing the fifth root close to the pons. The upper two divisions had been totally anaesthetic since my injection in July, 1928, but no increase of the anaesthesia of the third division resulted from this last operation, and the pain continued as before when she returned to Maida Vale in September, and persisted unaltered until her death in December, 1946.

I have given the names of the surgeons, who did their best to help me, so that there may be no doubt that the operations were done with the utmost skill: but how to explain the escape of the mandibular division from its numerous medical and surgical assaults is beyond me. It is, however, a further illustration of my thesis that occasionally the mandibular nerve is extremely difficult, if not impossible, to destroy.

Medullary Thrombosis

A fairly well known and interesting syndrome is that produced by thrombosis of one of the posterior inferior cerebellar arteries. This vessel, the largest branch of the vertebral artery, which is the first branch given off from the subclavian, winds backwards round the upper part of the medulla between the vagus and spinal accessory nerves, and over the restiform body to the under surface of the cerebellum, where it divides into two branches, external and internal. The latter supplies the middle lobe of the cerebellum and the side of the medulla. Hence thrombosis of this vessel will involve the spinal descending root of the trigeminal nerve (uncrossed) and the spinothalamic tract (crossed) ascending to the thalamus, causing analgesia of the face on the same side and of the trunk and limbs on the opposite side. Paraesthesiae and pain may occur in both these areas, and occasionally the facial neuralgia may be severe and shooting in character, resembling tabetic pains. It is not affected by light touches or by movements of the face, as in eating or talking, as is the case in true trigeminal tic, nor is this form of neuralgia amenable to Gasserian injection. Vertigo and vomiting and nystagmus may be early symptoms, with incoordination of the arm and leg on the same side and unsteady gait due to the cerebellar infarction.

Pontine Thrombosis

Thrombosis higher up in the pons, above the level of the decussation of the pyramids and of the ascending sensory tracts forming the median fillet, is apt to cause hemianaesthesia of the face, limbs, and trunk on the opposite side. The following case suggests the effect of a small pontine lesion involving the trigeminal fillet more than the spino-thalamic fibres, while the main sensory fillet close by must have escaped.

Case 6.—A woman aged 43 was sent to me in January, 1944, with a history of sudden onset of pain ten years before in the left upper jaw, across the cheek, down the mandible, and into the tongue, with pain in the left hand, the left fingers being contracted. The face felt at first as if on fire, and facial neuralgia has continued at intervals ever since, though the pain in the left hand faded and disappeared after four years. The facial neuralgia continued mainly in the left cheek, jaw, and side of nose, with momentary sharp shoots in the left lower jaw many times daily and occasionally at night. Two years later the neuralgia was limited entirely to the cheek and side of nose. There was no objective sensory loss to touch or pinprick anywhere, and no motor weakness, though the left forearm jerk was slightly increased. The plantar reflexes were flexor.

This case was sent to me as trigeminal neuralgia for Gasserian injection, but as investigation showed the lesion to be intrapontine, and localized to the neighbourhood of the right median fillet, no alcohol injection was indicated. The type of pain was similar to that met with after posterior inferior cerebellar thrombosis, and differed from the pains of trigeminal tic in not being started by the movements of eating and talking or by light touches.

The neuralgic pains in these medullary lesions resemble tabetic pains somewhat closely, and the sclerotic lesions of the posterior columns and roots in tabes may be compared with the sclerotic lesions of intramedullary and intrapontine fillet thrombosis.

Paroxysmal Supraorbital Neuralgia, Spontaneous and Post-traumatic

Under this heading I do not wish to include the sinus headaches of antral and frontal infections, migrainous neuralgias, or the post-traumatic dural headaches following concussion and subdural haemorrhage.

Case 7.—A man when aged 49 received a severe blow on his right eye from a squash ball which made him "see stars" badly. About three weeks later, when driving his car, he was attacked by sudden violent pain in the right eye, and had to stop, the pain lasting an hour. There was no congestion of the eye, no lacrimation, and no vomiting. Similar attacks recurred for a few weeks until he was fitted with glasses for reading. Then he was quite free for four years, when similar intermittent attacks recurred, two or three daily, lasting about an hour, for three or four weeks. Another intermission for two years occurred until three weeks before I saw him in December, 1946. He was having much domestic worry at that time, to which he ascribed the return of the pain, although the seizures were quite sudden. Partial inner Gasserian injection, causing analgesia of the two upper trigeminal areas, cured the paroxysmal attacks, and he has been free for the last three and a half years, except for some constant aching in the right eye lately. This is possibly aggravated by heavy business work and family worry, and also by the strain of driving daily 46 miles to and from business.

The diagnosis of the cause of these sudden attacks of violent pain is difficult. They closely resemble post-traumatic ciliary neuralgia, but without the ocular congestion and lacrimation usual in that condition. The pain is referred to the eyeball rather than to the supraorbital area, and as nothing wrong can be found with the eye I class it as a post-traumatic ciliary type.

Paroxysmal Trigeminal Tic Affecting the Supraorbital Area Only

Case 8.—A man aged 54 was sent to me a year ago on account of violent neuralgia which had been recurring in spasms for the past seven weeks. His first attack had occurred 23 years ago, at the age of 31, the pain starting suddenly at the inner canthus of the left eye and shooting up over the forehead. These spasms, lasting 10 to 15 minutes, recurred at intervals for the following fortnight, and since then at intervals of four or five years. He describes the pain as being hot, "like a firework," and almost unbearable, and for seven weeks it had been worse than ever. I realized this was a true case of trigeminal tic affecting only the ophthalmic division, although it has persisted in that division until the present time, the longest period I have known this type to be limited to the first division without invading the maxillary area. Usually after three or four years or less this spasmodic neuralgia spreads to the second division, the pain running down the side of the nose and into the upper jaw and cheek to the upper lip. The patient would not agree to a Gasserian injection, and I therefore gave a local procaine-and-alcohol injection to the supraorbital notch in May, 1949. This caused only partial numbness, the nerve not having been well hit, and the spasms continued for another two weeks, then disappearing until June, 1950, when violent spasms of pain recurred as before. He again asked for a supraorbital injection rather than Gasserian, and this time I obtained total anaesthesia of the left half of the forehead, eyelid, and scalp as high as the vertex. The painful spasms, however, persisted for several days unless he kept perfectly still in bed, light touches on the left side of the face starting off the pain, and he now admitted that the left upper lip was sensitive, a touch on it starting the supraorbital pain. This proved at long last that the second division was becoming involved.

Although it is quite common for the first onset of pain in trigeminal tic to involve both the ophthalmic and second divisions of the nerve at the same time, it is rare for this type of paroxysmal neuralgia to affect the supraorbital area or the eye alone. When this is the case I have known it continue thus for three or four years, and even once for nine years, but this last case, in which the neuralgia was limited to the inner canthus of the eye and the supraorbital area for 23 years before showing signs of involvement of the second division, is unique in my experience. At the same time it should be noted that total anaesthesia of the supraorbital nerve area did little or nothing to relieve the pain, indicating that the source of the neuralgia was deeper and would require an inner Gasserian alcohol injection or a fractional section of the inner half of the sensory root to cure it.

Glossopharyngeal tic, though very much rarer than the trigeminal form, perhaps in the order of 1 to 100 cases, is now better known since I first described it (Harris, 1921). It is still often confounded with trigeminal tic or with otic or geniculate neuralgia, but its definite characteristics should be sufficient to distinguish it. The pain is usually felt on swallowing, and often runs into the ear, which may become so sensitive that the patient will leave the ear for years unwashed. Touches on the tonsil will often start the pain, which is referred to the throat and ear and to the back of the cheek in front of the ear. The painful paroxysms recall the trigeminal type, and the only cure is avulsion of the nerve.

The nerve may be irritated by a basal tumour, and trigeminal tic may also be closely simulated by intracranial pressure from an acoustic neuroma or other basal tumour, such as an intracranial aneurysm of the internal carotid artery.

Summary

Five cases of a form of trigeminal neuritis are described in which paroxysmal trigeminal tic follows at varying intervals after a period of total unilateral facial numbness.

The question whether the cases of trigeminal neuritis described are due to latent disseminated sclerosis is considered disproved.

Paroxysmal trigeminal tic occurs in a considerable proportion of cases of disseminated sclerosis, without previous numbness and anaesthesia of the face.

In many cases of disseminated sclerosis temporary numbness of one side of the face may occur, with anaesthesia and loss of taste on that side. These cases do not later develop paroxysmal trigeminal tic.

Loss of taste, either temporary or permanent, on the front of the tongue is commonly found in unilateral fifth-nerve paralysis in addition to the spontaneous cases of numbness in trigeminal neuritis and in disseminated sclerosis.

Analysis of 2,000 cases of trigeminal tic shows that this neuralgia occurs about twice as often in women as in men.

The lesion producing the numbness and anaesthesia of the face in trigeminal neuritis is probably a root neuritis of the fifth nerve close to or just inside the pons.

The frequency of trigeminal tic, unilateral and bilateral, in disseminated sclerosis is almost certainly due to local irritation of the trigeminal spinal root by the diffuse patches of sclerosis in the pons.

Rare forms of trigeminal pain due to medullary or pontine thrombotic lesions are described.

An occasional difficulty—even impossibility—in producing total anaesthesia and cure of third-division neuralgia, either by injection or by surgical root resection, is described.

Reasons are given for ascribing the origin of trigeminal tic to peripheral causes in the end-nerve filaments in the jaws.

Paroxysmal trigeminal tic of the ophthalmic division is compared with post-traumatic supraorbital pain resembling ciliary neuralgia.

References

Gowers, W. R. (1893). *Diseases of Nervous System*, 2nd ed., pp. 216, 225. London.
Harris, W. (1921). *Brain*, **44**, 565.
—— (1926). *Neuritis and Neuralgia*, p. 247. Oxford Medical Publications.
—— (1935). *British Medical Journal*, **1**, 1112.
—— (1940). *Brain*, **63**, 209.
Oppenheim, H. (1911). *Text Book of Nervous Diseases*, 5th ed., translated by A. Bruce, **1**, 337. Edinburgh.
Parker, H. L. (1928). *Brain*, **51**, 60.

PROLONGED TREATMENT OF RHEUMATOID ARTHRITIS WITH A.C.T.H. ALONE AND WITH GOLD*

BY

J. GOSLINGS, M.D.
W. HIJMANS
P. M. v. LIMPT
Department of Rheumatology

AND

HENRIËTTE A. v. GILSE
Department of Endocrinology and Diseases of Metabolism

(From the Medical Service, University Hospital, Leyden, Holland)

From the first publications of Hench *et al.* (1949) and Thorn *et al.* (1949) the following conclusions can be drawn: (1) adrenocorticotropic hormone (A.C.T.H.) has a very favourable effect on the symptoms of rheumatoid arthritis, (2) the symptoms reappear when the administration of A.C.T.H. is discontinued, and (3) with the dosage used untoward reactions appear. When, in October, 1949, a certain quantity of A.C.T.H. ("cortrophine," Organon†) was put at our disposal, we set ourselves to search for a maintenance dose which would keep the rheumatic process under control but cause no untoward reactions; and to inactivate the rheumatic process with A.C.T.H., and during its administration to begin with one of the approved medical therapies, in the hope that no relapse would then occur after discontinuation of the A.C.T.H. injections.

Here, therefore, we concern ourselves exclusively with clinical application. The theoretical bases and the pathophysiological and chemical problems of A.C.T.H. therapy have been dealt with in the comprehensive survey with extensive bibliography of Boland (1950).

Plan of Study

Three women and two men with rheumatoid arthritis, and one man with ankylosing spondylitis, were selected for treatment. The diagnosis was based on the results of the clinical data, biopsies, *x*-ray photographs, serology, and other non-specific data such as sedimentation rate (Westergren), haemoglobin, etc. In view of the fact that we were striving to find an effective treatment for rheumatoid arthritis, complete rest in bed was prescribed for all the patients for a fortnight before and after the beginning of the A.C.T.H. treatment. This was followed by a period of graded re-educative remedial exercises and mobilization. Spectacular exertions, of which some patients were already capable after a few days, were thus intentionally avoided.

During the pre-treatment period a thorough physical examination was carried out, with special documentation of the condition of the joints (ergometry, measuring, photographing, and filming of the swellings and of limitations of function). Special laboratory investigations were made of kidney function (concentration, phenol red, urea clearance), liver function (galactose-tolerance test, van den Bergh reaction, prothrombin index, cholesterol

*This research was aided by a grant from the Institute for Preventive Medicine, Leyden.

†We are much indebted to Organon, Oss (Holland), who kindly supplied us with the pituitary adrenocorticotropic hormone used in these studies.

esters, alkaline phosphatase, Hanger test, bromsulphalein test), adrenocortical function (insulin tolerance test, Robinson–Power–Kepler test, total neutral urinary 17-ketosteroids), as well as routine blood smears and counts, and electrocardiograms. There was no restriction of food, apart from a low salt content (about 2 g. NaCl a day), but the composition of the diet was noted daily. No balance studies were made, since we wanted to find the best treatment, and it seemed advisable not to interfere with an increased appetite, from which the patient might benefit.

During the treatment period the investigations were repeated at regular intervals, and at first the blood pressure was taken daily and the weight recorded weekly.

The general scheme of treatment was :

1st day: 3 × 25 mg. A.C.T.H. intramuscularly, with application of Thorn tests after the first injection.
3 days: 6 × 10 mg. A.C.T.H.
10 days: 6 × 7 mg. A.C.T.H.
2 weeks: 6 × 3 mg. A.C.T.H.
2 weeks: 6 × 2 mg. A.C.T.H.
2 weeks: 6 × 1 mg. A.C.T.H.

The dose of A.C.T.H. is expressed in mg. of an American standard preparation. The different lots used have been assayed in accordance with the Sayers test. The equivalent of 25 mg. American standard preparation contains: vasopressin and oxytocin: *lot 1*, 0.33–0.66 E ; *lot 2a*, 0.7–0.9 E ; *lot 3x*, 0.125 E ; *lot 4*, 0.35–0.70 ; prolactin, none ; thyrotropic and gonadotropic hormone, a very small amount or none.

In determining the quantity of A.C.T.H. to be injected, we followed the basic idea that, after an optimal improvement with a relatively high dosage, the condition could be stabilized with a low maintenance dose.

Sayers *et al.* (1949) and Li (1950) found that already a very short time after injection A.C.T.H. could not be detected in the blood. We therefore considered the possibility that frequent injections might give better results. The 14-day limit was chosen, as any possible relapse would almost certainly fall within this period. Diagnosis of a relapse was based on the reappearance of signs and symptoms of arthritis, in addition to a rise in sedimentation rate (E.S.R. expressed throughout as 1 hour/2 hours value).

Case 1

A woman aged 37—height, 5 ft. 4½ in. (1.64 m.); weight, 7 st. 2 lb. (45.4 kg.)—had had rheumatoid arthritis since 1942, beginning 10 days after fifth delivery. During the first few years treatment with various courses of gold therapy was successful, but a relapse occurred about six weeks after each course. A complete remission during pregnancy in 1948 lasted until three days after delivery. She was a thin, tired woman, not looking ill ; the rheumatic process was localized chiefly to the shoulders, elbows, and hands ; the mammae were atrophic ; and there were remains of a "gold" dermatitis to the right of the mouth. E.S.R. 14/32, Hb 12 g.%. During the last few years menses were irregular, with sometimes an interval of a few months.

With the A.C.T.H. dosage the articular symptoms reacted very quickly, the stiffness first, then the pain, and finally, on the third day, the swelling. On the second day the patient could comb her hair for the first time in five months ; the next day she could take off her wedding ring for the first time in four years. On the ninth day the dermatitis, which had been visible for four years, had disappeared. The increasing appetite was no less striking.

From this time improvement in her general condition was less spectacular, but progress continued during the fifth and sixth weeks (6×2 mg. A.C.T.H. per day). The E.S.R. fell to 1/3, her complaints were limited to tenderness on pressure or painfulness on motion of some proximal interphalangeal joints. Fatigue, however, still persisted. On the 39th day the dosage was decreased to 6×1 mg., and seven days later the E.S.R. was 5/12, while two days later she complained of slight pain in the right forearm, followed after another five days by measurable swelling of the second metacarpo-phalangeal joint of the right index finger. Most of these symptoms disappeared again with one day of 5×7 mg., and then daily 5×3 mg. of A.C.T.H. At the same time (72nd day) gold treatment was begun.

It is known that at the beginning of gold treatment the E.S.R. often rises and the condition of the patient may temporarily deteriorate. The A.C.T.H. was maintained at 5×3 mg. a day for seven weeks. During this period her condition did in fact grow worse, combined with objective signs in the right shoulder, the right elbow, and some proximal interphalangeal joints, but was definitely less serious than on admission. As soon as the optimal condition was reached again the A.C.T.H. dosage was gradually decreased by one injection a day, while the gold treatment was continued. The gradual decrease in the A.C.T.H. dosage seemed desirable to avoid possible symptoms of a temporary shortage of endogenous A.C.T.H.

On the 138th day A.C.T.H. was discontinued ; the patient had by then received a total of 1,960 mg. of A.C.T.H. and 1,540 mg. of gold (aurothioglucose). The gold treatment was then continued with a maintenance dose of 50 mg. once every two weeks. Fourteen weeks later the patient's condition showed a slight but clearly visible deterioration: some finger-joints were swollen again. The gain in weight was maintained (see Fig. 1). E.S.R. 10/25, Hb 12.2 g.%, menses regular, mammae containing glandular and fatty tissue, fatigue less evident.

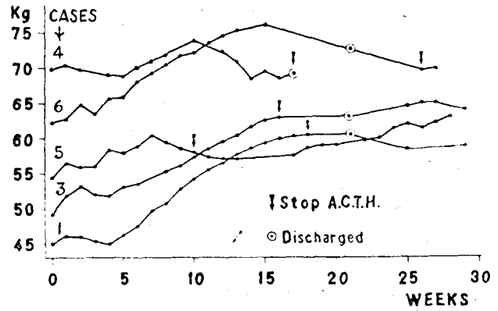


FIG. 1.—Weight records of five patients treated with A.C.T.H. The weight of the sixth was taken only once, at the beginning of the treatment, as the clinical condition did not permit movement of the patient.

Case 2

A man aged 44—height 5 ft. 6 in. (1.68 m.), weight 9 st. 2 lb. (58 kg.)—had had severe rheumatoid arthritis and psoriasis since 1939, with some complete remissions. Varying success with many types of therapy: amidopyrine ("pyramidon"), gold, manganese preparations, *x* rays, etc. Since January, 1949, in bad condition, with no favourable reaction to any therapy.

He was an emaciated man, suffering severe pains, looking very ill, with temperature continuously subfebrile to febrile (minimum 37.5° C., maximum 40° C.), blood culture repeatedly negative, E.S.R. 145/154, Hb 8.05 g.%. There was very extensive psoriasis, which latterly had a tendency to improve, and extensive abnormalities characteristic of rheumatoid arthritis in practically all the joints, with contracture and subluxation of both knees.

The severity of this case induced us to prolong the initial period of high-dosage A.C.T.H. On the second day with maximum temperature 37.5° C., his appetite was considerably increased, and he slept well and felt much better. On the fourth day swelling of the left hand began to decrease. The affected joints gradually became less painful, and after a week he needed hardly any analgesic, which before he had used in large quantities. The skin symptoms also showed a rapid improvement. In the third week of treatment the temperature rose once to 38° C., while the E.S.R., which had dropped to 51/78, was up to 75/108, with the psoriasis worse and the rheumatic complaints showing no further improvement. Dosage was still 6×7 mg. at this time. On the 32nd day of treatment dosage was decreased to 6×3 mg. because of our small supply of A.C.T.H., and his temperature rose almost immediately to a maximum of 39° C., the E.S.R. became 138/150, and swelling of the joints and pains increased, especially in the hands.

An attempt was made to check the process with a relatively high dosage (6×15 mg.) and then to maintain the improved condition with a smaller quantity of A.C.T.H. At first there was the usual favourable effect ; the temperature returned to normal, and only the psoriasis did not improve. After a few days of 6×10 mg. a relapse occurred. On the 75th day the A.C.T.H. therapy was discontinued and the treatment with gold begun, while amidopyrine had already been given for a few days. The condition of the rheumatic process remained stationary, but the psoriasis had meanwhile assumed very serious proportions and was of an atypical erythrodermatic nature with strong livid colouring. On the 99th day the A.C.T.H. therapy was resumed with a dosage of 8×3 mg. This produced only a slight temporary effect. On the 125th day the A.C.T.H. was finally stopped after a gradual decrease of the number of daily injections.

In all, this patient received 3,170 mg. of A.C.T.H. in two periods of 75 and 27 days respectively, with an interval of 23 days. After this the psoriasis got gradually worse and the rheumatic process took a mutilating form. The patient became cachectic and died approximately 16 weeks after the last A.C.T.H. injection. Necropsy showed bronchopneumonia and atrophy of the adrenal cortex, especially of the zona glomerulosa, with local fibrosis and depletion of lipoids. Microscopical examination of the hypophysis is being carried out.

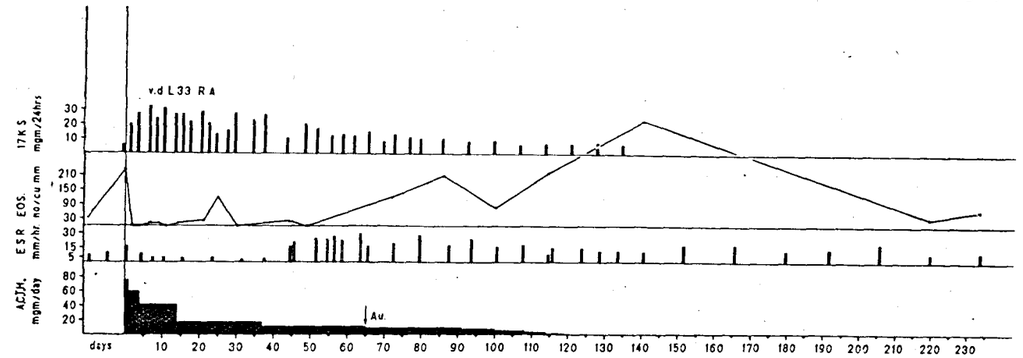


FIG. 2.—Case 3. Rheumatoid arthritis treated with diminishing doses of A.C.T.H. Gold therapy began on the 65th day and continued with a maintenance dose of 50 mg., administered once every two weeks in the out-patient department. (The top chart shows 17-ketosteroid excretion.)

Case 3

A woman aged 33—height 5 ft. 7¾ in. (1.72 m.), weight 7 st. 10 lb. (49.2 kg.)—had had rheumatoid arthritis since 1937, with secondary osteoarthritis of both knee-joints, moderately active and slowly progressive. The patient several times received gold therapy, to which she reacted favourably in the beginning, but not at a later stage. Other forms of treatment were unsuccessful. Several days before each menstruation the pain and stiffness of the joints increased and became most severe during the first two days of each cycle. She was a pale, thin, gloomy woman, with the hands, wrists, elbows, knees, and feet affected. E.S.R. 15/36, Hb 11.6 g.%. With this patient the clinical course of the illness corresponded roughly to that of Case 1. After 30 days' treatment she had only slight pain in the knees when walking upstairs. In the seventh week of treatment (dosage 6×2 mg.), she had a common cold. The E.S.R., which had fallen to 4/10, rose to 24/27. There were no joint complaints. In view of the intercurrent infection, we decided not to lower the dosage to 6×1 mg., and thus deviated from the scheme. Experience with Cases 1, 5, and 6 indicates that this last dose is too small. In view of the shortage of A.C.T.H., we did not dare to risk a relapse, which would compel a temporary increase in dose. On the 65th day gold treatment was started ; on the 120th day the patient received her last A.C.T.H. after gradual decrease in the number of daily injections. The patient had had by then a total of 1,839 mg. A.C.T.H. and almost 1,500 mg. aurothioglucose. She received a maintenance dose of aurothioglucose of 50 mg. once every two weeks. Sixteen weeks later her condition was still excellent, with only minimal complaints of the knees. E.S.R. 10/24, Hb 11.3 g.%. Her weight remained constant at 64 kg., and she was very satisfied and cheerful (see Fig. 2).

During treatment her menses became slightly irregular, the shortest cycle being 18 days. In spite of the satisfactory therapeutic results, premenstrual intensification of joint symptoms sometimes recurred. Repeated endometrial biopsies revealed both ovulatory and anovulatory bleeding. We were unable to find a correlation between the occurrence of premenstrual complaints and the type of bleeding.

Case 4

A man aged 65—height 5 ft. 7 in. (1.70 m.), weight 11 st. (70 kg.)—had had rheumatoid arthritis since 1942 with contracture of the knee-joints. Various reactions to many kinds of treatment—e.g., gold (last series of injections in 1947), amidopyrine, salicylate, "atophan," "menformon," etc. He had a somewhat grey complexion (aurosis ?), but otherwise looked healthy. He was sullen and made no effort to co-operate. The rheumatic process had affected practically all the joints, with a rheumatic nodule on the right elbow and secondary osteoarthritis of both knees. On further physical examination no abnormalities were found, except a trace of pretibial oedema. E.S.R. 125/135, Hb 10.9 g.%. Since February, 1948, he had albuminuria, a full analysis of which had been made elsewhere. Blood pressure, blood urea, renal function, and urine sediment were normal during that period ; this was confirmed on admission here. The congo-red test was negative. It was difficult to decide whether we had to deal with a late gold nephrosis of long standing or an albuminuria as an accompanying symptom of rheumatoid arthritis (Schneiderbaur, 1938 ; *New Engl. J. Med.*, 1947).

In this case of rheumatoid arthritis, too, a very striking reaction was observed at the beginning of treatment. On the 16th day the E.S.R. had fallen to 15/33, and there were no complaints of pain ; the swelling had gone, and even the contracture of the knee-joints had diminished. The nodule could no longer be felt. The patient had also undergone a change and become friendly and cheerful. After the dosage had been decreased to 6×3 mg. the E.S.R. rose again (54/68). A higher dosage (6×7 mg.) produced only a temporary fall. After 26 days with 6×7 mg. the E.S.R. was again 120/126.

It is possible that the first rise in the E.S.R. was the result of a knee regression, the second of an intercurrent cold. It is noteworthy that both times the patient had no joint complaints, while objective symptoms of relapse were also absent. On the 60th day the A.C.T.H. therapy was stopped owing to lack of material. The following day signs and symptoms of arthritis reappeared. On the 73rd day A.C.T.H. was once more available and the patient received 8×3 mg. The clinical condition now improved considerably, but the E.S.R. remained very high.

Finally we gradually lowered the dosage by decreasing the number of injections. The patient received a total of 2,625 mg. A.C.T.H. in 118 days. A change-over to amidopyrine had to be stopped because of granulocytopenia.

Because of the albuminuria we were very cautious in the administration of gold. The patient received only a few injections containing a very small quantity of gold. These were immediately discontinued when erythrocytes appeared in the urine. According to the few data available, the albuminuria had since February, 1948, gradually risen from 0.5 to 3 g. per litre. During the two treatment periods the variations were so pronounced (2–40%) that it seemed impossible to draw any conclusion on the influence of A.C.T.H. on the albuminuria.

At his own request the patient left the hospital. On the day of departure a blood sample was taken. When the laboratory reported that the blood urea had risen considerably (96 mg. per 100 ml.) he had already gone. Soon afterwards he was admitted elsewhere. Five weeks after the last A.C.T.H. injection the patient died of uraemia. Necropsy was not performed.

Case 5

A woman aged 56—height 5 ft. 7¼ in. (1.71 m.), weight 8 st. 12 lb. (56.5 kg.)—had had very active rheumatoid arthritis since 1948, but received no treatment. The process was localized to practically all the joints, with slight contracture of both knees. E.S.R. 126/153; Hb 10 g.%. She was undernourished, could hardly walk a few yards, and was sullen and unfriendly. A few abnormalities were discovered during the routine examination; the Robinson–Power–Kepler test was positive, the quantity of urine excreted during the night (500 ml.) being more than the largest quantity (320 ml.) excreted during the day (factor A = 17.5). With the insulin tolerance test, the lowering of blood-sugar values was insufficient and occurred too late, the initial level not being reached after two hours.

The articular signs and symptoms improved within an extraordinarily short time from the start of treatment, and the E.S.R. dropped linearly to a level of 10/22 on the 12th day. In view of this favourable effect and the rapid rise in excretion of 17-ketosteroids in the urine (maximum 53.5 mg. per 24 hours) and the high blood-sugar level with the abnormal glucose tolerance test, we lowered the dosage more rapidly: four days 6×7 mg., followed by six days 6×3 mg. and 16 days 6×2 mg. On the 15th day of treatment the pain and swelling of the joints had completely disappeared. In the subsequent period during which the dosage was 6×1 mg., a relapse occurred with a rise of the E.S.R.

With one day on 5×7 mg. and then 5×3 mg., the patient again reached an optimal condition. At this point a gold treatment was started. As pronounced diabetes had meanwhile developed (see below), we decided to stop the A.C.T.H. (on the 66th day). Next day there was an acute and violent swelling of several metacarpo-phalangeal joints, with redness and distended veins suggestive of gout. This disappeared after a few days, while a relapse of the rheumatoid arthritis gradually became perceptible in all the previously affected joints, the process being, however, clinically less violent than on admission. The clinical treatment with gold and physiotherapy was continued. Four months after the cessation of A.C.T.H. administration the patient's general condition was tolerable.

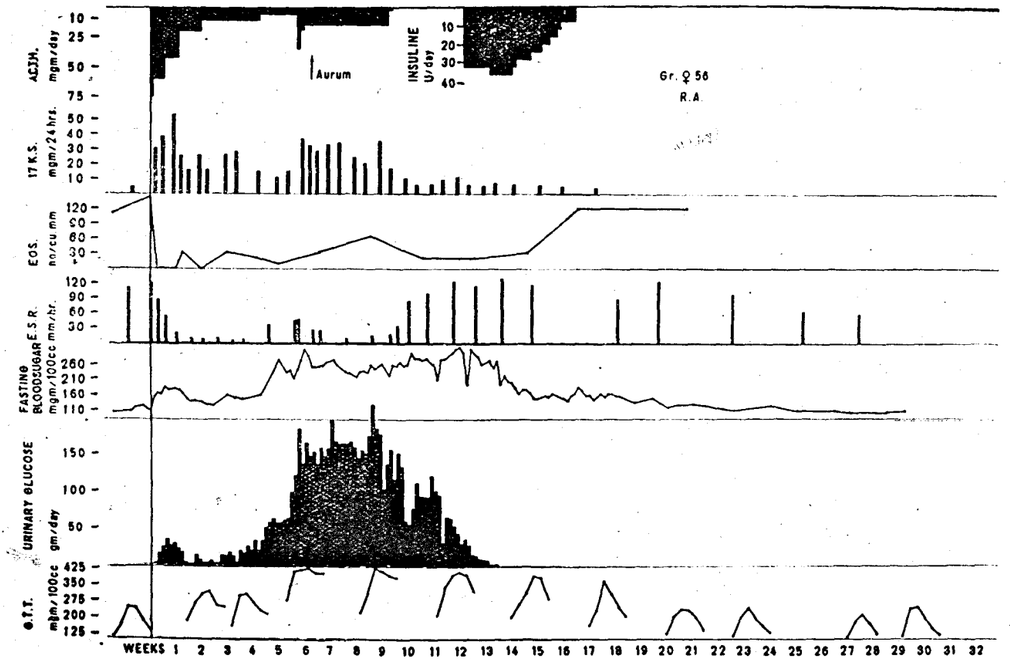


FIG. 3.—Case 5. Rheumatoid arthritis treated with A.C.T.H. The total daily dose of A.C.T.H. was divided over six injections, that of insulin over two injections.

↑ Aurum = First day of gold therapy. E.S.R. = First hour value obtained by Westergren method. G.T.T. = The blood sugar was determined initially before the oral administration of 50 g. of glucose, and ½ hour, 1 hour, 1½ hours, 2 hours, and 2½ hours later.

the rheumatic process much less active, and the E.S.R. 58/79; she could then walk fairly well.

Special Observations

As stated, the patient had an abnormal blood-sugar curve to start with. Her fasting blood-sugar values were constantly at the upper limit of normal or abnormally high (110/136 mg. per 100 ml.). During the first days of treatment they rose to a maximum of 187 mg. per 100 ml., and then gradually returned to the initial level. In the first week the glycosuria was maximally 34 g. daily, which was much more than with the other patients. These signs of disordered carbohydrate metabolism at first diminished, then suddenly progressively increased during the low dosage of 6×1 mg. (fasting blood sugar 250 mg. per 100 ml., glycosuria up to 200 g.). It is possible that an intercurrent cold was a provocative agent in this case. When during four weeks the diabetes did not improve we decided to discontinue the A.C.T.H. therapy (66th day). The fasting blood-sugar levels remained high, and the glycosuria diminished slightly (the greatly decreased food intake during the relapse occurring in this period must be taken into account). When, after a few weeks, the condition remained unchanged, though perhaps on a lower level, we gave the patient insulin. With a relatively low dosage (maximum of 36 units daily), administered during one month in gradually diminishing quantities, the starting condition was reached three months after the last A.C.T.H. injection (see Fig. 3).

As a second untoward reaction, we must report a series of symptoms which were a result of vascular occlusion: paraesthesiae in the fingers, with cold finger-tips; at a later period disappearance of the radial pulse and failure to register oscillation on oscillometric examination of the left upper arm; and finally a homonymous hemianopsia on the left side as a result of an occlusion of the right posterior cerebral artery. Whether the A.C.T.H. can be held responsible for the vascular signs in this patient is unknown. An arteriosclerotic retina was diagnosed before the treatment, and the renal threshold for glucose excretion was too high. The already existing pre-diabetic condition also seems to point to general arteriosclerosis. The occlusion of the radial artery was accompanied by relatively slight clinical signs of decreased peripheral arterial blood supply. This points to a good collateral circulation and a vascular obliteration which has developed very slowly, again suggesting a diminished circulation before the administration of A.C.T.H.

It is also worthy of note that a parotid swelling (chronic parotitis?) which the patient had shown for some years disappeared completely after four days of A.C.T.H. injections, to reappear only two months after cessation of this treatment. Biopsy revealed a (sub-)chronic inflammation with lymphocytic infiltration.

Case 6

A man aged 32—height 5 ft. 7¼ in. (1.71 m.), weight 9 st. 11 lb. (62.1 kg.), known to us since 1947 as suffering from ankylosing spondylitis with typical *x*-ray signs in the sacro-iliac joints and vertebral column. He had been treated several times with *x* rays and amidopyrine, with varying success. The E.S.R. was never lower than 45/80.

He showed severe spinal stiffness, and was unable to attend to his administrative activities; E.S.R. 73/115, Hb 12.2 g.%. The E.C.G. showed a short P–R interval and prolonged QRS time.

A.C.T.H. treatment had a very rapid effect. On the morning of the third day the patient could leave his plaster bed without help, which he had never been able to do before. This as well as the increased 17-ketosteroid excretion (maximum 67.8 mg. in 24 hours) was sufficient reason for us to lower the dosage more rapidly than originally planned. After 15 days the patient received 6×2 mg. A.C.T.H. a day, the E.S.R. being at that moment 4/9. Except for the sudden appearance of an auricular fibrillation (see below), the clinical progress continued uninterrupted, and the mobility of the vertebral column increased regularly. After the patient had received 6×1 mg. daily for a week, there was a slight relapse and the E.S.R. rose to 45/84. With a dosage of 5×7 mg. for a day, followed by 5×3 mg. for 39 days, the complaints once again rapidly disappeared and the E.S.R. dropped, though more slowly than at the beginning. In this period amidopyrine medication was started, while the A.C.T.H. dosage was gradually and regularly reduced, as in the case of patients 1 and 3. With one dose of 3 mg. a day the complaints began to return (17th week). Amidopyrine, in combination with 2×3 mg. A.C.T.H. a day, created a very satisfactory condition, however. This scheme of treatment was continued for 42 days in the out-patient department; the patient had already resumed his normal activities (16th week). On the 175th day the A.C.T.H. treatment was finally stopped and the patient's condition remained satisfactory. The E.S.R. did not run parallel with the good clinical condition and fluctuated round values of 45/70. The weight remained constant.

The abnormal E.C.G. has already been mentioned. Auricular fibrillation occurred on the 23rd day, and the E.C.G. showed that this fibrillation was a rapid one with aberrant ventricular complexes. The patient reacted promptly to quinidine sulphate, and the A.C.T.H. therapy was continued. No more sudden attacks occurred. The A.C.T.H. was not necessarily directly responsible for the auricular fibrillation, for it can appear spontaneously with the mentioned pre-existing E.C.G. alterations.

Laboratory Data

Thorn Tests.—These were performed on the first day of treatment after administration of 25 mg. A.C.T.H. intramuscularly. Circulating eosinophils were counted in the counting-chamber (diluting solution: eosin 0.1 g., 40% formol 1 ml., distilled water to 100).* In five of our six cases a fall of more than 50% was noticed after four hours. In some this fall still continued after that time. In Case 2 there had been an eosinopenia for more than a year before treatment. The rise of more than 50% in the U/C ratio was seen only in three of the six patients (Cases 1, 3, and 4). There was no correlation between the results of these tests and a good clinical reaction, and no connexion could be shown between the reappearance of eosinophilic cells and the occurrence of a relapse.

Carbohydrate Metabolism.—In all cases there was a rise of the fasting blood sugar, which returned to normal with lower dosage. The glucose-tolerance curves were temporarily of a lag type. The most striking deviations were found in Case 5 with diabetes. The other two women showed only temporary glycosuria. There was no ketonuria, the CO_2-combining power of the blood fluctuated, but remained within normal limits.

Electrolyte Metabolism.—In view of the fact that retention of sodium and chloride was expected, combined with an increased potassium excretion, we prescribed a low-sodium diet (about 2 g. NaCl) and 4–5 g. potassium daily. The blood values remained strikingly constant. With all the patients we noticed an almost complete disappearance of sodium and a great decrease in the amount of chloride in the urine during the first days. Parallel with this there was a slight retention of fluid in the first week. No oedema was seen, and the blood pressure remained constant.

17-Ketosteroids.—The urinary excretion of the neutral 17-ketosteroids increased considerably, reaching its maximum after about a week. This maximum was about 30 mg. per 24 hours, except in Cases 5 and 6, in which it was about 60 mg. During the further course of A.C.T.H. treatment these values diminished, but they

*This method has been used in our department for the last four years and has proved to be satisfactory in all respects. It was described for the first time by Zollikofer (*Zeitschrift für mikroskopische Technik*, 1901).

always remained above the initial levels, which were on the whole subnormal. After discontinuation of A.C.T.H. therapy there was a rapid return to the initial value. Results of a chromatographic analysis of the 17-ketosteroid mixture produced under influence of A.C.T.H. will be discussed elsewhere.

Serology.—The following serological tests were regularly performed: anti-streptolysin-titre, L and O agglutination, and the modified Rose test (van Loghem-Langereis, 1950). The clinical condition and the values of the titres showed a distinct parallelism (see table). We are here at variance with the results obtained by Ragan *et al.* (1949). The explanation may be that our period of observation was longer.

Table Showing Changes in the Serological Reactions in Case 3. A.C.T.H. was Administered During 120 Days

Day of Treatment	A.S.T.	L Aggl.	O Aggl.	Sensitized Sheep Cell Aggl.
1	80	160	160	32
8	80	80	160	16
16	80	160	160	0
24	50	20	160	8
31	32	20	40	0
52	40	0	180	0
66	25	20	0	0
80	45	0	20	0
94	45	0	20	0
115	125	0	40	6
134	70	0	40	0
194	70	0	40	8
	80	0	40	0

X-ray Photographs.—No change occurred in *x*-ray pictures of the joints.

Temperature.—Apart from the change already recorded in Case 2, we saw an immediate drop of 0.5° to 1° C. in some of the patients, even in cases where the temperature was apparently normal before treatment.

Weight.—With all the patients, appetite increased from the first day. On an average, the need for calories was roughly doubled. In accordance with this, there was a regular increase in weight, which certainly cannot be explained on the basis of fluid retention (see Fig. 1).

Untoward Reactions

Apart from the untoward reactions recorded in the clinical reports of the individual patients, the following details seem worthy of note. After the first injections, two women (Cases 1 and 3) complained of vague spasms in the abdomen (uterus ?), which were difficult to locate. These spasms disappeared spontaneously after a few minutes. A few weeks after the beginning of the treatment, all the patients developed acne, chiefly in the face. The female patients showed a slight increase of hair on the cheeks, upper lip, and extremities. The face became fuller, but a real "moonface" was not to be observed. The pigmentation of the skin increased more or less intensely, diffused as well as localized in freckles, in the folds of the skin, and on places of venepuncture, injections, biopsy scars, Pirquet reactions, and, in Case 3, on the elbows and the knuckles of the hands. All the symptoms mentioned disappeared during the protracted lower A.C.T.H. dosage (see Figs. 4 and 5). We were very much struck by the similarity of these pigmentations to those seen in Addison's disease.

General Remarks on Dosage

On the results of experiments, Li suggested the desirability of dividing the daily dose over several injections. We think this suggestion may be of importance to the clinician. On transition from 4 × 5 mg. to 6 × 3 mg. (Case 1), the laboratory data indicated an intensified adrenocortical activity, which was fully comparable to that at the beginning of the administration of A.C.T.H.: retention of water, Na and Cl; K excretion; glycosuria with increased fasting blood-sugar values; and increase of the 17-ketosteroid excretion.



FIG 4.—Case 3. Pigmentation of the hand on the 62nd day of treatment. Dosage 6×2 mg. A.C.T.H. daily; total amount received. 1,359 mg.

From our studies, we are inclined to draw the conclusion that the dosages originally indicated by Hench *et al.* (1949), Thorn *et al.* (1949), Elkinton *et al.* (1949), Markson (1949), and other authors are too high for moderately severe cases. This view has meanwhile also been expressed by other workers (Mach *et al.*, 1950; Bröchner-Mortensen *et al.*, 1949). We, too, perhaps set the initial dose too high. This dose leads to a rapid decrease of the E.S.R. with remarkable improvement of the clinical condition, but at the same time causes signs and symptoms of hyperfunction of the adrenal cortex. During the protracted low dosage thereafter these untoward reactions mostly disappeared again, while the rheumatic process remained favourably affected. It thus seems worth investigating in the future what can be achieved with a lower dosage from the beginning, even though results may be obtained more slowly. It may be possible to avoid untoward reactions in this way. And with clinical application in cases of rheumatoid arthritis it is not always necessary to make the patients reach an optimal condition in a very short time.



FIG 5.—Case 3. Return to normal condition—14 weeks after last A.C.T.H. injection.

(The two photographs were taken under identical conditions.)

In four cases (1, 3, 5, 6) it was possible to maintain the clinical remission with 6 × 2 mg. In three cases (1, 5, 6) the dose was lowered to 6 × 1 mg. a day; in all three the result was a relapse. Two patients (2, 4) had a recurrence of signs and symptoms with a higher dosage (6 × 10 mg. and 6 × 7 mg. respectively). Both were serious cases complicated by other affections.

Summary

Five patients with rheumatoid arthritis and one with ankylosing spondylitis have been treated with A.C.T.H. in low dosage over a period of two to six months.

In three moderately severe cases of rheumatoid arthritis and in one serious case of ankylosing spondylitis the result was favourable. In two cases of rheumatoid arthritis with a complication (psoriasis, albuminuria) the improvement was temporary and relapse occurred in spite of a repetition of the initial high dosage.

The condition of the four favourable cases was maintained with 6×2 mg. of A.C.T.H. daily. A dosage of only 6×1 mg. daily resulted in a relapse in three of them.

An attempt was made to maintain their improved condition with gold therapy. More experience with this combined treatment is required before conclusions can be drawn.

The commonly known untoward reactions were observed in a varying degree. One patient developed a serious diabetes and also showed symptoms of vascular occlusion. These phenomena gradually disappeared with a low dosage or after discontinuation of the A.C.T.H.

We are much indebted to Professor Dr. S. E. de Jongh for his invaluable advice and the continuous interest he took in our work, to Professor Dr. A. Querido for his encouragement and guidance, to Professor Dr. J. Mulder and Professor Dr. E. Gorter for the facilities granted, to Dr. A. J. Zwart, Voorspuy, Mr. W. A. L. Dekker, Dr. H. P. Jonxis, and Dr. K. D. Wotman for the chemical examinations, to Mr. A. Kassenaar for the hormone analyses, and to Dr. J. J. van Loghem and Dr. E. J. van Loghem-Langereis for the serological investigations. For technical assistance our thanks go to our nursing, laboratory, and secretarial staff.

References

Boland, E. W. (1950). *Ann. rheum. Dis.*, **9**, 1.
Bröchner-Mortensen, K., George, Joh., Hamburger, Chr., Snorrason, E., Sprechler, M., Videbaek, Aa., and With, Torben K. (1949). *Acta endocrinol.*, **3**, 39.
Elkinton, J. R., Hunt, A. D., jun., Godfrey, L., McCrory, W. W., Rogerson, A. G., and Stokes, J. (1949). *J. Amer. med. Ass.*, **141**, 1273.
Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1949). *Proc. Mayo Clin.*, **24**, 181.
Li, C. H. (1950). *Nord. Med.*, **43**, 363.
van Loghem-Langereis, P. E. (1950). Diss. Amsterdam.
Mach, R. S., Brügger, Y., Della Santa, R., and Fabre, J. (1950). *Schweiz. med. Wschr.*, **80**, 5.
Markson, D. E. (1949). *J. Amer. med. Ass.*, **141**, 458.
New Engl. J. Med. (1947). **237**, 405.
Ragan, C., Grokoest, A. W., and Boots, R. H. (1949). *Amer. J. Med.*, **7**, 741.
Sayers, G., Burns, T. W., Tyler, F. H., Jager, B. V., Schwartz, T. B., Smith, E. L., Samuels, L. T., and Davenport, H. W. (1949). *J. clin. Endocrinol.*, **9**, 593.
Schneiderbaur, A. (1938). *Z. klin. Med.*, **133**, 643.
Thorn, G. W., Bayles, T. B., Massell, B. F., Forsham, P. H., Hill, S. R., Smith, S., and Warren, J. E. (1949). *New Engl. J. Med.*, **241**, 529.
—— Forsham, P. H., Prunty, F. T. G., and Hills, A. G. (1948). *J. Amer. med. Ass.*, **137**, 1005.

BURNS—I. INITIAL TREATMENT, LOCAL AND GENERAL*

BY

R. P. OSBORNE, F.R.C.S.

(From the Plastic Surgery Department, Royal Southern Hospital, Liverpool, and Ministry of Pensions Hospital, Stoke Mandeville, Bucks)

A very considerable number of articles have been written on this subject during the last 10 years. The purpose of this paper is not to present anything new, but to emphasize certain points which, while often neglected, are essential if the objects of treatment are to be achieved. In brief, these objects are to restore the patient to his or her normal mode of living in the shortest possible time and with the minimum loss of function and disfigurement.

Success in these aims will be greater in those hospitals where there exists a plan of treatment from admission to discharge—a plan understood and adopted by all concerned. Experience may be a great teacher, but the registrars and house-surgeons, who so often play a major part in these cases, should from the outset have available the experience of their seniors; otherwise their bitterness will be as nothing compared with that of the patient.

Prevention and First Aid

Between wars, burns continue to occur with depressing frequency (Colebrook, 1950); depressing because so many could be avoided by common-sense methods. Fireguards should be essential, and not luxuries, wherever there are children or known cases of epilepsy in the household. The shining red element of an electric fire is an object of attraction to a child—an object to be grasped by the exploring hand with possible crippling consequences, and yet so easily avoided if the fire is fixed high up on the wall of the room. Tea-pots, tea-cups, and cooking utensils should be placed out of reach of a child's hand.

Immediately after the injury the patient will be suffering from shock of nervous origin—that is, akin to fainting. For this condition the treatment consists in keeping the patient warm (not hot), giving sweet drinks, and imparting calm reassurance. The use of narcotics will depend upon the presence of a doctor and the absence of any other undiagnosed injury.

The burned areas should be covered with the cleanest material available at the site of the accident, varying from sterile gauze in factory dressing stations to the cleanest linen material in the home, kept in position by firm but not tight bandages. Blisters should not be punctured. Clothing should not be removed unless there is a considerable delay before a hospital can be reached.

Burns Units

The Burns Unit of the Birmingham Accident Hospital, designed and planned with such magnificent results by Bourdillon and Colebrook (1946), is something to envy. With the present financial state of the National Health Service it is unlikely that other cities will be so fortunate. A compromise, representing a very definite step in the right direction, was reached by Professor Kilner during the war: it involved the sacrifice of a corner of the ward by converting it into a completely enclosed dressing-room. The expense involved is small and the beds are reduced by only one. Burns should not be dressed in the general ward.

*Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Liverpool, 1950.

Cleansing and Anaesthesia

The aim of the cleansing is to eliminate any bacteria on the burnt surface and on a considerable area of adjacent unharmed skin. Most authorities are agreed that the best agent for this purpose is a 1% solution of "cetavlon" (cetrimide, *B.P.C.*), which is both detergent and bactericidal. Gentleness must be the theme; the areas must be washed, not rubbed or scrubbed. Rubbing or scrubbing cannot do any good, and may easily damage or destroy unburnt layers in a case of partial thickness loss. The procedure should be regarded as a major operation, with all the usual preparation of personnel, but opinion is divided on the question of a general anaesthetic. Some prefer to rely on an analgesic with a dosage table covering all ages (Wallace, 1948), whilst others, including myself, employ a "light" general, using gas and oxygen supplemented if required with a little cyclopropane. Cyclopropane has the advantage of being comparatively non-toxic and capable of administration with large percentages of oxygen (Gray, 1946—personal communication).

Initial Dressings

The dressing is planned not as a mere cover, but with two distinct objectives. The first is to reduce the risk of infection and cross-infection so far as is possible—a risk to be borne in mind from the beginning to the end of the treatment. After seven years' experience, I still prefer the Bunyan–Stannard envelope method, full details of which have appeared in the literature (Bunyan, 1941; Hudson, 1941; Osborne, 1944). Alternatively, I would recommend either the use of vaselined gauze (Allen and Koch, 1942) or penicillin cream 400 units to the gramme (Clark *et al.*, 1943; Colebrook, 1950), with the local application extending beyond the burn, and wool and crêpe bandage well beyond the gauze. The bandages should be fixed by strapping which extends on to unburnt skin, or, especially in children, by a light plaster shell (Colebrook *et al.*, 1947), the aim being to prevent their becoming loose by movement or the exploring hands of the child.

The second object is to reduce the oozing and oedema due to the escape of plasma contents from the capillaries into the surrounding tissues. Unless resorption takes place within a few days the plasma becomes converted into a gel, followed by the proliferation of fibroblasts with subsequent fibrosis. To overcome this complication the use of pressure is implied (Allen and Koch, 1942). The pressure supplied by a dressing is neither a measurable nor a constant quantity; what is required is firm but not tight bandaging over a moderately bulky dressing or over the Stannard envelope. Such dressings should include the whole of the limb so as to avoid constriction with further oedema distally.

Plaster-of-Paris has been advocated on very sound principles (Barnes, 1943), but tragedies in the form of gangrene have been seen when such a dressing has been applied by the unskilled. The best and only constant pressure is the atmospheric. Elevation is thus indicated. Limbs should be elevated by suspension (arm with the hand splinted in position of function to a saline stand, leg with foot and back splint to a Balkan beam) and not by resting upon a heap of pillows. The elevation begins the moment the patient returns to the ward, and is maintained for 72 hours. Thereafter the limb is lowered for gradually increasing periods according to the initial severity.

Change of Dressing

Subsequent dressing of burns should be carried out with the same care and asepsis as at the initial dressing: it should therefore not be performed in the general ward. Equally important is it that the patient's confidence should not be lost: there must be neither tears nor fears.

When an envelope is used, daily irrigations can be begun on the fourth day. Other types of dressing can be left until the tenth to the fourteenth day unless, (*a*) they have worked loose or been disturbed; (*b*) there is a staining of the bandages due to discharge from beneath—for in the presence of this there is an excellent track for the entry of organisms; (*c*) there is a persistent elevation of temperature not otherwise explained; or (*d*) if β-haemolytic streptococci are found in the smears taken at the initial cleansing. The majority of the partial-thickness burns will have healed during this period; on those that have not, the initial type of dressing should be renewed for a further four or five days.

Full-thickness Skin Burns

When the initial dressing is changed on the tenth to the fourteenth day the slough of a full-thickness skin burn should be starting to separate. Since the object of treatment should be to carry out skin-grafting as soon as possible, the aim must be to hasten separation of the slough. Clearly, surgical excision is the most rapid method, and when possible this should be done, but only if the surgeon is prepared to apply skin grafts two or three days later. If he is not so prepared, then the case should be transferred to a department where this can be done. Otherwise a totally unnecessary drain is placed on the patient's reserves, infection is inevitable, and scar contracture unavoidable, even if grafts are eventually applied. In small burns, especially industrial or electrical, it is possible to excise the burned area within a day or two after the injury. In the larger burns, however, the general condition of the patient generally makes it unwise to excise until the second week. That the excision is complete will be evident when bleeding tissue is reached, and it is this bleeding which often prevents immediate application of skin grafts.

If surgical excision is not carried out the type of dressing should be changed on the tenth to the fourteenth day. Instead of the initial penicillin cream, a chlorine-containing compound, such as eusol, Dakin's solution, or "milton," should be used in the form of compresses over tulle gras changed every 24 or 48 hours. It is at this stage that the Bunyan envelope method is most valuable, for by it the risk of added infection associated with frequent changes of dressing is reduced to a minimum. Furthermore, such dressings can be associated with pain, especially in children. There are two other methods of hastening the separation of sloughs—the first being saline baths, used with such success by Sir Archibald McIndoe (1940) during the last war. A continuous flow of saline, at a thermostatically controlled warm temperature, runs through the bath, into which the patient is placed by trained orderlies. The burns are thoroughly irrigated by the saline, and the patient experiences great comfort.

There is finally the use of such agents as pyruvic or phosphoric acid (Connor and Harvey, 1946) as primary local applications to the burned surface, changed every two or three days. This is said to lead to the complete separation of the slough in 10 to 12 days without damage to the underlying tissue. Enough is not yet known of the method in this country to pass any comment, but answers to inquiries made during a visit to America suggested that it is not without pain.

To summarize, in dealing with a full-thickness skin burn the aim should be to graft as soon as possible, preferably after surgical excision, but, failing this, immediately flat, red, firm, healthy (that is, no haemolytic streptococci present) granulation tissue is present.

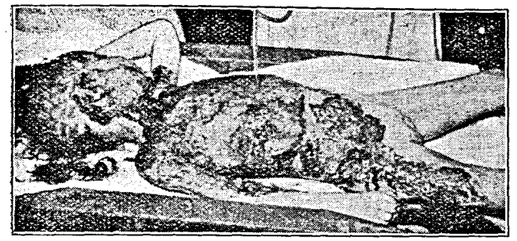


FIG. 1.

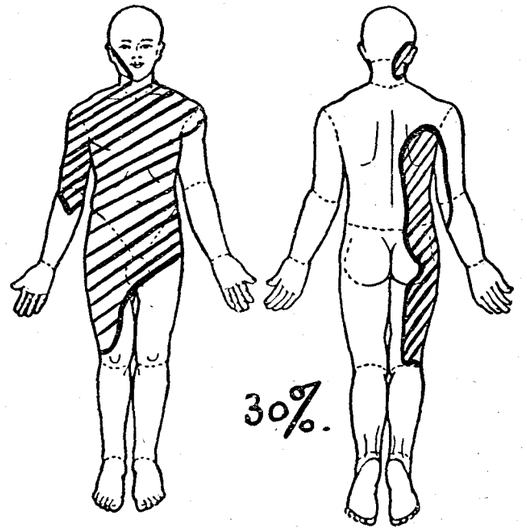


FIG. 2.

FIGS. 1 and 2.—Condition of child aged 4 with full-thickness burns involving 30% of body surface. (November 23, 1949.)

Illustrative Case

A child aged 4, whose clothing caught fire on October 28, 1949, was taken to a local hospital, where the burns were dressed with sulphathiazole cream. She was transferred to the Plastic Surgery Unit, Stoke Mandeville Hospital, Aylesbury, on November 23, with extensive full-thickness burns involving 30% of the body surface. All areas were freely discharging pus (*Bact. coli, Proteus,* and *Ps. pyocyanea*). The dressings were foul-smelling and contained a large number of maggots. She had a swinging temperature (103° F.—39.4° C.). Haemoglobin 67%. (Figs. 1 and 2.)

The child was treated in a Bunyan–Stannard bed with irrigations of 1% milton. Autogenous postage-stamp grafts to abdomen, chest, and neck, taken from left thigh and lower leg, were applied on November 28. Post-operative dressing by irrigation on December 1 showed 100% "take" of grafts. Haemoglobin 44%.

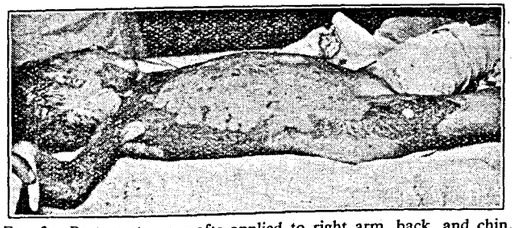


FIG. 3.—Postage-stamp grafts applied to right arm, back, and chin. (December 20.)

On December 20, postage-stamp grafts taken from left upper arm and left thigh were applied to right arm, back, and chin. Haemoglobin 75% (Fig. 3). First dressing on December 26 showed 100% "take" except in chin, where there was some loss.

Healing was complete by January 1, 1950, except for small areas on right thigh, to which further grafts were applied. Haemoglobin 86%.

In February, contracture of the neck, axilla, and right elbow scars was already marked, but the child was quite well and running about the ward (Fig. 4).

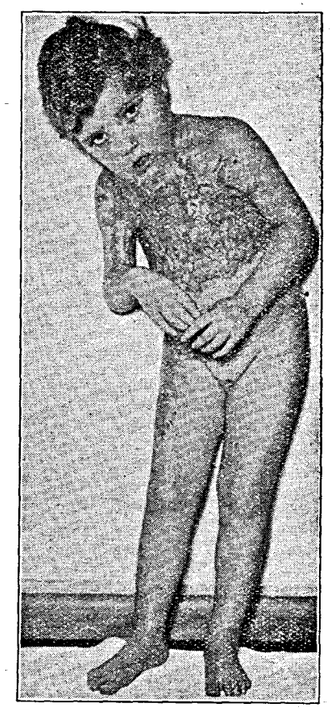


FIG. 4.—Condition of child in February, 1950.

On April 18 the scar tissue of the neck was excised, followed by the application of a large free graft from the left thigh. Haemoglobin 82%. This graft was dressed on April 24, showing a 100% "take."

Since then the child has been in a convalescent home, and will be readmitted for correction of the scar contracture of the axilla and elbow (Fig. 5).

General Measures

On admission to hospital, save in minor injuries, there will be evidence of shock in the form of pallor, thirst, restlessness, and a rapid pulse. A fall of blood pressure is, however, a late sign in burns. Local treatment should not be started until there has been a good response to the treatment of the shock. This treatment is begun immediately, and consists in allowing the patient to drink freely of sweetened drinks, and in relieving pain, administering plasma, and applying warmth.

In regard to the last, the temperature should not exceed 70° F. (21.1° C.); there is often a tendency to apply heat rather than warmth, in the form of electric blankets or lamp-bearing cradles. Below, the general measures are discussed under the following headings: the circulatory system, metabolism, and infection.

The Circulatory System

As a result of the burn many of the capillaries and small vessels in the involved area will be destroyed or their contents thrombosed. In the underlying tissue, and in a wide adjacent area, the capillaries show an increase in the permeability of their walls, so that there is an outpouring of plasma. The local effect of this is blister formation or oedema, or both; the general effect is the manifestation of true shock. Since this plasma loss can be very considerable,



FIG. 5.—Condition of child after stay in convalescent home. Correction of scar contracture of axilla and elbow still to be carried out.

there is haemo-concentration, proved and measured by a haematocrit reading.

The loss of fluid may continue for as long as 72 hours with little absorption by lymphatics, and unless steps are taken to limit this loss the effects may be disastrous. If incorrectly treated, clotting of the escaped fluid occurs, with consequent limitation of movement, stretching of surrounding healthy tissue, with anoxia, and, finally, proliferation of fibroblasts followed by scar contracture (Glenn, 1944).

It is thus one of the most important problems in the early treatment of burns to find and use methods to control this abnormal loss from the capillaries. The measures at our disposal are: firm dressings, elevation (that is, the use of atmospheric pressure), immobilization, and intravenous administration of plasma or other fluid. The first three have already been discussed.

Plasma Loss

As plasma has been and is being lost the rational remedy is to give plasma by the intravenous route. It is safer to have some method of calculating how much plasma to give: no good can follow rapid infusions in large quantities. A rough guide is that suggested by Harkins *et al.* (1942), giving 50 ml. for every 1% surface area involved. A more reliable method is the haematocrit. The first two pints (1.14 litres) can be given rapidly, but thereafter the rate should be 40 drops a minute. After the initial haematocrit reading (on admission of the patient) the amount to be given will be governed by further readings taken every few hours. The desired level is 45, but even when this is reached infusion should be continued for 12 to 24 hours, since the loss from the capillaries continues.

Anaemia

With a full-thickness skin burn involving 8% or more of the body surface anaemia will occur. The exact cause is unknown, but there is a depression of bone-marrow activity, and it is thought that infection and protein deficiency play a large part, certainly after the first week. If allowed to develop or remain untreated the consequences are (Moore *et al.*, 1946): a lowered resistance to infection (thus creating a vicious circle); anorexia; hypoproteinaemia; delay of application of skin grafts due to unhealthy granulation tissue; and reduction in the amount of take of skin grafts.

In view of these serious consequences it is clear that blood must be given early—even from the beginning of treatment in severe cases—and repeated at intervals to maintain a high level of haemoglobin (80% or more). This demands estimations of the haemoglobin every two or three days, and in calculating dosage it is to be remembered that one pint (570 ml.) of blood will raise the level by 7%. One pint of packed red cells, which takes about six hours to run in, will raise the level by 12% (Le Hane, 1950—personal communication). Transfusions may be required as often as twice a week in extensive burns.

Metabolism

A great deal of work has been carried out on the changes in the chemistry of the blood and urine in cases of burns. These are complex and their aetiology not yet fully understood, but the outstanding feature is the disturbance of the metabolism of protein. In severe burns there is an increase over the normal requirement of proteins, because of the demand for tissue repair and the production of red blood cells. From the onset, however, there is a loss of protein due to plasma loss (exudation and oedema), followed by that due to toxaemia, discharge of pus, loss of appetite, haemorrhage (for example, graft-cutting or secondary haemorrhage), and a negative nitrogen balance. The plasma protein level (6.5–8.5 g. per 100 ml., with albumin/globulin ratio 1.7 : 1) may not fall at once while the patient's reserves (muscles) of protein are being used. There will, however, be the clinical signs of wasting and exudation from the burnt surface. Protein will be lost by exudation until skin grafts have taken and coalesced.

The consequences of hypoproteinaemia are an increased nitrogen loss in the urine, general malnutrition, oedema, and delay of healing. As protein is essential for repair and energy, its loss must be anticipated. It is easy to order a high-protein diet (for example, milk, especially skimmed, meat, liver, eggs, brewers' yeast), but unfortunately anorexia is a complication of burns.

Plasma is a poor, and blood a good, source of protein, but they are insufficient. The continued efforts of a good ward sister are required, but these may need to be supplemented by amino-acids given by means of a Ryle's tube. The fluid (for example, "casydrol") should be run in slowly and shut off at intervals, in order to diminish the nausea which is apt to follow. While such diet is essential if healing is to occur, and indeed if life is to be saved, it must not consist solely of protein; carbohydrate and sodium chloride are to be included (for example, glucose-saline drinks or infusions), together with a small amount of vitamin C (fresh fruit, vegetables).

There is therefore a need to keep an accurate intake and output chart, so that the surgeon and ward sister are alert to the day-to-day requirements. If the patient is making progress there will be a good output of urine of low specific gravity; on the other hand, oliguria with a raised specific gravity is a bad sign. The fluid loss is not entirely by the kidneys; there may be very considerable loss due to exudation and sweating. But the kidneys play the major part in eliminating the unwanted products of tissue breakdown, and the fluid intake must be sufficient to ensure a satisfactory output (for example, aged 6 months, 350 ml.; 2 years, 500 ml.; 10 years, 1,000 ml.; adults, 1,500 ml. a day).

Infection

A chart to record the results of all smears, suggested by Professor Kilner, saves endless trouble in looking through sheafs of reports. It also presents at a glance a picture of progress made and of the introduction of added infection.

Although the area burned is rendered sterile at the time of injury, it is only a matter of hours before bacterial contamination occurs. The aim of the initial cleansing is to render the burned area and the skin around for a considerable distance as bacteriologically clean as possible. The next aim is to maintain this cleanliness, which is achieved either by the use of occlusive dressings (envelope method) or by infrequent changes of dressings (Allen and Koch, 1942; Colebrook *et al.*, 1947) carried out under strict aseptic conditions. Under such treatment infection should not occur in the partial-skin-thickness burn. The only certain method of avoiding infection of the full-skin-thickness burn is immediate excision and grafting. When this is impracticable, bacterial contamination is to be expected when the slough is separating, and until grafts have coalesced. Provided the haemolytic streptococcus is not present and the number of other bacteria (staphylococci, diphtheroids, Gram-negative bacilli) is small, no serious consequence will ensue. Nevertheless, every effort must be made to keep this contamination to a minimum, and, if the haemolytic streptococcus appears, the explanation of how it got there must be sought at once.

Sources of Infection.—The possible origins of the initial bacterial contamination are: the application of unsterile coverings as first-aid measures—for example, rugs, blankets, etc.; the patient's own clothing before it is removed; and the nose, throat, and hands of those who inspect or dress the burn. The sources of origin of added infection (Colebrook *et al.*, 1947) are: the patient's nose, throat, skin, or alimentary tract (that is, in perineal or buttock burns), air-borne infection in the ward as a result of bed-making, changing dressings, or dusting of floors; interference with dressings by the patient, particularly children; from flies; from non-sterilized blankets, woollen jackets, and dolls; inefficient protective dressings; and faulty dressing technique.

Effects of Infection.—If infection is not kept under control sloughs are slow in separating, and pale, exuberant, dirty-looking (yellowish) granulation tissue will appear. Fever with an irregular temperature, anorexia, and anaemia will ensue, and so cause a delay in healing. The anaemia lowers the resistance to infection, and thus a vicious circle is established, which becomes increasingly difficult to break as the general condition deteriorates. The amount of discharge increases, with an unpleasant odour. The take of grafts becomes less certain as the amount of infection increases, and especially so if haemolytic streptococci are present.

Prevention of Infection.—Infection and added infection are prevented or kept to a minimum by intelligent first-aid methods, the administration of systemic penicillin from the moment of admission, scrupulous care at the initial cleansing, and the provision of a dressing (or envelope) extending well beyond the burned area, so applied that it cannot move (for example, slipping down a limb).

Thereafter the prevention of infection depends upon the maintenance of perfect cover; the acceptance of the principle that dressings shall not be carried out in the general ward; day-to-day inspection of dressings for any evidence of seepage of discharge; preventing interference with dressings by the fingers of young patients, by splinting of limbs; infrequent changes of dressing; taking smears for bacteriological examination at every change of dressing together with penicillin- and streptomycin-sensitivity tests; preventing anaemia and keeping the patient in a good general condition; and, above all, the early removal of sloughs and early application of skin grafts.

Treatment of Infection

It is to be emphasized that an anaemic patient will make but a poor and temporary response to any form of chemotherapy. Penicillin should be used systemically from the time of admission of the patient (100,000 units eight-hourly) or "distaquaine" (300,000 units once daily). Whether penicillin is continued or a change is made to streptomycin (8 g. in a three-day course) will depend upon the results of the bacteriological examinations and sensitivity tests. Penicillin powder or penicillin-sulphathiazole powder (5,000 units of penicillin in sulphathiazole powder) can be used locally as a spray, but these are inactivated if "milton" disinfectant is being employed.

The difficulty in treating infected burned surfaces lies in the fact that the Gram-negative bacilli (*Pseudomonas pyocyanea, Proteus, and Bact. coli*) tend to predominate. The search for an efficient antibiotic for these organisms continues, and in the meantime no drug used singly or in combination can be relied upon with any certainty. The success of any drug or the decision to change to another is decided by the improved local condition checked by the results of the bacteriological examinations.

We find milton disinfectant of great value in the treatment of these mixed infections of burns together with systemic penicillin or short courses of streptomycin. With some of the smaller heavily infected granulating surfaces we sometimes use streptomycin compresses (1 g. dissolved in 50 ml. of normal saline) over tulle gras, with firm bandaging for two or three days immediately before applying skin grafts. The compresses are renewed three or four times a day.

The best treatment of all is the application of skin grafts, but this demands the presence of flat, red, firm, healthy granulation tissue (or a recently excised area)—a state of affairs possible only with assiduous local and general treatment as outlined above. Dramatic improvement may follow the use of plasma, even more so the use of blood, but relapse soon occurs after either. The successful application of skin grafts is the only means by which improvement can be maintained; the drain on the patient's protein reserves ceases; the appetite improves and is maintained: there is an increase in weight; and the mental outlook becomes bright and cheerful, more especially as function returns. To achieve this end quickly demands recognition that all concerned shall regard the treatment of burns as a major concern calling for team-work with sustained vigilance. Everything that is done for the patient must have a reasoned explanation.

Too often the initial treatment of a severe burn is excellent, but is followed by a period of inactivity during which the patient is literally dependent upon his own resources, and during which he steadily goes downhill.

References

Allen, H. S., and Koch, S. L. (1942). *Surg. Gynec. Obstet.*, **74**, 914.
Barnes, J. M. (1943). *British Medical Journal*, **1**, 408.
Bourdillon, R. B., and Colebrook, L. (1946). *Lancet*, **1**, 561, 601.
Bunyan, J. (1941). *British Medical Journal*, **2**, 1.
Clark, A. M., Colebrook, L., Gibson, T., Thomson, M. L., and Foster, A. (1943). *Lancet*, **1**, 605.
Colebrook, L. (1950). *A New Approach to the Treatment of Burns and Scalds*. Fine Technical Publications, London.
—— Duncan, J. M., and Butterfield, W. J. H. (1947). *Lancet*, **1**, 321.
Connor, G. J., and Harvey, S. C. (1946). *Ann. Surg.*, **124**, 799.
Glenn, W. W. L. (1944). Ibid., **119**, 801.
Harkins, H. N., *et al.* (1942). *Surg. Gynec. Obstet.*, **75**, 410.
Hudson, R. V. (1941). *British Medical Journal*, **2**, 7.
McIndoe, A. H. (1940). *Proc. R. Soc. Med.*, **34**, 56.
Moore, F. D., *et al.* (1946). *Ann. Surg.*, **124**, 811.
Osborne, R. P. (1944). *Brit. J. Surg.*, **32**, 24.
Wallace, A. B. (1948). In *British Surgical Practice*, **2**, 518. Butterworth Medical Publications, London.

BURNS—II. SKIN COVER FOR FULL-THICKNESS SKIN LOSS*

BY

J. P. REIDY, F.R.C.S.

Plastic Surgeon, Westminster Hospital and Stoke Mandeville Hospital

For the purpose of this paper it is considered that the burned area of the patient is ready for the application of skin. The patient has been treated as described in the paper by Mr. R. P. Osborne (page 1025) and the granulating areas have been rendered healthy, flat, and free from sloughs as near three weeks as possible from the date of injury. It is not necessary, in my opinion, that the granulations should be sterile, but it is necessary for success that the bacteria should be reduced from +++ content to + by the use of appropriate chemotherapy. The preparation of granulations for grafting argues the need for frequent smears to check the bacterial content and to indicate the appropriate chemotherapy. It is surprising how often one meets cases of burns treated indiscriminately with penicillin, etc., without even one smear being taken.

Object of Early Skin-grafting.—Early skin cover, even if at first only partial, reduces toxaemia and improves the general condition of the patient. Successful early skin cover gives early healing, reduces the formation of fibrous tissue, and permits restoration of function. In short, the earlier the healing the better is the chance of the return of normal function.

Autogenous Skin-grafting

Except in those cases of burns of 40% or more of the body surface, it is usually possible and best to use the patient's own skin. There is no place to-day for pinch grafts in the treatment of burns: the donor area is pitted and spoiled for future use. The Thiersch graft is more satisfactory in every way.

Under general anaesthesia the donor site—for example, the thigh or arm—is cleansed with a solution of "cetavlon" 1% and then with ether-meth, and draped with towels. Sheets of thin split-skin are cut, using a skin-grafting knife or a dermatome. My own preference is for a Humby knife, or a Marks-Blair knife with a roller attachment. When sufficient graft is cut, the sheet of skin is spread, raw surface upwards, on tulle gras. This sheet is cut into strips ½ in. (1.25 cm.) or less in width, and these strips, placed parallel to and close to each other on tulle gras, are again cut at right angles, so as to obtain small squares of graft ½ in. or less across, arranged in chessboard pattern.

Skin graft applied as a sheet to a granulating wound is likely to fail because of the presence of exudate from the wound surface which creeps under the graft and lifts the whole sheet. The same sheet of skin graft applied as small squares is more successful in that exudate can escape between the squares and is absorbed into the dressing (Fig. 1). Furthermore, applied in squares, a given sheet of skin will cover a wound area larger than the original intact sheet. It is therefore more economical as well as more sure. As the epithelization occurs from the margins of the squares, the smaller the squares the greater the available length of margin. Although a "patchwork" appearance may result from the application of skin in this fashion it must be stressed that the appearance is of secondary importance to the early healing and return of function.



FIG. 1.—Recent burns; face and eyelids. (*a*) Central tarsorrhaphy to right eyelids. Postage-stamp grafts to granulations. Slough still present on forehead. (*b*) Postage-stamp grafts coalesced. Thiersch graft to both right eyelids. (*c*) Months later: postage-stamp grafts replaced by sheet of Thiersch graft, to improve appearance. (*d*) End result. Hairy Wolfe graft to replace right eyebrow. Right eyelids separated.

The burned area is now exposed and a smear taken for bacteriological check. The granulations may be gently cleansed with "cetavlon" and then with saline, and finally compressed with dry gauze. There is no need to shave down the granulations, though this is advocated by some. The sheet of graft is applied to the granulations and held in place by strips of 3-in. or 6-in. (7.5-cm. or 15-cm.) cotton bandage stuck on to the normal skin adjacent to the burn area by "mastisol." Pressure is then applied, using gauze packs wrung out in normal saline and "elastoplast" or a many-tailed bandage.

Dressings are removed on the fourth, sixth, and eighth days after grafting only as far as the stuck-down cotton bandage, which is left undisturbed, so that the underlying grafts are not moved. Removal of dressings must be done very carefully, otherwise the grafts will come off as well. Smears can be taken of any exudate which escapes between the graft squares through the bandage on to the dressing. On the tenth day the grafts are exposed by the removal of the cotton bandage and tulle gras. The take of grafts is noted and the grafts are then re-covered with tulle gras and a saline gauze pack. Dressings thereafter are infrequent—every three to four days until the grafts coalesce, about 14 to 18 days after application.

*Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Liverpool, 1950.

The keloid scar becomes softer and paler and less indurated during several months after irradiation, and this regression may proceed for one to two years and so reduce any disfigurement. Where there is deformity by contracture, release of the contracture and the insertion of a skin graft is usually necessary, associated with pre-operative and post-operative irradiation.

The recent red fleshy scars respond best to irradiation. The whiter and older keloids are usually hard and fibrous, and these respond less well to radiotherapy, though it is advisable to combine radiation before and after excision. The same procedure is indicated in the surgical excision of keloid linear scars—to enlist the help of the radiotherapist. Linear scars are usually given irradiation five to ten days before operation, so that excision takes place during the actual period of *x*-ray reaction. Post-operative irradiation takes place shortly after the removal of stitches—that is, five to seven days after excision of the scar.

Late Cases of Burns and Healed Burns

Naturally, not all cases of burns reach the plastic surgeon in the early stages; nor is this desirable—otherwise he would be overwhelmed. Some cases arrive partly healed, with granulating surfaces and early contractures, and some are healed, but with scar contractures, loss of function, and disfigurements.

The unhealed cases are treated as primary cases, with investigation of the general condition, as well as provision of early skin cover. It is equally important to consider the levels of blood, plasma proteins, salts, and vitamins in these as in the early cases.

The healed cases include all those, of whatever source, in which there is loss of function and/or disfigurement by scarring. These may well be present even where adequate preliminary patch grafts have been applied, but it is expected to be less where this early treatment has been available.

The problems here are long-term and consist of: (*a*) restoration of function by scar excision and suture, scar excision and skin-grafting, and attention to tendons and joints; (*b*) improvement of appearance by irradiation of keloid scars, the use of full-thickness (Wolfe) skin grafts, and the use of skin flaps; and (*c*) physiotherapy, occupational therapy, and rehabilitation, as treatment of these cases may be spread over several months with intervals out of hospital.

Restoration of Function.—In brief, attempts are made to free affected joints by removal of scars, with or without the insertion of skin, and by the employment of the Z-plasty procedure. Attention to tendons and joints may require sheet skin or flaps on the backs of the hands and digits, and stripping up of extensor tendons to allow freedom of movement. Capsular thickenings, particularly around the metacarpophalangeal joints, can be relieved by capsulotomy. The position of ankylosed interphalangeal joints may be improved by arthrodesis, and, in fact, arthrodesis may be indicated where work on tendons is not justified by the expected result. Amputation of the fifth finger in a badly burn-scarred hand is often necessary.

Improvement of Appearance.—*X*-ray irradiation of keloid scarring of the chin and cheeks may improve the appearance sufficiently to do without surgical treatment. The use of full-thickness skin (Wolfe) is reserved for the purpose of obtaining good cosmetic results—for example, the provision of hairy grafts for eyebrows, and to provide skin for eyelids, nose, and cheeks of good colour and texture. Skin flaps are used in burn cases to provide skin and subcutaneous tissue where these have been lost—for example, on the face and neck, and on hands. The area to be covered should be known when the flap is raised, and for this reason the skin flap is used for final cosmetic results, after function has been restored so far as is possible, and not to release a scar contracture where the extent of gape of the incised wound cannot be predetermined.

Physiotherapy.—At all operative stages the surgical treatment is backed up by the physiotherapy department, members of which do so much to restore the usefulness of limbs and joint muscles, and to improve the blood supply of grafts and flaps. Further assistance is gained from occupational therapy between operations, to relieve boredom, as well as to improve function. This includes weaving, knitting, leather work, carpentry, and machining, though these are particularly applicable to hand injuries. Extremely useful progress has been made by certain firms in the motor industry who have modified their machine tools to assist the worker with joint and tendon injuries.

BIBLIOGRAPHY

Allen, H. S. (1948). *Surg. Clin. N. Amer.*, **28**, 125.
—— and Koch, S. L. (1942). *Surg. Gynec. Obstet.*, **74**, 914.
Block, M. A., and Tsuzuki, M. (1948). *Amer. J. Surg.*, **75**, 417.
Braithwaite, F., and Moore, F. T. (1948). *Brit. J. plast. Surg.*, **1**, 81.
—— and Watson, J. (1949). Ibid., **2**, 21.
Brodie, N. (1947). *Amer. J. Surg.*, **74**, 834.
Brown, J. B., and McDowell, F. (1943). *Skin Grafting of Burns*. Lippincott, Philadelphia.
Bunyan, J. (1941). *Proc. R. Soc. Med.*, **34**, 65.
Cope, O., Langohr, J. L., Moore, F. D., and Webster, R. C. (1947). *Ann Surg.*, **125**, 1.
Curtis, L. (1947). *Surg. Clin. N. Amer.*, **27**, 1466.
Douglas, B. (1944). *Surgery*, **15**, 96
Farmer, A. W., and Woolhouse, F. M. (1945). *Ann. Surg.*, **122**, 39.
Hannay, J. W. (1941). *British Medical Journal*, **2**, 46.
McIndoe, A. H. (1941). *Proc. R. Soc Med.*, **34**, 56.
Matthews, D. N. (1945). *Lancet*, **1**, 775.
Osborne, R. P. (1944). *Brit. J. Surg.*, **32**, 24.
—— (1945). *Postgrad. med. J.*, **21**, 121.
Owens, Neal (1947). *Plast. reconstr. Surg.*, **2**, 226.
Pearson, R. S. B., Lewis, E. E., and Niven, R. B. (1941). *British Medical Journal*, **2**, 41.
Pfahler, G. E., and Keefer, G. P. (1948). *Amer. J. Roentgenol.*, **59**, 378.
Reidy, J. P. (1944). *Proc. R. Soc. Med.*, **37**, 705.
—— (1948). *Med. Pr.*, **219**, 5.
Ross, W. P. D. (1950). *Brit. J. plast. Surg.*, **2**, 233.
Wakeley, C. P. G. (1941). *Proc. R. Soc. Med.*, **34**, 43.
Wallace, A. B. (1949). *Brit. J. plast. Surg.*, **1**, 232.
Watson, E. F., Hoge, W. G., and Koch, S. L. (1946). *Quart. Bull. Nthwest. Univ. med. Sch.*, **20**, 286.
Webster, J. P. (1944). *Ann. Surg.*, **120**, 431.

In the annual report (1949) of the Colonial Office on the East Africa High Commission (H.M.S.O., London) reference is made to the establishment in Nairobi of the East African Bureau of Research in Medicine and Hygiene. The Filariasis Research Unit, with headquarters in Mwanza, Tanganyika Territory, was also set up in 1949. The objects of the unit are to ascertain how serious a problem filariasis is to the economy and welfare of East Africa, and to investigate methods of control and treatment of filarial diseases, either by the use of drugs or by the control of insect carriers, or both. Pilot surveys were carried out in Tanganyika, and the results showed that bancroftial filariasis was worst near large masses of water—salt and fresh—and confirmed the remarkable patchiness of distribution of the disease even in areas showing a high overall incidence. Hetrazan has been found very effective in abolishing larval forms of filariasis from the body surface. Different courses of treatment have been tried out, and the individuals concerned will be followed up to ascertain the relative merits of the different dosage schemes. The East African Medical Survey is continuing its work in spite of staffing difficulties. The aim of the survey is to obtain a picture of the state of health of the African and information about how best to control the more important of the common diseases of East Africa. An innovation which will prove of value is the introduction in the Malya area of registration of births and deaths. In Kenya research is continuing on relapsing fever.

FIXATION OF A CORNEAL GRAFT BY AN ACRYLIC SPLINT

BY

H. B. STALLARD, M.D., F.R.C.S.
Surgeon, Moorfields Eye Hospital; Ophthalmic Surgeon, St. Bartholomew's Hospital

The fixation of a corneal graft is a matter of considerable importance both for its immediate fate and for its ultimate clarity; for any gross displacement of the graft may lead to its complete loss, together with the hazard of a lost eye, and small degrees of tilting are followed by opacification of the graft to some extent.

Some surgeons (Tudor Thomas and Castroviejo) favour the cutting of an oblique shelf in the deeper layers of the cornea to prevent the graft from slipping into the eye. The disadvantage of this procedure is that surgical manœuvres are increased compared with the clean cutting of the graft with a trephine alone, and in using instruments to effect the shelf some extra trauma is inflicted on the deeper layers of the cornea. Even with the utmost manual skill and perfect instruments the evenness with which such a shelf may be fashioned lacks microscopical precision.

In cases in which no attempt is made to cut a shelf, a graft cleanly cut by the trephine, 0.1 mm. less in diameter than that of the recipient's corneal bed, will, when perfectly fitted and maintained thus, remain in position and not slip into the anterior chamber.

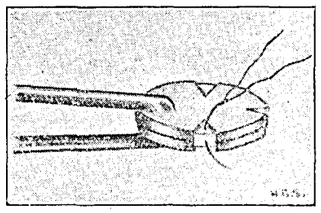


FIG. 1.—Arruga's box for holding full-thickness corneal transplant during the insertion of sutures.

It is generally agreed that some means of preventing the graft from being projected forwards and dislodged from its bed is desirable. This is effected by means of sutures placed either directly through the edges of the graft and its bed or indirectly in the adjacent cornea and made to traverse the graft as a mesh of sutures, preferably crossing it at eight sites equidistant from each other. There are many designs for the placing of such sutures. Mattress sutures passed through the conjunctiva and episcleral tissues at the limbus are often doomed to failure, for the long traverse across the cornea favours their displacement and they may endanger the graft by slipping between its edge and its bed. However, this is obviated by C. W. Graham's technique of lashing together the vertical and the horizontal mattress sutures at their four sites of crossing by four loops of silk tied anterior to each crossing.

Direct suturing of the edge of the graft is technically difficult and is apt to injure the graft, but is necessary in cases of aphakia and when it is feared the vitreous may herniate forward into the graft bed. To perform direct suturing special instruments are needed. Fig. 1 shows the corneal graft retained in Arruga's box, notched at four sites on its circular edge to give access to the passage of Grieshaber's corneal needles threaded with 000 black silk. It is of course important to mark the cornea with precision at the site for insertion of the sutures, for any irregularity will cause kinking of the graft and so imperfect coaptation of its edge.

Indirect suturing by the passage of mattress or some other design of stitch through half the thickness of the cornea about half-way between the edge of the graft bed and the limbus is generally effective in maintaining a graft in position. It is difficult to be sure that the right degree of tension is present in each suture and that this is evenly disposed among the eight sites where sutures cross the graft edge. Inequalities of pressure from these sutures may lead to slight lifting of the graft edge at places between the meshes of the suture network.

To effect evenly distributed pressure on the graft edge in one plane I have been trying a modification of Pittar's ring. Pittar's ring is made of tantalum, and so has the disadvantage that it is impossible to see the position of the edge of the graft at the end of operation and at subsequent dressings. It has a central aperture 3.5–4 mm. in diameter, and in some cases the graft is apt to bulge forward into this aperture.

The modification made for me by Theodore Hamblin consists of an acrylic splint (Fig. 2) shaped to conform with the curvature of the anterior surface of the cornea. The splint is a disk 1.5 mm. thick, 7.5 mm. in diameter, and from its edge there extend four flanges (see Fig. 2, a) at equidistant intervals. The end of each flange reaches to within 1 mm. of the limbus, and 1.5 mm. from the end of the flanges there is a notch on each side for the retention of a silk suture used for anchoring the flange to the cornea.

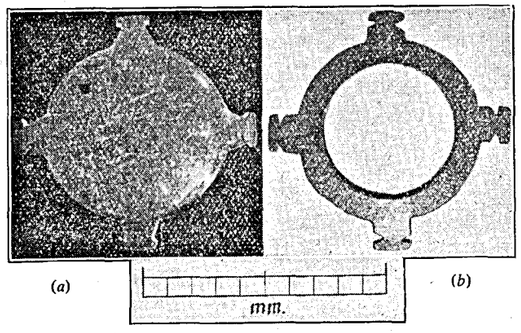


FIG. 2.—(*a*) Acrylic splint with flanges. (*b*) Pittar's tantalum marking-ring.

I have tried splints with a hole in the centre, 1 mm. and 2 mm. in diameter, in the belief that this would act like a perforated contact lens and allow some oxygenation of the graft. In two cases the hole filled with mucus and exudate, and temporarily a superficial central opacity occurred in the graft immediately beneath the site of the hole and corresponding with it in size. This opacity cleared within nine days of the removal of the splint. The disk splint also helps to mould the anterior surface of the graft. This was particularly evident in a case of interstitial keratitis where corneal grafts in both eyes were retained by this splint. The visual result in the right eye is 6/5 with a small minus cylinder, and in the left eye is 6/9, with no apparent refractive error and unimproved by a lens.

Operative Technique

Pittar's tantalum marking-ring with an aperture 5.1 mm. in diameter (Fig. 2, b) is placed on the cornea so that the disk of opaque cornea to be removed is included within the aperture of the ring and lies over the pupil. With the ring in place a 5.1-mm. trephine is fitted into the aperture and with several turns of the trephine the corneal epithelium is cut. The trephine and marking-ring are now removed and the trephine cut is stained with fluorescein.

The acrylic splint is now placed on the cornea so that it overlaps the trephine incision, which is seen through the transparent acrylic as a green ring. The flanges are placed in the 12 to 6 o'clock meridian and the 9 to 3 o'clock meridian. The cornea is dried with the tip of a sterile filter paper at the sites of the notches in the flanges, and these sites are marked on the cornea with a dot of gentian violet.

The acrylic splint is now removed. No. 000 black silk sutures threaded at each end with Grieshaber's needles are passed through half the thickness of the cornea at the site of the dots; in the case of the 12 and 6 o'clock flanges the sutures pass transversely and in the 9 and 3 o'clock positions they pass vertically (Fig. 3). The arms of these

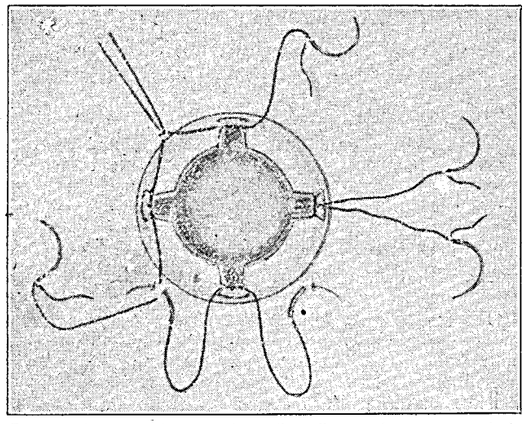


FIG. 3.—Suture anchorage of acrylic splint to the cornea and the conjunctiva at the limbus.

sutures are then secured to the head towel with bulldog clips in their proper order.

The disk of opaque cornea is now cut with a 5.1-mm. trephine and removed. Any tags of Descemet's membrane are trimmed. The corneal graft is set into its bed and the acrylic splint is placed over this. The edges of the graft are clearly seen through the transparent acrylic, and any necessary adjustment may be made with the tip of an iris repositor. The notches of the flanges are placed in line with the sutures, which are now brought forward in the notches and tied with a surgical knot, the needles being retained on the ends of the sutures.

To make the anchorage of the acrylic splint even more secure each arm of the suture is brought out through the conjunctiva at the limbus at a site about equidistant from each flange (Fig. 3). For instance, in the right eye the temporal arm of the 12 o'clock flange suture is carried through the conjunctiva at 10.30 o'clock and so is the upper arm of the 9 o'clock flange suture. These sutures are then tied and their ends left long. A like procedure is done with the nasal arm of the 12 o'clock flange suture and the upper arm of the 3 o'clock flange suture, which traverse the limbal conjunctiva at 1.30 o'clock, and so with the other sutures to effect additional anchorage at 7.30 and 4.30 o'clock in the limbal conjunctiva. The ends of these sutures are left long and the pairs of these are then brought obliquely across the acrylic splint from 7.30 to 1.30 and 4.30 to 10.30 o'clock. This cross of double sutures is the third means of anchoring the acrylic splint.

Post-operative Technique.—Between the eighth and tenth days after operation one or two of the limbal sutures cut out, but the corneal sutures hold firm. The acrylic splint is removed on the tenth day. In seven cases thus treated to date, the graft has been clear, its edge showed perfect coaptation to the bed in the recipient's cornea, and its surface was evenly moulded by the splint to conform with the curvature of the cornea. There has been some conjunctival irritation, particularly at the limbus.

Summary

A method of fixing a corneal graft by means of an acrylic disk splint with four flanges anchored to the cornea with sutures is described.

Acknowledgment for the use of Fig. 1 is made to Messrs. John Wright, of Bristol, who published it in the second edition of *Eye Surgery*, and for Fig. 2 to the Editor of the *British Journal of Ophthalmology*.

EFFECTS OF PENICILLIN AND STREPTOMYCIN ON VACCINE LYMPH

BY

V. N. KRISHNAMURTHY, M.D.
Superintendent, Government Vaccine Institute, Bangalore (Indian Union)

With the best of care, heavy bacterial contamination of vaccine lymph (calf lymph) is inevitable during its preparation, and as many as 500 million organisms per ml. may be present, particularly in the Tropics. They belong mostly to the cocci group, but may include also *Bacillus subtilis, Bact. coli, Pseudomonas pyocyanea*, yeasts, and fungi; anaerobic organisms may also be occasional contaminants. None of the methods so far advocated to reduce the number of bacteria can be considered satisfactory. The use of eggs and tissue-culture to prepare the sterile vaccine aseptically has not met with universal approval, because of the uncertain immunizing power of the product: calf lymph still holds the field. Many institutes in India employ what is known as the "chloroform process," in which chloroform vapour is bubbled through the vaccine lymph for a known time to sterilize it. But, since chloroform has no action on spores, the spore-bearers present in the lymph persist. Other countries use different methods. But so far no method has been found consistently to give absolute bacterial sterility.

The antibiotics, by virtue of their action on bacteria, should be of great value in the purification of vaccine lymph; and I have made a detailed study of their use under different conditions.

Effect of Penicillin on Glycerinated Vaccine Lymph

This has already been investigated by various workers (Diaz Romero, 1945; Morin and Turcotte, 1946; Patel, 1948) with very encouraging results, but in my experience it is disappointing (Krishnamurthy, 1949). This is probably because previous work seems to have ignored the possibility of interference with the sterility tests by the residual penicillin in the stored lymphs. In the present experiments residual penicillin from the treated lymph was removed by alternate washing with distilled water and centrifuging four times, and the sediment was tested for sterility. The plate showed numerous colonies of staphylococci and a few

B. subtilis groups of organisms, while the unwashed lymph (still containing penicillin) naturally gave no growth whatever (Table I).

TABLE I.—*Effect of Penicillin*

No.	Penicillin (Units per ml.)	Duration of Contact with Penicillin	Colony Count on Lymph Samples	
			Before Removal of Penicillin	After Removal of Penicillin
1	500	1 week	No growth	230 millions per ml.
2	5,000	1 ,,	,, ,,	238 ,, ,, ,,
Control	Nil (untreated lymph)		240 millions per ml.	

0·1 ml. of undiluted lymph was used for testing unwashed penicillin-treated lymphs and 1 ml. of one in a million dilution was used for penicillin-removed and untreated control lymphs.

It is clear that the organisms are not killed but merely inhibited by penicillin, and once the penicillin is removed or inactivated the inhibited organisms show up.

Effect of Streptomycin on Glycerinated Vaccine Lymph

In one of the experiments streptomycin was added in concentrations varying from 500 μg. to 10,000 μg. per ml. of glycerin vaccine lymph and preserved in cold storage. Sterility tests after varying periods gave encouraging results. It was observed that there was a fall in the bacterial population proportional to the concentration of streptomycin and the duration of its contact (Table II).

TABLE II.—*Effect of Streptomycin*

Sl. No. of Lymph	Conc. of Streptomycin (μg. per ml.)	Staphylococcal Colony Count per ml After	
		24 Hours	1 Week
1	500	10,200	7,900
2	1,000	1,400	1,100
3	2,000	300	100
4	5,000	240	40
5	*Nil*	252 millions	240 millions

No appreciable difference was noted between tests done before and after removal of residual streptomycin by alternate washing with distilled water and centrifuging six times, except that there was some growth of *B. subtilis* afterwards, showing that the spores were only inhibited and not killed by the antibiotic.

In combination with 500 units of penicillin per ml. as little as 500 μg. of streptomycin per ml. reduced the bacterial contamination to a greater extent (Table III).

TABLE III.—*Effect of Combined Action of Streptomycin and Penicillin*

Sl. No.	Conc. of Penicillin (Units per ml.)	Conc. of Streptomycin (μg. per ml.)	Colony Count per ml. After	
			24 Hours	1 Week
1	500	500	150	60
2	1,000	1,000	130	60
3	2,000	2,000	140	30
4	*Nil*	*Nil*	252 millions	240 millions

Tests were done after removing the residual antibiotics to eliminate penicillin interference. *B. subtilis* spores were found to be unaffected by this method also.

A study of the effects of these antibiotics under conditions optimal for their action, permitting a growth phase of the bacterial flora of the vaccine, was next taken up.

Effects of Antibiotics on Vaccine Pulp at 37° C.

Vaccine material (vaccine pulp) immediately after collection from the calf was diluted with two volumes of distilled water (no glycerin was added) and well emulsified. The emulsion was then treated with streptomycin in concentrations varying from 500 μg. to 10,000 μg. per ml., both singly and in combination with penicillin, and incubated at 37° C. for 24 hours. Bacterial reduction was complete after 24 hours' incubation in 5,000 μg. of streptomycin per ml. singly or in combination with 1,000 units of penicillin. *B. subtilis* spores were also affected. It was found that moulds which persisted in lower concentrations were suppressed in 10,000 μg. of streptomycin (Table IV).

TABLE IV.—*Effect of Streptomycin and Penicillin on Vaccine Emulsion (Without Addition of Glycerin) at 37° C. for 24 Hours*

Sl. No. of Samples	Conc. of Streptomycin (μg. per ml.)	Conc. of Penicillin (Units per ml.)	Bacterial Count per ml.
1	500	—	1,800 staph.
2	1,000	—	1,500 staph.
3	5,000	—	Moulds only
4	10,000	—	*Nil*
5	—	500	Numerous *Bact. coli* and 250 staph.
6	—	1,000	Numerous *Bact. coli* and 200 staph.
7	500	500	150 staph.
8	1,000	1,000	120 staph.
9	1,000	5,000	Moulds only
10	1,000	10,000	*Nil*
Control	—	—	1,200 millions (staph., *B. subtilis*, *Bact. coli*, and moulds)

Tests were done after removal of residual antibiotics.

Penicillin alone in concentrations of 500 and 1,000 units per ml. under the same conditions brought down the staphylococcal contaminants to 250 per ml. and 200 per ml., respectively, and the *B. subtilis* content to *nil*, but allowed an abundant growth of *Bact. coli* (Table IV).

External Application to the Calf

Application of streptomycin in combination with penicillin in varying concentrations over the vaccinated area of the calf twice a day for five days also yielded good results. Three different concentrations (100 units of penicillin and 1,000 μg. of streptomycin per ml., 500 units of penicillin and 5,000 μg. of streptomycin per ml., and 100 units of penicillin and 10,000 μg. of streptomycin per ml.) were used on different animals. The first application was about one hour after vaccinating the animal, and the last one about 18 hours before the scraping of the vesicles. The scraped material was emulsified in glycerin in the usual manner and stored in the refrigerator. It was interesting to find that external application of streptomycin reduced the bacterial contamination to a very great extent, the count being not more than 200 organisms per ml. of vaccine lymph in all the cases. *B. subtilis* spores were unaffected by this method also.

Effects on Potency of Lymph

Vaccine lymphs treated with different concentrations of the two antibiotics for varying periods were tried periodically for potency on rabbits. The highest concentration of penicillin used was 10,000 units per ml., with a contact period of about one year, and of streptomycin 10,000 μg. per ml., with a contact period of about six months. None of the samples tested showed any loss in potency.

Clinical Trial on Children.—Penicillin-treated lymphs were not tried on human beings, on account of their bacterial impurity. A preliminary trial, on children, of streptomycin-treated lymphs (both with and without further dilution) satisfying the various standardization tests indicated that the vaccination "takes" were normal and uneventful. The work is being pursued further.

Discussion

Chain and Duthie (1945), Todd (1945), and others have established that penicillin is bactericidal against susceptible organisms only during their growth phase in a nutrient medium and not while "resting" in a non-nutrient fluid. Glycerinated vaccine lymph is a non-nutrient medium, which explains the failure of penicillin in reducing the bacterial flora.

On the other hand, Strauss (1947) and Garrod (1948) have clearly demonstrated that streptomycin is bactericidal both in nutrient and in non-nutrient fluids, though needing higher concentrations in the latter; and streptomycin has likewise proved effective in lymph. Further, it acts synergistically with penicillin, as little as 500 μg. of streptomycin with 500 units of penicillin per ml. producing an equally effective bacterial reduction of vaccine lymph. Chain and Duthie (1945), Himmelweit (1945), and Pulaski, Kleinman, and Duncan (1946) report that certain antibiotics in combination with sulphonamides, bacteriophage, or other antibiotics have such a synergistic action.

While the Therapeutic Substances Act permits up to 5,000 organisms per ml. of lymph, streptomycin-treated lymphs have barely 200 organisms per ml.—in some cases no bacteria at all. The minimal requirement for a consistently successful vaccination "take" in children in the Tropics is a 10^{-4} or 10^{-5} positive potency (as tested by continuous vaccinal vesiculation on the rabbit); the streptomycin-treated lymphs have usually a 10^{-8} positive potency, or more. This permits the use of highly diluted vaccines and effects a great saving in production cost.

Summary

The effects of penicillin and streptomycin on vaccine lymph (calf lymph) under different conditions are described.

Penicillin is ineffective in reducing the bacterial flora of vaccine lymph under those conditions; this becomes evident only when tests are conducted after removal of residual penicillin from the penicillin-treated lymphs.

Streptomycin successfully brings down the bacterial flora of the vaccine lymph to the required extent.

Neither antibiotic affects the potency of vaccine lymph.

The application of these findings to the preparation of purer calf lymph at a substantially lower cost than at present is discussed.

I am grateful to Dr. T. Chandrasekhariah, Director of Public Health in Mysore, for granting the facilities to undertake this work and for permission to publish this paper. I wish also to thank my staff for their co-operation throughout.

REFERENCES

Chain, E., and Duthie, E. S. (1945). *Lancet*, **1**, 652.
Diaz Romero, C. (1945). *Arch. Soc. Biol. Montevideo*, **12**, 152. Abstract in *J. Amer. med. Ass.*, 1946, **131**, 1100.
Garrod, L. P. (1948). *British Medical Journal*, **1**, 382.
Himmelweit, F. (1945). *Lancet*, **2**, 104.
Krishnamurthy, V. N. (1949). *Curr. Sci.*, **18**, 373.
Morin, J. E., and Turcotte, H. (1946). *Canad. J. Res.* (E), **24**, 149.
Patel, T. B. (1948). *Indian med. Gaz.*, **83**, 452.
Pulaski, E. J., Kleinman, A. M., and Duncan, G. G. (1946). *Ann. N.Y. Acad. Sci.*, **48**, 183.
Strauss, E. (1947). *Proc. Soc. exp. Biol., N.Y.*, **64**, 97.
Todd, E. W. (1945). *Lancet*, **1**, 74.

The British Hospitals Contributory Schemes Association combined its second annual general meeting in London on October 13 with a conference on convalescence and aftercare opened by Sir Allen Daley, chief medical officer of London County Council. Mr. Henry Lesser was reappointed president, Mr. W. G. Nevin honorary treasurer, and Mr. John Dodd honorary secretary. Three million citizens are now raising £2m. a year to obtain benefits supplementary to the National Insurance and Health Service Acts, and the thirty schemes affiliated to the association raised charitable income for amenities for hospital patients, medical research, and medical charities of more than £40,000 in 1949.

Medical Memoranda

Cushing's Syndrome Presenting with Features of a "Type II" Nephritis

The following case is interesting enough to be placed on record.

CASE REPORT

A 3-para aged 41 was admitted on January 3, 1949, complaining of swelling of face, abdomen, and lower limbs of two months' duration. There was some frequency of micturition and thirst.

On admission she was found to be obese, with gross, very soft pitting oedema of lower limbs and abdomen; hair growth was normal; blood pressure 190/90; fundi were normal. The urine contained a "light cloud" (40–80 mg./100 ml.) of albumin; no casts; no sugar; protein, 0.252 g. per 100 ml.; total protein in 24 hours, 3.8 g. The blood urea content was 29 mg. per 100 ml.; blood urea clearance, 68% of average normal; plasma total protein, 4.6 g.% (albumin 3.1 g., globulin 1.3 g., fibrinogen 0.2 g.); A/G ratio, 2.4:1. Serum cholesterol, 408 mg./100 ml.

The presumptive diagnosis was Type II nephritis (Ellis), and she was put on a salt-free high-protein diet. After three weeks the oedema had almost subsided. There was only a trace of albumin in her urine (0–2 mg./100 ml.), and she felt better. Her blood pressure was still 190/90. She was discharged and told to attend the out-patient department for a follow-up.

The patient was readmitted on February 16. She had been getting weaker for three weeks, suffering from intense thirst, anorexia, constipation, and mental depression, and had missed two periods.

On examination she was ill, lethargic, and dehydrated. There was a dusky cyanosis of her rather large face, which was covered with fine downy hair. The skin throughout was dry and scaly, and there was generalized pitting oedema, most noticeable in the legs. The external primary and secondary genitalia were atrophic. Blood pressure was 185/105; fundi were normal. A firm mass could be palpated in her right loin as well as a firm and possibly irregular liver edge. Cutis marmorata was noticed. A diagnosis of Cushing's syndrome was made, with a suprarenal lesion and some renal defect.

Investigations after readmission showed: blood urea, 58 mg./100 ml.; urine, 40–80 mg. of albumin per 100 ml.; very few hyaline and granular casts; haemoglobin. 73%; R.B.C., 4,270,000; C.I., 0.85; serum cholesterol, 200 mg./100 ml.; 17-ketosteroids per 24 hours, 31 mg.; blood sodium, 335 mg./100 ml.; blood potassium, 16.5 mg./100 ml.; plasma phosphorus, 1.2 mg./100 ml.; serum calcium, 8.7 mg./100 ml.; urine loaded with sugar and acetone (to 2%); blood sugar content, 407 mg./100 ml.

After stabilization of her diabetes Mr. Donald Barlow, on April 5, removed a large encapsulated suprarenal tumour. In spite of pre- and post-operative saline plasma, "eucortone," deoxycorticosterone acetate, "methedrine," etc., the patient died 14 hours after the operation.

Post-mortem findings showed a typical adrenal cortical carcinoma with secondary deposits in the liver and lungs. Macroscopically the kidneys, thyroid, and pituitary gland were normal. The left adrenal was smaller than normal. Microscopically the kidneys showed some tubular cloudy swelling, but the glomeruli gave no evidence of nephritic change. True basophil adenoma was not found in the pituitary, but there was an excess in the numbers of basophil cells present.

COMMENT

The interesting feature of this case is that the oedema and albuminuria were so pronounced that it was at first assumed to be an example of "Type II" nephritis.

There might have been a number of explanations for this.

1. *Renal Disease.*—Cushing (1933) and MacMahon, Close, and Haas (1934) mention hypertension, chronic nephritis, and even malignant nephrosclerosis in association with Cushing's syndrome. However, in the present case output was adequate, specific gravity between 1010 and 1020 at all times, albuminuria never severe enough (40–80 mg./100 ml.) to explain the massive oedema, and blood urea and urea clearance were within normal limits, as were plasma total and fractional proteins and the albumin/globulin ratio. One point of interest is that on her first admission the patient's serum cholesterol was 408 mg./100 ml. (a feature together with physical signs suggesting Type II nephritis), but at the time of her second admission it was only 200 mg./100 ml. At necropsy there was neither macroscopic nor microscopical evidence of renal disease.

2. *Disturbance of Salt-Water Metabolism.*—It has been found that in Addison's disease there is a lowering of serum sodium and chloride concentration and an increase in serum potassium (Loeb, 1932), leading to loss of fluids, dehydration, and collapse. It would seem reasonable to assume that in a case such as ours, in which there was an excess of actively secreting cortical substance, evidenced by raised ketosteroid excretion, there might be retention of serum sodium and loss of serum potassium, leading to increase of the crystalloid concentration of the blood, fluid retention, and oedema. In our patient, at a time when the oedema was extreme, we obtained and checked a normal blood sodium and potassium reading.

In conclusion, I must admit that the cause of the oedema in the patient remains elusive.

My thanks are due to Dr. R. Sleigh Johnson, under whose care the patient was admitted, for permission to publish this paper and for his continued interest and encouragement; also to Dr. G. E. Thomas for performing the post-mortem examination.

F. W. WOLFF, M.B., B.S.

REFERENCES

Cushing, H. (1933). *Arch. intern. Med.*, **51**, 487.
Loeb, R. F. (1932). *Science*, **76**, 420.
MacMahon, H. E., Close, H. G., and Haas, G. M. (1934). *Amer. J. Path.*, **11**, 177.

Recurrent Obstruction of an Obturator Hernia

The following case brings out the important features of the condition, the main factors of which are difficulty in diagnosis, difficulty in reduction, and difficulty of repair.

CASE REPORT

A married woman aged 64, who had had a bilateral femoral hernia operation many years previously, was admitted in August, 1947, with intestinal obstruction. Her symptoms of colicky abdominal pain, vomiting, constipation, and pain on the inner side of her right thigh subsided with conservative treatment. A barium meal and follow-through were normal afterwards, and she was discharged.

In May, 1948, she was readmitted with the same condition. Laparotomy through a right mid-paramedian incision was performed. Nothing was seen, but a hand put down into the right iliac fossa felt a loop of bowel tied down there. Gentle traction freed this, and, though the site of obstruction was not seen, it was thought that the bowel had been adherent to the abdominal end of the right femoral canal. The abdomen was closed, and the patient recovered uneventfully.

In May, 1949, the patient was again admitted with acute intestinal obstruction. She complained of pain down the inner side of the right thigh. Examination revealed tenderness in the region of the pectineus muscle. In view of this sign and her previous history, a diagnosis of strangulated obturator hernia was made and operation undertaken.

Operation.—A low right paramedian incision was made and the diagnosis confirmed, a loop of ileum being strangulated in the right obturator canal. Traction from within failed to reduce this. The sac was therefore exposed through the upper part of the right thigh. The pectineus and the adductor longus were retracted, and the adductor brevis split, bringing the sac into view. Opening the sac revealed a small knuckle of ileum. Reduction was effected by pressure from below and traction from above. A small area of non-viable bowel was inverted with Lembert sutures.

Repair was attempted by means of stitches inserted through the proximal end of the obturator canal via the abdominal wound. These stitches failed to obliterate the canal owing to the usual difficulty of finding tissue to close the gap without interfering with the obturator vessels and nerve.

Accordingly, the canal was plugged from below by a rolled-up piece of tantalum gauze inserted through the thigh wound. This was held in place by suturing the adductor brevis over the lower end. The thigh and abdominal wounds were then closed.

The patient's convalescence was uneventful, and the subsequent radiographs have shown that the tantalum remains *in situ*. The wounds healed by first intention. Six months after the operation no further symptoms had developed.

COMMENT

Strangulated obturator hernia is a rare condition first described in France in 1724, but an operation was first performed for it by Hilton 74 years later. Pre-operative diagnosis is seldom made, and the operative mortality is in the region of 30%. It is much commoner in women, and 50% of the cases described were in their sixties. The youngest case reported was that of a child of 12.

The sac is not palpable except in large herniae, when it may protrude superficially between the pectineus and adductor longus. Pain down the inner side of the thigh and even in the knee is due to irritation of the obturator nerve, which lies medial to the sac. Irritation of the genicular branch of this nerve causes pain in the knee. The sac, which usually contains small intestine, may in very rare cases strangulate between the two layers of the obturator membrane.

Repair has not often been attempted, and this would seem to be important, as a case was reported by Corner in 1908 in which a patient suffered two recurrences of strangulation in six years. There is little doubt that the obstruction in 1948 in the above case was also due to an obturator hernia which was reduced and not repaired.

I would like to thank Mr. T. W. Mimpriss, who performed the hernial repair, for his help in the production of this report.

B. W. T. PENDER, F.R.C.S.

Members of the medical profession and public health workers from Italy, France, British Guiana, Singapore, and Brazil have been attending a three-weeks public health course in Bristol arranged by the British Council in association with the city's medical officer of health and the university. Demonstrations were arranged of sanitation in the house and in restaurants and other public places, the handling of food and drink, and the control of nuisances and offensive trades. Housing problems were also considered, both in the city of Bristol and in rural areas. Finally, those attending the course had the opportunity of observing how the maternity and child-welfare service was organized.

Reviews

SURGICAL TECHNIQUE

Techniques in British Surgery. Edited by Rodney Maingot, F.R.C.S. (Pp. 733; 473 figures. £3 15s.) Philadelphia and London: W. B. Saunders Company. 1950.

This book consists of a number of separate articles on various surgical subjects written by 29 distinguished British surgeons, each article being on a subject in which the author is an acknowledged expert. As might be expected, every article reaches a high level both in matter and presentation, but the uniformity of the level is evidence of careful selection by the editor, and he is to be congratulated on his judgment. The production is of the highest order, and results in a volume as attractive in appearance as it is valuable in content.

It is not easy to review a series of articles as varied in aim as in authorship, and it is impossible even to refer to them all. They fall, however, into certain natural groups. In the first we would place a series of longer articles on subjects of interest to the general surgeon, if such a being any longer exists. They are at least of vital importance to all who have to deal with a wide field of surgery. We shall refer to them in the order in which they appear.

Bennett describes the treatment of empyema thoracis in an excellent article, beginning with a discussion of the principles involved and the means available for the precise diagnosis upon which the success of treatment is shown to depend. He clearly describes conservative treatment and active surgical treatment with a wealth of detail which every surgeon will appreciate. Chronic empyema is as fully discussed, and he gives useful hints for handling these difficult cases. The whole article is obviously the outcome of wide experience and is of great value.

Ian Aird discusses in a practical way the diagnosis and management of acute intestinal obstruction. In treatment he stresses the value of gastro-duodenal suction combined with intravenous fluid, deferring operation to the moment of choice, and he makes useful practical suggestions on these matters which seem so simple to those without experience. The discussion of operations is clear and apposite.

Norman Tanner discusses the surgery of peptic ulcers in an article which for sound approach and practical detail could not be excelled. For partial gastrectomy the procedures he adopts are the Polya-Hofmeister and Billroth I operations, and these he describes with great clarity and completeness. Every point of precise technique is studied and illustrated, and every surgeon in this field will appreciate the vast experience which is so generously placed at his disposal. The difficult problems of anastomotic ulcers, perforation, and haemorrhage are well discussed, and the whole article is obviously inspired by sound judgment in which daring and caution are well balanced.

F. H. Bentley considers acute infections of the hand and succeeds in compressing an immense amount of valuable information into small compass. It is not every surgeon who realizes the great importance of these conditions and who is prepared to devote to them the care and attention which they demand. The advent of penicillin has vastly increased the possibilities of success, but it has in no way reduced the need for care and skill, and every surgeon who has to treat these difficult conditions will value this practical guide, full of precise detail such as can result only from ripe experience.

The management of senile and diabetic gangrene is discussed by A. M. Boyd in a brilliant and original paper. He shows that obliterative vascular disease includes a number of separate entities in which spasm, trauma, degeneration, and thrombosis all play a part. His thesis is illustrated by a series of arteriograms which make quite clear the essential points in differential diagnosis. The important differences between juvenile and senile obliterative arteritis are well explained, as are the corresponding differences in treatment. He discusses treatment in detail and brings much light and not a little hope into a region of surgery hitherto lacking both.

In the second group we place those articles on subjects which are now properly regarded as the field of the specialist. In every case these reach a very high level. The modern treatment of head injuries is discussed by Rowbotham; he describes technical points clearly, and operation details are well illustrated. Lambert Rogers has an interesting article on spinal tumours, and succeeds in giving a useful condensed account of diagnosis and operative work.

Piercy gives an admirable account of the thyroid gland and discusses fully every aspect of its surgery. The preparation of the patient and important preliminaries to operation are clearly set out; he then gives a clear and detailed description of operative removal of the gland. There is no field in which detail is of more importance, and here every detail is shown clearly in beautiful illustrations. The article is a masterpiece of effective condensation.

Pneumonectomy is discussed by Holmes Sellors and pulmonary tuberculosis by Price Thomas in articles which are in a sense complementary and are on a highly specialized field of work. As one would expect, both articles reach a very high standard and show clearly the great advances of recent years. In both great attention is properly given to the special technique involved, and it can be readily followed from the fine illustrations supplied.

Articles on vagal resection by Daintree Johnson and on cardiospasm by Maingot deal effectively with two difficult problems and deserve close attention. Vaughan-Jackson supplies an admirable paper on arthrodesis of the hip, knee, and ankle, describing in detail the latest practice, and Lawson Dicks gives a clear account of bone transplants in bone and joint injuries. Wakeley brings forward many interesting points in a short article on cysts of the epididymis.

Also on specialized work is a fine article on congenital defects of the heart by Mercer, with much valuable detail from his own experience. Keynes presents a brief but masterly description of thymectomy for myasthenia gravis, to which he has made so distinguished a contribution. Illingworth describes the operative treatment of carcinoma of the head of the pancreas, largely from his own work in this advanced field of surgery.

Dennis Browne describes an ingenious operation for hypospadias, and contributes articles on congenital disorders of the hip and talipes. Discussing the rectum, Norbury gives an interesting account of benign strictures, while Lloyd-Davies and Naunton Morgan describe the combined operation for carcinoma with which they have obtained brilliant results.

Here we can only mention other articles—each of importance in its own field—on Parkinson's disease, by Oliver; on mammaplasty, by McIndoe; on aseptic anastomosis and on herniae, by Monro; on radical prostatectomy, by Millin; on female stress incontinence, by Read; on

recurrent dislocation of the shoulder, by Crawford Adams; and on nerve suture, by Zachary.

The whole book is characterized by clear and concise presentation and contains in brief form an extraordinary amount of important detail. It is a masterpiece of production, and the illustrations are exceptionally well chosen and of a high artistic level. We would congratulate the editor and all the contributors on a brilliant achievement which does honour to British surgery.

HENRY SOUTTAR.

ANTIHISTAMINES

The Antihistamines. Their Clinical Application. By S. M. Feinberg, M.D., and others. (Pp. 291. $4.) Chicago: The Yearbook Publishers Inc. 1950.

The comparatively recent introduction of antihistamine substances into clinical practice, the multiplicity of preparations available, the claims and counter-claims for their efficacy in this or that condition, and yet their known wide sphere of therapeutic usefulness make a short book on the subject welcome, especially when it is written by acknowledged experts. This work condenses the facts, crystallizes the essence, and presents the practical application of our present knowledge of these drugs. The approach is mainly clinical, though there is a short introductory section on the part played by histamine in the production of anaphylaxis and allergy and on the chemistry of the antihistamines, without which an intelligent understanding of the practical application of these drugs is impossible. The clinical work is largely based on the authors' own experience, but 586 references are quoted—a solemn thought when it is considered that they represent only a fraction of the papers published on the subject. It is refreshing to find that European literature is widely referred to, which has not always been a feature of many otherwise excellent American works.

The authors conclude that, properly used, antihistamines are almost specific antidotes in urticaria and angioneurotic oedema, of great value in hay fever and to a slightly less extent in perennial vasomotor rhinitis, and of occasional benefit in the pruritic dermatoses; that used topically they have a part to play in various dermatitic, nasal, and bronchial conditions; that "dramamine"—the 8-chlorotheophylline salt of "benadryl"—prevents motion sickness in a very high proportion of cases, though it is acknowledged that adequate comparative studies with hyoscine have not been made to test the relative efficacy of the two drugs; and that antihistamines are of little or no value in the treatment or prevention of asthma, the common cold, and acute nephritis. Most authorities in this country will entirely agree with these views. The book contains a mass of useful information and may be confidently recommended to the practising doctor.

D. M. DUNLOP.

PAPERS ON PSYCHO-ANALYSIS

The Psycho-Analytic Reader. An Anthology of Essential Papers, with Critical Introductions. Edited by Robert Fliess, M.D. The International Psycho-Analytical Library, No. 38. (Pp. 358. 18s.) London: The Hogarth Press. 1950.

This is an anthology of twenty-six psycho-analytical papers, short and long, most of which have been hitherto either inaccessible to the English reader or likely to escape his attention. It will be of service to the psycho-analytical student, but rather baffling to those who are not already grounded in psycho-analytical theory and who cannot therefore be expected either to appreciate or to understand fully a mixed bag of unfamiliar communications.

Of special interest to the psychiatrist are Tausk's paper on the "Influencing Machine" in schizophrenia and Brunswick's supplement to Freud's analysis of the famous Wolf-Man case. A small collection of papers by Abraham includes that on the "Impostor" (1925), in which Abraham described how a "wife-mother" transference brought about the social regeneration of a chronic criminal psychopath. The most systematic part of the book contains papers by Deutsch, Lampl-de Groot, and Brunswick on that bone of psycho-analytical contention, the development of female sexuality.

Like most anthologists, Dr. Fliess mars his good effects by including a number of superfluous scrapings from the porridge-pot. Reich's articles on characterology are meagre fare which should have been omitted from the menu. The editing is efficient, if sometimes lacking in discrimination.

EDWARD GLOVER.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Papers of the Michigan Academy of Science, Arts, and Letters. Edited by E. S. McCartney and H. Van der Schalie. Vols. 32 and 33. (Pp. 522 and 414. 60s. each volume.) London: Geoffrey Cumberlege. 1950.

Congenital Heart Disease. By J. W. Brown, M.D., F.R.C.P. 2nd ed. (Pp. 344. 30s.) London: Staples Press. 1950.

Applied Mycology and Bacteriology. By L. D. Galloway, M.A., and R. Burgess, M.Sc., Ph.D. 3rd revised edition. (Pp. 184. 12s.) London: Leonard Hill. 1950.

A Textbook of Biochemistry. By P. H. Mitchell, Ph.D. 2nd ed. (Pp. 695. 51s.) London: McGraw-Hill Book Company. 1950.

The Royal Cancer Hospital Mechanically Sorted Punched Card Index System. Edited by the Records Committee. 2nd ed. (Pp. 102. No price.) London: Royal Cancer Hospital. 1950.

Orthopaedic Surgery. By W. Mercer, M.B., Ch.B., F.R.C.S.Ed., F.R.S.Ed. 4th ed. (Pp. 1,016. 50s.) London: Edward Arnold. 1950.

Memories of Eighty Years. By J. B. Herrick, M.D. (Pp. 270. 37s. 6d.) London: Cambridge University Press. 1950.

Dible and Davie's Pathology. By J. H. Dible, M.B., F.R.C.P. 3rd ed. (Pp. 963. 54s.) London: J. and A. Churchill. 1950.

Wheeler and Jack's Handbook of Medicine. Revised by R. Coope, M.D., B.Sc., F.R.C.P. 11th ed. (Pp. 648. 20s.) Edinburgh: E. and S. Livingstone. 1950.

Illustrations of Bandaging and First Aid. Compiled by L. Oakes, S.R.N., D.N. 4th ed. (Pp. 308. 8s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

The Scottish Chemists' Index of Modern Remedies. 5th series. (Pp. 86. 5s.) Glasgow: The Scottish Chemist. 1950.

An Eighteenth Century Lectureship in Chemistry. Edited by A. Kent, M.A., Ph.D. (Pp. 233. 21s.) Glasgow: Jackson. 1950.

Problems of Infancy and Childhood. Edited by M. J. E. Senn, M.D. (Pp. 156. No price.) New York: Josiah Macy, jun., Foundation. 1950.

Doctor Come Quickly. By F. J. Clancy, M.D. (Pp. 248. $2.95.) Seattle: Superior Publishing Company. 1950.

Psychiatrie Générale. By P. Guiraud. (Pp. 664. No price.) Librairie le François. 1950.

Dermatosi Piogeniche. By E. G. Scolari and others. (Pp. 191. No price.) Florence: Soc. Editrice Universitaria. 1950.

Heparin und Heparinoide Dicumarol. By Th. Halse. (Pp. 225. 13.50 francs.) Zurich: S. Hirzel. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY NOVEMBER 4 1950

WORLD MEDICAL ASSOCIATION

The Fourth General Assembly of the World Medical Association met this year in New York from October 16 to October 20, under the presidency of Dr. Elmer L. Henderson, also President of the American Medical Association. The week before this the Council of the W.M.A. and its committees were hard at work consolidating what has already been done and preparing plans for the future. On its social side the New York meeting was a brilliant success owing to the thoughtfulness and generosity of our colleagues in the U.S.A. and the hard work of preparation done before the meeting by the Secretary-General, Dr. Louis H. Bauer, and his assistant, Miss Natwick. No one who was fortunate enough to be present will forget the annual dinner given by the American Medical Association or the visit to West Point, when Major-General Bryant E. Moore said that the promotion of closer ties among national medical associations might help to diminish the intensity of national ambitions and remove the causes of enmity. The same note was struck by Dr. Henderson in his speech at the dinner. He observed that if co-operation proved to be possible in one field of international activity, then it should be possible "in the entire broad pattern of international relations."

Although it is said of every international congress, it can be said with even greater force of a meeting of representatives of 39 different national medical organizations—that the value of such a congress lies not so much in the speeches and discussions in public session as in the informal meetings and conversations outside the assembly chamber. Medical men from East and West quickly find that, however different their circumstances, their professional problems are remarkably alike, and in the informal exchange of conversation it is possible to learn more than in formal debate. For these reasons alone it is once more to be regretted that there was no medical man representing Russia or those States under her domination. It is not easy to understand why they hold back, because even if they may think they have nothing to learn, surely they would not dislike the opportunity to teach. The great thing about the W.M.A. is that discussion is free and views are exchanged without fear or favour. It is difficult to see how a synthesis of news and views can be reached in the absence of the give-and-take of discussion or, in Marxian terminology, in the absence of thesis and antithesis. It is to be regretted too, as Dr. J. A. Bustamante informed the Assembly, that the rules of the Argentina Medical Association forbid it to have affiliation with any other medical group. The doctors of Argentina are therefore not represented in the W.M.A. It is much to be hoped that these barriers will in time disappear and that the W.M.A. will be strengthened and made truly international by the inclusion in it of representatives from the great Slav countries and of the largest country in South America. In this respect the World Health Organization (W.H.O.) also suffers, although it has differed from the W.M.A. in that the U.S.S.R. did to begin with belong to W.H.O. and through its hard-working delegates make a substantial contribution. The W.M.A. and W.H.O. share many other things in common, a point that was stressed by Dr. Edward J. McCormick, of the Board of Trustees of the American Medical Association, when he stated during the meeting in New York that there was no conflict between the two. The General Assembly welcomed the opportunity of hearing the Director-General of W.H.O., Dr. Brock Chisholm, speak at its meeting. Discussions between the principal officers of the W.M.A. and W.H.O. next year should bring these two organizations much closer together. Their objects and aims coincide at so many points as to make each indispensable to the other.

The W.M.A. is of course still in its early infancy. In its brief three years of existence it has certainly gone a long way to reach its first declared objective—namely, "to promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available." Under the guidance of its Chairman of Council, Dr. T. C. Routley, it has done a vast amount of work in studying and reporting on the professional problems which confront the medical profession in different countries, to refer to another of its objectives. The 174-page book presented to the delegates at New York gave in three languages an account of what has been done in the past year. We may instance, for example, the highly interesting report on pharmaceutical practice in 24 countries and also that on social security schemes in 13 countries. Other and shorter reports were on standard nomenclature, an international pharmacopaeia, and on medical education: in the last of these the W.M.A. is taking a quickening interest. It is, however, difficult to bring these subjects to life in the General Assembly. According to a familiar pattern the chairmen of the various committees present their reports to the Assembly, and then, by a side-wind as it were, a long discussion takes place on such a subject as euthanasia. The Press on both sides of the Atlantic seizes on this topic for its news value, and ignores the duller, but more significant, matters before the meeting. However fascinating

a subject euthanasia may be for debate, it was hardly to hear this discussion on an impromptu basis that delegates had travelled several thousand miles. That it aroused interest instead of the discussion on the formal reports of committees points perhaps to a weakness in the mechanism of the General Assembly. If this is to be a live part of the W.M.A. structure in the same way as the House of Delegates is of the American Medical Association and the Representative Body of the B.M.A., then the delegates who are not members of Council must have the opportunity of being more fully informed of the subjects for discussion. They must also be fully informed of the attitude of their own national organizations to these questions. They must come not only with as full as possible a knowledge of the items on the agenda, but with authority to put forward the views of their own organizations. This can be done only if the national associations take a more active interest in the work of the W.M.A. and make provision in their annual time-tables for a thorough review of those matters under consideration by the W.M.A. At the moment too heavy a burden is being placed on those individuals who serve on the Council and committees of the W.M.A. It is their initiative and enthusiasm which have put the W.M.A. on the international map. But the time has come for this to be backed up in a more consecutive and organized fashion by the 39 national medical associations who represent the 500,000 doctors belonging to them.

X-RAY DIAGNOSIS OF PLACENTA PRAEVIA

Placenta praevia is, in the first place at least, usually diagnosed by inference. The stage of gestation, the nature of the bleeding, the non-engagement of the presenting part afford evidence for a presumptive diagnosis and are in themselves sufficient to warrant the transfer of the patient to a hospital where caesarean section or other appropriate treatment can be employed at short notice. But not infrequently these signs and symptoms are inconclusive, and it becomes necessary to distinguish between placenta praevia and other causes of antepartum haemorrhage. Digital palpation is generally used, but this procedure carries a very definite risk. Brisk haemorrhage may be provoked—haemorrhage that becomes alarming and, despite rapidly instituted transfusion, may endanger the life of the mother and, more particularly, the life of the foetus. Alternative methods of diagnosis are therefore desirable; and to this end modern radiology has much to offer.

Unfortunately, save in very unusual conditions (extensive calcification), the placenta does not throw any shadow by which it may be distinguished from its immediate surroundings. The early attempts at diagnosis were therefore based on indirect methods. One of these was to inject a radio-opaque substance into the amniotic fluid in order to outline the amniotic sac; any localized interruption of the rounded contour was taken to indicate the placental position. Another method was to inject an opaque substance into the urinary bladder and to measure the thickness of the soft tissue intervening between the bladder and the presenting part of the foetus (usually the foetal head). This method enabled a presumptive diagnosis to be made for or against the presence of a low-lying, anteriorly placed placenta. For various reasons neither of these methods has gained much favour with clinicians, and until recent times an easy and reliable method of radiological diagnosis of placental position was an intriguing but seemingly uncapturable will-o'-the-wisp. In 1934 Snow and Powell[1] claimed that the uterine wall, placenta, and amniotic fluid could, by simple and direct methods, be collectively displayed with sufficient clarity to enable a localized thickening indicative, they claimed, of placental site to be identified in a majority of cases. They chiefly used the lateral position for radiography (as distinct from the usual antero-posterior position), because the soft tissues of the pregnant abdomen could then be displayed without confusion from shadows of overlapping skeletal structures. Moreover, the placenta (which is usually attached to either the anterior or posterior uterine wall) could then be seen to better advantage.

Many workers, mostly in the U.S.A., quickly followed the lead. Notable among these were Dippel and Brown,[2] who gave a clearer and fuller account of the technical problems encountered. These latter workers claimed a correct diagnosis of placenta praevia in each of 11 cases in which subsequent verification became possible. With this promising start it is surprising that the merits of the new method have not been more generally acknowledged outside the U.S.A. Two reasons for the tardy acceptance may be cited. In the descriptions given by Snow and Powell and the other early exponents insufficient attention was paid to an accurate description of what did and what did not constitute placental site. For example, Dippel and Brown were content to state: "The placenta is localized in the region where the structures between the outer uterine wall and the foetal soft parts are definitely increased in thickness." Nor did these early workers more than barely acknowledge that confusion is sometimes caused by the presence of amniotic fluid in greater than average amount; yet this complicating factor is, in fact, the greatest single cause of error in the interpretation of the radiographs. In this country the possibilities of the method were early explored by Chassar Moir.[3] In a series of experiments he showed that, contrary to Snow and Powell's belief, the placental

[1] *Amer. J. Roentgenol.*, 1934, **31**, 37.
[2] *Amer. J. Obstet. Gynec.*, 1940, **40**, 986.
[3] Ibid., 1944, **47**, 198.
[4] *Brit. J. Radiol.*, 1949, **22**, 81, 557, and 643.

wall, the amniotic fluid, and the placenta all threw shadows of equal radiographic density, and that in normal circumstances it was impossible to distinguish any one of these structures from the other two. His investigations left no doubt that the definition previously offered of what constituted placental shadow was much too facile, and the accuracy of interpretation of some of Snow and Powell's original specimen radiographs and tracings was seriously questioned. Nevertheless Moir acknowledged within limitations the possible use of the method; his chief plea was for a more careful definition of the characteristics of the placental shadow.

Recently a comprehensive reinvestigation of the whole subject has been made by Reid[4] in Oxford. In a series of three papers he has covered the theoretical basis and practical application of this method of soft-tissue radiography. His conclusions are these. By appropriate technique and use of an exposure-equalizing filter a lateral radiograph of the pregnant abdomen will in a majority of cases reveal the placental site, though some experience is necessary to ensure a correct interpretation of the shadows. In doubtful cases re-examination with the patient in such a position that gravity bears on the foetus from a new direction will usually clear up any uncertainty of diagnosis. Gravity, he found, causes the foetus to sink to the lowest part of its amniotic bath. With the mother in the lateral recumbent position the foetus settles against the lower lateral wall, where, unless there are complicating factors, it will lie equidistant from the front and back walls of the uterus. With the mother in the erect position it will lie in contact with the anterior uterine wall, and with the mother in the dorsal reclining position it will lie in contact with the posterior uterine wall. These and other criteria have enabled Reid to diagnose placental position correctly in nearly all those cases in which subsequent verification became possible. Reid's work has recently been discussed at a meeting of the Section of Gynaecology and Obstetrics of the Royal Society of Medicine, and a report of the discussion is given elsewhere (page 1055).

So much for the identification of placental position in general. The foregoing methods hold good also for the diagnosis of placenta praevia, and others are available. Presumptive evidence is usually obtained by noting that the localized thickening of the uterine wall (placental site) is at a low level and continues towards the lower uterine segment—where, however, it becomes obscured by the overlapping shadows of the pelvic bones. There is also a lack of any shadow that could be held to represent placenta in the upper part of the uterus. A further diagnostic feature to which Reid directs special attention is that the presenting part (usually foetal head) is constantly displaced above the pelvic brim. The displacement, which is chiefly from the sacral promontory or from the symphysis pubis, according to the position of the placenta, is constant; and if this abnormality of head–brim relationship is maintained in a second radiograph in which use is made of the effect of gravity on the foetus the diagnosis of placenta praevia becomes fairly certain. In Reid's own work positive radiographic evidence of placenta praevia was found in 47 out of 50 cases in which there had been clinical proof of that condition. In 73 cases in which placenta praevia was diagnosed or suspected radiologically but without clinical diagnosis of that condition, 31 later presented clinical evidence of placenta praevia. The remaining 42 patients delivered themselves normally, and clinical evidence of placenta praevia was neither sought nor found; in many of these a low implantation of the placenta was probably present.

This modern development of radiology is important. No longer need the obstetrician remain in such doubt about the position of the placenta or be so severely tempted as to make vaginal examinations in dangerous and unsuitable circumstances. Finally, there is a further point in favour of radiological examination: indication is sometimes given of the presence of a major degree of placenta praevia when bleeding has not yet occurred and when the only abnormality has been an unexplained high position of the foetal head. Appropriate treatment may then be planned in safe advance of any bleeding.

GENERAL PRACTITIONERS' CONFERENCE

Although the Health Service has been running for over two years, the medical profession, and particularly general practitioners, are still disquieted by many of the conditions under which they have to work. When the Conference of Local Medical Committees met on October 26, motions implying dissatisfaction with pay dominated the agenda, though the conference warmly endorsed one from Yorkshire East Riding emphasizing that the Health Service has tended to lower the status of the general practitioner. These have for some time been the two main themes in the correspondence columns of the *Journal*. The body of the conference, representing as it does all general practitioners in the Health Service, proved itself to be watchful both of its executive committee's activities and of the Government's regulations.

The General Medical Services Committee, an autonomous committee of the B.M.A., acts as the executive of the Conference of Local Medical Committees. It is interesting to note that a voluntary organization provides the executive mechanism for representatives of statutory committees. The implications of autonomy have often been debated and its wisdom questioned, but there can be no doubt that it is a convenient arrangement and one which, however difficult to define, works well in practice. The Conference showed a lively independence when debating whether to change the date

of its annual meeting from the autumn as at present to the early summer just before the Annual Representative Meeting of the B.M.A., and preferred the existing arrangement, one argument for its preference being that the Conference should look as well as be autonomous. Delegates are sent to these conferences by the local medical committees—statutory bodies recognized by the Minister of Health and representing general practitioners in the areas of executive councils. These committees are the heirs of the old medical and panel committees and do much the same work, though there is more of it. They watch over the interests of general practitioners locally, appoint members to the executive councils, and their representatives meet at this conference to hammer out an agreed policy. As representatives of the profession in their respective areas they play an important part —and a successful one—in keeping medical practitioners as free as possible from outside interference. Doctors new to general practice will find the secretary of their local medical committee a useful adviser, and he will be able to give guidance on the many regulations that now control, and sometimes ensnare, the practitioner.

Many administrative problems that are part of the daily work of these committees were before the meeting, which was deftly guided through its agenda by the chairman, Dr. W. Jope. But of first importance was the action to be taken to obtain juster remuneration for general practitioners, the terms of which are still not settled with the Ministry. Inquiries into earnings and expenses are being made, and it had been expected that these would be completed by the end of the year. That they are unlikely to be was accepted by the meeting as beyond the control of the Ministry or of the G.M.S. Committee. The representatives decided therefore to meet again at a special conference in March next year, or earlier if the inquiries are finished before that date. Though doctors are naturally restive about the continued delay, much of which in the past has been the result of the Ministry's dilatoriness in the face of pressure from the G.M.S. Committee, no other course was possible. The Whitley machinery for general practitioners has not been used in the present dispute mainly because agreement has not been reached between the staff and management sides of the General Whitley Council on a satisfactory arbitration formula, and negotiations therefore continue as before.

Meanwhile local meetings of the British Medical Guild are being held for further discussions with a view to collecting resignations from the Health Service if the present inquiries do not lead to a satisfactory solution of the problem; that is, the Conference decided not to collect resignations until the inquiries are complete. These will be held ready to use if the drastic step of withdrawal ever becomes necessary. If this threat is to be effective, 80% of general practitioners' signatures are required, and the Conference agreed that any number much below that would jeopardize their bargaining power. In addition the meeting decided, in opposition to what some thought to be wiser counsels, that mass withdrawal could not be effective without withholding Ministry of National Insurance certificates. The argument that these certificates do not have to be signed by medical practitioners weighed little with the meeting, and the feeling of the representatives was clear that doctors would have a powerful weapon in refusing to give them. Whether they will use it if the time comes seems to be a matter worth examining again in the circumstances then.

The Health Service disciplinary machinery has been criticized recently in our correspondence columns, and it was again at the Conference. A full investigation into it was asked for, as well as a number of detailed changes. Meanwhile a special subcommittee of the G.M.S. Committee is examining the whole machinery, and the committee has already requested that a number of alterations be made. On the whole the machinery seems to work fairly, for the present arrangements have evolved through long experience under National Health Insurance. But continued scrutiny of such an important subject is needed, and no doubt the G.M.S. Committee will give it.

BURNS

Over this week-end the children who have held on too long to the firework or been too close to the bonfire will be keeping some doctors busy. Elsewhere in this issue Mr. R. P. Osborne and Mr. J. P. Reidy, in separate papers, give their detailed views on the various stages of the treatment of burns. Those familiar with the wonders wrought by prompt and adequate shock treatment, early grafting of deep burns, and skilful plastic repair at a later stage will agree that great advances have been made during the last decade. Although modern therapy has saved many patients who would formerly have died and has eased the lot of many survivors, there is still little cause for complacency about the continued high incidence of burns. Colebrook[1] has stated that in England and Wales some 100,000 patients each year require hospital treatment for burns and scalds. Between 20,000 and 30,000 of these patients are admitted for an average stay of not less than 50 days. In the year 1938 burns caused as many as 1,241 deaths. Although the mortality has fallen by half since that time there does not seem to have been any great reduction in the number of accidents causing burns. The medical profession has in some ways been too preoccupied with the strictly medical aspects of this problem, and more serious thought should be given to effective preventive measures and the provision of more burns centres.

It is known that one-fifth of all fatal and a half of all non-fatal accidents in the home are due to burns and scalds.[2] A large number of these are preventable: the majority of the victims are small children, and many of the most serious cases are due to the ignition of clothing by unprotected fires. The menace of the unprotected fire has again been pointed out recently by Colebrook,[3] who has especially emphasized the danger of electric fires. At the present time we in this country manufacture properly guarded fires for export to some countries, but we tolerate the sale of incompletely guarded ones for ourselves. It is indeed regrettable that the manufacturers of electric and gas fires have not yet reached agreement about fireguards. The fire-proofing of clothing materials is another matter of great importance. Nine out of ten fatal burns admitted to the Birmingham Accident Hospital were due to the ignition of clothing.[4] Colebrook has even suggested that it might be more economical to subsidize the cotton industry to produce safe materials than to endure the financial costs and physical suffering which result from accidents of this kind.

Whatever success may attend our efforts in the prevention of burns, it still remains to be decided what are the best conditions in which to treat the burns that do occur. The magnitude of this problem is not always appreciated by general surgeons, who for the most part see few cases in the course of each year. The treatment of these patients in general wards is usually most unsatisfactory: the case fatality rate of severe burns may be reduced two- or threefold when the patients are treated in special burns centres, while the period of incapacity is shorter and the functional results are much better. Osborne thinks that the present financial state of the National Health Service is likely to preclude the formation of burns units on the scale of that at the Birmingham Accident Hospital, but it need not necessarily be assumed that a determined professional declaration in favour of burns centres would be met by any serious official resistance. The only way to match the very high standards set by the few existing centres is to establish others in large towns and industrial centres. It would cost relatively little to convert part of the accommodation in a few large general hospitals, and, since new beds would not be needed but rather more efficient use of those at present available, there should be no great difficulty in finding the nurses. Where nursing difficulties do exist, and particularly in wartime or after some major fire disaster, there would seem to be a strong case for the "exposure" method of treatment recently described by Wallace,[5] of Edinburgh. Although some have argued that Wallace's method is not applicable to deep burns, this method is worthy of fuller trial. Even if it seems advisable to apply dressings later on in the treatment of deep burns, the exposure method would obviate much labour and difficulty in the early stages. The early establishment of one burns unit in the metropolitan area (probably four or more would eventually be needed), preferably in association with, though not necessarily in, a teaching hospital, should be all that is necessary to persuade doctors and administrators alike that these units are thoroughly necessary. From the educational standpoint, it would be possible to teach students in a few days what they rarely learn at present in the whole course of their clinical training. The all-round benefits of this policy to both patients and the profession would be out of all proportion to the effort made.

[1] *A New Approach to the Treatment of Burns and Scalds*, 1950. London.
[2] *An Inquiry into Accidents in the Home*, 1950, Report of Domestic Accidents Panel, Ministry of Works.
[3] *Lancet*, 1950, **2**, 305.
[4] Ibid., 1950, **2**, 260.
[5] *British Medical Journal*, 1950, **2**, 360.

FACIAL NEURALGIA

Neurology owes a debt of gratitude to Dr. Wilfred Harris for his pioneer and long-continued work on the causation and treatment of facial pain. Though Schlösser[1] in 1903 was the first to inject alcohol into the peripheral branches of the trigeminal nerve at their foramina of exit from the skull as treatment for trigeminal neuralgia, it was Harris[2] who in 1910 was the first to inject alcohol into the Gasserian ganglion. His first patient obtained complete relief of pain for the remaining 27 years of his life.[3] In 1940 Harris reported that he had treated at least 2,500 patients suffering from trigeminal neuralgia. His advocacy of the method of alcohol injection and the excellent results obtained in so many cases treated by him and by those experienced in his technique have placed the procedure in the forefront of the methods of treatment of this disease. Though operative section of the sensory root of the trigeminal nerve may be the method of choice in some younger patients, alcohol injection is to be preferred in the many elderly victims of the disease and in those who do not want an intracranial operation. It was Harris also who stressed the frequency of trigeminal neuralgia in disseminated sclerosis and who showed that injection would cure the pain in these patients. This was an important but rather surprising finding, since an intramedullary cause for the pain might be postulated, and other facial pains of intramedullary origin, such as the pain which may occur in syringobulbia or following a posterior inferior cerebellar thrombosis, are not relieved by ganglion injection or sensory root section. In the opening pages of this issue Harris again discusses the relationship of certain forms of trigeminal neuritis to disseminated sclerosis.

In 1921[4] he described another type of paroxysmal facial pain, glossopharyngeal neuralgia. This is very much rarer than the trigeminal variety, but causes pain of similar character and intensity, the distribution being in the lateral region of the throat and tonsil and around the ear, spreading to the back of the lower jaw. The pain tends to come on after yawning, swallowing, eating, and talking, and sometimes after the mouth of the external auditory meatus has been touched. Harris showed that this type of neuralgia could be cured by avulsion of the glossopharyngeal nerve as high in the neck as possible, though intracranial section of the nerve is thought by some to be the more satisfactory treatment. In 1926[5] and 1936[6] Harris threw further light on the problem of facial pain by his description of migrainous or ciliary neuralgia. In this not uncommon condition attacks of pain round an eye, and on the forehead and sometimes the cheek of the same side, occur repeatedly for several weeks, and the patient may then be free of pain for a long period before the pain recurs. The pain is constant and is usually accompanied by unilateral lacrimation and sometimes nausea; it does not possess the paroxysmal quality of trigeminal neuralgia nor is it associated with the usual precipitants of the latter. Harris emphasized its affinity to migraine and showed that the pain could be relieved by alcohol

[1] *Z. Augenheilk.*, 1903, **10**, 335.
[2] *Lancet*, 1912, **1**, 218.
[3] *Brain*, 1940, **63**, 209.
[4] *British Medical Journal*, 1921, **2**, 896.
[5] *Neuritis and Neuralgia*, 1926. London.
[6] *British Medical Journal*, 1936, **1**, 457.

injection of the supraorbital and infraorbital nerves, or more permanently by Gasserian ganglion injection. The fact that some of these patients obtain relief from ergotamine tartrate supports Harris's view of the migrainous nature of the condition.

Many problems of the aetiology and correct treatment of the atypical facial neuralgias remain unsolved, but during the last 40 years Harris has made a series of fundamental contributions to our understanding of facial pain, and, as his paper in this number of the *Journal* shows, he is continuing to use his unrivalled experience to clarify the problem.

CANCER REGISTRATION

With the publication of a booklet on cancer registration in England and Wales[1] the first step in an important new field of public health has been completed. In 1945 the national registration of cases of cancer began. At first only a few centres co-operated, but every year the number has increased, until now there are 74 centres registering cases from some 275 hospitals. All cases treated by radiotherapy are notified, but the proportion notified of those which are treated surgically, or not treated at all, is still low. The primary object of registration is to enable the value of different forms of treatment to be assessed, so that patients may be provided with the most effective treatment. No one institution can provide answers to the question of what are the best results obtainable for cancer of every site, and no specialized institution can provide information about the average prospect for patients living in different regions of the country. Answers to these questions can be achieved only by means of a country-wide follow-up of all new patients on a uniform plan.

The method of registration introduced will help to achieve these results. It will also allow comparisons to be made with the prevalence of different types of cancer in different countries. A subcommittee of the World Health Organization[2] has recommended that "cancer registration projects aiming at ascertainment of follow-up histories" should be encouraged, and has prescribed definitions and rules for their development. Valuable information about the aetiology of cancer can be expected from the comparison of its incidence in different parts of the world, where different social habits predominate. Also important are the methods recommended for calculating the survival and recovery rates after treatment. If uniformly adopted, they will allow comparisons to be made between individual surgeons' results—comparisons which have hitherto been difficult, if not impossible, to make. It will also be possible to determine the prognosis of those cases which are deemed unfit for anything but palliative treatment. The time is past when the natural history of untreated cancer can ever hope to be determined, but it would be useful to know the extent to which "inoperable" differs from "hopeless." Dunphy[3] has recently described two cases, such as all surgeons have heard of, in which spontaneous arrest and regression occurred after their classification as being beyond treatment, and many patients must stay a longer course than is generally expected. Such knowledge will be particularly valuable at a time when new "cures" are being thrust on the public, backed by the evidence of individual cases. It is much to be hoped that the number of hospitals notifying cases will be rapidly extended.

[1] Stocks, P., *Studies on Medical and Population Subjects, No. 3, Cancer Registration in England and Wales: An Inquiry into Treatment and its Results*, 1950. London. H.M.S.O.
[2] *Tech. Rep. Ser. World Health Organization* (to be published). A summary is given in the *Chronicle of the World Health Organization*. 1950, 4, 286.
[3] *New Engl. J. Med.*, 1950, 242, 167.

NOBEL PRIZE, 1950

It was announced from Stockholm on October 26 that this year's Nobel Prize for Medicine has been awarded jointly to Drs. Philip S. Hench and Edward C. Kendall, of the Mayo Clinic, Rochester, Minnesota, and to Professor Tadeus Reichstein, of the University of Basle, Switzerland. This recognizes not only the recent outstanding work (first published last year) on the treatment of rheumatoid arthritis with cortisone and A.C.T.H., but Dr. Kendall's earlier important contributions to biochemistry—the first crystalline preparation of thyroxine on Christmas Day, 1914, the first synthesis of glutathione in 1929, and numerous chemical studies of the adrenal cortical hormones—and also Dr. Reichstein's fundamental chemical work on the steroids of the cortex which led him to the original discovery of cortisone, in 1937, and of desoxycorticosterone acetate. as well as his successful synthesis of vitamin C in 1933.

Dr. Hench was born in Pittsburgh in 1896, and graduated M.D. there in 1920. Practically all his professional life has been spent at the Mayo Clinic, where he became a first assistant in 1923. He has been consultant and head of the section on rheumatic diseases since 1926, and, being much impressed by the remarkable temporary improvements often seen in sufferers from rheumatoid arthritis during periods when they are pregnant or attacked by jaundice, he has since 1929 endeavoured to track down the biochemical factor common to these two conditions which brings relief.

Dr. Kendall, who is 64, graduated from Columbia in chemistry in 1908, and, after gaining his Ph.D., worked for a short time with Parke, Davis and Co., and at St. Luke's Hospital, New York, before becoming head of the section on biochemistry at the Mayo Clinic in 1914. Since the early thirties he has worked on the chemistry of the adrenal cortex, and his Compound E (cortisone) was first produced in minute amounts in 1941: not till 1948 could Merck and Co. prepare enough for clinical trial.

Dr. Reichstein was born at Wloclawek, Poland, in 1897. His family later moved to Zurich, where Reichstein attended the technical high school, graduating as a chemical engineer in 1920. At Zurich he came under the influence of a succession of great chemists, H. Staudinger, Richard Kuhn, and L. Ruzicka, and it was the latter who persuaded him in 1931 to give up his industrially sponsored work on the flavouring matters of roasted coffee and turn to physiological chemistry. He became assistant professor at Zurich in 1934, and professor of pharmacy at Basle University in 1938. In 1946 he was chosen to be head of the division of organic chemistry and director of the laboratories in the same university. He has isolated more than 27 crystalline steroids from the adrenal cortex, and developed many important technical syntheses.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MANAGEMENT OF THE EPILEPTIC

BY

Sir CHARLES SYMONDS, K.B.E., C.B., D.M., F.R.C.P.

Physician-in-charge, Department for Nervous Diseases, Guy's Hospital; Physician, National Hospital for Nervous Diseases, Queen Square

The title of this article would imply that epilepsy is a unity, but this is not so. There are clinical variants of idiopathic epilepsy, excluding symptomatic epilepsy, with which we are not at the moment concerned, which differ widely not only in their pattern but in their needs for management and medical care. These must be separately considered, but it will first be profitable to discuss certain general problems, on the assumption that the diagnosis has already been made.

Management of Relatives

Idiopathic epilepsy commonly begins in childhood or early adolescence, so that the diagnosis has to be given and explained to the relatives rather than to the patient, and, as the success or failure of treatment will depend greatly upon the extent of their co-operation, the explanation must be full. They should be told that the occurrence of an epileptic attack means that there is a liability to further attacks—a liability which depends upon some innate or constitutional flaw in the brain that cannot so far as we know be eradicated. As the result of this defect nerve cells are apt to discharge in an explosive way, and this may happen at any time and usually without apparent cause. The main part of treatment will be to give medicines which counteract the explosive tendency; these must be given in such a way that so far as is possible the gunpowder is kept continuously damp. Even without treatment there may be long periods of freedom from attacks. The best medicine and the best dosage for the individual case can often be determined only by trial.

For all these reasons it is important that from the first the relatives shall take a long view of the situation, observing and recording the number and times of attacks, together with any precipitating causes, and be prepared to allow a thorough trial of each medicine or combination of medicines before it is changed. They should be warned that even if the attacks should cease it will be advisable to continue with the treatment for two to three years to ensure against recurrence. After all this, they will need some encouragement and may fairly be told that there are many cases in which the liability is so slight that it is entirely controlled by medicines and the attacks cease; that if they cease for three or four years they will probably not recur; and, further, that there are many more cases in which, though the attacks continue, they are so infrequent as to interfere very little with the patient's life, and their occurrence is known only to his intimates. It may be explained that the proportion of serious cases is small, and that one person out of every two hundred suffers from this malady in some degree.

A question often asked at this stage is whether the medicines given to prevent the attacks may damage the brain. The answer to this is no, but it should be added that some of the medicines which may be used can have the effect of making the patient dull and drowsy for the time being. Any such effect rapidly disappears if the dose is reduced, and no permanent harm can result. On the other hand, the attacks themselves sometimes have a dulling effect on the mind, and if such symptoms should be observed care must be taken in their interpretation. They may mean that the patient is having too little medicine, not too much.

Regime for the Patient

It is important that the epileptic patient should so far as possible lead a normal life, but there are a few general rules to be mentioned.

Attacks may be precipitated by hypoglycaemia. Therefore the patient should not go too long without food. If he is to be exposed to such risk he should carry sweets or chocolate to fill the gap. Extreme hydration is another known precipitant. The ingestion of an abnormal amount of fluid at any one time should, therefore, be avoided. Attacks are apt to occur after a night short of sleep, so if the patient has a late night he should have a late morning. Excessive physical fatigue may sometimes lead to an attack and should be avoided. This does not mean that the patient must not take part in games and normal exercise, only that he should not overexert himself when untrained.

Education.—It has long been recognized by experienced clinicians and, more recently, has been shown by electroencephalographic studies that attacks are more apt to occur when the mind is vacant than when it is busy. Mental concentration therefore is good, not bad, for the epileptic, and his education should proceed normally. In view of his handicap it is even more important for him than for the ordinary person to advance his knowledge.

Avoidance of Accidents.—The risk of making the patient feel different from others must be weighed against that of accidents. The epileptic, of course, cannot hold a driving licence. If liable to attacks during the day he should not ride a cycle on crowded roads. He should not swim unless accompanied by someone who knows his disability and who can take care of him, and he should not go into a crowded swimming-bath. No other restrictions need be imposed unless the attacks are exceptionally frequent.

Diet.—Apart from the ketogenic diet, now seldom used in the treatment of epilepsy, there is no evidence that any dietetic restriction whatever has any influence upon the disease.

Drug Treatment

There are at present three drugs of standard use in the treatment of epilepsy—phenobarbitone, sodium phenytoin (sodium diphenyl hydantoinate; "epanutin"), and troxidone ("tridione"; 3,5,5-trimethyloxazolidine-2,4-dione). Which of these shall be used must be determined by the clinical history, aided occasionally by the electroencephalogram (E.E.G.).

Troxidone is of specific value for attacks which exhibit the following pattern. The onset is usually in childhood; the attacks from the first are of frequent occurrence, often several times daily, and they are sudden, brief, and stereotyped. They may take the form of momentary loss of consciousness, sudden falling with little disturbance of consciousness, or myoclonic jerks of the upper limbs. Recovery

after the attack is immediate. The E.E.G. usually, but not invariably, shows the wave-and-spike form of abnormality, and is therefore a most valuable guide to the use of troxidone in minor epilepsy. This drug is made up in capsules containing 0.3 g. The suitable initial dose for patients aged 12 or older is 0.3 g. thrice daily after food. Between the ages of 5 and 12 the initial dose should be two capsules a day, and under 5 one capsule daily. The toxic effects of the drug are discussed below. Variations in tolerance may compel reduction of the dose or allow its increase if necessary.

The drug has not yet been on trial long enough for a final assessment of its value, but it would seem that in about 25% of cases the attacks are abolished, and in a further 50% they are reduced in frequency to a quarter or less, while in the remainder there is little or no improvement. In the cases which respond to troxidone improvement is generally seen within ten days. If the attacks are abolished the dosage may be gradually reduced after two months and the drug withdrawn at the end of six months if there is no recurrence. When the attacks continue despite treatment the dose should be increased and a watch kept for toxic symptoms. For patients over the age of 12 four capsules a day is usually a decisive one—this is to say, if they do not respond to this they are unlikely to respond at all. If on the maximal dose the attacks are much reduced in number and remain at the same frequency the drug should be gradually withdrawn, when it is often found that the improvement is maintained.

Troxidone is of value only for the type of attack described above (true petit mal) and may aggravate the liability to other types of attack. Combined treatment with troxidone and phenobarbitone or sodium phenytoin is necessary for patients who suffer from true petit mal together with other forms of epilepsy.

Phenobarbitone has replaced the bromides as the most effective of the sedative anticonvulsants. Its main disadvantage is that in some persons an effective dose causes drowsiness and difficulty in concentration. At first the dose should be ½ gr. (32 mg.) thrice daily after food at 12 years or over, ½ gr. night and morning between 5 and 12, and ¼ gr. (16 mg.) thrice daily under the age of 5. The object of treatment is, of course, to control the attacks without causing toxic effects. There is much variation in individual tolerance. For most types of attack it is best to begin with phenobarbitone and, if the attacks are not controlled, to increase the dose to the limit of tolerance; then, if necessary, sodium phenytoin can be given in addition. Many patients will tolerate 3 gr. (0.2 g.) of phenobarbitone a day without unpleasant symptoms.

Sodium phenytoin has not the sedative effect of phenobarbitone and appears rather to inhibit the epileptic discharge than protect the brain from its effects. Thus with its use the attacks may be fewer than when phenobarbitone is given but more severe when they do occur. Often, therefore, a combination with phenobarbitone is desirable. Sodium phenytoin is made up in capsules containing 1½ gr. (0.1 g.). The average dose for a patient aged 12 or over is one capsule thrice daily if it is the only drug given. Or one capsule may be given night and morning together with phenobarbitone ½ gr. thrice daily after food. Sodium phenytoin is also made up in capsules containing ¼ gr. (50 mg.) suitable for younger patients.

Methoin ("mesontoin"; 3-methyl-5:5-phenylethylhydantoin) has an effect comparable to that of sodium phenytoin, but in large doses is less toxic. If, therefore, there is a favourable response to sodium phenytoin but toxic symptoms make it impossible to continue with it, methoin should be tried. It is supplied in tablets containing 0.1 g. For an adult one tablet should be given daily for a week in addition to whatever daily dose of sodium phenytoin the patient has been able to tolerate. The latter drug should then be reduced by one capsule (1½ gr.—0.1 g.), this being replaced by one tablet of methoin, and week by week a further exchange should be made until sodium phenytoin has been entirely replaced by methoin, which may then be increased weekly to obtain the desired effect or to the limit of tolerance. Six tablets (0.6 g.) daily is the average maximal dose for the adult, but double this amount may be tolerated by some patients.

Timing and Spacing of Drugs

The rules for troxidone have already been stated. In the use of phenobarbitone and sodium phenytoin attention should be paid to the time of day at which the attacks usually occur, and the dose should be so divided that the maximum effect is obtained at this time. For example, many epileptics are especially liable to attacks in the first hour or two after waking. Such patients should be given an appropriate dose of phenobarbitone or sodium phenytoin, or both, on waking, with smaller doses during the day. When the attacks are nocturnal only it is unwise to give the whole daily dose at bedtime, for if this is done the attacks may be inhibited during the night and appear during the day with much greater inconvenience. If, for example, such a patient is given 1½ gr. of phenobarbitone at bedtime he should also take ½ gr. two or three times during the day. Female epileptics may be specially liable to attacks about the menstrual period, at which time the dosage should be increased.

Toxic Effects of Drugs

With troxidone blood changes are potentially the most dangerous, either agranulocytosis or thrombocytopenia. All patients treated with troxidone should have their blood examined monthly, and the treatment should be stopped if the absolute neutrophil count falls below 1,600 per c.mm., or if there is a steep fall in the number of platelets. Acneiform, macular, or urticarial rashes may occur. Rarely there is drowsiness and slight ataxia. Photophobia in some degree is common and may require the use of sun glasses in bright weather.

Drowsiness is the most frequent toxic symptom of phenobarbitone. Severe intoxication may cause ataxia, nystagmus, and confusion. A macular rash is seen in some patients who are intolerant of the drug.

Nausea and vomiting occur in some patients if sodium phenytoin is given on an empty stomach. Rashes of an erythematous type are seen in about 5% of cases. Hyperplasia of the gums is not uncommon, but is not a serious symptom. Overdosage occasionally produces drowsiness, ataxia, and nystagmus.

An erythematous rash is the commonest toxic effect of methoin. Drowsiness occurs with overdosage.

Treatment of Status Epilepticus

Status epilepticus is not uncommonly fatal if not promptly treated. Paraldehyde by injection is by far the most effective remedy. For an adult 8–10 ml. of paraldehyde is injected into the gluteal muscle and the site of the injection massaged. The paraldehyde need not be sterilized. If the fits continue 5 ml. of paraldehyde intramuscularly is given half-hourly until they stop. The persistence of local twitching without generalized convulsion is not an indication for continuing the injections. This may last for some time after the emergency is over. If an immediate effect is required, as in the case of a patient who has been in status epilepticus for some time and is dangerously exhausted, thiopentone may be given intravenously in a dose of 0.25 g. for an adult, followed by intramuscular paraldehyde if necessary.

Social Considerations

Choice of Occupation.—The occupation of the epileptic must be so planned that it will not involve driving a car or any other activity which will involve special risk. Occupations or professions for which a medical examination is required are generally barred. This problem must be faced early. True petit mal in young children, if not associated with any other variety of epilepsy, carries the most favourable prognosis, and when the attacks have ceased for a year or two they can be forgotten, but in the other forms the possibility of recurrence even after a long lapse has to be remembered.

Marriage and Parenthood.—No epileptic should marry unless the prospective partner has been given by the doctor a full explanation of the nature and possible course of the illness. This should be done at a private interview with the patient's written consent. The risk of transmission to offspring is serious only if there is an inherited tendency on both sides. There is evidence which suggests that a person may carry and transmit the liability without any personal or family history of epilepsy, but is then likely to show an abnormal E.E.G. A normal E.E.G. in the non-epileptic partner is therefore an additional safeguard. If the result of these inquiries is negative the risk of an epileptic having epileptic offspring is practically negligible.

Driving Licence.—The applicant for a driving licence is required to answer yes or no to the question, "Do you suffer from epilepsy?" He is instructed if in doubt to get professional advice. Supposing that the applicant, having suffered from epilepsy, has as the result of treatment been free from attacks for two or three years, what should be the professional advice? There is no provision in law which defines the time which must elapse from the occurrence of a seizure before an applicant for a driving licence may be certified as not liable to fits, so that the medical practitioner is entitled to his own opinion and is responsible for balancing the interests of his patient against the public safety. In doing so he should bear in mind that the Ministry of Transport in drawing up the regulations for driving licences were advised by a special committee of experts, appointed by the British Medical Association, that "once an epileptic, always an epileptic," and that any person who has at any time suffered from fits should be refused a driving licence, though no legal ruling was made. If therefore the doctor believes that in a particular case it would be reasonable that an application should be considered from a person who has at one time had seizures, he should give the applicant a statement to this effect with a note of the time (to the best of his belief) which has elapsed since the last attack and the date on which treatment ceased. This statement the applicant can then present to the local authority.

A.C.T.H. is now available to all the 6,572 United States hospitals registered by the American Medical Association. Previously the manufacturers of the drug had restricted the supply to about 100 research clinics and hospitals for experimental use only, but production has now increased to the point where it can be offered for sale to all approved hospitals. On May 1 the price was cut from 250 dollars (about £90) to 100 dollars (about £35) per gramme.

WORLD HEALTH ORGANIZATION

DIRECTOR-GENERAL IN LONDON

Dr. Brock Chisholm, Director-General of the World Health Organization, spoke at the United Nations Information Centre in London on October 26 on the organization and work of W.H.O. He announced that, in response to a request from the Unified Command, W.H.O. was sending five public health teams to Korea to advise on the prevention of epidemics and the restoration of the health services. The teams would work under the Unified Command initially and consist of public health officers, sanitary engineers, and social workers, the last being provided by the social department of the United Nations. Thirteen members had so far arrived in Korea, and were under the command of Dr. Walter Crichton (Great Britain).

"Contracting Out"

After describing W.H.O. services, such as the epidemiological reporting service, biological standardization, and work on an international pharmacopoeia, Dr. Chisholm drew attention to the principle of "contracting out" adopted by W.H.O. in concluding international agreements on health matters. The ratification of the old health conventions was a slow affair and some countries never did ratify them. Under the constitution of W.H.O. a time limit was set within which any country not wishing to adhere to an agreement must notify its reasons for dissenting; otherwise it was bound by the agreement.

Help to Backward Countries

Previously, help had been given to backward countries by sending out skilled teams to perform various services for the inhabitants. But when the outsiders went home "the jungle took over." Now it was recognized that the people of the country must help themselves, and that what should be done from outside was the giving of advice and provision of training facilities in more advanced countries, and the loan of specialized advisers. W.H.O. made available technical personnel who helped backward nations to study their own problems and identify their weak points. W.H.O. had provided 900 fellowships for persons to study abroad; these fellowships, awarded through Governments, covered not only medicine but nursing, hospital administration, and other related fields. There were about 100 W.H.O. fellowship students in Britain at the present time. W.H.O. also supplied medical literature to institutions in different countries.

Teaching teams were sent where they were needed. A Scandinavian team had been to Vienna to instruct surgeons in the technique of the "blue baby" operation, and a British team had been sent to Yugoslavia to demonstrate the techniques of plastic surgery developed in this country during and after the war. Clearly it would not be practicable to send comparable teams to under-developed countries. In Ethiopia, for instance, there were no indigenous doctors and no supporting professions, but there was a high rate of chronic disease. There it was necessary to build a foundation upon which a medical profession could be erected. During the past few years W.H.O. had therefore arranged for the training of nurses and sanitary workers. Two Ethiopians were now studying medicine abroad, but they were sent to study not in Europe but where they could learn in an environment appropriate to the conditions of practice in which they would have to work: they were therefore studying in the Sudan. It was no good teaching doctors and nurses from the back-villages of China public-health procedures which required three telephones on their desks.

Russia and W.H.O.

Dr. Chisholm was asked about the relationship of the U.S.S.R. and her satellites to W.H.O. He replied that at the beginning of last year the U.S.S.R., Byelo-Russia, and the Ukraine wrote letters saying they intended to leave the Organization. These letters were signed only by vice-ministers of health, and the Assembly of W.H.O. refused to recognize these withdrawals. The other Eastern European countries,

except Czechoslovakia and Yugoslavia, had taken similar action. Legally, they remained members of W.H.O., but they were not now being co-operative. W.H.O. continued to make all its facilities available to these countries, just as it did to Spain, although Spain could not be admitted to the Organization until she was admitted to the United Nations.

SCOTTISH FEVER GROUP

The fourth annual meeting of the Scottish Fever Group was held at Knightswood Hospital, Glasgow, on October 7 with Dr. T. ANDERSON in the chair. The morning session was opened by two papers dealing with the use of streptokinase in tuberculous meningitis. Dr. M. B. EADIE (Knightswood) had given streptokinase to alternate patients in a series of 44, all of whom received the same streptomycin regime. When attention was directed to those cases proved bacteriologically and followed up for a period of six months there was no difference between the two treatment groups as regards mortality. Disturbing and severe, though not fatal, reactions had been noted when a second course of streptokinase was given after an interval. Dr. J. T. NAISMITH (Belvidere) described the side-effects noted in 11 patients when intrathecal injections of streptokinase were restarted after an interval of three to four days. The reactions had been of such a severe character that further use of the material had been abandoned. Dr. I. B. L. WEIR (Public Health Department, Glasgow) and Dr. C. D. RIGG (Paisley) drew attention to certain aspects of the recent outbreaks of poliomyelitis in Glasgow and Renfrew. A feature of the 1950 epidemic in Glasgow had been the high proportion of cases in the 0–5 years age-group. Marked differences in the local grouping of cases had also been observed, although there seemed to be a tendency, both in 1947 and in 1950, for the Glasgow cases to occur with greater frequency along main streets. Dr. W. NAPIER (Shieldhall) described four cases of Kaposi's varicelliform eruption and discussed the theories of its pathogenesis. Dr. N. R. GRIST (Knightswood) had examined material from five such cases and had been able to demonstrate an aetiological relationship of vaccinia virus in four of them.

The afternoon session was opened by Dr. A. JOE and Dr. G. SANGSTER (City Hospital, Edinburgh), who described four examples of leptospirosis (canicola) infection in man. A portable apparatus for air-sampling was described by Dr. A. T. WALLACE (City Hospital, Edinburgh), and Dr. A. DRIMMIE (Knightswood) gave the results obtained by using a simple dust-sampler in pneumonia and measles wards. Although there was a high recovery of haemolytic streptococci, the isolation of typable pneumococci was infrequent. Dr. J. LAWSON (Ruchill) drew attention to the increasing importance of acute laryngo-tracheo-bronchitis in an analysis of a series of 14 cases. The mortality was high, despite massive penicillin therapy. The failure of penicillin was probably accounted for by the fact that the pneumococci and staphylococci isolated from the majority of the cases had proved resistant to it. Certain features of the pathology suggested the possibility of a primary virus infection. Aureomycin, which had been used in a few cases, had not been strikingly successful. Dr. J. SMITH (City Laboratory, Aberdeen) recorded his collected results on the presence of agglutinable *Bact. coli* in babies suffering from gastro-enteritis. It was clear that the type of *Bact. coli* isolated was not constant; for the type originally present in Aberdeen (associated with a heavy mortality) had disappeared and from the less severe disease now prevalent a different type had been obtained. Dr. R. H. GOSLING (City Hospital, Edinburgh) had studied a series of 75 cases of salmonella infection, the majority due to *S. typhi-murium*. Despite chemotherapy, the patient might continue to excrete the causative pathogen for as long as four to eight weeks, and Dr. Gosling's analysis showed that those under 2 years of age were most difficult to clear. Dr. B. R. NISBET (Kilmarnock) had performed Schick tests on patients admitted to a maternity hospital. The Schick-negative rates obtained in different age-groups showed considerable variation. The figures suggested that if diphtheria again became prevalent it might show a high incidence among the older and supposedly immune population. Dr. R. H. A. SWAIN (Bacteriology Department, Edinburgh University) reported the results of agglutination studies in cases of glandular fever using the Newcastle disease virus. The test had proved disappointing and had not made a contribution to the diagnosis. Dr. R. S. DEWAR (Strathclyde, Motherwell) had used chloramphenicol in a small outbreak of paratyphoid fever and gave a summary of the results.

Two demonstrations were given, one on the pathology of anterior poliomyelitis by Professor D. F. CAPPELL and the other by Dr. N. R. GRIST showing the appearance of the pock virus infections on the chorio-allantoic membrane.

The meeting was attended by about 70 persons, and the papers gave rise to a lively discussion.

MEDICAL DEFENCE UNION

The council of the Medical Defence Union has now issued its annual report and statement of accounts for 1949–50. The Union, under the presidency of Mr. Ivor Back, F.R.C.S., who was elected at the last annual meeting, has as usual had an active year. Membership continues to rise, and in July of this year stood at the record number of 34,452. The Union has recently moved its headquarters to B.M.A. House, where it is installed in offices on the third floor of the South Wing.

It appears from the report that the Union conducted no fewer than 2,125 cases during 1949. But, in addition to this work on behalf of individual practitioners, useful advances have been made in other fields. The Union carried out an examination of the disciplinary procedure of the General Medical Council, and as a result made some 27 recommendations for its improvement. Many of the Union's recommendations have been incorporated in the new Medical Act, and the council pledges itself to press for the incorporation of the remainder in the rules of procedure which will be prepared at a later date. Arising also from the Medical Act, the council has under consideration the special position likely to arise from the creation of a group of "provisionally registered" practitioners. It will be recalled that, before full registration is accorded, newly qualified practitioners are to be required to spend a specified period at an approved hospital, institution, or health centre and to produce to the G.M.C. a certificate of satisfactory service in this appointment.

Since the introduction of the National Health Service there has been a marked increase in the number of complaints made against doctors. The Medical Defence Union stresses the importance of seeking expert advice early when such complaints are lodged. The report draws attention also to the unsatisfactory legal position of hospital medical staff when either the doctor personally or his employing authority is sued for his alleged negligence. The employing authority need not necessarily assume responsibility for the doctor's defence—although ordinarily it will do so in the case of a nurse—and, further, if the complainant seeks to make the hospital authority liable that authority is required to claim from the doctor a contribution towards any damages awarded. A number of other subjects are briefly discussed in the report—the procedure at Service committees, witnesses' allowances, the legality of adding a "ceiling" to an agreed rate of remuneration, notification of infectious diseases, third-party risks, drugs in cars, disputed accounts, etc.

During the year, 199 out of the 2,125 cases handled by the Medical Defence Union were passed to the Union's solicitors. Of these 74 concerned allegations of professional negligence, 38 arose out of inquests, and 20 were due to allegations of libel or slander.

The membership subscription has been raised from £1 to £2 per annum. There is, however, a reduced rate for practitioners joining within three years of registration for their first three years of membership.

THE NOBEL PRIZE-WINNERS IN MEDICINE

This year the prize is shared among two American workers and a Swiss organic chemist (see the annotation on p. 1046). Photographs by Associated Press.



Dr. Philip Showalter Hench.



Dr. Edward Calvin Kendall.



Dr. Tadeus Reichstein.

EXHIBITION OF MEDICAL PHOTOGRAPHY

The third exhibition organized by the Medical Group of the Royal Photographic Society was international in character. Entries were received from Australia, Austria, the Channel Islands, the Gold Coast, Portugal, South Africa, Sweden, Switzerland, and the United States, in addition to those from the United Kingdom. The exhibition, which was first shown at the house of the Medical Society of London in June, was opened in the museum of the Royal Infirmary, Manchester, on October 7, by Mr. Robert Newell, F.R.C.S., dean of post-graduate studies in the University. The chair was taken by Dr. John F. Wilkinson, chairman of the medical board. Both the chairman and the opener referred to the very great advances which have been made in medical photography in recent years. There was now far less tendency to photograph "very large lumps," and the camera was becoming an instrument of every-day use in most branches of medicine and surgery. Yet in an age of specialization Mr. Newell reminded his audience that it was still "the man behind" that counted, and he said that the material exhibited was eloquent proof of this.

The exhibition included 107 mounts (33 from overseas) and 93 colour transparencies (22 from overseas). One motion-picture from Switzerland was also accepted. Probably the most striking feature of the whole was the absence of the over-enlarged prints of rarities which were a feature of earlier collections, and the large number of composite mounts bearing photographs, radiographs, micrographs, and charts, designed to present a complete picture to the student. In this manner St. Bartholomew's Hospital presented the fitting of a hollow acrylic obturator after maxillary excision, Manchester a keyed diagram technique for the annotation of photographs of surgical operations, and the Postgraduate Medical School of London a very complete pictorial account of the repair of a popliteal aneurysm. From Professor Olivecrona's clinic in Stockholm came a pair of mounts illustrating the extirpation of a meningioma.

Several specialized techniques were covered; infra-red photography was more widely and more intelligently used; ophthalmic photography from the Institute of Ophthalmology, London, was of a very high order, and there were some good prints of metazoan parasites from the Instituto Portugues de Oncologia. The Royal Hospital for Sick Children, Glasgow, produced some of the best pictures of children we have seen. It is notable that these were made by electronic flash, using exposures of only a few microseconds. There is no doubt that this equipment is the answer to the wriggling infant.

The colour transparencies were good—probably as good as they could be. But there is still need for a process which will yield paper prints at a cost in money and time which the hospital and medical school departments can meet. The single example, from America, of the new "Flexichrome" process, which combines the skills of the photographer and the painter, attracted much interest.

The exhibition is without doubt the best collection of medical photographs to be shown to date, and the organizers are to be warmly congratulated.

CEREBRAL PALSY

The British Council for the Welfare of Spastics summoned a largely attended conference on the cerebral palsy problem on October 14. It was divided into medical and educational sessions. The chairmen were Mr. Fred Messer, M.P., and Mr. Paul S. Cadbury. A welcome to the conference was given by Professor Andrew Topping, dean of the London School of Hygiene and Tropical Medicine, where the meetings were held.

Paediatric Aspects

Professor NORMAN B. CAPON, of Liverpool, said that, although what might be called primary mental deficiency was not common in the spastic, he was afraid that the American views on this subject were too optimistic. He found 50% of his own patients to be children who were definitely retarded, though the retardation might in some measure be removed by treatment, especially when directed to enlarging the space-world of these people. The American figures also gave an incidence of cerebral palsy which he did not think was borne out by experience in this country. He believed the frequency in Great Britain to be between one and two per thousand children of school age. A figure of 1.9 had been mentioned in Sheffield, and of 1.0 in Birmingham, which would give Birmingham 150 spastic children of school age, whereas on the figures for America the number would be 600.

Cerebral paralysis was a problem *per se* and needed special consideration. Unfortunately, lay people thought treatment to be synonymous with cure. Many of these children could be treated in the sense of amelioration but not in the sense of cure. As for aetiology, in about two-thirds of the cases which came within his cognizance the cause was unknown; in the other third it was reasonable to associate it with difficult birth.

Aetiology of Cerebral Palsy

Mr. G. A. POLLOCK, of Edinburgh, said that it was reasonable to suppose that the first-born child was more likely than later children to be subject to head injury at birth. In 1948 in Scotland, out of 2,966 stillbirths registered, 118 were said to be due to birth injury, which would include cerebral injury, and, of these, 56 were first births and 21 second. Among white races cerebral palsy was more common than among negroid and Oriental peoples. The fact that negro babies at birth were smaller than white babies might have some connexion with this, as also the fact that Rh anomalies, with an incidence of about 15% in the white races, had an incidence of only 5% in the negro and 1% in the Oriental. For long it had been accepted that imperfect medical attention at birth was a cause, but an investigation in South Virginia showed that the incidence of cerebral palsy in a poor population where births were attended only by midwives or handy-women was no greater than after births in the highly skilled maternity hospital. In fairness to the doctor it should be said that not more than 10%, if as much, could be ascribed to bad obstetrics. In dealing with

post-natal causes he mentioned the effect of relatively minor injuries. He had recently seen two cases of spastic paraplegia, one following a slight blow from a schoolfellow, and the other from a fall of only two feet, apparently with no particular hurt at the time.

Dr. J. H. CROSLAND, of Croydon, said that there was no real comparison between the child with cerebral palsy and the handicapped child with poliomyelitis or tuberculosis of the hip. To rehabilitate these children they must be examined very carefully and by people expert in this field. The first necessity was screening before the child entered school. In England there was one institution (Queen Mary's, Carshalton) doing excellent work for these children under school age, and, he thought, four schools dealing with children of school age. For the child above school age until recently very little had been done, though there was now one school for young people from 14 to 20. Rehabilitation took a long time in these cases, perhaps as long as 10 or 15 years.

Dr. C. D. S. AGASSIZ (Carshalton) said that those who had to deal with handicapped children should emphasize not their handicap but their normality, and the children should be brought so far as possible into ordinary schools, the people who had to deal with them being warned to make allowance for movements or grimaces which might be disturbing.

Preparations and Appliances

URETHRAL SPHINCTER GUARD

Mr. A. WILFRID ADAMS, surgeon in charge of the Genito-urinary Department, Bristol Royal Hospital, writes: Internal surgery of the posterior urethra plays a useful part in urology; but incontinence is more apt to ensue than after open prostatectomy, which has somewhat retarded its popularity. An instrument to prevent one encroaching on the sphincter concerned is here described. It may appeal especially to younger

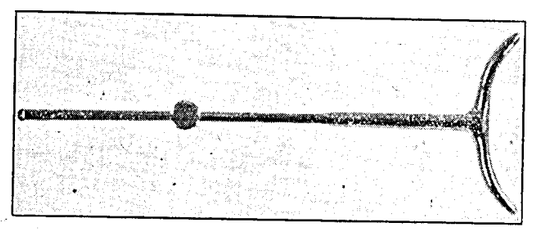


FIG. 1.—Sphincter guard seen from front and side.

surgeons embarking on the long training involved in the mastery of the transurethral technique.

It is of stainless steel and like a crutch, the concavity of which is pressed back in the right peno-scrotal fold and propped against the free edge of the subpubic arch. The stick of the crutch projects forwards parallel with the penis and is marked in centimetres. In taking measurements a fixed point on the external part of the resectoscope is chosen. I find the vulcanite flange, where the sheath joins the working part of the resectoscope, best (see diagram). The figure opposite it on the scale is recorded with the instrument in three positions—namely, viewing (*a*) the floor of bladder, (*b*) the urethral verge, (*c*) the verumontanum. The last is the vital reading. A typical series would be 3, 5, and 8 cm. Elongation of the posterior urethra is indicated by the distance between (*b*) and (*c*). My late registrar—Mr. F. R. Hurford—kindly gave me the idea of a sliding marker. It is fixed by a screw, which is visible even with a subdued light in the theatre, and best set opposite the verumontanum. This anatomical landmark rises from the urethral floor just proximal to the sphincter, like a sentry forbidding the operator to trespass distal to this point.

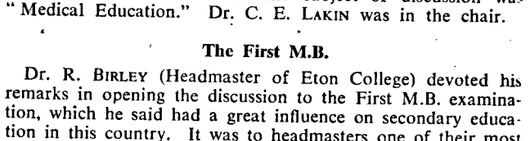


FIG. 2.—Diagrammatic sketch of instrument in use (1, prostate; 2, verumontanum).

When measuring, the assistant always presses the crutch firmly against the bone, which guarantees a constant base-line when distances of the resectoscope are being checked by it.

After the initial record is taken the operation proceeds. As the accumulation of cuttings interferes with the proceedings, the sheath is pushed back to the shortest of the three measurements—that is, 3 cm.; this brings the open end to the easiest position for evacuation of the fragments. When completing the excavation near the apex of the prostate one approaches danger and the sphincter guard chiefly comes into play. It is of special service where the urethra is spacious—for then the instrument can easily slip out of the safe range—and again in the short posterior urethra of the fibrous bladder-neck or the neurogenic bladder. A stunted or damaged verumontanum lacks definition and may become unrecognizable during operation. The guard can be kept in position as long as desired and does not interfere with the action of the resectoscope.

I am grateful to the Genito-Urinary Manufacturing Co., Limited, for making the tool, and to Mr. Christmas, instrument technician at this hospital, for the prototype of the device.

Reports of Societies

MEDICAL EDUCATION

THE HEADMASTER OF ETON AND SIR HENRY COHEN ON THE MEDICAL CURRICULUM

At a meeting of the Section of Medicine of the Royal Society of Medicine on October 24 the subject of discussion was "Medical Education." Dr. C. E. LAKIN was in the chair.

The First M.B.

Dr. R. BIRLEY (Headmaster of Eton College) devoted his remarks in opening the discussion to the First M.B. examination, which he said had a great influence on secondary education in this country. It was to headmasters one of their most difficult and tiresome problems. Whenever three headmasters were gathered together it was on the cards that they were discussing the First M.B. He himself was in entire agreement with the B.M.A. report "The Training of the Doctor," except that he thought the report a little too optimistic, or not sufficiently alarming. It frequently happened that an intending medical student received little if any instruction in general cultural subjects after 15 or 16; the whole time was devoted to physics, chemistry, and biology with a view to passing an examination which would exempt him from the First M.B. This was educationally unsound and indefensible.

Some significant figures were given in the *Lancet** about a year ago. It was stated that of 485 external candidates for the London First M.B. in July, 1948, only 62 (13%) passed. There was something wrong, to his mind, with an examination in which only 13% passed, unless it was a strictly competitive

**Lancet*, 1949, 2, 529.

examination as for a college fellowship. Either the examination was unsatisfactory or a great many people were going in for it who ought not to be doing so. At University College, London, students might be accepted conditionally for the second examination on the consideration of their school record, a special examination, and an interview—exactly the right three-pronged fork on which to catch people. In 1948, 41 were accepted on those terms—a selection of one in seven—but of those 41, 18 subsequently failed in the First M.B. These were selected people, and yet nearly half of them failed to pass. It seemed to throw some doubt on the suitability of that examination.

The First M.B. was originally a university examination, taken by people after they got to the university. In special cases it was found useful to start on it at school, and the situation gradually and inexorably developed so that before the war it was pretty well established that in order to read medicine at a university the boy had to pass three out of four parts of the First M.B. before he went up. At Cambridge there was in some colleges more or less a demand, and in others the expression of a preference, that a boy should take all four parts before he went up. This examination was being quietly but remorselessly pushed along the shelf so that it was becoming the business of the schools and not of the universities. All this led to a very restricted amount of education at the schools and not to the type of education wanted for the future doctor. It tended to restrict the instruction in any other subjects than those definitely needed for this examination. At Eton there was an admirable arrangement for extra studies—three periods a week in any subject of choice, from archaeology to Russian. But from the point of view of the First M.B. it was a fantastic arrangement. He supposed that from that point of view they ought to stop this sort of thing, but it would be very unfortunate if they did.

The trouble was, of course, that more was demanded of the students than before. How was this to be got out of them—or put into them? A certain amount could be done by making them work harder. Was the boy to spend longer on his education to be a doctor because more was demanded of him, or was he to spend about the same time and start his specialized education rather earlier? Economic pressure in favour of the second solution would be very strong, particularly in view of the two years of military service, and it would not be of the least use for headmasters to make protests on the matter. It would need a decision either that less was demanded at the earlier stage or that longer was taken over it.

While in Germany he had had to face this problem in an acute form. There was intense pressure on the part of students to get through as quickly as possible, and at the same time there was an interest in the whole problem of general education. At one of the greatest of the technical high schools in Germany, that of Berlin-Charlottenburg, there was a strong party which felt it absolutely essential to broaden the curriculum and give the students "general studies" as they called them. It entailed a year's longer study, and he and many other people thought the students would not take it, but such was the enthusiasm and so strong the feeling that this was what they must do, that the students themselves were the strongest supporters of it. It was carried through with great sacrifices; in fact it was started during the hideous difficulties of the Berlin blockade.

So far as the public schools were concerned, said Dr. Birley in conclusion, they could do little or nothing of any use until the question of the First M.B. was tackled. However much individuals amongst them might insist on retaining certain general cultural subjects, the economic pressure would be so strong that it seemed likely that specialization would begin at too early an age and be too intense as it went along. That was the problem he left with medical educationists.

The Aims of the Medical Curriculum

Sir HENRY COHEN, chairman of the Special Committee of the B.M.A. which issued the recent report on "The Training of the General Practitioner," began by saying that in many discussions on medical education the sentiment emerged that the student should be encouraged to become a research worker or should have the rather dubious ambition of becoming a teacher of medicine, and that the medical curriculum should provide for these eventualities. He thought that those considerations should be put on one side in the knowledge that the student who showed an aptitude for research or for teaching would receive the direct individual encouragement of his teacher. The medical curriculum to-day was still fitted into the provisions of the Medical Act, 1886, under which the standard of proficiency which the student had to show in his final examination was to be such as "sufficiently to guarantee the possession of the knowledge and skill requisite for the efficient practice of medicine, surgery, and midwifery."

The curriculum in 1886 was probably adequate for this purpose. But in 1886 bacteriology was only at its beginning; epidemiology was concerned mainly with typhoid and typhus, cholera, and smallpox; serology and chemotherapy were unknown; hormones and vitamins were undiscovered, and diagnostic instruments mostly rather primitive.

It was the view of the committee over which he had presided that the aims of the medical curriculum should be reconsidered. The curriculum should aim at showing students what were the scope and potentialities of medicine and what were the duties and responsibilities of its practitioners. It should aim to equip the student, not with a mass of factual knowledge, but with sound basic principles. He should have not only competence in certain indispensable techniques but, as the result of his training, an intellectual resourcefulness and initiative in the handling of unusual and unexpected situations. The question of whether he was to practise in a specialty or to engage in general practice came later.

He believed that the general structure of the curriculum which had existed for more than half a century should be retained. There should still be premedical, preclinical, and clinical studies, though he disliked the term "preclinical," and thought there should be continuity between the so-called preclinical and clinical studies. He hoped it would be emphasized time and time again during the premedical period that chemistry, physics, and biology were instruments of medicine and would provide the answers to medical problems only in terms of chemistry, physics, and biology, and that there were other means of regarding medical problems. The instruction in the preclinical and clinical period should include not only the normal structure and function of the body, but the normal psychology of the patient and the recognition that he was a member of a family and of a society. During the last decade or so there had been an increasing appreciation of one important conception in medicine, namely, that diseases as defined by Sydenham, specific entities with their pathognomic signs, were merely conveniences for description, and that in fact disease was essentially a matter of deviation from the normal.

"During his clinical period the student must be enlightened to recognize that diabetes mellitus, for example, is not a disease but a problem in carbohydrate metabolism which he first encountered in his physiology and biochemistry, and that heart-block is not an entity but a disturbance of function which he can appreciate only if he remembers his physiology."

Fundamental Principles in Medicine

Sir Henry Cohen went on to say that he believed there were fundamental principles in medicine which could be taught to the student and which had their application in all fields of study, and if he were challenged he could mention many of them. There was, for example, the general principle that the intensity of symptoms was directly proportional to the range of pathological change. Whether they were dealing with an anaemia which developed rapidly, and therefore gave rise to significant symptoms, or slowly, so that it might go unsuspected for months, whether they were dealing with a cerebral tumour of rapid growth or slow growth, the same principle applied. The student throughout his training should have a holistic outlook.

The curriculum must be designed with sufficient flexibility to ensure that it could be modified according to the needs of student and teacher and the demands of growing knowledge. There must be periodic revisions and revaluations of content. The trouble in the past had been that in the endeavour to satisfy the 1886 Act any new accession of knowledge had been pushed into the curriculum, making it a patchwork quilt instead of a texture of clear design. Again, he thought they were still too hidebound in individual departments. There was still too great an autonomy of the departments of medicine and surgery in relation to each other and of the preclinical departments in relation to the clinical.

Dr. Birley had strongly emphasized the humanistic outlook. Sir Henry Cohen believed that there might be a more successful approximation between medical and general education if the historical approach to medical problems were adopted. This would enable the present to be interpreted in terms of the past and would emphasize that medicine was not a static body of knowledge but for ever changing. Students also should be encouraged to question, to discuss what was and what was not reasonably to be accepted from authority. Someone had said that the first commandment should be "Distrust thy father and thy mother." Finally, the teacher must seek intellectual honesty; there was a real danger in medical teaching of overlooking the significance of this. In medical teaching above all there was a risk that the teacher should regard himself as omniscient. He must be prepared to shed some of his omniscience in the interests of intellectual honesty.

Sir Henry Cohen summed up in these terms:

"The process of medical education is, in my view, to prevent the practitioner from being taken by surprise. To the badly trained doctor every problem is solved by rule of thumb or else it remains a mystery. He does not anticipate it, he cannot explain it, and if he solves it he does so by instinct or by chance. But the well-trained doctor knows in advance the difficulties with which he is likely to be confronted; some of them he anticipates, for others he will find an explanation, and perhaps reverse a probable explanation."

Of the need for general cultural education, he said that in one sense professional education was wider and in another sense narrower than general education. General education equipped a man for the business of life; professional education prepared him for his work and calling. If medical education lost sight of the need for equipping practitioners for the business of life itself it had failed. It should produce not merely competent general practitioners but men whose equipment for life itself—its enjoyment and service in it—had been enriched and strengthened by the training they had received in the medical schools.

Tuition in General Practice

Dr. G. O. Barber said that the young practitioner on entering general practice found a very different situation from that to which he had been accustomed in hospital. For one thing, he did not have the facilities at his command which the hospital had provided, and for another, he was expected, perhaps for the first time, to deal with the whole individual and his environment. There were two ways of looking after the health of the community: one was to have medical knowledge and facilities concentrated in large efficient hospitals, to which the patient would be directed by outside "scouts"; and the other was the traditional method of caring for the patient so far as possible in his home surroundings. For his own part he believed in the traditional method, and that the general practitioner, living in community with his patients, was an integral figure in medicine. But how should general practice be taught? In the report of Sir Henry Cohen's Committee a year under the guidance of an experienced general practitioner was recommended—in a sense a return to the old apprenticeship system, which would in time bear fruit.

He proceeded to give an account of a plan for instructing general practitioners, based upon one of the London hospitals. Informal talks were given on the kind of problems which the young practitioner would encounter. The common ailments which would occupy 90% of the general practitioner's time—the chronic cases of asthma and rheumatism and so forth—were described. He himself was accustomed to take his doctor's bag and give a homely, anecdotal talk about its contents. The students also went down and saw general practice in action. At the general practitioner's surgery they met the people who were his helpers—his secretary, the district nurse, the health visitor, perhaps the medical officer of health, the people with whom he was associated every day. With the help of the British Medical Association a filmstrip was available to illustrate work in general practice which could not very well be shown directly. Individual students came and occupied for two or three days a room at the general practitioner's house—a room ordinarily reserved for an assistant or locumtenent—and accompanied the practitioner on his rounds. It was not only the student who learned from such an association; the general practitioner himself learned as much or more.

Dr. Ffrangcon Roberts said that it was a matter of general wonder how students could possibly keep pace with the increase of knowledge. He was sometimes afraid that they got a knowledge of the facts without the proper grounding in principles. Facts were easily acquired, but their wider implications were not always absorbed. Dr. J. C. Waterlow said that students in a year accumulated an extraordinary number of facts, and yet often failed in their examinations. What they needed was to be taught to put together the facts they already knew. He added that he had suffered under the teaching of psychology in the preclinical period. He suggested that study in anthropology, as, for example, the work of Westermarck, or nowadays Margaret Mead, might be taken during that period. Professor W. Burridge complained that all committees on the curriculum seemed to add something to the burden, never to take anything away. It was a mistake to let the professors in any particular branch of medicine decide what that part of the curriculum was to contain; they were always unwilling to drop anything.

Dr. Birley, in reply, said that there was a real danger of a boy whilst still at school spending too much time on the physics, chemistry, and biology which he had to do for the First M.B. Recently he saw 70 boys individually in connexion with a particular matter and asked each of them the question, "Can you ever remember having looked at anything in a chemistry textbook and wondering whether it was not true?" Three of them said they thought perhaps they had; the other 67 were sure that no such idea had ever crossed their minds. On the subject of general studies he recalled a remark by a professor of pedagogy at Bonn: "I sometimes wonder whether students need these general studies, but I am sure we must all agree that the professors do."

Sir Henry Cohen said that he believed the doctor's work would be well served if the patients with whom he had to deal had some knowledge of scientific method and could eliminate personal prejudices concerning certain methods of treatment. After all, their patients included public men and others who were able men in different walks of life, yet often they had less appreciation of scientific method and the evaluation of evidence than the man in the street. It was not for entirely unselfish reasons that his committee had urged that general culture be provided in the schools; it was important not only that the medical student of the future should have a general cultural background but that, in this increasingly scientific age, such a background should be afforded to the general community so that they might have a scientific training and be accustomed to the evaluation of data. He did not share Dr. Waterlow's apprehension about the teaching of psychology in the preclinical years. He himself took psychology in the faculty of arts and it was of great value to him. At Liverpool the students were instructed in psychology not by a professional psychiatrist, but by a professor of philosophy. He agreed that it might be a good thing to have a committee which would delete from the curriculum instead of adding to it, and his committee took some steps in that direction, but it incurred the wrath of the anatomists when it insisted that enough of the kind of anatomy it envisaged might be learned in four terms instead of five.

DIAGNOSIS AND TREATMENT OF PLACENTA PRAEVIA

A discussion on new ideas about the diagnosis and treatment of placenta praevia took place in the Section of Obstetrics and Gynaecology of the Royal Society of Medicine on October 20. Mr. V. B. Green-Armytage presided.

Clinical Signs and X-ray Appearances

Mr. John Stallworthy said that the problems peculiar to posterior placenta praevia had been studied at Oxford for the last 10 years. During the last three and a half years Dr. Frank Reid, of the Department of Radiology of Oxford United Hospitals, had been associated with the work. Dr. Reid had been interested in soft-tissue radiography. His work was based on two main principles: the use of an aluminium filter to obtain clear definition of the placenta, and the study of the effect of gravity in different positions of the patient. Mr. Stallworthy showed a number of drawings from *x*-ray films demonstrating the site of the placenta. While he acknowledged the value of radiological help, it must be seen in the right perspective, and clinical methods had first place.

Safe vaginal delivery with placenta praevia depended on adequate control of haemorrhage by the presenting part. The clinical importance of a posterior placenta was that it might result in cephalopelvic disproportion preventing foetal engagement. It was also commonly associated with low insertion of the cord. This could be detected clinically in time to save the baby and was an indication for caesarean section.

The characteristic clinical sign of posterior placenta praevia was forward displacement of the presenting part, which could be confirmed radiologically. He held that the relationship of the presenting part to the brim was more important than the position of the placenta in relation to the os. If the presenting part engaged, vaginal delivery should occur; if it would not engage, section was indicated. If the placenta praevia was on the anterior wall the chances that it would cause clinical trouble were much less. Radiology was a useful tool in the selection of cases for prospective treatment, and it could also exclude those cases of ante-partum haemorrhage thought to be due to placenta praevia but in which the placenta was shown radiologically to be normally situated. During the past 18 months at Oxford 25 patients admitted for suspected placenta praevia had been discharged after *x*-ray examination, undelivered and without vaginal examination, and in none had their subsequent clinical course challenged the wisdom of such action. The special value of this procedure was in the saving of hospital beds.

Mr. Stallworthy gave details of 250 patients with placenta praevia treated between 1941 and the present date. There was one maternal death (due to nasopharyngeal carcinoma). The incidence of caesarean section was 40%. Foetal wastage was 18%, but in the last 100 cases it had been reduced to 13.7%. The aim was to have no maternal deaths from haemorrhage and a foetal wastage of 10% or less. This ideal could be achieved, but only if the problems peculiar to posterior placenta praevia were fully appreciated.

Limitations of Radiographic Assistance

Mr. C. H. G. Macafee reported on 341 cases of ante-partum haemorrhage admitted to the Royal Maternity Hospital, Belfast, during the period 1944–8. Of this number 108 were cases of placenta praevia; there was spontaneous or forceps delivery in 50 of these, and caesarean section was done in 58. There was one maternal death, due to an incompatible blood transfusion. The foetal wastage (uncorrected figure) was 9 stillbirths and 6 neonatal deaths, a total of 15 (14%). In 55 cases of placenta praevia treated expectantly for at least one week in hospital, caesarean section was carried out in 33 (60%), and among these there were 6 stillbirths and neonatal deaths, a death rate of 10.8%.

It was possible by abdominal palpation to suspect placenta praevia, and relatively easy to decide whether the placenta lay in front or behind. In the majority of cases the placenta was situated posteriorly. In most of the cases of fourth-degree placenta praevia there was very extensive posterior attachment to the upper uterine segment. Referring to the fact that there had been only 55 cases of placenta praevia treated expectantly in his hospital in nearly five years, he suggested that 11 patients a year would not tax the resources of any obstetric department. He was convinced that none of these admissions could have been avoided by soft-tissue radiography. Where placenta praevia was already suspected before or after haemorrhage had occurred, diagnosis by clinical methods, excluding vaginal examination, could be as accurate as, as well as more generally applicable than, soft-tissue radiography. Radiographic assistance should be sought only to confirm what was already suspected, and treatment should be guided largely by clinical findings and judgment. The admission of the cases he had reported depended on clinical findings alone. Radiography had its importance in deciding the treatment of patients with haemorrhage of doubtful origin.

Reasons for Improved Results

Professor F. J. Browne said that to explain the good results which the last two speakers had reported certain factors should not be forgotten, namely, the greater use of transfusion, the use of penicillin and sulphonamides, the increased frequency of caesarean section, and the fact—for which teachers in the undergraduate schools were to be thanked—that doctors were sending their cases earlier to hospital. There could be no doubt about the importance of the posterior placenta or of the danger of low insertion of the cord. The important thing for the clinician to remember was that the foetal heart should be watched in all cases; if it became irregular when vaginal delivery was pending it showed that the cord was being compressed and was an indication for caesarean section. The largest group of cases of ante-partum haemorrhage were those in which the cause was not known.

As to soft-tissue radiography, he had studied Dr. Reid's paper, but he noted that Dr. Reid was right in all his cases only when he made a negative diagnosis. He mentioned about 200 cases in which the diagnosis of "no placenta praevia" was confirmed. But, placenta praevia being the rare condition that it was (perhaps one in a thousand), Professor Browne rather fancied that, taking 200 cases at random, one would be pretty safe in saying, without an elaborate *x*-ray examination, that there was no placenta praevia. Of Reid's positive cases, numbering, he thought, 73, only in 50% was the diagnosis confirmed clinically, and if this happened in the Department of Radiology at Oxford, what was likely to happen in more benighted departments elsewhere?

Mr. Stallworthy had told them that if the head was sufficiently high and placenta praevia had been diagnosed by *x* rays, when the patient reached the 36th week he took her to the theatre and tried to push the head into the pelvis, and if the head did not go into the pelvis he did caesarean section. But if the head was high and the patient was not bleeding, why not leave her alone? Moreover, could they ever be sure about the 36th week? In his experience no patient was ever right in her dates. Why not allow her to go to term? As it was, one might get a premature baby, and "lose on the roundabouts what one had gained on the swings." The engagement of the head in the pelvis did not exclude placenta praevia. The classification of placenta praevia in four degrees had been challenged, but he was not persuaded that the degree did not matter; if there was complete placenta praevia the patient was far more liable to get severe haemorrhage.

Technique in Diagnosis

Mr. C. McIntosh Marshall contrasted the figures at Liverpool Maternity Hospital for the period 1926–34 with those for the period 1941–50. The total number of cases of placenta praevia during the earlier period was 306. The maternal deaths numbered 19 (multigravidae, 16; primigravidae, 3). Caesarean section was done in 57 cases. No maternal deaths followed caesarean section, but 11 of the deaths occurred after treatment by version, six after puncture of membranes or no treatment, and two after the use of Willett's forceps. In 1941–50, out of 250 cases, caesarean section was done in 176, version in 23, and

artificial rupture of membranes or normal delivery was effected in 51. Caesarean section was thus performed in 70% of the cases. The total foetal mortality was 18% ; the foetal mortality of the cases submitted to caesarean section was 14%. Of the patients on whom caesarean section was performed because of suspected placenta praevia, 65% had no digital examination per os.

By and large, the practice of the hospital had come to follow what he himself had laid down in 1939 as the practice of a reputable hospital. What he had urged was that placenta praevia could be diagnosed by the history of the case and abdominal palpation. He had strongly advised that the finger be kept out of the os. What he had heard that evening from Mr. Stallworthy and Mr. Macafee had seemed to justify his emphasis on the importance of clinical signs. All that Mr. Stallworthy had said about the importance of the posterior placenta was extremely important. The anterior-wall placenta was not so dangerous. Mr. McIntosh Marshall gave an account of the practice at his hospital.

Claims for Caesarean Section

Dr. LINTON SNAITH gave the results at Newcastle-upon-Tyne General Hospital over the last six years. There had been 90 cases of placenta praevia. The general line of treatment was conservative. His own preference was for caesarean section unless the head was engaged or could be made so. Maternal mortality had been *nil*. Of 91 babies born (one set of twins), 28 had died, but the corrected foetal loss was 14% ; he was excluding cases which were premature (below 32 weeks), deformed foetuses, and those in which no foetal heart was heard on admission. In the other cases there was one death for which he thought the anaesthetic was responsible, and two due to abnormalities unconnected with placenta praevia. Caesarean section was performed in 65 cases (70%), the operation being lower segment in 48 out of the 65. He still thought that caesarean section was a desirable method of treatment. He was unashamedly in favour of not examining vaginally. The only cases he examined vaginally were those in which the patient probably had not a placenta praevia. The diagnosis could be made by history and abdominal palpation. It was possible that unnecessary caesarean sections might occasionally be carried out, but the risk of this in perhaps one case out of a hundred was outweighed by the saving of heavy bleeding ; and, after all, one often saved the foetus, which would otherwise have perished from ante-partum haemorrhage.

Dr. NINIAN FALKINER looked upon placenta praevia as an ectopic pregnancy. The pathology of the condition had not been alluded to sufficiently. One of the things that had been impressed upon him was the extraordinary efficiency of the lower segment in controlling post-partum loss in placenta praevia. Professor Browne had seemed to think that the lower segment was inefficient, but he thought it did its job very well indeed. He was in full agreement with Mr. McIntosh Marshall in his ideas about the diagnosis of placenta praevia, and he thought the last speaker had summed it up very well when he said that he carried out vaginal examination only when he thought there was no placenta praevia. His caesarean section rate was 44%.

Summing up the Discussion

In some further discussion Professor CHASSAR MOIR referred to the change in attitude towards caesarean section in this country. During the present discussion rather scant justice had been done to radiology, and he spoke in high terms of the work of Dr. Reid at Oxford. Mr. G. J. SOPHIAN said that no speaker had touched on the mechanics of the uterus. It had been shown in America that the lower uterine segment during labour was in a condition of tonic contraction with each labour pain. He thought this was of extreme significance from the point of view of the lower segment being considered as a contributory cause of foetal death in placenta praevia.

Sir WILLIAM GILLIATT said that the thing that had struck him most was the suggestion that radiology provided an additional means of accurate diagnosis of placenta praevia. That was the outstanding feature of the discussion. Radiology had come to the help of obstetrics in many ways. In contracted pelvis no one would think of neglecting it. Mr. Stallworthy had properly emphasized that he did not, because of the availability of a radiologist, neglect clinical examination, but this additional help of radiological diagnosis was to be welcomed.

The openers, handicapped by the lateness of the hour (the meeting went on for nearly three hours), made brief replies. Mr. STALLWORTHY paid a tribute to the foresight of Mr. McIntosh Marshall. It was not the case, he said, that the results of radiological examination were merely of a negative character. The new ideas were justified in the unprecedented lowness of the maternal mortality and foetal wastage figures.

LIVERPOOL MEDICAL INSTITUTION

STUDENT HEALTH SERVICES

The second ordinary meeting of the 114th session of the Liverpool Medical Institution was held on October 19, with the president, Dr. DAVID JOHNSTON, in the chair.

Dr. R. W. PARNELL (Oxford) opened a discussion on "A Medical Service for Students." Dr. Parnell drew attention to the fact that the student health movement was world-wide, and that outside Britain and America there were known to be 58 university health services in 25 different countries ; routine chest radiographs were taken at 50, while at over two-thirds there was a general physical examination. In America there were 200 member institutions in the American Student Health Association, which had held annual meetings for more than 25 years. In Great Britain only four of the 17 universities now had no whole-time student health officer.

Industrial health services existed because there were advantages in making provision for a group of the population with common needs. It would be unfair to suggest there was no industry among 130,000 students in Great Britain. Health examinations were valuable in at least two ways. They were preventive, and they provided health records of a definite occupational group, from which its risks could be computed.

Dr. V. COTTON CORNWALL said that in a medical service for students the prevention and treatment of tuberculosis were very important factors. Dr. Nicholas Mallison's figures showed that about 0.2% of non-medical and about 1% of medical students were victims of this disease. Apart from preventive measures such as B.C.G. inoculation and serial radiographs and clinical examinations, steps should be taken to minimize the disabilities from which these students suffered. The idea of a post-cure rehabilitation centre of, say, 100 beds for the country was an excellent one, but would take time and money to organize. If, however, the regional boards and the universities would co-operate something could be done *at once* to improve matters. All students should be sent to one hospital in a region for treatment, and the faculties to which the students belonged should make themselves responsible for guiding their studies for as many hours as the physician in charge considered suitable.

Dr. R. W. BROOKFIELD drew attention to the fact that medical care was only one aspect of the much larger subject of student welfare. Catering arrangements, means of transport, and effective supervision of lodgings were of great importance for the well-being of the student and should be the responsibility of suitably equipped lay officers who could work in conjunction with the medical officer. In those universities where each student was under the supervision of a tutor, the latter could make most valuable contributions to the physical and mental health of those in his care by drawing the attention of the medical officer to suspected abnormalities and discussing appropriate remedies with him.

Dr. G. W. TAYLOR said that, in view of the frequency of anxiety states and other mental illnesses amongst university students, which the medical service had demonstrated, he would point out the usefulness of the regency system as operated in the Scottish universities. The regent—guide, philosopher, and friend of the student in times of trouble, and not necessarily a member of the medical faculty—was in a position to understand the mild anxiety state and give early help.

Correspondence

The B.M.A. War Memorial and Epsom College

SIR,—We disclaim at once any thought of questioning the absolute discretion of the British Medical Association in dealing with money it may collect for a war memorial. However, the correspondence in your columns instigated by the letter of Dr. J. B. Wrathall Rowe in the *Supplement* of August 12, page 89, shows that the aims and objects of Epsom College are less widely known to the medical profession than we should like them to be, and this prompts us to a brief explanation.

The College exists to provide a place where sons of medical men and women can get a first-class public school education strictly at cost price and where admission is open to all others at slightly higher cost, though it is the sons of medical men and women who have the first call.

The Royal Medical Foundation of Epsom College, whose accounts are kept separate from those of the College itself, collects from the medical profession and its friends funds wherewith to pay the College bursar the whole cost of education, board, and clothing for 50 sons of registered practitioners whose circumstances necessitate help of this kind: these are practically all orphans—and war orphans are considered to have a special claim. Many scholarships, exhibitions, and bursaries are also paid for by the Foundation, some held at the College itself, some at preparatory schools, and some at local grammar schools. Scholarships for girls at other schools are also paid for by the Foundation, and extra financial help for this aim is one of our most pressing needs. If the resources of the Foundation were greater (only a very small percentage of the profession at present subscribe) more and better scholarships could be provided and improved College buildings and class-rooms erected.

In brief, Sir, the College has been doing its best for 97 years, with very limited support from the profession, to carry out exactly what Dr. Rowe and other critics of the Council of the British Medical Association regard as the most worthy object of a war memorial. It seems clear to us that many members of the medical profession do not understand the position.—We are, etc.,

J. S. COTMAN,
Treasurer.
HAROLD SPITTA,
Chairman of the Council.
ERNEST GOODHART,
Vice-Chairman of the Council.

Epsom College, Surrey

Psychology and Science

SIR,—I am grateful to Sir Cyril Burt for his kind letter (*Journal*, October 21, p. 943) but cannot accept his strictures. It appears to me that the "proof" which he takes as indicative of science is merely successful prediction. If I may take a simple example, copper sulphate is believed to be composed of copper and sulphuric ions. If this is so, we predict that, if copper is dissolved in sulphuric acid, copper sulphate will be formed. Also if an electric current is passed through the solution the metal will be deposited and the acid formed at the respective poles. These predictions are found, in arranged conditions, to be true, and so the theory is "proved." If on some occasions zinc instead of copper were produced the theory would be disproved because the predictions were incorrect. Newton thought that light travelled in straight lines, and arranged conditions which, if his predictions were correct, would show that this was so. They apparently did, and he thought that he had proved his proposition. However, Einstein predicted that in certain conditions light would bend, the conditions were found, and light did bend. Newton's predictions were wrong and Einstein's correct on this occasion, so we say that Einstein's theory was proved.

The present difficulty regarding statistical proof in psychotherapy is that the mind is so subtle, so immeasurable, and treatment so slow to yield the large numbers of cases the statistician demands. Nevertheless a certain amount of statistical work, even in this branch of psychiatry, has been published. I am astonished, however, that Sir Cyril should suggest that there is insufficient statistical evidence regarding leucotomy. It is just here where innumerable papers, which surely Sir Cyril must have seen, all demonstrate that so many cases have been cured, so many relieved, and so many unchanged. Many of us are sceptical of these statistics and are inclined to say, "Tell me not in mournful numbers," since one sees so many of those who are "unchanged." Sounder statistics do seem to suggest that insulin and electric convulsions (in spite of the ignoramuses) are beneficial in suitable cases.

Everyone will agree with Sir Cyril that clinical experience should be combined with statistical comparisons, but surely it is time that someone uttered a protest against the domination of the statistician. I have not had time to confirm it, but from my general reading I think that many diseases were first described on what statisticians would regard as useless evidence: for example, I believe fragilitas ossium was described on two cases, Paget's disease of bone on half a dozen, and Huntington's chorea on a few more. Can anyone deny that the exact descriptions and beautiful water-colours made by such old physicians as Addison and Bright were any less "scientific" than the columns of figures which are poured out daily ? Statistics are useless without the initial clinical observations, and it is here that the statistical investigation so often fails.

The word "ignoramus" was used originally because it was felt that one should be humble in one's ignorance and not denigrate the work of others which one might not understand. I have not the wide knowledge of Sir Cyril, so perhaps I feel differently, but when I am confronted with the marvellous complexity of the human body and see the incredible subtlety of the mind I feel that it is presumptuous to describe myself even as an ignoramus, although that term means accepting the blundering stupidities Sir Cyril associates with it.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

SIR,—Dr. F. M. R. Walshe's criticisms of psychological medicine (August 12, p. 379 ; September 16, p. 677), and Sir Cyril Burt's suggestion that statistical criteria should be applied to its results (October 21, p. 943), are welcome. We need an audit of the high claims to authority made by some psychiatrists and well exemplified in Dr. Dillon's letter (October 21, p. 943). Dr. Dillon, taking the field like a man who regards himself as the hope of his side when the earlier batsmen have failed, makes what he calls a reasoned rebuttal of Dr. Walshe's theses. He then proceeds to an admission that psychology—i.e., psychiatry—has no unity of method or concept, giving no definition of it except that it is not what many medical psychologists believe. To this vague specialty he claims to add history as a species.

We must remember H. A. L. Fisher said he found in history "no plot, rhythm, or predetermined pattern," that G. M. Trevelyan claims to see of the future "no more than others," and that A. J. Toynbee warns explicitly against the "error of applying to historical thought, which is a study of living creatures, a scientific method devised for the study of inanimate nature." It is clear that Dr. Dillon is making very high claims indeed, including an ability to collate and manipulate the processes of the mind according to "the true scientific method." That some psychiatrists have persuaded themselves they possess this power seems undoubted, and they are ready to assume control of patients' lives to an extraordinary degree, even overriding rules of medical conduct. This control extends, as Dr. Walshe has emphasized, into the administration of the law: and yet, as Sir Cyril Burt points out, very little established basis exists for current psychiatric practices. This basis may not be of the same nature as that of the inorganic sciences, but therapeutic results will be equally susceptible of statistical analysis, and there is real need to estimate them as carefully and impartially as the latest cancer cure.—I am, etc.,

Hove, Sussex. W. A. BOURNE.

Accidents in the X-ray Room

SIR,—I was interested in your comments (October 7, p. 827), dealing with the cases of tellurium poisoning which Colonel (now Professor) Tunbridge, Dr. Martin, and I wrote up in the *British Journal of Industrial Medicine* in 1944. The sodium tellurite was obtained from a bottle in my pathological laboratory, and was mislabelled at its source of supply. This was proved eventually by proceedings in which I believe both the dependants of the men who died as the result of this retrograde pyelography were compensated, the bottle at the time being labelled sodium iodide. This fact did not come to our notice, however, till months later, as the cases occurred on active service, and there was a gap between the occurrence of the cases in North-west Europe, and the settlement months later in the United Kingdom.

The barium carbonate poisoning cases mentioned in your article were also most interesting. I well remember in West Africa in 1942 being consulted in a series of acute food-poisoning cases which affected officers and other ranks in R.A.S.C. messes. These were most disturbing cases, and the Army hygiene people finally tracked it down to contaminated flour. It appeared there had been a large import of barium carbonate for rat-poisoning purposes, the rat poison consisting of barium carbonate one part and oatmeal three parts. It was decided that somehow at the docks a sack of barium carbonate had burst and the white amorphous powder had been mixed up with some flour by mistake. It was coincidental that the persons to be involved were the suppliers of the flour to the Army locally —i.e., the R.A.S.C. The hygiene people were very effective in dealing with this matter, and the only African involved was the cook, who stole some of the pastry from the officers' mess, with results that were as startling as those that affected those he cooked for. Very promptly all bread and flour were withdrawn from military establishments and no further cases occurred.

The symptoms were of sudden onset, consisting of sudden collapse, diplopia, dysphagia, dryness of the throat, with vomiting in some cases, but no diarrhoea. The patients were for the most part apyrexial, and the whole business was most puzzling. No fatalities occurred in these series of cases, which amounted to somewhere about twenty persons affected.—I am, etc.,

Bromley, Kent. JOHN KEALL.

War on Leeches

SIR,—Two of your recent correspondents (*Journal*, September 16, p. 679; and October 14, p. 891) have written concerning the tenacity of leeches to the nasopharynx. In Malaya during the past two years there have been deep-penetration patrols pushing increasingly further into the jungle for increasingly longer periods, and, as it fell to my lot to push with them, I found a tenacity of leeches not only to the mucous membrane of the nasopharynx but of many other places.

The site which was most alarming to the host and from which I experienced the greatest difficulty in removing a leech was the penile urethra. Neither I nor the two hosts concerned had the courage to wait until the leech became engorged and would release its jaws, and then see if it could be passed upon micturition. It might have become too swollen.

Weight of equipment carried was the overriding factor in that terrain, and to be burdened with an onerous collection of ethyl chloride sprays, which leeches loathe, cocaine solutions, bottles of ether, or other "leech-grip releasers" meant unnecessary exhaustion and bulk to the point of interference with patrol mobility. Hence I removed three leeches respectively from the anterior end of the inferior concha of the left nostril, the buccal wall, and the tonsillar fossa on the right by gripping them with a haemostat and pressing a burning cigarette-end held in another haemostat against them. The ensuing heparin-released haemorrhage was controlled by the application of a small piece of alum.

The first leech in the urethra could be seen about ¼ in. (0.6 cm.) from the meatus upon dilatation with haemostat blades. It had lodged there during the night, which the host had spent on the jungle floor. He felt discomfort upon awakening, and upon micturition found an interrupted stream and a frank haematuria. When I approached him with a burning cigarette-end held in a haemostat he confided that, although he was alarmed because of the site of the leech, he was even more alarmed at the prospect indicated by my approach.

It had been noticed previously that leeches did not lodge on the skin areas soaked in dimethyl phthalate, the mosquito repellent, and the negritos as a counter-measure smeared themselves with coconut oil, although this appeared to be more of a mechanical disadvantage to the sucker of the leech. Salt, although it disturbed the leech's personal osmotic balance, would in the concentration required be somewhat traumatic to the damaged urethra, which was also true of dimethyl phthalate, but to a lesser degree. I retracted the meatus, gripped the end of the leech with a haemostat, and poured a few drops of dimethyl phthalate on the leech. It disengaged its jaws and was removed. Alum was not applied and bleeding occurred for about an hour.

A similar case occurred two months later in May of this year, and the leech was removed in the same way. After these two incidents some of the men decided that prevention was a far better thing, and in particularly heavily infected areas wore condoms when they slept at night.—I am, etc.,

Workington. R. IAN K. BLYTH, Lately Medical Officer, Army Jungle Warfare Experimental and Training Centre.

Leech in the Nasopharynx

SIR,—I was interested to read (*Journal*, September 16, p. 679) an account of a case of haematemesis due to a leech finding its way into the nasopharynx. This brought back to mind that while stationed in Lansdowne, in the United Provinces of India, during the winter of 1937–8, I had a similar case—that is, in so far as a leech entered the nasopharynx of a Garhwali sepoy. I recall trying unsuccessfully to remove the leech with forceps. It was not until I sprayed into the nose a solution of adrenaline hydrochloride 1 in 1,000 that I succeeded in removing the leech, which was over 2 in. (5 cm.) in length. I suppose the adrenaline had a similar effect to the cocaine in the earlier case. —I am, etc.,

Prince Edward Island. KENNETH I. E. MACLEOD.

SIR,—On reading the note by Dr. A. Cameron on haematemesis from leeches in Palestine and Jordan (September 16, p. 679) I was reminded of three such cases which I encountered in Nazareth during the summer months of 1946 and 1947. However, in all three the presenting symptom was gradually increasing hoarseness accompanied by occasional expectoration of blood-tinged sputum. Examination of the pharynx revealed the leech to be attached to the epiglottis in two cases and the posterior wall of the pharynx in the third. They were removed by cocainizing the throat and extracting with forceps, something which I might say is easier said than done.—I am, etc.,

Norwegian Hospital, Brooklyn, N.Y. RENDEL LEVONIAN.

Insulin and E.C.T. for Rheumatoid Arthritis

SIR,—We read with great interest the article on this subject by Dr. G. D. Kersley *et al.* (*Journal*, October 14, p. 855). These authors note that after E.C.T. there was no significant drop in the number of circulating eosinophils five hours after treatment, "constancy of the fall of eosinophils with insulin, but absence of change with E.C.T." They suggest that the action of insulin hypoglycaemia may be the result of stimulation of the adrenal cortex, or of the synergic action of insulin and endogenous cortisone.

If Dr. Kersley and his associates are using the term "a significant drop in the eosinophil count" in the sense suggested by G. W. Thorn, P. H. Forsham, F. T. G. Prunty, and A. G. Hills (*J. Amer. med. Ass.*, 1948, **137**, 1005) our results in a greater number of estimations (like those of M. D. Altschule, B. H. Parkhurst, and K. J. Tillotson, *J. clin. Endocrinol.*, 1949, **9**, 440) have not led us to the same conclusion. Thorn *et al.* consider that a fall greater than 50% is indicative of a satisfactory adrenocortical response, when the second eosinophil count is made four hours after A.C.T.H. administration. We have observed a fall of this magnitude in patients treated with electroconvulsion, the fall being most frequently observed and greatest after the first treatment. It should, however, be noted that our patients were not suffering from rheumatoid arthritis but from some form of mental illness, and that premedication was limited to small doses of "amytal," no D-tubocurarine being administered. Details of our findings will be published in due course.

We agree with Dr. Kersley that a marked fall in circulating eosinophils follows insulin hypoglycaemia, and we have noted that the frequency and magnitude of this fall were usually greater with higher dosage. In all cases in which coma or even sopor was induced for therapeutic purposes a "significant" depression in the post-treatment count was met with. We also agree that the eosinophil count of various individuals varies within very wide limits, but so does the count of the same individual on different days, and it is therefore unlikely that the true depression of the number of circulating eosinophils can be estimated more accurately by comparison with the count taken on any one of the no-treatment days. All that can be claimed is that the afternoon count on a no-treatment day is usually higher than the morning count of the same patient on that particular day. On the evidence available to us we do not feel inclined to conclude that the action of insulin differs from that of E.C.T. in that the former, but not the latter, may stimulate adrenocortical activity.—We are, etc.,

Arlesey, Beds. F. MACKENZIE SHATTOCK. LORNA P. MICKLEM.

SIR,—I have read with interest almost amounting to amazement the article entitled "Clinical Assessment of Rapidly Acting Agents in Rheumatoid Arthritis" (*Journal*, October 7, p. 810). The "assessment" of the value of the substance used depended on one injection and an examination one hour and again one week after it. Will anyone in the world accept such an experiment as being of any value whatsoever? Would any of our colleagues take a series of cases of auricular fibrillation and test the efficacy of digitalis by one dose, "assessing" its effects one hour and one week later? Was any series of "assessments" made in a similar manner on penicillin, or the sulphonamides, or insulin? Until the material is used correctly we shall continue to see such "assessments" and adverse reports appearing in the specialized press.—I am, etc.,

Derby. R. LATHAM BROWN.

Pernicious Anaemia and Gastric Carcinoma

SIR,—In the correspondence occasioned by our report (August 12, p. 405) Dr. D. Jennings (September 2, p. 575) maintains that pernicious anaemia and gastric carcinoma arise together. We are unable to find anything to support this interesting hypothesis in our series. On the contrary (cf. our Table VI), many gastric carcinomata arose several (on the average eight) years after P.A. was diagnosed, and only two out of fifteen cases were diagnosed within one year of the discovery of P.A.

Jennings's theory that our series might be selected, so that some patients were not admitted to a P.A. clinic until gastric carcinoma had developed, is a source of error which may be disregarded in our series. In all 15 cases of gastric carcinoma, P.A. was diagnosed primarily in the Bispebjerg Hospital.

In the same number of the *Journal* it is emphasized by Dr. J. F. Wilkinson (September 2, p. 576) that the mortality in our series is 38%, as compared with only 20% in his own larger series. This difference may be due to the fact that our patients are older than Wilkinson's. As appears from our diagrams, there was no excessive mortality worth mentioning among the P.A. patients. Wilkinson does not mention whether an excessive mortality was found among his patients.

Our series is smaller than Wilkinson's, but by reporting the age and sex distribution among our patients and the length of the follow-up period we have shown, by means of a comparison with a similar population without P.A., that the incidence of gastric carcinoma is significantly increased among the P.A. series. Such a comparison, which is of decisive importance to this entire question, has not been performed by Wilkinson. In our opinion percentages are of doubtful value in assessing the incidence of carcinoma in a series of patients whose sex, age, and follow-up period are unknown.—We are, etc.,

Copenhagen, Denmark. JOHANNES MOSBECH. AAGE VIDEBAEK.

Emergency Leucotomy

SIR,—Dr. M. O'C. Drury's memorandum (September 9, p. 609) makes strong demands on our credulity. After some two years' treatment and observation of a typical case of anorexia nervosa, during which time a transorbital leucotomy was performed, a radiograph of the chest was taken and showed "a cavity below the right clavicle . . . doubtless tuberculous." Here we should like to have a little more evidence before admitting the "doubtless." If there was active tuberculosis with cavitation, one would expect some sputum. We are not told whether there was any; nor, if sputum was obtainable, whether tubercle bacilli were found. Presumably the radiograph was considered to be sufficient evidence in itself of *active* tuberculosis without any need for further careful clinical examination. Without, however, troubling about this, the conclusion is arrived at forthwith that the patient's "emaciated state and continued dependence on tube-feeding pointed to a *fulminating phthisis* soon ending the story." The patient's emaciated state was fully accounted for by her anorexia nervosa, and there seems to be here a confusion of cause and effect. However, all is made right by performing a further leucotomy—a full one this time—and in about a month's time an *x*-ray report reads, "Cavity cleared . . . and infection almost gone." One wonders how the radiologist can tell that the infection has almost gone. We are told that "in spite of the presence of a tuberculous cavity, it was decided not to confine her to bed," as the "after-treatment of a leucotomized patient should be one of continual occupation." In a long experience of tuberculosis I have not heard of the mere existence of a cavity being made a reason for confining a patient to bed. The concluding comment is: "A specifically psychiatric procedure and the ignoring of the physical disease during convalescence led to an eventual healing of a *proved* tubercular lesion—a healing as rapid as any collapse treatment would have produced." Well, if this is sound scientific reasoning, leucotomy should become more popular than ever, and the danger of being subjected to it more imminent.—I am, etc.,

Folkestone. E. WEATHERHEAD.

The Dangers of Mixing Domestic Cleansers

SIR,—The letter of Dr. E. Bellamy (*Journal*, October 14, p. 893) prompts me to record a similar experience which I had with a patient two months ago. In this instance a middle-aged lady with a slight asthmatic tendency, but who had had no attack for several years, decided to clean her bath with "harpic" (contrary to instructions on the tin, which state that the contents should be used for W.C. bowls only), and, following this, thought she would finish off the process with "domestos." At once the bath was filled with chlorine fumes, and she was seized by a most acute attack of asthma involving a severe degree of collapse into the bargain. Soon afterwards I was able to apply the usual remedies, and in a few days she had fully recovered, but I endorse the view that the dangers accompanying the mixing of domestic cleansers should be more widely known—particularly to housewives.—I am, etc.,

Kirton-in-Lindsey, Lincs. A. C. THOMSON.

Infection by Syringe

SIR,—I was greatly interested to read in the *Journal* (July 22, p. 185) the article by Drs. R. J. Evans and E. T. C. Spooner regarding the possibility of transfer of infection when multiple injections are made with the same syringe but using a fresh sterile needle in each operation. The authors are to be congratulated on the ingenious and completely scientific research methods they have used to demonstrate that the possibility of

infection always exists, and that this is in all probability due to the sucking back of infected material from the tip of the needle when the needle is removed from the end of the syringe.

I note, however, that both in the article of Evans and Spooner and in your editorial comment in the same number (p. 204), it is apparently assumed that there would be no change in the procedure, other than the use of a separate syringe for each operation, which might remove the possibility of infection. It occurs to me that there may be a very simple and practical method of doing this. All it requires is a small piece of "plasticine," beeswax, or similar material. The suggested procedure would be the following. When after the injection the needle is removed from the tissue, which is possibly infected, the tip of the needle is thrust into a small piece of plasticine. While this is done, a positive pressure must be maintained on the plunger of the syringe. The needle is then removed from the end of the syringe, and the plug of plasticine should prevent the suction pressure from drawing any fluid up the barrel of the needle. Fluid would be, on the other hand, sucked from the syringe. The plasticine plug could then be removed from the needle before it is placed in the sterilizer.

This procedure is really identical with that used by physiologists in the newer techniques of using hypodermic syringes for the collection of gas samples (as introduced by Scholandaer and others). It would be of great interest if Drs. Evans and Spooner could find time to test this suggested procedure. If they could show that when it was used the possibility of infection became minimal, the present methods might be considered absolutely safe if supplemented by this additional precaution.—I am, etc.,

University of Western Ontario, Canada. ALAN C. BURTON.

Camels and the Temperature Chart

SIR,—I am glad that Dr. B. Webber (September 16, p. 682) has drawn attention to the misapplied use of the term dromedary to describe a two-humped temperature chart. My article in fact called it "camel" and I added dromedary in parentheses. I have no doubt that "dromedary" will continue to be used, possibly because teachers prefer it for its more sonorous quality.—I am, etc.,

London, S.W.6. W. HOWLETT KELLEHER.

Distinction Denied

SIR,—From the sheltered seclusion of the House of Lords (see report in the *Journal* of October 28, p. 1005), Lord Moran has appeared to throw derision at those consultants who have refused to be classified for distinction awards, or who have declined to accept them after they have been announced: these persons are stigmatized as the "few uneasy agnostics." If to these two groups are added those who have refused the initial salary as a consultant, it is my belief that the total number is not inconsiderable. Many see in this system the more rapid approach of the day when all consultants will be full-time servants of the Ministry of Health and when private consulting practice will automatically cease.

Is it just that the recent president of one of our Royal Colleges should speak thus of those members of his own profession who place principles in front of monetary awards? Lord Moran himself stated in the same speech that "in these days of penal taxation it is necessary for them (that is, the consultants) to take thought for their dependants." He might have added that those who refuse these moneys also debar themselves from appreciable superannuation benefits in their years of retirement. It may appear to Lord Moran that, because a large number of consultants have accepted these awards, they believe them to be just and proper: from my own knowledge I say that a large number of consultants have reluctantly accepted the awards from sheer financial necessity, and do not believe in the principle that any committee can grade every member of a highly trained profession, working in a field as diverse as medicine, into classes "A," "B," "C," or "Nil."

Your correspondent "Z" (October 21, p. 944) draws attention to the fact that the classification of consultants into groups of different merit is already becoming public property and is bound to affect the choice of a consultant by general practitioners and by patients. How can it be otherwise? The secretaries and the finance officers of 14 regional hospital boards and of 36 boards of governors of teaching hospitals have already been informed of the classification of those in their employment: and any member of any one of these boards has the perfect right to see the list of awards. How long then can the information be kept confidential?

It will be a sad day for Medicine and for Great Britain when the levelling influence of the Welfare State forces all men to accept its dictates against their own consciences.—I am, etc.,

London, W.1. E. C. WARNER.

Medicine by Radio

SIR,—I should like to endorse Dr. Douglas Robb's letter (*Journal*, October 14, p. 890) complaining of the possible mischief resulting from the recent medical talks on the radio. I am not a wireless enthusiast myself and so have never actually heard these talks, but they are frequently quoted to me, and if the quotations are at all accurate these anonymous doctors seem to dogmatize on matters which are, to say the least, controversial. An added danger clearly lies in the fact that credulous people are likely to place undue reliance on these opinions, thinking that a doctor who talks on the radio must be far cleverer than his more modest colleagues.—I am, etc.,

Winchcombe, Glos. E. H. EASON.

SIR,—I desire to join Dr. Douglas Robb (October 14, p. 890) in his protest against the broadcasting of anonymous medical voices by the B.B.C. In order to assess the worth or otherwise of the views expressed by a speaker or writer one should know who and what he is, and what are his qualifications and experience. Anonymity deprives us of this basis of judgment and criticism. If I may adapt the old legal axiom, I would say that the expert must not only be an expert but should be seen to be one.—I am, etc.,

Belfast. H. G. CALWELL.

Substances Added to Tobacco

SIR,—Dr. E. J. Trimmer in his letter to the *Journal* (October 14, p. 889) makes a serious error in stating that saltpetre or other substance is added to tobacco to make it burn more rapidly. The addition of any such substance is completely prohibited by the Tobacco Act of 1842, and stringent penalties are imposed for any infringement of the regulations. The manufacture of tobacco in this country is carried out under rigorous supervision by H.M. Customs and Excise, and no substance other than water may be added to tobacco without written authority from the Board of Customs. In the case of flavoured tobaccos, a volatile flavouring agent dissolved in duty-paid ethyl alcohol and water may be added, but permission for such addition is granted only after samples of the material have been approved by the Government chemist.—I am, etc.,

F. D. NEECH,
London, N.W.1. Chief Chemist, Carreras, Ltd

Transmission of Kala-azar

SIR,—The generally accepted theory that sandflies are vectors of leishmaniasis has received a knock-down, if not a knock-out, blow by the criticisms of Malone and Brooks.[1] These arguments, together with Shortt's[2] attempted refutation of them, have been summed up in a letter by Brooks[3] which has recently appeared in the *Indian Medical Gazette*. The editor of the *I.M.G.* in commenting on Brooks's recent publication states, "The case against the sandfly may still be 'not proven'"; and an eminent protozoologist, the late Dr. Clifford Dobell, F.R.S., appears to have put it in even stronger terms, for according to Brooks (*loc. cit.*) Dobell described the sandfly theory as "a classical example of wishful thinking" (on the part of those who sought to incriminate the sandfly) and a "protozoological myth."

We have only to consider the following points which, if the argument of Malone and Brooks cannot be refuted, dispose of the theory

once and for all. (1) *P. argentipes* (the supposed vectors of kala-azar in India) under natural conditions take only one blood meal and do not live for more than five or six days, yet to transmit kala-azar under laboratory conditions they must be kept alive at least ten days and induced to take a second blood meal at the end of this period. (2) The life of this sandfly, in laboratories, is artificially prolonged by an absence of larval food, by keeping the insect at a uniform temperature of 28 ± 1° C., and by feeding it on raisins after the first blood meal, this being an entirely unnatural diet, as evidenced by the fact that the ovaries of the flies given a raisin diet fail to develop. (3) Experiments to recapture *P. argentipes* released on the day they emerged from their pupal cases conclusively showed that those insects did not live beyond five days, and much evidence in earlier experiments when the flies were kept under natural conditions and in the presence of larval food supports this finding. (4) There is no evidence whatever which suggests that the known distribution of *P. argentipes* in India is similar to that of kala-azar. (5) *P. argentipes*, in nature, very rarely if ever harbours flagellates of leishmania. In fact infected *argentipes* are so few that they could not possibly account for epidemics such as rage from time to time in Assam. Moreover, of the few flies infected with flagellates (about ten of the thousands examined) six were recovered from a cattle-shed in a small batch of 69. As is well known, sandflies may harbour natural flagellates, not leishmania, though possibly indistinguishable from them, and it seems probable, therefore, that no fly has ever been found in India with a natural leishmanial infection. (6) Sandflies will not bite a skin wet with perspiration, and this is entirely against the theory that these insects are responsible for the devastating epidemics of kala-azar in Assam, especially as infection generally occurs during the monsoon months, when skins are pouring with perspiration. (7) All attempts to transmit Oriental sore by the bites of infected *P. papatasii* or other sandflies *under natural conditions* have proved uniformly unsuccessful. (8) Epidemiological considerations suggest strongly that contact, and not *Phlebotomus*, is the important factor in the transmission of kala-azar and Oriental sore.

Space does not permit detailed consideration of the points enumerated above, but the fact remains that the arguments of Malone and of Brooks cannot be ignored. In the interests of science their objections must be refuted, and, till this is done, textbook teaching on the subject should be altered to suit facts, for, Sir, in the words of Bacon, "Books must follow sciences, and not sciences books."—I am, etc.,

Mussoorie, U.P., India. B. J. BOUCHÉ.

REFERENCES

[1] Malone, R. H., and Brooks, A. G. (1944). *Indian med. Gaz.*, **79**, 484.
[2] Shortt, H. E. (1946). Ibid., **81**, 310.
[3] Brooks, A. G. (1950). Ibid., **85**, 380.

The Causes of Death in Diabetes

SIR,—Dr. Elliott P. Joslin's statistical note "A Half-century's Experience in Diabetes Mellitus" (May 13, p. 1095) is instructive. A record relating to 35,597 persons, about 60% of whom proved diabetic and about 50% of whom again turned out to be fatal, represents a valuable material worth publication as basic data for further studies. It can of course be summarized into a table giving the number of cases under a multiple classification by age, sex, year of admission, year of death, types of application, nature of treatment, duration of illness before admission, etc. The valuable article in its very condensed form fails, however, to throw light on certain points of importance.

For instance, a comparison ought to have been made of the percentage of fatality (to total incidence) of the respective causes individually. It is not enough to know that the percentage of deaths from "coma" to total deaths from "all causes" has fallen. It is also useful to investigate if the percentage death from "coma" to total incidence of coma and to total incidence of diabetes is declining also, and if so to what extent.

Again, the percentages shown in Table II in each of the six eras, added up for the eight "causes," always exceed 100%, indicating that the eight causes enumerated therein are not mutually exclusive—i.e., a patient may have more than one cause responsible for his death. The number of such mixed cases is, however, not likely to be large, and should have been shown separately along with categories of single causes—e.g., coma and gangrene, cancer and tuberculosis, etc.

Finally, it is also desirable to split up Table II further by the duration of illness in the patient, which may have a differential effect on the fatality of a cause.—I am, etc.,

Indian Statistical Institute, Calcutta. J. M. SEN GUPTA.

Spontaneous Amputation of the Cervix

SIR,—Mr. I. F. MacMath (*Journal*, August 26, p. 498) gave an interesting account, concluding with some suggestions regarding aetiology. Since this accident in labour is comparatively rare I think it is worth recording a further case.

The patient, aged 37, had a previous pregnancy associated with toxaemia in 1941. That labour commenced at term and was prolonged throughout its course owing to some degree of pelvic contraction. The baby was born eventually, spontaneously, and weighed 6 lb. 2 oz. (2.6 kg.). On the occasion of the present pregnancy the patient developed mild toxaemia, and at term I induced labour by means of a high rupture of the membranes. The cervix was approximately 1½ in. (3.7 cm.) long but admitted 1½ fingers, and there was a laceration on one side of it. The head was fixed in the brim, but there was no evidence of disproportion. Labour commenced briskly 36 hours later. Three hours before delivery the patient started to bear down when the cervix was only three fingers dilated and the head was in the mid-cavity, and she continued to do so till spontaneous delivery took place, in spite of generous supplies of analgesia and every conceivable means of dissuasion at the disposal of the midwife. The total length of the first and second stages was 10¼ hours. At the end of the third stage there was some bleeding, but the quantity of blood lost was not more than 10 oz. (280 ml.). The midwife, however, was alarmed to see lying with the placenta a ring of cervix which measured 1½ in. (3.7 cm.) in depth and 3 in. (7.4 cm.) in diameter. It was oedematous and purple, and the amputation extended from the upper level of the old laceration. The patient made an uninterrupted recovery. When I saw her again six weeks after delivery there was no vaginal discharge. On inspection, the cervix was level with the vaginal vault and was healed, and appeared like a small button with a red centre where endocervical mucosa was present.

In most of the cases reported, spontaneous amputation of the cervix has taken place in primigravidae. In this case, I should say that the factors responsible were the uncontrollable pushing of the patient together with the presence of an old laceration of the cervix.—I am, etc.,

Margate. JEAN R. C. BURTON-BROWN.

Unsuspected Coat Button in an Infant

SIR,—The following case is reported not because it is remarkably outstanding in any particularly unusual features, but in order to emphasize in the care and treatment of young children the importance of always bearing in mind the possibility of the presence of a foreign body, either in the respiratory passages or in some portion of the gastro-intestinal tract.

The patient, a child of 10 months, was first seen in the hospital casualty department on October 6, 1949. The history then was that it had not been well for the previous six days, and that on September 31 it had vomited once or twice about five minutes after its feeds. Similar slight vomiting had recurred on the following two days, after which it had ceased. The child then was found to have a temperature of approximately 100° F. (37.8° C.), which was more or less maintained up to the time of admission to hospital. Apart from the vomiting already mentioned the feeds had been taken well, and the bowel action was normal. There was also no history of any respiratory symptoms. As the pyrexia continued to be present, and the general practitioner concerned could find no obvious cause for it, the case was referred to hospital for further investigation.

In the casualty department the medical officer on duty could find no abnormal clinical signs except, possibly, some degree of reddening of the tonsils and fauces. Air entry was good and equal on both sides of the chest and there were no adventitious sounds. Later, in the ward, the urine was tested and also found to be normal. In view of the doubtful appearance of the tonsils a tentative diagnosis of tonsillitis was made, and the patient was given a course of "sulphatriad." In less than two days his temperature fell to normal—where it remained for the next three days. It then rose again to 101° F. (38.3° C.), and on October 11 an *x*-ray picture of the chest was taken—not because of any special indication, but simply on the off-chance of finding some cause for the pyrexia, such as a hilar adenitis.

This radiograph demonstrated, much to everyone's astonishment, the presence of a fairly large circular foreign body which appeared to be of the nature of a metal washer, or the wheel of a toy motor-car. The child was then given a general anaesthetic, and with the aid of a laryngoscope the object could be seen impacted in the post-cricoid region of the pharynx. When it was removed it proved to be a metal coat button 1 in. (2.5 cm.) in diameter. After the operation the patient was put on penicillin, the temperature fell, and he made an uninterrupted recovery.

During the whole of the time in hospital prior to the discovery of the foreign body the child took his feeds well, including solid food, and never once vomited or showed any signs of dysphagia. His chest and abdomen were examined daily and at no time were any abnormal physical signs detected. A 1 in 10,000 Mantoux test which was carried out on admission was also negative.

In this case, as in others of a similar kind, there was no history of the child having swallowed a foreign body; when he first began to vomit, his parents thought that some of his food had "upset his stomach," since there was no difficulty in the actual swallowing mechanism. The location of the button at the level of the cricoid-pharyngeal junction was in the situation most commonly found (in 75% of such cases). The foreign body is usually found immediately below the cricopharyngeus muscle, for here the musculature is weak in comparison with that directly above. Furthermore, at this point the oesophagus becomes anatomically constricted, so that these two factors combined may be sufficient to prevent the continued passage of a foreign body. Other sites where narrowing of the oesophagus occurs, and where arrest may take place, are at the hiatus in the diaphragm (the second most common), and at the level of the arch of the aorta. If the offending object is not removed an inflammatory reaction will be set up and a retro-pharyngeal abscess or even perforation of the oesophagus may occur. In this particular case presumably the secondary rise in temperature was due to a developing oesophagitis.—I am, etc.,

London, E.2. GEORGE NEWBOLD.

Oro-antral Fistulae

SIR,—In answer to various verbal and written requests for further details of the method of closure of oro-antral fistulae described in your correspondence columns of September 9 (p. 630), to carry a flap under a short tunnel or "bridge" is a well-tried device. However, it might not seem feasible, at first sight, in dealing with the palate. The bridge, partly composed of tissue which would otherwise have to be sacrificed or pared away to freshen the edges of a defect, holds the pedicle in its new position safely, without restricting its blood supply. Only the distal portion of the flap need be sutured. To divert a pedicled flap through a short tunnel or bridge to its new destination almost guarantees the success of any plastic operation. The bridge eventually atrophies and disappears. The pedicle, containing nutrient vessels and nerves, survives, thus closing the defect with well-nourished tissues.—I am, etc.,

Halifax. W. O. LODGE.

Treatment of the Common Cold

SIR,—It was a pleasure to me to read the unprejudiced statistical analysis of the value of the antihistamine drugs in treatment of the common cold (*Journal*, August 19, p. 425). It is always salutary to be reminded that personal experience is merely misleading. Nevertheless, the following case history may be of interest to your readers. I myself have been a prey to such upper respiratory infections, of increasing severity, all my life. In winters at home I progressed from one cold to another, in which during the early phases a profuse rhinorrhoea made life almost intolerable, and thought impossible. Purely automatic actions with one hand (the other clasping a handkerchief to a dripping and fissured nose) were feasible, but otherwise intelligent occupation for me altogether ceased until the second phase, which was one of prolonged expectoration of the reaction set up in the larynx, trachea, and bronchi. My friends, with justification, christened me "Winnie-the-Pooh," in that I was fierce only in the winter months.

Here in Singapore, where there is no winter, I hoped for relief but found none. There was not even a seasonal improvement. When the reports of success from antihistamine drugs percolated through to the more remote East I consumed "benadryl" in increasing doses, and it served to make me sleepy and irritable as well as miserable. I was not sanguine enough to expect any result from promethazine hydrochloride either, nevertheless I took a 25-mg. tablet one day simply because I had been sent a sample. To my surprise, therefore, the rhinorrhoea ceased absolutely, with the result that it was possible to work and think (the malaise was of negligible importance) and, more important, the usual sequelae did not develop. These effects have been confirmed in later colds.

I am aware that one cannot judge by individual cases. It is possible that in my case an acute allergic rhinorrhoea is provoked by the infection, and that this is controlled by "phenergan." I find it hard to believe that I am unique in this respect, and to those others who suffer from the "uncommon cold" I would strongly recommend at least a trial of one or more of the antihistamine drugs.—I am, etc.,

Singapore. KEMBLE GREENWOOD.

Midwife and Doctor

SIR,—At a time when there is once again a certain amount of deterioration in the relations between midwife and doctor it is interesting and useful to recall the advice of William Smellie, who experienced similar difficulties 200 years ago. In his treatise on the *Theory and Practice of Midwifery*, edited by McClintock (1, 432), one may read about the midwife as follows:

> . . . She ought to avoid all reflections upon men practitioners; and when she finds herself at a loss, candidly have recourse to their assistance. On the other hand, this confidence ought to be encouraged by the man, who, when called, instead of openly condemning her methods of practice (even though it should be erroneous), ought to make allowance for the weakness of the sex, and rectify what is amiss, without exposing her mistakes. This conduct will effectually conduce to the welfare of the patient, and operate as a silent rebuke upon the conviction of the midwife; who, finding herself treated so tenderly, will be more apt to call for necessary assistance on future occasions, and to consider the accoucheur as a man of honour and a real friend. These gentle methods will prevent that mutual calumny and abuse which so often prevail among the male and female practitioners; and redound to the advantage of both; for no accoucheur is so perfect but that he may err sometimes; and on such occasions he must expect to meet with retaliation from those midwives whom he may have roughly used.

—I am, etc.,

Oxford. G. GORDON LENNON.

POINTS FROM LETTERS

Schizophrenia and Dienoestrol

Dr. G. ROSENBERG (Guildford) writes: A female patient of mine, now 27½ years of age, has been suffering from schizophrenia for the last eight years. She was a certified patient in a mental hospital (no shock treatment) and is now living with her parents, who run a farm. She was discharged contrary to the hospital's advice. She was restless, unable to concentrate her mind upon anything, and uncooperative. The hospital's prognosis was not good. Nine months ago her mother told me that her menstruation was irregular, scanty, lasting less than 24 hours. I decided, reluctantly, to try "dienoestrol" 1 mg. once a day. After about three weeks there was a marked and quite unexpected change in the patient's behaviour. She began to show interest in her surroundings and even started to make herself useful on the farm and in the house. Two months later I stopped the administration of dienoestrol, fearing the consequence of overdosing and sexual embarrassment. The old condition of restlessness and destructive negativism returned after ten days. Her mother asked me to restart the treatment, "as it was so much easier to live with her, when she took the pills." The patient responded by becoming again, and remaining, friendly and co-operative. There is so far no sign of abnormal sexual behaviour. She has never had a spontaneous remission of this extent and duration since 1943.

Mind and Body

Dr. G. C. ADENEY (Ditchling, Sussex) writes: The argument of Dr. G. E. Beaumont (October 21, p. 937) in disposing of the psychogenesis of ulcerative colitis seems to carry with it a remnant of the Cartesian fantasy wherein mind and body became two distinct entities. . . . There is one sheet anchor we must lay hold on. It is that a man (or woman) is a single being, and not a duality. To say that "a disorder of the mind produces a disease of the body" implies a duality, and the very word psychogenic is misleading in this respect. . . . For us they should be terms to represent in shorthand the two mutually accommodating methods of approach to the sick human being, one the subjective and the other the objective. This dual approach to man *in toto* is for diagnosis and for therapy an empirical necessity, and the art of medical practice is the combination of the two.

Obituary

WILLIAM GLEN LISTON, C.I.E., M.D., F.R.C.P.Ed.

Lieutenant-Colonel William Glen Liston, I.M.S.(ret.), died at Morar, Inverness-shire, on October 18, aged 78. He was well known for his work on the part played by rat fleas in the transmission of plague.

Liston was born in Secunderabad, where his father was an Army chaplain. He was educated at George Watson's College, Edinburgh, and at the Albany Academy, Glasgow, and he went on to study medicine at Glasgow University, where he graduated M.B., Ch.B. in 1897. He proceeded M.D. with honours in 1902. In 1898 he entered the Indian Medical Service, and during the training course at Netley he came under Almroth Wright, then professor of pathology at the Army Medical School. Almost immediately after his arrival in India he was appointed to work with the Indian Plague Commission, a Royal Commission, and in a laboratory in Bombay he studied the plague bacillus, attempting to isolate the organism from soiled clothes and floors, though with practically no success. He was then posted to military duties, and after completing these he entered the Bombay civil medical department, joining the staff of the Plague Laboratory under Haffkine. He also interested himself in the study of anopheles carriers of malaria, and in 1904 was joint author of a really valuable monograph on the anopheles mosquitoes of India. His most important work, however, was his investigation of the transmission of plague by rat fleas, the results of which were published in 1905. By ingenious experiments he established the crucial fact that close contact between infected and healthy rats did not result in infection spreading in the absence of rat fleas. This work was confirmed and extended by the second Indian Plague Commission of 1907 under Sir Charles Martin, as he later became. The work of this Commission rather overshadowed Liston's earlier researches.

In 1911 Liston became director of the Bombay Research Laboratory, where he had under him a group of young men from the recently formed Bacteriological Department of India, later to be called the Research Department of the Indian Medical Service. The laboratory was several miles from the centre of Bombay, but Liston hardly ever missed a daily visit to one or other of the three large hospitals, where his advice was sought by the physicians and surgeons, and where he himself collected the specimens requiring examination. He also became senior member of the Plague Research Department, and was awarded the C.I.E. in 1913. His wide interests included membership of the Bombay Municipality, where he did valuable work. During the later part of his service he warmly advocated the foundation in Bombay of a school of tropical medicine and hygiene, but unfortunately he failed to obtain the necessary support for his plan. During the first world war his special experience was used in military service, and he was mentioned in dispatches. Liston became a Fellow of the Royal College of Physicians of Edinburgh in 1923, and a year later he retired from the I.M.S. and was soon appointed bacteriologist to the Edinburgh Royal College, where he found congenial and useful work. He was also appointed by the Colonial Office as their consulting physician for Scotland. He attended the Centenary Annual Meeting of the British Medical Association in London as Vice-President of the Tropical Diseases Section.

Glen Liston was a greatly respected member of the Indian Medical Service, who by steady work in the early days of medical research in India built up a reputation as a sound and reliable worker and a good comrade. Some of his contemporaries felt that he did not reap the full rewards his work deserved.—L. R.

Lieutenant-Colonel PATRICK WILKINS O'GORMAN, I.M.S., died on September 22 in London, aged 90 years. He was born in Calcutta, where his father, who came of a military family in Limerick, held an appointment under the Government of Bengal. O'Gorman served for a time in the Indian Medical Department before coming home to study medicine at Edinburgh University. He qualified in 1886, and shortly afterwards he was successful in open competition in gaining an entrance into the Indian Medical Service. Returning to India, he was appointed as a surgeon in the Sirhind district in 1888, and in 1891 he saw active service on the North-west Frontier in the first and second Miranzai expeditions, for which he received the India Frontier Medal and Clasp. During a period of what appears to have been study leave he obtained the D.P.H.(Cambridge) in 1898 and graduated M.D.(Brussels) in 1899. He became a Member of the Royal College of Physicians of Edinburgh in the same year. In 1908 he was promoted to the rank of lieutenant-colonel and for a time he was in charge of the medical store depot in the Lahore district. In the 1914–18 war he again saw service on the North-west Frontier, and in 1917 he served as administrative medical officer to the Lindi Force in German East Africa. He was mentioned in dispatches and made a C.M.G. in 1918. A year later he was invalided from the service. On his retirement a new chapter of activities opened up for him. He was a founder member of the Guild of SS. Luke, Cosmas, and Damian in 1910, and for this, in later years, he was honoured by the Papal Cross. He was the first editor of the *Catholic Medical Guardian*, and for many years was a regular visitor in all weathers to the platform of the Catholic Evidence Guild in Hyde Park. He was a founder of the Catholic Pharmaceutical Guild of Great Britain and a co-founder of the Catholic Nurses Guild. In addition, from 1933–9 he gave lectures on tropical diseases and sanitation to missionaries at St. Charles College, North Kensington. His professional interest in the welfare of lepers continued to the last. He was unmarried.

Dr. GILBERT WILLIAM CHARSLEY, who was in general practice in Sydenham until he retired in 1937, died in Hampstead on September 29 aged 79 years. Born in Beaconsfield in 1870, he was educated at Magdalen College School and Birmingham University, where he studied medicine. He qualified in 1895, and six years later graduated M.B., Ch.B.(Birm.). After some years of hospital and private work Charsley went into partnership in Malvern. Shortly before the 1914–18 war he moved to Sydenham. He served in the R.A.M.C. during that war and was in a hospital ship which evacuated sick and wounded from Gallipoli. When the war ended he returned to Sydenham, where he remained in practice until he retired. He took an active part in the affairs of the B.M.A., being chairman of the Lewisham Division in 1922 and again in 1929–30. He represented the Division at the Annual Representative Meetings in 1931, 1932, and 1933, but his main interest was always in the Benevolent Fund of the Association. Charsley was honorary physician of the South-eastern Children's Hospital for over 20 years, though he excelled in what is now known as geriatrics—the care of the aged and infirm. He always regarded medicine as a vocation, and as such to be held superior to any monetary considerations. A man of high ideals, he was in all respects a kindly Christian gentleman. He is survived by his wife, his son, and his daughter. His elder son was killed in an air accident during the last war.—G. R.

Mr. ROBERT YOUNG AITKEN, whose working years were given to the service of surgery in Blackburn and district, and especially to the Blackburn Royal Infirmary, died at his home near Blackburn on October 6, at the age of 78. He had been in ill-health for some time. He was born at Dalry, in Ayrshire, and studied medicine at Glasgow University, graduating M.B., C.M. in 1893. He proceeded M.D. in 1897 and became a Fellow of the Royal

College of Surgeons of England in 1901. Shortly after qualifying he obtained the post of house-surgeon at the Blackburn Royal Infirmary, and thus began his long connexion with this institution. He was elected assistant honorary surgeon in 1901 and became senior honorary surgeon in 1914. On his retirement in 1932 he became honorary consulting surgeon to the hospital. During the first world war he did much surgical work at the Calderstones Military Hospital, and for this he was awarded the O.B.E. For more than 30 years he was a medical referee under the Workmen's Compensation Act, and he was chairman of the Blackburn Insurance Committee from 1943 until its demise in July, 1948. He consented to be president of the Blackburn Royal Infirmary in 1943, and he was appointed its first patron when the new hospital service commenced in 1948. The infirmary possesses two "memorials" which gave Robert Aitken much happiness. First, on his retirement, his portrait in oils—from friends and admirers—was presented to him by Lord Moynihan and hung in the Infirmary. Secondly, in 1948, a ward was named the "Aitken Ward" and a tablet commemorating his services to the Infirmary was affixed.

W. B. writes: Aitken's surgical life in Blackburn began at just the right time: the rising tide of modern surgery was beginning its sweep over the provincial hospitals, and he was well equipped and eager to develop it to the full. For a number of years he had had valuable experience as a general practitioner with a very large practice, but surgery was always his absorbing interest, and he soon gave up everything to devote himself whole-heartedly to it and to the building up of a first-class surgical department at the infirmary. In Blackburn, when we are inclined to be reminiscent, we talk of "before Aitken's time" or "after Aitken's time," so tremendous was his influence and so notable was his work. He was a surgical pioneer, full of energy and enthusiasm, but with a high regard for the art of surgery and the good of his patients. The amount of surgical work he carried out was enormous: as he himself said at the Moynihan presentation ceremony, "I have made little or no mark on the public life of Blackburn, but I have put my professional 'mark' on many thousands of its inhabitants." We who knew him best would not accept his estimate of the value of his civic worth: he was an active magistrate for 26 years, and was universally admired and respected by his fellow-townsmen. Those of us who worked with him during the last 30 years have felt a respect, amounting almost to devotion, for a great surgeon and a much-loved colleague. His memory will for years remain warm in the hearts of many of the people of Blackburn and its neighbourhood.

Dr. STEWART SEPTIMUS SIMMONS, who was in practice in South Norwood for 37 years, died at Monxton, Andover, on October 8, at the age of 80. He studied medicine at University College Hospital, qualifying in 1896. A year later he started in practice in South Norwood, where he was for many years district medical officer. Although he took little part in public work and was by nature a modest man, his life was a model of the integrity and scrupulous attention to ethical behaviour which was the hallmark of his generation, and he will be remembered with gratitude for his conscientious work. He was forced to retire in 1937 on account of ill-health, but a splendid constitution enabled him to enjoy a span of years in the companionship of his wife, who predeceased him by two months. He is survived by two sons, who are both members of the medical profession.—H. H. A. E.

Dr. ISAAC BAINBRIDGE died in Brough, Westmorland, where he had been in practice for nearly 40 years, on October 10, at the age of 65. He studied medicine at Durham University, graduating M.B. with honours in 1910. He proceeded M.D. in 1933. Almost immediately after qualification he began to practise in his native town of Brough, where he remained until his death. One of the old type of country doctors, Dr. Bainbridge never spared himself in his work for his patients, who came first always in his thoughts. He had a very wide and extensive practice amongst the small towns, villages, and fell farms of North Westmorland, and this wide practice in winter entailed feats of physical endurance when the roads and fells were snow- and ice-bound. His recreations were shooting and fishing, and he was both a first-class shot and an excellent salmon fisherman in the rivers Eden and Lune. Dr. Bainbridge was immensely popular with all classes of the community, and he was buried in the ancient churchyard of Brough in the presence of a very large congregation. By his death the people of North Westmorland have lost a good doctor, a wise and shrewd counsellor, a staunch friend, and a great gentleman. Our sympathy is extended to his widow and daughter.—E. C. B.

Dr. SAMUEL THOMPSON ROWLING died at his home in Leeds on October 12, at the age of 76. He was educated at Leeds Grammar School, Yorkshire College, and Leeds University, graduating M.B., Ch.B. with honours in 1896. As a student he won the Hardwick Prize in clinical medicine. After holding an appointment as a house-surgeon at the General Infirmary and a short period in general practice, he decided to specialize in anaesthetics, and he became anaesthetist to the General Infirmary at Leeds in 1910 and later to the Ministry of Pensions Hospital, Leeds, and to the West Riding County Council Hospital at Otley. In the first world war Rowling served for a time in the R.A.M.C. He took the D.A. in 1935 and became a Fellow of the Faculty of Anaesthetists (R.C.S.) in 1948. He was a lecturer in anaesthetics at the University of Leeds for many years, and, although he was due to retire in 1939, he continued to teach his subject during the second world war. He was the first president of the Yorkshire Society of Anaesthetists. Quite early in his career Rowling realized the need for a knowledge of the concentrations of inhaled gases and vapours, and he produced an ingenious chloroform–paraffin bottle and a modification of Clover's inhaler. This work came to be quoted by the standard textbooks and was incorporated in his thesis for the M.D. degree, which he obtained in 1920. The work of the University of Leeds was of great interest to him, and he was chairman of Convocation from 1924 to 1926. He was a keen first-aid teacher, being corps surgeon to the St. John Ambulance Brigade. A man of strong religious convictions, he was an enthusiastic Church worker. His sympathy and kindly courtesy were manifest in all his dealings with his patients and his professional colleagues.—F. W.

Medico-Legal

DRUNK BUT NOT IN CHARGE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In applying the prohibition in the 1930 Road Traffic Act against drunkenness while in charge of a motor-car, the courts have tended to push the concept of "in charge" to unreasonable lengths: so much so that it has been practically impossible for a person alone in a car to divest himself of responsibility for the vehicle even by such an extreme step as parting with his ignition key so that the car could not be moved. It is on record, we believe, that a court has convicted a person who was not the owner of the car and was not able to drive it even when sober, but had been left alone in it for convenience while drunk and incapable.

A recent decision, however, showed a welcome disposition to adopt a more practical standard. A general practitioner, owing to a combination of fatigue and a few drinks, found himself unfit to drive his car. He therefore gave the ignition key to a friend and retired harmlessly to the back seat. On the way home the friend had to make a business call, and while the doctor was alone in the car a police officer found him asleep. The court found that the facts did not constitute the offence charged, and dismissed the case.

Subject to Ministry of Health approval, Newcastle Town Moor Isolation Hospital is to be extended and equipped as a 70-bed plastic surgery centre. It is hoped that it will eventually become the headquarters of smaller plastic surgery units in the region. The demand for plastic surgery in the North-east is said to be very great because of the number of industrial accidents.

Medical Notes in Parliament

Infant Foods and Maternity Benefits

On October 19 Mr. TURTON asked whether Mr. Bevan knew that medical practitioners under the National Health Scheme were unable to prescribe special foods for infants suffering from digestive troubles; that in certain areas local health authorities operated a means test in considering whether an infant should be provided with these special foods; and what steps he was taking to remedy this position.

Mr. BEVAN answered that the pharmaceutical services provided under the National Health Service were limited to drugs and medicines. Local health authorities had power to make a charge for baby foods supplied by them where they considered this to be justified by the parents' means. He saw no reason to alter this arrangement.

Mr. JANNER asked whether Mr. Bevan was aware that owing to the shortage of nurses and hospital accommodation many expectant mothers had to have their confinements at home, and that the maternity benefits paid to them were the same as to those who were confined in hospitals. He advocated steps to give extra financial assistance to expectant mothers confined in their own homes, to cover the additional expenses.

Mr. BEVAN said he had no powers under the National Health Service Act which would enable him to make grants towards expenditure incurred privately. A change in National Insurance maternity benefits would be a matter for the Minister of National Insurance. At her request the National Insurance Advisory Committee was now engaged in a review of these benefits.

Accommodation of Cancer Cases

Mr. PETER SMITHERS on October 26 asked whether the Minister of Health would make special provision under the National Health scheme for the accommodation in hospital of incurable cancer cases, to avoid their being placed in wards for the aged and infirm.

Mr. ANEURIN BEVAN replied that it was for the regional hospital boards to decide on the allocation of beds between different types of case. He had no reason to suppose that they did not take into account the special circumstances of these patients.

Health Control Form

Mr. SMITHERS also asked what purpose was served by Health Control Form No. 2, which required those entering the United Kingdom to state where they had spent each of the previous 14 nights; and whether he would now withdraw this form.

Mr. BEVAN replied that the form now in use was not quite as described. Without delaying the passengers it showed whether they had recently been in an infected area and enabled any necessary measures to be taken. He could not withdraw the form so long as the International Sanitary Conventions required it to be used.

Cortisone

Mr. EDWARD EVANS on October 24 asked the Lord President of the Council what steps were being taken by the Medical Research Council and other bodies to make available for sufferers from rheumatoid arthritis the drug cortisone, now being produced in the United States of America; and whether adequate funds to develop this research were and would continue to be made available to these bodies.

Mr. HERBERT MORRISON said an extensive programme of co-ordinated research on cortisone and related substances was being carried out and adequate funds were available to develop the work. The question of providing cortisone for the routine treatment of patients was outside the Council's province, but much more research was necessary before it could safely be recommended for general use in rheumatoid arthritis.

Group Captain C. A. B. WILCOCK said that treatment of rheumatoid arthritis by cortisone was experimental and had serious effects on patients, particularly on women. He asked for an assurance that the drug would not yet be made available to the public.

Mr. MORRISON replied that this important consideration would be kept in mind.

Mr. RAYMOND BLACKBURN asked whether it was true that cortisone would be made available in November at drug stores in the United States. The Medical Research Council should keep in touch with America on the subject.

Mr. MORRISON said there was no doubt about such contact. He did not know whether the drug was being made available in American drug stores. It did not follow that cortisone should be made available here. The production of cortisone in this country must be limited by the availability of the essential material, for which no alternatives were in immediate prospect. Limited supplies were imported for use in hospitals. Arrangements for its production would be considered as soon as practicable.

Pay in the Services

Wing-Commander N. J. HULBERT on October 25 asked the Minister of Defence for a statement on pay increases for the medical branch of the Services.

Mr. E. SHINWELL said the urgency of this matter was well understood and he hoped to make a statement soon.

Major NIALL MACPHERSON asked what was the average increase in pay of the European doctors in the medical service in Malaya and Singapore, comparing 1950 with 1938; and what was the rise in the cost of living for Europeans in those territories as between 1938 and 1950.

Mr. J. GRIFFITHS replied that for most doctors the average increase was between 50% and 60%. For those in the highest posts it was 30%–50%. In August, 1950, the Singapore cost-of-living index for Europeans was 110% above the 1938 level; in June, 1950, the corresponding index for the Federation of Malaya stood at 142% above 1939.

In answer to a suggestion that Asian doctors should be recruited for East African medical vacancies, he said that East African Governments already employed Asian doctors, but he was satisfied that European doctors were also needed.

Dishonest Certificates

On October 28 Major GUY LLOYD inquired how many reports had been received from doctors of dishonest attempts to obtain sick certificates from them. The "racket" was notorious.

Dr. EDITH SUMMERSKILL, Minister of National Insurance, replied that she was not aware of any such reports, and she must register a protest on behalf of patients and doctors. If a patient asked for a certificate to which he was not properly entitled, the doctor would refuse, but would not communicate with her on the subject. Her Department had no responsibility for the matter.

Blood Transfusion and Atomic Warfare.—In reply to a question on October 19, the Minister of Health said he was asking regional hospital boards to plan for the expansion of the Blood Transfusion Service and the establishment of duplicate centres.

St. Thomas's Hospital.—The Minister of Health stated on October 19 that the board of governors had prepared a scheme for the entire reconstruction of the hospital, and it was hoped preliminary work would start this year.

Aliens and N.H.S.—Instructions have been issued to Immigration Officers that, where they are satisfied that the sole purpose of an alien's visit is to secure free medical treatment, leave to land should be refused.

Purity of Ice-cream.—Recent bacteriological tests have shown improvement, but the Minister of Health is not satisfied that there is any test reliable enough to justify its use as a legal test for this purpose.

Help for the Deaf.—According to a statement by the Minister of Health, a number of hospitals already provide training in lip-reading. While it may be possible to extend this in a limited way, training in lip-reading is, strictly, a function of the education rather than of the hospital authorities. (About 90% of patients continue to use the "medresco" hearing-aids regularly.)

Antibiotics from the U.S.—The Minister of Health stated in a written answer on October 24 that aureomycin was already being imported from the United States. Import of terramycin would be considered if the need arose.

Electrocution.—On live rails other than those belonging to the London Transport Executive 16 children were killed and 10 injured during 1949.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on October 12 the degree of D.M. was conferred on N. B. Myant.

UNIVERSITY OF LONDON

The degree of D.Sc. has been conferred on Dr. H. O. Schild (University College) and Mr. J. J. D. King, Ph.D., F.D.S. R.C.S. (King's College Hospital Medical School).

UNIVERSITY OF WALES

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

HYGIENE.—A. S. Bater, Joyce M. Bennett, Vyvien J. Bennett, D. R. Boyns, P. Callaghan, J. S. Campbell, L. V. Chubb, G. W. Clark, Patricia M. Coldrick, R. L. Coppock, B. N. Davies, Barbara C. Edwards, J. C. Evans, Marjorie J. S. Evans, J. N. Glanville, P. I. Harry, A. P. Jones, A. P. Jones, D. J. Jones, Olive C. Jones, Nesta Lewis, Rachel B. J. Lewis, Margaret E. Lloyd, Mary I. Lloyd, Janet M. Moffat, I. B. Morgan, E. J. Phillips, R. P. Phillips, D. H. Richards, G. Williams, W. Williams, Eve Wiltshaw, Isobel M. Young.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on October 26, with the President, Dr. W. Russell Brain, in the chair, Dr. W. G. Wyllie, Dr. L. B. Cole, and Dr. F. Avery Jones were elected Councillors.

The following were elected representatives of the College: Professor T. L. Hardy on the Committee of Management; Professor A. A. Moncrieff on the Central Midwives Board, the President, Sir Leonard Parsons, Sir Harold Boldero, Dr. W. G. Barnard, and Sir Allen Daley on the Standing Joint Committee of the three Royal Colleges; Dr. C. M. Hinds Howell, Dr. T. C. Hunt, Dr. J. C. Hawksley, and Dr. J. B. Harman on the Committee of Reference; Dr. C. M. Hinds Howell and Dr. J. B. Harman on the Central Medical War Committee; and Dr. C. E. Newman on the Examination and Tuition Advisory Board of the Association of Medical Records Officers.

Dr. V. H. Springett was appointed Milroy Lecturer for 1952, his subject being "An Interpretation of Statistical Trends in Tuberculosis."

The President announced that the Jenks Memorial Scholarship had been awarded to Peter Milton Scott, late of Epsom College.

MEMBERSHIP

The following, having satisfied the Censors' Board, were elected Members of the College: A. P. C. Bacon, G. A. Beck, E. A. Beet, L. Brotmacher, N. J. Brown, W. J. G. Burke, R. A. Burston, F. G. Campbell, F. S. Carter, S. Cope, B. Creamer, G. S. Crockett, G. W. Csonka, B. A. D. Curtin, R. G. Epps, L. P. L. Firman-Edwards, A. A. Fraser, J. V. Gordon, E. P. W. Helps, Constance M. Hesling, H. D. G. Hetherington, Major, R.A.M.C., Yee Ip, P. N. Laha, M. W. Leivers, R. Lwin, J. Mackinnon, R. S. Male, H. G. Mather, J. M. Mehta, A. B. Mukharji, D. R. L. Newton, C. M. Ogilvie, C. M. B. Pare, Margaret M. Platts, W. L. Sanders, Captain, R.A.M.C., G. Selby, D. E. Sharvill, R. H. Vines, W. V. Wadsworth, Joan C. Wells, G. B. Westmore.

LICENCES

Licences to practise were conferred upon 154 candidates (including 26 women) who had passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board and who have complied with the necessary by-laws:

R. G. Adams, W. V. Agnew, D. G. E. Alldridge, D. F. A. Aubin, J. A. C. Bamford, Agnes R. D. Bartels, I. Blakeway, R. M. Bland, M. H. S. Bound, Betty B. Boxall, Yvonne J. Bradfield, G. S. Brind'ey, I. M. Brown, A. A. F. Bryson, Patricia M. Bushell, E. P. Cadbury, W. H. Callander, S. J. Carne, Mary A. Carter, M. W. Cemlyn-Jones, H. N. Chambers, E. H. Cooper, Sheila D. Cooper, C. H. Corby, R. G. Covell, Elizabeth P. Cracroft, J. R. Currie, A. J. I. Dacre, Mary G. C. A. Dale, D. F. C. Deacon, G. R. C. Deacon, N. S. de Alwis, J. H. de Graeve, Helen M. Dence, M. A. de Valero Wills, J. A. Dickinson, P. L. C. Diggory, S. B. Donigiewicz, J. W. Draper, Winifred B. Drew, P. G. J. Duncan, B. Edwards, I. A. El-Bahrawy, B. R. Ellis, P. Engel, J. E. Epsom, M. L. E. Espir, J. F. A. Everson, P. V. N. Ezekwe, Mary U. Franklen-Evans, T. Freeman, R. E. Graham, W. S. Griffiths, I. M. Guiver, T. K. Hardy, J. G. M. Harrison, Robina Harry, Ursula E. E. Henderson, P. G. Higgins, D. Hines, G. C. A. Holden, J. M. Holden, P. E. B. Holmes, W. D. Hopkins, H. Horwitz, Desiraie M. G. Howells, St. C. M. L'A. Hubbard, P. E. Huddy, E. M. Hume, Anne L. Hunter, Elsie S. Jaikaran, A. Jedrzejczak, M. H. F. Johnson, Pamela M. Johnson, E. T. J. Jones, R. J. B. H. Jones, N. Kaye, P. H. Kendall, D. G. Kibblewhite, D. E. W. Knight, F. W. Knowles, R. Korn, J. P. Lavender, A. C. K. Lawrence, Eileen Lawson-Matthew, A. D. Leschen, Mair E. Lewis, Margaret E. Lloyd, D. H. M. Lord, R. J. Lunniss, N. MacDonald, K. M. McFadyean, K. E. MacLachlan, A. D. McLaughlin, A. R. May, D. H. Mellins, R. P. Michael, G. Miller, B. K. Montgomery, Jean E. Moore, Margaret C. R. Moore, Doreen P. Morgan, J. G Norman, R. G. Owen, H. J. G. Palmer, Mary Parsons, D. L. Pedersen, B. W. Petty, H. F. Pile, E. N. Plomer, H. F. W. Pribram, J. K. Price, R. B. Pridie, J. H. Ratcliffe, J. H. Reading, R. B. O. Richards, Margaret M. Roach, B. A. Roberts, A. L. Ross, J. W. Rotenberg, J. J. H. Rymer, H. N. St John, Barbara J. Salisbury, J. F. Santer, F. B. Sartory, S. A. Seligman, I. M. Sharpe, I. M. Simmonds, E. M. E. I. Sondervorst, N. E. Stebbings, F. P. Stephens, K. H. Stone, J. D. Sutcliffe, R. A. Sutherland, L. R. Sweetman, S. S. Swift, Ginette M. Tebbutt, I. B. Thomas, P. K. Thomas, H. T. Thompson, D. J. G. Tilley, J. A. Tottle, Rachel E. Turner, R. Vickers, F. H. Walker, I. H. Wallington, A. V. Watts, W. I. White, Philippa M. D. Wigan, J. Ll. Williams, R. A. Williams, J. B. Williamson, J. P. W. Young, T. M. Young.

DIPLOMAS

Diplomas in Child Health were granted, jointly with the Royal College of Surgeons of England, to S. Binder, F. S. W. Brimblecombe, and P. West, and to the other 89 successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

Diplomas in Tropical Medicine and Hygiene, in Industrial Health, and in Physical Medicine were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

Diplomas in Medical Radio-diagnosis were granted, jointly with the Royal College of Surgeons of England, to P. F. J. New and G. A. Smith.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England held on October 12, with Sir Cecil Wakeley, President, in the chair, the Honorary Medal of the College was presented to Lord Webb-Johnson in recognition of his many generous acts and continued labours in the interest of the College during his eight years of Presidency.

Mr. A. McKie Reid was admitted as a Member of the Court of Examiners and Mr. E. C. B. Butler was admitted to the Board of Examiners in Dental Surgery (Surgical Section).

Mr. W. Kelsey Fry was co-opted to the Council to represent Dental Surgery in place of Professor R. V. Bradshaw (resigned).

Professor F. Wood Jones was reappointed as Sir William Collins Professor of Human and Comparative Anatomy and Conservator of the Anatomical Museum for a further year.

Professor D. Slome was admitted as Professor of Applied Physiology and Bernhard Baron Research Professor.

The Hallett Prize was presented to Tara Chandra (Lucknow University) and Malik Shaukat Hasan (Punjab University).

J. J. Fryatt, formerly of Lewes County School, was admitted as Macloghlin Scholar.

P. M. Scott, formerly of Epsom College, was nominated as the 58th Jenks Scholar.

A Diploma of Fellowship was granted to P. Das (Lucknow) and a Diploma of Membership was granted to R. P. Michael (University College Hospital).

Diplomas were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

DIPLOMA IN CHILD HEALTH.—R. P. Aronson, Anne L. Barlow, Dorothy V. Bignell, Winifrid M. Bond, I. S. Booth, Elspeth S. K. Campbell, N. Chaliha, Patricia Chippindale, S. A. Chowdhury, Jill C. Clark, Pauline M. Cole, Maureen D. Connolly, Lorna H. Cooper, Leonora A. Crawford, Jean M. Dance, Cecile R. Doniger, A. S. Dunn, H. G. Dunn, B. R. Eaton, Sarah Evans, Sheila M. Forsyth, W. P. Foster, Catherine E. E. Frain-Bell, Joy K. Goodacre, Ruth Goodier, Anne Guy, Eve Hammer, D. McR. Hanna, S. A. H. Haqqani, R. P. Harwood, J. C. Haworth, Margaret I. Hendrie, H. Herlinger, Rachel M. Hickinbotham, Eugenie C. Illingworth, R. J. Isaac, Elizabeth M. Johnson, D. V. M. Jones, M. C. Joseph, P. Kalyanikutty, B. Kaminer, K. B. Kapur, K. R. Keay, M. Kennedy, J. D. Kerr, B. S. Kulkarni, Lillian J. Letty, C. S. Livingstone, Freda W. Lunt, J. B. Lyn-Jones, D. A. McGreal, Blanche M. MacIver, R. S. Male, A. Mohammad, C. M. Monro, S. A. M. Morton, M. J. Murray, E. M. K. Muwazi, Sylvia N. Nabarro, D. S. Nadkarni, J. G. Neville, D. O'Brien, T. E. Oppé, R. H. Percival, S. Prakash, Elizabeth Preston-Thomas, L. Rabinowitz, Irene Rajaratnam, K. V. Robinson, Christine M. Rooke, R. G. Rooney, J. Rubie, M. L. Sehgal, S. H. Shah, J. F. Skone, R. W. Smithells, Rosemary Stephens, Margaret E. R. Stoneman, Elizabeth G. S. Summerhayes, G. T. Tandy, C. Taylor, J. H. Thomas, Margaret R. Topping, Iris V. I. Ward, Pamela E. Warner, Evelyn D. Watkins, Elizabeth L. Watson, Mary B. Watson, S. T. Winter.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—C. B. Andrade, J. E. Azar, S. Bell, B. Blewitt, G. F. J. Campion, Margaret T. Chambers, J. G. Craddock, S. K. Das, R. C. Desai, S. T. Gaballa, J. M. B. Garrod, H. M. J. Gilles, C. E. M. Gunther, Ursula M. Hay, R. G. P. Heard, K. Jambundabongse, Lillyan G. Jayewardene, A. M. Khan, V. J. Kinariwala, K. J. Lie, L. E. Lie-Injo, W. C. D. Lovett, Marie D. Merchant, E. D. Myers, S. E. N.-A. Otoo, W. Peters, H. M. G. Shanly, L. Silverstone, J. S. Sood, M. S. Vaidya, S. Vaishnava, J. L. C. Whitcombe, A. Zahra.

DIPLOMA IN INDUSTRIAL HEALTH.—J. A. Dryden, D. G. Evans, I. S. Eve, S. D. G. N. Gowda, M. S. Kataria, J. C. McDonald, R. A. G. Smith, P. A. M. van de Linde.

DIPLOMA IN PHYSICAL MEDICINE.—W. St. J. Buckler, D. A. Kininmonth, J. B. Stewart, H. F. B. Symons, D. L. Woolf, C. B. Wynn-Parry.

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—G. A. Smith.

St. Nicholas Hospital, Plumstead, was recognized under paragraph 23 of the F.R.C.S. regulations.

The Council received from Dr. L. T. Clarke, of Birmingham, a curtain embroidered with the arms of the College as a background for displaying the mace, and from Mr. R. J. Willan a silver gilt chain for the President's badge of office.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh held on October 25, with Mr. W. Quarry Wood, President, in the chair, the following who had passed the requisite examinations were admitted Fellows: E. Cameron, H. McK. Carey, A. F. Crook, A. P. McE. Forrest, A. Hart, R. F. Hendtlass, R. P. Hewitson, S. D. Joshi, R. T. S. Louttit, J. A. Mantle, N. G. Mehta, H. C. Reid, A. R. G. Salem, J. T. Shearer, M. N. Tempest, R. Yaholnitsky.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Professor H. N. Green will deliver the Dr. John Burns Lecture in the Hall of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, on Wednesday, November 15, at 5 p.m. The title of the lecture is "The Fundamental Nature of Shock." All medical practitioners are invited to attend.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

The notifications of poliomyelitis in the week ending October 21 were: paralytic, 197 (223); non-paralytic, 81 (85); total, 278 (308). The figures for the previous week are in parentheses. Notifications for the corresponding week in 1947 and 1949 totalled 288 and 414 respectively. Total uncorrected notifications for 1950 to and including the week under review are 7,290. The corresponding figures for 1947, 1948, and 1949 were 7,742, 1,905, and 4,892 respectively.

Devon (7) and Cheshire (5) showed a material increase in notifications; increases elsewhere were comparatively insignificant. Lancashire registered a large decrease (11) compared with the preceding week; Gloucester showed a decrease of 8, Wilts 6, and Hertford, Surrey, and the West Riding 5 each. Elsewhere small decreases were generally distributed. The total reduction in notifications in the week under review compared with the preceding week was 30, composed of 26 paralytic and 4 non-paralytic. The steady decrease in weekly notifications is satisfactory.

Quarterly Returns for Eire

The birth rate during the second quarter of 1950 was 22.5 per 1,000, being 0.3 above the June quarter of 1949. The infant mortality was 44 per 1,000 registered births, compared with 50 for the corresponding quarter of the preceding year. The general death rate was 12.9, and was 0.4 below the rate for the previous June quarter. Deaths from respiratory tuberculosis were 501, and 147 from other forms of tuberculosis: these were 86 and 5 respectively below the numbers of the second quarter of 1949.

Infant Mortality in England and Wales

The provisional figures for England and Wales for the third quarter of this year show that the infant mortality rate, 24 per 1,000 live births, and the stillbirth rate, 22.3 per 1,000 total births, were the lowest rates ever recorded for any quarter.

Discussion of Table

In *England and Wales* the largest variations in the trends of infectious diseases were increases in the number of notifications of measles 1,095 and scarlet fever 129, and a decrease of 45 for acute poliomyelitis.

An increase in the incidence of measles occurred throughout the country, but the rise was larger in the north than in the south; the largest increases were Lancashire 236, Yorkshire West Riding 206, and Derbyshire 150. The largest rise in the number of notifications of scarlet fever was 33 in Warwickshire. The feature of the returns for diphtheria was an increase of 3 in Warwickshire and a decrease of 3 in Durham. The largest fluctuation in the local trends of whooping-cough was an increase of 37 in Lancashire.

The chief centres of dysentery were Lancashire 37 (Droylsden U.D. 9); Leicestershire 28 (Leicester C.B. 27); Surrey 18 (Surbiton M.B. 17); London 17; Yorkshire West Riding 17; Lincolnshire 10 (Scunthorpe M.B. 10).

The largest returns for acute poliomyelitis were Lancashire 31 (Liverpool C.B. 10, Manchester C.B. 8); Yorkshire West Riding 28 (Leeds C.B. 5, Sheffield C.B. 5); Gloucestershire 24 (Bristol C.B. 14); Kent 19 (Orpington U.D. 11); Surrey 15; London 14; Warwickshire 12 (Birmingham C.B. 10); Devonshire 11; Middlesex 10.

In *Scotland* decreases were recorded in the number of notifications of measles 52, scarlet fever 23, acute poliomyelitis 10, while increases were reported for whooping-cough 42 and dysentery 33. The incidence of scarlet fever declined in all areas except the south-eastern area, where a rise of 3 was recorded in the number of notifications. The notifications of dysentery have increased for four consecutive weeks and are now at the highest level since April. The largest returns of dysentery were: Glasgow 58, Dumfries 39, Stirling county 33, Edinburgh 15, Lanark county 12. The largest returns of acute poliomyelitis were: Glasgow 8, Ayr county 6, Angus county 4, Ross and Cromarty county 3.

In *Eire* an increase of 10 in the number of notifications of measles and a decrease of 12 for whooping-cough were recorded. An outbreak of measles involving 27 notifications was reported from Wicklow, Rathdown R.D. Whooping-cough has declined throughout the country during the past three weeks with the exception of Dublin C.B., where a slight rise has occurred, and 35 of the 41 cases were notified in this city during the week reviewed.

In *Northern Ireland* only small variations occurred in the trends of infectious diseases for the country. The largest local fluctuations were an increase of 13 in the notifications of measles in Armagh county and an increase of 11 in the notifications of scarlet fever in Down county.

Week Ending October 21

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,227, whooping-cough 2,674, diphtheria 42, measles 5,876, acute pneumonia 432, acute poliomyelitis 278, dysentery 169, paratyphoid fever 13, typhoid fever 3.

No 41

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 14.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	28	3	16	4	1	29	3	12	1	1
Deaths		1	1				1	—		
Diphtheria	40	5	14	5	4	85	9	32	1	1
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	180	17	182	1	4	179	10	75	2	3
Deaths		—			—				—	—
Encephalitis, acute	2	—	—		—	—	—	—	—	—
Deaths		—		—			—			
Erysipelas			14	4	1			31	10	2
Deaths							—			
Infective enteritis or diarrhoea under 2 years				20	18				100	
Deaths	11		4	2	—	40	1	12	9	4
Measles*	5,009	303	145	97	72	992	44	42	108	42
Deaths†		—	—	1	—			—	—	—
Ophthalmia neonatorum	45	3	14		—	43	2	8	—	—
Deaths										
Paratyphoid fever	8	2	—		—	13	—	3 (B)	3 (B)	—
Deaths	—		—		—	1	—	—	—	—
Pneumonia, influenzal	382	18	5		3	354	23	2	2	4
Deaths (from influenza)‡	5	2	1	—	—	6	2	1	—	—
Pneumonia, primary			130	¶				164	25	
Deaths	123	19		3	7	135	23		9	7
Poliomyelitis, acute	308	14	39	1	4	463	68	3	4	—
Deaths§	11	1		—		20	3			
Puerperal fever			7					13		
Deaths							—			
Puerperal pyrexia‖	91	7	6		—	108	7	8	1	—
Deaths							—			
Relapsing fever	—	—			—	1	1			—
Deaths										
Scarlet fever	1,193	81	139	72	70	1,844	155	243	85	144
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	7	1	—	3	—	14	1	1	4	1
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	2,461	231	264	41	30	875	51	68	31	32
Deaths	3	—	—	1	—	3	—	—	1	—
Deaths (0–1 year)	222	21	32	12	8	258	32	32	25	13
Deaths (excluding stillbirths)	4,417	682	534	173	112	4,079	635	530	144	100
Annual death rate (per 1,000 persons living)			10·7					10·6	8·9	
Live births	7,439	1320	843	404	216	7,442	1163	858	395	264
Annual rate per 1,000 persons living			16·9					17·2	24·5	
Stillbirths	150	22	29			192	25	11		
Rate per 1,000 total births (including stillborn)			33					13		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

Medical News

West Midlands Physicians Association

The inaugural meeting of the West Midlands Physicians Association was held in Birmingham on October 21. Sir Leonard Parsons, F.R.S., was elected president, and Professor A. P. Thomson, Dr. J. H. Sheldon, Professor W. M. Arnott, Dr. A. M. Nussey, Dr. S. R. F. Whittaker, and Dr. J. P. P. Stock were elected members of the executive committee. Dr. A. G. W. Whitfield was appointed secretary and treasurer.

Central Council for Health Education

On October 24 the Central Council for Health Education, founded 23 years ago, was reconstituted to consist of only 24 members. Of these, 15 are officially appointed representatives of the various associations of local authorities. The council will continue to organize and run training courses for members of local-authority staffs throughout the country. It will extend the material aid that it gives to individual local authorities. In addition, it plans a pilot experiment in education of the public concerning cancer, and the provision of teaching aids to assist doctors, midwives, and nurses in the preparation of expectant mothers for pregnancy and childbirth.

A message from the Minister of Health commented on the valuable work done by the council in providing expert advice and material for the assistance of local authorities on direct and personal education and on the instruction and training of personnel. He felt sure that the new and closer link with the local-authority associations would result in greater support of the council by local authorities and a consequent extension of authorities' health education activities. He thought that his Department's responsibilities for the dissemination of information on health and disease could best be carried out by the preservation of a proper balance between the central departments and the local authorities and voluntary organizations, and between general publicity and personal persuasion.

The Heberden Society

A clinical meeting of the Heberden Society was held on October 21 at the Canadian Red Cross Memorial Hospital, with Dr. E. G. L. Bywaters as host, and the president, Dr. W. S. C. Copeman, in the chair. Cases presented included rheumatic carditis, Still's disease, disseminated lupus erythematosus, temporal arteritis, hyperparathyroidism with chronic nephritis, dermatomyositis, and sarcoidosis.

Festival of Britain Accommodation

An inquiry has been received from Paris from the World Medical Association about the possibility of French doctors being received as paying guests by English doctors for the Festival of Britain next year. Hotel accommodation is already difficult to obtain. Anyone able to assist medical visitors from overseas in this way is asked to write to Dr. H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, stating what he is prepared to offer and the periods he can receive guests, with a note of any charges.

Thoracic Surgery Demonstrations in Spain

Mr. T. E. Holmes Sellors is visiting Madrid and Barcelona between October 20 and November 6 to demonstrate thoracic surgery and to lecture for the British Council. Dr. Parry Brown, who is accompanying Mr. Holmes Sellors as anaesthetist, will also give lectures on his specialty.

Christmas Seals

Some attractive seals for sticking on Christmas mail have been prepared by the National Association for the Prevention of Tuberculosis. They are sold at a ½d. each or 8s. for two sheets of 100. The money from their sale helps the N.A.P.T. in its programme of research and education for the prevention of tuberculosis. They may be obtained from the N.A.P.T. at Tavistock House North, Tavistock Square, London, W.C.1.

Sir Charles Hastings Lecture

The Sir Charles Hastings Lecture will be delivered by Sir Lionel Whitby in the Great Hall of B.M.A. House on November 22 at 6.30 p.m. His theme is "Can Disease Be Prevented?" Dr. Charles Hill will be in the chair. This is the first Hastings Lecture to be delivered since 1939, and it is intended primarily for the public. Doctors in the London area are asked to bring the lecture to the notice of the public. Admission is free by ticket obtainable from B.M.A. House, and small handbills advertising the lecture are available on application to the Public Relations Department, B.M.A. House, Tavistock Square, London, W.C.1, to any doctor willing and able to have them displayed.

Ross Award

The Ross Award was founded in 1949 by the standing committee of the Ross Institute, which resolved that it should be presented from time to time to persons who had distinguished themselves in the furtherance of Ronald Ross's ambition to control malaria on an extensive scale. The award has now been offered to Mehmed Aziz, M.B.E., chief health officer of Cyprus, for outstanding services in the control of malaria. He has worked for over thirty years in this field, and the Cyprus anopheline eradication scheme (1947–50) is largely due to him. This successful attempt to eradicate indigenous species of mosquito is a pioneering example to the world.

Van Meter Prize Award

The American Goiter Association again offers the Van Meter Prize Award of $300 and two honourable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association, which will be held in Columbus, Ohio, U.S.A., on May 24, 25, and 26, 1951, provided essays of sufficient merit are presented in competition. The competing essays may cover either clinical or research investigations; should not exceed 3,000 words in length; must be presented in English; and a typewritten double-spaced copy in duplicate sent to the corresponding secretary, Dr. George C. Shivers, 100, East Saint Vrain Street, Colorado Springs, Colorado, U.S.A., not later than March 1, 1951. A place will be reserved on the programme of the annual meeting for presentation of the prize award essay by the author, if it is possible for him to attend. The essay will be published in the annual *Proceedings* of the association.

Charing Cross Hospital

The Treasury has sanctioned the purchase of 47 acres for the site of the new Charing Cross Hospital and Medical School. The proposed site is at present occupied by Northwick Park Golf Club, and is within sight of Harrow School. The new hospital will provide accommodation for 800 in-patients, with an out-patients department and all other ancillary services. No date has yet been fixed for starting building operations.

Lebanon Hospital for Mental Diseases

The Lebanon Hospital, which celebrated its golden jubilee last August, was founded at Asfuriyeh, Beirut, by the Swiss missionary Theophilus Waldmeier. Before its advent the treatment of the insane in that part of the world was often primitive and cruel. The first home for the insane in Biblical lands, it remains to-day the only international inter-religious mental hospital in the Middle East. Several countries have provided buildings, of which there are now about 25. The hospital is governed by a general committee in London and an executive committee in Beirut. During its lifetime more than 14,000 patients have been treated, and modern methods of diagnosis and treatment are in use. The neuropsychiatric clinic of the hospital has been able to do much in the early treatment of mental and nervous disorders and in preventive psychiatry. Classes are held at the hospital for fourth-year students of the American University of Beirut. The hospital has not easily survived post-war financial difficulties, and fresh capital is needed for extensions and equipment, for developing the department of occupational therapy, and for building up a centre for the early treatment of mental disorders. Further information about the Lebanon Hospital may be obtained from the London Office of the Committee, Drayton House, Gordon Street, W.C.1, and tickets for a recital of poetry and music at Friends House at 7 p.m. on November 7 can be purchased at the same address.

Grenfell Association

The Grenfell Association, whose medical mission on behalf of settlers in Labrador and northern Newfoundland is so well known, is again this year offering for sale Christmas cards, stationery, and stamps, proceeds from which will go towards the support of the mission. An illustrated catalogue of the cards is now available, price 1d., from the secretary, Grenfell Association, 66, Victoria Street, S.W.1.

COMING EVENTS

R.C.S. of England

Sir Harry Platt will deliver the Bradshaw Lecture before the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., on Thursday, November 9, at 5 p.m. His subject is "Diagnosis and Prognosis in Sarcoma of Bone."

British Medical Students Association

The annual general meeting of the British Medical Students Association will be held at Manchester University on November 9–11.

Institute of Ophthalmology

A further series of advanced lectures will be given in the lecture theatre of the Institute of Ophthalmology, Judd Street, London, W.C., on various dates between November 10 and December 19, at 5.30 p.m. Admission to the lectures is free, and details will be published in the "Societies and Lectures" column week by week.

Chemotherapy of Cancer

A meeting of the Fine Chemicals Group of the Society of Chemical Industry will be held at the Royal Institution, 21, Albemarle Street, London, W., on Monday, November 13, at 7 p.m., when Professor A. Haddow, Director of the Chester Beatty Research Institute of the Royal Cancer Hospital, will deliver a lecture on "The Chemotherapy of Cancer." The subsequent discussion will be opened by Professor E. Boyland.

Maudsley Lecture

The twenty-fifth Maudsley Lecture will be delivered by Professor Aubrey Lewis before the Royal Medico-Psychological Association at the Royal Society of Medicine, Barnes Hall, 1, Wimpole Street, London, W., on Friday, November 17, at 2.15 p.m. His subject is "Henry Maudsley, His Work and Influence." Psychiatrists and other medical practitioners, psychologists, and members of the legal profession, teachers and students are invited to attend the lecture. Admission is without ticket.

Association of Army Psychiatrists

The eighth reunion of Army psychiatrists will be held at Slater's Restaurant, 142, Strand, London, W.C., on Saturday, November 18, from 7.30 to 10.30 p.m. Particulars may be obtained from the honorary secretary, Dr. J. C. Penton, The Old Farm House, 1, Gatehill Road, Northwood, Middlesex.

Course on Endocrinology

A course on recent therapeutic advances in endocrinology will be held at the Hôpital Laennec, Paris, from November 20 to 25. Professors and doctors of the faculties and hospitals of Paris, Geneva, Brussels, Liége, Lyons, and Toulouse will take part. The subscription for the course (4,000 francs) should be sent to Dr. Albeaux-Fernet at the Hôpital Laennec. The course is divided into two sections: series A (clinical) and series B (biological). Those proposing to attend should indicate which course they wish to take.

SOCIETIES AND LECTURES

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

Monday

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—November 6, 4.30 p.m., *"The Treatment of Facial Paralysis,"* by Miss D. J. Collier.

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 6, 5 p.m., *"Surgical Treatment of Cerebral Tumours in Children,"* by Mr. W. McKissock.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—November 6, 5.30 p.m., *"The Management of Squint in Children,"* by Mr. T. K. Lyle.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 6, 4.30 p.m., lecture-demonstration for postgraduates by Dr. E. Stengel.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Peter's Hospital, Henrietta Street, London, W.C., November 6, 3 p.m., ward round by Mr. J. G. Sandrey.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 7, 5.30 p.m., *"Viruses as Causes of Disease,"* by Dr. C. H. Andrewes, F.R.S.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 7, 5 p.m., *"Lupus Erythematosus,"* by Dr. W. N. Goldsmith.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 7, 5 p.m., *"The Problem of the Hippocampus,"* by Professor W. E. le Gros Clark, F.R.S.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At St. Paul's Hospital, Henrietta Street, London, W.C., November 7, 11 a.m., demonstration of cardiovascular syphilis by Dr. E. G. B. Calvert; (2) at St. Peter's Hospital, Henrietta Street, London, W.C., November 7, 5 p.m., *"Transvesical Operations on the Prostate,"* by Mr. A. R. C. Higham.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 7, 3.45 p.m., *"The Germ Layers,"* by Professor J. D. Boyd.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 7, 5 p.m., *"Genetics in Ophthalmology,"* by Professor Arnold Sorsby.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 7, 5.15 p.m., *"Some Recent Advances in the Physiology of Vision,"* by Professor Hamilton Hartridge, F.R.S.

Wednesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 8, 5 p.m., *"Medical Mycology."* lecture-demonstration by Dr. R. W. Riddell.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 8, (1) 11 a.m., *"Signs, Symptoms, and Asymptomatic Carrier State of Gonorrhoea,"* by Dr. A. H. Harkness; (2) 3.30 p.m., museum demonstration by Mr. J. D. Fergusson; (3) 5 p.m., *"Endoscopic Operations on the Prostate,"* by Mr. R. Ogier Ward.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 8, 3.45 p.m., *"The Development of the Intestinal Tract,"* by Professor J. D. Boyd.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 8, 4 p.m., *"Clinical Ophthalmology"* (Revision), by Mr. R. A. Burn and Mr. R. P. Crick; 5.30 p.m., *"Ophthalmic Neurology,"* by Mr. L. H. Savin.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 8, 3.30 p.m., *"The Role of Chemistry in Relation to Public Health,"* by Mr. C. J. Regan, B.Sc., F.R.I.C.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, Wandsworth Common, London, S.W., November 8, 8.30 p.m., *"Urinary Infections,"* by Mr. H. K. Vernon.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At the General Infirmary at Leeds, November 8, 8 p.m., *"The Problem of Apnoea,"* by Dr. Michael D. Nosworthy.

Thursday

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, London, W., November 9, 8 p.m., *"Emotional Immaturity and Masculine Protest Syndrome,"* by Dr. J. Bierer. The discussion will be opened by Dr. Alan Maberly.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 9, 5.30 p.m., *"Inherited Immunity,"* by Dr. H. J. Parish.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.—November 9, 3 p.m., demonstration of surgical cases by Mr. Stephen Power.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, November 9, 5 p.m., *"The Surgical Significance of the Intestinal Vascular Patterns,"* by Mr. J. A. Ross.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 9, 5 p.m., *"Drug Eruptions,"* by Dr. G. B. Mitchell-Heggs.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 9, 3 p.m., *"Metabolic Processes Supporting the Activities of the Brain,"* by Dr. H. McIlwain.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 9, (1) 11 a.m., *"Local and Systemic Complications of Gonorrhoea,"* by Dr. A. H. Harkness; (2) 5 p.m., *"Retropubic Operations on the Prostate,"* by Mr. A. W. Badenoch.

ROYAL ARMY MEDICAL COLLEGE.—At Lecture Theatre, John Islip Street, London, S.W., November 9, 5 p.m., *"The Value of Immediate Plastic Procedures in Trauma,"* by Sir Harold Gillies.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 9, 3 p.m., *"Ocular Aspects of Cranial Nerves,"* by Professor Brodie Hughes; 5 p.m., *"Diagnosis and Prognosis in Sarcoma of Bone,"* Bradshaw Lecture by Sir Harry Platt.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 9, 5.30 p.m., *"Operative Surgery,"* by Miss J. M. Dollar.

ROYAL SOCIETY, Burlington House, Piccadilly, London, W.—November 9, 4.30 p.m., *"The Development of Microbiology,"* Leeuwenhoek Lecture by Sir Paul Fildes, F.R.S.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 9, 4.30 p.m., lecture-demonstration on psychiatry by Sir Paul Mallinson.

UNIVERSITY OF WALES: WELSH NATIONAL SCHOOL OF MEDICINE, Reardon Smith Lecture Theatre, Park Place, Cardiff.—November 9, 8 p.m., *"Infection and Disease, with Special Reference to Tuberculosis,"* by Professor F. R. G. Heaf.

WINGFIELD-MORRIS ORTHOPAEDIC HOSPITAL; NUFFIELD ORTHOPAEDIC CENTRE, Oxford.—November 9, 8.30 p.m., *"Congenital Dislocation of Hip: A Revision and Assessment of Results of 200 Cases,"* by Dr. R. Esteve.

WREXHAM AND DISTRICT CLINICAL SOCIETY.—At Wynnstay Arms Hotel, Wrexham, November 9, 7.30 p.m., *"Gastroscopy—Its Value in Diagnosis and Treatment,"* by Mr. Howell Hughes.

Friday

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 10, 5.30 p.m., *"The Use of Irradiation in Ophthalmology,"* by Mr. P. Jameson Evans.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—November 10, 5 p.m., clinical neurological demonstration by Dr. Helen Dimsdale.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 10, 3.45 p.m., *"The Development of the Heart and Circulatory System,"* by Professor J. D. Boyd.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—November 10, 8 p.m., Symposium: *"Anaemia."*

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 10, 5.15 p.m., *"Chemical Transmitters,"* by Dr. W. S. Feldberg, F.R.S.

●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At South Kensington Hotel, 41, Queen's Gate Terrace, London, S.W., November 10, 7.15 for 7.45 p.m., dinner meeting. *"Radiological Pitfalls,"* by Dr. Cochrane Shanks.

Saturday

KENT PAEDIATRIC SOCIETY.—At Farnborough Hospital, Kent, November 11, 2.30 p.m., "Brains Trust." Question Master, Dr. N. M. Jacoby, with Dr. Appleby, Miss Forstner, Miss Harvie, and Dr. Levs.

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Lecture Theatre, King's College Hospital, Denmark Hill, London, S.E., November 11, 10.30 for 11 a.m., *"The Evolution of the Surgical Treatment of Pulmonary Tuberculosis,"* by Mr. J. B. Hunter. To be followed by annual luncheon and annual general meeting of the society.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Dewar.—On October 26, 1950, at Newcastle-upon-Tyne, to wife of Dr. H. A. Dewar, twins—son and daughter.

McGill.—On October 24, 1950, at Connaught Nursing Home, Cardiff, to Dr. Eileen (formerly Clarke), wife of Dr. A. D. McGill, a daughter.

Rogers.—On October 20, 1950, at the Sudbridge Nursing Home, Stroud, to Rosamond (formerly Aldrich), wife of Dr. S. C. Rogers, a daughter—Anne Frances.

Russell Stoneham.—On October 17, 1950, at Windsor, to Pauline (formerly Walker), wife of Dr. F. J. Russell Stoneham, a sister for Angela—Heather.

Sheldon.—On October 21, 1950, at Westminster Hospital, London, to Beryl, wife of Dr. J. V. Sheldon, a brother for Richard.

Thomson.—On October 25, 1950, to Nancy S. M. Thomson (formerly Milne), M.B., Ch.B., wife of Thomas Nairn Thomson, B.Sc.(Econ.), Ivybank, Blairgowrie, Perthshire, a daughter.

Wilson.—On September 21, 1950, to Jane (Dr. Ruth Audrey Ainsworth), wife of William Weatherston Wilson, F.R.C.S., a son.

DEATHS

Graham.—On October 16, 1950, at Cell Barnes Hospital, St. Albans, Herts, Malcolm Frank Douglas Graham, M.C.P.S.Ont., Captain, I.M.S., retired.

Hipwell.—On October 21, 1950, at Cedar Grange, Caterham, Surrey, Harry Hipwell, M.D., late of 18, Elgin Road, London, N., aged 91.

Jones.—On October 23, 1950, at Edinburgh, Guy Carleton Jones, C.M.G., M.D., F.A.C.S., Major-General, late R.C.A.M.C., of 34, Plewlands Gardens, Edinburgh, and Ottawa, Canada.

Lucy.—On October 20, 1950, at his home, Penn Court, Hollingbourne, Kent, Sidney Herbert Reginald Lucy, M.R.C.S., L.R.C.P., late of Malaya.

McCrea.—On October 23, 1950, at "Lisna," Wargrave, Berks, John McCrea, M.B., B.Ch., aged 78.

Any Questions?

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

Nail Biting

Q.—*Can you suggest any treatment for nail biting in a girl aged 3½ years who, despite her mother's efforts with sticking plaster, gloves, and aloes—and chastisement—still persists in biting her nails whenever the opportunity offers?*

A.—The treatment of nail biting can be successful only if the aetiology of the habit is known and understood. Studies of nail biters, both adults and children, show that this arises from excessive emotional tension. The work of Bovet (*Schweiz. Arch. Neurol. Psychiat.*, 1942, **49**, 39; Ibid., 1942, **50**, 14) demonstrates that nail biting represents a sort of compromise between impulse and inhibition, in which frustration is the excitant, and is closely allied to fear. Again, from a careful survey of a large number of college students (Coleman, J. C., and McCalley, J. E., *J. abnorm. soc. Psychol.*, 1948, **43**, 517) the aetiology of nail biting was shown to be closely allied with feelings of inadequacy and insecurity, the latter especially in relation to parental figures. A number of the nail biters recalled this habit being provoked by feelings that they could not depend upon any consistent discipline, and so were unsure of what they should do. This set up feelings of guilt which were to some degree satisfied by biting, i.e., a masochistic reaction. There is a close connexion between this habit and anger, and the same group of students showed associations to angry feelings when as children they were not allowed to be independent.

In this case there is a Shakespearian flavour about the mother's reaction. "I will bite my thumb at them," says Capulet, *"which is a disgrace to them if they bear it."* The small girl's nail biting, to judge by the harsh treatment it has evoked, seems to her mother like a challenge. The scene is played on: "Do you bite your thumb at me, Sir?" to which the dogged answer is: *"I bite my thumb."* In Romeo and Juliet there succeeds the clash of swords; in the nursery the clash of personalities, bitter aloes, chastisement, and the transmutation of a temporary anxiety sign into a fixed habit. Rightly, if perhaps unconsciously, the mother has diagnosed biting the nail as a sign of anger, but she has failed to recognize that this anger is a reaction to fear, especially the fear of not being loved. The child is biting herself rather than bite her mother, and the cure lies in maternal tenderness. It is clear that to try to suppress the habit by stern measures will only intensify the anxiety that induces it. The first thing is to find out what is the main cause of excessive tension and unhappiness, and to relieve these conditions. There is also the habit factor to be considered. Rough nails provide irritation, and biting these can be a relief. It is useful to soften the nails by castor oil or olive oil to avoid rough edges. This will be more effective if the mother can make this appear not as a punishment but as an act of love; such a nice child should have nice nails—sentimental perhaps, but going to the root of the trouble.

Eclampsia

Q.—*What are the most recent figures for the incidence of, and the maternal and foetal mortality from, eclampsia in this country? Also, why is caesarean section held in low repute as the means of delivering the eclamptic patient?*

A.—The number of cases of eclampsia occurring in any one year in this country is unknown: the disease is not notifiable, not all cases are admitted to hospital, and not every hospital publishes an annual report. Moreover, the incidence varies widely from one part of the country to another, being low in London and the South-east, and relatively high in the industrial areas of the North. Some country areas with less efficient maternity services may also have more cases.

A rough estimate for one large provincial city is 1 case of eclampsia in 700 deliveries, and this may be compared with a recent figure of 1 in 500 to 800 deliveries in the U.S.A., given by N. J. Eastman in *Williams' Obstetrics*, 10th edition, 1950 (Appleton-Century-Crofts, New York). The figures published by J. B. Dewar and W. I. C. Morris (*J. Obstet. Gynaec. Brit. Emp.*, 1947, **54**, 417) may also be helpful. These are concerned with the counties of Ayr, Dumfries, Kirkcudbright, and Wigtown (population approximately 500,000). Obstetrical emergencies admitted from this area included 88 cases of eclampsia during the five years 1939–43, and 48 cases during the subsequent four years.

The results of treatment have improved in recent years, but vary considerably with the standard of medical service in different areas of the country. Moreover, the statistics for any hospital depend on whether it receives every case of eclampsia occurring in its area, or whether it receives only the severe cases. What can be achieved is shown by Dewar and Morris, who, using rectal "tribromoethanol" in 44 consecutive cases, record only two maternal deaths (4.5%)—as compared with a maternal mortality of 20.5% in the previous 88 cases. R. J. Kellar (*Modern Trends in Obstetrics and Gynaecology*, 1950. Edited by R. K. Bowes. London: Butterworth) mentions that, using the same method, he treated about 40 cases without a single maternal death, while in the practice of the Simpson Maternity Hospital there were four deaths in the last 101 consecutive cases. Other figures in the literature suggest a general conclusion that the maternal mortality, given early and adequate treatment, is about 4 or 5%.

The number of stillbirths and neonatal deaths is also less than it was, but probably remains in the region of 40%. It is doubtful whether many hospitals can improve on the 31% combined stillbirth and neonatal death rate recorded by Dewar and Morris.

Caesarean section in the treatment of eclampsia is held in low repute because of the appalling results which attended its use in the earlier part of this century. Opinion was crystallized by papers by J. Munro Kerr and Eardley Holland in 1921 (*J. Obstet. Gynaec. Brit. Emp.*, 1921, **28**, 338, 358), in which it was shown that the maternal mortality was 32% and the foetal and infant mortality 50%. At that time relatively crude anaesthetics were being given to women suffering from liver necrosis, oedema of the lungs, and profound metabolic upset; the operative technique was not so good as at present; and the operation was often reserved for the worst type of case.

Nowadays it is generally recognized that, provided modern methods of anaesthesia are available, caesarean section has a definite although quite small place in the treatment of eclampsia. The indications are: (*a*) When eclampsia is complicated by some other obstetric condition, such as disproportion, demanding abdominal delivery. (*b*) Sometimes in the interests of the baby (in an elderly primigravida, for example) when the case is seen at the onset of fits, and when labour is not in progress, and when a long hard cervix makes it clear that delivery cannot be expected for a long time. (*c*) In the comparatively rare case when the patient recovers from eclampsia without going into labour and without the foetus dying *in utero*, and when an unripe cervix or high presenting part makes it unwise to carry out surgical induction of labour.

Choline Chloride

Q.—*What is choline chloride and what are its actions? Where is it found naturally?*

A.—Choline chloride, $Cl.N(CH_3)_3.C_2H_4.OH$, has a very weak action resembling that of acetylcholine, though its depressant effect on the circulation is almost imperceptible. Acetylcholine is a powerful stimulant of the parasympathetic nervous system. It therefore slows the heart, dilates the peripheral blood vessels, and contracts the pupil and the intestinal and bladder musculature. As acetylcholine is rapidly destroyed by choline esterase its use in therapeutics is impracticable and drugs with a more persistent action are employed. Choline chloride has been used in doses of 10 gr. (0.65 g.) intravenously, and there are various proprietary preparations of it, but a much more satisfactory and powerful drug is carbamylcholine chloride, of which the official name is carbachol (*B.P.*). This is given in doses

of 1/240 to 1/120 gr. (0.27 to 0.54 mg.) subcutaneously or intramuscularly—never intravenously. It is used to relieve postoperative paralytic ileus and to promote micturition in paralysis of the bladder. It should not be given to collapsed patients or asthmatics, and should be used with great caution in the elderly. Atropine is a specific antidote to it. Acetyl-β-methylcholine chloride is sometimes employed in the treatment of supraventricular paroxysmal tachycardia in a dose of 25 mg. subcutaneously.

Choline, which is a member of the vitamin-B complex, occurs naturally in many foodstuffs. It is present in meat, fish, cheese, and most vegetables. Egg yolk and to a less extent liver are its richest sources. It is used in the synthesis of substances necessary for fat transportation, and animal experiments suggest that it prevents and may even cure fatty degeneration of the liver. It has not been much used for this purpose in a medicinal form in practical therapeutics, though foods rich in choline may be of some value in the prevention and treatment of acute and chronic hepatitis.

Choline and Coronary Thrombosis

Q.—*A patient suffering from coronary thrombosis has read in the lay press about the use in America of choline in the treatment of this condition, and he wishes to know if it would be of any benefit to him. Can you give me any information about this?*

A.—Choline is obtainable in this country and may be given in doses of 10–20 g. daily by mouth. There is evidence that this substance helps to prevent experimental atherosclerosis in rabbits and that it may even cause atheromatous lesions to disappear. Morrison and Gonzalez (*Amer. Heart J.*, 1950, **39**, 729) tested its effect on a series of 115 patients with proved coronary thrombosis and compared the course of the tested cases with that of 115 untreated controls which were similar in other respects. During the time under review (1 to 3 years) there were 14 deaths in the treated group and 35 in the untreated. There was no significant difference in the incidence of angina pectoris or effort dyspnoea.

For a general account of choline see the previous answer.

Stress and Schizophrenia

Q.—*Do strain and stress provoke the onset of schizophrenia?*

A.—Yes. Kallmann in his report to the International Congress of Psychiatry, Paris, 1950, on his immense collection of 953 pairs of twins, in which at least one twin in each pair had become schizophrenic, finds evidence that an attack of schizophrenia can be precipitated by physical and emotional strains, pregnancy, acute infections, or a drastic reducing diet. Other observers—e.g., Schulz—have found that in some cases minor head injuries, such as concussion, may have played a part. The main causation, however, cannot be ascribed to such factors. Hereditary influence is the only constant causative factor known; but by itself it is often insufficient, and an environmental noxa may be required to bring on the psychosis. There seems, however, to be little difference in subsequent course and outcome, whether or not the illness has been provoked (or could have been provoked) by an environmental stress.

Red Perspiration

Q.—*I have recently seen a case of what might be termed "red perspiration." The axillary sweat was definitely red, and it stained the undergarments. What is the cause of this condition?*

A.—Red sweat in the axillae is probably always due to either bacteria or parasitic fungi on the axillary hairs. If fungus infection is not evident macroscopically the hairs should be examined under a microscope and cultures made. The treatment is to shave the axillae and apply a mild antiseptic.

Heparin and Hyaluronidase

Q.—*What is the rationale and what are the indications for the administration of hyaluronidase with heparin?*

A.—On theoretical grounds the addition of hyaluronidase to heparin should result in accelerated absorption of the heparin from a subcutaneous depot. This effect has been demonstrated recently by Tuchman and Moolten (*Amer. J. med. Sci.*, 1950. **219**. 147). They found that, if the site of injection was first infiltrated with a small quantity of hyaluronidase, repeated subcutaneous injections of heparin could be given without pain and would produce a prolongation of the clotting time comparable to that achieved by using the same dose intravenously. They point out that this method of administration makes it possible for nurses to give the injection.

Kimmelstiel–Wilson Syndrome

Q.—*What is the Kimmelstiel–Wilson syndrome?*

A.—P. Kimmelstiel and C. Wilson (*Amer. J. Path.*, 1936, **12**. 83) described a renal lesion, which they called intercapillary glomerulosclerosis, in eight patients dying with diabetes mellitus. A characteristic symptom-complex had been noted in their patients, the main features of which were diabetes mellitus, albuminuria, massive oedema, hypertension, and renal failure. Since the original description the frequency of combined diabetic and hypertensive retinopathy, anaemia, and lipoid cells in the urinary deposit has been stressed. Riskin and his colleagues have written a useful review of the subject, with a full bibliography (*Medicine*, 1948, **27**, 429).

East Africa and Pulmonary Tuberculosis

Q.—*Is the climate of East Africa likely to have any adverse effect on a person who has arrested pulmonary tuberculosis and wishes to emigrate there?*

A.—Climate *per se* has little effect on tuberculosis of the lungs, though the hot moist climate of the coast may not be advantageous. The dangers arise partly from other diseases—for instance, malaria—which may have a debilitating effect, partly in relation to nutrition, partly from the tendency to lead too strenuous a life in a country where games are universally played and where rural life (especially on farms) is apt to lead to unexpected physical strain, and partly from the nervous strain (often called tropical neurasthenia) which is sometimes a marked feature of life in the Tropics, especially in small communities. Another point of importance is that although in the main centres of population expert medical advice may be readily available this is rarely true of the rural areas.

NOTES AND COMMENTS

Dispensing of P.A.S.—Dr. JACK ESSEX (London) writes: With reference to "Any Questions?" (October 14, p. 901) in which cachets of 1.5 g. of P.A.S. are recommended for easy administration, I would draw attention to the availability in this country of dragées of sodium P.A.S. each providing 0.34 g. These are smaller and much easier to swallow than the larger presentation, and are not resisted by children or patients with laryngeal lesions. The necessity of swallowing a greater number at each dose is surely inconsequential compared with the advantage of easy deglutition.

Correction.—Dr. R. D. LAWRENCE (London, W.1) writes: May I ask you to correct a bad error I made in the list of stimulating writers on medical teaching in my article "The Training of Clinical Teachers" (August 26, p. 482)? The name Ffrench should have been Ffrangcon Roberts, to whom I apologize.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.) TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 11 1950

TREATMENT OF PULMONARY TUBERCULOSIS WITH STREPTOMYCIN AND PARA-AMINO-SALICYLIC ACID

A MEDICAL RESEARCH COUNCIL INVESTIGATION

(Made with the co-operation of the British Tuberculosis Association Research Committee)

A controlled investigation into the effects of *para*-amino-salicylic acid (P.A.S.) in the treatment of pulmonary tuberculosis has been completed, and the following is a report of the results. The inquiry was planned and directed by a joint subcommittee of the Medical Research Council's Streptomycin in Tuberculosis Trials Committee and the British Tuberculosis Association's Research Committee. The Subcommittee was composed of the following members: Dr. Geoffrey Marshall (chairman), Professor R. Cruickshank, Dr. Marc Daniels, Dr. W. Pointon Dick, Professor F. R. G. Heaf, Professor A. Bradford Hill, Dr. J. V. Hurford, Dr. K. Perry, Dr. J. G. Scadding, Dr. W. E. Snell, and Dr. P. D'Arcy Hart (secretary). The centres at which the work was carried out, and the clinicians and pathologists co-operating in the trial, were as follows:

Brompton Hospital, London.—Clinicians: Dr. J. R. Bignall, Dr. J. W. Crofton (working under the direction of the honorary staff of Brompton Hospital). Pathologists: Dr. J. W. Clegg, Dr. T. D. M. Martin.

Clare Hall County Hospital, Herts.—Clinician: Dr. T. A. W. Edwards. Pathologists: Dr. H. Loewenthal, Dr. R. F. Welch.

Colindale Hospital, London.—Clinicians: Dr. M. Hemming, Dr. W. C. Harris. Pathologists: Dr. J. L. Hamilton-Paterson, Dr. E. D. Hoare.

Fazakerley Sanatorium, Liverpool.—Clinicians: Dr. O. F. Thomas, Dr. J. Hamilton Gifford. Pathologists: Professor A. W. Downie, Dr. C. A. St. Hill.

Harefield County Hospital, Middlesex.—Clinicians: Dr. L. E. Houghton, Dr. G. P. Maher-Loughnan. Pathologist: Dr. E. Nassau.

King George V Sanatorium, Surrey.—Clinicians: Dr. J. V. Hurford, Dr. W. D. Moore. Pathologist: Dr. N. P. L. Wildy.

London Chest Hospital, London.—Clinician: Dr. L. J. Grant. Pathologist: Dr. W. I. Leslie.

London Hospital Annexe, Essex.—Clinicians: Dr. K. Perry, Dr. N. Lloyd Rusby, Dr. D. C. L. Beatty. Pathologist: Dr. F. C. O. Valentine.

Sully Hospital, Glamorgan.—Clinician: Dr. L. R. West. Pathologist: Dr. Ruth L. Milne.

Yardley Green Hospital, Birmingham.—Clinician: Dr. Hector J. T. Ross. Pathologist: Dr. B. R. Sandiford.

The clinicians met periodically under the chairmanship of Dr. Geoffrey Marshall, and the pathologists under the chairmanship of Professor R. Cruickshank. The Medical Research Council's Tuberculosis Research Unit was responsible for the co-ordination of the trial and Professor Bradford Hill for its statistical design; Dr. Marc Daniels, of the Unit's staff, analysed the results and prepared the report for the Committee. The radiological results were assessed by a panel composed of Dr. A. F. Foster Carter, Dr. P. Kerley, and Dr. G. Simon.

Introduction

In 1948 the Medical Research Council received requests, from the Ministry of Health and from the British Tuberculosis Association, to organize clinical trials of P.A.S. in pulmonary tuberculosis. Favourable effects of the drug had been reported from Sweden by Lehmann (1946). Early observations in this country by different workers were conflicting, and, as a decisive answer had been reached for streptomycin by the method of controlled clinical trial (M.R.C., 1948a), it was agreed by clinicians in doubt about the value of P.A.S. that the method should be applied to trial of this drug.

It was clear, in view of the proved efficacy of streptomycin in the forms of pulmonary tuberculosis considered most suitable for chemotherapy trials, that an investigation with a control group treated by bed-rest only would no longer be possible. The Committee decided, therefore, to compare the effect of P.A.S. treatment in one group of patients with the effect of streptomycin in another group having similar disease. Further, it seemed possible that the combination of P.A.S. with streptomycin might delay or prevent the emergence of streptomycin resistance. Accordingly it was decided to have three concurrent groups, the treatment being in one group P.A.S. alone (P group), in a second streptomycin alone (S group), and in the third streptomycin plus P.A.S. (SP group). Finally, though retrospective comparisons are subject to error, it was hoped that, since exactly the same type of disease as in the first trial was selected, it would also be possible to compare the results in this investigation with those of the control group treated by bed-rest alone in the first trial (M.R.C., 1948a). The inclusion of a streptomycin group in the present trials would afford evidence of the validity of such a comparison between the first and second trials. The first patients were admitted in December, 1948, and by October, 1949, 183 patients had been accepted. In December, 1949, results concerning streptomycin resistance were already so striking that an interim communication was made (M.R.C., 1949). The present report is the full analysis of the trial.

Plan and Conduct of the Trial

The methods of the investigation were similar in nearly all respects to those of the first trial. They were fully described in the report of that trial; briefly they were as follows:

The type of case to be investigated was acute progressive bilateral pulmonary tuberculosis, believed to be of recent origin, bacteriologically proved, unsuitable for collapse therapy, age group 15 to 30. Letters were sent, through the Regional Hospital Boards, to chest physicians and

medical superintendents of general hospitals in the areas from which the chosen centres could receive patients; the letters outlined the proposed scheme and asked that particulars and *x*-ray films of possibly suitable patients should be sent to the Tuberculosis Research Unit. Particulars and films of cases submitted were considered by the Committee's selection panel, who decided if a case came within the limits of the definition. When a patient had been accepted as suitable, arrangements were made through the Regional Hospital Board for admission to one of the centres; these patients were given high priority, and nearly all were admitted to the respective centre within two weeks of approval.

After acceptance by the panel, the determination of the treatment group (P, S, or SP) in each case was made by reference to a randomly constructed list (based upon random sampling numbers) held confidentially in the Tuberculosis Research Unit. Patients were not told that they were taking part in a special investigation. After admission each patient was under observation for at least one week before treatment for the trial started; during that week all prescribed preliminary examinations were carried out. Clinical observations were entered on standard record forms designed particularly for this trial; these forms provided for details of history, examination on admission, monthly routine re-examinations with assessment of progress since last examination, observation of toxic reactions, temperature and treatment records, and finally a pathological record form. Instructions on required frequency of examinations were given. The nature of the treatment to be followed in each group was laid down, and is described under "Treatment."

When six months' observation had been completed in the required number of cases, all records and *x*-ray films were sent to the M.R.C. Tuberculosis Research Unit for analysis. The analysis presented here is therefore based on all available material from the centres at which the patients were treated, but has been made independently of those centres. The basic analysis was submitted to the clinicians and pathologists at the centres; the comments and discussion in this report represent a consensus of opinion of all those concerned.

Number of Patients in the Trial

166 patients were available for the analysis of results: 59 in the group treated with P.A.S. (P group), 54 treated with streptomycin (S group), and 53 treated with streptomycin and P.A.S. (SP group). 183 had been accepted, but 12 did not enter the trial, and 5 were later excluded. Of the 12 who did not enter, 3 had died while awaiting admission; 2 died within three days after admission (treatment had not begun); 2 refused to enter hospital; 3 were, after further examination on admission, considered unsuitable for the trial (one of these would have been in the P group, two in the SP group); 2 left hospital after a few days against medical advice. In 5 other patients treatment for the trial was started, but the cases were excluded from the analysis for the following reasons. In one case (P group) the physician in charge decided after a week that the patient should have streptomycin in addition. Two patients—one in the P group, one in the S—left after a month: one was worried about domestic affairs, and the other was discharged because totally uncooperative. In 2 other cases—one in the P group and one SP—treatment was stopped within the first month because of severe toxic reactions; strictly, this should be regarded as a failure of treatment, though it has not been possible to take it into account in the analysis; these cases are described later (see "Toxicity").

Condition on Admission

Table I shows the condition of patients before the start of treatment, as reflected by their general condition (assessment by the clinician in charge), temperature, and sedimentation rate (Westergren, 200 mm., reading at one hour).

TABLE I.—*Condition on Admission*

General Condition	Group P	Group S	Group SP	Average Evening Temp. in First Week*	Group P	Group S	Group SP	Sedimentation Rate	Group P	Group S	Group SP
Good ..	7	7	8	Afebrile† ..	5	4	7	0–10	1	1	1
Fair ..	27	25	23	Less than 99° F. (37·2° C.) but febrile	20	17	13	11–20	2	1	3
Poor ..	25	22	22	99–99·9° F. (37·2–37·75° C.)	18	18	19	21–50	23	18	26
				100° F.+ (37·8° C.+)	16	15	14	51+	33	34	22
Total	59	54	53	Total ..	59	54	53	Total	59	54	52‡

* Temperature taken by mouth.
† A patient was considered afebrile if *all* temperatures recorded were below 99° F. (37·2° C.).
‡ Sedimentation rate not done in one case.

The data indicate that clinically most of the patients were fairly ill, and that the distribution of cases was about equal in the three groups. The SP group had less cases with a sedimentation rate above 50.

Though the main analysis here will be concerned with a comparison of results in these three groups, there is some interest in comparing the results with those obtained in the first M.R.C. trial of streptomycin in pulmonary tuberculosis. The interest particularly concerns a comparison of the results in the P group of the present trial and the control group in the first trial, since there is no other available method of assessing the effects of P.A.S. treatment as compared with treatment by bed-rest alone. It is useful, therefore, to consider how the cases in this trial compare with those admitted to the first streptomycin trial. In the first trial, on admission the general condition was considered to be poor in 50% of the 107 patients and fair in 35%; in the second trial, reported here, the corresponding figures are 42% and 45% of the 166 patients. The sedimentation rate on admission was, in the first trial, above 50 in 61% and between 21 and 50 in 34%; in the second trial it was above 50 in 54% and between 21 and 50 in 41%. The figures suggest that the patients in the second trial were not quite so severely ill as those in the first, but the differences are not significant.

In Table II are set out the main data concerning condition on admission of patients in the control group (C group) of the first trial, alongside those in the P group of the present trial. It can be seen that, judging by the factors listed, the group C and the group P patients are closely comparable.

X-ray Classification

As in the first trial, the panel of clinicians who were appointed to select cases for the trial adhered so far as was possible to the definition laid down. Cases in which cavitation constituted the predominant lesion were excluded, and so also were cases which, though bilateral, had only a small amount of disease in one lung. The main conditions were that the lesions should be extensive, that they should appear from both the history and the *x*-ray appearances to be of fairly recent origin, and that in the judgment of the panel the patients could reasonably be regarded as unsuitable for collapse therapy at least for some months. As in the first trial, however, it was found that there were variations within the limits of the definition:

TABLE II.—*Condition on Admission. Comparison with First Trial*

General Condition	C Group 1st Trial No.	C Group 1st Trial %	P Group 2nd Trial No.	P Group 2nd Trial %	Max. Evening Temp. in First Week*	C Group 1st Trial No.	C Group 1st Trial %	P Group 2nd Trial No.	P Group 2nd Trial %	Sedimentation Rate	C Group 1st Trial No.	C Group 1st Trial %	P Group 2nd Trial No.	P Group 2nd Trial %
Good	8	*15*	7	*12*	98–98·9° F. (36·7–37·15° C.)	4	*8*	5	*8*	0–10 ..	0	*0*	*1*	*2*
Fair	20	*39*	27	*46*	99–99·9° F. (37·2–37·75° C.)	12	*23*	21	*36*	11–20 ..	2	*4*	2	*3*
Poor	24	*46*	25	*42*	100–100·9° F. (37·8–38·85° C.)	17	*33*	13	*22*	21–50 ..	20	*39*	23	*39*
					101° F.+ (38·3° C.+)	19	*36*	20	*34*	51+ ..	29	*57*	33	*56*
Total ..	52	*100*	59	*100*	Total ..	52	*100*	59	*100*	Total ..	51†	*100*	59	*100*

* Not comparable with Table I, in which figures are based on *average* evening temperature. † Examination not done in one case.

many cases accepted for the trial had less extensive lesions than others, and many had much cavitation, while others had none or very little. Nevertheless, an assessment of the degree of cavitation, made on an arbitrary basis by one radiologist who viewed all the films, shows that distribution on the basis of extent of cavitation was similar throughout the three groups (Table III).

TABLE III.—*Extent of Cavitation*

Group	Total	Extent of Cavitation on Admission* Nil	One-plus	Two-plus	Three-plus
P ..	59	9	16	26	8
S ..	54	5	21	21	7
SP ..	53	9	19	18	7
Total	166	23	56	65	22

* Assessment on a single film before treatment started. Tomograms were not taken into account.

In the first trial a simpler classification was used, based on whether gross cavitation (large or multiple cavities) was present or absent: of the 107 patients, 62 (58%) showed large or multiple cavities in the film taken on admission. If categories 2-plus and 3-plus in Table III are regarded as corresponding to the group showing large or multiple cavities in the first trial, the distribution appears to be similar: 87 of 166 cases, or 52%, were thus classified. Taking specifically again the C and P groups: of the 52 C cases in the first trial, 30 (58%) had gross cavitation; of the 59 P cases in the second trial, 34 (again 58%) had 2-plus or 3-plus cavitation.

On the basis of the data concerning condition on admission and the *x*-ray classification, added to the fact that the same panel of clinicians selected the cases on the same criteria as before, it may be concluded that the two series are reasonably comparable.

Treatment

A. First Three Months

Treatment of the three groups in the present trial was as follows:

P group.—20 g. daily of the sodium salt of P.A.S. by mouth, in four doses of 5 g. at 8 a.m., noon, 4 p.m., and 8 p.m. The P.A.S. was given in solution suitably flavoured, and only in capsules if not tolerated in solution.

S group.—Streptomycin* only, 1 g. (1 million units) a day, in one dose by intramuscular injection at 8 a.m.

SP group.—P.A.S. plus streptomycin,* in doses as for the two other groups.

Treatment in each case started at the end of a preliminary observation week, during which all initial examinations were made, and was given in each group for three months continuously. It was recommended that no other treatment apart from bed-rest be given during these three months unless the condition should so change that other measures became necessary and urgent. In fact, artificial pneumothorax was induced in one SP case in the third month.

*The streptomycin used was in the form of the sulphate, obtained from one manufacturer.

B. Second Three Months

The recommended procedure was that the three months of chemotherapy should be followed by a month of observation on bed-rest alone. At the end of this period—that is, four months after the start of treatment for this trial—any other treatment might be initiated. This decision was taken on the basis of experience already acquired with chemotherapy; it was felt that in many cases collapse therapy could not reasonably be withheld beyond this time. The additional treatment given in this period may be considered under the headings of (1) collapse therapy, and (2) streptomycin in the P group.

(1) *Collapse Therapy.*—Collapse therapy was applied in 20 P cases, 22 S cases, and 22 SP cases; pneumonectomy was performed in one P case and one SP case. Although it was recommended that collapse therapy should not be applied before the fifth month, exception was to be made for patients believed to require collapse therapy urgently before that time. In the P group it was begun in the fourth month in 7 cases and in the fifth or sixth month in the others. In the S group 6 were begun in the fourth month, and in the SP group 7; in addition, one (already mentioned) was begun in the third month in the SP group. Thus, although there was more frequent departure from the recommended procedure than expected, it occurred fairly equally in all three treatment groups. The details of collapse therapy applied are shown in Table IV.

TABLE IV.—*Collapse Therapy and Chest Surgery Initiated During the Trial*

	P	S	SP
Artificial pneumothorax {Maintained	10	5	12
Artificial pneumothorax {Abandoned	4	4	4
Artificial pneumoperitoneum	7*	13	8*
Thoracoplasty	1	0	0
Pneumonectomy	1	0	1
Total patients with collapse therapy or pneumonectomy	21	22	23

* Two P cases and 2 SP cases after abandoned artificial pneumothorax.

(2) *Streptomycin.*—Four patients in the P group were given streptomycin after the end of their three months of treatment for the trial. To one patient streptomycin was given for six weeks, starting a week after the three-months period, and an artificial pneumoperitoneum was induced five days later. During the first three months her general condition was thought to have improved slightly, but she had lost weight and the E.S.R. remained high (75); in the fourth month she made considerable improvement, gained 10 lb. (4.5 kg.), and the E.S.R. came down. In another

case streptomycin and P.A.S. were given in the fifth and sixth months; in the fourth month there had been definite clinical deterioration, but after the new course of therapy the patient improved rapidly. In a third case, also, there was definite improvement during a course of combined streptomycin and P.A.S. therapy in the fourth and fifth months. The fourth patient was given streptomycin at 4½ months, and pneumonectomy was performed two weeks later. In the first three cases there was improvement that might well be attributed to streptomycin treatment. Though allowance for these cases cannot be made in the analysis, it should be remembered that by the addition of streptomycin treatment the overall results in the P group were slightly better than they would otherwise have been.

Toxicity

Giddiness was recorded during treatment in 12% of patients having streptomycin, either alone or with P.A.S., but in only one patient was the symptom severe. Caloric tests of vestibular function were not carried out regularly. One patient having streptomycin alone had a slight transient rash.

Three patients having P.A.S. alone developed rashes during treatment. In two the rash was not severe and treatment could be continued. The other patient developed an extensive rash at the end of the fourth week; it was accompanied by a high fever, and treatment had to be stopped; this case has been excluded from the main analysis.

Four patients in the SP group developed rashes. It is not known whether the rashes were due to streptomycin or P.A.S. In two the rash subsided rapidly. In another there was a marked toxic reaction 3½ weeks after starting treatment; the symptoms responded dramatically to cessation of chemotherapy and did not reappear on its resumption three weeks later. In a fourth there was a very intense toxic general reaction from the 24th day; after several attempts to resume the prescribed therapy, each producing a marked reaction, dihydrostreptomycin was given and was well tolerated. This case is excluded from the main analysis.

Gastro-intestinal symptoms were common in those having P.A.S., being recorded in 58% of the P group and 51% of the SP group. The recorded incidence varied widely between the centres: in some centres slight symptoms were not noted. In most centres the symptoms occurred slightly more often in women than in men. Nausea at some period during treatment was recorded in 38% of all those having P.A.S.; diarrhoea was recorded in 33% and vomiting in 24%. In only one instance was it necessary to reduce the daily dose of P.A.S., and the gastro-intestinal symptoms did not cause treatment to be stopped in any patient in either treatment group.

Results at End of Six Months

Mortality

In each group of the present trial one patient died within the treatment period: one P case on the eighth day, one S case in the seventh week, one SP case in the third week. Five other deaths occurred subsequently: one in the P group in the fourth month, one in the S group in the fifth month, and three more in the S group in the sixth month. The differences in mortality are not statistically significant. The occurrence of deaths in the S group in the fifth and sixth months is similar to what was observed in the S group in the first trial, when four deaths occurred in the same period. The fatality rate of 3% in the P group is considerably lower than that of the control group in the first streptomycin trial, which was 27%; the difference is significant.

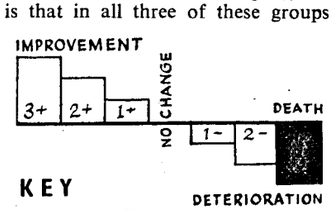
Results Based on Assessment of Radiological Appearances

TABLE V.—*Assessment of Radiological Appearance at Six Months as Compared with Appearance on Admission*

Second Trial: Radiological Assessment	P Group No.	P Group %	S Group No.	S Group %	SP Group No.	SP Group %	First Trial: Radiological Assessment	Control Group No.	Control Group %	Streptomycin Group No.	Streptomycin Group %
Improvement:											
Three-plus	1	*2*	9	*17*	7	*13*	Considerable improvement	4	*8*	28	*51*
Two-plus..	12	*20*	21	*39*	20	*38*	Moderate or slight improvement	13	*25*	10	*18*
One-plus..	20	*34*	10	*18*	19	*36*					
No material change	20	*34*	3*	*6*	3	*6*	No material change	3	*6*	2	*4*
Deterioration:							Moderate or slight deterioration	12	*23*	5	*9*
One-minus	4	*7*	5	*9*	2	*4*					
Two-minus	0	—	1	*2*	1	*2*	Considerable deterioration	6	*11*	6	*11*
Deaths ..	2	*3*	5	*9*	1	*2*	Deaths	14	*27*	4	*7*
Total ..	59	*100*	54	*100*	53	*101*	Total	52	*100*	55	*100*

* Includes one patient discharged at 4 months; the assessment at that date was "no change."

Considering first of all the results in the present series on the basis of *x*-ray assessment (Table V and Fig. 1), the first outstanding fact is that in all three of these groups of patients, admitted with severe progressive disease, the majority had shown improvement at the end of six months. Secondly, improvement was noted in more patients of the groups receiving streptomycin than of the group receiving P.A.S. only: the total improved were 56% in the P group, 74% in the S group, 87% in the SP group. Furthermore, in the patients receiving streptomycin the proportion showing 2-plus or 3-plus improvement was greater than in the group receiving P.A.S. alone: roughly half the former and slightly less than a quarter of the latter showed improvement



Key to Charts 1, 2, and 3.

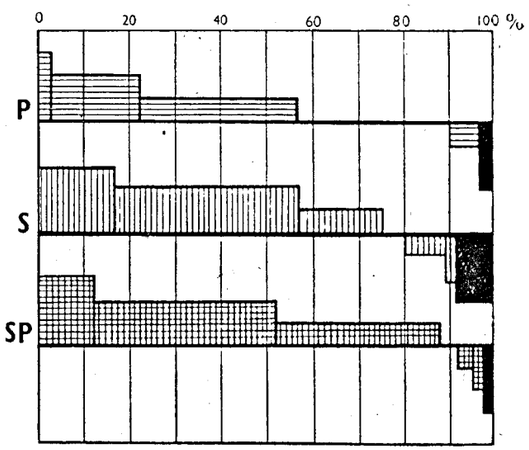


FIG. 1.—Assessment of radiological appearance at six months compared with appearance at start of chemotherapy

of this degree. The difference is statistically significant. It is reflected conversely by the large number in the P group (34%) who showed no material change over the six months, as compared with 6% in both the S and the SP groups. Summarizing, while results were good in all groups, they were definitely less good in the P group than in the two others. So far as the difference between the S and SP groups is concerned, while the proportion of patients showing improvement, and among these considerable improvement, was high in both groups, the overall improvement was higher in the SP group than in the S group. In the SP group one patient died and three others deteriorated; in the S group five died and six others deteriorated. These differences, however, are below the level of statistical significance.

Coming now to a comparison with the results of the first trial, it is here again striking that the group receiving only P.A.S. showed far better results than the control group of patients with similar disease but treated by bed-rest alone, though it must be remembered that three P cases were apparently improved by streptomycin given in the later months. Of the control group 33% showed improvement, compared with 56% of the P group; 61% had at the end of six months deteriorated or died, compared with only 10% of the P group. It is obvious that, while the patients receiving only P.A.S. fared definitely less well than those receiving streptomycin, they fared very much better than if they had been treated by bed-rest alone.

Results Related to Condition on Admission

It is interesting to consider the effects of the three types of treatment in relation to the clinical condition of the patients at the start of treatment. The two most important single factors of variation in condition within each group were the temperature and the extent of cavitation. In Table VI the results of *x*-ray assessment at six months after the start of treatment are shown in relation to the temperature and extent of cavitation on admission. To simplify the figures, those with cavitation classified as 2-plus or 3-plus are here grouped as having "gross" cavitation, while those classified as 1-plus or with no cavitation have been grouped under "other" cases.

Table VI shows that in all three treatment groups the worst results were in the patients whose average temperature at the start of treatment was over 100° F. (37.8° C.), and all the deaths occurred among such cases. Within this group the results were particularly bad among the patients who had gross cavitation. By chance the P group had a larger number of these patients with gross cavitation and high temperatures than occurred in the other two groups. It should be noted that only in the least febrile patients was considerable improvement (2-plus or 3-plus) seen in the P group on a scale comparable with the groups receiving streptomycin; here 11 of 25 P patients showed considerable improvement, compared with 16 of 21 S patients and 14 of 20 SP patients. Among those with average temperatures over 99° F. (37.2° C.), only two out of 34 P patients showed considerable improvement, compared with 14 of 33 S patients and 15 of 33 SP patients.

As might be expected, the results were generally less good among patients with gross cavitation than among the others.

TABLE VI.—*Radiological Assessment at Six Months. Results Related to Condition on Admission*

Average Temp. During Week Before Treatment Started	Cavitation	Group	Total	Radiological Assessment at 6 Months: Improvement 3-plus or 2-plus	Improvement 1-plus	No Change	Deterioration	Deaths
100° F.+ ..	Gross	P	14	1	5	3	3	2
		S	9	3	0	1	2	3
		SP	7	4	0	0	2	1
	Other	P	2	0	1	1	0	0
		S	6	2	2	0	0	2
		SP	7	2	3	1	1	0
	Total	P	16	1	6	4	3	2
		S	15	5	2	1	2	5
		SP	14	6	3	1	3	1
99–99·9° F.	Gross	P	9	1	5	2	1	0
		S	12	6	4	1	1	0
		SP	10	4	5	1	0	0
	Other	P	9	0	3	6	0	0
		S	6	3	3	0	0	0
		SP	9	5	4	0	0	0
	Total	P	18	1	8	8	1	0
		S	18	9	7	1	1	0
		SP	19	9	7	1	0	0
Less than 99° F.	Gross	P	11	4	3	4	0	0
		S	7	4	1	1	1	0
		SP	8	5	2	1	0	0
	Other	P	14	7	3	4	0	0
		S	14	12	0	0	2	0
		SP	12	9	3	0	0	0
	Total	P	25	11	6	8	0	0
		S	21	16	1	1	3	0
		SP	20	14	5	1	0	0

Results in Men and Women

The results, considered separately for men and women, are shown in Table VII and Fig. 2. The results were better in women than in men; the differences in results for all men and all women are statistically significant, and the same trends appear in each of the three treatment groups. In each group more deteriorated or died among the men than among the women, and fewer improved. Three-plus improvement was seen in 4% of the men and in 15% of the women; 2- or 3-plus improvement was seen in 30% of the men and in 52% of the women. The results in the 30 women in the SP group were remarkable: there was

TABLE VII.—*Radiological Assessment at Six Months. Results Related to Sex*

Group	Sex	Total No.	Total %	Improvement 3-plus No.	3-plus %	2-plus No.	2-plus %	1-plus No.	1-plus %	No Change No.	No Change %	Deterioration 1-minus No.	1-minus %	2-minus No.	2-minus %	Deaths No.	Deaths %
P	M	30	*100*	0	*0*	5	*17*	10	*33*	11	*37*	3	*10*	0	*0*	1	*3*
	F	29	*99*	1	*3*	7	*24*	10	*35*	9	*31*	1	*3*	0	*0*	1	*3*
S	M	20	*100*	1	*5*	8	*40*	5	*25*	1	*5*	2	*10*	0	*0*	3	*15*
	F	34	*101*	8	*24*	13	*38*	5	*15*	2	*6*	3	*9*	1	*3*	2	*6*
SP	M	23	*99*	2	*9*	6	*26*	10	*43*	2	*9*	1	*4*	1	*4*	1	*4*
	F	30	*100*	5	*17*	14	*47*	9	*30*	1	*3*	1	*3*	0	*0*	0	*0*
All	M	73	*99*	3	*4*	19	*26*	25	*34*	14	*19*	6	*8*	1	*1*	5	*7*
	F	93	*100*	14	*15*	34	*37*	24	*26*	12	*13*	5	*5*	1	*1*	3	*3*

deterioration in only one case; 28 improved, and in 19 of them the improvement was 2- or 3-plus.

Only persons aged 15–30 were included in this trial; the same differences between results in males and females appear within the separate age groups 15–19, 20–24, and 25–30. On analysis of the data concerning condition on admission there is no disparity between the two sexes to account for the difference in results; while on the one hand more men had temperatures of 100° F. or over (30% compared with 23% of women), on the other hand more women had 3-plus cavitation (18% compared with 7% of men). From the data available on serum drug levels in this trial, there is no indication that the levels reached were higher or were maintained longer in women than in men.

There was a greater proportion of men in the P group than in the other two, and this could have weighted the

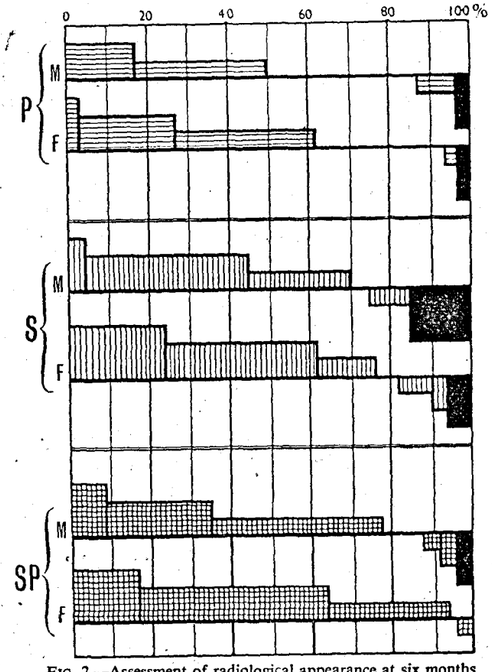


FIG. 2.—Assessment of radiological appearance at six months compared with appearance at start of chemotherapy. Males and females.

results unfavourably in the P group; but the differences between results in males and females in this group are smaller than in the others, and the weighting is negligible.

It is interesting to note that in the first trial a higher mortality in males than in females occurred in both S and C groups, but the differences were not large enough to be significant.

Clinical Changes during the Period of Trial

Division of Periods for Assessment

Assessment of changes has been made to cover four separate periods: the first two months, the third month, the fourth month, and the last two months. It was thought useful to analyse what was happening before the end of the three-month treatment period; assessment at one month would have yielded little result, as changes were then not yet evident, especially as regards x-ray appearances; the first period of two months was therefore chosen, and a further period of one month carrying on to the end of treatment. The fourth month had been prescribed as a month for observation after the end of treatment, and it was requested that, where possible, other treatment should not be introduced at that time. Finally, during the last two months of the six months for the trial, clinicians were at liberty to institute any other form of therapy. It was therefore necessary to have a separate assessment for the fourth month and for the last two months.

General Condition

As in the previous trial, the assessment of changes in the general condition was made by clinicians in charge of the patients, and constituted an overall impression based on clinical facts and on the patient's appearance and feeling of well- or ill-being.

It is obvious from Table VIII that in all three groups the great majority of patients improved. So far as the overall improvement in the six months is concerned, there is little difference between the three groups except in

TABLE VIII.—*Progress in General Condition after Start of Treatment*

Period (months from start of treatment)	Group	Total	Improvement		No Change	Deterioration	Deaths
			2-plus	1-plus			
0–2	P	59	5	43	7	3	1
	S	54	13	38	2	0	1
	SP	53	20	26	4	2	1
2–3	P	58	0	26	28	4	0
	S	53	1	31	20	1	0
	SP	52	2	34	14	2	0
0–3	P	59	7	43	5	3	1
	S	54	17	35	1	0	1
	SP	53	23	25	2	2	1
3–4	P	58	2*	23	26	6	1
	S	53	0	21	23	9	0
	SP	52	0	35	15	2	0
0–4	P	59	11*	38	7	1	2
	S	54	20	29	2	2	1
	SP	53	31	18	2	1	1
4–6	P	57	2†	28	25	2	0
	S	52	1	16	22	9	4
	SP	52	14	24	17	7	0
0–6	P	59	29†	33	3	2	2
	S	53	34	20	1	3	5
	SP	53	4	15	0	3	1

* Marked improvement followed streptomycin treatment in one case.
† Marked improvement followed SP treatment in two cases.

the proportion showing marked improvement, which was greatest in the SP group and least in the P group. Another important fact is that marked improvement occurred earlier in the groups receiving streptomycin than in the P group; in the first two months only 5 patients in the P group showed marked improvement, compared with 13 S patients and 20 SP patients. Finally, clinical deterioration occurred most frequently after treatment had stopped, and more in the S group than in the two other groups: in the fourth month deterioration was seen in 9 S patients, compared with 2 SP patients and 7 P patients (including one death); in the last two months clinical deterioration occurred in 13 S patients (including 4 deaths), compared with 7 SP and 2 P patients. The statistical significance of these differences is doubtful, and account must be taken of the effect of streptomycin treatment given in 4 P cases.

Comparing the results with those of the control group in the first trial, we find that deterioration was seen there in 50% of patients (including 27% deaths), compared with 6.8% in the P group of the second trial (including 3.4% deaths).

Temperature

Patients were regarded as afebrile if their evening temperatures were below 99° F. every day for a week before the date considered. Table IX shows, for patients who were febrile on admission, the results at successive periods after the start of treatment.

TABLE IX.—*Temperature Changes in Patients Febrile on Admission*

Average Evening Temperature During Week Following Admission	Group	Total	No. of Patients Afebrile at End of:			
			2 Months	3 Months	4 Months	6 Months
Less than 99° F.	P	20	15	15	16	16
	S	17	15	13	13	15
	SP	13	9	9	11	10
99–99·9° F.	P	18	10	11	11	14
	S	18	14	12	11	11
	SP	19	12	13	17	14
100° F.+	P	16	4	1	4	5
	S	15	5	6	2	5
	SP	14	7	7	7	8

There is very little difference between the groups. Response of temperature to treatment was rapid in all three groups. Almost the maximum effect was obtained in the first two months, at which time 29 of the P group, 34 of the S group, and 28 of the SP group were afebrile. As might be expected, the results were least impressive in the patients most febrile on admission; in these cases the SP patients fared perhaps better than the others, but the differences are too small to be significant.

Weight

The overall weight changes are shown in Table X. During the three-months treatment period there was good weight gain in all three groups, but particularly in the S group. The smaller gain in the other two can be ascribed to the digestive disturbance caused by P.A.S. treatment in the large dosage given. Seventeen S patients each gained 14 lb. (6.35 kg.) or more during this period, compared with 11 P patients and 6 SP patients.

During the following three months there was a reversal of this picture. The average gain during this period was 8.4 lb. (3.8 kg.) in the SP group, 6.2 lb. (2.8 kg.) in the P group, and 2.6 lb. (1.1 kg.) in the S group. Seven SP patients gained 14 lb. or more, compared with 5 P patients and 4 S patients.

Over the whole six-month period there was no significant difference in average weight gain in the three groups. The numbers who gained 14 lb. or more were: in the P group 23, in the S group 19, and in the SP group 27.

Sedimentation Rate

A fall in the sedimentation rate after the start of treatment was seen in all three treatment groups. It occurred more rapidly in the SP group than in the other two, and at the end of six months twice as many of the SP group had sedimentation rates within normal limits as in the other two groups. The difference is significant. The results appear to be no better in the S group than in the P group.

TABLE XI.—*Changes in Sedimentation Rate (Westergren)*

	Group	Total	Sedimentation Rate				Deaths
			0–10	11–20	21–50	51+	
At start of treatment	P	59	1	2	23	33	—
	S	54	1	1	18	34	—
	SP	52*	1	3	26	22	—
At 2 months	P	59	5	13	24	16	1
	S	54	6	11	13	23	1
	SP	53	11	12	18	11	1
At 3 months	P	59	8	13	25	12	1
	S	54	9	8	19	17	1
	SP	53	11	14	18	9	1
At 4 months	P	59	7	11	21	18	2
	S	54	8	7	23	15	1
	SP	53	15	14	16	7	1
At 6 months	P	59	11	16	17	13	2
	S	53*	11	8	18	11	5
	SP	53	21	9	18	4	1

* Result not recorded in one case.

Changes in Radiological Appearances during Period of Trial

As in the first trial, chest radiographs of all patients in the trial were viewed by an independent panel, composed of two radiologists and one clinician. The clinician was medical superintendent of a sanatorium to which some of the patients from one centre were sent after the trial; apart from this, members of the panel were not acquainted with any of the cases involved. Assessment was made in the same way as before, except that under "improvement" and "deterioration" three degrees of change were allowed. In fact, no films were classed as showing deterioration 3-minus. The measure of agreement was much the same as that found before, and the same method of dealing with cases of disagreement was adopted.

The results are tabulated in Table XII, and shown graphically in Fig. 3.

The overall results for the six months (0–6) have already been discussed. Considering now the changes at different periods of the six months, though on the whole most patients in each group fared well throughout the trial, certain differences emerge. During the three-months treatment period very few cases deteriorated, but the number of patients who improved was significantly greater in the two groups receiving streptomycin than in that receiving P.A.S. only, and in this group the number showing no radiological change was correspondingly higher. These differences are statistically significant.

During the month following the end of treatment (3–4 months), death occurred in one P case and deterioration

TABLE X.—*Weight Changes**

Period	Treatment Group	No. of Patients Weighed	No. of Patients Showing Weight Change						Total Gain in Weight (All Patients) (lb.)	Average Gain in Weight per Patient (lb.)
			Lost Weight			No Change	Gained Weight			
			14 lb. or More	7–13 lb.	Less than 7 lb.		Less than 7 lb.	7–13 lb.	14 lb. or More	
First three months	P	58	0	4	4	4	22	13	11	+370	+6·4
	S	52	0	1	4	1	13	16	17	+556	+10·7
	SP	49	1	3	2	1	16	20	6	+292	+6·0
Second three months	P	56	0	1	10	2	14	24	5	+348	+6·2
	S	48	0	3	12	3	20	6	4	+127	+2·6
	SP	49	0	0	4	0	18	20	7	+414	+8·4
Six months	P	56	0	2	3	0	9	19	23	+714	+12·8
	S	48	2	0	3	1	6	17	19	+676	+14·1
	SP	49	0	2	1	1	5	13	27	+706	+14·4

* For conversion into metric weights, 1 lb. = 454 g.

TABLE XII.—*Changes in the Radiological Picture*

Interval	Group	Total		Radiological Assessment: Improvement 3-plus		Improvement 2-plus		Improvement 1-plus		No Change 0		Deterioration 1-minus		Deterioration 2-minus		Died	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0–2 Admission to end of 2 months	P	59	100	0	0	1	1·7	21	35·6	34	57·6	2	3·4	0	0	1	1·7
	S	54	100	0	0	5	9·3	24	44·4	21	38·9	3	5·6	0	0	1	1·8
	SP	53	100	0	0	2	3·8	24	45·3	26	49·1	0	0	0	0	1	1·9
2–3 months	P	58	100	0	0	0	0	14	24·1	43	74·1	1	1·7	0	0	0	0
	S	53	100	0	0	0	0	21	39·6	31	58·5	1	1·9	0	0	0	0
	SP	52	100	0	0	0	0	25	48·1	26	50·0	1	1·9	0	0	0	0
0–3 months	P	59	100	0	0	5	8·5	23	39·0	27	45·8	3	5·1	0	0	1	1·7
	S	54	100	1	1·8	11	20·4	26	48·2	13	24·1	1	1·8	1	1·8	1	1·8
	SP	53	100	0	0	9	17·0	31	58·5	11	20·8	1	1·9	0	0	1	1·9
3–4 months	P	58	100	0	0	0	0	7	12·1	50	86·2	0	0	0	0	1	1·7
	S	53	100	0	0	0	0	14	26·4	36	67·9	3	5·7	0	0	0	0
	SP	52	100	0	0	0	0	17	32·7	35	67·3	0	0	0	0	0	0
0–4 months	P	59	100	0	0	8	13·6	22	37·3	24	40·7	3	5·1	0	0	2	3·4
	S	54	100	3	5·6	16	29·6	21	38·9	10	18·5	1	1·8	2	3·7	1	1·8
	SP	53	100	2	3·8	14	26·4	26	49·1	9	17·0	1	1·9	0	0	1	1·9
4–6 months	P	57	100	0	0	0	0	18	31·6	34	59·6	5	8·8	0	0	0	0
	S	52*	100	0	0	1	1·9	23	44·2	16	30·8	6	11·6	2	3·8	4	7·7
	SP	52	100	0	0	0	0	28	53·8	19	36·5	4	7·7	1	1·9	0	0
0–6 months	P	59	100	1	1·7	12	20·3	20	33·9	20	33·9	4	6·8	0	0	2	3·4
	S	54	100	9	16·7	21	38·9	10	18·5	3†	5·6	5	9·3	1	1·9	5	9·3
	SP	53	100	7	13·2	20	37·7	19	35·9	3	5·7	2	3·8	1	1·9	1	1·9

* One patient was discharged at 4 months. † Includes assessment of one case at 4 months.

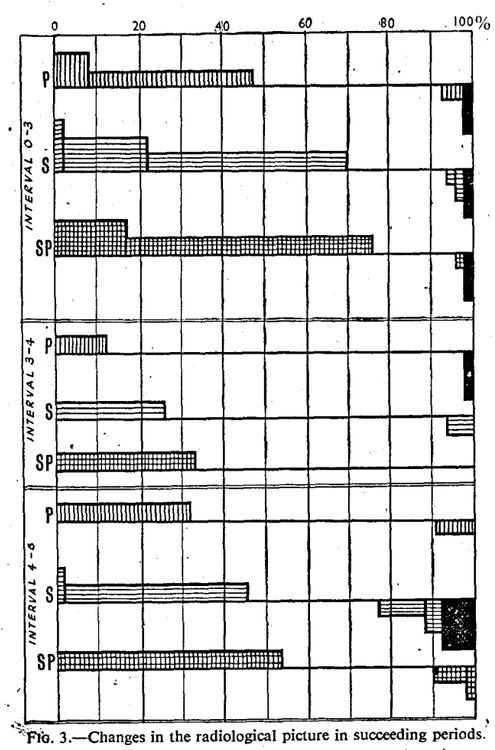


FIG. 3.—Changes in the radiological picture in succeeding periods.

in 3 S cases. During this month the number showing improvement was in all groups lower than in the previous month, and again higher in the S and SP groups than in the P group. At the end of the fourth month 51% of P patients were better than at the start of treatment, compared with 74% of S patients and 79% of SP patients. The group receiving only P.A.S. had fared much better than the original control group, of whom only 18% had shown improvement at the end of four months; deterioration or death had occurred in 56% of the controls and in only 8% of the P cases. It is important to note that the difference was striking already at this stage, and was therefore unconnected with the greater use of collapse therapy in this trial than in the first.

In the last two months, though again in the P group there were twice as many showing no material radiological change as in the streptomycin groups, the most interesting difference in the three groups is in the number of S cases deteriorating. In this period the only deaths occurred in this group: a total of 23.1% of S cases deteriorated or died, compared with 8.8% of the P patients and 9.6% of the SP patients. Here again, however, it is difficult to assess the significance of the difference, since 4 additional P cases might have deteriorated during this period had they not received streptomycin. In the same period in the first series, deterioration or death occurred in 36% of control cases and 38% of streptomycin cases.

Bacteriology: (A) Bacterial Content of Sputum

Sputum was tested by direct examination and culture, on admission and twice a month or more often during the six-months period. Where there was no sputum, material from gastric lavage and/or laryngeal swab was cultured. Specimens positive on direct examination or on culture were obtained from all patients before or shortly after treatment started. In Table XIII are grouped the results of all *examinations* made during successive months after the start of treatment. The only results excluded are those where a specimen was negative on direct examination and was not cultured. The great majority under the heading "positive direct examination" were positive on culture as well as on microscopical examination. The negative results are shown graphically in Fig. 4.

The results in the SP group are seen to be consistently better than in the other two groups, in respect both of the proportion of specimens giving negative cultures and of the proportion of positives which were positive on culture only. There is little difference between the S and P groups, except in the last two months, in the proportion of specimens giving negative cultures; there was then a rise in the S group and a fall in the P group.

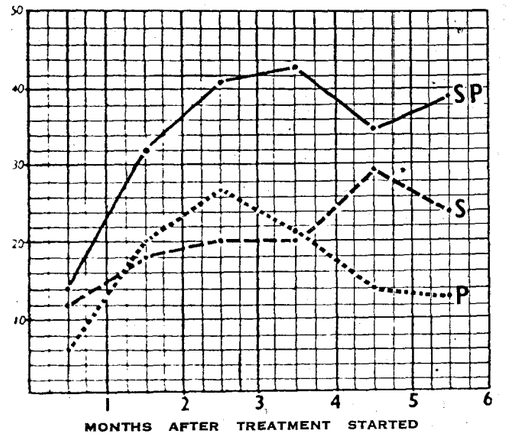


FIG. 4.—Negative results (percentage negative cultures of total specimens examined) in succeeding months in the three treatment groups.

TABLE XIII.—*Presence of Tubercle Bacilli*

Time	Group	Total Patients from Whom Specimens were Examined	Total Specimens Examined No.	%	D+ Positive Direct Examination No.	%	C+ Negative Direct Examination Positive Culture No.	%	C− Negative Direct Examination and Culture No.	%
On admission	P	59	59	100	54	91	5	9	0	0
	S	54	54	100	46	85	8	15	0	0
	SP	53	53	100	45	85	8	15	0	0
1st month	P	52	104	100	75	72	23	22	6	6
	S	53	118	100	84	71	20	17	14	12
	SP	53	114	100	71	62	27	24	16	14
2nd month	P	58	132	100	83	63	23	17	26	20
	S	54	131	100	76	58	32	24	23	18
	SP	52	126	100	53	42	32	26	41	32
3rd month	P	56	150	100	74	50	35	23	41	27
	S	53*	147	100	87	59	31	21	29	20
	SP	52	133	100	42	32	36	27	55	41
4th month	P	57	135	100	67	50	40	29	28	21
	S	53	119	100	69	58	26	22	24	20
	SP	52	114	100	31	27	34	30	49	43
5th month	P	55	125	100	72	58	35	24	18	14
	S	50	103	100	54	52	19	19	30	29
	SP	50	107	100	37	35	33	30	37	65
6th month	P	50	99	100	56	57	30	30	13	13
	S	48	84	100	46	55	18	21	20	24
	SP	46	90	100	37	41	18	20	35	39

In Table XIV are shown, for successive months after the start of treatment, the numbers of *patients* who gave only negative results throughout the respective month.

Considering the bacteriological results in this way, it is seen that, except in the first month, the results were consistently best in the SP group and least good in the P group. In the fourth month, following the termination of treatment, 14 (27%) of 52 SP cases were negative, compared with 7 (13%) of 53 S cases and 6 (11%) of 57 P cases. In the sixth month the percentage of negative cases was 33 in the SP group, 19 in the S group, and 8 in the P group. The results are significantly better in the SP group than in the two others.

If we consider now the number who were persistently positive throughout the three months of chemotherapy, the results are as follows: 28 (48%) in the P group, 32 (60%) in the S group, and 16 (31%) in the SP group.

In conclusion there can be no doubt that, so far as the effect of the chemotherapy on bacterial content of sputum was concerned, the results were best in the patients who received both streptomycin and P.A.S.

TABLE XIV.—*Number of Patients with Negative Results (Direct Examination and Culture) Throughout Successive Months*

Month After Treatment Started	Group	Total Patients from whom Specimens were Examined (A)	No. of Patients Giving Only Negative Results (B)	Total Specimens Examined in B	Percentage Patients Negative B/A
First	P	52	1	3	2
	S	53	5	7	9
	SP	53	1	1	2
Second	P	58	6	14	10
	S	54	8	17	15
	SP	52	10	20	19
Third	P	56	5	13	9
	S	53	6	14	11
	SP	52	15	27	29
Fourth	P	57	6	12	11
	S	53	7	10	13
	SP	52	14	25	27
Fifth	P	55	4	9	7
	S	50	9	22	18
	SP	50	12	24	24
Sixth	P	50	4	6	8
	S	48	9	16	19
	SP	46	15	28	33

(B) Bacterial Drug Resistance

Streptomycin Sensitivity

One of the most important objects of the trial was to estimate the effect of combined streptomycin and P.A.S. treatment on the development of streptomycin resistance. Arrangements were made to examine for streptomycin sensitivity as many as possible of the positive cultures isolated from patients in the groups receiving streptomycin treatment. The technique employed was the same as that previously reported (M.R.C., 1948b). All strains isolated before the start of streptomycin therapy showed sensitivity similar to that of the standard strain $H_{37}Rv$. In Table XV are summarized the results of the streptomycin sensitivity tests in each of the six months. The results are designated by the resistance ratio (R.R.), which is the ratio of the minimum concentration of streptomycin to which the tubercle bacilli of the patient are sensitive, to the corresponding figure for the standard strain H37Rv.* The result recorded for each case is that for the specimen with the highest degree of streptomycin resistance in the respective month. The results are shown graphically in Fig. 5.

The results referred to in an interim communication (M.R.C., 1949) have been fully confirmed. There is, between the S and SP groups, a remarkable difference in the emergence of streptomycin resistance. If we consider those strains with a resistance ratio over 8, we find that the proportion of cases producing such strains rose to a maximum of 70% in the fourth month in the group receiving streptomycin only, and a maximum of 9% in the fifth month in the group receiving streptomycin plus P.A.S. The difference is pronounced in each successive month, and there can be no doubt of its significance. The very low proportion of resistant strains was maintained in the SP group to the end of the six months. It is interesting to observe also that in respect of those strains with a resistance ratio between 4 and 8 the proportion was higher in the patients receiving streptomycin alone. At the end of the six months 89% of the SP patients producing positive cultures had completely sensitive strains, and only 21% of the S patients.

1. Streptomycin Resistance in SP patients

Four patients in this group became negative shortly after treatment started, and one other patient died. The

*A strain with R.R. less than 4 is considered to be completely sensitive.

TABLE XV.—*Streptomycin Resistance in the S and SP Groups, in Successive Months After the Start of Treatment*

Interval After Treatment Started	Group	Total* Examined (Cases)	Cases Giving Negative Cultures	Cases with Positive Cultures Examined for Sensitivity		Streptomycin Resistance Ratio† (Highest Recorded During the Month)							
						Less than 4		4–8		9–99		100+	
				No.	%	No.	%	No.	%	No.	%	No.	%
1 month ..	S	49	5	44	*100*	37	*84*	4	*9*	3	*7*	0	*0*
	SP	45	1	44	*100*	42	*95*	2	*5*	0	*0*	0	*0*
2 months ..	S	51	8	43	*100*	18	*42*	13	*30*	5	*12*	7	*16*
	SP	48	10	38	*100*	35	*92*	2	*5*	1	*3*	0	*0*
3 months ..	S	53	6	47	*100*	12	*26*	8	*17*	10	*21*	17	*36*
	SP	48	15	33	*100*	29	*88*	2	*6*	1	*3*	1	*3*
4 months ..	S	49	9	40	*100*	6	*15*	6	*15*	10	*25*	18	*45*
	SP	47	14	33	*100*	26	*79*	5	*15*	1	*3*	1	*3*
5 months ..	S	49	9	40	*100*	6	*15*	10	*25*	8	*20*	16	*40*
	SP	48	12	36	*100*	30	*83*	3	*8*	1	*3*	2	*6*
6 months ..	S	43	9	34	*100*	7	*21*	6	*18*	9	*26*	12	*35*
	SP	43	15	28	*100*	25	*89*	2	*7*	0	*0*	1	*4*

* The total includes all with negative cultures throughout the month, or with positive cultures of which at least one was examined for sensitivity. Excluded are those for whom no specimen was available and those for whom no specimen was fully examined in the respective month.
† The ratio of the minimum concentration of streptomycin to which the tubercle bacilli of the patient are sensitive, to the corresponding figure for the standard strain H37Rv.

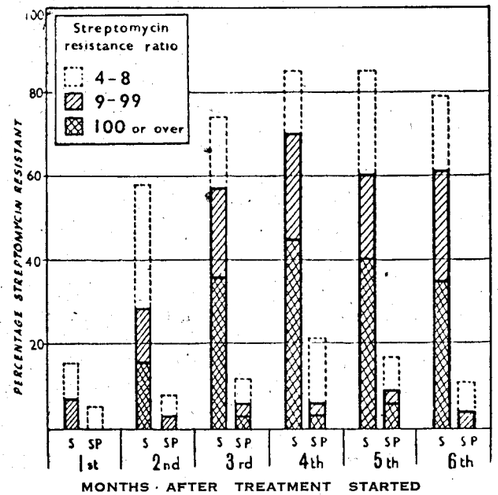


FIG. 5.—Percentage of cases with streptomycin-resistant strains in succeeding months.

following analysis relates to the remaining 48 patients. In 36 cases (75%) all strains isolated were completely sensitive. In 7 cases, strains with a resistance ratio between 4 and 8 were isolated at some time. In 5 of the 7 the R.R. was only 4. In another case all cultures were negative until the end of the fourth month, when the R.R. of a positive culture was 8; in subsequent cultures the R.R. varied between 2 and 8. In another the R.R. was 8 for three consecutive cultures after the middle of the third month, previous cultures having been sensitive.

Five patients produced at some time cultures with R.R. above 8 (Table XVI). In 2 of the 5 cases there was only a single resistant culture, and subsequent ones were sensitive. The resistance ratio of the single culture was in one of these patients (Case 72) 400, and appeared at four and a half months; in the other patient (Case 82) 20, and appeared at three months. A third patient (Case 75) produced three consecutive resistant cultures, after which other cultures were sensitive; the ratio of the first resistant culture, produced at seven weeks, was 20, of the next 20, and of the third 100. Cultures from the fourth patient (Case 143) at a little over four months after start of treatment had an R.R. of 24, a month later 200, and at six months 100. The fifth patient (Case 93) had at three months a culture with R.R. over 125, two weeks later one completely sensitive, and four weeks after this one with R.R. over 2,500. No further cultures were obtained from this patient. It is of interest to record that this was the only SP case in which P.A.S. resistance also was demonstrated in the strains isolated. It is reported, however, that the cultures in this case were very atypical in appearance; moreover, two cultures did not produce typical tuberculous lesions in guinea-pigs six weeks after inoculation, but both gave rise to a local abscess, in the pus of which acid-fast organisms were demonstrated.

In 2 of these 5 cases there had been extensive cavitation (3-plus) on admission, in 2 only 1-plus, and in one none; there is no indication, therefore, that resistance arose more frequently in patients with gross cavitation. Nor is there any significant indication of clinical deterioration connected with the drug resistance demonstrated in these cases. Radiological deterioration was recorded in the last two

TABLE XVI.—*Streptomycin Resistance in SP Group*

Case No.	Condition on Admission				Streptomycin Resistance		*X*-ray Assessment at 6 Months	Course
	General Condition	Average Evening Temperature	E.S.R.	*X*-ray Extent of Cavitation	Time of Emergence (Weeks After Treatment Started)	Resistance Ratio		
72	Fair	99·6° F.	35	3+	20	400 (single culture)	Improvement 2-plus	Improved during treatment. Clinical relapse in 6th month, without radiological deterioration
82	Poor	102·1° F.	27	3+	14	20 (single culture)	Deterioration 1-minus	Clinical improvement throughout. Radiologically, no change for 4 months, then slight deterioration
75	Poor	99·1° F.	37	0	7	20–100	Improvement 3-plus	Improved throughout in all respects
143	Fair	100° F.	116	1+	18	24–200	Improvement 2-plus	Improved throughout, except that, after being afebrile, at 6 months temperature was occasionally over 99
93	Fair	99·9° F.	24	1+	12	125–2,500	Improvement 3-plus	Improved throughout in all respects

months only in Case 82, with no clinical relapse. In Case 72 there was a clinical relapse at five months, without radiological deterioration.

Summarizing, though streptomycin resistance with R.R. above 8 was demonstrated in 5 cases, in 3 of these the last strains isolated were sensitive, and one of the 2 others appears to have been abnormal and showed great variations in sensitivity.

2. *Streptomycin Resistance in S patients*

In 3 S cases examinations were persistently negative after the first week of treatment, and in one case after the first month. One patient died in the second month. The analysis of streptomycin resistance in the S group relates to the remaining 49 patients. In only 4 of the 49 cases (8%) were all strains completely sensitive. In 12 other cases the R.R. was never more than 4 to 8. Strains more resistant were produced in all of the remaining 33 cases.

In 13 of the 33 cases the R.R. was over 8 but less than 100. In 3 of the 13 there was reduction of resistance in that for the last strains from these patients the R.R. was not over 8; in 2 of the 3 cases the R.R. had risen to 16, and the reversion occurred in the fifth and sixth months; in the other case the R.R. was over 64, and reverted to 8 in the fifth month.

In the remaining 20 cases strains were isolated which had an R.R. of 100 or more. Reduction of drug resistance was observed in 4 of these: one reverted to complete sensitivity after producing strains with R.R. over 2,000; in another, strains with R.R. only 6 emerged in the fifth month, after previous strains which had been up to 200; in the other 2 cases the resistance ratio dropped from 128 and 400 to 16 and 25.

As in the first series, the development of resistance was related to the severity of disease present at the start of treatment. Marked streptomycin resistance (R.R. 100 or over) emerged in 15 of the 24 cases with gross cavitation (2- or 3- plus), and in only 5 of the 25 others. It was seen in 8 of the 13 cases with average temperature over 100° F. (37.8° C.) on admission, in 8 of the 18 with temperature of 99–99.9° (37.2–37.75°), and in 4 of the 18 with lower temperatures. The high proportion of acutely ill patients among those whose tubercle bacilli subsequently became highly resistant, and the difficulty of ascribing the poor prognosis in these patients to their initial condition or to the drug resistance, were discussed in the report of the first trial. It is of particular interest to consider this point again, in view of the results of combined therapy. Were the better results of combined treatment due simply to an additive therapeutic effect, or were they also due to the prevention of drug resistance?

Within the S group we can relate the prognosis to both the clinical condition and the emergence of streptomycin resistance. The data are set out in Table XVII and Fig. 6.

It can be seen that within each of the clinical groups—highly febrile, not highly febrile but having gross cavitation, and others—results were less good in those patients who developed a high degree of drug resistance. Though the figures are small, they show the same trend in all groups. It is noteworthy that, of the 16 patients with R.R. less than 9, the two who did not show improvement at the end of six months were two of the 6 patients whose R.R. reached 8 at some time. In other words, all 10 patients whose R.R. was always less than 8 improved; in 9 of the 10 the improvement was 2-plus or 3-plus (this is shown in the adjusted totals of Table XVII). At the other end of the scale, 9 of the 20 patients with R.R. over 99

TABLE XVII.—*Results in S Group Related to Clinical Condition at Entry to Trial and Subsequent Emergence of Streptomycin Resistance*

Clinical Condition	Streptomycin Resistance Ratio	Total	Results at 6 months. *X*-ray Assessment				Death
			Improvement		No Change	Deterioration	
			3+ or 2+	1+			
High fever (average temp. 100° F.+)	Less than 9	2	1	0	0	1	0
	9–99	3	1	2	0	0	0
	100+	8	2	0	1	1	4
Gross cavitation but temp. below 100° F.	Less than 9	4	3	0	1	0	0
	9–99	6	3	3	0	0	0
	100+	8	3	2	1	2	0
Other patients	Less than 9	10	9	1	0	0	0
	9–99	4	2	2	0	0	0
	100+	4	2	0	0	2	0
Total ..	Less than 9	16	13	1	1	1	0
	9–99	13	6	7	0	0	0
	100+	20	7	2	2	5	4
If R.R. = 8 is taken as lower limit of resistance, results are: ..	Less than 8	10	9	1	0	0	0
	8–99	19	10	7	1	1	0
	100+	20	7	2	2	5	4

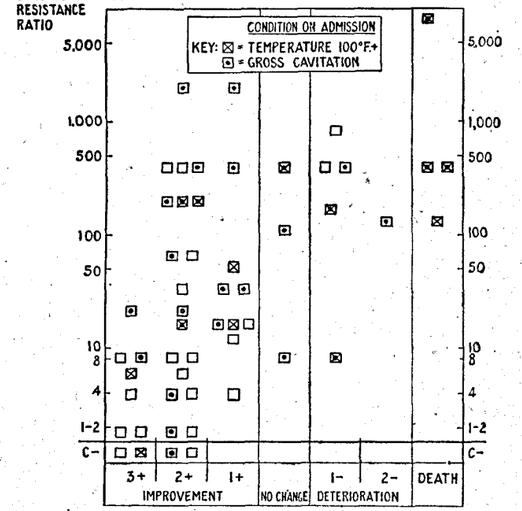


FIG. 6.—Streptomycin resistance related to radiological assessment at six months and to condition on admission. Each square represents one case. C–: Culture negative after first month of treatment.

deteriorated, and the 4 deaths occurred in this group. Of the 12 S patients who deteriorated or died in the last two months (see Table XII), in 9 the R.R. had previously risen to over 100. In one of the remaining 3 the R.R. reached 12, in another 8, and the last remained sensitive throughout. It is highly probable, considering these facts, that streptomycin resistance was responsible or partly responsible for failure of the drug to prevent deterioration, and that the better results of combined treatment were due in part to the maintenance of streptomycin sensitivity.

The number of cases in which later less resistant strains were isolated is too small to show any difference in clinical results. One of the 8 died. The relevant details were analysed to see if there was less reversion to sensitivity in cases with gross cavitation; but, although none of the 8 cases had cavitation classified as 3-plus on admission, here

again figures are too small to be significant. Possible association of reversion with collapse therapy was also investigated, but in only one case did reversion occur shortly after the induction of collapse treatment. It is, however, interesting to note that, in the patient who died, a first drop of the resistance ratio from 128 to 16 occurred after a spontaneous pneumothorax. It was unfortunately not possible to get post-mortem specimens in this case to test for sensitivity, as permission for necropsy was refused.

P.A.S. Sensitivity

P.A.S. sensitivity was not studied as thoroughly as streptomycin sensitivity, partly because of early impressions that P.A.S. resistance rarely occurs, and partly because tests were regarded as not very reliable. The test still does not give results as satisfactory and constant as the test for streptomycin sensitivity. Tests checked by different observers have in a few cases given widely different results. The technique was similar to that employed for streptomycin sensitivity tests. The normal range of sensitivity by this method is between 0.12 and 1.0 μg. P.A.S. per ml.

For 22 of the 59 P patients there is no information on P.A.S. sensitivity after the first month of treatment. The following analysis relates to the remaining 37 cases. In 25 of these the resistance ratio was never above 8. Resistant strains were isolated from the remaining 12 cases. In 4 of these, however, only a single resistant strain was found. In one of the 4 a strain with a resistance ratio of 40 emerged at four months; 8 sensitive strains preceded it, and 4 sensitive strains followed. In 3 other cases a single resistant strain emerged near the end of the six months' trial period, having been preceded by several sensitive ones. In one of the 3, tests by a second pathologist gave results as resistant (R.R. 16) for all strains throughout the six months, including the first one.

Eight cases produced resistant strains on more than one occasion, with R.R. varying between 20 and 800. In 2 of the 8 cases resistance emerged between six and seven weeks after treatment started; in 5 others the interval was 10 to 13 weeks; in one it was 16 weeks. In 2 cases sensitive strains were again isolated before the end of six months. No significant difference in prognosis was found between the patients from whom P.A.S.-resistant strains were isolated and the others.

Because of the unsatisfactory test, it may be questioned if any importance should be attached to these results, but it should be noted that the finding of resistant strains on more than one occasion occurred in 8 of the 24 cases with gross cavitation (2- or 3-plus), and in none of the 13 others (only cases tested for sensitivity are included in these totals); this difference is statistically significant.

In the SP group, information on P.A.S. sensitivity after the first month is available for 30 cases. In all but 2 cases the strains were sensitive throughout. In one a single strain with a resistance ratio of 40 was isolated in the sixth month, followed by a sensitive strain two weeks later. In another patient (Case 93 already mentioned) resistance to both P.A.S. and streptomycin was found; this patient responded well to treatment, and did not deteriorate later.

Discussion

The present trial has shown clearly the beneficial effect of P.A.S. treatment alone in acute progressive pulmonary tuberculosis, confirming the reports of Swedish authors, and in particular the results of a controlled clinical investigation recently reported by the Swedish National Association against Tuberculosis (1950). Our patients given P.A.S. alone fared much better than a comparable group with similar disease in our first streptomycin trial, treated by bed-rest alone (M.R.C., 1948a). Whereas at the end of six months 27% of the control cases in the first trial had died and the condition of another 34% had deteriorated on radiological assessment, only 3% of the present P group died and the condition of another 7% deteriorated on the same basis in this period. Improvement in the general condition, where it occurred during P.A.S. therapy, was rapid, with fall of temperature, reduction of sedimentation rate, and weight gain; radiological improvement was less impressive in its degree.

P.A.S. alone was, however, less effective than streptomycin alone. Although the radiological condition deteriorated in only a few of the P.A.S.-treated patients, in 34% there was no appreciable radiological change during the six months' observation; the comparable figure in the patients receiving streptomycin was 6%. On the other hand, less than a quarter of the P cases, but more than half of the S group, showed radiological improvement of considerable degree (2-plus or 3-plus). The difference was noted particularly in febrile patients; for those with average temperatures of 99° F. or more on admission, considerable radiological improvement was evident in only 6% of the P group and in over 40% of the S group. Fewer P cases than S cases became bacteriologically negative. The differences in the clinical improvement were less obvious: response of temperature and of sedimentation rate to treatment was equally rapid in the two groups, and average weight gain over the six months was similar. Improvement in general condition was, however, less, and occurred later, in the P group than in the S group.

When the two groups receiving streptomycin (S and SP) are compared, the outstanding difference is in the emergence of streptomycin-resistant strains of tubercle bacilli. Streptomycin resistance (as judged by a "resistance ratio" greater than 8) was detected in 33 of the 49 S cases from which results were available from the first month onwards, whereas streptomycin-resistant strains occurred in only 5 of the 48 SP cases (in 4 of these 5 cases resistance emerged late in treatment or after its cessation; in 2 of them only a single resistant culture was obtained, subsequent cultures being sensitive). The association of P.A.S. with streptomycin had therefore a most marked effect in delaying or preventing the emergence of streptomycin-resistant variants of the infecting organisms. Similar results have been reported by Karlson and his co-workers (1949) and from the extensive trials of the Veterans Administration (1949, 1950). At the Ninth Streptomycin Conference of the Veterans Administration the following results were reported from Fitzsimons General Hospital, Denver, Colorado: in a group of 95 patients treated with streptomycin every three days and P.A.S. daily, none developed streptomycin resistance, compared with 33% of 97 patients treated only with streptomycin every three days and 76% of 66 patients treated only with streptomycin daily (the evaluation was made after 120 days of therapy). Although the course of the combined therapy in the present series was only three months, the effect in preventing the development of streptomycin resistance continued until the end of the sixth month. The present results were obtained with a high dose of P.A.S.—namely, 20 g. of the sodium salt—a dose which caused digestive discomfort. It is not known if lower doses would have an equal effect on streptomycin resistance: an M.R.C. trial designed to answer this question is in progress.

The therapeutic differences between the two streptomycin-treated groups were not great; most of them do not satisfy tests of statistical significance, though the improvement was, on the whole, somewhat greater in the patients who received P.A.S. as well as streptomycin than in those who received streptomycin alone. Radiologically, 74% of the S cases and 87% of the SP cases improved; but "considerable" improvement was noted in a larger proportion of the S group. The sedimentation rate was normal at six months in 40% of the SP group and in 21% of the S group; among patients febrile on admission slightly more of the SP than of the S group became afebrile. The clearest effect of combined treatment, apart from that on drug resistance, was on the bacterial content of the sputum: throughout the period of the trial, after the first month of therapy, more SP than S cases were converted to negative; in the sixth month, 33% of SP cases were bacteriologically negative, compared with 19% of S cases.

As in our first trial, failure of chemotherapy after emergence of drug resistance was evident in that, among the patients receiving streptomycin only, the disease pursued a less favourable course in cases producing resistant strains than in the others; this was still so after taking into account differences in severity of disease on admission. The clinical relapses in the fifth and sixth months occurred particularly in resistant cases. Though the figures involved are small, the total evidence, including that of the first trial, makes it probable that the prevention of streptomycin resistance was in part responsible for the rather more favourable clinical results which were associated with combined therapy. On the other hand, in many patients from whom resistant strains were isolated improvement continued even when the resistance ratio was over 100. Moreover, from a few of the cases producing resistant strains sensitive cultures were isolated later. Drug resistance therefore must not be overstressed as a factor in prognosis. Strains from one lesion may be resistant while those from another in the same patient may be sensitive; and the patient's own recuperative powers may be sufficient to cope with the drug-resistant bacilli remaining after elimination of the more sensitive organisms.

P.A.S. resistance was observed in several of the cases on P.A.S. therapy only. Although the present methods of testing are thought to be unsatisfactory, there is no doubt that such resistance can develop, albeit less frequently than streptomycin resistance. This risk must certainly be taken into account when planning the use of P.A.S.

It is now possible to adjudge the place of P.A.S. in the chemotherapy of pulmonary tuberculosis, although it must be emphasized that the comparisons in the present trial apply to the results of treatment given for equal short periods—namely, three months with each drug; no comment can be made on the possible effects of more prolonged P.A.S. or combined therapy. Leaving aside the types of disease in which chemotherapy could have little appreciable effect, P.A.S. given alone has a place in the treatment of cases which show apparently complete streptomycin resistance. The most important conclusion concerns the use of combined therapy. In view of its effect on streptomycin resistance, it is obvious that the addition of P.A.S. prolongs the period of effective streptomycin treatment. As used at present, the main object of any chemotherapy in pulmonary tuberculosis is to prepare selected cases for collapse treatment or chest surgery; in appropriate cases combined therapy should be continued until this objective is achieved, whether this is a matter of weeks or months; the gains may be only transitory, and there should be no delay in the use of other measures at the opportune moment. Combination of P.A.S. with streptomycin not only renders effective administration of streptomycin possible for longer periods than previously, but probably permits also of repeated effective courses. The use of chemotherapy thereby becomes justifiable for a wider range of lesions. There has been much discussion on the advisability of giving streptomycin to patients with lesions which might be expected to heal without either collapse treatment or chemotherapy. The main argument against streptomycin alone in such cases has been that the development of drug resistance might prejudice the prognosis should there be a relapse with more severe disease at a later date. This argument is now less valid, and the extension of chemotherapy to early or small lesions is worth investigation; but evaluation of the results will be extremely difficult. It should still be remembered, moreover, that neither P.A.S. nor streptomycin is without toxicity, and that the emergence of streptomycin resistance is not entirely prevented by combined therapy.

Summary

166 patients with acute progressive bilateral pulmonary tuberculosis were studied in a clinical trial of P.A.S. and streptomycin.

59 patients were treated with P.A.S. (P group), 54 with streptomycin (S group), and 53 with both streptomycin and P.A.S. (SP group). Patients were assigned to a treatment group by random selection.

P.A.S. was given in the form of the sodium salt, 20 g. daily. The daily dose of streptomycin was 1 g. Chemotherapy was given for three months, and observation for the trial continued for a further three months.

Patients treated only with P.A.S. fared much better than patients with similar disease treated without chemotherapy in the first M.R.C. trial of streptomycin in pulmonary tuberculosis.

P.A.S. was less effective than streptomycin. In 34% of the P group there was no appreciable radiological change, compared with 6% of the S group. Marked radiological improvement (2- or 3-plus) was seen in 22% of the P group and in 56% of the S group. The difference was greatest in febrile patients.

Improvement was somewhat greater in the SP group than in the S group, but the differences are small. The proportion of cases becoming bacteriologically negative was highest in the SP group. The outstanding effect of combined therapy was on emergence of drug resistance. Strains with a streptomycin resistance ratio above 8 were isolated in 33 of 49 S cases, and in only 5 of 48 SP cases; in 2 of these 5 there was only a single resistant culture.

Deterioration in the S group was related to the emergence of streptomycin resistance.

The Committee wishes to express its gratitude to all the clinicians and pathologists of the centres for their constant co-operation, and is also much indebted to the nursing staff and laboratory technicians of the centres.

References

Karlson, A. G., Pfuetze, K. H., Carr, D. T., Feldman, W. H., and Hinshaw, H. C. (1949). *Proc. Mayo Clin.*, **24**, 85.
Lehmann, J. (1946). *Lancet*, **1**, 15.
Medical Research Council (1948a). *British Medical Journal*, **2**, 769.
—— (1948b). *Lancet*, **2**, 862.
—— (1949). *British Medical Journal*, **2**, 1521.
Swedish National Association against Tuberculosis, Therapeutic Trials Committee (1950). *Amer. Rev. Tuberc.*, **61**, 597.
Veterans Administration, Washington (1949). *Transactions of the 7th and 8th Streptomycin Conferences.*
—— (1950). *Transactions of the 9th Streptomycin Conference.*

The Association of Psychiatric Social Workers has published the fourth number of its annual journal, *British Journal of Psychiatric Social Work*, copies of which may be obtained for 3s. 6d. from the association at 1, Park Crescent, London, W.1. It includes articles on the work and training of psychiatric social workers and news of interest to them.

INTRA-ARTERIAL HISTAMINE IN TREATMENT OF CLAUDICATION AND REST PAIN

BY

W. ARTHUR MACKEY, M.B., F.R.C.S.Ed., F.R.F.P.S.

Assistant to the Professor of Surgery, University of Glasgow

When the main vessel of a limb is obliterated by thrombosis the blood supply to points more distal depends upon the adequacy of the collateral network. In some cases this is such that the existence of thrombosis may remain unsuspected; in others, signs and symptoms of ischaemia are produced.

Insufficiency of the supply of arterial blood to the capillary network of the skin carries with it the risk of gangrene. Inadequacy of arterial input to the capillary network of the muscles results in claudication. It is useful to separate these two aspects of peripheral arterial insufficiency, since the arterioles feeding the capillary beds concerned are under systems of control which differ quantitatively. The arterioles of the skin are much more completely under control of the sympathetic nervous system, while those of the muscles normally respond mainly to the metabolites produced by muscular action.

The general aim of treatment is to aid and augment the development of the collaterals, since normally the disease of the main vessels is so final and permanent that no recanalization is to be expected. The principle utilized is to produce vasodilatation, either intermittent or permanent.

Most of the methods in current use, however, are either insufficiently potent or insufficiently specific in their point of application (Fig. 1). The latter demerit may constitute

THEORETICAL EFFICACY OF VASODILATOR THERAPIES

AGENT	SYMPATHOLYTIC DRUGS	SYMPATHECTOMY	I.A.H
DILATOR EFFECT	ESSENTIALLY CUTANEOUS & ACRAL — GENERAL —	CUTANEOUS & ACRAL — LOCALISED —	LOCALISED BUT CUTANEOUS & MUSCULAR
EFFECT ON B.P.	LOWERED	NO EFFECT	NIL TO SLIGHT UNLESS DOSAGE RATE EXCESSIVE

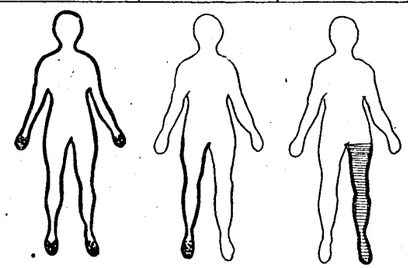


FIG. 1.—Schematic representation of the incidence of vasodilator effect.

a danger. This is particularly obvious in methods of treatment involving the use of drugs which produce general vasodilatation. Such vasodilatation must necessarily occur predominantly in the least diseased portions of the arterial tree. It must, in addition, be accompanied by a lowering of arterial pressure. There is a consequent possibility that the net result may be to deviate blood from the areas most in need. I have observed femoral thrombosis to occur as an immediate sequel of the intravenous injection of a potent vasodilator drug. More local vasodilatation is produced by an appropriate sympathectomy which releases the arterioles from the control of the vasomotor centre. In the case of the lower limb this operation may therefore result in significant improvement in the cutaneous circulation, especially of the feet. It is found to relieve "rest pain," and it unquestionably diminishes the danger of gangrene in cases not excessively advanced. It is less common, however, for reasons noted above, to find a striking improvement in claudication follow sympathectomy.

The ideal method of treatment will be one acting, in the main, upon the small blood vessels of the most affected limb only, and without any particular bias in favour of either the superficial or the deep vessels. The method described by Mufson (1948), in which a dilute solution of histamine acid phosphate is introduced into the lumen of the femoral artery, would seem theoretically to fulfil these criteria. During the past year the method has been used in a series of 14 cases of arteriosclerosis obliterans with arterial insufficiency of the lower limbs. Worthwhile improvement has been achieved in nine, and five have remained unimproved. So far as can be determined, none has been made worse. The results are summarized in Tables I and II, and brief protocols are given.

TABLE I.—*Details of Improved Cases*

No.	Age	Yards Walked		Rest Pain	
		Before	After	Before	After
1	52	200	400	—	—
2	62	200	500	—	—
3	53	70	200	—	—
4	53	200	No limit	+	—
5	58	100	2 miles	+	—
6	56	100	250	—	—
7	51	200	800	+	—
8	56	80	2 miles	—	—
9	60	200	400	—	—

TABLE II.—*Results (14 Cases)*

9 cases	.. Average age, 55·7 years	..	Improved
5 ,,	.. ,, ,, 60·2 ,,	..	Not improved

Technique

Two mg. of histamine acid phosphate is dissolved in 500 ml. of normal saline, which is delivered under pressure into the femoral artery at the groin after percutaneous puncture (Fig. 2). Administration customarily takes 30 to 45 minutes. This dose of histamine introduced direct into the general circulation would have profound systemic effects, but administered intra-arterially it appears to be bound and utilized to a very large extent in the tissues of the limb, and general effects are slight. An ordinary intravenous apparatus is used and air pressure is applied, controlled by means of a sphygmomanometer at a level between the diastolic and systolic pressures of the recipient Delivery is through a Kaufman syringe and a serum needle of No. 4 gauge. Records are made of blood pressure, pulse rate, skin temperature, and the magnitude of arterial pulsation at calf level. In addition, general effects such as facial flushing are noted. The present cases have been treated in a routine fashion with 10 intra-arterial infusions spaced at intervals of one week.

Observed Effects

Within seconds of the start of the infusion a bright flushing appears in the upper thigh, generally in a patchy fashion, and spreads distally to a variable extent. In some cases the flush is followed by the formation of a thick histamine weal. Commonly, flushing extends no further

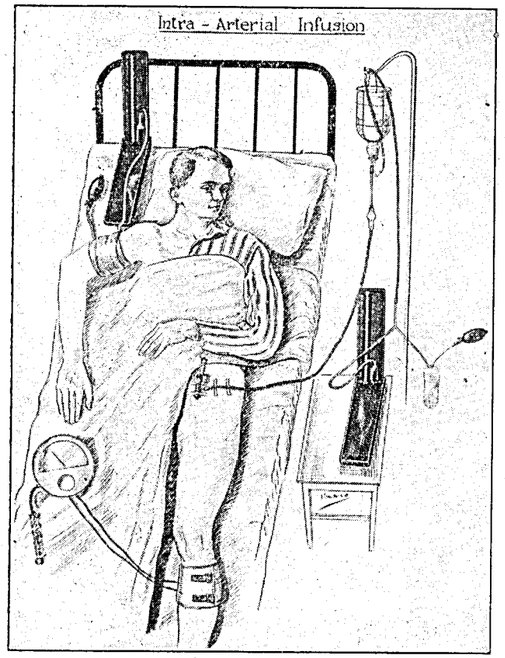


FIG. 2.—Method of infusion

than the knee, but as the series of injections progresses at weekly intervals there is a tendency for the flush to extend further down the leg, and in some cases to reach the toes. Skin temperatures run roughly parallel with the flushing. The flushed area shows a rise in skin temperature. In the more successful cases there is a rise in the temperature of the toes. The records of the arterial pulsations at calf level, made with the Boulitte oscillometer, run to a curious and interesting pattern. During the infusion there is almost invariably a diminution in the magnitude of oscillation. Immediately following the termination of the infusion there is often a very striking increase in these pulsations. This is to a large extent short-lived, but a small proportion of the increase may be carried forward to the following week. Some patients claim an improvement in walking capacity quite early during the series of injections, and this tends to increase. In others, benefit is delayed and less in degree. In some there is no change.

Discussion

The rationale of the method is that the smaller blood vessels exposed to the solution of histamine undergo full dilatation and that the arterial blood is driven in more abundantly and under greater pressure. If these premises be accepted it is reasonable to expect that repeated treatments will facilitate the dilatation and hypertrophy of the smaller arteries and possibly capillaries on which depends the development of an adequate collateral circulation. This is, of course, the principle underlying other methods of treatment, such as pavaex, intermittent venous occlusion, Buerger's exercises, and sympathectomy.

That histamine is effective in achieving this objective in a proportion of cases is indicated by the progressive clinical and objective improvement which has been recorded.

The curious behaviour of the oscillometric readings during the administration is difficult to explain. A number of factors may be at work, such as lowering of the systolic blood pressure, damping out of the troughs of the diastolic portion of the pulse wave by entry of the injection fluid principally during this phase, effects upon the blood vessels of the temperature of the fluid injected, and alteration of the viscosity of the blood in the limb by admixture of saline. Since in a "successful" case the injection is commonly associated with rise in temperature of the toes and improvement in their colour, it seems unlikely that the histamine solution produces, in fact, vasoconstriction followed by full vasodilatation. Further controlled investigation is obviously required, and in particular plethysmographic study.

It is of interest that two of the cases (Case 1 and Case 6) had been unimproved by operation (lumbar ganglionectomy and adrenalectomy). It must be pointed out also that, in general, the improvement achieved has been essentially subjective and clinical. In few cases has there been a material improvement in the oscillometric readings. In some there has been evidence of progress of degeneration in other parts of the arterial tree.

Improved Cases

Case 1

A dairyman aged 52, first seen on November 10, 1947, complaining of claudication of six years' duration, limiting walking to 200 yards (180 metres) and compelling him to give up work six months previously.

Examination.—A big, well-built man in fair general condition. B.P. 135/80. There was patchy calcification of arteries.

Treatment.—Left lumbar ganglionectomy and excision of left adrenal gland on November 26, 1947. Following this operation his condition improved only a little and for a short time, and by August 25, 1949, he was rather desperate. He was able to walk only 50 yards (46 metres). He had a moderately severe degree of vascular insufficiency, affecting both legs. Oscillometer reading: right, 1.5; left, 1.5. A course of intra-arterial histamine (I.A.H.) drips, 2 mg. of histamine acid phosphate (H.A.P.) in 500 ml. normal saline—10 infusions given into each femoral artery (20 in all)—between August 26, 1949, and January 24, 1950.

Result.—Fairly marked clinical improvement was produced. When seen on March 24, 1950, the patient was enthusiastic regarding the improvement in his walking. He was then able to walk for 400 yards (360 metres). Oscillometer reading: left, 1.5; right, 2.0. It was noted at this time that there was convincing evidence of fairly severe progressive myocardial damage.

Case 2

A clerk aged 62, first seen October 14, 1948. Had had tiredness in both legs for one year. Recent disabling claudication, right, at 400 yards.

Examination.—A well-preserved man, rather florid. B.P. 185/85. Electrocardiogram showed myocardial damage. Pulses present at both ankles. Oscillometric reading: right, 5.0; left, 5.0. Arteriogram: almost normal vascular pattern in right leg as far as ankle. Some tiny patches of atheroma in the tibial vessels, especially at points of branching.

Treatment.—On the findings it was felt that the symptoms complained of could not be due to the modest degree of vascular damage present, and so a course of physiotherapy was arranged, from which no benefit was derived. Indeed, by March 26, 1949, the symptoms had increased and a thrombotic complication had obviously occurred in the left leg. Oscillometric reading: right, 5.0; left, 1.5. Claudication now severe on the left side at 200 yards. May 26: disability increasing;

poor result from vasodilator tests. A course of I.A.H. infusions, into the left leg, was given between May 31 and August 5.

Result.—There was a temporary improvement in the left oscillometric reading, which by August 5 had risen to 5.0. There was marked improvement in his capacity for walking, but about this time he began to suffer from claudication on the right side, and it was found that the oscillometric reading on this side had now fallen to 1.5. By this time, also, the myocardial condition was giving cause for increasing anxiety. On March 16, 1950, he still had pain in the right calf, and walked 500 yards slowly. Oscillometric reading: left, 3.0; right, 1.5. He was eager to have a course of I.A.H. infusions in the right side. The final result showed improvement in the status of the leg under treatment. Arterial degeneration was progressing elsewhere.

Case 3

A shipyard rigger aged 53 first seen June 2, 1949. Principal complaint, severe claudication in both calves, worse on left, of one year's duration, limiting walking to 60–70 yards (55–65 metres); also palpitation, headache, and giddiness.

Examination.—A very big, heavy, muscular, plethoric man. B.P. 190/100. Condition of feet satisfactory, but pulses not felt. Oscillometric reading: right, 4.5; left, 0.5.

Treatment.—A course of I.A.H. infusions was given between June 5 and September 17, 1949, into the left femoral artery.

Result.—Towards the end of the course these infusions were associated with a significant improvement in oscillometric readings—from 0.5 to 2.5—and, on occasion, with flushing extending as far as the foot. When last seen on November 10 the patient was emphatic in claiming both local and general benefit from the treatment. He was at work and able to walk 200 yards at a moderate pace. Oscillometric reading: right, 5.0; left, 1.5. B.P. was now 165/80. He was no longer having "blackouts," and described himself as "feeling better in every way."

Case 4

A self-employed engineer aged 53, first seen March 31, 1949. Claudication at 200 yards left calf for three months. Left foot cold; marked rest pain at night.

Examination.—A well-preserved man. B.P. 125/80. Marked vascular insufficiency, left leg. Foot pallid—wellnigh cadaveric in appearance. Oscillometric reading at calf level: right, 10.0; left, 0.25. Arteriography: obliteration of the left popliteal artery over a distance of 2 in. (5 cm.), with excellent collaterals and distal refill.

Treatment.—A course of I.A.H. infusions was given between April 5 and June 11, 1949.

Result.—The response to the drips was variable, but in general it was characterized by flushing and warming of the foot, the temperature rising as much as 3.5° C., and the oscillometric reading rising from 0.25 to 2.0. The final result must be classified as good. (1) The rest pain has disappeared. (2) The colour of the toes of the left foot and calf is good. The oscillometric reading is virtually unchanged; right, 8.0; left, 0.25. He is doing a normal day's work. If he walks slowly he can go on indefinitely. He is emphatic regarding the benefit derived from the injections.

Case 5

A tram driver aged 53, first seen June 2, 1949. Had had claudication left calf of three years' duration; now coming on at 100 yards (90 metres). Rest pain severe in left foot.

Examination.—A heavy muscular man, hypertensive. B.P. 260/115. Severe vascular insufficiency, left leg. Oscillometric reading at calf level; right, 5.0; left, 0.25. Arteriogram: obliteration of left superficial femoral.

Treatment.—A course of I.A.H. infusions, into the left femoral artery, was given between June 4 and September 8, 1949.

Result.—At no time was there a very striking objective result from the infusions. Marked vascular reaction occurred in the thigh, but rarely and to minimal extent did this reach the lower leg and toes; the oscillometric reading also remained unchanged. Despite this, the patient claims some improvement in that he is able to walk about a mile (1.6 km.), and sometimes more, without pain, and rest pain is markedly diminished. On February 18, 1950, he wrote: "Keeping very well; constantly at work. Walked about two miles (3.2 km.) a few days ago without having to stop. Very little pain in foot at night." The result may be assessed as "serviceable benefit."

Case 6

A railway goods yard foreman aged 56, first seen February 17, 1949. Claudication right calf at 100 yards, of three months' duration, associated with numbness and coldness of right foot.

Examination.—A fairly well preserved man. B.P., 180/90. Severe vascular insufficiency right leg. Arteriogram: marked atheroma of femoral artery. Principal damage just distal to bifurcation of popliteal, where the main trunk breaks up into three small inadequate channels. Seen again March 7. During last 10 days or so has developed trouble with the left leg, which is now, if anything, more disabled than the right, claudicating at 80 yards (73 metres), with pain both in calf and in anterior tibial muscles. Oscillometric reading: left, 0.5; right, 1.0.

Treatment.—Ganglionectomy and adrenalectomy, left, on May 2, 1949. The left foot was warm on June 9. Oscillometric reading: left, 1.5; right 0.5. Despite objective evidence of increased arterial input on left side, functional capacity unchanged. A course of I.A.H. infusions—10 in each leg (20 in all)—was given between June 26 and October 9, 1949. These were generally associated with flushing and warming of the toes and increased oscillometric readings.

Result.—Decisive improvement in both legs. Last seen December 12: at work and walking 250 yards (230 metres) without pain; walking three to four miles (4.8 to 6.4 km.) per shift in short stretches at his work. Oscillometric reading: left, 1.0; right, 0.75. Left foot hot and dry; right cool. The result may be assessed as a serviceable improvement in a case unmodified by ganglionectomy and adrenalectomy.

Case 7

A metal worker aged 51, first seen July 7, 1949. Claudication left calf of 10 weeks' duration, limiting walking to 200 yards. Severe rest pain left foot, disturbing sleep.

Examination.—General condition good. B.P. 120/90. Severe arterial deficiency left leg. Left foot cool and pale. Oscillometric reading: right, 7.0; left, 0.1.

Treatment.—Response to vasodilator test, *nil*. A course of I.A.H. infusions was given between September 3 and December 5, 1949.

Result.—Improvement in walking comfort began early in the course of injections, associated fairly regularly with rise in temperature in the toes of the left foot, as great on occasion as 3° C. There was a slight improvement in oscillometric readings, but probably not significant. At the end of the course he was able to walk half a mile (0.8 km.) at moderate pace, and was relieved of rest pain.

The patient returned to work on December 12, and was still working on February 22, 1950. There was no rest pain and no severe claudication.

Case 8

A boot and shoe repairer aged 56, first seen February 3, 1949. Claudication right calf, of sudden onset seven months previously, associated with the feeling of deadness of the limb and now limiting walking to 80 yards (73 metres).

Examination.—Only fair nutrition. B.P. 170/90. Gross narrowing of the retinal arteries. Severe arterial insufficiency right leg. Oscillometric readings: left, 9.0; right, 1.5.

Treatment.—A course of I.A.H. infusions was given between March 20 and June 21, 1949.

Result.—The infusions, in general, produced flushing as far as the toes and a significant increase in oscillometric readings, on one occasion as great as from 0.5 to 4.0. In parallel with this his walking improved steadily, and when last seen on July 29, 1949, he was able to walk slowly for 30 minutes on the level. Pain, formerly present in the calf muscles, no longer occurred, its place being taken by an easily bearable aching sensation around the heel and tendo achillis. Oscillometric readings not materially altered: left, 8.0; right, 1.5.

On February 20, 1950, he wrote: "Condition satisfactory. At work. Have walked nearly two miles, with discomfort only."

Case 9

A male telegraphist aged 60, first seen August 5, 1949. Claudication affecting left leg for two years and right leg for six weeks. Walking distance about 200 yards.

Examination.—A reasonably well preserved arteriosclerotic. B.P. 160/90. Oscillation: right, 0.2; left, 0.2. Feet bluish; marked capillary stasis.

Treatment.—As the recently affected right leg seemed to be improving, it was decided to observe the case while a course of vitamin E, 450 mg. daily, was given. This produced no effect, and claudication persisted, limiting walking to 200 yards. A course of I.A.H. infusions was given between November 19, 1949, and January 23, 1950.

Result.—When examined on February 3, 1950, the patient was delighted with his recent progress, and was emphatic that the histamine infusions had resulted in a striking improvement in his walking capacity. He was now able to walk 400 yards and to get to and from his work easily. Despite the subjective improvement, the oscillometric readings were unchanged. On April 14 the improvement had been maintained.

Unimproved Cases

Case 10

A time-keeper aged 65, first seen June 30, 1949, with claudication at 200 yards left calf for one month, and a history of anginal pain.

Examination.—A plethoric, hypertensive male. B.P. 220/120. Marked vascular insufficiency left leg. Commencing atrophy of pulp of great toe. Oscillometric reading at calf level: right, 7.0; left, 0.5.

Treatment.—A course of I.A.H. infusions was administered at weekly intervals into the left femoral artery at the groin between July 7 and October 29, 1949.

Result.—Histamine infusions associated with fairly marked general reaction, but negligible improvement in circulation in calf or in foot. Clinical status at end of course unaltered.

Case 11

A labourer aged 58, first seen January 27, 1949. Claudication left calf for three years; recently much worse, coming on at 100 yards, associated with pallor, coldness of foot, and rest pain.

Examination.—Severe generalized arteriosclerosis. B.P. 210/100. Left foot pallid; very poor reaction to vasodilator tests. Arteriogram: severe atheroma with thrombosis left superficial femoral. Fairly good collateral network.

Treatment.—A course of I.A.H. infusions was given between June 2 and August 23, 1949.

Result.—Occasional slight rise of temperature in foot and temporary increase of oscillometric reading on one occasion only. Last seen September 1, 1949: clinical status unchanged.

Case 12

A man aged 61, first seen June 10, 1949. Five months' history of claudication; sudden onset, now limiting walking to 100 yards. No rest pain.

Examination.—A well-preserved rather plethoric workman. B.P. 180/100. Marked vascular insufficiency right leg. Cutaneous circulation good. Oscillometric readings: left, 6.0; right, 1.5.

Treatment.—A course of I.A.H. infusions was given between June 16 and September 2, 1949.

Result.—In general, although the injections were associated with vasodilatation, on occasion reaching the foot, and slight improvement in the oscillometric readings, there was no striking improvement in functional capacity. On February 20, 1950, he was still at work. Claudication occurred at 100–150 yards.

Case 13

A storeman aged 67 was admitted on July 29, 1949, suffering from arterial thrombosis left leg, on a basis of severe arteriosclerosis. B.P. 200/100; acute ischaemia left leg. A course of heparin injections was given without benefit. On August 16, 1949, he was transferred to the surgical division.

Examination.—Severe arterial insufficiency both legs, worse on right side; pregangrenous stasis; severe rest pain. Oscillometric reading: right, 1.5; left, 0.25.

Treatment.—A course of "padutin" injections was given without effect; this was followed by a course of 10 I.A.H. injections into the left femoral artery, beginning on November 8, 1949.

Result.—Treatment conferred little benefit, and on December 23 the thrombotic process on the right side advanced and became more complete than on the left. Throughout his illness mental changes were severe. He was irritable and depressed, but these symptoms were improved to a striking degree by administration of dextro-amphetamine—so much so that it was possible to allow him to go home on January 16, 1950. His condition otherwise remained unchanged.

Case 14

A clerk aged 50, first seen March 22, 1949. Intermittent claudication right, of six months' duration, now coming on at 200 yards.

Examination.—A well-preserved, heavy muscular man. B.P. 180/100. Oscillometric reading: right, 1.0; left, 10.0.

Operation (April 20).—Right lumbar ganglionectomy. There was a temporary improvement in the circulation of the right leg, but by June 24 exercise capacity was as before operation, and by August 5 was actually less. Oscillations at this time were: left, 9.0; right, 0.5.

Treatment.—A course of I.A.H. infusions was administered between September 9 and December 22.

Result.—There was no improvement whatsoever in walking. The right foot remained warm at all times as a result of ganglionectomy.

Summary

A clinical trial has been made, in a series of 14 cases of arteriosclerosis obliterans, of intra-arterial histamine therapy as described by Mufson (1948). In two of the cases both limbs were treated.

A course of treatment has consisted of 10 infusions, at weekly intervals, of 2 mg. of histamine acid phosphate in 500 ml. of normal saline.

In nine cases capacity for walking has improved and "rest pain," when present, has been diminished. In five cases there has been no improvement. In no case has the treatment done obvious harm.

I have been much indebted to Dr. Sheila Christian, Dr. James Allan, and Dr. John Leitch for help with the tedious work involved in the large number of arterial infusions represented by this brief paper.

REFERENCE

Mufson, I. (1948). *Ann. intern. Med.*, **29**, 903.

Some common-sense advice attractively set out on the care and feeding of babies is provided in four pamphlets issued by the Central Council for Health Education. They are intended for mothers, and tell them how to prepare food, about the elements of breast feeding, and when to consult the family doctor. Entitled "Planning Ahead," "The Natural Way," "Mixed Feeding," and "Weaning," they are obtainable for 6d. each from the council at Tavistock House, Tavistock Square, London, W.C.1.

BLOOD-PRESSURE CHANGES DURING ANGIOCARDIOGRAPHY

BY

SHEILA HOWARTH, M.B.

(From the Institute of Cardiology, National Heart Hospital)

In view of the increasing number of accidents reported as a result of angiocardiography, further information about changes occurring in the circulation after the injection of diodone for this purpose would seem to be of interest. Below are reported changes in blood pressure recorded during routine angiocardiography.

Material and Methods

Six cases were investigated, in five of which an intracardiac shunt was demonstrated (Table I). The cases were subjected to routine procedures used for angiocardiography at the National Heart Hospital for the purpose of diagnosis. All the subjects were non-reactors to iodine-sensitivity tests. Each case was premedicated, and five were lightly anaesthetized before diodone injection. Continuous blood-pressure records were taken from the brachial or femoral artery, using a condenser manometer (Hansen, 1949).

Results

A conspicuous fall in blood pressure occurred in every case following the injection of diodone (Table II). Typical examples are shown in Figs. 1, 2, and 3. The fall in blood pressure was not immediate, but was delayed for approximately 6 to 20 seconds after injection. The duration of the low-blood-pressure state varied from case to case. The fall in arterial pressure was neither so striking nor so prolonged after the second injection as after the first in Case 6, in which two sets of angiocardiograms were taken. The pulse pressure decreased in all cases as the blood pressure fell.

Little or no rise in blood pressure was associated with the sudden injection of diodone. A control injection of saline, given in the same bulk and at the same rate as that of diodone, produced no change in blood pressure (Fig. 4).

Cardiac irregularities occurred following diodone injection in Cases 2 and 6 (first injection) (Table II). In Cases 1, 3, 5, and 6 (second injection), however, there was no obvious irregularity, though a conspicuous fall in blood pressure took place.

TABLE I.—*Details of Cases*

Case	Age Sex	Diagnosis	Premedication	Anaesthetic	Injection 70% Diodone	Remarks
1	38 M	Pulmonary hypertension from chronic bronchitis and bronchiectasis	Quinidine sulph., 5 gr. (0·32 g.) Atropine sulph., 1/100 gr. (0·65 mg.) Morphine sulph., ¼ gr. (16 mg.) "Benadryl," 50 mg.	Nil	55 ml.	
2	6 F	Fallot's tetralogy	"Avertin" p.r., 0·1 ml./kg. b.w. Atropine sulph., 1/100 gr.	Thiopentone i.v. Procaine i.v.	25 ml.	Respiration increased in depth for about two minutes
3	11 F	Pulmonary stenosis. Atrial septal defect	Quinidine sulph., 3 gr. (0·2 g.) "Omnopon" 1/6 gr. (11 mg.) Scopolamine, 1/300 gr. (0·2 mg.)	Thiopentone i.v. Procaine i.v.	45 ml.	Slight breath-holding immediately after injection
4	21 F	Fallot's tetralogy	Quinidine sulph., 5 gr. Atropine sulph., 1/50 gr. (1·3 mg.) Omnopon, 1/3 gr. (22 mg.)	Small doses of intravenous thiopentone and procaine	52 ml. 45 ml.	Not anaesthetized; sedated. Blood-pressure records successful with second injection only. Respiration quicker; moved slightly after injection
5	11 M	Pulmonary atresia. Ventricular septal defect	Omnopon, 1/6 gr. Atropine sulph., 1/100 gr.	Thiopentone i.v. Procaine i.v.	37 ml. 37 ml.	Momentary breath-holding on injection. B.P. records on second injection
6	5 M	Pulmonary atresia. Ventricular septal defect	Thiopentone p.r., 0·6 g. Atropine sulph., 1/100 gr.	Thiopentone i.v. Procaine i.v.	20 ml. 20 ml.	Recordings from femoral artery during both injections

TABLE II.—*Showing the Effects of Diodone Injection on the Blood Pressure*

Case	Time After Injection of Diodone (Blood Pressure in mm. Hg)									Remarks
1	Before 147/77	30 sec. 110/60	50 sec. 80/50	1 min. 87/58	1½ min. 120/70	3½ min. 137/77				Delay of approximately 20 seconds after injection before B.P. fell. Resting heart rate 90, increasing to 150 at 1 minute
2	Before 108/69	30 sec. 60/35	1 min. 63/38	2 min. 72/44	3 min. 88/58	4 min. 118/75				Delay of about 9 seconds before B.P. fell. Cardiac irregularities and arrhythmias (Fig. 2)
3	Before 104/75	20 sec. 90/62	30 sec. 68/46	50 sec. 59/44						Delay of approximately 13 seconds before B.P. fell
	—	—	—	—	—	—				1st injection: B.P. fell, but bad record
4	Before 169/86	20 sec. 123/66	30 sec. 95/53	1 min. 111/63	1½ min. 132/72	2 min. 150/83	2½ min. 165/93	4½ min. 178/76		2nd injection: Delay of approximately 12 seconds before B.P. fell. Nodal rhythm at rest
	—	—	—	—	—	—	—	—	—	1st injection: No record taken
5	Before 100/70	10 sec. 80/64	1 min. 50/43	4 min. 70/53	6 min. 78/58					2nd injection: Delay of 6–7 seconds before B.P. fell
6	Before 110/69	At inj. 94/64	30 sec. 57/38	1 min. 40/32	1½ min. 40/34	2½ min. 45/34	3 min. 50/36	3½ min. 50/38	12 min. 108/74	Arrhythmia began 30 seconds after injection, when B.P. had already fallen
	Before 148/85	20 sec. 107/55	30 sec. 88/45	1 min. 90/45	1½ min. 95/52	2½ min. 98/55	3 min. 112/64			Delay of about 8 seconds. No cardiac irregularities

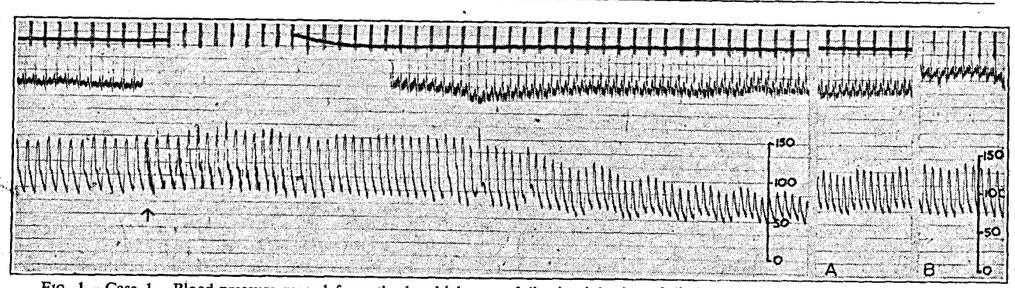


FIG. 1.—Case 1. Blood-pressure record from the brachial artery following injection of diodone (indicated by arrow). The interference on this and subsequent records is due to vibration of the cassette changer. A was taken 1½ minutes after injection with the same zero level; B at about 3 minutes with a different zero. Time (top tracing) in seconds. Calibrations in mm. Hg. The E.C.G. is also shown.

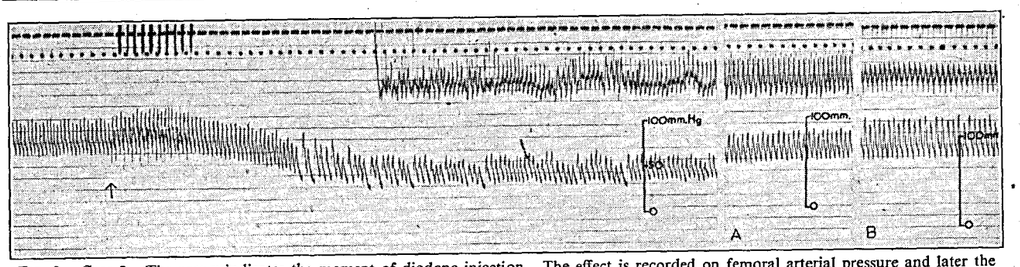


FIG. 2.—Case 2. The arrow indicates the moment of diodone injection. The effect is recorded on femoral arterial pressure and later the E.C.G. A was taken 2¾ minutes after injection, B about 5 minutes. Time in seconds.

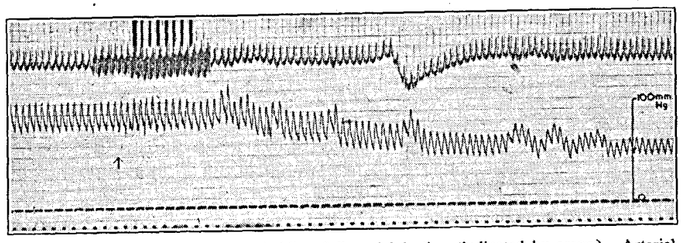


FIG. 3.—Case 3. Slight breath-holding followed injection (indicated by arrow). Arterial blood pressure fell. Time in seconds (bottom of tracing). Interference on the E.C.G. was caused by angiocardiogram time switch. Signals refer to fall of *x*-ray plates.

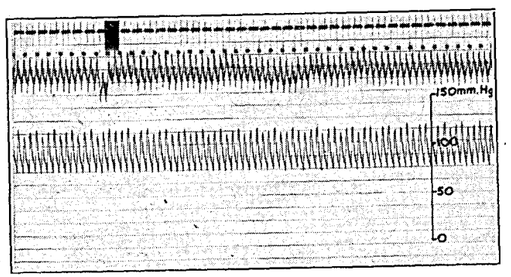


FIG. 4.—Case 2. Control injection of saline, injected at same rate and in same bulk as diodone, produced no effect on blood pressure or E.C.G.

Discussion

The mechanism of the fall in blood pressure is at present undetermined. It would seem to be independent of sudden injection of fluid bulk, since a control injection of saline did not produce it. The time interval existing between the injection and the fall in arterial pressure suggests a peripheral action of diodone, either directly on the arterioles or indirectly through sino-aortic or other reflex mechanisms. Intra-arterial and, to a lesser extent, intravenous injection of diodone has been shown by indirect methods to give rise to vasodilatation in the dog hind-limb, both direct and reflex mechanisms being involved (van der Linden, 1942). The effect of diodone on cardiac output has not been determined. The electrocardiogram, in spite of a considerable fall in blood pressure, may remain unchanged throughout the procedure.

Summary

Continuous blood-pressure records were obtained in six cases during angiocardiography.

There was a conspicuous fall in blood pressure in every case.

I am indebted to Mr. J. G. Davies for technical assistance. The angiocardiograms were carried out by Dr. J. B. Lowe and the registrars of the National Heart Hospital, and Dr. B. G. B. Lucas administered the anaesthetics.

REFERENCES

Hansen, A. Tybjaerg (1949). *Pressure Measurement in the Human Organism.* Teknisk Forlag, Copenhagen.

van der Linden, P. C. (1942). *Arch. int. Pharmacodyn.*, **67**, 14.

An American research organization is helping to establish a new research institute dealing with tropical medicine in equatorial Africa. It is being built at Harbel, in Liberia, on land given by the Liberian Government. The institute will include laboratories for research in the causes of tropical diseases and their effects. Studies will also cover tropical husbandry and agriculture, with emphasis on food staples for men and animals. A committee representing medical schools and commercial groups in the United States has already recommended a number of study projects. Dr. Elmer Berry, of the U.S. Public Health Service, is acting director of the institute, and is supervising the construction of the research laboratory. He will also direct its first project, which is to be the study of schistosomiasis. At the same time he will test various means of controlling carriers of the disease. In the course of this work he will visit French West Africa, the Gold Coast, Sierra Leone, Nigeria, French Equatorial Africa, the Belgian Congo, Tanganyika, Kenya, Uganda, and Northern Rhodesia. Research at the institute will be supervised by the U.S. Public Health Service.

THE PROBLEM OF THE THERAPEUTIC CONVULSION

BY

THOMAS D. POWER, M.D., M.R.C.P.
Consultant Psychiatrist, Brentwood Mental Hospital

The points of interest about a general convulsion differ according to whether it is viewed from the neurological or the psychiatric angle. The neurologist is concerned with the nature of the pathogenic agent, its possible site of action in the brain, its frequency of operation, and the remedies with which to combat it. The psychiatrist, on the other hand, is faced with the additional problem : How is it that a general convulsion can benefit mental illness ? He knows that by inducing a number of convulsions in a patient suffering from mania, melancholia, or acute schizophrenia he can remove, as if by magic, the symptoms of these vastly different syndromes. Nor does it detract from his scientific interest if in many cases the clinical improvement is only temporary. He is still left with the question : How can an insane person be rendered sane by such means ?

It seems to me that before a solution to this problem can be found closer attention must be paid to the neurophysiological mechanism underlying a convulsion. What is a convulsion ? Hughlings Jackson (1931), among his many brilliant contributions to the subject of epilepsy, makes the following points. He says : "It is to be insisted on that a convulsion, in any case, is nothing whatever else than a sudden, excessive, and rapid development of the *normal* movements which the centre suddenly and excessively discharging represents." And again : "A severe epileptic convulsion, to take that case for illustration, is nothing whatever else than a sudden, excessive, rapid, and consequently a nearly contemporaneous development of many of the patient's commonplace daily movements. . . . Speaking figuratively, we may say that the epileptic discharge is trying to develop all the functions of the body excessively, and all at once ; a severe fit is a fairly successful attempt. Let me give a very simple illustration. If there be a centre for locomotion, then during slight sequent discharges of its elements in health there is walking or running ; but if very many of these elements were to discharge suddenly, rapidly, and excessively, the man walking or running would not go faster ; on the contrary, he would be stopped, would be stiffened up into a tetanus-like attitude by the *contemporaneous* development of many locomotor movements."

According to Jackson, therefore, during a convulsion many movements are taking place at once and in this way lose their individuality, the resulting tetanic posture being the algebraical sum of the pulls exerted by agonists and antagonists. There is, in fact, a condensation of movement, or, as he himself expresses it, "a clotted mass of movement."

Prominent among Hughlings Jackson's teachings was the doctrine of dissolution. His hypothesis was that nervous dissolution proceeded in the reverse order to that of evolution, and that many of the symptoms of nervous disease, including post-convulsive phenomena, could be explained in this way. There was, he claimed, a reduction from the least organized, most complex, and most voluntary behaviour towards that which was most organized, most simple, and most automatic. Strangely enough, Jackson never applied this theory to the convulsion itself, but only to the manifestations which followed the fit. Nevertheless, his suggestion that during a convulsion there is a fusing of many highly evolved movements into one gross movement deserves consideration from the standpoint of the doctrine of dissolution, because evidence accruing from the embryological method of approach to the study of behaviour suggests that differentiated movement is evolved from mass movement.

"Total Pattern" Theory of Development

There are two schools of thought regarding the development of behaviour in the individual. According to one, it is evolved by the integration of simple reflexes into complex formations. This is the view ordinarily held in this country. According to the second school, with which the name of Coghill is associated, behaviour is integrated as a whole from the beginning, and from this "total pattern" local reflexes become segregated off as development proceeds. It is with this second view alone that we are here concerned, not because the first does not merit an equal hearing, but because it is already the accepted teaching in England. The reader is, however, referred to a critical review of the "total pattern" theory by Windle (1944), a distinguished protagonist of the opposing school.

Coghill (1929a) showed how in the embryo of the amphibian *Amblystoma* movements destined to become local first formed part of a generalized movement. For instance, movements of the fore-limbs, hind-limbs, and gills could not at first occur independently of trunk movements. As development proceeded, however, the limbs and gills were enabled to act by themselves by the dropping out of the trunk component. Coghill did most of his work on *Amblystoma*, but he considered his findings applied equally well to the human foetus. He says (Coghill, 1929b) : "I am convinced by a study of all available records of movements in human foetuses of the first six months that behaviour develops in man as it does in *Amblystoma*, by the expansion of a total pattern that is integrated as a whole from the beginning and by individuation of partial patterns (reflexes) within the unitary whole."

Barcroft and Barron (1939), studying the sheep foetus, found a certain amount of evidence which supported Coghill's theory. Their investigations showed that at an early stage of development extensive bodily reactions were initiated by stimulating the foetal head, and that as time went on independent patterns of behaviour—for example, respiration—became segregated out from the initial total response. While admitting the validity of some of the arguments of the opposing school, they conclude that, "so far, therefore, as local and mass responses are concerned in the sheep, local mechanisms do appear to become segregated out from the total response in the sense implied by G. Coghill in his account of the development of behaviour in *Amblystoma*."

Observations on the human foetus have necessarily been scanty. Minkowski, a prominent worker in this field, although he did not subscribe to Coghill's views, is reported by Irwin (1932) as having found in human foetuses considerable irradiation of nervous impulse. There were no isolated reflexes which were localized in the segments stimulated ; on the contrary, reactions from local stimulation tended to irradiate over the whole body. This finding of Minkowski's would seem to imply mass activity. Hooker (1936), another authority on behaviour in the human foetus, says in an interim report : "Every bit of evidence from the work of Minkowski and from the other unfinished study [his own] of which I have been speaking indicates that the responses of human foetuses to tactile stimulation follow a Coghillian sequence : first the expanding total pattern ; then the rather rapid process of individuation of specific reflexes from the total pattern."

Apart from these findings in the foetus, numerous observers of infant behaviour have testified to the predominance of total reactions in the early days of post-natal life. Gilmer (quoted by Dewey, 1935), who studied the spontaneous responses of four infants from 1 to 10 days old, claims that the newborn's behaviour organization is body-wide ; his responses are total bodily responses. Irwin (1932), reviewing his own findings in conjunction with those of Coghill and Minkowski, says : "Differentiation and specificity of behaviour in infants, therefore, probably develop out of an original matrix of mass activity ; mass activity probably is the earliest activity of the uterine organism." Langworthy (1932), another authority, says : "Even the newborn infant responds to stimuli with widespread motor responses which spread and increase in intensity with the strength of the stimulus. It is only later as a differentiation from the response of the organism as a whole that refinement and delicacy of activity evolve."

Application of "Total Pattern" Theory to Therapeutic Fit

Let us now return to the therapeutic convulsion and see how far we can apply the above-mentioned findings to it. Do the motor phenomena of the fit reflect a reversal of nervous evolution to the level of the foetus, where mass activity is said to dominate behaviour ? There is certainly in the tonic stage of the fit an exaggerated sustained movement, or tetanic posture, of universal distribution. The body and limbs become a rigid mass which can be rolled about in one piece like a log of wood. This rigid mass of muscle is not, however, quite bereft of nervous organization, for "plasticity" can be demonstrated in it in the following way. If during the tonic phase the patient's arm be forcibly flexed or extended at the elbow the limb will tend to remain in the position in which it is placed. We have therefore a widespread sustained movement which retains a degree of nervous organization, and which, according to Hughlings Jackson, consists of a variety of normal movements merged into one. Is it too far-fetched a speculation to regard the normal movements as having retraced their evolutionary pathway and lost their identity in a mass movement similar to the one from which they were originally evolved ?

A tonic decerebrate posture similar to the one so often assumed by patients during the tonic phase of the fit has also been demonstrated in the sheep foetus. Describing this manifestation in the sheep foetus, Barcroft (1941) says : "By the sixtieth day, if the foetus be delivered, it exhibits a different picture : the fore-legs are tensely stretched out side by side, the head and tail are extended, and the foetus presents the appearance of an animal suffering from what is known as 'decerebrate rigidity.'" While it is easy to attribute the decerebrate attitude in the human fit, as in the case of the sheep foetus, to the absence of the controlling influence of higher centres, this hardly fits in with Jackson's teaching that in the convulsion there is a sudden, excessive, and nearly contemporaneous development of many *normal* movements. Jackson certainly had in mind movements of a much higher order than any that could be initiated after decerebration. On the other hand, the application of the "total pattern" theory of development to the tonic phase of the fit appears to be consistent with Jackson's view. Arguing from it, the universal tonic spasm with its attendant decerebrate posture could be explained as a reversion of the higher brain mechanism to the pattern of functioning exhibited in the foetus in the face of a grave threat to the functional integrity of the organism brought about by the action of the convulsant. In the resulting widespread discharge the more highly evolved nervous elements would *participate*, but in a more primitive way than was their wont.

If we assume that the tonic stage of the fit reflects a return to an early pattern of nervous activity, then we can regard the clonic stage as representing the first step towards re-evolution. Coghill, as already indicated, considered that behaviour developed in the embryo by a gradual suppression of the "total pattern," so that local movements were permitted to occur apart from it. Something rather like this seems to be taking place during the clonic phase of the fit. The hitherto continuous motor spasm gives place to intermittent spasms which become spaced at progressively increasing intervals until finally they die out altogether. As the fit proceeds slight movements at the hip, shoulder, knee, and elbow begin to appear, the movements at the proximal joints preceding those at joints more distally placed. The limbs cease to be stiff rods so rigidly attached to the trunk that when they are passively moved the whole body moves, and become segmented appendages as is normally the case. This dawn of independence on the part of the limbs is further enhanced by the gradual establishment of ascendancy of certain groups of muscles over their antagonists so that the range of movement at the implicated joints is progressively extended. There is, in other words, a breaking up of the total pattern, or a commencing crude differentiation of movement.

With the progress of the clonic phase another thing is seen to happen : minute respiratory gasps accompany some of the clonic spasms. Hitherto, apart from one long expiration (or occasionally an inspiration) at the beginning of the fit, respiration has been in abeyance, but it now begins to function, first in conjunction with the widespread clonic spasms, and then, after the termination of the fit, in complete independence. This compares with the way in which Barcroft and Barron (1936) tell us respiratory movements are established in the sheep foetus. These authors say : "They are derived from a general mass movement of an extensor type by the dropping out of the movements of the head and limbs."

The above interpretation of the clonic phase of the fit implies that the convulsion is terminated by inhibition rather than by exhaustion, which is the more usual explanation. There are several clinical facts which seem to support such a hypothesis. In the first place, the terminal jactitations of the fit are quite as strong as those which precede them, and there is no tapering of intensity such as one would expect if the nerve cells were becoming exhausted. Secondly, the knee-jerks, although often abolished immediately after a fit, may be exaggerated from the moment the fit ceases, which is not consistent with exhaustion of spinal neurones. Thirdly, if a chemical convulsant such as triazol be used a second fit may follow a few minutes after the first, and in this event the second fit will be quite as strong as its predecessor. This again is difficult to reconcile with an exhausted nervous system.

But, apart from these arguments, there is the undoubted fact that therapeutic convulsions are associated with so little danger to life. Anyone who, like myself, has been inducing them almost daily for over a decade without a single fatality must have been struck and puzzled by this. In view of the frail condition of some of the patients treated it is questionable whether such a happy result could have been achieved if exhaustion of nerve cells had been the operative factor in ending the fits. Indeed, the more one studies the manifestations of the therapeutic fits the stronger is the impression given that one is here dealing with a physiological rather than with a pathological mechanism.

In making this comparison between the movements displayed during an adult convulsion and those manifested in foetal life it is not, of course, claimed that the foetus when

subjected to a local stimulus reacts with the equivalent of an epileptic fit, for it is quite obvious from the literature and from cinematograph studies of foetal behaviour that this is not the case. All that is argued is that during a therapeutic fit there is a state of mass motor activity involving widespread irradiation of nervous impulse, which corresponds in principle to the type of activity displayed in the foetus in response to local stimulation; furthermore, that this is followed by an apparent segregating out from the original mass movement of certain independent movements, which again roughly corresponds to the pattern of development in the foetus. It is perhaps worth mentioning as an additional point that Barcroft (1941) refers to movements elicited in the sheep foetus as "spasms," and when widespread as amounting to "a trifling convulsion of most of the body."

Psychophysical Relationships

The theory that the convulsion represents a return to the foetal level of nervous functioning does not explain its beneficial therapeutic effect, but it promises a more fruitful line of approach to the problem than do current views about the nature of a fit. It has the merit of enabling one to investigate the psychic phenomena which follow a fit—namely, the post-convulsive confusional state—with certain possibilities in mind. For instance, if there has taken place during the fit a reversal of nervous evolution there may well have been a parallel reversal of psychic evolution, in which case one might find in the post-convulsive state a partial reliving of past experiences. The well-known retrograde amnesia associated with such fits would harmonize with this.

Again, the fusing of normally discrete movements during the fit might be correlated with a tendency to fuse psychic material after it. Indeed, this may be the reason why the term "confusion" is applied. The establishment of psychophysical relationships such as these—and they are not the only ones suggested by the theory outlined above—would be likely to throw light upon the problem of how multiple fits can benefit mental illness. The post-convulsive confusion represents the first demonstrable effect of the fit upon the mind, and it is reasonable to assume that some relationship exists between this and its later therapeutic influence. The frequent persistence of amnesic symptoms after recovery from the original mental symptoms supports such an assumption. Glandular and metabolic effects doubtless also occur, but the core of the matter seems to lie in an alteration of cerebral functioning and, by concomitance, of mental functioning, brought about by the direct action of the convulsive process.

Summary

Attention has been called to some of Hughlings Jackson's teachings regarding the nature of a convulsion. Reference follows to the physiological theory that local movements are evolved from mass movement, and authorities are quoted who support the theory. On the basis of this assumption an attempt has been made to explain the therapeutic convulsion as a reversion of behaviour to the level of the foetus.

REFERENCES

Barcroft, J. (1941). *Nature, Lond.*, **147**, 762.
—— and Barron, D. H. (1936). *J. Physiol.*, **88**, 56.
—— —— (1939). *J. comp. Neurol.*, **70**, 477.
Coghill, G. E. (1929a). *Anatomy and the Problem of Behaviour*, p. 18. Cambridge Univ. Press.
—— (1929b). *Arch. Neurol. Psychiat., Chicago*, **21**, 989.
Dewey, E. (1935). *Behaviour Development in Infants*, p. 106. New York.
Hooker, D. (1936). *Yale J. Biol. Med.*, **8**, 579.
Irwin, O. C. (1932). *Psychol. Rev.*, **39**, 189.
Jackson, J. Hughlings (1931). *Selected Writings*, edited by J. Taylor, p. 354. Hodder and Stoughton, London.
Langworthy, O. R. (1932). *Brain*, **55**, 265.
Windle, W. F. (1944). *Physiol. Zool.*, **17**, 247.

TREATMENT OF INTERTROCHANTERIC FRACTURES OF THE FEMUR BY INTERNAL FIXATION

BY

G. P. ARDEN, M.B., F.R.C.S.

AND

G. J. WALLEY, B.M., F.R.C.S.

(From the Accident Service of the Windsor Group of Hospitals)

Only of recent years have surgeons been stimulated to treat intertrochanteric femoral fractures by internal fixation as a means of obviating the long inactivity and bed-stay of the aged patient. Previously Brittain (1942) had used a flanged pin alone, but in the most urgent group (the comminuted) the pin had tended to cut out. Extending the principle of a firm hold on the shaft cortex, the Capener-Neufeld and McKee type blade-plates were evolved. Reports on several American series of such cases have appeared, but only one in the United Kingdom.

Operative treatment has been advocated for the following reasons: (i) early ambulation; (ii) a more accurate and stable reduction of the fracture; (iii) improved final function; (iv) fewer general complications (chest, pressure sores, thrombosis, nerve lesions, incontinence); (v) shorter hospital stay and quicker turn-over; (vi) lower mortality.

Reports in the Literature

Cleveland *et al.* (1947) reported on 95 cases out of a total of 133 treated by internal fixation with a Neufeld-Capener nail. Their operative mortality was 12.6% and the average hospital stay 57 days. Complications reported by them were overdriving of the nail and breaking of the nail in three cases following early weight-bearing. They claimed a lower mortality and a lower incidence of all complications compared with cases treated conservatively. Hammond (1948) reported a series of cases treated by operative means, with a mortality of 21%. His patients were up on crutches in two to three weeks after operation and began weight-bearing at the end of four months. He also claimed a lowered mortality and complication rate compared with cases treated conservatively.

Evans (1949) reported on 22 unselected cases treated by operation with a Neufeld-Capener nail and claimed the same advantages of early ambulation, greater comfort for the patient, and quicker turn-over and lowered mortality. Murray and Frew (1949) have reported on 100 cases of trochanteric fractures of the femur treated conservatively, and claimed a low mortality, good function, and a low incidence of general complications (except for drop-foot). They stated that the operative complications of shock, infection, and haemorrhage more than outweighed any advantages.

Present Series

Our series comprises 43 consecutive fractures of the intertrochanteric area treated by us at five local hospitals in the last two years. Thirty-seven cases (90%) were treated by operation; these cases were selected. The remaining six were treated conservatively for the following reasons: (*a*) three patients were considered unfit (one died); (*b*) two were cases of crack fracture with no displacement, (*c*) one was a child aged 5.

We used a McKee nail-plate in 35 cases and a McLoughlin nail-plate in two. We preferred the separate nail and plate to the Capener-Neufeld because of its easier and more accurate insertion, and the non-rigid junction prevented the risk of the nail-plate breaking. All the nail-plates were made of stainless steel, and the screws used were vitallium with different electro-potential. No apparent harm results from the use of dissimilar metals, screws removed one year later being firmly held in by the bone.

Operative Technique

Cases were pinned as soon as the anaesthetist considered them to be fit for operation. In a few instances blood was transfused during the operation (six cases). Three others were given blood post-operatively for shock (two of these patients died). Under general anaesthesia on a Hawley table, reduction was accomplished by traction, wide abduction, and internal rotation.

A 5-in. (12.5-cm.) incision was made, exposing the upper end of the femur. Two 9-in. (22.8-cm.) guide wires were inserted through the base of the trochanter up into the head of the femur (the position of this was judged by bony points) and then checked by radiographs; no director was used. A suitable McKee nail was inserted so as to be at least ½ in. (1.25 cm.) short of the joint line, and this was checked by radiographs. The nail advances ¼ in. (0.6 cm.) during the subsequent weeks as the fracture line absorbs, and may penetrate the joint.

The blade-plate was adjusted to fit the contours of the upper outer femoral cortex by plate-benders, and was fixed by four screws penetrating both cortices. The operation should be completed within 40 to 90 minutes.

After-treatment

No external support for the leg was used, the physiotherapist starting active exercise of the affected hip 24 hours post-operatively. General leg and breathing exercises were also given. Patients were given 250,000 units of penicillin twice daily post-operatively for 48 hours to control potential chest and wound infections. They were encouraged to get out of bed and sit in a chair within 12 days, and two weeks after the operation began walking on crutches without weight-bearing. At the end of four weeks they were discharged home, and attended the nearest physiotherapy department twice weekly for exercises and the fracture clinic for follow-up.

When radiographs showed satisfactory union the patient began weight-bearing; this was usually at 11 weeks after injury.

The average hospital stay of 37 days is considerably shorter than that mentioned in other papers (Table V).

TABLE I.—*Analysis of Results*

No. of cases	37
Deaths	5 post-operative (13·5%); 2 late (excluded: 4 months, 1 year post-operative)
Average age	69·7 years (37–88)
Sex	Male 11; female 26
Side	Right 20; left 17
Average time, injury to internal fixation	6 days (1–28 days)
Average time, fixation to getting up	12 days (3–31 days)
Average hospital time	37 days (4–105 days)

This has been helped by fairly good home conditions in this area; and two patients returned early to a mental home, where they could be nursed satisfactorily.

Out of 37 cases there were five deaths in hospital and two late deaths from unassociated conditions; two further cases were excluded as less than six months had elapsed since operation. Several cases have been followed up for two years. Results of a follow-up are shown in Table II. One patient left hospital walking on crutches; but her general health began to fail, and, as she is now bedridden, in the final assessment the result in her case has been regarded as poor. In about half the cases shortening of ½ to 1½ in. (1.25–3.75 cm.) was recorded; in all of them this was due to a varus deformity of the neck. This result is unsatisfactory, and is probably due to loosening of the nut, although in two cases the nail bent (Fig. 1). A third possibility is that the nail cuts upwards in the head. Details of complications occurring in the series are shown in Table III.

TABLE II.—*Results at Follow-up*

Follow-up	90%
Average time of weight-bearing	11 weeks (5–34)
Average time to walk in comfort	4·5 months
Still living	30
Bedridden (unconnected causes)	1
Shortening	13 cases in 25 recorded
Average hip flexion	90°
Stiff hip (0–45 degrees)	1
Stiff knee (0–45 degrees)	5 (1 rheumatoid)
Pain in hip	5 (1 old osteoarthritis of hip)
Pain in knee	5 (1 rheumatoid)

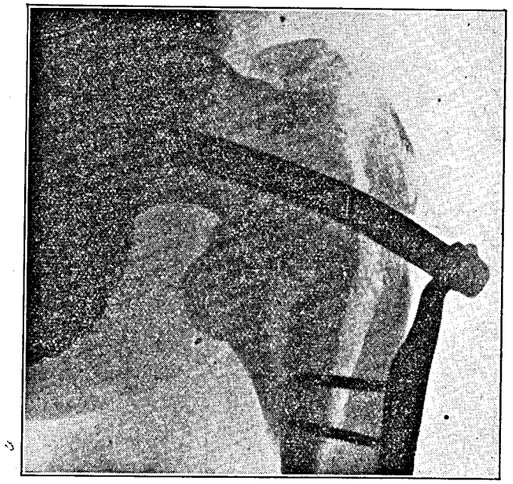


FIG. 1.—Radiograph on twelfth post-operative day, showing bent nail.

TABLE III.—*Complications*

Hospital deaths	2 shock, 1 heart failure, 1 liver failure, 1 unknown
Wound infection	6 (slight), all healed
Wound haematoma	3, all healed
Femoral vein thrombosis	1
Pressure sores, heel	4 (small), all healed
Chest infections	1 bronchopneumonia
Nail complications	2 bent, 2 penetrated head; 1 loose nut
Incontinence of urine	4
Deformity	9 (angle less than 120 degrees), with definite varus

One patient aged 42 developed a painful and stiff hip and knee after operation. She has not improved since, and in her case the result is assessed as poor; no cause,



FIG. 2.—Radiograph showing fracture with considerable displacement, also osteoarthritis of hip.

however, has been found for this. Of seven patients who complained of pain in the hip and/or knee, three had similar symptoms before their injury, due to pre-existing osteoarthritis and/or rheumatoid arthritis. Figs. 2 and 3 show the result before and after treatment of a fracture



FIG. 3.—Same case as in Fig. 2. Radiograph two months after operation, showing a satisfactory femoral angle and callus formation.

with considerable displacement, and associated with osteoarthritis of the hip.

Five patients died within a week of operation—two of them from post-operative shock. Operation in one of them, aged 86, was technically difficult owing to extreme density of the bone, and the operation time was long (3½ hours). The patient dying from liver failure was on dicoumarol for a femoral vein thrombosis, and it is possible that this was the cause of death. This case has, however, been regarded as a post-operative death. In one case with wound infection the whole wound gaped after the removal of the stitches. Healing occurred after a secondary suture despite mild wound infection. One patient, after return to work as an aircraft fitter, complained that the metal in his femur caused a magnetic compass deviation of 7 degrees. After some months the metal became "degaussed" and ceased to have any effect. Urinary incontinence was a troublesome complication, as it considerably increased the risk of wound infection.

In two cases the nail penetrated the head some weeks after operation. The nail and plate were removed after union and the final function in both cases was fair, with 90 degrees of hip flexion. The only deformity which

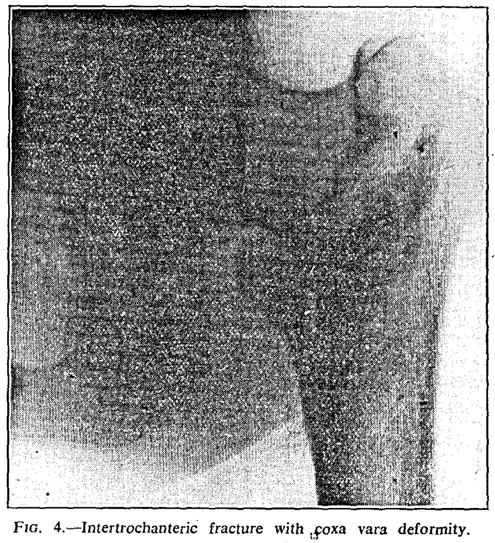


FIG. 4.—Intertrochanteric fracture with coxa vara deformity.

occurred was coxa vara (Figs. 4 and 5)—in nine cases the angle was less than 120 degrees, this giving rise to measurable shortening. In one case the nut loosened several turns, but did not come right off.

In one case the nail bent and was removed. This patient can flex her hip to 90 degrees, has 1-in. shortening, and gets some pain in the hip. She is able to walk short distances and the result has been assessed as fair. One nail bent after five days in bed with no weight-bearing at all. In another case union was unusually rapid, considerable callus being present at five weeks, as shown in a radiograph. She began weight-bearing at this stage.

Assessment in patients of 70 years of age is difficult, as some already had limited function before injury (Table IV). If they return to this state of activity, then the result is good. Two patients classified under "good" fall into this

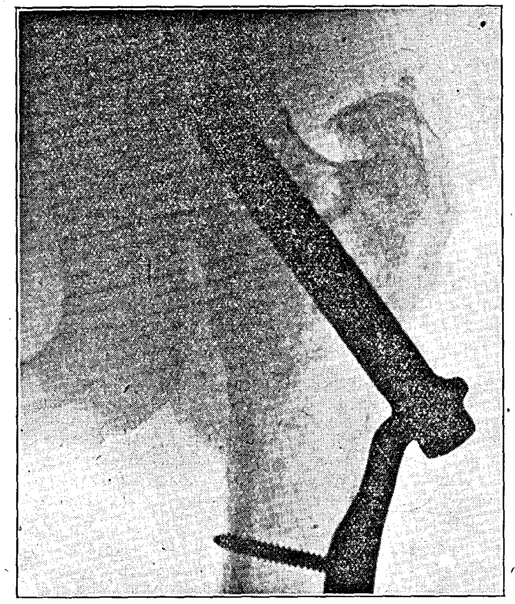


FIG. 5.—Same fracture as in Fig. 4 three months after operation.

category; one had rheumatoid arthritis and the other was 88 years of age. Some cases classed as fair on account of shortening had excellent function; one such patient walked 8 miles at the age of 62. In Table V comparison is made with results obtained by other workers.

TABLE IV.—*Final Assessment in 28 Surviving Cases*

Result	Cases	Remarks
Good ..	17 (60·7%)	Can walk at least 1 mile or as far as before injury. Hip movements more than 90 degrees. No real hip or knee pain. Shortening less than ½ in.
Fair ..	9 (32·1%)	Can walk up to half a mile. Hip movements more than 60 degrees. Shortening less than 1½ in. Only slight hip or knee pain
Poor ..	2 (7·1%)	Unable to walk; pain ++. Stiff knee and/or hip

TABLE V.—*Results Compared With Other Series*

	No. of Cases	Mortality	Hospital Stay	Weight-bearing
Cleveland ..	95	12·6%	57 days	Not stated
Hammond ..	45	21%	Not stated	4 months
Evans	22	0	49 days	Not stated
Arden and Walley	37	12·5%	37 ,,	11 weeks

Conclusions

We are of the opinion that operative treatment of these fractures offers the following advantages: (*a*) early ambulation; (*b*) greater subjective comfort for the patient; (*c*) fewer general complications; (*d*) shorter hospital stay; (*e*) an earlier return to normal function. We do not consider that the mortality was lowered or that a more accurate reduction was maintained. These two factors might be improved with modification of the method used.

Suggested Modifications.—More blood transfusion at operation to control shock. Modification of the nail-plate: (i) four fins to prevent bending of nail; (ii) a single Egge-type slot in the plate to encourage early union; (iii) a serrated spring compression washer or lock nut to prevent the nut becoming loose, and thus prevent a varus deformity.

Summary

A selected series of 37 intertrochanteric fractures treated by internal fixation have been reviewed.

We are of the opinion that the advantages offered by this method should encourage its use in the great majority of cases of this fracture, but not as a routine.

Certain nail complications are mentioned, and modifications of the nail-plate are suggested.

REFERENCES

Brittain, H. A. (1942). *British Medical Journal*, **1**, 463.
Cleveland, M., Bosworth, D. M., and Thompson, F. R. (1947). *J. Bone Jt Surg.*, **29**, 1049.
Evans, E. M. (1949). Ibid., **31B**, 190.
Hammond, G. (1948). *Penn. med. J.*, **51**, 759.
Murray, R. C., and Frew, J. F. M. (1949). *J. Bone Jt Surg.*, **31B**, 204.

ACUTE POISONING WITH POTASSIUM BICHROMATE

BY

C. N. PARTINGTON, M.B., Ch.B., D.C.P.

Deputy Director, County Laboratory, Dorchester

Inorganic chemical poisoning is to-day probably the rarest form of food-poisoning, and therefore is likely to be overlooked. Accidental poisoning through taking potassium bichromate by mouth must be rare; few records are reported by Taylor (1934) or Glaister (1938). The apparent ease with which it occurred in the following cases illustrates that chemical poisoning must always be considered in patients presenting with unexplained acute gastro-enteritis.

Case Histories

Two people were taken suddenly ill with severe abdominal pain and vomiting 10 minutes after eating porridge. Diarrhoea occurred soon afterwards. The patients were initially distressed, but shortly after the symptoms abated they appeared little the worse for their experiences, and there have been no sequelae. The medical practitioner had noticed a blueness of their skin, and, with the history given, decided to seek advice, submitting a sample of the oatmeal for examination. On close questioning, one of the patients remarked that the supernatant fluid of the cooked oatmeal was bright yellow.

Examination of the Oatmeal.—The oatmeal (crushed oats) was seen to contain small red-orange particles. These were not evenly distributed throughout—one jar contained several, and another jar a few. The particles were crystalline and dissolved readily in water, giving a yellow solution. The oatmeal was further examined for mites, rancidity, and bacterial contamination, all with negative results. It was thought that the crystals could be those of potassium bichromate, and tests were undertaken to prove this. (1) The solution of the crystals released iodine from potassium iodide. (2) The weak solution gave a rose-pink solution with silver nitrate. (3) The dilute solution, acidified with sulphuric acid and sulphurous acid then added, produced a green colour. (4) A similar effect to No. 3 was produced by substituting alcohol for sulphurous acid and then warming the mixture. (5) The solution, acidified with sulphuric acid and treated with hydrogen peroxide, produced a blue colour due to the formation of perchromic acid;

on shaking with ether the blue colour could be transferred to the ether layer. (6) The acid solution formed a soluble magenta-coloured compound with diphenylcarbazide. Tests 5 and 6 were found to be the most sensitive.

Urine.—On routine testing of a specimen of urine from one of the victims a trace of albumin was found.

Test 6, which appeared to be the most sensitive test for chromium, was negative, but it was noted that, by using controlled urines, considerable quantities of chromium must be present before the above tests were positive. This is not an unusual finding in testing for some radicals in the presence of organic matter.

Source of Contamination.—Assurance is given that it did not occur in the victims' home. The package of oatmeal had travelled from Scotland to the South of England by parcel post, and it was known that it was necessary to repack it at a post office in Southern England, for a Post Office damage slip was affixed. With the above results and the possibility of legal proceedings, a sample was submitted for confirmation of the findings to Dr. J. H. Hamence, an expert analyst, who reported: "Potassium bichromate present to the extent of 0.25%."

Discussion

Fatalities following potassium bichromate poisoning, usually suicidal, are not uncommon, and Leschke (1934, p. 85) refers to a fatal case of suicidal poisoning in which a woman aged 21 took 15 g. of the substance. Taylor (1934, p. 548) records that the death of a woman aged 21 occurred in hospital about 24 hours after she drank 7 g. of potassium bichromate, which she had been incorrectly advised to try as a cure for neuralgia. Leschke (1934, p. 84) stated that 0.5 g. of potassium bichromate can cause serious symptoms of intoxication.

The early features are sore throat, vomiting, and diarrhoea. The urine frequently contains albumin and blood, and cases of only moderate severity may develop anuria with nitrogen retention, in spite of which the blood pressure remains abnormally low. Nervous symptoms, headache, stiffness of the back of the neck, and cramps are described. Haemorrhages into the intestinal tract, bronchi, and serous cavities may occur in severe cases. It is possible that these haemorrhages may be the outcome of a uraemia. It would seem that symptoms need not be proportional to the amount of potassium bichromate consumed, as the probable vomiting, and the time of its onset, must modify the amount of poison retained.

Sore throat was not a complaint in the cases described above. A trace of albumin was present in the urine, but there were no other features suggesting renal damage. The blue colour of the skin noticed by the practitioner in these cases is described (Taylor, 1934, p. 546) as a feature in some cases of potassium bichromate poisoning. The history of acute gastro-enteritis within so short a time of partaking of food (10 minutes) strongly suggests chemical poisoning. Staphylococcal food-poisoning is the form of bacterial food-poisoning with similar symptoms. Such cases, however, are typified by vomiting, diarrhoea, and acute prostration within two and a half to three hours, and are associated with well-recognized incriminating defects in the preparation of the food. The incidence, too, is much greater after certain foods, and excessively rare after oatmeal stored dry and eaten hot immediately after cooking.

Summary

Two cases of acute gastro-enteritis following food-poisoning by oatmeal contaminated with potassium bichromate are described. The features of chemical food-poisoning as compared with bacterial poisoning are mentioned, and the place of chemical food-poisoning in acute gastro-enteritis is considered.

Thanks are due to Dr. J. Hamence for his expert opinion, and to Dr. H. F. G. Hensel, who was first consulted by the patients.

REFERENCES

Glaister, J. (1938). *Medical Jurisprudence and Toxicology*, 6th ed. Edinburgh.
Leschke, E. (1934). *Clinical Toxicology*. London.
Taylor's *Principles and Practice of Medical Jurisprudence*, 1934, edited by S. Smith, 9th ed., vol. 2. London.

Medical Memoranda

Dysgerminoma of the Ovary

The term "dysgerminoma" is applied to a type of solid ovarian carcinoma the histology of which is identical with that of a seminoma of the testis. The following is a report of two cases.

CASE 1

The patient, a girl aged 16, complained of feeling tired and of a lump in the right axilla. She had been told that "her tummy was sticking out." She had never menstruated. Examination revealed a large abdominal tumour and a firm gland in the right axilla. A radiograph of the chest was clear.

In March, 1947, a biopsy of the axillary gland was performed. Its centre was completely necrotic, and on section a few malignant cells were seen in one of the lymph sinuses, but it was not possible to make an exact diagnosis. A week later the abdomen was explored and a right-sided ovarian tumour attached to a long pedicle was found. There was some malignant infiltration of the pelvic floor and of the left side of the posterior abdominal wall. One or two enlarged glands were found in the mesentery. The tumour was removed by ligating and dividing the pedicle, and the abdomen was closed. The specimen measured 14 by 6 by 6 cm. and on microscopy was seen to be a dysgerminoma. In April the patient was given a course of *x*-ray treatment to the pelvic region and was discharged apparently quite well.

In December, 1947, a mass of secondary glands developed in the epigastrium. After *x*-ray treatment it regressed completely. In September, 1948, a mass of malignant glands developed in the left posterior triangle of the neck. A further course of *x* rays caused this to resolve. In March, 1949, a mass appeared in the central abdomen and left iliac fossa. With further *x* rays this disappeared. When last seen (October, 1949) the patient was very fit. She is, however, small and sexually infantile.

CASE 2

A girl aged 9 was admitted in April, 1949, six hours after she had been struck on the abdomen whilst playing. She had had severe epigastric pain and had vomited three times.

On admission the pain had largely passed off. A large mobile tumour was palpable in the lower abdomen. One pole of the tumour was tender. As her acute symptoms had disappeared, she was kept under observation and two days later laparotomy was performed.

An encapsulated tumour was found attached to a long pedicle arising from the left ovarian region. The ovary was incorporated in the medial aspect of the pedicle, but the growth was separate from it. The growth was removed by cutting across the pedicle, the ovary being left behind. One pole of the tumour was contused, presumably as a result of the injury. The growth was 14 by 9 by 6 cm. in size and on section was found to be a dysgerminoma.

The patient made an uneventful recovery from the operation and was seen from time to time in the out-patient department. Early in June she appeared perfectly well, but gave a history of an attack of colicky pain which had subsided spontaneously. Examination revealed nothing abnormal and she was told to report again in two months. However, she did not attend, and inquiries revealed that during July she had developed increasing abdominal distension and had died, presumably from metastases.

COMMENT

Case 1 is of interest in that it demonstrates the well-known radio-sensitivity of dysgerminomata. In spite of metastases when the patient was first seen, the disease was under control two-and-a-half years later.

Case 2 occurred in a patient comparatively young for this disease, though there have been several cases recorded in younger children. Russell (1938) reported a case in a child of 4 and McNally (1945) one in a child of 5. Novak's (1946) youngest patient was 6.

A few other extra-ovarian dysgerminomata have been reported, and, while the occurrence of the growth in such sites may be due to nests of embryonic tissue remaining behind during the course of development, it could also be explained by metastatic spread from a minute primary tumour. In Case 2 there did not seem to be any primary ovarian tumour.

The accepted treatment for localized dysgerminomata is excision of the affected tube and ovary, as recurrence in the other ovary is rare. Most authorities advise irradiation afterwards only if recurrence occurs, since it is obviously undesirable completely to destroy the patient's ovarian function, as the disease occurs in the young and the growth is usually of moderate malignancy only. The history of Case 2, however, suggests that this may not always be the wisest course. For those of adult age with hypoplasia genitalis there is obviously no objection to giving *x*-ray treatment post-operatively as a routine, nor is there when bilateral growths have been removed. Where metastases are present *x*-ray therapy gives comparatively good results, especially when one considers the poor prognosis of malignant disease arising in the young.

These cases were admitted under the care of Mr. Victor Riddell (who performed the operation on the first case) and Mr. M. F. Nicholls, and my thanks are due to them and to Mr. J. Jackson Richmond, to whom Case 1 was sent for *x*-ray treatment.

J. A. S. GREEN, F.R.C.S.

REFERENCES

McNally, P. A. (1945). *J. Obstet. Gynaec. Brit. Emp.*, **52**, 193.
Novak, E. (1946). *Gynecological and Obstetrical Pathology*. Saunders, Philadelphia.
Russell, P. M. G. (1938). *J. Obstet. Gynaec. Brit. Emp.*, **45**, 258.

Low Oesophageal Perforation at Gastroscopy

Low perforation of the oesophagus with the flexible gastroscope is extremely rare (Schindler, 1950). The present case may therefore be of interest. It was the 320th of an otherwise uneventful series.

CASE REPORT

The patient was a wheelwright of 40 years, and of sthenic habitus. In about 1929 a gastro-enterostomy had been performed for pyloric stenosis. Since then he had been in good general health until six months before the gastroscopy, when high epigastric pain returned for two weeks. After a remission of four months a similar pain once more recurred, midline in site and passing through to the back. It was associated with epigastric fullness and belching half-way through a meal. The pain reached its maximum three hours after food; it also occurred nocturnally. There was no vomiting, no melaena, and no marked change in weight. His general condition called for no comment, his haemoglobin being 100% and a barium meal showing a well-functioning stoma and no evidence of ulceration. A stomal ulcer or persistent duodenal ulcer was, however, suspected.

Gastroscopy was attempted at 10.30 a.m. on April 13, 1949 (by C. F. J. C.), using a Hermon Taylor type with rubber "finger-tip." Premedication consisted of "pethidine" 100 mg. with scopolamine 1/150 gr. (0.4 mg.) intramuscularly one hour beforehand; at 10 a.m. a Ryle's tube was passed and the patient given a tablet of "decicain" 50 mg. to suck. The instrument passed easily for over three-quarters of the distance, the patient showing no signs of distress. For about five minutes efforts were made by inflation, by flexion of the gastroscope, and by minor adjustments of the degree of extension of the head to obtain a field of vision, but none was forthcoming. During this period the patient, on being questioned, indicated that he was comfortable. The instrument was then withdrawn: there was a smear of blood on the rubber finger-tip.

At about noon the patient began to complain of increasing chest pain, by 2 p.m. he was very shocked and in great distress—sweating profusely, pale, restless, and with a thready pulse. His general and mental condition recalled the clinical picture of a recent coronary thrombosis. The pain appeared to be chiefly substernal, radiating to the back, up to the neck, and down to the left hypochondrium. There was marked epigastric tenderness and rigidity. In the left supraclavicular fossa surgical emphysema was visible and palpable, confirming our fears that instrumental perforation had taken place. Pressure over the sternum caused pain.

The abdominal pain with unyielding abdominal muscles suggested that the injury was a low one and probably close to the diaphragm. An *x*-ray film was taken in the erect posture, and no air could be seen under the cupolae, but the mediastinum was spongy with air bubbles, presumably pumped in at gastroscopy. A second film was taken after a small barium swallow (which enhanced the substernal pain): this showed an extravasation of the opaque medium just above the diaphragm into the mediastinal tissues on the right side. Operation revealed a ragged perforation in the gullet large enough to admit a fountain-pen, and about 1 in. from the diaphragm. The gullet wall at this point was thin and papery. There was no haematoma or other sign of injury, suggesting that the end of the gastroscope had temporarily stretched this point just on the diaphragmatic hiatus, piercing it, and had then been withdrawn. The tear was sutured, and the patient made a good recovery, but on the eighth day it became evident that a fistula had formed between gullet and operation track. The patient began to decline and died on the 26th day.

At necropsy the oesophagus showed a rent 1 in. (2.5 cm.) long on its antero-lateral aspect, at a point ¾ in. (1.9 cm.) above the diaphragm. The edges had separated and there was little sign of repair. On the anterior surface of the stomach 1 in. above the site of the previous gastro-jejunostomy was a recent perforation, ¼ in. across, of a chronic peptic ulcer. The splenic flexure of the colon, the tail of the pancreas, the hilum of the spleen, and the upper pole of the left kidney were tightly bound to one another and the stomach by dense fibrous tissue, in places almost 1 in. thick. This had abolished their mobility, and had bent and distorted the cardiac orifice of the stomach; which explained why the gastroscope had been unable to pass beyond the oesophagus.

COMMENT

(1) Pathological immobility of the oesophagus or cardia in the region of the diaphragm adds to the inherent risks of gastroscopy, and, if possible, its presence and degree should be assessed before instrumentation. (2) A "barium swallow" is of assistance in locating the site of an oesophageal perforation. (3) It seems evident that the tear would not in this case have healed under a conservative regime.

C. F. J. CROPPER, F.R.C.P.Ed.,
Senior Physician, Ronkswood Hospital.
P. HOUGHTON, F.R.C.S.,
Senior Surgeon, Ronkswood Hospital.
P. KIDD, M.B., B.Ch.,
Pathologist, Worcester Royal Infirmary.

REFERENCE

Schindler, R. (1950). *Gastroscopy*, p. 92. University of Chicago Press.

Reviews

MODERN OBSTETRICS AND GYNAECOLOGY

Modern Trends in Obstetrics and Gynaecology. Edited by Kenneth Bowes, M.D., M.S.(Lond.), M.B., Ch.B.(Liverpool), F.R.C.S. (Pp. 778; 139 figures. £3.) London: Butterworth and Co. 1950.

The editor of this book states in the preface that "the wealth of anatomical and physiological and other researches on fundamental problems of gynaecology and obstetrics which have appeared in the last 15 years makes it necessary for a book on the lines of progress in these subjects to include chapters from contributors who are not engaged in clinical work in them." Thus 12 of the 50 chapters are written by non-clinicians, and they are probably the most interesting, since they contain much that will be new to the gynaecologist unless he is in the habit of reading the anatomical and physiological journals. They are on such subjects as the early stages of human development, both normal and abnormal, foetal physiology, and the most recent work on pituitary trophins and steroid hormones. There is also a chapter on lactational physiology and the use of radio-isotopes in research. All these chapters are interesting, and they show how the advances in scientific technique can open up new fields of knowledge in clinical obstetrics They should be read especially by the younger gynaecologists, some of whom might be stimulated to take an active part in work of this kind or at least to have a closer link with the physiologist. It is interesting also to see chapters on statistics and psychological and social factors. These chapters leave many questions unanswered and point to the need for further research on all these subjects.

Of those chapters on clinical subjects, many give great practical help in the management of cases of diabetes or tuberculosis in pregnancy, anuria, the rhesus factor, endocrine disorders, or venous thrombosis. Many of the others give a detailed and accurate account of the present postgraduate teaching on the subject without contributing anything very original. They also contain extensive bibliographies which should prove most useful to the serious student. Some of the others are not nearly detailed enough for a work of this kind. But with such a large number of contributors a uniformly high level could hardly be expected, especially in the clinical field.

Mr. Bowes is to be congratulated in covering such a comprehensive field and striking a happy balance between the clinical and scientific approach. This book will do much to widen the horizon of the clinician. The high standard of production, clear type, and excellent illustrations combine to make an attractive volume which should be a useful addition to the clinician's library.

DUGALD BAIRD.

OPHTHALMOLOGY

Principles of Ophthalmology. By Thomson Henderson, M.D. (Pp. 230; illustrated. £1.) London: William Heinemann Medical Books. 1950.

This small book is a résumé of the author's ophthalmological writings and in a sense is an epitome of his work on glaucoma, which appeared in 1910. The first part is a study of the comparative anatomy of the mammalian eye with special reference to its asymmetry; this contains much useful anatomical information. The second part is a summary of the author's equally useful and well-known studies of the mammalian angle of the anterior chamber, including descriptions of the sclerosis which occurs in this region with age. The third part is a study of the mechanism of accommodation, and the remainder of the book is on the physiology of the intra-ocular circulation and the intra-ocular pressure, with their pathological implications. Henderson maintains his old thesis that the intra-ocular pressure is identical with the intracranial, being normally under 10 mm. Hg, and claims that the exit of the aqueous humour is (apparently solely) through the suprachoroidal space. Glaucoma is due to the blockage of the passages between the anterior chamber and this space, either by sclerosis of the cribriform ligament (primary glaucoma) or by post-inflammatory changes (secondary glaucoma), and consequently the most effective treatment for all types of this disease is a cyclodialysis. A difficult subject is thus much simplified.

The parts of the book giving the facts of comparative anatomy are useful, but the sections on physiology should be read critically, for seldom will there be found so many sweeping conclusions based on premises so slender and sometimes of questionable validity. There is a refreshing air of dogmatism throughout which is frightening to the experienced reader and perhaps dangerous to the inexperienced. Thus axial myopia is due to a giving-way of a weak sclera in an unhealthy child with lowered vitality: this is an unarguable fact propounded with the utmost confidence. In many places the reasoning is difficult to follow. Thus the exit of the aqueous through the suprachoroidal space is said to be proved by three considerations: the necessity to ensure pressure equilibrium on either side of the retina, the existence of the interspaces of the cribriform ligament, and the clinical occurrence of the resorption of a hyphaema or hypopyon. The canal of Schlemm is dismissed as superfluous as an exit—and this even though anyone may observe the outflow of the intra-ocular fluid in the aqueous veins which drain this canal.

STEWART DUKE-ELDER.

APPLIED CHEMISTRY

Thorpe's Dictionary of Applied Chemistry. Volume 10, 4th edition, revised and enlarged. (Pp. 913; illustrated. £5.) London: Longmans, Green and Co. 1950.

The present volume of this well-known publication runs from "plagioclase," disposed of in one line as "a soda lime felspar," to "sodium," which, standing on its dignity as one of the most important elements in the chemical calendar, declines to be dismissed in fewer than 92 pages. The scope and variety of the contents are well illustrated by the opening monographs on plant pigments, plasticizers, plastics, platinum, plum, and podophyllum. Adversity proverbially makes strange bedfellows, but no stranger than does *Thorpe's Dictionary*. Few of the articles are directly related to medical subjects.

The major articles are masterly condensations by writers (who have themselves experience in these fields) on subjects to which several published monographs may already have been devoted. Reference is made to these for more detailed information and also to other articles in the *Dictionary* itself on important compounds about which individual monographs have appeared in other volumes.

After informative articles on polyacids, porphyrins, potassium, pottery, powder metallurgy, and proteins, there are important monographs on the chemistry of some of the more formidable heterocyclic rings—pterins, purines, pyrazine, pyrazole, pyridine, and pyrimidine. These useful articles are academic in nature, though many of the compounds referred to are of industrial importance, and are replete with the particular form of ideograph peculiar to the organic chemist at his most truculent. The spell is broken by a more general article on pyrotechny, suitable for young chemists of all ages. Articles on radioactivity and radium reflect the expansion of interest in these subjects, as does that on the separation of rare earths.

The value and importance of rubber are shown by the 86 pages on this subject, in which sources, processing, and vulcanization are discussed, as well as chemical constitutions of the material in its raw and processed forms. The same article includes an account of the various forms of synthetic rubber and compares and contrasts the source materials and methods of manufacture. Silicones, silver, smoke, and soap, including synthetic detergents, form an industrial crescendo reaching fortissimo at sodium, with which the volume ends.

In addition to the major articles, many of which have been mentioned as an indication of the contents of this volume, there are a large number of smaller monographs on less important topics and items included solely for cross reference to other articles in order that the information given on them should not be missed.

B. A. HEMS.

CHILDBIRTH AND MOTHERHOOD

Introduction to Motherhood. By Grantly Dick Read, M.A., M.D. (Pp. 92; illustrations. 6s.). London: William Heinemann Medical Books. 1950.

When in the early 'thirties Dr. Grantly Dick Read introduced his method of "natural childbirth" the medical public was sceptical if not hostile. On the other hand, many women were quick to appreciate that he had what for them was a new message; this is not the first example of the laity leading the medical profession. The demand for physiological childbirth, at first a ripple, is now a tidal wave. Those who still refuse to heed it should seriously ask themselves whether they are not failing in their service to the community.

As with other ideas that have originated in this country it has needed American organization and enthusiasm to put them over and convince the world of their practical advantages. The "Read" system for the conduct of pregnancy and labour has been in operation in certain obstetric centres in the U.S.A.—notably that associated with Yale University and the name of Dr. Herbert Thoms. Reports have been published to show that antenatal preparation (more important is the attitude of the attendants in the delivery room) can help to make childbirth an exhilarating experience.

In this small book, intended for those contemplating marriage and parenthood, the author explains in simple language what motherhood involves. As would be expected, he has described the emotional aspects of pregnancy and labour. There are four phases during the act of birth when the emotions may gain the upper hand and disrupt the harmony of the natural process. By being forewarned a woman will recognize these changes as milestones in the course of labour to be passed with a feeling of achievement. The exercises, simply and clearly illustrated, can be practised without any special instruction, and the labour position is one which should be more widely adopted in this country. No medical author has been so extensively read by laymen as Dr. Dick Read, and it is safe to predict that this latest book of his will be appreciated by a wide public.

W. C. W. NIXON.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Principles of Public Health Administration. By J. J. Hanlon, M.S., M.D., M.P.H. (Pp. 506. 42s.) London: Henry Kimpton. 1950.

Eyes and Industry. By H. S. Kuhn, M.D. 2nd ed. (Pp. 378. 60s.) London: Henry Kimpton. 1950.

Favourite Prescriptions. Edited by Sir Heneage Ogilvie, K.B.E., D.M., M.Ch., F.R.C.S., and W. A. R. Thomson, M.D. (Pp. 76. 4s.) London: The Practitioner. 1950.

Principles and Practice of Surgery. By J. K. Berman, A.B., M.D., F.A.C.S. (Pp. 1,378. 105s.) London: Henry Kimpton. 1950.

Psychology: Principles and Applications. By M. E. Madigan, Ph.D. (Pp. 403. 30s.) London: Henry Kimpton. 1950.

Pain and Its Problems. Edited by Sir Heneage Ogilvie, K.B.E., D.M., M.Ch., F.R.C.S., and W. A. R. Thomson, M.D. The Practitioner Handbooks. (Pp. 194. 12s. 6d.) London: Eyre and Spottiswoode. 1950.

Rest and Pain. By J. Hilton, F.R.S., F.R.C.S. Edited by E. W. Walls, M.D., Ch.B., B.Sc., and E. E. Philipp, M.A., M.B., B.Chir., M.R.C.S., M.R.C.O.G. (Pp. 503. 25s.) London: G. Bell. 1950.

Der Muskelstoffwechsel des Herzens. By H. H. Schumann, M.D. (Pp. 150. M. 14.50.) Darmstadt: Dietrich Steinkopff; London: George Pulman. 1950.

Tumeurs du Foie. By B. Ninard. Text and illustrations. (Pp. 792. No price.) Paris: Librairie le François. 1950.

Introducción a la Metòdica Functional para el Diagnòstico Médicoforense. By Professor E. G. Morales. (Pp. 81. No price.) Barcelona: Byp. 1950.

Patología del Riñón Cardíaco. By Dr. J. P. Redondo. (Pp. 77. No price.) Barcelona: Byp. 1950.

Patologia, Parassitologia ed Igiene dei Paesi Caldi. By Professor M. Giordano. Vols. 1 and 2. 3rd ed. (Pp. 1,623. 12,000 lire for the two vols.) Rocca San Casciano: Cappelli. 1950.

Tumores Ovaricos. By J. M. Bedoya Gonzalez. (Pp. 222. No price.) Madrid: Biblioteca de "Acta Ginecologica." 1950.

La Terapia Antibiotica in Dermatologia, Venereologia, Sifilografia. By J. Cappelli and others. (Pp. 334. No price.) Florence: Soc. Editrice Universitaria. 1950.

Ergebnisse der Chirurgie und Orthopädie. Edited by K. H. Bauer. 36th volume. (Pp. 480. No price.) Berlin: Springer. 1950.

Fortschritte auf dem Gebiet der Kreislauferkrankungen. By various authors. (Pp. 91. M. 9.) Darmstadt: Dietrich Steinkopff.

The Design of Toxicity Tests, by Dr. W. L. M. Perry (Medical Research Council Special Report Series, No. 270; H.M.S.O. 1950, 1s. 6d.), is a 50-page booklet which discusses the best kinds of observation to make in assays of hormones, vitamins, drugs, etc., in the light of recent advances in statistics, and as such is addressed primarily to those with the requisite mathematical knowledge. The relative accuracy of the different methods is estimated, and the author points out that, using the same number of animals in both cases, a graded response toxicity assay is four times more sensitive than a quantal ("all-or-none") response.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY NOVEMBER 11 1950

THE CHEMOTHERAPY OF TUBERCULOSIS

We publish in the opening pages of this issue a full report of the Medical Research Council's investigation into the effects of treating pulmonary tuberculosis with streptomycin and *p*-aminosalicylic acid (P.A.S.). This substance, introduced by Lehmann as a chemotherapeutic agent in its own right, has come to be regarded more as an adjunct to treatment with streptomycin, not only for such synergic effect as the two drugs exert but more particularly because P.A.S. appears to prevent the development of bacillary resistance to streptomycin. So strongly did the early results of the M.R.C. investigation support this conclusion—which had also been reached on the basis of extensive studies in the U.S.A.—that a preliminary report on the advantages of combined therapy was issued nearly a year ago.[1] The present report gives the full results to date and analyses them in detail.

Comment in the U.S.A. on the conduct of this trial, despite its scale being smaller than that of its American counterpart, has been very flattering, and the present report will command the same respect. The trial has been conducted under the most rigorous conditions, of which not the least important is the narrow and precise definition of the type of disease accepted for treatment. This definition, continued from the earlier trial of the effects of streptomycin alone,[2] is such, and has been so adhered to, that the controls treated by bed rest alone in the earlier trial form a comparable group to those in the present one. It was considered to be no longer justifiable to have such a control group in the present series, and the 166 patients were allotted by a random method to three treatment groups, one receiving P.A.S. alone (20 g. daily), one streptomycin alone (1 g. daily in a single dose), and the third receiving both treatments—the duration of the course in all groups being three months. After a further observation period of the same length the uniform records kept at the 10 hospitals taking part in the trial were sent to the M.R.C. Tuberculosis Research Unit for independent assessment and analysis. It will be seen that all possible data indicating the course of the disease have been subjected to the most careful assessment, and only the main conclusions will be referred to here. P.A.S. alone had an unquestionably beneficial effect. The percentages of the patients in this group dying or showing radiological deterioration during the trial were respectively 3 and 7, whereas in the original control group they were 27 and 34. On the other hand, patients receiving streptomycin only did better: they more often showed radiological improvement and more often became sputum-negative. In the combined treatment group clinical improvement was somewhat more definite: the sedimentation rate fell more rapidly than in either of the other two groups. and the proportion of patients becoming sputum-negative was higher. But the main difference was in the development of bacillary resistance to streptomycin. Whereas this was found in 70% of cases receiving streptomycin only, the highest percentage reached in the combined treatment group was only 9. The effect of P.A.S. in preventing the development of bacillary resistance is thus amply confirmed, and the authors of the report appear to take the view that its main function is simply to enable streptomycin to continue to exert a therapeutic effect for a longer period.

It is interesting to compare these findings with those recently reported from the U.S.A. in connexion with the vast study organized by the Veterans' Administration. Some of the most notable are those reported by Hughes[3] in 560 cases treated at the Fitzsimons General Hospital. Denver. The standard dose of P.A.S. in the U.S.A. is only 12 g. daily, and the main group of patients receiving combined treatment have been given 1 or 2 g. of streptomycin not daily but only every three days. Among 102 patients so treated the percentage developing bacillary resistance after 120 days was *nil*. This astonishing fact finds some counterpart in the behaviour of bacilli on these "intermittent regimens" without P.A.S. A daily dose of streptomycin continued for 120 days leads to bacillary resistance in over 70% of cases, but when the drug is given every three days the percentage is only 33. Since other reports suggest that intermittent treatment gives good clinical results, there seems to be a strong case for reducing the frequency of streptomycin administration. The latest information from Denver also indicates that, although streptomycin treatment can well be intermittent, that of P.A.S. must be continuous.[4] In a large group of patients to whom both drugs were given only every third day, those whose treatment has continued for over 90 days are yielding bacilli resistant to streptomycin with increasing frequency after that stage. This regimen is therefore likely to be abandoned.

It must not be supposed that P.A.S. alone has no place in the treatment of pulmonary tuberculosis. Its beneficial effect has been demonstrated not only in the M.R.C. trial described here but in a carefully controlled trial in Sweden,[5] where cases of different types and grades of severity were treated. Unless any of the newer

[1] *British Medical Journal*, 1949, **2**, 1521.
[2] Ibid., 1948, **2**, 769.
[3] Trans. Ninth Streptomycin Conference, April, 1950. Veterans' Administration, Washington, D.C.
[4] Quarterly Progress Report, Streptomycin Committee, October, 1950. Veterans' Administration, Washington, D.C.
[5] *Amer. Rev. Tuberc.*, 1950, **61**, 597.
[6] *Schweiz. med. Wschr.*, 1950, **80**, 375.

antibiotics and other chemotherapeutic agents now being tested prove more effective than present indications suggest, P.A.S. will remain the principal standby for streptomycin-resistant cases. There is something to be said for using it, certainly in preference to streptomycin, in early cases with a good prognosis. Whether combined treatment is justifiable in such patients is discussed at the end of the report we publish to-day. A reasonable attitude toward the two drugs and their respective functions is that adopted by von Leitner and Masson,[6] of Leysin, who have recounted at some length their experiences in the treatment of 73 cases with P.A.S. In their view this drug is not only useful in relatively favourable cases but should form the basic treatment in more severe ones. Streptomycin, on the other hand, is a weapon to be used in a crisis, whether for an acute exacerbation or in preparation for operation. Merely to use it indiscriminately may be to throw away a trump card needed at a later stage. Despite the very welcome findings in trials with combined treatment, this is an attitude towards streptomycin which it would perhaps be unwise to abandon altogether.

TRANSFUSION AND VIRAL HEPATITIS

The amount of blood now being used for transfusions either as plasma, serum, or whole blood is very large. In the June quarter of this year a total of 250,000 donors gave their blood, and, according to the Ministry of Health, there are some 388,000 registered donors. A varying proportion of donors of blood, possibly as high as 0.5%, carry in their blood stream a virus which is destined to cause hepatitis in some of those transfused, and the wider use of blood and blood products has been accompanied by a rising incidence of viral hepatitis. In some reported series the incidence of hepatitis after the injection of plasma has been as high as 16%.[1] At present there is no means of telling who are carriers of the hepatitis viruses, nor who are likely to suffer from hepatitis as a result of inoculation with these viruses. In addition, it is now well recognized that many patients suffering from hepatitis due to inoculation with blood and its products do not necessarily become jaundiced and their hepatitis may thus remain undiagnosed. Cases of fatal liver cirrhosis are now being recognized in patients who were inoculated as long as six years previously with an icterogenic serum which at the time gave rise to no apparent disability. Niels Svith[2] has recently reviewed the evidence for hepatitis without jaundice. At present there is no way of inactivating the hepatitis viruses in serum or plasma, much less in whole blood. In 1944 Oliphant[3] claimed that irradiation of human serum with ultra-violet light inactivated the hepatitis viruses, and this was apparently confirmed by Oliphant and Hollaender,[4] and by Blanchard and his colleagues.[5] MacCallum,[6] however, using a less refined technique for irradiation, found that even with the inoculation of very small doses complete protection could not be guaranteed by the use of irradiated serum, for 1 of 10 volunteers developed hepatitis after receiving the serum. As a result of the claims that it was possible thus to destroy any hepatitis virus which might be present in the blood stream without damaging the blood proteins, all the commercial serum and plasma available in America has been exposed to ultra-violet light, in accordance with the requirements of the National Institute of Health.[7]

There is now unequivocal evidence that exposure to ultra-violet light does not destroy hepatitis viruses in the serum or plasma. Rosenthal, Bassen, and Michael[8] describe two cases in which jaundice appeared 106 and 120 days after the intravenous infusion of ultra-violet irradiated plasma. A third case is of some interest. A man who had been operated on for removal of the prostate by a one-stage operation received 500 ml. of whole blood, and 71 days later he developed hepatitis. The blood used for transfusion was obtained from a donor who had received several infusions of irradiated plasma. Barnett and his colleagues[9] similarly describe three cases of hepatitis, two of which were fatal, after transfusion with irradiated human plasma. The symptoms developed 43, 47, and 56 days after transfusion. James and his colleagues[10] record a larger series. Thirty persons were transfused with one batch of commercial irradiated human plasma. Ten of these patients died in from 1 to 33 days after the transfusion from the illness for which the transfusion had been given. Of the remaining 20 patients, 12 are known to have developed hepatitis. And with another batch of irradiated plasma 1 out of 5 recipients has so far developed hepatitis. In these cases the incubation period has varied from 48 to 108 days. It is thus obvious that ultra-violet irradiation of serum or plasma does not inactivate the hepatitis viruses (the procedure was, of course, always inapplicable to whole blood).

It has been suggested that nitrogen mustard may be used to destroy these viruses: this compound is known to inactivate certain viruses when present in blood, but there is no direct evidence that it has this effect on hepatitis viruses. In addition, it is questionable whether intravenous injections of nitrogen mustard could always be safely given to seriously ill persons. Since there is at present no simple, fool-proof method of destroying hepatitis viruses in serum or plasma, much less in whole

[1] Havens, W. P., *Penn. med. J.*, 1949, **52**, 1653.
[2] *Hepatitis uden Ikterus: nogle kliniske Iagttagelser*, 1950, Ribe, Copenhagen.
[3] *Bull. N.Y. Acad. Med.*, 1944, **20**, 429.
[4] *Publ. Hlth Rep., Wash.*, 1946, **61**, 598.
[5] *J. Amer. med. Ass.*, 1948, **138**, 341.
[6] *Proc. R. Soc. Med.*, 1946, **39**, 655.
[7] *Minimum Requirements: Normal Human Plasma* (6th revision), 1949, Federal Security Agency, National Institute of Health, Bethesda, Md.
[8] *J. Amer. med. Ass.*, 1950, **144**, 224.
[9] Ibid., 1950, **144**, 226.
[10] Ibid., 1950, **144**, 228.

blood, other steps must be taken to reduce the incidence of a condition which may cause very serious illness if not death. In the first place it ought to be seriously considered whether so many injections of plasma are really necessary. Before the war transfusions were comparatively rarely given except when essential to save life: now there is in some quarters a tendency to give injections of plasma merely to "make sure." In fact the consumption of blood is fifty times what it was in 1938. There might be a little more hesitation in giving transfusions if it were fully realized that every patient who is given a transfusion lies under the threat of hepatitis, acute liver necrosis, and possibly cirrhosis. When transfusions are absolutely necessary the use of either salt-poor human albumin or gamma globulin may have to be considered. If these substances are unavailable, then it is essential that very small pools of plasma should be used, possibly from not more than five donors. No person who has ever knowingly suffered from infective hepatitis should ever become a donor, and, since during an epidemic of infective hepatitis there are many cases without jaundice, blood should not be collected in areas where an outbreak is occurring or has occurred during the previous six months. It follows from this that there is a strong case for making infective hepatitis notifiable.

BERNARD SHAW

When Bernard Shaw talked to a medical audience in the kind of way familiar to those who have read his preface to *The Doctor's Dilemma* they usually greeted his more preposterous statements with enthusiastic laughter. Whatever case he had against doctors lost much of its force and point by—to the medical mind—absurd overstatement made, it would seem, for effect, and by such inaccuracies as, "Microbes are so fond of carbolic oil that they swarm in it." Salvarsan, according to Shaw, "combined mercury with arsenic."

When discussing medical matters he coupled a supreme disregard for fact with a dogmatism that exceeded the dogmatism he condemned in the doctor, and he knew only too well that ridicule is often a more effective weapon than argument: "A surgeon named Lister had just brains enough for the crude germ theory." Part of his case against the medical profession was based on the violence of his feelings about vivisection. "I would rather swear fifty lies than take an animal who had licked my hand in good fellowship and torture it." And so strongly did he feel, that he went to the ridiculous limit of saying that "one of the reasons why radiography was not discovered sooner was that the men whose business it was to discover new clinical methods were coarsening and stupefying themselves with the sensual villainies and cut-throat's casuistries of vivisection." No wonder Rebecca West said of Shaw that "when he talks about science he makes a noise like a Los Angeles yogi."

It is a good thing for any profession from time to time to be stung out of its complacency. But Shaw, it may be argued, spoilt so much of his case by displaying his ignorance of medicine that what was to the point was often lost or ignored or forgotten. For example, he criticized with justice and accuracy the neglect by medicine of statistics and talked of the need for the control experiment when this was for the most part ignored by the clinical research worker. He saw, too, that the conditions of practice (at the time he wrote *The Doctor's Dilemma*) were in many respects unsatisfactory. He saw the practising doctor as "an emergency man" whose "pay is wretched." "The real woes of the doctor," Shaw wrote, "are the shabby coat, the wolf at the door, the tyranny of ignorant patients, the work-day of 24 hours, and the uselessness of honestly prescribing what most of the patients really need: that is, not medicine but money." Behind his mockery and ridicule there was a passion for order and a hatred of poverty, and an impatience with imperfection that made him lambaste those he liked. When he referred to the reproaches of those who accused him of making "angels" of the medical men in *The Doctor's Dilemma* he said: "But I did not go beyond the warrant of my own experience."

The contemporary world has put him as a playwright in the ranks of the immortals. Medical men and women—apart from how they may react to him as a dramatist—will think of him with alternating moods of irritation and affection. That he stirs up both emotions may show that he has done us more good than we are willing to admit.

ANKYLOSING SPONDYLITIS

Although ankylosing spondylitis is a well-defined entity, generally easy to diagnose and successfully treated by deep *x* rays, delay in diagnosis is unfortunately still common and the general recognition of the value of *x*-ray therapy is tardy. Mowbray, Latner, and Middlemiss[1] in a clinical, radiological, and biochemical study of 137 cases have emphasized the features which make the diagnosis of ankylosing spondylitis easy and have confirmed by the results of their treatment with deep *x* rays how beneficial and even curative that treatment may be.

Ankylosing spondylitis predominates in males and begins most often in the twenties. The disease may progress rapidly after its onset, though at times it may pursue a slow course and may even remain dormant, only to break into activity at a later age. It nearly always begins in the sacro-iliac joints and extends from there along the spine. In exceptional cases only a segment of the spine may be affected at first, so that radiologically normal sacro-iliac joints are not certain proof of freedom from the disease, as Hart and his colleagues have shown.[2] From the sacro-iliac joints and spine the arthritic changes extend to the adjacent joints—namely, the costo-vertebral joints and the hip- and shoulder-joints—but extension to the more peripheral joints is rare. In the pelvis new bone formation in the muscle attachments to the ischial tuberosities may appear, and Saville[3] has found involvement of the manubrio-sternal synchondrosis in almost three-quarters of his cases. Clinically the advanced case is unmistakable. Rounded kyphosis of the rigid spine may give the patient a "teapot-handle" attitude, and such cases are long past redemption. In the early stages backache or pain in the buttock may be the only complaint. On examination stiffness of the lumbar spine may be found, and if limitation of chest expansion is also observed it only remains to confirm the diagnosis by *x*-ray examination of the sacro-iliac joints. But even with good chest movement a painful, stiff lumbar spine in a young adult male without neurological signs should at once suggest the possible diagnosis of ankylosing spondylitis. Attacks of iritis occasionally occur in the course of the disease.

The earliest radiological change is a marginal decalcification causing an apparent increase of the joint space. Areas of erosion of the joint surface follow, and this change is accompanied by an osteoblastic reaction, with sclerosis beyond the eroded areas. This characteristic combination of irregular erosion and adjacent sclerosis is best and earliest seen in the sacro-iliac joints. Eventually bony trabeculae extend across the joint, and solid bony fusion results. Davison and his colleagues[4] found a tendency to greater excretion of 17-ketosteroids in cases of ankylosing spondylitis, but Mowbray, Latner, and Middlemiss and Hart and his colleagues in their biochemical investigations have found the 17-ketosteroid excretion to be normal; nor have they found any positive serum-flocculation reactions such as have been described by Carter and Maclagan[5] in rheumatoid arthritis. From every point of view ankylosing spondylitis is distinct from rheumatoid arthritis.

Early and accurate diagnosis of ankylosing spondylitis is important because of the beneficial effect which deep *x*-ray therapy has on the course of the disease. Scott,[6] who was one of the pioneers in this work, advocated wide-field application of deep *x* rays in homoeopathic doses. Others have not been able to confirm his results, and most radiotherapists now administer about 2,000 r over a period of three weeks in doses on alternate days. It is usually sufficient to treat only the areas of active disease, though McWhirter[7] advocates treatment of the whole spine. Some early cases seem to be permanently cured, and in most cases the patient may be rendered free of pain and the disease arrested for long periods. Relapses sometimes occur, but are usually amenable to further *x*-ray therapy; they are generally due to extension of the disease to an untreated area. Cases occasionally may be resistant to treatment, and for them Hart and his co-workers suggest that fresh blood transfusion is beneficial. All other forms of treatment are second in importance to *x*-ray therapy. Exercises to maintain or increase mobility should be given, and breathing exercises to improve the limited chest expansion are particularly important. Immobilization in any form with the object of arresting the disease is to be condemned, for it leads only to a stiff joint. If kyphosis is developing, a back support may be given, though these patients, who are generally very thin, do not take kindly to such appliances. If the hip-joints are stiff, arthroplasty may be done, though the results have proved relatively disappointing. But if there is complete fusion of the hip-joints an arthroplasty, though it may give only a 30-degrees range of movement, can enable a patient to resume a more active life. Of recent years osteotomy of the spine has been undertaken for severe kyphosis, as Smith-Petersen has described,[8] but it is to be hoped that earlier diagnosis and appropriate treatment will diminish the number of cases requiring such drastic surgery.

[1] *Quart. J. Med.*, 1949, **18**, 187.
[2] Ibid., 1949, **18**, 217.
[3] Paper read at the British Orthopaedic Association Meeting, April, 1950 (see *British Medical Journal*, 1950, **1**, 1264).
[4] *J. clin. Endocrinol.*, 1947, **7**, 201.
[5] *British Medical Journal*, 1946, **2**, 80.
[6] *A Monograph on Ankylosing Spondylitis*, London. 1942.
[7] *Brit. J. Radiol.*, 1945, **18**, 302.
[8] *J. Bone Jt Surg.*, 1945, **27**, 1.

EDUCATION AND MEDICINE

In spite of the fact that the Moran, Goodenough, and Cohen committees have all deplored the launching of boys and girls into the narrow stream of medical education at an increasingly early age, the process still continues. Dr. L. Birley, the headmaster of Eton, has recently spoken on the subject of medical education at a meeting of the Section of Medicine at the Royal Society of Medicine (reported in the *Journal* of November 4, p. 1053), and he made it quite clear that headmasters were not in favour of such early specialization. He described the first M.B. examination as "a very difficult and exceedingly tiresome problem," and he did little to hide his own poor opinion of its suitability as a test for boys and girls still at school. One intelligent boy's failure to pass the biology section of the first M.B. he ascribed to the boy's inability to suppress a wide range of interests, with the result that "he had not really tackled the subject of biology in a way which would have been most efficacious for the first M.B. examination." This is surely a most scathing comment. Of course Dr. Birley was not speaking against the examination as such, but against the system which forces schoolchildren to take it before they can become medical students at a university or medical school. Under the same system the boy or girl who is up to scholarship standard in classics, history, or modern languages is finding it increasingly difficult to obtain permission to study medicine at some universities. At Cambridge, for instance, Dr. Birley states that the medical faculty have quite definitely abandoned any idea of giving tuition for the first M.B. examination. On the other hand, there are some hospital medical schools which students taking the premedical course find it easier to enter than those taking the preclinical course A writer in *The Times Educational Supplement* has recently stated that students who have obtained a Higher School Certificate with exemption from first M.B. may fail to gain admission to a medical school.

Most school teachers would agree that the wide range of learning which lies open to inquiring minds usually becomes visible and inviting some time between the ages of 16 and 18. Medical students should not necessarily be drawn only from those who answer the invitation by applying

themselves to a closer study of the behaviour of matter, nor should those who are not going to be scientists have the perquisite of avoiding the study of science. As Sir Henry Cohen said, when speaking after Dr. Birley at the R.S.M. meeting, it was important not only that the medical student of the future should have a general cultural background but that in this increasingly scientific age such a background (which naturally included science) should be afforded to the general community. It is of course true that the student who feels the lack of the cultural background which should have been painted in for him at school will seek it, and usually obtain it, at the university, medical school, or even hospital, as Dr. D. McI. Johnson recently testified in this *Journal*. For this reason there is much to be said for the practice at Liverpool University which Sir Henry Cohen described. Here first-year medical students who have obtained exemption from one or more parts of the first M.B. examination can choose to attend any university course they like—history, logic, psychology, etc.—while also studying the premedical subject or subjects in which they had not reached a sufficient standard at school.

To arguments about medical education there is no end. But in the long run what is taught matters less than those who learn and those who teach. It may be a counsel of perfection, but there should be no difficulty in training good doctors if the same care was taken to select students as the Admiralty takes to select naval officers and if all teaching was given—in schools, universities, and hospitals—by those who could inspire as well as instruct.

HOSPITAL THREATENED

For some months the Kingston and Malden Victoria Hospital has been in conflict with the South-west Metropolitan Regional Hospital Board over the use to which the hospital is to be put, and matters came to a head recently when the board declared that no patients were to be admitted to the hospital after October 31. This notice to clear out was received at the hospital only twelve days previously. The decision seems to have been taken against the wishes of all the general practitioners there, members of the public, the borough councils of Kingston and Malden, and the intentions of the Minister of Health. The general practitioners on the staff have done well to secure wide publicity for their protest.

The Victoria Hospital has 44 beds, to which 26 of the local general practitioners have access. It is unusually well planned, all the departments, with the exception of the children's ward, being on the ground floor, and it has an excellent operating theatre, *x*-ray equipment, and out-patient department. The pride of the local doctors and populace, it has become the envy of the regional board. In May last year the board's review committee proposed that the hospital should cease to be staffed by general practitioners and should become a gynaecological unit for the Kingston General Hospital, which stands hard by. The scheme would provide more orthopaedic facilities at the General Hospital. The review committee consisted of a physician and a surgeon from two towns on the south coast and a pathologist at Kingston. Subsequently the Victoria Hospital was offered in exchange clinical assistantships at the General Hospital and alternative accommodation at the Surbiton Annexe. This place has 46 beds for the chronic sick, but the Victoria Hospital claims that it falls far short of the needs of a modern general-practitioner hospital, having no *x*-ray department, no facilities for surgical operations, no central heating, and inadequate nursing accommodation. In addition, though it has 46 beds for chronic cases, space could be found for only about 22 beds for the acute cases normally admitted to general-practitioner hospitals.

Regional boards have powers under the N.H.S. Act to change the use of hospitals, but these powers are delegated to them by the Minister of Health, and the boards are subject to his direction. The Minister expressed his views on the matter in Circular R.H.B. (49) 132.[1] He there warned regional boards "to guard against the feeling that local cottage hospitals are merely buildings to be used as additional accommodation for relieving pressure on beds at the district general hospital of the group." He emphasized the value of these cottage hospitals to the general-practitioner service of a district, as well as the important part they play in maintaining the level of general practice by giving opportunities for formal and informal consultation between general practitioners and consultants.

No doubt the South-west Metropolitan Regional Hospital Board is acting with the best intentions, though it has not been noticeably sensitive to local opinion. But the need for an extension of the General Hospital's services is said to be great, and the present scheme has been advanced as the most practicable of the various alternatives. A public meeting is being held on November 23. If this is decisively in favour of the Victoria Hospital continuing as a general-practitioner hospital, presumably the regional board would have to reconsider its decision.

MEDICAL CHARITIES

The financial relief of doctors in distress, and of their wives, widows, and children, is the province of the great medical charities, the chief of which are the Royal Medical Benevolent Fund and the Royal Medical Foundation of Epsom College. The R.M.B.F., on whose behalf Lord Webb-Johnson[2] recently appealed for Christmas gifts, is a general medical charity maintained entirely by the profession. By far the largest regular donor to these two charities is the Medical Insurance Agency, which for many years past has contributed all its profits to their funds. The object of the R.M.B.F. is to give prompt financial help to members of the profession and their dependants who through illness or misfortune are in need. In addition to the payment of grants and annuities, the R.M.B.F. makes provision for more personal services; through the Ladies' Guild, clothes and medical comforts for the sick are provided, and advice and personal help are available; visits are made to the homes of those who can be helped in this way. The Fund has opened a residential house where some of the more elderly beneficiaries may spend their last years in comfort and ease.

The Royal Medical Foundation of Epsom College also provides pensions for medical practitioners and their widows in reduced circumstances, but the Foundation's most notable work is in the field of education. There are some 50 Foundation Scholars, necessitous sons of doctors, who are educated and maintained at Epsom College free of all cost. A number of Council Exhibitions are also awarded to the sons of doctors, and through the St. Ann's Scholarships help is given towards the education of doctors' daughters. These scholarships and exhibitions are in addition to grants which are made towards the general support of needy families. Another charity which has as its object the assistance of doctors' children in their education is the Dain Fund, of which the annual report appears in this week's *Supplement* (p. 195).

Apart from the consequences of war—of which November 11 comes once more as a sad reminder—there are many other misfortunes which may befall a doctor or his family, and all these charities help in such cases. There are two funds, the Sir Charles Hastings Fund and the Christine Murrell Fund, devoted to the relief of temporary financial difficulty occurring at critical periods in a doctor's life. Both funds provide loans to doctors, to help at the start of their professional lives or to tide them over special troubles, and also occasionally to allow a medical student to complete his training if, through the death of his father, this would otherwise be impossible.

Lastly, with the surplus of the money subscribed for the Association's war memorial it is proposed to establish scholarships and bursaries to assist in the education of the children of doctors who gave their lives in the war of 1939–45.

At this time of year, with Christmas not far off, many will wish to give to these special medical charities. This may be done by sending donations either directly to the particular fund it is desired to support or to the B.M.A. Charities Trust Fund, which distributes its money to the several Funds according to their needs. Better than a single donation is a seven-year covenant, in which the donor undertakes to pay a fixed yearly sum to the charity of his choice for a period of seven years; this allows the charity to claim an income-tax rebate which nearly doubles the value of the donation at no increased cost to the donor. Covenant forms may be obtained from the secretaries of the individual charities or from the B.M.A. Charities Trust Fund at B.M.A. House.

ULTRASONIC IRRADIATION OF GALLSTONES

Although ultrasonic waves have been used to some extent in treatment, particularly in Germany, there is admitted to be a gap between "physico-technical knowledge" and knowledge of their mode of action on human and animal tissue.[1] Barth and von Sanden,[2] reviewing results in 1,000 cases, have been able to suggest no more satisfactory method for the assessment of dosage than that of ceasing treatment when pain is caused. It would seem, therefore, that this form of treatment must be regarded as empirical. There is an interest, none the less, in the experimental fragmentation of biliary calculi by ultrasonic waves, as described by Lamport, Newman, and Eichhorn[3] at the annual meeting of the American Physiological Society, for it is a reasonable expectation that any material which is at once rigid and brittle would suffer greater damage from rapidly alternating physical stresses than would body tissues which lack these qualities. Their first experiments were on human calculi, which were placed in water inside cellophane bags and there fragmented. The experiment was essentially physical in character, and little was learnt about therapeutic application. Later, however, the cellophane bags were replaced by exteriorized loops of rabbit intestine, filled with saline but with the blood supply intact. Approximately 80% of the calculi were fragmented during exposures of 10 seconds, and "no immediate change in the gut appeared." The later results have not yet been determined.

THE SECRETARY OF THE B.M.A.

At this year's Annual Meeting Dr. Charles Hill informed the Representative Body of his intention to place his resignation in the hands of the Council in view of the pressure of his Parliamentary work. Dr. Hill joined the staff of the Association as Assistant Secretary in 1932, was made Deputy Secretary in 1935, and succeeded the late Dr. G. C. Anderson as Secretary in 1944. During the war years he made a reputation as a successful broadcaster and became widely known to the general public as the "Radio Doctor." His desire to enter political life became manifest when he stood as an Independent for Cambridge University in the General Election of 1945. Failing to be elected, he was subsequently adopted as the combined National-Liberal-Conservative candidate for Luton, the Council of the B.M.A. giving him permission to stand while still acting as Secretary of the Association. He was returned as the successful candidate after a closely contested fight and after a political broadcast which caught the ear of a large public. His decision to resign from the secretaryship was received with the greatest regret by the Council of the Association and his many friends and colleagues in the medical profession, who will all wish him every success in the career to which he has decided to devote his immense energy and ability.

Dr. Angus Macrae, whom the Council of the Association has appointed as its new Secretary, is a graduate of Edinburgh University. Since he was appointed Assistant Secretary in 1935, Dr. Macrae has done much quiet and unobtrusive work as secretary to many of the Association's important committees. During the war he had much to do in connexion with the Central Medical War Committee, and after Dr. Anderson's death in 1944 his work with this committee increased greatly. Dr. Macrae brings to his important office high qualities of mind and an intellectual integrity which he has unreservedly put at the disposal of the Association during his 15 years of office.

The next session of the General Medical Council will open on Tuesday, November 28, at 2 p.m., when the President, Professor David Campbell, will take the chair and deliver an address.

[1] *British Medical Journal, Supplement*, 1949, **2**, 168.
[2] *British Medical Journal*, October 14, p. 887.

[1] Stuhlfauth, K., and Wuttge, K.-H., *Klin. Wschr.*, 1949, **27**, 662.
[2] *Dtsch. med. Wschr.*, 1950, **75**, 179.
[3] *Fed. Proc.*, 1950, **9**, 73.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

ENURESIS

BY

DOUGLAS HUBBLE, M.D., M.R.C.P.

Physician, Derbyshire Royal Infirmary, Derby City Hospital, and Derbyshire Hospital for Sick Children

Involuntary micturition is the normal infantile habit both by night and by day. Children should acquire day-time control in the second year, and during the third year the dry bed should also be achieved. If, in the absence of disease, repeated involuntary micturition occurs after the third year, then to this disorder of function the name enuresis is given. To this same symptom occurring in organic disease, whether in children or in adults, the description "incontinence of urine" is applied.

By its frequency alone, enuresis must be regarded as the most important disorder of function in childhood, and when the social consequences of bed-wetting are considered its importance as a potential disturber of development in childhood can hardly be exaggerated. Every family doctor is familiar with the unhappy story. Even in young children the failure to attain control of the bladder causes much distress to parents, and presents the child with a physical situation to which it has to make some mental adaptation. The mother's unhappiness is intensified by the washing of sheets and night-clothes—an unwelcome addition to her daily work. When the condition persists for a few years, as it often does, anxiety regarding the future is added to the depression concerning the present state.

Normal Control of Micturition

There is still uncertainty about the exact nature of the physiological control of micturition. In the automatic bladder of infancy and disease micturition is accomplished through the agency of a spinal reflex which causes relaxation of the sphincter followed by a mass contraction of the muscular coat of the bladder—the detrusor. In the adult the intravesical pressure is normally maintained at 15 ml. of water; as the bladder fills with urine this pressure is kept constant by relaxation of the detrusor. When the volume of urine exceeds a certain limit the pressure begins to rise, and at 18 ml. of water the impulse to micturate is recognized as a result of rhythmical bladder contractions. This impulse is inhibited, as Denny-Brown and Robertson showed in cystometric experiments on themselves, by cortical inhibition of the spinal reflexes. While the existence of this cortical inhibition is certain, other investigators have suggested that, in addition, cortical impulses will promote detrusor activity, while others report that stimulation of higher centres will cause relaxation of the bladder.

In cystometry the bladder is slowly filled through a urethral catheter attached to a manometer on which the intravesical pressure is recorded. In the adult the desire to micturate occurs when the bladder contains about 3 oz. (85 ml.), and again at about 6 oz. (170 ml.), but this impulse can be overcome by deep breathing and is not accompanied by a rise of pressure. As the bladder is increasingly filled the need becomes urgent and eventually cortical inhibition is overcome and involuntary micturition occurs. In the adult the impulse to micturate at these levels is inhibited by cortical impulses, but in the infant this cortical control is only slowly developed.

Ellison Nash describes four stages in this progress: the automatic bladder of infancy; the small bladder of increasing capacity in which the impulse to void is still uninhibited (high-tension, uninhibited); the bladder which will hold 3 oz. or more, but in which the impulse is still succeeded by micturition (low-tension, uninhibited); and the "adult" bladder in which the contractions are inhibited by cortical activity (low-tension, inhibited). In the cystometric investigation of a large number of children suffering from functional enuresis, Nash found that nearly half of them showed the normal adult pattern, while the remainder fell in the other three groups. The only conclusion one can draw from this is that, while the bladder control in these children, as tested by cystometry, may show evidence of physiological retardation or regression, it may, on the other hand, be indistinguishable from that of normal persons, whether children or adults.

Incidence of Enuresis

The incidence of enuresis is variously estimated as being between 5 and 15% in the child population. If the higher figure is accepted, it must include children who are occasional and intermittent bed-wetters; if the lower figure, then it includes only those whose enuresis is unremitting for long periods. Most observers agree that boys are somewhat more often afflicted than girls, while children of all classes suffer from it. Enuresis may persist into adult life, but there is a tendency to spontaneous cure towards adolescence. There are no reliable figures for the incidence of enuresis amongst adults, but it is certainly less than 1%.

History and Examination

Children suffering from enuresis can immediately be separated into two groups—those whose bed-wetting has persisted from infancy, and those in whom nocturnal control of micturition had been completely established but in whom, at a later age, regression to an infantile habit has occurred. From published figures it may be assumed that about one in every three or four children brought to the family doctor on account of enuresis has for some reason relapsed from a state of adequate control. In many children there is no complaint of day-time disturbance of micturition, but in about one-third of them questioning will reveal that bladder control is not perfect by day. The most common symptom is frequency, the next urgency, and in some actual day-time enuresis occurs. Children in this group have been described as having "irritable bladders." Physical abnormalities in these children should be sought for, but when found they should not be too easily assumed to have aetiological significance. Thirty years ago some authorities regarded the presence of threadworms or of spina bifida occulta as a pathogenetic factor. To-day they are held to be of no aetiological importance. Incontinence of faeces occurs occasionally in children who have enuresis.

Children suffering from enuresis should pass their urine in a free stream; if, from the mother's account, there is a possibility that they suffer from dribbling incontinence, they should be watched while micturating and suprapubic palpation and pressure should be applied after micturition. If a clean specimen of urine contains pus cells, then a catheter specimen must be obtained; if this, too, contains pus cells a complete urological investigation must be made.

The genitalia should be closely inspected and abnormalities noted. Evidence of skin inflammation and mucous membrane hyperaemia is not infrequent in chronic enuretics. There are some who maintain that such changes precede the enuresis or at least provide adequate reason for its persistence. Most observers, however, regard these changes as secondary and not causal. To describe an area of hyperaemia in the urethra or bladder-neck as urethritis or trigonitis (in the absence of pyuria) is as outmoded as to believe that hyperaemic gastric mucosa deserves the description of gastritis. Adhesions around the corona or the clitoris have been thought to be significant by a few clinicians.

Children who suffer from nocturnal enuresis are said to sleep deeply. This observation was first made by Trousseau, and most parents can be persuaded to agree with him. It should be said, however, that we have no index for profundity of sleep, and that most young children, whether bed-wetters or not, are awakened with difficulty.

History-taking should include an account of the child's physical development and mental growth. His psychological adjustments to his parents, siblings, companions, and teachers should be inquired into, and his performance at work and play assessed. The nature of his progressive adaptation to his disorder is important. Special consideration should be given to the personality of the parents, particularly of the mother. With American children it is thought that excessive emphasis by an over-anxious or obsessional mother on the early acquisition of a continent habit is the commonest cause of enuresis in children. Evidence of a similar sort may sometimes be obtained in this country. Conversely, in overcrowded homes and with negligent mothers, early training may occasionally be shown to have been defective. Parents whose personalities are not unusually deviated and who have an unequivocal affection for their children are not likely to harm them either by apparent neglect or by overemphasis on training. The occurrence of other manifestations of instability—negativism, temper-tantrums, masturbation, habit-spasms, day-dreaming, nail-biting, and stammering—is not infrequent. F. G. Still pointed out that acquired enuresis occurs most commonly in children aged from 5 to 8 years—at a time when such functional nervous disorders as habit-spasm and stuttering are apt to appear.

When the enuresis is acquired an opportunity arises to get an answer to one of Halliday's famous questions, "Why he took ill when he did." The answer usually lies in one of the normal stresses of childhood—an illness, an operation, the birth of a sibling, the temporary or permanent loss of a loved one, and so on. When the incapacitating environmental situation is disclosed the interest shifts to an attempt to discover why this particular form of somatic expression was chosen. Has the child shown any previous instability of bladder control? Did the parents or other relatives suffer from enuresis? A history of enuresis of some degree in the father or mother will be obtained in more than one-third of all cases. The mother of an enuretic child told me recently that she had wet the bed until she was 18 years old, that her brother had been in trouble while in the Army for the same reason, and that her mother had been enuretic when married.

Differential Diagnosis

If enuresis is defined as a functional disorder of micturition, then an obligation is laid upon both family doctor and paediatrician to exclude organic disease in all patients presenting with urinary incontinence. Fortunately, routine history-taking, physical examination, and microscopy of the urine are sufficient to reveal those conditions which will require further investigation.

If the enuresis is acquired, then general disorders such as diabetes insipidus, diabetes mellitus, chronic nephritis, epilepsy, and disease of the spinal cord must be remembered and excluded. Petit mal may be accompanied by diurnal incontinence, but the story of the transient attacks of unconsciousness is not easily missed. Urinary infection is an occasional cause of acquired incontinence, and it requires continuous investigation until its aetiology and cure are established. When enuresis has persisted from infancy, whether intermittently or persistently, then organic disease of the brain such as a mental defect, with or without paresis, should be excluded. Enuresis is not more common in children with defective intelligence than in those with normal cerebration. Braithwaite found that the intelligence quotient in 60 enuretic children was of normal range. In enuresis which has persisted for many years, however, the percentage of persons with a low I.Q. is increased, and in such cases this must be regarded as a finding of aetiological significance.

The most important differential diagnosis is a lesion of the urinary tract. Much valuable work in the elucidation of these conditions has been done in recent years by urologists, and by their warning writings they have made those who treat enuresis in children suitably aware of the diagnostic problem. The actual incidence of these surgical conditions presenting as urinary incontinence is variously estimated. The urologists describe it as 10% of all cases of enuresis—this is certainly a much higher incidence than will be found in patients presenting in the ordinary hospital out-patient department or in the consulting-room. The family doctor will not miss these cases if he will make certain of three facts: (1) that the child is not suffering from dribbling incontinence; (2) that the bladder cannot be palpated in the suprapubic region after the child has micturated; and (3) that there are no pus cells in the child's urine.

Aetiology

The aetiology of enuresis is both debatable and debated, and these controversies will not be continued here.

In a functional disorder with such an extraordinarily high incidence it is certain that multiple aetiological factors are at work; these should be considered under three heads—constitutional, environmental, and local.

The constitutional factor in enuresis is ill defined (nor has it been much elucidated by cystometry), but it may reasonably be assumed to reside in some instability of neuromuscular control. The frequent finding of enuresis in relatives seems to support the existence of a constitutional factor, though the possibility that this finding depends on an environmental association cannot be excluded.

That the environmental factor is often a psychological one is clear from the histories of children who revert to enuresis after being "dry." But the environmental situation in the second and third years is not easily determined in retrospect. A disorder of function such as enuresis that has lasted for months and years has inevitable results which encourage its persistence: on the one hand are the neurological factors implicit in chronic habituation, and on the other the emotional reactions which ensue both in parents and in children. The disorder persists long after the precipitating situation has disappeared and been forgotten.

It is possible that conditions giving rise to reflex irritation may occasionally precipitate enuresis; it does not seem reasonable or necessary to assume that they could continue

as direct causes over a number of months or years, nor does it seem reasonable to accept such conditions as a tight foreskin, threadworms, coronal and clitoral adhesions, or a hypertrophied verumontanum as relevant in pathogenesis.

Treatment and Prognosis

The weapons in the doctor's armoury for the control of enuresis have changed but little in the course of 30 years, and there is not much in the following description of treatment that would not have been familiar to F. G. Still. These weapons are (1) psychotherapy—suggestion, explanation, and encouragement; (2) bladder-training; and (3) drugs—belladonna, ephedrine, phenobarbitone, and amphetamine.

Psychotherapy.—The family doctor should exchange his physicianly scepticism for a surgical confidence in the potentialities of successful therapy. Parents and children must be persuaded out of a wearied and fatalistic acceptance of their unhappy situation. Anxiety must give place to confidence, and hope must cast out shame. While the personalities of mother and child should be assessed, no suggestion of blame should be attached to either. The child should be encouraged to make his own record of the dry nights, and a system of rewards may be usefully instituted. No recourse should be made to the psychotherapist unless the situation plainly demands it or unless the methods outlined here have failed. It must not be forgotten that there is a bad habit to be broken, and until it is removed a profoundly dysgenic situation remains. The symptom itself is the cause of a psychological disturbance more important than any which may have produced it, and the doctor's plain duty is to get rid of it. The battle against enuresis is a long one, and the doctor should play his cards one by one, always keeping a therapeutic trick up his sleeve.

Bladder-training.—The restriction of the child's intake of fluid has not been shown to have any therapeutic value, but since there is some evidence that polyuria occurs in these children they should, if not asleep, be made to micturate within an hour of going to bed. They should later be thoroughly awakened at the parents' bed-time and made to pass water. Micturition should be made a fully conscious act, and to put a stuporous child on the pot is to perpetuate a condition which one is seeking to alter. Older children and adults may be given an alarm-clock to waken them at some time between 10.30 p.m. and rising. A system of day-time training should be instituted in the holidays. The child should be sent to the lavatory at fixed but gradually increasing intervals, beginning at one hour and increasing the interval by a quarter of an hour every second day. If the child can hold its water for three-hour periods in the day, dryness at night is facilitated. This method is most successful in children with irritable bladders who have day-time frequency.

Drugs.—These are much more useful in therapy than some allow them to be. Sometimes they fail because they are casually and inefficiently applied. Suggestion is valuable in the control of enuresis, and since these remedies have a rational basis the physician's belief in their reasonableness will undeniably enhance their therapeutic powers. Drugs should be pushed to the limit of the child's tolerance before they are discarded. It is not uncommon to find that some children can tolerate a dose of 1–2 gr. (65–130 mg.) of ephedrine or 15–20 min (0.9–1.2 ml.) of belladonna. Ephedrine is the most successful drug; it reinforces the sphincteric action. Methyl ephedrine is more prolonged in its action than ephedrine and has fewer side-effects. For a child aged 5–10 years, ⅔ gr. (45 mg.) should to begin with be given in the morning, at tea-time, and at the parents' bed-time. Belladonna may be used at the same time (if ephedrine fails when given alone) and in increasing dosage until it produces dryness of the mouth or paralysis of accommodation, when the dose should be reduced. Phenobarbitone in doses of ¼ or ½ gr. (16 or 32 mg.) should be given to the nervous child who suffers from day-time frequency, together with ephedrine or belladonna. The child who is difficult to awaken may be given amphetamine, 2.5–10 mg., at bed-time, in order to lighten the depth of sleep. In some children ephedrine has a similar effect.

Associated conditions such as balanitis or vulvo-vaginitis should be treated whether or not they are thought to be affecting the enuresis. Stilboestrol in doses of 0.5–1 mg. given daily for two to three weeks is often effective in curing vaginitis. Enuresis should not be treated by circumcision. The occasional wet bed may be ignored, but a long relapse will require a fresh approach to the problem, with the institution of the old remedies and the introduction of new methods.

Chronic Enuresis

The measures outlined above may be expected to be successful in most cases of acquired or intermittent enuresis There will remain a number of children with chronic enuresis—possibly representing one-third of all cases—who are unaffected by such treatment. They should be removed if possible to the home of a relative prepared to tackle the problem, to a residential school, or to a special boarding-school. It has often been found that measures which failed at home can be successfully applied elsewhere. In the days when hospital beds could be found for such children most of them achieved dryness during their stay in hospital. During the war, when enuretic evacuee children constituted a widespread social problem, Miss A. M. Maynard reported from the Quedley Hospital, Haslemere, where these children were taken for treatment, that "almost every case has been cured temporarily, and many permanently." There is little doubt that six months in a residential school would be expected to cure most of those children whose enuresis cannot be controlled at home.

Recruiting board and Service experience has shown that a considerable number of enuretic children carry their disability into adult life. The problem in enuretic adults and in children with chronic enuresis is essentially the same, for in all adults with functional incontinence of urine the disorder has persisted since childhood. It is obvious that the longer a bad habit has persisted the more difficult it is to break, but to compensate for this difficulty there are positive factors which will facilitate successful therapy in chronic enuresis. For example, there should be present, even in persons with I.Q.s between 70 and 100, a greater wish to be cured. It is also possible to apply sterner disciplinary measures, such as the regular wakening through the night by alarm-clock. Davidson and Douglass* report favourably on an electric apparatus which wakens the patient by the ringing of a bell at the start of micturition when the bag on which he is lying becomes wet. The success of such a device, which may well be due partly to an increased confidence that there will be no soaking of the bed and partly to a natural distaste for being harshly called from sleep to get out of bed, to turn off a bell, to micturate, and to change a wet pad for a dry one, illuminates the nature of the mental processes which are perpetuating this disorder of function.

Ström-Olsen reports that amphetamine is very successful in the treatment of enuresis in adults. He emphasizes again that large doses may be required, varying from 10 to 30 mg. given at bed-time. Before any person is dubbed an incurable enuretic, almost any therapeutic method is justifiable, however fallacious its aetiological foundation. Such methods as the injection into the bladder of increasing quantities of fluid have been shown to be successful by some observers, and may well be tried before hope is abandoned. If all fails, the unfortunate is condemned in perpetuity to the nightly companionship of the mackintosh sheet and the rubber-bag urinal.

*British Medical Journal, 1950, 1, 1345.

EIGHTIETH BIRTHDAY OF DR. DAIN

Dr. Guy Dain celebrated his eightieth birthday on November 5. His outstanding services to the profession in administration and medical politics have earned the gratitude of medical men and women increasingly legislated upon by successive Governments in the last 40 years. Dr. Dain was early a shrewd counsellor and later the protagonist in the struggle waged by doctors to prevent their traditions and professional independence from being submerged in State bureaucracy. Though now playing a smaller part in B.M.A. affairs, his great experience is still often placed at the disposal of the Association, and he is a familiar figure at many committees.



By H. J. Whitlock, Birmingham

Born and educated in Birmingham, where he has been in general practice all his life, Dr. Dain began his medico-political work when National Health Insurance was introduced in 1911, becoming a member of the first insurance committee and of the first panel committee. At that time his persuasiveness and tact did much to allay the hostility of many members of the insurance committee towards representatives of the medical profession. In 1917 he brought his knowledge of this work into the ambit of B.M.A. Headquarters when he became a member of the Insurance Acts Committee, of which he was chairman for 12 years. He also presided for five years over the annual conference of Local Medical and Panel Committees.

In 1936 he was awarded the Gold Medal of the Association for his services to the profession, though they were soon to be continued more strikingly. The following year he was elected to the chair of the Representative Body, which he filled at the Plymouth and Aberdeen meetings, and in 1943 he became Chairman of Council, holding that important office for six of the most stormy years through which the profession has ever passed.

Among other activities that he has packed into a busy life are his many years of service on the General Medical Council, to which he was first elected in 1934 as a direct representative of the medical practitioners of England and Wales, and his service on the Council of the Royal College of Surgeons as the general-practitioner representative: the College elected him an honorary Fellow in 1945.

The current interest—not only in this country—of hospital and health care on a regional basis has led to a revived demand from students of hospital administration and others for the *Interim Report on the Future Provision of Medical and Allied Services* (1920), commonly referred to as the Dawson Report. Since the *Report* has long been unobtainable from H.M. Stationery Office, King Edward's Hospital Fund for London has, with their permission, had a limited number reprinted. Copies may be obtained on application to the Fund at 10, Old Jewry, London, E.C.2.

PUBLIC HEALTH IN WESTERN UNION COUNTRIES

A CHADWICK TRUST LECTURE

A Chadwick Trust lecture was given at Westminster Medical School on October 24 by Dr. NEVILLE M. GOODMAN, a senior medical officer of the Ministry of Health, on public health administration in the countries—Belgium, France, Luxembourg, and the Netherlands—whose Governments, with the Government of Great Britain, signed in 1948 the treaty of economic, social, and cultural co-operation. Under that treaty a permanent commission with a small secretariat was set up in London, with committees of experts in various subjects, one of them public health administration, and it was as a member of that committee that Dr. Goodman recently visited the four countries in order to gain a general picture of their developments in this field.

National Outlooks on Administration

Dr. Goodman said that perhaps a distinction between the French and Belgian attitude towards administration and the British attitude was that France and Belgium regarded administration as a science and Great Britain regarded it as an art. The French and Belgian approach was logical though sometimes not very practical; the British approach was practical but nearly always illogical. The British put emphasis on personnel, the French on the proper definition of positions and functions. Again, the Dutch tradition of individual and local self-reliance and effort had fostered the conservation of voluntary effort in public health and other fields. The French and Belgian systems owed much to the Napoleonic concepts of administrative law and centralization. The British tradition of sanitary reform, as essentially a matter for local authorities, had fixed the broad lines of our public health system on a local basis.

In Luxembourg public health administration was entirely centralized. Its Minister of Health performed many duties which would be undertaken by the permanent head of the department in other countries. The medical director had no medical assistants except the director of a laboratory. He dealt with epidemiology, State hospitals for tuberculosis, mental health, and maternity services, and he was concerned with or advised on a great variety of other questions. He carried out all the duties which the medical officer of health of an English county would carry out. The ability and energy of the present Minister went very far to make up for exiguous staffing. In Luxembourg the coal and iron industries had their own medical services. All doctors were trained outside the country; 70% of students were trained in France, 15% in Belgium, 10% in Switzerland, and a few went to Germany. Medical and pharmaceutical practice was supervised by a medical college.

Structure of Health Ministries

In France there was a Ministry of Public Health and Population, in Belgium a Ministry of Public Health and the Family, in Holland a Ministry of Social Service. The British was the earliest and most stable of these central public health administrations. All four Ministries had functions additional to health—in Great Britain housing and relations with local authorities which elsewhere were questions for the Ministry of the Interior; in France, the Ministry handled demography and emigration, but not social security. In Belgium the Health Ministry dealt with housing, physical education, and sport.

Dr. Goodman went on to point out various differences in structure and organization of the Ministries. In all the countries except the United Kingdom, doctors and other technical health staff were eligible for and in fact held technical positions on a level with non-technical administrators. The permanent head of the Ministry in each country was a doctor. A special and important feature peculiar to France, which dated from pre-revolutionary days, was a corps of general inspectors. There were nine of these, five of them doctors

and four administrators, all with equal status except that the senior acted as the head. They were appointed for life on the nomination of the Minister and had executive powers. They had been described as the eyes and ears of the Minister himself. Their duties included special missions—for example, to investigate a severe local epidemic of poliomyelitis or to go to a colony to unify its medical services with those of metropolitan France. Each year they conducted an inquiry into a subject of current importance; in 1948 they inquired into the organization of public assistance, and in 1949 into the care of abnormal children.

Varying Functions

The five special divisions in the French Ministry were concerned respectively with administration, public health and hospitals, social hygiene, pharmaceutical services, and population. In Belgium the Ministry had two general divisions, one serving hygiene, social medicine, the family and housing, and public assistance, and the other physical education and sport. In the Netherlands Ministry of Social Service there were two divisions, one dealing with national and international health, and the other with a miscellaneous group of functions. Great Britain differed widely from the others, one important difference being that the technical people were not intermingled with the others. In Great Britain a system of statutory advisory committees was a quite recent development, arising from the National Health Service. In the other three countries such committees were of great importance and of considerable age. In France there were three such bodies: the Académie de Médecine, the Conseil d'Hygiène (founded in 1903), and the more recent Conseil d'Hygiène Sociale. It was required that all three must be consulted on certain health matters.

In Belgium the two Royal Academies and the Conseil d'Hygiène covered nearly everything in the field of medicine. The Netherlands had a permanent commission with two directors.

Systems of Control and Discipline

Systems of control and discipline varied considerably in the different countries. In Great Britain the discipline of the medical profession was in the hands of the General Medical Council and to some extent the Royal Colleges. In France the creation of a guild of doctors was much discussed between the wars and was finally brought about in 1945. It was organized both on a departmental (regional) basis and at the national level. The regional committees had disciplinary powers ranging from the issue of a warning notice to removal from the *Register*; all their hearings were private. A code of ethics was instituted in 1947. In Belgium the system was similar to that obtaining in France, while in Holland it was somewhat like our own.

In local public health administration outside the central authority the difference between the other three countries and Great Britain could be summed up by saying that in the former the arm of the central authority was extended over the country in the shape of prefects; in the older and larger towns the medical officer of health was a State employee. The position was somewhat similar to that which obtained in the United Kingdom during the war when there were regional commissioners with their officers. The public health administrative units in France were the department (county) and the commune (municipality). As many of the departments in France were too small to have their own service there was a strong tendency to revert to the regional organization inaugurated by Marshal Pétain. In Belgium and Luxembourg the set-up was much the same. In Holland it was more like our own, and there was great scope for initiative. The major difference was the absence of the sanitary inspector. It was strange to find health visitors dealing with reported nuisances and bad housing. He felt that a health service without sanitary inspectors was like an army without sergeant majors.

To sum up, it could be said that in all four countries the actual work done was very similar. Perhaps the most striking difference between the other countries and Great Britain was in the status of the medical officer of health, who in this country was usually a whole-time specialist, but elsewhere was a local-authority employee only, as a rule, in the larger towns, where he was often a part-time clinician; in the rest of the country he was a civil servant.

Training of Public Health Officers

Time did not permit Dr. Goodman to make many comments on the hospital or specialist services. Maternity and child welfare and tuberculosis control in Belgium were almost entirely in the hands of national voluntary organizations, very heavily subsidized by the State but not controlled in any way.

With regard to the training of public health medical officers, the instruction of medical students was comparable in all four countries, though he had the impression that it was perhaps more thorough on the Continent than in at least some schools in Great Britain, where the amount of time devoted to public health varied greatly. In postgraduate instruction in public health there was, of course, in this country the training for the diploma, whereas in the other countries it was only quite recently that any uniformity had been achieved in the medical schools in this respect. In the Netherlands such postgraduate instruction was only beginning this year. On the other hand, the creation of a national school of public health in Paris in 1947, combined with the alarming fall in the number of D.P.H. students in this country since 1948, made it appear that we might be in danger of losing our long-standing lead in public health training.

In conclusion Dr. Goodman said that each of the Western Union countries had good and less good points in its public health system, and each had certainly something to learn from the others. The convergent development aimed at in Western Union countries by the Brussels Treaty could be achieved in public health only if they began by knowing something about the organization in the other countries.

Nova et Vetera

A MEDICAL CONTRACT FROM THE EIGHTEENTH CENTURY

A typical feature of the English Poor Law Administration of the eighteenth century was the system of "contracting" or "farming out the poor," as it used to be called. The contract was as a rule given by tender. The contractor undertook either the whole administration of the Poor Law for the parish or, more frequently, only parts of it—for example, the administration of the workhouse or the removal and transport of such paupers as did not belong to the parish in accordance with the Act of Settlement. Following this general pattern, churchwardens and overseers of the poor often made a contract with the local general practitioner for the medical treatment of the needy. These contracts, too, were often given by tender.

The appointed doctor became responsible either for all the poor living in the parish or only for those who belonged to the parish; in the latter case he could charge extra fees for the casuals. Some parishes paid per head or for services rendered. The contract usually included the provision of medicines; occasionally a special contract was made with the apothecary. The system of making contracts became popular because it was thought to offer an opportunity for reducing expenditure and cutting down the poor rate. The whole system, however, was bound to lead to frequent abuses, the medical contracts making no exception. Sidney and Beatrice Webb (1927) have described in detail the disadvantages and abuses of the system.

My attention has been drawn to a medical contract found among the parish records of Poulton-le-Fylde (near Blackpool) which runs as follows:

January 28, 1722/3

Agreed by Doctor Green of Doncaster and Nathaniel Cartmel, Overseer of the Poor of Poolton.

The said Doctor Green agrees to cure John Eves of a fistula and all other distempers.

The said Nath. Cartmel agrees for that cure to pay to the said Doctor Green two Guineas, one now in hand and the other when the cure is perfected.

Received January 28 1722/3 for the use above mentioned the sum of one pound one shilling by me.

(signed) EDWARD GREEN.

There is evidence to show that Dr. Green was an itinerant quack to whose repertory the curing of fistulas belonged. I am much obliged to Mr. G. S. Millner, chairman of the Preston Historical Society, for the following information. In 1695, one Edward Green from Yorkshire, apprentice to Roger Gately, surgeon, complained to the Justices of the Peace in Middlesex that his master did not teach him surgery, but, being a mountebank, "kept a public stage" and compelled him to be a "rope-dancer, tumbler, and jack-pudding." After a careful consideration the Justices discharged Green from his apprenticeship (Dowdell, 1932). This decision, being regarded as an important test case regarding apprentices bound to surgeons, was quoted in legal textbooks in the eighteenth century (Burn, 1780; Bott, 1793). According to Burn, Green, after his discharge, "set up the trade of mountebank himself." Among the Charity Papers of John Hornby (1643–1708), of Newton-with-Scales, near Kirkham, Lancashire, is a handbill from the end of the seventeenth or early part of the eighteenth century in which it is announced "that to this place [Preston or Kirkham] is come Edward Green of Doncaster, Operator and Oculist," who recommended himself for the cure of a long and colourful list of diseases such as "Cancers, Hairlips, Strangury, Spitting of Blood, Ague of all sorts, Dropsie, Greensickness, Scald-heads, Leprosie, Bloody-Flux, Fistulas, French Pox, Kings Evill, Scurvy, etc." Green stated proudly that he "had a stage erected in 1698 in the Famous University of Oxford." There seems to be little doubt that the Dr. Green mentioned in the contract in 1722 is identical with the mountebank Green.

One does not know whether or not medical contracts based on payment by result were frequently made. They were undoubtedly known for a long time. Hampson (1934) has reported three such contracts from Wisbech. In the first, made in 1597, one Henry Edmunds was promised "10/ yf he doe heale the said sore leg viz in hand 3/4; upon the lyking of the Healing 3/4; and upon the full Healing 3/4; and yf it be lyked well to give more." In 1678 it was agreed "that Mr. William Clarke shall have £3 for the curing of the Legg of old Bennit, and in case hee make a perfect Cure of it then to have it made up Five Pounds." The third contract, made in 1697, did not allow any payment in advance. It was agreed "Dr Daves to have three pounds for cureing Winterton of his Fits, out of which the said Mr Daves is to pay for all Medicines. Mr Daves to be paid three months after the Cure be perfected; if he make no cure to have nothing either for judgment or Medicines." Miss D. Marshall (1926) has reported a similar contract of the eighteenth century from Burton-on-Trent; in it no details are given about the condition to be cured. It is only stated: "At a vestry meeting it was agreed to give Mr. Gills the sum of £10 for the cure of Jacob Mosley the younger, in case he shall make him sound and well, so as to be able to work at his trade and get his living. No cure no pay. The money to be paid three months after he shall be reported cured."

There is no record to show whether Dr. Green succeeded with the cure of the fistula and received his second guinea. One case at least is recorded in which the money had to be given back. J. Hammond (1897) has quoted from the churchwarden's accounts of St. Austell (Cornwall) the following entry: "1709, By cash returned by Mrs. Burden for not curing Creppers head 1-1-0."

Professor Sigerist (1950) has recently pointed out that it has become necessary to extend the scope of research in medical history. Local history documents provide material for the study of the social background of medicine. This material has been little used so far by the medical historians.

A. FESSLER, M.D.

REFERENCES

Bott, E. (1793). *Decisions of the Court of King's Bench upon the Laws relating to the Poor*, 3rd ed. rev. by F. Const. London.
Burn, R. (1780). *The Justice of the Peace, and Parish Officer*, 14th ed. London.
Dowdell, E. G. (1932). *A Hundred Years of Quarter Sessions. The Government of Middlesex from 1660–1760.* Cambridge.
Hammond, J. (1897). *A Cornish Parish.* London. Quoted by D. Marshall (1926).
Hampson, E. M. (1934). *The Treatment of Poverty in Cambridgeshire, 1597–1834.* Cambridge.
Marshall, D. (1926). *The English Poor in the 18th Century.* London.
Sigerist, H. E. (1950). *British Medical Journal*, 1, 1424.
Webb, S. and B. (1927). *English Local Government: English Poor Law History: Part I.* The Old Poor Law. London.

Preparations and Appliances

AN AID TO INTUBATION

Dr. W. N. VELLACOTT, senior registrar, Department of Anaesthetics, West Middlesex Hospital, writes: One of the minor irritations which have beset me when intubating under direct vision has been the occasional tendency of a large floppy tongue to hang down over the right side of the laryngoscope blade. This may both decrease the view of the larynx and obstruct the easy passage of the tube. A small alteration may be made with advantage, it is thought, on both the Magill and the Macintosh type of laryngoscope. A narrow metal shelf is added to the right border of the blade to hold up the right edge of the tongue. In the Magill type this shelf is quite flat, any downward curve being carefully avoided; in the Macintosh type the shelf simply widens the existing blade. This addition does not, as may seem likely, traumatize the faucial pillars, provided reasonable care is taken.

In both models the shelf starts 1⅛ in. (3.5 cm.) from the tip, and is itself 2⅛ in. (6 cm.) long. In the Magill type it widens the blade to a total of ⅞ in. (2.2 cm.), or to 1 in. 2.5 cm.) if preferred, at its widest point; to the Macintosh blade, having its own method of disposing of much of the tongue, a narrower shelf is fitted, an additional ¼ in. (0.6 cm.) being sufficient.

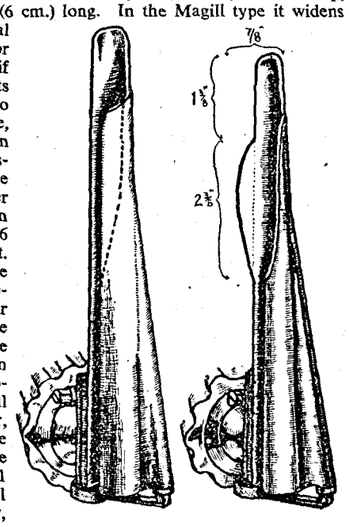


FIG. 1. FIG. 2.

In the case of the Macintosh laryngoscope the metal for the shelf must be produced from some outside source. In certain laryngoscopes of the Magill pattern, however, the metal may be provided from the blade itself. Fig. 1 shows the normal aspect from below, and the dotted line indicates metal which may, in most models, be removed and reshaped for the shelf. This alteration is an advantage in itself, as it provides more space for the passage of the tube; this has been recognized by several designers of laryngoscopes, and is embodied in the more recent Forreger model. Fig. 2 shows the final result from below. The mechanical side of this alteration seems to cause no difficulty to any hospital engineer.

Correspondence

Psychology and Science

SIR,—Dr. Clifford Allen, while agreeing with Sir Cyril Burt that "clinical experience should be combined with statistical comparisons," is yet moved to add that "it is time that someone uttered a protest against the domination of the statistician" (November 4, p. 1057). I am myself unaware, perhaps blissfully, of any such domination; but if it should exist, or even be in danger of existing, may I be the first to protest against it?

In your admirable review of Fifty Years of Medicine you included an article entitled "Statistics in Medicine" (January 7, p. 68). In this Professor Raymond Pearl—himself a most distinguished biologist and statistician—is quoted as having said that statistical knowledge is not a "higher kind of knowledge than that derived in other ways" but a valuable adjunct in most fields and an essential method in many. No medical statistician would dissent for a moment from that view, nor from the conclusion drawn in the same article that "the medical statistician must be no high priest of an occult art but a partner in the solution of medical problems." It is certainly as a partner that I understand our role in clinical medicine—but a partner, be it understood, in every step of an investigation and not merely as a hack worker in the final analysis.

A second misapprehension under which Dr. Clifford Allen labours is that statisticians invariably need vast numbers to satisfy their appetites. For example, fragilitas ossium was described, he says, on two cases, numbers which "statisticians would regard as useless evidence." Why should they? If "exact descriptions" were given of these two cases and "beautiful water colours" supplied to illustrate them, then of course they are scientific evidence, and undeniable evidence of an occurrence—whether it be of one case or two. It would only be in relation to any subsequent appeal from the particular to the general that the statistician—and equally any trained scientific worker—could object. If on the basis of these two cases the clinician (in practice, let us say, near Smithfield Market) should be so unwise as to argue that the condition was specific to butchers, then the statistician might suggest that the experience was both too select and too slender in size to justify any such generalization.

Usually scientific workers do wish to pass from the particular to the general—to say, for example, that a treatment given to a sample of patients will, on the average, be of general benefit to mankind. And here statistical reasoning must play a part. In letting it play its part I myself, however, would far sooner have a small number of accurately recorded observations than any number of the inaccurate records that Dr. Allen would appear to think form my daily diet. Such accurate records on merely 50 treated and 50 control patients gave a very great deal of information about the value of streptomycin in young adult phthisis. The essence of that trial lay not in large numbers but in its accuracy and, above all, in its control. Are similarly controlled trials of forms of psychotherapy impossible? I find it difficult to believe that they are, and I suggest that statistical co-operation (not domination) might usefully contribute to them. As Sir Cyril Burt pointed out, clinical experience and statistical comparisons are not incompatible.—I am, etc.,

London, W.C.1. A. BRADFORD HILL.

SIR,—Dr. Frederick Dillon's comments (October 21, p. 943) on the late R. G. Collingwood incite even the least worthy of his pupils to protest. The statement, "Collingwood's fallacious teaching . . . based as it is upon a naive and uninformed attitude to psychology," is unwarrantable: the slightest acquaintance with Collingwood or his philosophical or historical work would make the epithet "uninformed" to him of all men least applicable. The criticism of such as carry Dr. F. M. R. Walshe's influence within the medical profession may effect that reformation in psychological medicine which is desirable to moderate enthusiasms which not infrequently lay it open to ridicule and create exaggerated pretensions to authority in practical affairs.

Dr. Dillon seems to believe that the sense-data of history are human actions which lie in the past. Sense-data cannot lie in the past: the sense-data of history are the phenomena present for the observer to interpret—stones, inscriptions, etc. It is the existence of these data which brings history under the category of a science. Collingwood's insistence on archaeological thoroughness, on the necessity of providing every possible datum, was not the least of his contributions to history. It is only upon a basis of careful observation of the phenomena provided that the historian (and the psychologist) can proceed by induction to formulate valid theories. The most valuable contribution to a life of Brutus would be the work of the archaeologist who unearthed sense-data previously unknown, not that of the psychologist who propounded new theories on the basis of the sense-data we now have. Surely such men as Schliemann, Evans, and Collingwood have shown this abundantly.

What does Dr. Dillon mean by valid scientific thinking? It would seem that scientific is here interpolated to give thinking a validity it would not otherwise possess. Valid thinking is the province of logic, the art of reasoning, and one somewhat neglected by medical psychologists, who would not otherwise, like Dr. Dillon, have to use the term "trained psychologist" to imply someone whose claim to psychological understanding was not a bogus one.—I am, etc.,

Westbury, Wilts. D. S. MACDONALD.

Protection of Laboratory Animals

SIR,—Those who suggest that laboratory animals do not obtain the humane care which public opinion expects and that there are physiologists who would be better employed outside a laboratory, and those who suggest that the claims of science and of the humane treatment of animals are in conflict, must be prepared to give chapter and verse for such grave allegations. Kindred statements too often founded on misunderstanding or misrepresentation are also made by antivivisectionists, yet their investigation has only succeeded in demonstrating the enormous contribution to knowledge and to the relief of suffering resulting from animal experiments (see *Journal*, October 14, p. 888).

Major C. W. Hume's definition of an experiment is, he says, "taken verbatim from the definition used at the Home Office for the guidance of inspectors." *Experiment* is not defined in the Act of 1876 and has never been defined in a court of law. The Home Office has no authority to make such a pronouncement, nor has it ever published a definition of the word. It is not very clear, therefore, from what "authoritative source" Major Hume got his definition, nor why he claims Home Office authority for it. It is one thing to state, as he does on page 7 of the *UFAW Handbook*, that "the Home Secretary . . . construes this phrase ['calculated to give pain'] to mean any procedure calculated to interfere with the normal health and comfort of an animal," but quite another thing to attribute authority to a statement which, if made, could not have been made with authority.

In dealing with the proposed Board of Control, your Special Correspondent (September 23, p. 724) assumed that the three qualifications listed by Major Hume were mutually exclusive. This interpretation does not seem to have been that which Major Hume intended; nevertheless it would be undesirable to allow the possibility of such a Board numbering among its members any persons without an understanding of scientific matters. That is a sure way of introducing the emotional element into a subject which is already too much bedevilled by uninformed emotionality. When we think of the essential part played by animal experiments in the wide field of biological research to-day, of the enormous strides made towards the relief of suffering which have been possible only through the use of animals for experiment, and of the fact that antivivisectionists, in spite of their great efforts, have been quite unable to discredit the appeal to the animal in such research: when we realize that this country, working under the Act of 1876 for three-quarters of a century, has played a leading part in such research, it is difficult to see why "a more comprehensive Act" should be called for.

Major Hume repudiates the antivivisectionist position; but he has not yet explained how an Act, resembling his draft in its unworkable detail, could have any other effect than the preventing of animal experiments in the country in which it was enforced. He seems to start with the idea that scientists who use animals are as a body liable to be irresponsible. One who was better acquainted with such people would know that this was very far from the truth. Were scientists as untrustworthy as Major Hume and some others suggest, all the legislation in the world could not prevent the dangers which seem to give Major Hume such sleepless nights. It is a fact, however, that scientists are intelligent people, the nature of whose work implies a very large sense of responsibility; and the working of the Cruelty to Animals Act of 1876 has shown abundantly that their co-operation, which is such an essential part in its administration, can be confidently looked for. Public and official examination of the working of this Act, and of the atrocities alleged by antivivisectionists, has merely strengthened this assertion. (See the *Reports of the Royal Commissions on Vivisection* of 1875 and 1906–12; the House of Lords decision on Commissioners of Inland Revenue *versus* National Anti-Vivisectionist Society, July 2, 1947; and the Press accounts of the deputation of leading antivivisectionist societies to the Home Secretary on February 23, 1948.) Unless Major Hume will accept this position it is not surprising that he cannot think of any other device for combining flexibility with effectiveness in legislation. Again, had he a greater knowledge of the administrative problems involved he would have seen the difficulties and dangers in an Act so complicated as his draft. He would have realized that administrative control demands the very greatest administrative discretion and therefore the minimum of legislative detail.—I am, etc.,

Camberley, Surrey. W. LANE-PETTER.

SIR,—With reference to a note by a special correspondent (September 23, p. 724) on Major Hume's draft of an Act for the protection of laboratory animals, I should like to point out that the definition of "experiment" to which he objects is, as I am given to understand, the definition that is at present *in use* by the Home Office. I have no experience of electrically produced anaesthesia, but I presume that your correspondent would prefer that it was laid down that an experimenter must first make sure that an adequate degree of anaesthesia has been produced—as by testing certain reflexes—rather than that the precise conditions for the electric current were given, for these presumably would vary with the species, size, and condition of the animal. As regards the proposed board of advice, presumably the Minister would appoint only such as had experience or knowledge of experiments on animals for his choice among those that had been active in discouraging cruelty to animals. As your correspondent remarks, this last may be a dangerous step, opening the board to cranks—for the Minister himself may be a crank.

However, would it not be best for your correspondent with his obvious practical experience to meet Major Hume, and with him see in what way the draft can be improved, and thus help Major Hume and U.F.A.W. in their praiseworthy efforts to diminish the sufferings of animals as much as possible without preventing experiments necessary for the advance of knowledge?

On this subject I should like to point out to all my fellow experimenters that there is one form of cruelty to which many seem blind, and that is confining an animal in too small a cage. In a certain laboratory I recently visited I was shocked to see a number of hens each in a cage far too small. A bird like a hen is used, naturally, to plenty of room, and it is a cruel act to confine them in small cages where they cannot move to and fro. I am sure the sufferings of some animals from surgical experiments are far less than the distress of many at their unnatural close confinement.—I am, etc.,

Letchworth. H. H. KING.

SIR,—In the draft Animals Bill of Major C. W. Hume (see *Journal*, September 23, p. 724), and in his and your other correspondents' letters (October 14, p. 888; October 21, p. 951), there are one or two lamentable features: the implied belief that many animal workers are unmindful or careless of their subjects' welfare and comfort; a rather grudging appreciation of the devoted physiologists who have benefited both animals and men by their discoveries; a *remote* and super-sentimental concern—without, I think, any real data upon which to base their guesses—about the ineffectiveness of 75 years' working of that extremely valuable piece of legislation, 39 and 40 Vic., Cap. 77. As new occasions have demanded—for instance, the advent of corticoid assays and of those for synthetic curarizing agents like C10—regulations and Home Office inspections have been matched to the hour. These have been made bearing in mind both the comfort and the welfare of the animal subjects, and with full and sympathetic regard for the quest.

Our legislation, in my experience, has on more than one occasion been the envy of workers in the U.S.A., who are sometimes hampered at home by uninformed sentimentality and not safeguarded by law, and of visitors from the other continents too. Therefore, as an experimentalist, I would recommend not only all licensees, but all humanists and veterinarians, to disregard these plausible but misguided attempts to reform the Vivisection Acts.—I am, etc.,

Caversham, Reading. F. J. DYER.

SIR,—Many readers will, I believe, question the judgment of your Special Correspondent in his criticism (September 23, p. 724). Those who have read Major C. W. Hume's document cannot fail to recognize the careful thought, free from any antivivisectionist bias, that has gone into it, and the author's bold attempt to remove some of the unnecessary suffering which laboratory animals undergo, even in this country, at the present time. Criticism of any new work is valuable, indeed essential, but to condemn such a draft out of hand because of its length, its clumsy legal form, and its "unscientific implications" is to do injustice to a document which contains fruitful ideas and a humane approach to this problem.

Stress is laid on electrical anaesthesia, and your correspondent criticizes the attempt to control this means of treating animals. But is it not clear from the work of Longley and others that this is one of those spheres in which direction is most urgently needed? Certain current strengths and waveforms are known to produce paralysis without anaesthesia, and the pain caused by surgical operation in this condition may be indescribably severe. A good deal has already been learnt about this phenomenon, and it is surely no absurdity to suggest that an informed Board of Control should advise on the conditions under which electricity may be used for anaesthesia. The implication that experimental work which has already been done should be ignored by the Minister is an unworthy comment on this important matter.

The document may be unwieldy in its present form, but its author can claim respect among scientific workers for his writing on the humane handling of animals, and it is to be regretted that, for want of better presentation of the legal case, that which is of value in the draft should have been so lightly thrust aside.—I am, etc.,

Newcastle-upon-Tyne. FRANK T. FARMER.

SIR,—The question whether man can ever be morally justified in inflicting suffering on animals for experimental purposes has always been beset with the greatest difficulties. Is it justifiable to do evil that good may follow? And where are we to draw the line? Is it as wrong to impale a worm on a hook as it is to stretch a dog on the laboratory table to investigate the physiological effects of certain operations? It seems hopeless to expect to get any general agreement on these questions. But one thing we ought to be able to do: to bring all animal experimentation under the strictest possible control, and to ensure that this control is really effective. I remember as an undergraduate at Cambridge a demonstration by Sir Michael Foster of the effect of stimulation of the vagus nerve in a cat in which the thorax had been opened and the vagus dissected out, the animal having been completely anaesthetized. Sir

Michael, I imagine, was a most humane man; but such an experiment, merely to demonstrate what was already known by every physiologist, would, I understand, not be permissible now.

Yet periodically we have detailed accounts of the repetition of operations such as those for the investigation of traumatic shock. In one such, some few years ago, the investigator—a leading surgeon of one of our London hospitals—tells us: "One hind leg of the anaesthetized animal [a cat] was struck several times with a hammer. . . . This method of trauma was used after the manner of many early investigators." In the summary of the paper (published in the *Journal*) we read: "The temporary beneficial effect of intravenous saline in shock is *again* shown" (the italics are mine). Nothing new seems to have resulted from the experiment, which necessarily makes most unpleasant reading. This experiment should now be no more permissible than that of Sir Michael Foster some 53 years ago. Many experiments have not the remotest relation to the advancement of human welfare.

The total number of animals used for experiments all over the world must run into thousands. All the well-known drug firms publish records of the effects of new drugs as shown by laboratory experiments on animals. It is quite certain that there are some investigators who are naturally callous in their treatment of the lower animals. Huxley noted how difficult it was made for him to defend the principle of vivisection before a Royal Commission when a Continental witness had declared that whether the animal suffered pain or not was a matter of no concern to him. It is these persons one has to guard against.

I agree with Dr. H. Robinson (*Journal*, October 14, p. 888) that the antivivisectionists are their own worst enemies. They will not admit that any good has accrued from animal experiments: they deny point-blank that vaccination is protective against smallpox, or that antitoxin is protective against diphtheria, or that insulin has saved thousands of diabetics. Hence, as Dr. Robinson says, doctors do not care to discuss animal experiments for fear of being called antivivisectionists, though this is surely a weak attitude to take.—I am, etc.,

Folkestone. E. WEATHERHEAD.

SIR,—In your issue of September 23, p. 724, a special correspondent says that if this draft became law in any country "animal experiments would for all practical purposes be brought to an end in that country. Alternatively, the Act would become a dead letter. To promote such legislation would therefore be a grave disservice to research and consequently to the whole community."

In view of this attitude it seems advisable to scrutinize the value of animal experiments. No one will deny that some of them—even in the biophysical realm—have been of the greatest advantage to man, but it is going to be very difficult for *Homo sapiens* to deny that some have been worthless, others unnecessary and even misleading. They require a scrupulous interpretation. And they are not always necessary. Da Vinci, one of the greatest men who ever lived, said: "There is no result in nature without a cause; understand the cause and you will have no need of the experiment." There is a place in medicine for dialectic. The greater one's aptitude for that, the less will one require experiment.—I am, etc.,

Rugby. R. H. PARAMORE.

Clinical Assessment in Rheumatoid Arthritis

SIR,—It was with interest that I read the article by Drs. C. E. Quin, R. M. Mason, and J. Knowelden (*Journal*, October 7, p. 810). Like most observers in this country, my results with deoxycortone and ascorbic acid in rheumatoid arthritis have been essentially negative. It is true that subjective improvement was claimed by half the patients, but clinically the arthritic condition remained unchanged.

Dr. Quin and his colleagues are to be commended for adequately controlling their investigation and for demonstrating once again the importance of the strictest control methods in evaluating any new drug. In this connexion I had a comparable experience in 1945 while undertaking an investigation for the Empire Rheumatism Council into the value of gold treatment in rheumatoid arthritis. Using the "blindfold" method of assessment, I found that subjective improvement was claimed by 81% of patients who had received myocrisin and by 72% with the inert control. From these results I concluded that "great caution should therefore be observed in assessing results of any form of therapy, and extravagant claims for any new drug should be avoided unless the investigation has been properly controlled."—I am, etc.,

Glasgow. T. N. FRASER.

Treatment of Pink Disease

SIR,—I recommend Dr. E. Brauer's suggestion (October 28, p. 1003) of trying the Australian treatment (sodium chloride by mouth and deoxycorticosterone by injection), having employed this method recently and obtained a very rapid recovery to normal.

The patient, a girl of 18 months, had already had the condition for several months when first seen, and so well established were the classical features that the diagnosis presented no difficulty. The child was wretched, underweight, dehydrated, losing hair rapidly, showed aversion to toys and food, cried all night, and lay around all day, frequently adopting the praying attitude on account of severe photophobia. The skin of the feet and hands was beefy in colour, cold and clammy to touch, and anaesthetic to pin-prick. The skeletal muscles showed marked hypotonia and the knee jerks were absent.

Sodium chloride was given by mouth mixed with a malt extract. Deoxycorticosterone acetate 5 mg. was given by intramuscular injection on eight successive days. On the evening of the first day the child slept well for the first time in several months. On the second day she smiled. On the third day she began to show appetite for food and interest in toys. By the eighth day she was well on the way to recovery and the photophobia and hypotonia had almost completely resolved. Within three weeks she was a normal, happy, healthy child. Within four weeks her hair had regrown and become curly again.

—I am, etc.,

Uffculme, Devon. F. MURRAY.

Isopropyl Chloride as Anaesthetic

SIR,—Mr. Henri L. M. Roualle's report of a case of cardiac arrest occurring under isopropyl chloride anaesthesia (*Journal*, September 23, p. 712) prompts me to describe my findings in an admittedly small series of cases in which I have administered this drug. All my patients were healthy adults with normal cardiovascular systems; the operations were plastic, multiple dental extractions, and hernia repairs.

T. J. C. MacDonald in his preliminary report on the use of isopropyl chloride (*Brit. J. Anaesth.*, 1950, **22**, 92) found that there was a very rapid induction and excretion and no side-effects or post-operative sequelae. From this report it seemed that isopropyl chloride might be a particularly useful drug for anaesthetizing patients on whom operations in the oral or nasal cavities were to be performed. The recovery time seemed to be rapid, so that the danger of aspiration of blood post-operatively would be minimized, and the absence of vomiting would prevent undue straining and bleeding on return to the ward.

Each of my patients was induced with thiopentone 0.3–0.5 g. Isopropyl chloride was placed in the ether bottle of a Boyle's apparatus and was vaporized by passing nitrous oxide and oxygen over it in the usual manner, a total flow of eight litres being used. I found:

(1) Rapid increase in concentration was possible without irritation to the respiratory tract.

(2) Muscular relaxation developed quickly and blind intubation could soon be attempted. In one case, due to difficulty in passing the endotracheal tube, the patient rapidly lightened, and in another case, due to slight delay in connecting the attachment tubing, lightening of anaesthesia occurred, the patient coughed on the tube and transient extrasystoles were noted.

(3) One-third of my patients developed extrasystoles of varying duration, and these occurred at a relatively low concentration of drug, the lever of the Boyle ether bottle being at the half-way-over mark and the plunger at the top of the bottle, the depth of anaesthesia being first plane of the third stage. These irregularities took the form of alternate beat extrasystoles; normal rhythm returned on decreasing the concentration of isopropyl chloride. Three other patients developed bradycardia: in one case the heart rate dropped from 80 to 44 beats per minute. MacDonald reported "no marked cardiac upset; noticeable bradycardia in the longer operations with greater depth of anaesthesia."

(4) Incidence of post-operative vomiting was high; half of my patients had some vomiting, and the duration was more than twelve hours in three patients. Although some had had multiple dental extractions where swallowed blood perhaps could have acted as a gastric irritant, the incidence is very much higher than if I had used ether or trichlorethylene to obtain the same degree of anaesthesia.

(5) Recovery in all cases was very rapid; all the patients were biting on, or extruding, their airways within a few minutes of cessation of the anaesthetic, and were awake and talking when visited about one hour after operation.

I record these findings to show that, although isopropyl chloride undoubtedly has advantages in not irritating the respiratory tract, and is accompanied by rapid recovery of consciousness, it does appear to have a definite toxic effect on the heart as shown by cardiac arrhythmias, and these occur at a lighter plane of anaesthesia than those seen under cyclopropane or chloroform. They develop at a level which coincides with maintenance of light anaesthesia, at which depth strong reflexes—e.g., those following moving the head of an intubated patient—are not completely abolished, and the combination of this stimulus on an already sensitized heart may initiate ventricular fibrillation and cardiac arrest. For this reason I have discontinued the use of isopropyl chloride for anaesthesia.—I am, etc.,

London, W.1. D. H. P. COPE.

Sea-sickness

SIR,—Here are a few words in support of hyoscine preparations as an effective drug to combat sea-sickness (see *Journal*, October 21, p. 946). I have been associated with boats since the age of 3, dinghies, sailing-craft (racing and otherwise), fishing-vessels, and power-boats, and am at present owner and master (including navigator) of a 150-ton twin diesel ocean-going yacht. It is therefore important that I remain on the bridge when others are forced to retire.

Before considering the prevention of sea-sickness, I must say that I believe that many do not appreciate that it affects different individuals in different ways, and very much depends upon the type of movement of the boat the person is on. For instance, it is very uncommon to find sea-sick racing yachtsmen when in small craft, but it is not uncommon to find ocean-going cruising yachtsmen very sea-sick. In the former the movements of the boat are sharp and jerky, and not unlike those of an aircraft, and the sensory mechanism that produces sea-sickness has hardly had time to recover from one sharp motion before it is off on another trend of sensory impressions. Now in the case of the ocean-going yacht or large type of craft the ocean rollers tend to produce the only too well known roll over to port, and then the rise and opposite roll to starboard, while the poor victim anticipates almost every sensation in advance as he descends with the ship to the bottom of the trough of another huge billow, and at times may not care if the ship never comes up again. In brief, the short sharp jerky movements of small craft, not unlike aeroplane movements, may have no effect on some individuals, but the slow anticipated movements can on occasions knock out the most hardy sailor.

Personally, I have never felt or been sick in an aeroplane (and I have been flying since 1916), nor have I ever been sick in a small sail racing craft over a period of many years, but I have been forced to my bunk on a passenger boat crossing to Norway with a flat calm sea disturbed by an unpleasant rolling swell. The hyoscine preparation I have found most effective in severe cases of sea-sickness is a preparation containing hyoscyamine 0.235 mg., camphoric acid 0.02012 mg., hyoscine 0.0638 mg. Preferably it should be taken before the effects of sea-sickness are felt, but for sailors (who always believe they will be all right) it should not be taken after the first eructations of gas from the stomach have come up. If it is administered later it tends to cause further gastric irritation, with the disastrous result that the victim suddenly rushes to the ship's side. The only hope at this stage is to administer it in suppository form with the victim lying at rest in his bunk. As to side effects, sometimes a certain dryness of the mouth comes on about one or two hours later, but this is easily dealt with by fluid refreshment. The drug also has a sedative effect on the mind when the nervous impressions may have been further stimulated by seeing the stern of the craft away down below in the trough of one wave and the bow high above on the crest of another wave, and one waits for the next plunge, rise, and fall. In gales in the Irish Sea last year and again in the Channel last September, with one engine out of commission and the second limping along, at times at the mercy of the Atlantic rollers, many on my boat were grateful for the discovery of hyoscine. In the small doses no after-effects appear to be experienced, and in the roughest of weather one feels good, eats, and functions on deck normally. I have no experience of "dramamine."—I am, etc.,

London, W.1. NORMAN P. HENDERSON.

SIR,—Seeing further correspondence in the *Journal* (October 7, p. 836; October 21, p. 946) about sea-sickness prompts me to mention that during a recent six-month period as ship surgeon I formed the impression that many people who said they were sea-sick were not actually suffering from motion sickness at all, but were merely the victims of autosuggestion. With these people a dramatic recovery almost invariably followed a dose of 5–10 mg. of "dexedrine," which very seldom required repetition.—I am, etc.,

Crumlin, Co. Antrim. R. RUSSELL LANG.

Treatment of Acute Liver Disease

SIR,—I am afraid that Dr. J. M. Walshe's letter (*Journal*, October 28, p. 1002) indicates that he has not read my article with sufficient care. May I quote from my publication?

The absolute number [of cases] is, however, somewhat small, and for this reason it would perhaps be wise to restrain one's enthusiasm. The results of therapy have proved so remarkable that it is hoped that others will adopt the same regime in similar cases and so help to arrive at a final assessment of its value.

It will be seen that I have made no conclusions with regard to the cause of the satisfactory outcome of therapy. I remarked in my article that gross amino-aciduria is known to be associated with a very grave prognosis (Dent). In this respect I am rather surprised to see that, whereas Dr. Walshe is well acquainted with the work of our distinguished colleagues on the other side of the Atlantic, he chooses to disregard that going on "across the road." To describe the work of Mossé in 1879 is hardly relevant, since diagnosis before death is uncertain without the help of modern biochemistry.

Dr. Walshe suggests that he has been using a similar form of therapy without success. He describes a principal difference and therefore infers other differences. In the early days of treatment of subacute infective endocarditis with penicillin therapy various groups of workers used similar forms of therapy, but results were dependent on dosage. Until Dr. Walshe can report a series of cases treated unsuccessfully with the exact regime given in my article one cannot attribute much importance to his remarks.—I am, etc.,

Newcastle-upon-Tyne. A. L. LATNER.

Unrecognized Rupture of the Uterus

SIR,—The following case may present some interesting features:

A married woman aged 30 was admitted to hospital as an emergency case with secondary post-partum haemorrhage, the history being that in the evening of the 16th day after an apparently normal labour and normal puerperium the patient had a severe flooding (which she put at four pints—2¼ litres), followed by the passage of several big clots. At the same time the patient was seized with severe pain localized mainly in the left side of her abdomen. The patient, who was a 4-para, had had no previous illnesses and a normal obstetric history, but her first pregnancy had been complicated by mild toxaemia.

On admission the patient was very pale but not restless, and she had no air hunger. The pulse rate was 88 and of good volume. Her doctor had given her injections of "coramine" and ergometrine before sending her to hospital, and he reported that the patient had never had any pyrexia in the puerperium and that her haemoglobin before confinement had been 78%. On examination the heart and lungs were normal. Abdominally the fundus of the uterus could not be felt. There was no mass palpable and no tenderness. Vaginal inspection revealed some clots in the vagina, but no fresh bleeding. A diaper the patient had been wearing the whole evening was not soaked. A vaginal examination was omitted at the time for fear of starting a further haemorrhage. A blood transfusion with compatible blood was begun and morphine ¼ gr. (16 mg.) given.

A provisional diagnosis of secondary post-partum haemorrhage due to retained products was made, and the patient was later taken to the theatre after premedication with "omnopon" and scopolamine. A finger through the cervix passed on the right side into the

uterus, but met no resistance on the left side. A ruptured uterus was diagnosed, but it could not be ascertained whether the rupture was complete or incomplete, as it seemed impossible to reach the upper limits of the rent in the uterus.

After the abdomen was opened a left broad ligament haematoma was found and a total hysterectomy was performed. Much difficulty was experienced in identifying the uterine vessels on the left side owing to distortion by the haematoma. The uterus was found to have a large rent extending up to the top of the broad ligament on the left side. A blood transfusion was continued during the operation, and the patient received a total of three pints (1.6 l.). The post-operative course was uneventful.

It was interesting to add up all relevant information afterwards. The midwife told me that, after a first stage of 11 hours and a second stage of only 25 minutes, a 10-lb. (4.5-kg.) baby was born. Immediately afterwards the patient had a post-partum haemorrhage and lost two kidney-bowls of blood. The loss continued after the placenta had been expelled, although the uterus was firmly contracted. The patient, however, appeared shocked at the time and her pulse went up to 140. However, the bleeding soon stopped and the general condition of the patient improved. Although the after-pains were severe the puerperium was otherwise uneventful. This shows that a rupture of the uterus may not be recognized unless the cervix is inspected, particularly if there is bleeding from a contracted uterus. Collapse, shock, and haemorrhage may not be marked.

The interest in this case is the rarity of unrecognized rupture of the uterus leading to secondary post-partum haemorrhage on the 16th day, a point which is not stressed in the literature.

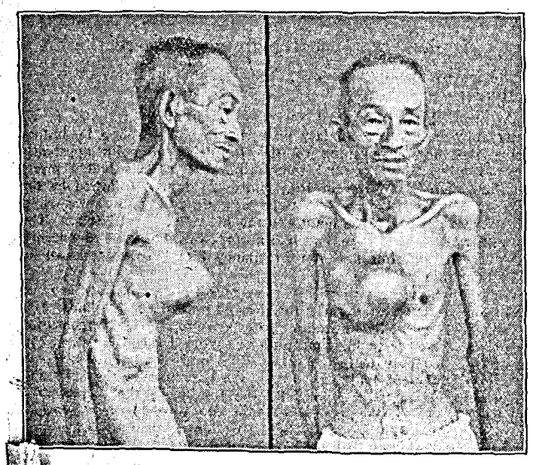
I should like to express my thanks to Mr. G. Dalley, consultant obstetrician and gynaecologist, for encouragement to publish the case and help in preparing the report.

—I am, etc.,

Dartford, Kent. W. GROSS.

An Unusual Thoracic Aneurysm

SIR,—A male Chinese aged about 60 was admitted to the Teluk Anson Hospital on March 28, 1950, with a history which was as vague as it was varied. First he said that he had had a "lump" on the front of his chest for two months. Then he remembered a very small lump before "Japanese time" (February, 1942). He could not remember having ever had any venereal disease, but seemed doubtful on that point. The Kahn test was positive. He was very emaciated on admission, and on the chest wall was a large pulsating tumour bounded above by the 2nd rib, below by the 7th, on the left by the left sternal border, and on the right reaching to the mid-axillary line. There were three dark patches which protruded somewhat



in the main mass where the pulsations were felt just under skin. Unfortunately it was impossible to obtain a radio-ph to determine the fate of the ribs and the sternum. He ted that though in the past he had suffered considerable pain the chest he was now quite free from pain.

The prognosis really depended on which would go first, the patient or the aneurysm. Mercifully the patient died in his sleep 14 days after admission, before the aneurysm burst. No post-mortem examination was allowed. Two photographs taken ten days before his death are shown.—I am, etc.,

Pahang, Malaya. R. M. B. LOWIS.

Mongolism in One of Twins

SIR,—Interest in the somewhat rare occurrence of mongolism in twins has been reawakened by the case reports of Dr. A. R. Graham (*British Medical Journal*, 1950, **1**, 706) and of Dr. T. H. Crozier and W. A. B. Campbell (*Journal*, October 14, p. 869). The following is a brief report on a further case.

A multipara aged 35 gave birth to binovular twin girls on November 25, 1949. In three previous normal pregnancies there was no history of mongolism. Each twin weighed nearly 5½ lb. (2.5 kg.), and the typical features of a mongol were plainly seen in one of them, whereas the other appeared perfectly normal. On January 4, 1950, at the age of 6 weeks, the mongol was admitted with an acute respiratory infection, but was discharged home after six days. At the time no abnormality was noticed on auscultation of the heart. On January 21 the baby's condition had deteriorated and she was readmitted with bronchopneumonia. Auscultation of the heart now revealed a loud systolic murmur maximal in the 3rd and 4th interspaces to the left of the sternum. This time treatment was unavailing and the baby died after seven days. Consent for necropsy was not given, but from the signs in the heart the presence of a septal defect was assumed.

—I am, etc.,

Birmingham. R. J. K. BROWN.

Pulmonary Tuberculosis and Thoracic Surgery

SIR,—Vacancies for thoracic surgeons advertised recently indicate that certain hospital boards are establishing thoracic surgical units in tuberculosis sanatoria, to which non-tuberculous cases will be admitted. Surgeons unlucky enough to secure such appointments seem likely to be predominantly, if not entirely, concerned with the surgical treatment of pulmonary tuberculosis. It is essential that a thoracic surgeon should deal with as wide a thoracic field as possible lest the evils of specialization be intensified. Efforts being made to transform tuberculosis officers of the old type, with their limitations, into chest physicians of wider outlook may or may not be successful. It would be ironical if at the same time a race of surgical carpenters predominantly limited to tuberculosis work were to be developed.

The practice of dealing with non-tuberculous cases in sanatoria, convenient though it may be to administrators and even for surgeons, is fundamentally wrong. Cases of tuberculosis specially transferred from sanatoria to general thoracic surgical units for operative treatment can be completely segregated from the other patients. The converse is in actual practice impossible. Non-tuberculous thoracic surgical cases are of the long-stay variety, and for most of that stay are ambulant. Even if housed in separate blocks it is in practice impossible to keep the two groups of cases apart and to prevent social contact in a sanatorium. It seems fatuous to preach to the public the importance of segregation of the tuberculous to avoid infection and then to admit debilitated sufferers from other diseases for operation into the same institution. Admittedly certain very active thoracic surgical clinics were built up in sanatoria as part of the Emergency Medical Service during the war. It may be that this was unavoidable, but I have been told by colleagues associated with such clinics of their conviction that infection has occurred. I myself have seen non-tuberculous cases detained for long periods of investigation in sanatoria who have shortly afterwards developed pulmonary tuberculosis; it would be difficult to prove that they were not infected while in those sanatoria.

The admission of non-tuberculous cases to sanatoria is sometimes advocated in order to improve the morale in those institutions and because by offering a greater variety of interesting work more nursing and other staff may be attracted. Surely it is unreasonable to expect thoracic surgery to serve as a bait in this way. The medical staff attached to most sanatoria are usually of little help in connexion with those other diseases of

the chest with which the thoracic surgeon has to deal. Thoracic surgery is not primarily the surgery of pulmonary tuberculosis, and, although that is a large part of the work, it is also largely concerned with cardiovascular, mediastinal, and oesophago-gastric conditions, and sanatoria are surely the last places in which they should be treated. The same surgical personnel should deal with all types of thoracic surgery, but their work in connexion with tuberculosis should be done in sanatoria and the non-tuberculous work dealt with in special clinics in, or in close association with, teaching hospitals where the highly technical ancillary services required are available. It may be inconvenient to ventilate such matters; indeed, it may already be too late to influence schemes apparently so far advanced. The points mentioned, however, seem to necessitate their being brought to the notice of those concerned with such matters.—I am, etc.,

Newcastle-upon-Tyne. GEORGE A. MASON.

Para-aminosalicylic Ointment for Leg Ulcer

SIR,—The following case may be of interest.

A woman, aged 47, reported at the clinic in January, 1950, that she had developed an ulcer on the outer side of the right leg 3 in. (7.5 cm.) from the ankle. This had commenced a week previously as a dark-red raised area about the size of a shilling and had ulcerated quickly, becoming the size of half a crown. The ulcer was surrounded by an area of brown pigmentation and increased rapidly in size. The margin was indurated and the base weeping, with three main sites discharging a mucopus which was sterile on examination.

The ulcer was treated with petroleum-jelly gauze and later with a paste of streptomycin in petroleum jelly (1 g. per dressing), but did not show any signs of healing. In April a dressing of 20% para-aminosalicylic acid in petroleum jelly was applied and left in position for a week. After a fortnight there was no further increase in size, and the base was clean and granulating. The area of discoloration decreased slightly, and was drier. At the end of a month there were three small raised areas of granulation tissue, the surrounding skin becoming dry. At the end of six weeks these were absorbed, leaving a bluish-brown discoloration. She left for the London area in June; the ulcer site was healthy, the skin firm, discoloured, but freely movable. This patient has a prolonged history of tuberculosis commencing with peritonitis and a left pleurisy in 1936, an infection of the thoracic 10th and 11th vertebrae in 1943, and cervical glands in 1949. These were resected, the incision healing with large keloid scar formation.

The rapid response of this chronic ulcer to para-aminosalicylic acid applied in ointment form, without toxic symptoms, suggests that such application would present an easy and safe dressing of chronic ulcers and sinuses without the toxicity of sulphone derivatives.—I am, etc.,

Lampeter, Cardigan. T. WALKER.

Orf in Man

SIR,—Contagious pustular dermatitis of sheep, or orf, is a virus disease whose main characteristics are described in its name. The contagiousness among sheep is extreme, but human infections are seldom reported and have been recognized in this country only since Peterkin's description in the year 1937. Blakemore, Abdussalam, and Goldsmith's case included virus studies.

The patient was a farm labourer, aged 61, who had been working as an assistant shepherd. His lambs had been affected by an epidemic of sores in the mouth, and he had been dressing them. He had also been handling calves affected with ringworm, and he attributed his illness to this cause. His sole lesion was on the flexor surface of the left wrist, and from a casual inspection would have passed for a carbuncle, but its painlessness immediately attracted attention. The affected skin was inflamed and oedematous over an area of 3 by 4 cm., and formed a plum-coloured swelling sharply defined from the surrounding healthy skin. Upon the summit there stood a blister, which contained a clear serous fluid. A kerion was unlikely in the absence of pustulation, and a search for fungus proved negative. The subsidence of the swelling during the next few weeks was consistent with the clinical diagnosis of orf, and confirmation was obtained from the laboratory.

Laboratory Findings.—Blister fluid was collected in capillary tubes and sent to the laboratory. The material received was diluted to about 5% in 10% horse serum broth and 500 units of penicillin and streptomycin was added per ml.

This diluted material was inoculated by scarification to the cornea of two rabbits. Neither animal showed any lesion at any stage. It was also inoculated on to the chorio-allantoic membrane of four tenth-day chick embryos. These were harvested after 72 hours and showed a number of minute (about 0.5 mm.), discrete, round opaque lesions which were similar to those described in contagious pustular dermatitis. This material was given three further passages in living chick embryos. On the second passage fewer lesions were present. On the third lesions were doubtful; on the fourth no lesions were present. These findings would be expected in contagious pustular dermatitis, but not in infection due to vaccinia or cowpox (Abdussalam, 1948).

Through the kindness of Professor Beveridge and Dr. H. P. Chu we were enabled to inoculate material from the first egg passage into a lamb. 0.5 ml. of a 10% suspension was inoculated by scarification on to the bare area of skin on the inner side of the thigh. On the fourth day the lamb developed a number of vesicular lesions typical of contagious pustular dermatitis on the inoculated area. Stained smears from these lesions showed typical elementary bodies of a pox-group virus.

Paired specimens of serum from the patient were taken early in the disease and in convalescence. Both specimens inhibited haemagglutination due to vaccinia virus to a dilution of 1:20 and neither showed complement-fixing antibodies against vaccinia. This was taken as added evidence that the pox-group virus present was not vaccinia. These laboratory findings completely confirm the clinical diagnosis of contagious pustular dermatitis.

We wish to thank Dr. C. H. Whittle for permission to publish this case.

—We are, etc.,

Cambridge. A. LYELL.
J. A. R. MILES.

REFERENCES

Abdussalam, M. (1948). Ph.D. Thesis. Cambridge.
Blakemore, F., Abdussalam, M., and Goldsmith, W. N. (1948). *Brit. J. Derm. Syph.*, **60**, 404.
Peterkin, G. A. G. (1937). Ibid., **49**, 492.

Pregnancy in Horn of Bicornuate Uterus

SIR,—In their paper (October 21, p. 926) Drs. D. Latto and R. Norman discuss the route taken by the spermatozoon in fertilizing the ovum in such a pregnancy. I should like to support their view that the part of the rudimentary horn attached to the other horn is canalized. In a case recently under my care this had been proved by hysterosalpingography, and in a second case where the pregnancy in the rudimentary horn died at the 13th week and was excised a month later a structure like a normal Fallopian tube, with a lumen of about the same size, was found.

I think that the use of the term "normal horn" is unfortunate and that "developed horn" would describe it better. Not only is the position of such a horn usually abnormal, but the changes in size and shape which it undergoes during pregnancy do not follow the pattern of that found in a normal uterus.—I am, etc.,

Inverness. J. A. CHALMERS.

Observations on Cervical Erosion

SIR,—In my recent publication on this subject (September 16, p. 647), the presence of the erosion was taken as an indication of underlying pathology which was held to be the cause of the symptoms reviewed. While it is realized that cervicitis may be present without a coexisting erosion (as Dr. Crichton points out in the *Journal*, October 28, p. 1003), only cases exhibiting erosion were included in the analysis in order to obtain a uniform series of cases. The series of 128 cases analysed in the paper were collected from a gynaecological clinic and were cases of "established" erosion. They were not recent post-partum erosions, which may be free from symptoms since they are not associated with secondary pathological processes.

The results of treatment by cauterization of the erosion and of the cervical canal without preliminary dilatation (99.2% cured with a recurrence rate of 4.7%) are not unsatisfactory. Atresia when it occurred (in 0.2%) affected the external os and was easily remedied. In a busy out-patient department the

advantages are obvious of a simple treatment which does not require the anaesthetic necessary to allow of preliminary dilatation of the cervical canal.—I am, etc.,

Shrewsbury. JEAN R. W. ROSS.

Poliomyelitis: Age Incidence

SIR,—In reference to Dr. W. P. Sweetnam's letter (October 21, p. 950) I should like to point out that the case incidence at the Moxley Hospital, Wednesbury, was from a wide area covering most of South Staffordshire and including rural as well as urban areas. Many of the more densely populated districts escaped with a low case incidence. The peak of notifications was reached during July. The proportion of cases under the age of 5 years did not decline until the month of September, and still remains high in the current month, although total notifications are diminishing. Up to September 30 the total of confirmed cases was 188 and the age incidence was as follows:

Under 1 year, 13; 1-5 years, 94; 5-15 years, 55; over 15 years, 26. In the 5-15 years group 43 cases occurred under the age of 10 years, making a total of 150 cases under the age of 10—approximately 80% of the whole.

In the years 1947-9 a total of 40 cases of poliomyelitis were admitted to the hospital and the age incidence was 0-5 years, 18; 5-15 years, 14; over 15 years, 8.—I am, etc.,

Wolverhampton. C. SIMPSON SMITH.

Activity in Advancing Years

SIR,—I have read with interest Dr. Marjorie W. Warren's article (*Journal*, October 21, p. 921) and should like to express my entire agreement with what she says about the desirability of encouraging activity, both mental and physical, in those advancing in years. I believe that by maintaining so far as possible one's interest in the everyday activities of life, and continuing to work with both brain and body so far as we are able, we can do something towards keeping old age at bay.

I know of course that one man's experience is of little significance, but for what it is worth I may perhaps be allowed to mention my own experience. I have almost all my life spent most of my spare time working really hard in my large garden (I have occupied the same garden for 49 years) and this I still do, gardening being my great hobby. All my adult life I have always had a cold bath immediately upon rising, summer and winter (I scorn ever to use the hot tap), and follow this up with a brisk rub till dry, and then my physical jerks, finishing up with a hand-stand. There may be no connexion, but up till now I have kept free from rheumatism, fibrositis, arthritis, etc., which are so often the bane of old age. This last summer I gave myself as a present for my 80th birthday a light-weight motor-cycle, although it was nearly 30 years since I gave up motor-cycling when I got my first car. This is a proper motor-cycle, not one of the toy things one sees running about. After I had got sufficiently used to driving it to feel justified in discarding the L plates I made a nine-day trip to Scotland on it, getting as far as Inverness, and during the seven days I was on the road I covered over 1,000 miles in spite of very indifferent weather, but I came back feeling perfectly fit and fresh. I honestly feel that by again taking up motor-cycling I have pushed back old age by several years. I have been T.T. all my life. I have been a very moderate smoker and for the last few years I have abandoned tobacco altogether. Early in life, thanks to maternal precept, I acquired a regular habit of daily evacuation at a fixed hour, and as a result I have never suffered from constipation. For drugs I have had little use and, I fear, less faith.

As for work, I have more on hand than I can always get through, but I believe strongly in the adage that "it's better to wear out than rust out."—I am, etc.,

Leicester. C. KILLICK MILLARD.

Safety in Prams

SIR,—If the further discussion (see also *Journal*, October 28, p. 1002) of the technical design of a perambulator is not a waste of space in a medical journal, may I be permitted to suggest that perambulators should revert from their boat-shaped, streamlined design to the old-fashioned tub shape? The difficulty of tipping would then be averted, as I have proved in my own case. My four children have all taken vigorous exercise in a perambulator bought in 1933, the year before the present high shallow type was produced, and never once did I have any trouble, although my unfortunate friends who did not need a perambulator until a year later were hanging their heaviest weights and flat-irons on their handles in an effort to preserve a balance. Let the makers put utility before elegance and return to the deep four-square pram, and they will find that the position of the straps will cause no trouble.—I am, etc.,

Middlewich. MARY MILNES WALKER.

Gangrene of Vestigial Tail

SIR,—The recent case report from Mr. P. J. Blaxland (October 14, p. 870) and the letter from Mr. R. J. McNeill Love (October 28, p. 1005) on vestigial tails prompt me to write concerning a complication which may occur in such remnants, even though they be of lesser degree. I have twice seen spontaneous gangrene and natural sloughing of a small tail remnant. In both cases the subject was an elderly man in whom no doubt the vascular reserve of the peripheries was diminished. One of these patients subsequently developed typical intermittent claudication. It would appear that the blood supply, with its end artery, is more precarious in such tail remnants than even that of the little toe. No doubt also the liability to trauma is greater—an important factor in the initiation.—I am, etc.,

Bath. C. PATRICK SAMES.

Tailed Races

SIR,—In his interesting report of "A Vestigial Tail" (October 14, p. 870) Mr. P. J. Blaxland mentions that tailed races have been described in the past in various parts of the world. Marco Polo asserted that they were to be found in the Nicobar Islands and in Sumatra; Columbus stated that the natives in Cuba had tails so long that they dug a hole in the ground for them when sitting down; others have described them in Central Africa. Similar stories are told of the Western Hebrides, while in the Middle Ages it was a popular jest against the men of Kent. Again, a prehistoric artist has depicted a tailed magician in the Grotte des Trois Frères.

These races, however, did not possess genuine tails but ritual appendages copying the animal mantle worn by the god for ceremonial purposes and imitated by kings and priests, and which in due course degenerated into artificial tails, flaps of loin cloth, and strings. Even in fairly recent times this ritual tail was worn on Plough Monday in England by the Chief Ploughman at the fertility rite of sowing the first seeds.

Within the last few years the Apa Tanis, a tribe almost in the original Neolithic state, have been discovered living in the foothills between Assam and Tibet wearing ritual tails made of split bamboo on ceremonial occasions, a relic of the very dim ages of the past.

It is interesting to speculate whether the Royal train and that of an archbishop may not be the glorified descendant of the humble caudal appendage.—I am, etc.,

Amesbury, Wilts. LOWELL WEBB.

POINTS FROM LETTERS

Radiation in the Shoe Shop

Dr. D. G. MAITLAND (Sydney, N.S.W.) writes: I feel certain that your leading article (September 2, p. 565) is an overdue warning to the general public. May I draw your attention to the *Medical Journal of Australia* of July 19, 1941, in which a letter from me is published asking that journal to use its influence to deter commercial firms and the public from the over-zealous use of *x*-ray apparatus?

Psychiatry and the Common Cold

Dr. H. M. FELDMAN (Leeds) writes: Clinical observations made in the course of my psychiatric practice confirm Dr. E. W. Braithwaite's theory of the common cold (October 21, p. 952). I have repeatedly observed signs of a particular emotional state preceding the onset of the symptoms of a cold. This state is always determined by a basic mental conflict involving some interpersonal relationship in the patient's life. It is manifested by a decrease of objective feelings of normal affection and sociability, and a tendency to self-absorption. A mood of irritability and restlessness may prevail. . . I do not wish to imply that there is no infective aetiology of the common cold, but I am convinced that the primary cause can be emotional.

Obituary

G. A. ALLAN, M.D., F.R.C.P., F.R.F.P.S.

Dr. George Allison Allan, for many years consulting physician to the Western Infirmary, Glasgow, died after a long illness at his home in Glasgow on September 8, aged 74 years.

Allan was educated at Hutcheson's Grammar School, Glasgow, and began to study medicine in the same town after a short period in business; he graduated M.B., Ch.B. in 1905, winning the Brunton Memorial Prize as the most distinguished undergraduate of the year. He became a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow in 1910 and proceeded M.D. with honours in 1924, obtaining the Bellahouston Gold Medal. In 1926 he became a Member of the Royal College of Physicians of London and a Fellow in 1932. At the Western Infirmary Allan began as resident house-surgeon and house-physician, and thereafter rose to a senior position on the staff, obtaining his own wards in 1929, after having been assistant physician and physician-in-charge of the electrocardiographic department. From 1913 to 1929 he was first assistant to the professor of medicine in the University of Glasgow. Allan was also consulting physician to the Ralston Hospital, Paisley, and the Glasgow Eye Infirmary. For a number of years Allan was compelled to combine the effort of a busy general practice in Partick with his growing interest in cardiology and his hospital and teaching duties. These were years of overwork in a conscientious man not physically very strong, and were watched with anxiety by many of his friends. However, from 1920 onwards he undertook only consulting work and rapidly built up a large consulting practice over the whole of the West of Scotland. He was a brilliant general physician, with a special interest in cardiology, and he published many original papers, particularly on cardiological subjects. For some time he was joint editor of the *Glasgow Medical Journal*. It gave him great pleasure when in 1948 he was made an honorary member of the Royal Medico-Chirurgical Society in Glasgow. As a teacher Allan was most stimulating. He had the gift of ignoring inessentials and getting right to the root of a problem without delay. He was always ready to assist and encourage his staff, and he maintained close interest in the careers of his house-physicians and students. Allan took a great interest in the work of the British Medical Association, and held many posts in it, including those of local general secretary at the Annual Meeting in Glasgow in 1922, president of the Glasgow and West of Scotland Branch in 1925-6, and chairman of the Glasgow Central Division from 1926 to 1929. He was a member of Council from 1922 to 1932, and of a number of the Association's committees, including for a short period the Journal Committee. He remained a member of the Scottish Consultants and Group Committee until 1946.

His wife died in 1944, and his only son, a doctor, was drowned while a prisoner of the Japanese in the last war. All through his medical career he was in poor health, but in spite of this he made himself very popular with his patients and friends through his great charm of manner. He was a keen sportsman, being particularly fond of golf, and he was captain of the Shanklin and Sandown Golf Club in 1948 and 1949. The sympathy of all who knew him will go to his widow and young daughter.—J. A. G.

Dr. FREDERICK LINDSAY DICKSON died in Ventnor on October 13, aged 42. He was educated at Uppingham School and St. John's College, Oxford. After obtaining his arts degree he entered the Colonial Service, but he was forced to retire owing to ill-health. He then decided to study medicine at the Middlesex Hospital and qualified in 1940. After holding appointments of house-surgeon and house-physician at the Stoke Mandeville E.M.S. and Ministry of Pensions Hospital, he went into practice at Wing, Bedfordshire. Shortly after the war he went into partnership in his home town of Shanklin.

Dr. FRANCIS WILLIAM GRANT, of Jarrow-on-Tyne, died at his home on October 15, at the age of 62, after an illness lasting three days. A native of Glasgow, Grant qualified L.D.S. (R.F.P.S.Glas.) at Glasgow Dental Hospital in 1909. Later he qualified in medicine at St. Mungo's College in 1912 (winning a gold medal in materia medica). After practising dentistry in Newcastle from 1912 to 1914, he became a general medical practitioner in North Shields. During the first world war he served as a captain in the R.A.M.C. from 1916 to 1919, and saw service in Greece and Egypt, being mentioned in dispatches. In 1920 he came to Jarrow as partner to the late Dr. O'Neil, and remained in practice there until he died. He was an honorary visiting surgeon to the Palmer Memorial Hospital, Jarrow. Grant was a keen member of the B.M.A., being chairman of the South Shields Division from 1938 to 1941 and president of the North of England Branch from 1939 to 1946. He also represented his Division at the Annual Representative Meeting at Manchester in 1929. He was a member of the Public Medical Service Subcommittee from 1936 to 1938, of the Council of the B.M.A. from 1939 to 1942, and a member of the Branch Council at the time of his death. In addition, he had been honorary secretary of the former Jarrow and Hebburn Public Medical Service, which operated the club system before the introduction of the National Health Service. Grant was chairman of the local medical war committee for South Shields, Jarrow, and Hebburn during the war years, and dealt with many difficult problems in an able and tactful manner, gaining the complete confidence of his colleagues. Apart from his medical work, he will be missed by his many friends outside the medical profession, for his activities were numerous and varied. He was president of Jarrow Rotary Club at the time of his death, and had been a magistrate since 1938. He also took his share of the work of trying to rebuild Jarrow in the difficult years between the wars, and was chairman of the committee which was set up to carry out the work initiated by the late Sir John Jarvis in developing Monkton Stadium as a sports centre. For many years he was closely associated with the Presbyterian Church, Jarrow, being chairman of the board of managers for 14 years till 1948. Of an equable temperament, he was always a source of strength, with his sound judgment and knowledge, and all his colleagues will remember him with affection. He is survived by his widow, daughter, and two sons, one of whom is a doctor.

Dr. CLAUDE ROBERTSON died suddenly at his home at Southsea on October 14. He studied medicine at St. Andrew's University, graduating M.B., Ch.B. in 1931. After holding an appointment as senior house-surgeon at the Royal Hospital, Sheffield, he entered general practice in Portsmouth. He was first and foremost a family doctor, and his patients will long remember his skill, kindness, and breezy manner. His activities were legion. He was honorary anaesthetist to the Royal Portsmouth Hospital, and also police surgeon. In activities outside medicine he had held the offices of president of the Portsmouth Rotary Club and chief of the Portsmouth Caledonian Society. It gave him great satisfaction to be honorary secretary and treasurer of the Portsmouth Division of the B.M.A., and Portsmouth's representative of the Representative Body from 1941 to 1949, when ill-health compelled him to retire. During this time the National Health Service came into being, and the amount of thought and care he gave to the new problems and the work he put in were prodigious. His enthusiasm, efficiency, and thoroughness were an example to all, and there is little doubt that his devotion to this work helped to hasten his end. He was elected vice-chairman of the Portsmouth Executive Council when it was formed. The sympathy of his friends will be extended to his wife and daughter, who has just begun her medical training at her father's old university.—E. C. T., K. V. M.

Medico-Legal

LIABILITY OF MANUFACTURERS FOR INJURIES TO PATIENTS FROM DEFECTIVE APPARATUS

BY

W. M. LEVITT, M.D., F.R.C.P.

Of Lincoln's Inn (and formerly of the Oxford Circuit), Barrister-at-Law; Associate Physician, Department of Radiotherapy, St. Bartholomew's Hospital

The increasing use of complicated electro-medical and anaesthetic apparatus in medical practice has led to correspondingly increased risk of injury to patients, and there necessarily follows a greater risk of legal action by those who may have suffered damage. It will be clear that where a medical man has been guilty of a breach of his duty of skill or care in the management of apparatus he will be liable for any damage that may be caused. This proposition is self-evident and does not require further notice here.

I propose to consider the case where injury is caused by some latent defect in the apparatus itself of which the medical man was not aware. It is true that the purchaser may have a right of action for breach of contract against the vendor in respect of apparatus that is not fit for the purpose for which it is supplied. The purchaser may not, however, be the medical man using the apparatus, nor indeed is the vendor necessarily the manufacturer. The position as regards action for breach of contract is therefore not very satisfactory from the point of view of protecting the medical user of apparatus, and the important question is whether a patient can have a right of action against the manufacturer to whose lack of care in manufacture he may really owe his injury.

It is a well-established principle of English law that only the actual parties to a contract (for example, for the supply of apparatus or goods) can sue upon the contract. Thus if I buy a motor-car in which there is a latent defect and my passenger (who is no party to the purchase) is injured as a result of the defect, no action for breach of contract for supplying the faulty car can be maintained by the passenger. Indeed, not until 1932 could he have had any action at all against the manufacturers of the motor-car in respect of his injuries. However, in that year a new principle of liability, not in contract, but under the general law of private wrongs, was laid down by the House of Lords in the case of *Donoghue* v. *Stevenson*, 1932, A.C. 562.

In that case a young man treated his lady friend to a bottle of ginger-beer. The lady, having drunk a portion of the contents, proceeded to pour out the remaining contents of the bottle, which included the decomposed remains of a snail. She thereupon became ill, and alleged subsequently that she had suffered a serious illness in consequence of what she had seen and drunk. For the first time in the history of English law a supplier of goods—the mineral-water manufacturer in this case—was held liable for a defect in his goods to a person with whom he was not in contractual relationship, and the lady was awarded damages. The principle as laid down by Lord Atkin was as follows:

> "A manufacturer of products which he sells in such a form as to show that he intends them to reach the ultimate customer in the form in which they left him, with no reasonable possibility of intermediate examination and with the knowledge that the absence of reasonable care in the preparation or putting up of the products will result in an injury to the consumer's life or property, owes a duty to the consumer to take that reasonable care."

This rule was originally laid down in respect of articles intended for consumption. It has, however, since 1932 been considerably extended.

In 1935 a passenger in a motor-cycle sidecar which came adrift on the road recovered damages for his injuries from the manufacturer, though he himself was a stranger to the transaction of purchase (*Malfroot* v. *Noxall*, 51 T.L.R. 551); and in 1940 a passenger in a motor-car which had recently been bought by another person as a reconditioned article recovered damages from the suppliers for injuries received when a wheel became detached on the road (*Herschtal* v. *Stewart and Ardern*, 1940, 1 K.B. 155). These two decisions thus extended the rule to machinery and to reconditioned goods, so bringing us within sight of our present problem—that of medical apparatus—in which the legal position of the patient would be analogous to that of the passenger in a motor-car. Finally, in *Haseltine* v. *Daw and Sons*, 1942, 2, K.B. 343, a visitor to a building recovered damages for injuries sustained in an accident to a lift which was kept in order under contract by the defendants, thus extending the rule to repairers of apparatus or machinery.

There can be little doubt that the principle of *Donoghue* v. *Stevenson*, as extended by the above cases, will apply to injuries to patients sustained as a result of defective apparatus; but it should be remembered that the principle applies only where the defect is hidden and unknown to the user (*Grant* v. *Australian, etc.*, 1936, A.C. 85). If, therefore, the medical man who used the apparatus knew of the defect, the operation of this principle would be excluded.

In view of the above cases, the law with regard to the liability of manufacturers and repairers of medical apparatus to patients who may be injured by defective apparatus may, in my opinion, be summarized as follows:

> Where a manufacturer or repairer knows that apparatus will be used by a medical man in the treatment of patients, he will be liable for any injury sustained by a patient as a result of any hidden defect in the apparatus due to lack of care in manufacture or repair, provided that the medical man using the apparatus was not aware of the defect and could not have been aware of it from any examination that a medical man could reasonably be expected to make.

The practical effect of this is that where a medical man or hospital authority is sued by a patient for injuries received in circumstances in which it would appear that the above rule can be applied, the manufacturers or repairers, if they have not already been joined as defendants by the plaintiff, should be brought in as third parties by the defendant medical man or hospital authority.

Illustrative Cases

The following examples may serve to make clearer the application of the above argument. A very brief summary of the facts of each case is followed by the opinion given thereon.

Case 1.—A patient was given an electro-medical treatment in the course of which he sustained a severe electric shock. Some hours later he suffered a cerebral thrombosis, from which he never completely recovered and which was attributed to the shock. Expert examination of the electro-medical apparatus which was used showed that the only insulating material between two electrical conductors working at a potential of 220 volts was a substance which deteriorated readily when exposed to heat or moisture and was in other respects unsuitable. The shock was, in fact, due to a breakdown of insulation from this cause. *Opinion.*—Provided that the practitioner had no previous knowledge of the defective construction of the apparatus, liability would rest upon the manufacturers, following the principle of *Donoghue* v. *Stevenson* (see above).

Case 2.—A patient sustained an *x*-ray burn as a result of a defect which developed in an instrument used for measuring *x*-ray dosage. Subsequent examination of this instrument showed a crack in an amber sleeve situated in the interior of the instrument and not visible to the user. Further investigation showed that the instrument had in fact been dropped by a technical assistant, though this had not been reported to any person in authority. *Opinion.*—The radiologist in charge of the department would not be liable. The hospital managers would probably be liable for the negligence of their servants. The manufacturers would not be liable.

Case 3.—A patient while under anaesthesia was given pure ether instead of air as a result of a defective governor in the apparatus. The patient died. There was nothing in the external appearance of the governor which would lead the anaesthetist to suspect that anything was wrong. *Opinion.*—If it could be shown that the manufacturers had been negligent and that usual and reasonable precautions had been taken by the anaesthetist to test the apparatus before administering the anaesthetic, the manufacturers would be liable to the patient, and this would be so even though the apparatus had been in use for a long time—for example, years.

Medical Notes in Parliament

Midwives without Certificates

On a motion for the continuance of certain Defence Regulations, debated on October 23, Captain Crookshank moved to omit Regulation 33.

Dr. CHARLES HILL said the persons covered by this regulation were women who, under Section 5 of the Midwives Act, 1936, had given up practice, or were required to give up practice with compensation. In general their experience was insufficient to enable them to justify their continuance as midwives. If Regulation 33 were continued, someone could be recognized as a midwife who had not practised midwifery for 11 years. He asked whether there was at present any justification for so diluting the midwifery service.

Mr. A. BLENKINSOP said the regulation applied only to those who had voluntarily surrendered their certificates. There was a steadily diminishing number of midwives to which this applied. In 1947 there had been 76, in 1948 65, and in 1949 61. Local authorities were anxious to retain the services of midwives who came back into midwifery work during and immediately after the war and were still urgently needed in those areas. There would be no point in making special provision for an amendment of the Midwives Act. The temporary provision would cease as the midwives concerned retired from service.

Captain Crookshank's amendment was negatived.

The Cost of Hospitals

During the debate on the address replying to the King's Speech, Mr. D. McA. ECCLES on November 2 referred to the rise in hospital costs. He said that in a London hospital with no more beds to-day than before the National Health Service the cost of maintenance had doubled. There must be some other cause for this increase than the cost of supplies and foodstuffs. The position was worse in the provinces, where the hospitals were not so well managed as the London teaching hospitals. He had looked the other day at the cost of the Royal Salopian Infirmary, Shrewsbury. Before the Act had come into operation that hospital had four or five members on its finance staff. A few months ago the governors were worried because they had 22 doing the same work for the same number of beds. They sent someone to look into this and were able to dispense with 12 of these 22. He understood that there was no difference in the efficiency of the work being done. That example could be multiplied throughout the administration of hospitals to-day. The Minister of Health had invented a monster which he was unable to control.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following degrees were conferred on October 28:

M.D.—G. P. Baker, P. E. Perceval, J. A. Harrington.

M.B., B.CHIR.—*S. E. Sebag-Montefiore, *Elizabeth McQ. D. Craig.

The Board of Research Studies has approved Joan E Keilin, M.B., B.Chir., and Mary E. P. Hele, M.B., B.Chir., for the degree of Ph.D.

*By proxy.

UNIVERSITY OF GLASGOW

On November 4 the degree of M.D. was conferred on J. T. Aitken.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At the annual meeting of the College held on October 25 the following officers were elected for the ensuing year: *President*, Mr. W. Quarry Wood; *Vice-president*, Mr. Frank E. Jardine; *Secretary and Treasurer*, Mr. J. J. Mason Brown; *Representative on the General Medical Council*, Sir Henry Wade; *Conservator of Museum*, Mr. J. N. J. Hartley; *Convener of Museum Committee*, Mr. John Bruce; *Librarian*, Mr. Douglas Guthrie.

Medical News

Belgian Award

The Prince Regent of Belgium has conferred the insignia of Commander of the Order of the Crown upon Sir Henry Letheby Tidy and Mr. Geoffrey Richard Edwards, Secretary, Royal Society of Medicine, in recognition of services rendered during the war.

Lecturing on Anaesthetics

Dr. Geoffrey S. W. Organe, anaesthetist to Westminster Hospital, is visiting Italy under the auspices of the British Council to lecture on anaesthetics. He will then lecture in Turkey, Syria, and the Lebanon, returning to London on December 19.

North of England Surgical Society

A North of England Surgical Society has been formed, and its first meetings will be held during the session 1950–1. Professor Grey Turner is a distinguished honorary member of the society, and membership includes surgeons from the North of England in an area corresponding roughly to the Northern Region—that is, from Carlisle to Newcastle and from the Tweed to North Yorkshire. The office-bearers for the first year are:—President: Professor F. C. Pybus (Newcastle). Vice-presidents: Mr. Norman Hodgson (Newcastle), Mr. J. E. Monro (Carlisle). Secretary: Professor F. H. Bentley (Newcastle). Treasurer: Mr. H. Harvey Evers (Newcastle). Members of the committee: Mr. D. C. Dickson (Middlesbrough), Mr. H. B. L. Levy (Sunderland). Five meetings will be held in the session. The principal home of the society will be the Medical School at Newcastle, but meetings will also be held in other large towns in the North. The opening meeting of the session was in Newcastle on November 10, when Professor F. C. Pybus presented an account of experimental work on carcinogenesis.

Family Life in Flats

The Minister of Health has appointed a subcommittee of the Central Housing Advisory Committee, under the chairmanship of Mr. Henry Brooke, M.P., "to examine social needs and problems of families living in large blocks of flats." The other members are: Alderman G. B. Eddie; Mr. C. W. Gibson, M.P.; Sir Lancelot H. Keay, R.I.B.A.; Mr. J. W. Laing, F.I.O.B.; Mr. P. L. Leigh-Breese, F.I.Hsg.; Professor J. M. Mackintosh; Miss E. Murray, F.S.H.M.; and Mrs. B. Wilson, J.P. Any persons or bodies desiring to submit evidence to the subcommittee should communicate with the joint secretaries, Miss M. Empson and Mr. J. C. H. Holden, Ministry of Health, Whitehall, S.W.1.

Vellore Hospital Jubilee Celebrations

The golden jubilee celebrations of Vellore Hospital and Medical College, South India, were celebrated at two meetings in the Caxton Hall, London, on October 12. The second meeting was a medical one, at which Sir George McRobert presided. A film of the ophthalmic work at the hospital was shown, and also a filmstrip of the work of the college and hospital generally. The vital part played by Vellore College as a Christian medical training centre was emphasized by all the speakers. Tribute was paid to the international and interdenominational nature of the staff and to their spirit of unity and purpose. During the celebrations a cable of congratulation was sent to Dr. Ida S. Scudder, founder of the hospital and college.

British Rheumatic Association

The British Rheumatic Association has commenced publication of a quarterly journal, the *B.R.A. Review*, which is intended for the lay public. The first issue includes a history of the association and papers on the home treatment of rheumatism, the employment of rheumatic patients, the almoner's work in a rheumatism unit, and ankylosing spondylitis. The *B.R.A. Review* is published from 5, Tite Street, London, S.W.3, and the subscription is 10s. 6d. per annum.

Nurses' War Memorial Chapel

The Nurses' War Memorial in Westminster Abbey was opened by the Queen on November 2. The chapel, a memorial to nurses who fell in the last war, is believed to be the only one of its kind in the world. It will eventually house a Roll of Honour containing the names of more than 3,000 nurses. The stained-glass window, which the Queen unveiled, occupies one side of the chapel and was designed and made by Mr. Hugh Easton. It depicts a kneeling nurse looking towards the Virgin and Child, with St. Luke above the kneeling figure. In the tracery is a lamp, symbolical of Florence Nightingale, and the base is occupied by nursing badges. The British Empire Nurses' War Memorial Fund, which was launched in 1946 by the *Nursing Mirror*, provided the funds for the chapel. The other purpose of the Fund is to finance postgraduate travelling scholarships for nurses and midwives.

22nd British General Hospital

A successful reunion dinner of the 22nd British General Hospital was held at Liverpool on September 30, with Colonel A. McKie Reid presiding. Some 66 officers, nursing sisters, and other ranks attended. A similar function will take place next year on September 29. Inquiries should be addressed to Mr. C. Cooke, 17, Greenhill Avenue, Calderstones, Liverpool, 18.

Wills

Dr. A. W. Holthusen, of Westcliff-on-Sea, left £5,570; Dr. George O. Gauld, of Nottingham, former captain of Notts County Cricket Club, left £8.419; Mr. C. C. H. Cuff, Nicosia, Cyprus, late of Colonial Medical Service, at St. Lucia, West Indies, and chief consulting surgeon on the Island of Cyprus and surgical specialist to the Government, left estate in England valued at £4,266; Dr. J. W. Hainsworth, of Gosforth, left £23,208; Dr. G. E. Downs, of Marlow, £62,253; Dr. F. W. Edwards, of Forest Hill, £11,137; Dr. E. L. V. Fitch, of Cleator, Cumberland, £21,210; Dr. T. J. S. Moffett, of Cullybackey, County Antrim, left estate in England and Northern Ireland valued at £8,995.

COMING EVENTS

Synthetic Polypeptides

A special general meeting of the Royal Society will be held at Burlington House, Piccadilly, London, W., on Thursday, November 16, at 4.30 p.m., to consider the annual report of council, and will be followed by an ordinary meeting at which papers on "The Structure of Synthetic Polypeptides" will be read. Messrs. C. H. Bamford, W. E. Hanby, and F. Happey will discuss *x*-ray investigation and Messrs. E. J. Ambrose and A. Elliott infra-red investigation. A discussion will follow.

Institute of Laryngology and Otology

Mr. V. E. Negus will deliver the annual address on "Physiological Principles in the Treatment of Diseases of the Nose and Throat" in the lecture hall of the Institute of Laryngology and Otology, 330–2, Gray's Inn Road, London, W.C., on Friday, November 17, at 4.30 p.m. The joint annual dinner of the medical staff of the Royal National Throat, Nose and Ear Hospital and the academic board of the institute will be held the same evening in the refectory of the institute.

Stephen Paget Memorial Lecture

The nineteenth Stephen Paget Memorial Lecture of the Research Defence Society will be delivered by Professor E. D. Adrian, O.M., F.R.S., in the physiology lecture theatre, University College, Gower Street, London, W.C., on Wednesday, November 22, at 5.30 p.m. His subject is "Experiments on the Nervous System." The annual general meeting of the society will be held after the lecture.

Society of Medical Officers of Health

The annual dinner of the Society of Medical Officers of Health will be held at the Piccadilly Hotel, London, W., on Thursday, November 23, at 7 for 7.30 p.m.

Royal Institute of Public Health and Hygiene

The Royal Institute of Public Health and Hygiene has arranged a public lecture on "Accident Prevention in the Home," to be given by Dr. C. A. Boucher, of the Ministry of Health, in the Concert Hall, Y.W.C.A., Shakespeare Street, Nottingham, on Monday, November 20, at 5 p.m. Admission is free without ticket and all interested are invited to attend.

Home and Family

The British Committee of the International Union of Family Organizations will hold a conference on "Homes and the Family" at Caxton Hall, Caxton Street, London, S.W.1, on Thursday, November 23, from 2.30 to 6.30 p.m. The recommendations on housing made by the Royal Commission on Population will be considered in the light of present needs. The speakers include Dr. John D. Kershaw on "Housing and Health: The Medical and Moral Effects of the Problem of the Family." Tickets cost 2s. 6d. and may be obtained from the Honorary Secretary, British Committee of the I.U.F.O., c/o British Social Biology Council, Tavistock House South, London, W.C.1.

Royal Dental Hospital

The annual clinical "At Home" of the Royal Dental Hospital of London School of Dental Surgery will be held at the hospital on Saturday, November 25, at 3 p.m., when cases of clinical interest illustrating the scope of the work undertaken by the hospital will be shown and when the various departments of the hospital and school will be open for inspection.

SOCIETIES AND LECTURES

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

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 13, 5 p.m., "*Clinical Aspects of Cerebral Tumours in Children*," by Dr. S. P. Meadows.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 13, 5.30 p.m., "*Clinical Application of Aureomycin in Ophthalmology*," by Mr. D. Ainslie.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—November 13, 8.30 p.m., "*Domiciliary Management of Pulmonary Tuberculosis*," discussion to be introduced by Dr. C. H. C. Toussaint and Dr. Alec Wingfield.

SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At the Royal Institution, Albemarle Street, London, W., November 13, 7 p.m., "*The Chemotherapy of Cancer*," by Professor A. Haddow. Discussion to be opened by Professor E. Boyland.

Tuesday

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 41, Queens Gate Terrace, London, S.W., November 14, 7 for 7.30 p.m., "*Some Interesting Films from the B.M.A. Library*," to be introduced by Mr. A. Dickson Wright.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, November 14, 5 p.m., "*The Treatment of Acute Nephritis*," by Professor Max L. Rosenheim.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 14, 5 p.m., "*Pathology*," by Dr. J. O. Oliver.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 14, 5 p.m., "*Thrombosis of the Arterio Basillaris*," by Professor A. Biemond (Amsterdam).

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 14, (1) 11 a.m., "*Gonorrhoea in the Female*," by Dr. W. N. Mascall; (2) 3.30 p.m., ward round by Mr. A. R. C. Higham; (3) 5 p.m., "*Disturbances of Micturition in Nervous Diseases and Injury*," by Mr. A. W. Badenoch.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 14, 3.45 p.m., "*The Development of the Genito-urinary System*," by Professor J. D. Boyd.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 14, 5 p.m., "*Science and Art of Refraction*," by Dr. T. H. Whittington.

Wednesday

EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, London, W., November 15, 5.30 p.m., "*The Constitution and Mental Illness: The Scope and Limits of Psycho-analysis*," by Dr. Emanuel Miller.

HARVEIAN SOCIETY OF LONDON.—At 26, Portland Place, London, W., November 15, 8.15 p.m., "*Towards a Healthy Old Age*" by the Rt. Hon. Lord Amulree.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 15, 5 p.m., "*Medical Mycology*," lecture-demonstration by Dr. R. W. Riddell.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 15, (1) 11 a.m., "*Abacterial Urethritis*," by Dr. A. H. Harkness; (2) 3.30 p.m., "*X Rays*," by Mr. H. K. Vernon; (3) 5 p.m., "*Cardiovascular Disease and Hypertension in Relation to Urology*," by Dr. J. C. Hawksley.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 15, 3.45 p.m., "*The Development of the Nervous System*," by Professor J. D. Boyd.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 15, 4 p.m., "*Clinical Ophthalmology*" (Revision), by Mr. R. A. Burn and Mr. R. P. Crick.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 15, 3.30 p.m., "*Health Services Available to the Public Through the Local Authority*," by Dr. A. B. Stewart.

Thursday

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—November 16, 8.15 p.m., "*Problems and Possibilities in the Use of Co⁶⁰ for Radiotherapy*," by Professor J. E. Roberts, D.Sc., F.Inst.P.

EDINBURGH CLINICAL CLUB.—At B.M.A. Rooms, 7, Drumsheugh Gardens, Edinburgh, November 16, 8 p.m., "*The Haematologist and the General Practitioner*," by Dr. J. Innes.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, November 16, 5 p.m., "*Bronchoscopy: Medical Diagnosis and Treatment*," by Dr. I. Malcolm Farquharson.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 16, 5 p.m., "*Cerebral Anoxia*," by Dr. R. S. Allison.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At Hillingdon Hospital, Uxbridge, November 16, 10.30 a.m., ward round by Mr. H. G. Hanley; (2) At St. Paul's Hospital, Henrietta Street, London, W.C., November 16, 11 a.m., "*Reiter's Syndrome*," by Dr. A. H. Harkness; (3) At St. Paul's Hospital, Henrietta Street, London, W.C., November 16, 5 p.m., "*Anaesthesia in Urology*," by Dr. T. A. B. Harris.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool.—November 16, 4 p.m., "*Chemotherapy of Cancer*," inaugural Florence Blair-Bell Memorial Lecture by Sir Stanford Cade. At Exchange Hotel, 7.30 p.m., annual dinner.

LONDON UNIVERSITY, Senate House, Bloomsbury, W.C.—November 16, 5.30 p.m., "*The Biological Aspects of War: Causes*," by Professor F. A. E. Crew, F.R.S.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 16, 5.30 p.m., "*Operative Surgery*," by Miss J. M. Dollar.

ROYAL MEDICAL SOCIETY.—At Royal College of Surgeons of Edinburgh, 18, Nicolson Street, Edinburgh, November 16, 7.15 for 7.30 p.m., president's annual dinner

ROYAL SOCIETY, Burlington House, Piccadilly, London, W.—November 16, 4.30 p.m., "*The Structure of Synthetic Polypeptides*," by C. H. Bamford, W. E. Hanby, and F. Happey (X-ray Investigation), and E. J. Ambrose and A. Elliott (Infra-red Investigation).

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 16, 7.30 p.m., laboratory meeting. Various demonstrations will be given.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 16, 4.30 p.m., lecture-demonstration on neurology by Dr. D. J. Williams.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 16, 1.15 p.m., "*Anatomy and the Graphic Arts*," by Dr. E. Ashworth Underwood.

WINGFIELD-MORRIS ORTHOPAEDIC HOSPITAL: NUFFIELD ORTHOPAEDIC CENTRE, Oxford.—November 16, 8.30 p.m., "*Distant Reflection of 100 Cases of Lumbar Disk Lesions*," by Mr. J. Pennybacker.

Friday

BIOCHEMICAL SOCIETY.—At Wright-Fleming Institute, St. Mary's Hospital Medical School, Paddington, London, W., November 17, 2 p.m., 291st meeting. Papers will be read.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—November 17, 5 p.m., meeting of Medical Members; 6.30 p.m., "*Some Aspects of the Production of Radioactive Isotopes*," by C. W. Gilbert, M.A., Ph.D.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330–2, Gray's Inn Road, London, W.C.—November 17, 4.30 p.m., "*Physiological Principles in the Treatment of Diseases of the Nose and Throat*," annual address by Mr. V. E. Negus. The joint annual dinner of the medical staff of the hospital and the academic board of the Institute will be held the same evening in the refectory of the Institute.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 17, 5.30 p.m., "*Angle of Anterior Chamber*," by Mr. H. E. Hobbs.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—November 17, 5 p.m., clinical neurological demonstration by Dr. Blake Pritchard.

●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—November 17, 12 noon, "*Sterility—Its Approach and Treatment*," by Dr. Bethel Solomons; 3 p.m., "*Some Surgical Problems Encountered in Gynaecological Practice*," by Mr. A. H. Charles; 5 p.m., "*Any Questions?*" Mr. A. J. McNair (chairman), Dr. Ian Donald, Mr. L. B. Patrick, Mr. D. M. Stern, and Mr. S. G. Clayton.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 17, 4.15 p.m., "*Pathology*," by Miss M. Savory.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—November 17, 8 p.m., address by Professor I. G. W. Hill.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—At Royal Society of Medicine, Barnes Hall, 1, Wimpole Street, London, W., November 17, 2.15 p.m., "*Henry Maudsley, His Work and Influence*," twenty-fifth Maudsley Lecture by Professor Aubrey Lewis.

Saturday

●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—November 18, 9.45 a.m., "*Non-malignant Pathology of the Cervix*," by Mr. Aleck W. Bourne; 11.30 a.m., "*Genital Prolapse*," by Mr. L. B. Patrick.

ROYAL LONDON HOMOEOPATHIC HOSPITAL, Great Ormond Street, London, W.C.—November 18, 10.15 a.m., "*The Homoeopathic Physician's Approach to His Patients*," by Dr. W. Lees Templeton; 11.15 a.m., "*The Importance of Temperament in Acute Work*," by Sir John Weir; 2 p.m., "*Homoeopathic Dispensary and Its Implications*," by Mr. Dudley W. Everitt, M.P.S.; 3 p.m., visit to wards and demonstration of a few acute cases by Dr. D. M. Foubister; 7 p.m., at 18, Thurloe Street, South Kensington. London, S.W., supper followed by discussion: "*Homoeopathic Approach to Medical Problems of the Day*," by Dr. Margery G. Blackie.

ROYAL SANITARY INSTITUTE.—At Kent and Canterbury Hospital, Canterbury, November 18, 2 p.m., Canterbury sessional meeting. Discussions: (1) "'*Q*' *Fever*," to be opened by (*a*) Dr. B. P. Marmion, (*b*) Dr. G. Slavin, M.R.C.V.S., and (*c*) Dr. M. S. Harvey; (2) "*Psittacosis: Recent Developments*," to be opened by Dr. A. D. Macrae.

Sunday

ROYAL LONDON HOMOEOPATHIC HOSPITAL, Great Ormond Street, London, W.C.—November 19, 10.30 a.m., "*Homoeopathic Treatment of Acute Conditions Generally*," by Dr. Percival G. Quinton. Questions and discussion to follow.

APPOINTMENTS

FAY, LEO, M.D., D.P.H., Medical Officer of Health, Taunton, 13, in addition to present post of Deputy County Medical Officer, Somerset.

MCMURRAY, J. M. H., M.R.C.S., L.R.C.P., Chest Physician to Creaton Sanatorium, Northamptonshire, and Associated Clinics.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—*Consulting Surgeon in Bristol Clinical Area*, C. H. Bartlett, M.B., B.Chir., F.R.C.S.; *Consulting Physician Paediatrician in North Gloucestershire Clinical Area*, Enid I. M. Addenbrooke, M.B., Ch.B., M.R.C.P., D.C.H.; *Consulting Orthopaedic Surgeon in Bath Clinical Area*, H. W. Hall, M.B., B.S., F.R.C.S.

SUTHERLAND, JOHN M., M.D., Senior Registrar, Northern Regional Hospital Board, Inverness.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Caldwell.—On October 23, 1950, at Mill Road Hospital, Liverpool, to Ann, wife of David L. Caldwell, M.R.C.P., a daughter (premature).

Gray.—On October 28, 1950, at Strathaven, to Marjorie (*formerly* Varcoe), wife of Thomas G. Gray, M.C., F.R.C.S.Ed., a son.

Hartnell.—On October 30, 1950, at British Military Hospital, Singapore, to Eileen, wife of Major H. R. Hartnell, M.B.E., R.A.M.C., a daughter.

MARRIAGE

Bryson—Thompson.—On October 5, 1950, at Bristol, Rev. Arnold George Bryson to Dorothy Joan Thompson, M.B., B.Chir., M.R.C.O.G.

DEATHS

Anderson.—On November 4, 1950, at Ruthin, North Wales, John Hubback Anderson, C.M.G., C.B.E., E.D., M.D., aged 67.

Bell.—On October 30, 1950, at a nursing-home, Claudia Anita Prout Rowse Bell, M.B., of Moorings, Bletchingley, Surrey, aged 77.

Blenkinsop.—On October 26, 1950, at Mtarfa Military Hospital, Malta, Frederick Linton Blenkinsop, M.B., Colonel, I.M.S., retired.

Blunt.—On November 1, 1950, at the Buchanan Hospital, Hastings, Eleanor Dorothea Blunt, M.B., B.S., D.Obst.R.C.O.G., of Black Mill, Ore, Hastings, Sussex.

Clarke.—On November 1, 1950, at Nottingham, James Kilian Patrick Clarke, M.B., B.Ch., D.P.H., D.T.M.&H., aged 64.

French.—On October 28, 1950, Frank Austin French, M.R.C.S., L.R.C.P., of Mont d'Or, Stocks Green Road, Hildenborough, late of Herne Bay.

Hill.—On November 2, 1950, at Gibbshill, St. Margarets-at-Cliffe, Kent, Susie Eleanor Hill, M.D.

Hughes.—On November 5, 1950, in a nursing-home, Ernest Ethelbert Hughes, Ch.M., F.R.C.S., of Capesthorne, Wythenshawe Road, Northenden, Manchester.

Mayo.—On November 1, 1950, at Little Orchard, Cowes, Isle of Wight, Thomas Alfred Mayo, M.B., F.R.C.S., aged 75.

Milne.—On October 28, 1950, at 40, Farington Street, Dundee, Francis Molison Milne, M.B., Ch.B., D.P.H.

Steele.—On November 1, 1950, William Hugh Steele, M.B., C.M., D.M.R.E., of Uphill, South Road, Newton Abbot, Devon.

Stevenson.—On October 21, 1950, at a nursing-home, Glasgow, Douglas Stuart Stevenson, M.B.E., M.B., Ch.B., F.R.F.P.S.Glas., Temple Cottage, Balmore, Stirlingshire.

Whittome.—On October 27, 1950, Harry Whittome, M.D., of 50, Shirley Drive, Hove.

No. 42

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 21.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county) (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	31	4	18		1	24	3	15	6	1
Deaths		—	1				—	—		
Diphtheria	42	6	17	3	1	92	9	30	3	7
Deaths	—	—	—	—	—	1	—	—	—	—
Dysentery	169	15	111		—	154	8	67	—	1
Deaths		—			—				—	—
Encephalitis, acute	3	1	—		—	2	—	—	—	—
Deaths		—		—			—			
Erysipelas			28	3	6		—	25	8	4
Deaths										
Infective enteritis or diarrhoea under 2 years				28	27				94	
Deaths	10		1	—	1	38	2	4	8	3
Measles*	5,876	366	140	114	56	1,052	40	37	119	53
Deaths†		—	—	—	1			—	—	—
Ophthalmia neonatorum	37	1	9		—	68	2	7	—	—
Deaths										
Paratyphoid fever	13	3	—	1 (B)	2	18	5	6 (B)	4 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	432	23	3		1	317	13	5	1	—
Deaths (from influenza)‡	12	2	—	1	—	5	2	—	—	1
Pneumonia, primary			141	¶				120	13	
Deaths	161	23		4	10	124	23		6	9
Poliomyelitis, acute	278	17	29	6	5	414	66	7	3	4
Deaths§	12	2		—		19	3			
Puerperal fever			4				—	5		
Deaths										
Puerperal pyrexia‖	72	3	8		1	81	6	5	1	2
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,227	81	193	81	46	1,909	168	251	135	159
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	—	1	1	2	6	3	—	3	1
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	2,674	251	303	54	35	834	26	53	44	46
Deaths	5	—	—	—	—	3	—	—	5	—
Deaths (0–1 year)	213	30	38	17	13	249	32	35	24	20
Deaths (excluding stillbirths)	4,447	716	565	146	132	4,085	651	507	161	100
Annual death rate (per 1,000 persons living)			11·4					10·2	10·0	
Live births	6,797	1126	886	410	200	7,044	1121	844	411	214
Annual rate per 1,000 persons living			17·8					16·9	25·5	
Stillbirths	179	23	21			172	18	32		
Rate per 1,000 total births (including stillborn)			23					37		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county) are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending October 28 were paralytic, 182 (197); non-paralytic, 71 (81); total, 253 (278). The figures for the previous week are in parentheses. Notifications for the corresponding week in 1947 and 1949 were 280 and 367 respectively. Total uncorrected notifications for 1950 up to and including the week under review are 7,543. The corresponding figures for 1947, 1948, and 1949 were 8,022, 1,975, and 5,259 respectively.

The largest decreases of notifications in county areas were Cheshire 5, Derby 5, Durham 5, Surrey 7, Yorkshire (West Riding) 7. The largest increases were Norfolk 6, Stafford 6, Worcester 6, Denbigh 5. A gradual reduction in notifications has now been maintained for several weeks.

Discussion of Table

In *England and Wales* an increase was recorded in the number of notifications of measles 867, whooping-cough 213, acute pneumonia 50, and a decrease of 30 was reported for acute poliomyelitis.

The largest rises in the number of notifications of measles were: Lancashire 229, Yorkshire West Riding 228, Middlesex 73, Surrey 72, London 63. Only small variations occurred in the returns for scarlet fever. No change occurred in the local trends of diphtheria. The largest returns during the week were Birmingham C.B. 8 and Liverpool C.B. 4. The largest increases in the number of notifications of whooping-cough were Lancashire 56 and Derbyshire 41.

The notifications of dysentery were 11 fewer than in the preceding week. The largest returns were Leicestershire 33 (Leicester C.B. 28); Lancashire 28; Yorkshire West Riding 25; London 15 (Chelsea 9).

The incidence of acute poliomyelitis has fallen in almost every area during the past six weeks. The only exception of note is Cheshire, where 11 cases, the highest recorded this year, were notified during the week reviewed. The largest returns during the week were Yorkshire West Riding 23 (Doncaster R.D. 5); Lancashire 20 (Liverpool C.B. 9); Kent 19 (Orpington U.D. 12); Devonshire 18 (Plymouth C.B. 4); London 17 (Lewisham 5, Lambeth 4); Gloucestershire 16 (Bristol C.B. 14); Warwickshire 11 (Birmingham C.B. 7); Cheshire 11 (Wallasey C.B. 4); Surrey 10; Sussex 10.

In *Scotland* rises occurred in the number of notifications of scarlet fever 54, whooping-cough 39, and decreases were reported for dysentery 71 and acute poliomyelitis 10. A rise in scarlet fever was recorded in every area except the south-east, where a fall of 5 was reported. The chief centres of dysentery were Glasgow 56, Dumfries 14, Edinburgh 12, and Lanark county 12. The largest returns for acute poliomyelitis were Glasgow 5, Angus county 5, Moray and Nairn county 3.

In *Eire* increases were reported in the number of notifications of measles 17, whooping-cough 13, scarlet fever 9, and diarrhoea and enteritis 8. The largest local rises were for measles 10 in Dublin C.B., and 12 for whooping-cough in Tipperary, Cashel Slievardagh R.D.

In *Northern Ireland* decreases in the number of notifications were recorded for scarlet fever 24 and measles 16, while a rise of 9 was reported for diarrhoea and enteritis. In contrast to the general trend of measles a rise of 10 was reported from Belfast C.B. The notifications of diarrhoea and enteritis have increased during the past few weeks in Belfast C.B., and 22 of the 27 cases were notified in this city during the week.

Week Ending October 28

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,141, whooping-cough 3,077, diphtheria 40, measles 6,632, acute pneumonia 435, acute poliomyelitis 253, dysentery 241, paratyphoid fever 14, typhoid fever 6.

Any Questions?

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

Radio-isotope Treatment of Polycythaemia Vera

Q.—*What place have radioactive isotopes in the treatment of polycythaemia vera?*

A.—Radioactive phosphorus, ^{32}P, has been extensively used with success in the treatment of polycythaemia vera. Remissions may last three, four, or five years, and treatment is possible on an out-patient basis. The only alternative satisfactory treatment, other than venesection, is whole-body *x*-ray therapy, and this entails admission to hospital for about a month. The technique of treatment with ^{32}P is not yet standardized, and patients should be referred to a major radiotherapy centre for treatment.

Familial Risk of Infantile Eczema

Q.—*A woman of 39, who has a family history of eczema but has not had it herself, has had two children, both of whom had eczema as infants. One of the children, when 6½ months old, was given egg custard and on the following day developed a generalized erythematous rash and there was a severe exacerbation of his eczema; a week later a purpuric eruption appeared and the child died a few days later. The mother wishes to have another baby. What are the risks of a similar occurrence if she does so? Is there any prophylactic treatment which could be given either to the mother during pregnancy or to the infant?*

A.—The important part of this question is whether a third baby is likely to run the risk of dying as a result of an allergic crisis as did one of the previous children. The reply is that the risk is so small that it should be ignored. The risk of another child suffering from eczema or some other allergic manifestation is greater, but no definite answer on the exact liability can be given. There is certainly a familial tendency to develop allergic symptoms, and the predisposition to do so seems to be genetically determined. However, other factors such as environment play an important part in the actual production of symptoms.

No treatment is known which will prevent the development of susceptibility, either given to the mother during pregnancy or to the infant later. The best advice to give is that the mother should have another baby and not worry about the risk of the child developing eczema. It would, however, be wise to try to make sure that the infant is breast-fed and, when weaning is necessary, that it is changed over to cow's milk and other foods very slowly. If symptoms of food allergy do appear, the antihistamine drugs are sometimes helpful at first, but of no value in the treatment of definite eczema. Reassurance and perhaps sedation of the mother after the birth of the child are likely to be of the first importance.

Mycotic Urethritis

Q.—*I have a patient, aged 45, who has had a persistent urethritis for several years in spite of prolonged therapy with sulphonamides, mandelic acid, penicillin, and streptomycin. The latest bacteriological report on the urine reads: "Culture negative: Yeasts +++, resistant to penicillin and streptomycin." What urinary antiseptic might be active against these yeasts? Would chloromycetin be of any use?*

A.—In the past yeast-like fungi were not infrequently isolated in the urethral discharge and urine: a large number of instances described in the literature followed either a faulty technique in instrumentation or prophylactic syringing. Nowadays, with improved methods of sterilization, mycotic infections of the urethra are extremely rare. Before taking specimens of the urethral discharge or urine for cultural examination it is essential that the external urinary meatus should be thoroughly cleansed with spirit, since *Candida albicans* can be isolated from the skin of apparently healthy individuals. Before making a diagnosis of mycotic urethritis it is also necessary to isolate *Candida albicans* or to detect spores and/or mycelial elements in smears on more than one occasion. The wording of the question suggests that fungus was isolated once only.

No known urinary antiseptic is effective in the treatment of mycotic urethritis: chloromycetin is useless. Urethro-vesical irrigations, however, with silver nitrate (1:15,000 to 1:10,000) are usually successful. In all probability the case is one of abacterial urethritis (the commonest type), which is usually resistant to the drugs employed here. The drug of choice in such cases is aureomycin, 0.5 g. eight-hourly for three days. It should be noted, however, that a persistent urethritis demands a urethroscopic examination and a thorough investigation of the upper urinary tract, as a more serious lesion may be responsible for the discharge.

Prevention of Penile Erection

Q.—*What is the best way of preventing erection after an operation on the penis? Stilboestrol 50 mg. three times a day proved ineffective.*

A.—Persistent erections after an operation on the penis are seldom a very troublesome complication, and when they occur the most usual treatment is to have recourse to the old-fashioned remedies of bromides and chloral, supplementing them at night, if necessary, with morphine. Stilboestrol is not likely to be effective unless started a week before the operation. Its disadvantage is that it produces degenerative changes in the testes. These changes are reversed when the hormone is abandoned, but it is seldom necessary to have recourse to such drastic treatment. Whatever drugs are used to combat erections, such subsidiary measures as avoiding additional stimulation of the penis through the weight of the bedclothes, tight bandages, and pyjamas, etc., must not be neglected.

Toxicity of Insecticides: "P.M.4"

Q.—*Is there any danger in a spray insecticide called "P.M.4" which is used by tomato growers?*

A.—P.M.4 is recommended for use in greenhouses as a fungicide. It contains 0.5% (weight in volume) of a phenyl mercury compound, the equivalent of 0.2% of mercury. Forty millilitres of the liquid preparation is dispersed as an aerosol to treat 5,000 cubic feet of space. Since the aerosol is delivered under pressure spray, drift is usually several feet ahead of the operator, who begins spraying at the end of the greenhouse and walks backwards to the door as he sprays. The greenhouse is closed during the application of the fungicide and for several hours afterwards. Before anyone enters the greenhouse again it should be ventilated thoroughly for several hours. Although the lower alkyl mercury compounds, such as the methyl and ethyl derivatives, are extremely toxic to man, causing damage to the sensory nervous system, there is no evidence that the higher alkyl mercury compounds, such as the phenyl and tolyl derivatives, have any harmful effects.

Cyanide in Salmon

Q.—*It is common for salmon to be offered for sale in this locality (Isle of Man) which have been killed by cyanide. Does this constitute a danger to health?*

A.—The use of cyanides for killing is, of course, effective and leaves little trace after the hydrocyanic acid has either been converted to thiocyanate or, where free, volatilized. The tissues are pink from a high oxygen saturation, being unable to utilize oxyhaemoglobin owing to the direct poisoning effect of HCN on the tissue oxidase enzymes. The quantity of cyanide absorbed from the gills would be far too small—and the more so after being broken down—to cause poisoning in man, even in fresh unprepared fish flesh. No HCN could remain after cooking: only traces of thiocyanate might remain.

Sterilization of Instruments Subject to Damage by Moist Heat

Q.—*What are the best and quickest ways of sterilizing surgical instruments, etc., for which moist heat cannot be used—e.g., cystoscopes and other electrical instruments and their cables, powder insufflators, absorbable gauzes?*

A.—The methods for the articles mentioned differ. A powder insufflator should be sterilized by dry heat at 160° C. for one hour. If the bulb and tube must be sterile also, they should be detached and autoclaved separately. It may be added that the powder itself will also require to be sterilized by dry heat unless initially sterile. For any materials for which neither dry nor moist heat is suitable, chemical sterilization is the only alternative. Formaldehyde vapour is the only possibility for complex instruments, especially those with electrical connexions which cannot be immersed in water. If immersion is feasible, the best solution is one containing formalin: that prescribed in the *National War Formulary* is:

Borax	..	..	..	..	15 g.
Formalin	..	..	..	..	25 ml.
Phenol	..	..	..	..	4 g.
Water	..	..	..	to	1,000 ml.

Such solutions produce absolute sterility—i.e., formalin destroys all forms of bacterial life, including spores, but to do this it requires time: six hours' exposure is the minimum. There is no rapid chemical method of achieving this result. If on the other hand it is considered necessary to kill only pyogenic cocci and other non-sporogenous bacteria, and provided that the instrument is clean and has no crevices, disinfection can be carried out in about 15 minutes with any quickly acting disinfectant, such as 75% spirit, 5% phenol, or 2% lysol.

Vaccination and Inoculation

Q.—*A baby, vaccinated at 6 weeks, developed a severe local reaction, and at the same time three or four vaccinia pustules on the feet. The baby made a good recovery and is in every other respect healthy. Is there any reason to suspect that inoculation against diphtheria and whooping-cough is contra-indicated following the severe reaction to vaccination?*

A.—The degree of reaction to vaccination varies considerably in different children, but there is no evidence to suggest that a baby which developed a severe vaccinial reaction should be similarly affected by subsequent inoculations with diphtheria or pertussis prophylactics. Local reactions are more likely to occur with combined diphtheria–pertussis vaccine, and it is therefore suggested that the child should have its inoculations against these two infections separately, preferably commencing at 4 to 6 months of age, with two or three injections of pertussis vaccine at monthly intervals, followed by two injections of A.P.T. or P.T.A.P.

Desensitization to Bee-Venom

Q.—*(1) Is it practicable to desensitize a patient who is abnormally sensitive to bee-stings? (2) If this is not feasible, what other protection is it possible to give to such a patient?*

A.—It is possible to hyposensitize—usually for a period of years—a patient who is abnormally sensitive to the effect of bee-stings, as is shown by the work of R. L. Benson (*J. Allergy*, 1929, **1**, 105; and *Arch. intern. Med.*, 1939, **64**, 1306). In practice one has to consider (1) the risks of a severe reaction from the injections (and the more sensitive the patient, the greater the risk and the less likely is the treatment to be successful); (2) for how long it will be necessary to go on with the treatment; (3) how much of a guarantee can then be given of freedom from reactions to a bee-sting; and (4) for how long, in the absence of further stings or with frequent (or infrequent) further bee-stings, relative immunity will last.

In practice, if it is impossible to carry out the ideal treatment—the prevention of further bee-stings—then hyposensitization carried out by an expert could certainly be expected to reduce the frequency and risks of severe reactions to further bee-stings. In the absence of such treatment, or even after such treatment, protection might be obtained by giving ephedrine and one of the antihistaminics just before exposure to possible bee-stings and certainly as soon as a sting occurs; if the subject receives a sting adrenaline might also be given in order to secure rapid relief.

Tetanus Antitoxin

Q.—*(1) Can any guidance be given on the degree of wound or abrasion in which administration of A.T.S. is advisable? (2) What are the chances of serious or fatal reaction following administration of A.T.S.? (3) Is it dangerous to repeat administration of A.T.S. within a given time?*

A.—(1) Tetanus is a very rare infection in civilian practice, although it must frequently happen that tetanus antitoxin is not given in the kind of penetrating or lacerated wound associated particularly with tetanus. This rarity may be due to the early and thorough surgical toilet which accidental wounds usually receive, although in most hospitals such treatment is supplemented with a prophylactic injection of 1,000–3,000 units of tetanus antitoxin. Infection is less likely to occur with a superfical abrasion, but here, too, the wound should be thoroughly cleansed and any collection of fluid evacuated. Tetanus antitoxin need not be given in such cases, but, since sepsis may predispose to tetanus if tetanus spores are present in the wound, local or systemic antisepsis should be used—e.g., a flavine dressing or an injection of penicillin.

(2) Anaphylactic reactions following the injection of a foreign protein are extremely rare—the risk has been put at 1 in 500,000. Inquiry should always be made for any allergic history—e.g., eczema, urticaria, hay fever, or asthma.

(3) The period of acquired sensitivity following the injection of foreign protein depends on dosage, the degree of purification of the antiserum, etc. With a small prophylactic dose of refined tetanus antitoxin, sensitivity would not ordinarily last for more than a few months. If there is a history of recent injection of antiserum, 1 ml. of 1:1,000 adrenaline should be given immediately before or after the second injection.

Diagnosis of Uniovular Twins

Q.—*Does the presence of a single placenta at the birth of twins establish that they are uniovular?*

A.—The present position with regard to the placental diagnosis of twins is this: fusion of the placentae is certainly not an adequate criterion of monozygosity; it occurs in pairs of unlike sex. On the other hand, von Verschuer (*Proc. roy. Soc. B.*, 1939, **128**, 62) considered that injected preparations of fused placentae may or may not show complete continuity of the two foetal circulations, and there seems to be good presumptive evidence that placental fusion which entails continuity of the capillaries and arterioles justifies a diagnosis of monozygosity.

NOTES AND COMMENTS

Raynaud's Disease.—SAVORY AND MOORE, LTD., London, write: In "Any Questions?" (September 23, p. 738) your expert states: "Local acetyl-β-methylcholine ('carbachol') ionization is helpful in some patients." May we point out, however, that acetyl-β-methylcholine is manufactured by us under the branded name of "amechol"? Carbachol is the official name for carbaminoylcholine chloride. The particular point is that by ionization "amechol" has now completely replaced carbachol, for not only is it of greater therapeutic efficiency, but the side-effects experienced with carbachol seldom occur with "amechol."

Correction.—"*Bact. coli* and Infantile Gastro-enteritis": 1943 in the 2nd para, line 5, of Dr. A. Compton's letter (October 14, p. 889) should read 1947.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 18 1950

FREEZING AND DESICCATION OF MOUSE TUMOURS*

BY

R. D. PASSEY, *M.C.*, M.D., D.P.H.
Professor of Experimental Pathology and Director of Cancer Research, University of Leeds

AND

L. DMOCHOWSKI, M.D., Ph.D.
Reader in Cancer Research, School of Medicine, University of Leeds

[WITH SPECIAL PLATE]

Gye and his colleagues (Gye, 1949; Gye, Begg, Mann, and Craigie, 1949; Mann, 1949b, 1949c; Mann and Dunn, 1949) published a series of experiments on the propagation of mouse tumours, first by frozen and then by frozen and desiccated tumour tissues. As the result of these experiments they arrived at the following conclusions: (*a*) that freezing alone is sufficient to kill tumour cells, and more effective still is freezing followed by drying; and (*b*) that the newly induced tumours must have been initiated by a virus, since frozen and frozen-and-dried tumour material is able to induce tumours on inoculation.

In view of the interesting experimental evidence and the far-reaching conclusions based on it, experiments were undertaken (*a*) to repeat the observations described by Gye *et al.* with their own and other tumours, and (*b*) to test their claim to have obtained evidence of a cancer virus.

The technique followed throughout the experiments was, in essence, that described by the above authors. The pump employed was the "Speedivac" Model 2 two-stage rotary vacuum pump, which gives a vacuum of 0.00001 mm. Hg and has a displacement of 48 litres a minute (W. Edwards & Co., Ltd.). No estimate of the weight of the dried material was made by Gye *et al.* so far as can be judged from their publications. They report no attempts to dry their material to a constant weight, and we know of none. Gye (1948–9, page 13) states that Craigie's apparatus "dries a gramme of finely divided tumour tissue in less than an hour," and that "the tissues have been dried to dust." In another experiment Gye (1948–9, page 14) refers to "fine dry scales of tissue" after drying for 130 minutes. As these were the only criteria of dryness described by him we accepted and adopted them. In most of the present experiments 5.3% glucose solution was used as a diluent fluid in quantities either equal to, or up to three times, the weight of the tumour material, usually 1 g. The drying-time varied according to the amount of tissue and diluent in the container. The desiccation process was usually carried on for 3½ hours. The dried material was reconstituted in 5.3% glucose solution or in 1 in 500 neutral solution of cysteine or in a fluid composed of equal quantities of 5.3% glucose solution and cysteine solution, all added in amounts from three to five times the original volume of the tumour-cell suspension. The resulting suspension was injected into the mice by various routes in quantities varying from 0.1 to 0.5 ml.

It was found that there was no difficulty in repeating the results of Gye *et al.*, both those of freezing and those of freeze-drying the various sarcoma tissues employed in the present experiments.

1. Experiments with Mouse Sarcomata

The results are set out in Table I. The failure to obtain tumours in the first two experiments with the 37S tumour may have been due partly to faulty technique or to the condition of the tumour tissue, while the negative result with the Crocker sarcoma may have been due to a temporary breakdown in the supply of solid CO_2, when the temperature in the insulated box rose to −12° C. The negative results with these two tumours will be referred to in the section on histology.

2. Experiments with Mouse Breast Carcinomata

Employing the same technique we found that the breast carcinomata do not stand up to the conditions of the experiment in the same way as do the sarcomata. The results both of freezing and of freezing followed by desiccation of mouse mammary carcinomata are presented in Table II.

It will be seen that while the results with the carcinomata are not as good as those with the sarcomata, they suffice to confirm the observations of Mann (1949b) and Mann and Dunn (1949). Altogether seven experiments were carried out—three with spontaneous C3H breast carcinomata and four with transplantable C3H breast carcinomata. While it must be admitted that the number of experiments is too small from which to draw any final conclusion about a possible difference between transplantable and spontaneous

*Preliminary demonstration given at the Second Informal Conference of the Northern Cancer Research Workers on Normal and Abnormal Cell Growth held at Leeds on September 24–25, 1949, and communicated to: (1) the Pathological Society of Great Britain and Ireland in London, January 7, 1950; (2) the Joint Meeting of the Netherlands Pathological Society and the Pathological Society of Great Britain and Ireland held in Leyden, April 14, 1950; (3) the Conference on the Freezing and Drying of Animal Cells at the National Institute of Medical Research, London, June 28, 1950; and (4) the 5th International Cancer Congress, Paris, July 16, 1950.

TABLE I.—*Freezing, and Freezing Followed by Desiccation, of Different Sarcomata*

Strain	Tumour	Diluent	Time Frozen	Desiccation Time	Method of Inoculation	Mice Sex	Mice No.	No. of Tumours	Time of Appearance	Time of Observation	Histology	Remarks
(C57 x A) F_2	37 sarcoma	None	30 days	Not done	Subcutaneous	M, F	10	0	—	11 weeks	Not done	—
,,	,,	,,	30 ,,	,,	Intrapleural	M, F	4	0	—	7 ,,	,,	—
,,	,,	,,	30 ,,	,,	Intraperitoneal	M, F	5	5	1–3 weeks	7 ,,	,,	—
,,	,,	,,	74 ,,	3½ hours	Subcutaneous	M	10	5	2–3 ,,	5 ,,	,,	5·3% glucose added before desiccation
C57 ..	C48 sarcoma	5·3% glucose	51 ,,	Not done	,,	M	3	3	5–8 days	3 ,,	Done	—
,,	,,	,,	51 ,,	,,	Intraperitoneal	M	3	3	5–8 ,,	3 ,,	,,	—
,,	,,	,,	51 ,,	3½ hours	Subcutaneous	M	3	2	2–5 weeks	7 ,,	,,	Desiccated tissue reconstituted in cysteine
,,	,,	,,	51 ,,	3½ ,,	Intraperitoneal	M	2	2	3 ,,	7 ,,	,,	,, ,,
,,	,,	,,	27 ,,	3½ ,,	Subcutaneous	M	18	18	1–2 ,,	3 ,,	,,	Desiccated tissue reconstituted in 5·3% glucose
C3H ..	C3H sarcoma	,,	7 ,,	3½ ,,	,,	M	7	4	2–3 ,,	4 ,,	,,	,, ,,
,,	,,	,,	10 ,,	2 ,,	,,	M	12	11	1 week	2 ,,	,,	Desiccated tissue reconstituted in equal volumes of 5·3% glucose and cysteine
,,	,,	,,	12 hours	1 hour	,,	M	6	6	4–5 days	2 ,,	,,	Desiccated tissue reconstituted in 5·3% glucose
RIII ..	RIII (No. 4) sarcoma	,,	87 days	3½ hours	,,	M, F	12	12	2 weeks	4 ,,	,,	,, ,,
(C57 x A) F_2	Crocker sarcoma	,,	107 ,,	Not done	,,	M, F	12	0	—	5 ,,	,,	—

TABLE II.—*Freezing, and Freezing Followed by Desiccation, of Mammary Carcinomata.*

Strain	Tumour	Diluent	Time Frozen	Desiccation Time	Method of Inoculation	Mice Sex	Mice No.	No. of Tumours	Time of Appearance	Time of Observation	Histology	Remarks
C3H ..	C3H spontaneous breast carcinoma	None	13 days	Not done	Subcutaneous	M	12	2	2–3 weeks	12 weeks	Not done	—
,, ..	,,	Physiological saline	13 ,,	,,	,,	M	6	4	4–8 ,,	14 ,,	,,	—
..	C3H transplantable breast carcinoma	None	30 ,,	,,	,,	M	12	0	—	12 ,,	,,	—
,, ..	,,	,,	30 ,,	,,	Intrapleural or intraperitoneal	M	6	0	—	12 ,,	,,	—
,, ..	,,	5·3% glucose	19 ,,	,,	Intraperitoneal	M	11	0	—	17 ,,	Done	—
,, ..	,,	None	74 ,,	3½ hours	Subcutaneous	M	12	0	—	12 ,,	Not done	Desiccated tissue reconstituted in 5·3% glucose
,, ..	C3H spontaneous breast carcinoma	5·3% glucose	11 ,,	3½ ,,	,,	M	3	1	8 weeks	12 ,,	Done	,, ,,

carcinomata in the resistance to freezing and drying, attention might be drawn to the results of Klinke (1940) and Cramer (1930), who similarly observed that spontaneous mammary carcinomata showed a greater resistance to cold (−196° C.) than transplantable breast carcinomata.

It is not altogether surprising that the sarcomata should withstand the treatments of freezing and of freeze-drying better than the carcinomata. The carcinomata as a whole are derived from more highly differentiated tissues than the sarcomata, and it would not be unreasonable to expect them to be more susceptible to adverse conditions. Certainly in our experiments there were more visible changes, suggesting cell damage, to be found microscopically in the case of the carcinomata than in the sarcomata; it may not be unreasonable to associate this fact with the experimental results.

Centrifugation of Frozen and Frozen-desiccated Material

Having satisfied ourselves that the results described by Gye *et al.* can be repeated at will, not only with the same but also with different tumours, we undertook an experiment to test whether an active agent or virus could be separated from the tumour cells or whether the tumour-inducing activity is associated with the tumour cells themselves.

Suspensions of minced tumour tissues which had been previously frozen, or frozen and dried, and then reconstituted were centrifuged at 3,000 to 7,000 times gravity for periods of time varying from two to five minutes. Such centrifugation is insufficient to remove viruses from fluid suspensions, and it is reasonable to expect that any virus present would remain in the supernatant fluid. Our aim was to obtain at least a partial separation of virus from the tumour cells, and to test the two resulting fractions for activity by inoculation. The results of inoculation of the sediment and of the supernatant fluids are shown in Tables III and IV.

As can be seen from these tables, tumours were induced in each case with the sediment obtained after centrifugation of the various tumour suspensions, and in no case were tumours observed following inoculation of the water-clear supernatant.

Table IV demonstrates the greater susceptibility to the combined treatment of cold and drying that was noticed in the mammary carcinomata as compared with the sarcomata. Only one tumour was induced by the carcinomata, and in this case by the sediment.

Thus from these centrifugation experiments it is quite clear that the power of tumour suspensions, whether frozen or frozen and then dried, to induce tumours remains with

TABLE III.—*Centrifugation of Frozen and Frozen-desiccated Sarcomata.*

Strain	Tumour	Diluent	Time Frozen	Desiccation Time	Centrifugation	Method of Inoculation	Mice Sex	Mice No.	No. of Tumours	Time of Appearance	Time of Observation	Histology	Remarks
(C57 x A) F_2	37 sarcoma	None	30 days	Not done	3,000 × g. 5 minutes	Subcutaneous supernatant	M, F	11	0	—	11 weeks	Not done	Centrifuged in 5·3% glucose
,,	,,	,,	30 ,,	,,	,,	Subcutaneous sediment	M, F	10	4	3–4 weeks	11 ,,	,,	,,
,,	,,	5·3% glucose	18 ,,	3½ hours	7,000 × g. 3 minutes	Intraperitoneal supernatant	M	7	0	—	9 ,,	Done	Desiccated tissue resuspended in cysteine
,,	,,	,,	18 ,,	3½ ,,	,,	Intraperitoneal sediment	M	9	3	5–13 days	9 ,,	,,	,,
C57 ..	C48 sarcoma	,,	51 ,,	Not done	3,500 × g. 5 minutes	Subcutaneous supernatant	M	2	0	—	12 ,,	,,	—
,,	,,	,,	51 ,,	,,	,,	Intraperitoneal supernatant	M	4	0	—	12 ,,	,,	—
,,	,,	,,	51 ,,	,,	,,	Subcutaneous sediment	M	2	2	5–9 days	3 ,,	,,	—
,,	,,	,,	51 ,,	,,	,,	Intraperitoneal sediment	M	4	4	9–13 ,,	3 ,,	,,	—
,,	,,	,,	51 ,,	3½ hours	7,000 × g. 5 minutes	Subcutaneous supernatant	M	6	0	—	12 ,,	,,	Desiccated tissue reconstituted in cysteine
,,	,,	,,	51 ,,	3½ ,,	,,	Subcutaneous sediment	M	9	6	4–5 weeks	12 ,,	,,	,,
C3H ..	C3H sarcoma	,,	30 ,,	3½ ,,	7,000 × g. 2 minutes	Subcutaneous supernatant	M	6	0	—	12 ,,	,,	Desiccated tissue reconstituted in 5·3% glucose
,,	,,	,,	30 ,,	3½ ,,	,,	Subcutaneous sediment	M	12	10	2 weeks	4 ,,	,,	,,
(C57 x A) F_2	Crocker sarcoma	,,	22 ,,	3½ ,,	7,000 × g. 3 minutes	Subcutaneous supernatant	M, F	16	0	—	16 ,,	,,	Desiccated tissue reconstituted in equal quantities of glucose and cysteine
,,	,,	,,	22 ,,	3½ ,,	,,	Subcutaneous sediment	M, F	22	16	1–3 weeks	9 ,,	,,	,,

TABLE IV.—*Centrifugation of Frozen and Frozen-desiccated Breast Carcinomata.*

Strain	Tumour	Diluent	Time Frozen	Desiccation Time	Centrifugation	Method of Inoculation	Mice Sex	Mice No.	No. of Tumours	Time of Appearance	Time of Observation	Histology	Remarks
C3H ..	C3H transplantable breast carcinoma	None	30 days	Not done	7,000 × g. 5 minutes	Subcutaneous supernatant	M	12	0	—	11 weeks	Not done	Centrifuged in 5·3% glucose
,,	,,	,,	30 ,,	,,	,,	Subcutaneous sediment	M	12	0	—	11 ,,	,,	,,
,,	,,	5·3% glucose	38 ,,	3½ hours	7,000 × g. 3 minutes	Subcutaneous supernatant	M	9	0	—	18 ,,	Done	Desiccated tissue resuspended in equal volumes of glucose and cysteine
,,	,,	,,	38 ,,	3½ ,,	,,	Subcutaneous sediment	M	9	0	—	18 ,,	,,	,,
,,	,,	,,	25 ,,	3½ ,,	7,000 × g. 2 minutes	Subcutaneous supernatant	M	7	0	—	21 ,,	Not done	,,
,,	,,	,,	25 ,,	3½ ,,	,,	Subcutaneous sediment	M	10	1	14 weeks	21 ,,	,,	,,

the tumour cells. Everything points to the activity being associated with the cellular material, alive or dead, as it is never found in the clear cell-free supernatant, as might reasonably be expected if the action were the results of a virus. A reasonable deduction from this observation is that some tumour cells may survive the treatment and thus be responsible for the transmission of tumours. Histological study greatly strengthens this deduction.

Histological Investigations

Gye *et al.* (1949) stated that the results of their histological examinations of random samples of cell suspensions had failed to support the idea of cell survival. Dried tissues examined by them "showed only a mass of debris and shrunken nuclei." In their papers there is little information about histological appearance, and in none of them do they present any illustration, nor is there any description, of the appearances of frozen and dried tumour material fixed *after* reconstitution. Mann and Dunn (1949) reproduce a photograph of a mammary carcinoma fixed immediately after freezing followed by desiccation but *before* reconstitution, although there is no figure to illustrate the same tissue fixed *after* reconstitution.

In each of the present experiments the minced tumour tissues were fixed in Bouin's fluid, stained with haematoxylin and eosin, and examined microscopically: (1) before freezing, (2) after freezing in 5.3% glucose, (3) after freezing followed by drying *before* reconstitution, and (4) after combined freezing and drying *after* reconstitution in glucose or cysteine.

The results are shown in Figs. 1–20 (see Plate). It is difficult to detect any differences in the appearance of many of the sarcoma cells before and after freezing (see Figs. 4 and 5). Similarly, after freezing and desiccation followed by reconstitution, the suspensions of sarcoma cells had an appearance similar to that of the same suspensions before freezing and drying (see Figs. 1 and 2, 4 and 7, 9 and 10, 11 and 13, and 14, 18, and 20).

However, in no case could intact cells be found after freezing and drying but *before* reconstitution: this observation agrees entirely with that described by Gye *et al.* (1949) (see Figs. 6, 12, and 19) in revealing "only a

mass of debris and shrunken nuclei." The addition of any of the mentioned diluents to the frozen and desiccated material *before* fixation in Bouin's fluid creates an amazing and dramatic effect on the fixed tissues (see Figs. 6 and 7, 12 and 13, and 19 and 20). Many of the tumour cells are, to all appearances, intact, resembling in their entirety the tumour cells before the treatment.

How it can have come about that Gye *et al.* (1949) and Mann and Dunn (1949) omitted this step is not clear; but it is a matter for conjecture whether the failure to observe the appearances of frozen and dried tissue *after* reconstitution might not have been one of the reasons for their interpretation of the results.

While the microscope cannot with certainty reveal if tumour cells are alive or dead, the appearance of tumour-cell suspensions obtained before and after freezing, or freezing followed by drying, strongly suggests that some of the tumour cells might have been alive and have been responsible for the induction of tumours either with frozen or with frozen-and-dried material. From the appearance of the tumour cells there is no evidence that they are dead. The biological results in every case support the inferences which might reasonably be drawn from the microscopical appearances. Thus in every case in which the tumours were obtained by inoculation with the treated material the microscope suggested that at least many cells might be alive: certainly they seemed very little altered when compared with the fresh tumour-cell suspension; while, in those cases in which the biological tests were negative, histological examination showed considerable cell injury or even loss of cell structure. This was particularly well shown in the experiments with the Crocker sarcoma (Fig. 3) and with 37S (Fig. 8). In the Crocker suspension, frozen for 107 days, no intact cells were seen and no tumours were induced, while the 37S tumour suspension, which presented profound cellular changes, gave fewer tumours than suspensions of other tumours treated in a similar manner. Again, in the case of C3H mammary carcinomata similar changes, indicative of cell injury, could be seen both in the frozen and in the frozen-desiccated material, which goes hand in hand with the erratic results obtained with the C3H mammary carcinomata, especially the transplantable one (see Figs. 15, 16, and 17).

To sum up, it might in general be said that, viewing the results of the microscopical studies as a whole, the material which presents little histological evidence of cell damage can be relied upon to induce tumours more readily than that which has a damaged appearance.

TABLE V.—*Summary of Results*

Tumour	Freezing Alone	Freezing and Desiccation	Centrifugation	No. of Mice	No. of Tumours
37 sarcoma ..	+	−	−	19	5
,, ..	−	+	−	10	5
,, ..	+	−	Supernatant	11	0
			sediment	10	4
,, ..	−	+	,,	7	0
				9	3
C48 sarcoma ..	+	−	−	6	6
,, ..	−	+	−	23	22
,, ..	+	−	Supernatant	6	0
			sediment	6	6
,, ..	−	+	,,	6	0
				9	6
Crocker sarcoma	+	−	−	12	0
,, ..	−	+	Supernatant	16	0
			sediment	22	16
C3H sarcoma..	+	−	−	25	21
,, ..	−	+	Supernatant	6	0
			sediment	12	10
RIII (No. 4) sarcoma ..	+	−	−	12	12
C3H spontaneous breast carcinoma ..	+	−	−	18	6
,, ..	−	+	−	3	1
C3H transplantable breast carcinoma ..	+	−	−	29	0
,, ..	−	+	−	12	0
,, ..	+	−	Supernatant	12	0
			sediment	12	0
,, ..	−	+	,,	16	0
				19	1

+ Denotes procedure carried out. − Denotes procedure not carried out.

Discussion

(a) Freezing and Drying

If there has been no difficulty in repeating the experiments of Gye *et al.* (Table V), the same cannot be said of accepting their interpretation—namely, that these experiments indicate a virus to be the cause of the successful transmission of tumours by frozen-and-dried material. Before discussing the reasons for the inability to agree with Gye's conclusions, experiments in this field by previous workers will be described and discussed. It is felt that a careful perusal of some of the available experiences of previous workers should in itself command the greatest caution in accepting the conclusions reached by Gye *et al.*, because in the literature there is ample evidence that extremes of cold, far beyond anything employed by Gye, can be successfully resisted by some organisms without jeopardizing life.

Gye *et al.* were obviously very much impressed with the inferences which they had drawn from experiments of Ida Mann (1949a), in which she found that embryonic tissues of mice do not survive exposure to freezing at −79° C. for one hour. But surely there was nothing new in this, as many previous observers had already published work of a similar nature. Thus Gaylord (1908) was not able to obtain subcutaneous transplantation of mouse embryo epithelium after exposure to −180° C. Lambert (1912) observed that chick embryos developed after exposure to −5° C. for 10 days, and that chick embryo heart was killed after one minute at −74° C., but survived at −20° C. for five minutes. Simonin (1931) found that fragments of mouse and rat embryo survived for five days at −5° C., but were killed at −15° C.

There are numerous publications on the storage of tumour tissues at low temperatures for periods varying up to two years, and a successful transplantation of such tissues into animals. The methods employed by different authors were extremely variable: long exposure to only a few degrees of cold, short exposure to very low temperatures, and single or repeated exposures to various temperatures have all been described for various types of tumours, usually with a great measure of success.

Michaelis (1905) was the first to observe the survival of Jensen rat sarcoma after exposure to liquid air for 30 minutes. Ehrlich (1907) reported survival of carcinoma cells after storage at −8° C. for two years and after 48 hours at 38° C. Salvin-Moore and Walker (1908) exposed a transplantable mouse mammary carcinoma to liquid air for 30 minutes, and succeeded in transplanting it. Salvin-Moore and Barret (1908) observed similar results after exposure of mouse sarcoma and carcinoma to liquid air for 20 minutes. Gaylord (1908) confirmed these findings. Cramer (1930) froze finely minced tissues of seven different mammalian tumours in CO_2 and found that sarcomata grew and carcinomata failed to grow on transplantation following this treatment. Some of the tumours (37S) induced tumours after freezing and thawing repeated eight times. Auler (1932) found that Ehrlich mouse carcinoma grew on transplantation after an exposure to −73° C. for 25 minutes, and Jensen rat sarcoma after five minutes at −73° C., and that Flexner–Jobling carcinoma failed to grow.

Barnes and Furth (1937) and Breedis, Barnes, and Furth (1937) successfully transplanted leukaemia of mice after exposure to −70° C. for 56 days and also a similarly treated sarcoma induced by benzpyrene. Breedis and Furth (1938) reported the survival of various tumours (sarcomata and carcinomata) after storage at −79° C. for 400 days. Klinke (1937) demonstrated successful transplantation of many mice and rat tumours after direct exposure to −196° C. for periods up to 47 hours. The only observed difference between tumours treated in this way and the controls was the delay in tumour appearance after freezing. Mider and Morton (1939) reported that Walker rat carcinoma and 37S and 180 mouse sarcomata grew on subcutaneous transplantation after exposure to −79° C.

Klinke (1940) succeeded in demonstrating growth in tissue culture of Ehrlich mouse sarcoma after exposure to −253° C. lasting 10 minutes, and of Jensen rat sarcoma after two days at −196° C. Although intact cells could be seen in tissue culture of a transplantable breast carcinoma after exposure to these temperatures, growth was not obtainable. Klinke concluded that exposure to low temperatures gives no basis for the existence of a virus in mammalian tumours because of the results of vital staining and growth in tissue cultures. Subsequent to Gye's papers, Craigie (1949a, 1949b, 1949c) with proper caution suggested that there may be some cell survival following freezing of tumour cells in a mixture of dextrose and 40% glycerol. Of all these results, Klinke's (1940) obtained after exposure of tumour cells to low temperature are perhaps the most pertinent, as he clearly demonstrated the survival and growth *in vitro* of tumour cells which had been so exposed. This property of survival following exposure to cold is not limited to tumour cells, as can be seen from the quoted literature.

Not only does the literature abound in examples of the survival of tumour cells after extremes of freezing, but there are many references to the ability of normal cells, tissues, and organisms to survive such treatment. Luyet and Gehenio (1938a) reviewed the experiments on survival of unicellular and other primitive organisms after freezing. Heilbrunn (1943) also reviewed experiments on the resistance of single-celled and multicellular animals and plants to very low temperatures. It is now known that some organisms can withstand temperatures close to the absolute zero, while others are killed at temperatures above the freezing-point of water, but the rate at which an organism is cooled and the rate at which it is brought back to higher temperatures is known to affect the ability of the organism to withstand the cold to which it is subjected.

De Jong (quoted by Heilbrunn) observed that trypanosomes are able to resist exposure to −190° C. Rahm (1922) demonstrated that nematodes, rotifers, and tardigrades placed in water cooled gradually could be brought to the temperature of liquid hydrogen (−253° C.) without death, but that they died when brought to that temperature suddenly. Luyet and Gehenio (1938b) reported survival of plant cells after exposure to liquid air, and Luyet and Hartung (1941) demonstrated survival of common vinegar eels (*Anguilla aceti*) after immersion in liquid air (−190° C.), preceded by immersion in 30% ethylene glycol solution, and rapid rewarming in water at 30° C. They reported that in one experiment they had observed a vinegar eel after freezing in liquid air give birth to a live offspring, which survived two weeks. Breedis and Furth (1938) reported survival of chicken epithelium after exposure at −79° C., Mider and Morton (1939) the survival of squamous epithelial cells of homologous skin grafts in the rat, and Briggs and Jund (1944) survival of normal mouse skin after exposure to −79° C. for one hour. Webster (1944) described survival of human skin on grafting after exposure to −72° C. for periods up to 17 days, and, what is even more interesting, after drying in the frozen state. Blumenthal and Walsh (1950) have recently demonstrated the survival of guinea-pig thyroid and parathyroid in auto-transplants exposed to −190° C.

There is besides a large body of work on the survival of spermatozoa following extremes of low temperatures, and even after freezing and drying. Davenport (1897) possibly was the first to show the resistance of human spermatozoa to low temperatures. Jahnel (1938) demonstrated the resistance of human spermatozoa to −196° C. and even to −269.5° C. The spermatozoa showed motility after 52 hours at −196° C., also after exposure to −79° C. for 40 days or to −269.5° C. for three hours. Weber (1938) observed motility of bull spermatozoa after 96 hours at 0° C. Luyet and Hodapp (1938) found that frog spermatozoa, and Shaffner, Henderson, and Card (1941) that fowl spermatozoa, are resistant to exposure to liquid air. Shettles (1940) observed that human spermatozoa show motility after exposure to −79° C. for up to two months, and to −196° C. (liquid nitrogen) or −269° C. (liquid helium) for five minutes. He also noted individual variation in the sensitivity of various samples of human spermatozoa to these three temperatures. Morphologically they appeared to be in good condition, and continued their motility for several hours; after freezing and drying the morphology of spermatozoa was preserved in his hands, but there was no motility. Hoagland and Pincus (1942) confirmed this observation and reported survival of 67% human spermatozoa after exposure to −195° C. Polge, Smith, and Parkes (1949) observed survival of fowl spermatozoa diluted in equal parts of Ringer's solution containing 40% glycerol at −79° C. for 20 minutes, and after freeze-drying for three hours at −25° C. in 20% glycerol in Ringer's solution.

Altogether from previous work it is crystal clear, therefore, that normal and tumour tissues can withstand freezing, even if embryo tissues cannot: yet in the face of the published evidence Gye (1949) definitely states: "The final conclusion we have reached from these studies is that malignant cells, like embryonic cells, are readily killed by extreme cold. . . ."

(b) Virus Claim

Gye (1949), Gye *et al.* (1949), Mann (1949b, 1949c), and Mann and Dunn (1949) claimed that their successful induction of tumours, after preliminary freezing or freeze-drying of tumour-cell suspension, was due to a tumour-inducing virus. Having decided that freezing and freeze-drying killed the cancer cell, they deduced that the ability of the frozen tumours to induce fresh tumours must have been due to a virus, the activity of which had not been destroyed. So far as can be ascertained from their published papers, this was a deduction from a limited observation. For Gye *et al.* carried out no experiments to separate the supposed virus from the cellular material, nor did they test biologically for the presence of life in the tumour cells after freezing or freeze-drying. But it is an established fact that successful implantation of cellular material is a sound test for cell life, and the simplest interpretation of their results is that the material which they were transplanting contained living cells. There was no need to invoke the presence of a virus.

Subsequent to the original papers (Gye, 1949; Gye *et al.*, 1949) Craigie (1949c) differed from the original view about desiccation as expressed therein. He considers the possibility that a few cells (about 1 in 1,000,000) survive desiccation. But it is still not clear, at least to us, that he

considers, as we do, that the surviving cells are responsible for the tumours induced with frozen-dried material.

Apparently Gye *et al.* made no attempt to look for a virus with the electron microscope, which in these days is perhaps the method *par excellence* for the detection of viruses. For what the observation is worth, we have found that such tumours as have been examined in low-cancer strains, whether induced or spontaneous, are free of any virus-like particles under the electron microscope, whereas in high-breast-cancer strains the electron microscope has consistently revealed the presence of particulate matter mainly of some 250 Å (Passey, Dmochowski, Astbury, and Reed, 1947; Passey, Dmochowski, Astbury, Reed, and Johnson, 1948, 1950; Passey, Dmochowski, Reed, and Astbury, 1950), which is always associated with the Bittner agent.

To sum up: first, in none of our centrifuge experiments were tumours induced with clear supernatants free from cells, while with few exceptions the sediments, in which apparently intact cells were always to be found, regularly induced tumours, which is clear evidence that the tumour-inducing activity was always associated with the tumour cell, and was not separable from it; secondly, the microscopical evidence provides further support for the belief that some of the cells had survived, in that, after the various treatments of freezing and freeze-drying, many intact cells were to be found which in appearance were very little different from the untreated minced material. It seems to us, in view of the available evidence, that there is no need to invoke a virus as the active agent.

It must, however, be admitted that a final decision on whether the cells are viable and are responsible for the results can be reached only after an attempt to grow tumour cells *in vitro* after freeze-drying. Experiments along these lines have been carried out in this department in collaboration with Dr. I. Lasnitzki, from the Strangeways Laboratory, Cambridge. The results of these experiments are reported in the paper which immediately follows this communication.

Summary and Conclusions

Minced tumours, both sarcomata and carcinomata, retain their power to induce fresh tumours after freezing and subsequent desiccation under the experimental conditions described by Gye *et al.*

Centrifugation at slow speeds of tumour tissues similarly treated, together with our histological studies, indicates that living cells, and not a virus, are responsible for the results.

We should like to express our thanks and appreciation to Mr. W. Blackledge, in charge of the photography department of Leeds University, for his help and great care in taking photographs of the histological specimens. We also wish to acknowledge the help given by Mr. Kenneth Morton in the preparation and staining of the histological specimens.

REFERENCES

Auler, H. (1932). *Z. Krebsforsch.*, **35**, 103.
Barnes, W. A., and Furth, J. (1937). *Amer. J. Cancer*, **30**, 75.
Blumenthal, H. T., and Walsh, L. B. (1950). *Proc. Soc. exp. Biol., N.Y.*, **73**, 62.
Breedis, C., Barnes, W. A., and Furth, J. (1937). Ibid., **36**, 220.
—— and Furth, J. (1938). *Science*, **88**, 531.
Briggs, R., and Jund, L. (1944). *Anat. Rec.*, **89**, 75.
Craigie, J. (1949a). *Brit. J. Cancer*, **3**, 268.
—— (1949b). *British Medical Journal*, **2**, 1485.
—— (1949c). *47th Sci. Rep. Imp. Cancer Res. Fund*, pp. 15, 16.
Cramer, W. (1930). *9th Sci. Rep. Imp. Cancer Res. Fund*, p. 21.
Davenport, C. B. (1897). *Experimental Morphology*, I. Macmillan, New York.
Ehrlich, P. (1907). *Z. Krebsforsch.*, **5**, 65.
Gaylord, H. R. (1908). *J. Infect. Dis.*, **5**, 443.
Gye, W. E. (1948-9). *46th Sci. Rep. Imp. Cancer Res. Fund*, pp. 13, 14.
—— (1949). *British Medical Journal*, **1**, 511.
—— Begg, A. M., Mann, I., and Craigie, J. (1949). *Brit. J. Cancer*, **3**, 259.
Heilbrunn, L. V. (1943). *An Outline of General Physiology*, p. 419 Saunders, Philadelphia and London.
Hoagland, H., and Pincus, G. (1942). *J. gen. Physiol.*, **25**, 337.
Jahnel, F. (1938). *Klin. Wschr.*, **17**, 1273.
Klinke, J. (1937). *Z. Krebforsch.*, **46**, 436.
—— (1940). *Klin. Wschr.*, **19**, 585.
Lambert, R. A. (1912). *Proc. N.Y. path. Soc.*, **12**, 113.
Luyet, B. J., and Gehenio, P. M. (1938a). *Biodynamica*, **1**, No. 33
—— —— (1938b). Ibid., **2**, No. 42.
—— and Hartung, M. C. (1941). Ibid., **3**, 353, 363.
—— and Hodapp, E. L. (1938). *Proc. Soc. exp. Biol., N.Y.*, **39**, 433.
Mann, I. (1949a). *Brit. J. Cancer*, **3**, 255.
—— (1949b). *British Medical Journal*, **2**, 251.
—— (1949c). Ibid., **2**, 253.
—— and Dunn, W. J. (1949). Ibid., **2**, 255.
Michaelis, L. (1905). *Med. Klinik*, **1**, 202.
Mider, G. B., and Morton, J. J. (1939). *Amer. J. Cancer*, **35**, 502.
Passey, R. D., Dmochowski, L., Astbury, W. T., and Reed, R. (1947) *Nature, Lond.*, **160**, 565.
—— —— —— —— and Johnson, P. (1948). Ibid., **161**, 759.
—— —— —— —— —— (1950). Ibid., **165**, 107.
—— —— Reed, R., and Astbury, W. T. (1950). *Biochim. biophys. Acta, Amst.*, **4**, 391.
Polge, G., Smith, A. U., and Parkes, A. S. (1949). *Nature, Lond.*, **164**, 666.
Rahm, P. G. (1922). *Z. allg. Physiol.*, **20**, 1.
Salvin-Moore, J. E., and Barret, J. O. W. (1908). *Lancet*, **1**, 227.
—— and Walker, C. E. (1908). Ibid., **1**, 226.
Shaffner, C. S., Henderson, E. W., and Card, C. G. (1941). *Poult. Sci.*, **20**, 259.
Shettles, L. B. (1940). *Amer. J. Physiol.*, **128**, 408.
Simonin, C. (1931). *C.R. Soc. Biol., Paris*, **107**, 1029.
Weber, H. (1938). *Ber. ges. Physiol.*, **103**, 294.
Webster, J. P. (1944). *Ann. Surg.*, **120**, 431.

CULTIVATION IN VITRO OF FROZEN AND DESICCATED MOUSE TUMOUR TISSUES*

BY

R. D. PASSEY, *M.C.*, M.D., D.P.H.
Professor of Experimental Pathology and Director of Cancer Research, University of Leeds

L. DMOCHOWSKI, M.D., Ph.D.
Reader in Cancer Research, School of Medicine, University of Leeds

ILSE LASNITZKI, M.D., Ph.D.
Sir Halley Stewart Fellow
(From the Strangeways Research Laboratory, Cambridge)

AND

A. MILLARD
Technical Assistant in Electron Microscopy
(From the Department of Biomolecular Structure, University of Leeds)

[WITH SPECIAL PLATE]

In order to arrive at a final decision on whether the conclusions of the experiments described in the preceding paper (Passey and Dmochowski, 1950), that freezing and dessication do not necessarily kill tumour cells, were sound, it was decided to put the matter to the test of tissue culture It was, however, fully realized that it is not as delicate a test as the biological one of animal inoculation, as the conditions of growth *in vitro* are, in general, not as good as those *in vivo*.

Method

The tumour used in the present experiments was the C3H sarcoma described in the original experiments by Gye *et al.* (1949). The tumour tissues were minced,

*Communicated to: (1) the joint meeting of the Netherlands Pathological Society and the Pathological Society of Great Britain and Ireland, Leyden, April 14, 1950; (2) the Conference on the Freezing and Drying of Animal Cells, at the National Institute of Medical Research, London, June 28, 1950; and (3) the 5th International Cancer Congress, Paris, July 16, 1950.

suspended in various concentrations of glucose (from 5.3% to 40%), frozen to −79° C. in solid CO_2, and stored at this temperature for periods ranging from 12 hours to 25 days. After storage at −79° C. the suspensions of tumour tissues were desiccated for periods varying from 30 minutes to 3½ hours. After desiccation the tumour material was resuspended in glucose of the same concentration as that in which it had been frozen. Part was used for tissue culture, part for histology, and the remainder injected subcutaneously into mice. The cultures were grown by the hanging-drop technique in a medium consisting of equal parts of chick embryo extract and of a mixture of rat and fowl plasma, in the proportion of three parts of rat plasma to two parts of fowl plasma. This medium has, in general, proved very suitable for the cultivation of fresh mammalian tumours.

Results

Thirteen experiments were carried out. The results are shown in the Table, which gives (*a*) the times of freezing and desiccation; (*b*) the amount of tumour material and the concentrations of glucose in which it was frozen, desiccated, and reconstituted; and (*c*) the behaviour of the tissue, both *in vivo* and *in vitro*.

Type of Tumour	Weight of Tissue/Amount of Glucose	Concentration of Glucose	Time of Freezing	Time of Desiccation	Growth *in vitro*	No. of Mice Injected	No. of Tumours	Time of Appearance of Tumours	Time of Observation	Histology after Desiccation and Reconstitution
C3H sarcoma ..	0·4 g./6·0 ml.	5·3%	12 hours	½ hour	—	6	6	4–7 days	7 weeks	Cells undamaged
,, ..	0·4 g./1·0 ml.	,,	12 ,,	1 ,,	—	4	2	14 ,,	9 ,,	Some cells damaged
,, ..	0·3 g./0·5 ml.	,,	12 ,,	1 ,,	+	17	16	5–7 ,,	3 ,,	Cells undamaged
,, ..	1·7 g./3.5 ml.	,,	10 days	2 hours	—	12	10	7 ,,	4 ,,	Some cells damaged
,, ..	0·6 g./1·5 ml.	,,	25 ,,	2 ,,	—	6	1	14 ,,	4 ,,	Many cells damaged
,, ..	0·7 g./1·5 ml.	,,	7 ,,	3½ ,,	—	5	4	2–3 weeks	4 ,,	Some cells damaged
,, ..	0·4 g./1·5 ml.	10%	12 hours	½ hour	—	6	5	7 days	7 ,,	Cells undamaged
,, ..	0·4 g./1·0 ml.	,,	12 ,,	1 ,,	—	6	3	7 ,,	7 ,,	Some cells damaged
,, ..	0·6 g./1·5 ml.	,,	25 days	2 hours	—	6	0	14 ,,	4 ,,	Majority of cells damaged
,, ..	0·4 g./1·0 ml.	20%	12 hours	½ hour	++	6	4	14 ,,	7 ,,	Cells undamaged
,, ..	0·4 g./1·0 ml.	,,	12 ,,	1½ hours	+	6	3	14 ,,	7 ,,	,, ,,
,, ..	0·6 g./1·5 ml.	,,	25 days	2 ,,	—	5	1	14 ,,	3 ,,	Many cells damaged
,, ..	0·6 g./1·5 ml.	30%	25 ,,	2 ,,	—	6	0	—	9 ,,	Majority of cells damaged
,, ..	0·6 g./1·5 ml.	40%	25 ,,	Not done	Not tested	6	1	16 days	7 ,,	Many cells damaged

In cultures of C3H sarcoma, obtained from fresh tumour material, abundant outgrowth consisting of malignant fibroblasts and macrophages could be seen after one day's incubation. As a rule, rapid liquefaction of the plasma clot took place in the actively growing cultures. Fig. 1 (see Plate), which is a phase-contrast photomicrograph of a living control culture, shows malignant fibroblasts in a zone of liquefaction. In Fig. 2 the edge of a control culture stained with haematoxylin can be seen.

Under the phase-contrast microscope, explants from frozen and desiccated tumour material which has failed to grow showed dark shrunken cells without any structure (Fig. 3). Such explants either do not stain at all or stain very lightly with haematoxylin. In stained specimens the nuclei appear completely amorphous and structureless.

In three experiments successful growth *in vitro* was observed in explants obtained from frozen and desiccated suspensions of tumour cells in glucose solutions. In suspensions of tumour cells in 5.3% glucose solution, frozen for 12 hours and desiccated for one hour, growth occurred in three out of 18 cultures. After 24 hours' incubation the edge of the explant appeared transparent under the phase-contrast microscope, and was composed of healthy cells. At this time many cells had wandered out into the medium (Figs. 4 and 5). This outwandering continued during subsequent incubation, and in spite of exposure to light during photography of the living cultures. After 48 hours' incubation the number of cells seen by means of the phase-contrast microscope had increased markedly (Figs. 6, 7, and 8). The outgrowth consisted of cells of the fibroblast type and some macrophages. Among these malignant fibroblasts binucleate cells could be distinguished.

In suspensions of C3H sarcoma cells in 20% glucose solution, frozen for 12 hours and desiccated for one hour and 15 minutes, growth was obtained in 5 out of 28 cultures (Figs. 9 and 10). The same material desiccated for 30 minutes showed growth in 13 out of 24 cultures (Figs. 11 and 12). In the latter cultures the zone of growth was larger and the cells more numerous, as seen under the phase-contrast microscope, than in those of the same tumour desiccated for 75 minutes. In both cases slender elongated cells of the fibroblast type, many of them binucleate and multinucleate, had grown out from the central explant. Filamentous or short rod-like mitochondria could be seen in the living cultures by means of the phase-contrast microscope. Cell division was present in most cultures, both after 30 minutes' and after 75 minutes' desiccation in 20% glucose. From 15 to 25 mitotic figures were counted in the outgrowth of such cultures. All stages of mitosis, some of them abnormal, could be distinguished (Figs. 13 and 14). Breakage and lagging of chromosomes, bridge-formation in anaphase, polyploidy, and spindle disturbances were observed. Some of the abnormalities probably led to the formation of the binucleate and multinucleate cells present among the resting cells. Liquefaction, which in this tumour is always associated with active growth, was seen in most cultures.

Examination of fixed and stained cultures showed that the central explant consisted of areas of both healthy cells and shrunken debris. This suggests that the unit of survival under the experimental conditions used is not a single cell but that groups of cells survive as a whole. The size of the outgrowth was seen to be in direct proportion to the size of the healthy areas in the central explant.

Discussion

Klinke (1940) demonstrated the survival and growth of tumour cells which had been exposed to low temperatures alone. In the present experiments growth in tissue culture consisting of cell migration and division has been obtained after freezing and desiccation for 30, 60, and 75 minutes. One series of cultures of C3H tumour cells failed to grow *in vitro* under the same conditions as those in which another series, obtained from a different transplant of the same tumour but treated in the same manner, showed outgrowth; this might have been due to the greater viability of the latter. In our hands suspensions of tumour cells desiccated for longer periods than 75 minutes failed to

grow in tissue culture, but induced tumours in mice. This is probably due to the more favourable conditions *in vivo*, which offer better chances of recovery for the treated tumour cells than does the environment *in vitro*; it suggests that successful growth in tissue culture depends on the length of time of desiccation. Although the degree of desiccation reached after 75 minutes may be high, it is realized that dehydration is not complete. If the time of desiccation is more prolonged only few, if any, cells can be expected to survive.

It seems that three stages in the behaviour of tumour cells following different lengths of desiccation can be distinguished: (1) positive growth *in vitro* and *in vivo*; (2) growth *in vivo* but not *in vitro*; and (3) no growth *in vivo* or *in vitro*. Possibly these three stages are related to the amount of water remaining in the tumour material. In this connexion it may be mentioned that, according to Polge, Smith, and Parkes (1949), a high proportion of the water, about 90%, can be withdrawn at low temperatures from fowl semen mixed with equal quantities of 30% glycerol in Ringer's solution without killing the semen. Klinke showed by means of vital staining that the number of living cells in frozen tumour material diminished quickly after thawing followed by incubation in tissue culture. His observation suggests that our failure in tissue culture, especially after the more prolonged desiccations, may also have been due partly to the non-survival of tumour cells during incubation which otherwise would have survived under the more favourable conditions *in vivo*.

As can be seen from the table, the microscopical appearance of tumour cells, after freezing and desiccation and subsequent reconstitution in various solutions of glucose, depended probably on the individual resistance of different samples of tumour cells to the treatment, but to a greater extent on the time of desiccation. Even after the same length of desiccation the number of tumour cells which appeared damaged and the number of tumours induced in mice varied with different samples of tumour material. This may have been the result of the tumours having a different optimum time of freezing and desiccation, owing to their different general condition at the time of the experiment.

The present successful attempts show that tumour cells can withstand a high degree of desiccation when frozen and yet remain viable. They confirm the conclusion reached in the first paper—namely, that the induction of tumours in mice with frozen and desiccated suspensions of tumour cells is due to the proliferation of surviving tumour cells.

Summary and Conclusions

Suspensions of sarcoma cells which have been frozen in glucose solutions and desiccated may show active growth *in vitro* after reconstitution in glucose.

This indicates clearly that some tumour cells survive freezing and desiccation, and that the tumours which develop in mice injected with tumour material which has been frozen and desiccated arise from such surviving cells.

These experiments strengthen the conclusion reached in the first paper, that surviving cells and not a virus were responsible for the results obtained by Gye *et al.*

REFERENCES

Gye, W. E., Begg, A. M., Mann, I., and Craigie, J. (1949). *Brit. J. Cancer*, **3**, 259.
Klinke, J. (1940). *Klin. Wschr.*, **19**, 585.
Passey, R. D., and Dmochowski, L. (1950). *British Medical Journal*, **2**, 1129.
Polge, G., Smith, A. U., and Parkes, A. S. (1949). *Nature, Lond.*, **164**, 666.

CELLULAR TRANSMISSION OF MOUSE SARCOMATA WITH FROZEN-DRIED TUMOUR TISSUES

BY

L. DMOCHOWSKI, M.D., Ph.D.

Reader in Cancer Research, School of Medicine, University of Leeds

AND

A. MILLARD

Technical Assistant in Electron Microscopy

(From the Department of Biomolecular Structure, University of Leeds)

[WITH SPECIAL PLATE]

Malignant cells of mouse tumours, after having been frozen to −79° C. and desiccated, have been grown in tissue cultures, as described in the preceding paper (Passey, Dmochowski, Lasnitzki, and Millard, 1950). This is unequivocal evidence of the viability of malignant cells after freezing and drying. There is therefore every justification for assuming that when frozen-dried tumour tissue is inoculated into mice the viable tumour cells present proliferate to form a tumour. Since the validity of this conception is crucial, it seemed desirable that the attempt should be made to confirm it experimentally. Our attention was drawn by Ludford to the advantages, for this purpose, of a technique, devised by Des Ligneris (1930), of grafting tumour tissue in plasma and serum which he described as "*in vitro* culture under *in vivo* conditions." Ludford recommended inoculating frozen-dried tumour tissue in clotted plasma, because he had found that it was possible, after inoculating cells embedded in plasma, to excise the clot after a few days and prepare from it histological sections in which the cells of the inoculum were clearly distinguishable from the surrounding tissues of the host. Experiments were therefore undertaken using this technique concurrently with those described by Passey *et al.* (1950).

Methods

The tumours used in the present experiments were the C3H and C48 sarcomata described in the original experiments of Gye *et al.* (1949) and in those of Passey and Dmochowski (1950) and of Passey *et al.* (1950). The tumour cells, in various concentrations of glucose, were submitted to storage at −79° C. and to desiccation for different lengths of time, followed by reconstitution in glucose of the same concentration as that used initially in each experiment. After reconstitution in glucose, the suspensions of tumour cells were centrifuged for three minutes at 7,000 times gravity, care being taken to keep the time of centrifugation as short as possible so as to avoid damage to cells. After discarding the supernatant fluid, equal amounts of a mixture of rat and fowl plasma (in a proportion of three parts of rat plasma and two parts of fowl plasma) and of chick embryo extract were added to the sediment (usually four to five drops of each) and gently shaken to obtain a suspension of cells in the medium. The suspension of tumour cells in the mixture of rat and fowl plasma and chick embryo extract was then put into an incubator at 37° C. for a few minutes to induce clotting. The clot was then cut into small pieces, some of which were taken for microscopical examination, and the rest grafted subcutaneously into mice by means of a trocar.

The medium used in the experiments was thus the same as that described in the tissue-culture experiments of Passey *et al.* (1950). Similarly, most of the suspensions of tumour cells were the same as those used for the tissue-culture work. Mice were sacrificed at various intervals after grafting and the clots excised and fixed in Bouin's fluid. Serial sections were stained with haematoxylin and eosin.

Eleven experiments with C3H sarcoma and one with C48 sarcoma were carried out. The accompanying Table gives the concentrations of glucose in which the tumour material was suspended, the times of freezing and desiccation, and the results of the microscopical examination of the clots excised at various intervals after grafting.

Sarcoma and Concentration of Glucose	No. of Days Frozen	No. of Hours Desiccated	Result of Microscopical Examination of Clots at Various Time Intervals Following Grafting into Mice: Original Clot	6 Hours	18 Hours	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	8 Days	No. of Positive Clots/ No. of Clots Injected
C3H 5·3%	½	½	+	+	+	−	+	+	∓					5/6
"	½	1	+•						∓	+++	+++	++		11/12
"	½	1	−	−		=	−	−	−					0/6
"	½	2	−			−	−	=	−	−				0/6
C3H 10%	½	½	+		+	∓	∓	−						3/6
"	½	1	+			∓	=	+	−					2/6
"	½	2	−			=	=	=	−					0/6
C3H 20%	½	½	+•			∓	∓	+	−					3/6
"	½	1½	+•			∓	=	−	+					3/6
"	½	2	−			−	=	−	−					0/6
C3H 30%	½	2	−			=	=	=						0/6
C48 5·3%	½	1	+						++++	∓++	++++	+++	+++	17/18

\+ Positive clot: contains tumour cells looking apparently unharmed. − Negative clot: no tumour cells apparently unharmed. ∓ Indicates one positive and one negative clot. = or ≡ indicates two or three negative clots. ++ or +++ indicates two or three positive clots. • Grown *in vitro* (Passey *et al.*, 1950).

As can be seen from the photomicrographs (Plate, Figs. 1–4), in many of the clots tumour cells apparently unharmed were found. An increasing number of tumour cells, some of them in division, clearly separated from the surrounding tissues of the mice, were seen in the clots taken out at intervals of 18, 24, 48, 72 hours, 4 days, and on the days following. These clots are designated as positive. Clots in which no apparently unharmed cells were found and which were ultimately absorbed are described as negative. It should be stressed that no actively proliferating cells outside the clots were seen in any of the serial sections. There is no doubt, from the appearance of the tumour cells in the first clots removed and the increasing number of cells in those taken out later, that large tumours would have resulted had growth been allowed to proceed uninterrupted. Growth in tissue culture was obtained only with the C3H tumour in 5.3% glucose frozen for 12 hours and desiccated for one hour, and with the same tumour in 20% glucose, frozen for 12 hours and dried for 30 minutes and 75 minutes (Passey *et al.*, 1950). With the grafted clots positive results were obtained with the same and also with other concentrations of glucose (see Table). The greater number of positive results obtained by inoculating the clotted suspensions of frozen and dried tumour cells into mice is not surprising in view of the more favourable conditions for growth in the animal body. According to Des Ligneris (1930) the medium in which the grafted tumour cells are embedded provides both better nourishment for the cells cut off from the normal circulation and better protection. The tumour cells within the clotted plasma induced no inflammatory reaction. Although a great many of them underwent necrosis, as could be seen in clots removed a day or two after grafting, yet a sufficient number survived and grew to form tumours.

Sections of implants of tumour tissues frozen at −79° C. were examined by Gye *et al.* (1949) at intervals of 2, 3, 4, 5, 6, and 7 days. They found, on the second day, that the mass of the implant was necrotic and surrounded by the normal subcutaneous tissue of the mouse. By the fourth day much of the implant was absorbed, and on the fifth, sixth, and subsequent days they observed the beginnings of a new sarcoma in the connective tissue surrounding the necrotic mass. They concluded that "the appearances do not suggest survival of any of the implanted tissue, but rather a fresh sarcomatous reaction of the encapsulating subcutaneous tissues of the host."

In the present experiments these clotted suspensions of tumour cells, which on microscopical examination when first prepared showed few, if any, undamaged cells, appeared as necrotic masses in all subsequent preparations made after grafting. They were gradually absorbed *in vivo* and usually disappeared on the fifth or sixth day after transplantation, whereas, as can be seen from Figs. 1–4, clots containing cells looking apparently unharmed when grafted into mice show an increasing number of tumour cells, with many of them in division, when examined at successive intervals after transplantation. No cells outside the clots were actively proliferating, as one would expect if a virus were present capable of diffusing out and infecting the surrounding tissue of the host. Thus the experiments demonstrate that the propagation of tumours with frozen-dried tissue is entirely a process of cellular transmission.

Summary

Suspensions of frozen and desiccated sarcoma cells embedded in clots formed by the addition of chick embryo extract to a mixture of rat and fowl plasmas were inoculated subcutaneously into mice. Sections of clots excised at varying intervals after grafting revealed the presence of viable tumour cells, increasing in numbers with the age of the grafts.

We should like to express our thanks to Dr. R. J. Ludford for his valuable suggestions and helpful advice for carrying out these experiments.

Addendum.—During the preparation of the above paper for publication an additional experiment along similar lines with the C3H sarcoma (0.8 g. of tissue in 1.5 ml. of 5.3% glucose), frozen at −79° C. for 95 days and desiccated for 210 minutes, was carried out. In spite of the prolonged desiccation, an increasing number of tumour cells were seen in the clots taken out at various intervals after grafting. This observation strengthens beyond shadow of doubt the conclusion reached above.

REFERENCES

Des Ligneris, M. J. A. (1930). *Brit. J. exp. Path.*, **11**, 249.
Gye, W. E., Begg, A. M., Mann, I., and Craigie, J. (1949). *Brit. J. Cancer*, **3**, 259.
Passey, R. D., and Dmochowski, L. (1950). *British Medical Journal*, **2**, 1129.
—— —— Lasnitzki, I., and Millard, A. (1950). Ibid., **2**, 1134.

ATELECTASIS AND BRONCHIECTASIS IN PERTUSSIS

BY

A. W. LEES, M.D., F.R.F.P.S., D.P.H.

(From Ruchill Hospital, Glasgow)

Laennec in 1819 reported that he had found at post-mortem examination bronchiectasis in the left lower lobe of a child aged 3½ months who had died after an attack of whooping-cough, and stated that he considered the latter disease to be the commonest progenitor of bronchiectasis.

Lander and Davidson (1938) showed experimentally that aspiration of viscid material into peripheral parts of the bronchial tree may be followed by atelectasis and a mechanical compensatory dilatation of the bronchi in the collapsed area. Lander (1946) concluded that when bronchiolar occlusion produces atelectasis with associated bronchial dilatation the following events may take place: (1) the collapsed portion of lung may re-expand, with disappearance of the compensatory bronchial dilatation ("reversible bronchiectasis"); (2) the collapse and consequently the associated bronchial dilatation may be permanent; and (3) the collapsed portion of lung may re-expand, but the bronchi remain dilated because of damage to their walls by infective processes.

Present Investigation

This work affords a ready explanation for the association noted by Laennec between bronchiectasis and pertussis, because in the latter disease, as Erwin (1939) observed, "the tenacious nature of the sputum bespeaks collapse." It was with this in mind that the present investigation was undertaken, though it was not forgotten that Tannenberg and Pinner (1942) and others had shown that bronchiectasis may also be produced by the damming up of secretions distal to obstruction of a main bronchus from intrinsic or extrinsic causes.

With a view to determining the incidence of atelectasis and bronchiectasis in whooping-cough, 150 consecutive cases of this disease admitted to Ruchill Hospital during 1946–7 were examined clinically and radiologically. Cases which arrived gravely ill and died without having full investigation were excluded from the series. The cases were *x*-rayed at weekly intervals, and, when atelectasis was detected or suspected clinically or radiologically, lateral films were taken to verify the diagnosis and define the location. Lordotic as well as lateral views were used when right middle-lobe or lingular collapse was suspected.

In cases showing collapse of marked or moderate extent, and in cases with slight persistent collapse, bronchography was carried out except in children under 1 year. Mantoux tests were done on all cases on admission, and, if negative, were repeated not sooner than eight weeks afterwards. All cases were followed up until there was no clinical or radiological evidence of respiratory disease; many were kept under observation for over a year, and one is still under observation almost three years after the onset of pertussis.

Criteria of Atelectasis

Complete collapse of an upper or lower lobe is often easy to detect clinically, though even here an infected atelectasis may be confused with pneumonic consolidation. Collapse of the right middle lobe, however, as Punch (1940) has pointed out, is usually completely masked by compensatory emphysema, and postero-anterior and lateral *x*-ray films are necessary for its detection. Doig (1946) and others have stressed that lordotic views often strikingly define atelectasis of the right middle lobe or lingular process.

When complete collapse of the right middle lobe can defy clinical recognition it is obvious that radiology is essential for the detection of small areas of atelectasis, and even then distinction from consolidation is not easy. If collapse is lobar or segmental in extent, postero-anterior and lateral *x*-ray films may reveal compensatory movements of the diaphragm, mediastinum, or interlobar fissures, and an opacity of characteristic shape, but when the collapse is very small these features are not seen. Diagnosis then depends on the appearance of the opacity and absence of pyrexia, leucocytosis, or other features of pneumonia, but, as infection and atelectasis may coexist, the distinction is often difficult. For this reason the diagnosis of small areas of atelectasis was not recorded unless confirmed by the independent opinion of a radiologist.

Radiological evidence of atelectasis was seen in 65 cases out of 150 (43%). The incidence in age groups is summarized in Table I.

TABLE I.—*Age Incidence of Atelectasis in 150 Cases of Pertussis*

Age in Years	Cases	Cases with Atelectasis
<1	44	9 (20%)
1—	30	14 (47%)
2—	19	11 (58%)
3—	17	9 (53%)
4—	13	8 (62%)
5—	12	8 (67%)
6—	11	6 (55%)
7—	3	—
8—	1	—
Total	150	65 (43%)

Lobar Incidence.—Some cases had more than one lobe involved, the lobes either showing atelectasis at the same time or becoming affected at different times. Thus, although atelectasis occurred in only 65 patients, more than 65 lobes were involved. In two cases the atelectasis was multilobular in distribution and these are excluded from the analysis. In the remaining 63 cases 85 lobes showed collapse of greater or less extent. Table II illustrates the number of times a particular lobe was involved, whether alone or in combination with other lobes. Table III indicates how often the lobes were affected singly and how often in combination.

TABLE II.—*Lobar Incidence of Atelectasis in 150 Cases of Pertussis*

Lobe	No. of Times Involved
Left lower	43 (50·5%)
Right lower	31 (36·5%)
Right middle	8 (9·4%)
Right upper	2 (2·4%)
Left upper	1 (1·2%)
Lingula	—
Total	85 (100%)

TABLE III.—*Anatomical Distribution of Atelectasis in 63 Cases of Pertussis*

Lobe or Lobes	No. of Times Involved
Left lower alone	25
Right lower alone	15
Left lower and right lower	14
Left lower and right middle	4
Right middle alone	2
Right upper alone	1
Right middle and right lower	1
Right lung and left upper	1
Total	63

Extent.—To indicate roughly the degree of lobar atelectasis encountered the collapse may be described as slight, moderate, or marked, the latter category indicating that the lobe was completely or almost completely collapsed, and the other categories indicating lesser degrees of involvement. Of the 85 instances of atelectasis, 60 (70.6%) were slight, 15 (17.6%) moderate, and 10 (11.8%) severe.

Time of Onset.—Atelectasis affected 85 lobes, and the time of onset was as follows: first week of illness, 2 cases of lobar collapse; second week, 10; third week, 18; fourth week, 24; fifth week, 12; sixth week, 8; seventh week, 4; eighth week, 4; ninth week, 1; tenth week, 1; eleventh week, 1. It will be seen that atelectasis occurred with increasing frequency until the fourth week of illness, and then its incidence declined.

Duration.—The duration in weeks of the collapse noted in the 85 affected lobes was as follows: 1 week, 16 instances; 2 weeks, 12; 3 weeks, 20; 4 weeks, 16; 5 weeks, 9; 6 weeks, 3; 7 weeks, 3; 8 weeks, 3; 9 weeks, 1; 13 weeks, 1; 18 weeks, 1. It will be seen that atelectasis seldom lasted longer than five weeks. In general, it could be said that atelectasis of slight extent cleared up more quickly than that of marked degree, but there were exceptions to the rule. In one case, for example, in which there was complete collapse of the right lung and extensive collapse of the left upper lobe, complete re-expansion occurred in four weeks.

Bronchopneumonia in Relation to Atelectasis

Bronchopneumonia is an extremely serious complication of whooping-cough and is probably responsible for most of the deaths occurring early in the disease. It has been mentioned, however, that those patients who were admitted to hospital gravely ill and who died before radiological investigation was possible are not included in this series.

Bronchopneumonia was detected radiologically and clinically in 30 of 150 whooping-cough cases. Seven of them developed the condition after admission to hospital. Atelectasis occurred in 12 (40%) of these 30 cases with bronchopneumonia. In 120 cases *x*-ray evidence of bronchopneumonia was not found, and of these, 53 (44%) developed atelectasis. In this series, therefore, bronchopneumonia occurring in whooping-cough had no influence on the incidence of collapse. Bronchographic studies failed to reveal any evidence of bronchial dilatation in whooping-cough cases complicated by bronchopneumonia except in atelectatic areas, and follow-up clinical and radiological investigations did not demonstrate the development of bronchiectasis in bronchopneumonic cases.

Slight enlargement of hilar glands was demonstrated radiologically in 28 (18.7%) of the 150 whooping-cough cases, but in no instance could collapse be attributed to this condition.

Indications of Onset of Atelectasis.—When this study was begun it was believed that an elevation of temperature might prove a valuable indication that atelectasis had occurred. This expectation was not realized, for analysis of the cases failed to show any definite correlation between rise of temperature and the occurrence of atelectasis; isolated temperature elevations were noted in cases in which collapse did not take place, while in some cases of extensive atelectasis the temperature was not elevated at all. It is interesting that Gray (1946) observed that pyrexia is less prominent when pulmonary collapse follows operations in the thorax than when it occurs after abdominal operations. None of the children complained of pain in the chest after pulmonary atelectasis, though some were too young to do so. Pleural friction was not detected over collapsed areas.

Conversion of the Mantoux test from negative to positive was not noted, nor did pertussis cause a "flare up" of existing foci of tuberculous infection.

Bronchial Dilatation in Atelectatic Areas of Lung

Six patients were encountered in whom pulmonary collapse of marked extent occurred. Two of them were under 1 year of age, and bronchography was not performed. This procedure was carried out in the four other cases, and in every instance well-marked dilatation of the bronchi in the collapsed area of lung was demonstrated. In one of these four cases there was extensive collapse of both lower lobes, with dilatation of the contained bronchi. Re-expansion of the right lower lobe took place after eight weeks, and re-expansion of the left lower lobe after nine weeks. Bronchography at this point showed very slight cylindrical dilatation of the bronchi in both lower lobes. Another bronchogram three months later showed that the bronchi had fully returned to their normal calibre. A "follow-up" examination showed no evidence of respiratory disease.

In the remaining three of these four cases the lung affected by the pulmonary collapse was relaxed by means of an artificial pneumothorax as a therapeutic measure. This must be mentioned, since the pneumothorax may have affected the duration of the atelectasis. In the first of these three cases the collapse affected the right middle lobe and the anterior basic segment of the right lower lobe. Re-expansion took place in eight weeks from the onset, and subsequent bronchography showed a normal bronchial tree. Eighteen months later a bronchogram revealed no abnormality and clinical observation did not show any evidence of pulmonary symptoms.

In the second of these cases the collapse affected the left lower lobe. Re-expansion occurred in thirteen weeks, and subsequent bronchography revealed a normal bronchial tree. A bronchogram eighteen months later again showed a normal bronchial tree, and there was no evidence of residual respiratory disease in a two-year "follow-up."

The third case had collapse of the left lower lobe on admission to hospital on March 26, 1947, and marked dilatation of the contained bronchi was subsequently demonstrated. The atelectatic area was grossly infected and the patient was gravely ill. Re-expansion took place eighteen weeks after onset, and subsequent bronchography showed an apparently normal bronchial tree. On discharge from hospital in September, 1947, the patient was free from symptoms, and physical and radiological examination of his chest revealed no abnormality. Since that time up to April, 1950, he has had three episodes of cough and sputum production lasting a fortnight or so during which crepitations could be detected over the left lower lobe. Bronchography on two occasions after his discharge from hospital revealed no definite bronchiectasis of the left lower lobe, though one set of films suggested slight cylindrical dilatation of the bronchi supplying the anterior basic segment. It seems probable that the left lower lobe bronchi have been damaged, though whether recovery will eventually take place remains to be seen.

Fifteen of the cases in the present series showed atelectasis of moderate extent, but the bronchi in the collapsed portion of lung were outlined in only 10. Of the 10 cases bronchographically investigated, bronchial dilatation was detected in four, but was very slight in extent. In all instances the collapse cleared up in approximately one month, and subsequent bronchography revealed a normal bronchial tree. A "follow-up" did not disclose any evidence of residual damage. Bronchography was also carried out in 10 cases in which atelectasis of slight extent was present, but bronchial dilatation was not seen.

For various reasons bronchographic examinations were performed on 25 of the whooping-cough patients in whom pulmonary collapse was not present. In some of these atelectasis had previously been detected and had cleared up, while others had suffered from the complication of bronchopneumonia. Bronchial dilatation was never demonstrated.

In this series of 150 cases of whooping-cough, therefore, three well-marked examples of "reversible bronchiectasis" were observed, and there was one case in which, though the collapsed area re-expanded and the dilated bronchi apparently reverted to normal, damage was sustained that may yet lead to progressive disease. In four other cases insignificant ephemeral bronchial dilatation was noted. Bronchial dilatation was never detected except in atelectatic areas.

Treatment

When pulmonary collapse is caused by aspiration of sputum into the peripheral parts of the bronchial tree postural drainage in the appropriate position (Nelson, 1934), or rolling the patient about and percussion over the affected area (Sante, 1927), may be employed in an attempt to dislodge the peccant mucous plugs. These methods were employed in the majority of cases and the collapse often cleared up, but it was difficult to evaluate their efficacy. Inhalation of carbon dioxide has been advocated for its effect in stimulating respiratory movements, and also for its reputed tendency to liquefy the mucous plugs (Coryllos, 1930; Brown, 1930; Banyai and Cadden, 1943). Bronchoscopic aspiration has also been employed, but in general has proved somewhat disappointing, for, although a mucous plug in a main bronchus may be easily removed, plugs in the peripheral bronchioles are obviously not so accessible. Blades and Dugan (1944), for example, had no success in four cases of collapse which subsequently resolved spontaneously, and Hennell (1946) failed in six cases, though he produced temporary re-expansion in one. Although desirable, this method was not employed in the present series.

It has been mentioned that in four cases in the series well-marked bronchial dilatation was demonstrated in collapsed lobes, and since the collapse was known to be recent it could be assumed that the bronchial dilatation was merely compensatory and likely to disappear if re-expansion of the lobe took place quickly enough. Pending re-expansion it was considered that, if the affected lung were relaxed by an artificial pneumothorax to an extent sufficient to counter the mechanical stresses dilating the bronchi, permanent bronchiectasis would be less likely to result. This measure was instituted in three cases, but, though the effect appeared to be favourable, no conclusions can be drawn.

Discussion

Engel (1947) has suggested that hilar adenitis is an important factor in the production of atelectasis in pertussis, and Paulson and Shaw (1949) have stressed that the right middle lobe bronchus is particularly likely to be compressed by enlarged hilar glands. Although slight enlargement of the hilar glands was noted in 18.7% of cases in the present series, collapse was never apparently due to this factor. In all instances of atelectasis the causative factor seemed to be obstruction of bronchioles or finer bronchi, and the likeliest mechanism aspiration of viscid sputum into the bronchial tree. At the same time it was often noted that a small area of atelectasis appeared which increased in extent over a period of two to three weeks, and if the cause were aspiration of sputum it would be anticipated that the collapse would be maximal from the beginning. Possibly in these cases the initial collapse was due to swelling of the bronchiolar mucosa or to aspiration of sputum with collapse of adjacent lung tissue due to subsequent "spill-over."

As Gray (1946) and others have pointed out that atelectasis occurs more often in children than in adults, possibly as a result of the narrower calibre of the bronchi, the low incidence of atelectasis in children under 1 year in the present series is interesting. Kohn *et al.* (1944) and Nicholson (1949) reported similar findings in pertussis, and it has been suggested that at this age little mucus is secreted by the bronchial mucosa.

Kohn *et al.* (1944) indicated that in pertussis a high incidence of right middle lobe collapse is to be expected, but in this series the incidence was that commonly found in respiratory affections, except for tuberculosis—namely, highest in the lower lobes, especially the left. In pulmonary tuberculosis Erwin (1939) found that collapse due to bronchiolar occlusion was most common in the upper lobes, and attributed this incidence to the fact that in tuberculosis secretion is found most commonly in this part of the lung. It is not easy, however, to apply this theory to pertussis. It is significant that the lobar incidence of bronchiectasis corresponds to the lobar incidence of atelectasis, and it is interesting that the lobar incidence of bronchiectasis in Tudor Edward's (1939) series of 166 lobectomies corresponds closely to the lobar incidence of collapse in this pertussis series, except that collapse of the lingula was not noted in the present study, though carefully looked for.

The comparatively frequent occurrence of "reversible" bronchiectasis was noteworthy, for, although the condition has been recorded by Findlay and Graham (1931), Findlay (1935), Jennings (1937), Franklin (1938), Raia (1938), Wilson (1939), Fleishner (1941), Ogilvie (1941), Diamond and Van Loon (1942), Blades and Dugan (1944), Lander (1946), and Wearing (1948), it is still regarded as something of a rarity, though it is probably observed much more commonly than reported. Lisa and Rosenblatt (1943) and Hinshaw and Schmidt (1944) denied that it was bronchiectasis at all, and thought the appearance of dilatation was an illusion due to foreshortening and crowding of the bronchi, but, as Ogilvie (1941) and Lander (1946) reported cases in which the collapse cleared up and the affected bronchi remained dilated, little doubt can now be entertained that the bronchi may be mechanically dilated as a result of pulmonary collapse, and that supervening infection may render the dilatation permanent.

How long atelectatic bronchiectasis may remain potentially reversible is unknown. In many of the reported cases the duration of the collapse could not be ascertained with certainty, but in one of Lander's (1946) cases the collapse lasted for four months, in Wearing's (1948) case it lasted for at least four months, and in a case reported by Raia (1938) the duration seems to have been six months. The degree of infection is doubtless the main factor militating against recovery, but it is conceivable that mere prolonged mechanical distension might leave the bronchi dilated even if the collapse cleared up, though this would possibly not be of much importance.

It was anticipated that small areas of collapse would not give rise to bronchial dilatation, as compensatory emphysema would be sufficient to relieve strain on the bronchi, and, as has been noted above, this expectation was realized in practice.

The incidence of respiratory disease following pertussis in this series was very low. Pulmonary collapse was noted in 43% of the patients, but in general it was small in extent and ephemeral. Re-expansion took place in all instances before the patient was discharged from hospital, and in only one case did prolonged clinical and radiological follow-up reveal residual damage to the respiratory tract, and even here eventual recovery seems to be possible. Kohn *et al.* (1944), in a clinical and radiological study of 222 cases of pertussis, did not mention any sequelae, but Nicholson (1949) reported 22 cases of collapse of more than two months' duration in a series of 48 pertussis patients, and stated that in seven followed for a year the collapse was still present.

Whatever the general incidence of pulmonary collapse in pertussis, its importance is obvious, for its relationship to bronchiectasis seems clear. As in many cases it is impossible to detect atelectasis clinically, an *x*-ray film before supervision ceases would seem to be the minimum demand on the radiological department. If, however, respiratory symptoms follow pertussis it cannot be too strongly emphasized that a negative *x*-ray film is of little significance, for atelectasis may have cleared up, leaving bronchiectasis behind. It still does not appear to be widely appreciated that recurrent attacks of cough or "pneumonia" and persistent localized crepitations call for bronchography; even to-day there is a tendency to wait for the appearance of copious sputum and clubbing of the fingers before suspecting bronchiectasis.

If atelectasis is detected during or after the attack of pertussis every effort should be made to promote re-expansion of the affected lung, remembering that this has happened six months after the onset of atelectasis (Raia, 1938), and may perhaps occur even up to a year afterwards. In general, surgical removal of a lobe collapsed for less than a year would appear to be inadvisable. When bronchial dilatation remains after re-expansion of a collapsed lobe it is no longer merely compensatory, and so far as is known will be permanent.

Where bronchial dilatation is pronounced, and evidence of infection obvious, surgical intervention is the treatment of choice, for the prognosis in such cases treated medically, as judged by the work of Findlay and Graham (1927), Roles and Todd (1933), Ford (1948), and others, is poor, though antibiotics and chemotherapy can nowadays generally cope with acute exacerbations. On the other hand, it may safely be said that the prognosis of cases with mild bronchial dilatation and little evidence of infection cannot be stated with any confidence, and a prolonged period of observation before advising lobectomy would appear to be indicated.

Summary

Atelectasis was noted radiologically in 43% of 150 pertussis cases, but in general it was slight in extent and of comparatively short duration. Six instances of virtually complete lobar collapse took longer than two months to resolve; in five of these the bronchi contained in the collapsed lobes were shown to be dilated and were seen to revert to their normal calibre when the lobes re-expanded. In the remaining case bronchography was not performed.

In four partially collapsed lobes slight bronchial dilatation was noted, which disappeared when the collapsed lung re-expanded.

In only one case did the attack of pertussis lead to persistent respiratory symptoms. In this case there was evidence of residual bronchial infection in a lobe which had been atelectatic for eighteen weeks. Although the bronchi in this lobe were markedly dilated when it was collapsed, bronchiectasis was not obvious after re-expansion.

The treatment of atelectatic bronchiectasis in pertussis is discussed, and a trial of artificial pneumothorax mentioned.

My thanks are due to Mr. R. S. Barclay for guidance and encouragement during the course of this work, and to Dr. T. Anderson for much valuable advice and for his kind help in the preparation of this paper. I am indebted to Dr. A. Maclean for assistance, and to Dr. W. Elliot, superintendent of Ruchill Hospital, for permission to publish this report.

References

Banyai, A. L., and Cadden, A. V. (1943). *Amer. J. med. Sci.*, **206** 479.
Blades, B., and Dugan, D. J. (1944). *J. thorac. Surg.*, **13**, 40.
Brown, A. L. (1930). *J. Amer. med. Ass.*, **95**, 100.
Coryllos, P. N. (1930). *Surg. Gynec. Obstet.*, **50**, 795.
Diamond, S., and Van Loon, E. L. (1942). *J. Amer. med. Ass.*, **118**, 771.
Doig, A. T. (1946). *Tubercle*, **27**, 173.
Edwards, A. T. (1939). *British Medical Journal*, **1**, 809.
Engel, S. (1947). *The Child's Lung*. London.
Erwin, G. S. (1939). *Brompton Hosp. Rep.*, **8**, 43.
Findlay, L. (1935). *Arch. Dis. Childh.*, **10**, 61.
—— and Graham, S. (1927). Ibid., **2**, 71.
—— —— (1931). Ibid., **6**, 1.
Fleischner, F. G. (1941). *Amer. J. Roentgenol.*, **46**, 166.
Ford, F. J. (1948). *Glasg. med. J.*, **29**, 1, 19
Franklin, A. W. (1938). *Proc. R. Soc. Med.*, **31**, 354.
Gray, I. R. (1946). *Thorax*, **1**, 263.
Hennell, H. (1946). *J. thorac. Surg.*, **15**, 239.
Hinshaw, H. C., and Schmidt, H. W. (1944). *Dis. Chest*, **10**, 115.
Jennings, G. H. (1937). *British Medical Journal*, **2**, 963.
Kohn, J. L., Schwartz, I., Greenbaum, J., and Daly, M. M. I. (1944) *Amer. J. Dis. Child.*, **67**, 463.
Laennec, R. T. H. (1819). *Diseases of the Chest*, 4th ed. Translated by John Forbes in 1834. London.
Lander, F. P. L. (1946). *Thorax*, **1**, 198.
—— and Davidson, M. (1938). *Brit. J. Radiol.*, **11**, 65.
Lisa, J. R., and Rosenblatt, M. B. (1943). *Bronchiectasis*. Oxford Univ. Press, London.
Nelson, H. P. (1934). *British Medical Journal*, **2**, 251.
Nicholson, D. P. (1949). *Arch. Dis. Childh.*, **24**, 29
Ogilvie, A. G. (1941). *Arch. intern. Med.*, **68**, 395.
Paulson, D. L., and Shaw, R. R. (1949). *J. thorac. Surg.*, **18**, 747
Punch, A. L. (1940). *Lancet*, **1**, 5.
Raia, A. (1938). *Amer. J. Dis. Child.*, **56**, 852
Roles, F. C., and Todd, G. S. (1933). *British Medical Journal*, **2** 639.
Sante, L. R. (1927). *J. Amer. med. Ass.*, **88**, 1539.
Tannenberg, J., and Pinner, M. (1942). *J. thorac. Surg.*, **11**, 571.
Wearing, J. D. H. (1948). *Lancet*, **1**, 822.
Wilson, R. (1939). *J. Pediat.*, **14**, 368.

SOME ASPECTS OF COLOUR-BLINDNESS*

BY

E. N. WILLMER, Sc.D.

In spite of the existence of numerous tests for colour-blindness, each to some extent based on one of the various theories of colour-vision and largely directed to the selection of personnel for the armed Forces and for certain branches of industry, there is no single test which can be regarded as infallible. This fact perhaps reflects more than anything else the inadequacy of colour-vision theories and the insecure basis upon which most of them rest. The occasion is thus opportune for a review of some of the fundamental aspects of the problem and for an evaluation of certain recent observations on colour-blind subjects.

Ever since the days of Thomas Young the necessity for three variables in the mechanism for normal colour-vision has been recognized, and three separately excited pathways from the eye to the brain have been postulated. More than three such pathways are usually considered unnecessary, though at times more have been suggested in order to account for special aspects of colour-vision. Perhaps because of the common experience of mixing pigments, and among physicists and physiologists of mixing lights, in which three primary colours are required in order to match all the spectral colours, it has generally been assumed that each pathway registers the sensation of one of the primary

*Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Liverpool, 1950.

colours—that is, there is a blue pathway, a green pathway, and a red pathway. Each pathway, when stimulated alone, would then give rise to the sensation appropriate to it. When two or more pathways were stimulated, intermediate hues would be obtained—for example, yellow, blue-green, etc. This idea has commonly been elaborated further to suggest that the actual receptor cells in the retina must be of three classes—red receptors, green receptors, and blue or violet receptors.

While the triploid character of normal colour-vision can hardly now be doubted, this somewhat naive conception of the complex mechanism involved must be regarded as inadequate, and the position must be examined afresh.

Activation of the Retinal Receptors

From the information which is available on the behaviour of one class of retinal receptors—namely, the rods and their contained rhodopsin or visual purple—and if it is assumed that the other receptors behave in a similar manner, it seems probable that the retinal receptors in general may be activated by substances with relatively broad absorption spectra, so that they are sensitive to a wide range of wavelengths. This is borne out also when the spectral sensitivities of eyes possessing predominantly cones are considered.

On the other hand, some recent work on the properties of certain photosensitive substances produced in the laboratory by the breakdown of visual purple may indicate the possibility of active substances with much narrower absorption bands and therefore with greater selectivity; but so far there is no direct evidence that these substances occur under physiological conditions. The sensitivity of the rods lies mostly between 400 mμ and about 640 mμ, with its maximum at about 500 mμ. Eyes dependent on cones, on the other hand, have a range extending from 440 to 700 mμ, with maximum sensitivity at about 570 mμ. It is well known that when the rods are responding alone, as they may do in very dim light, they give rise to a colourless sensation. The eye under such conditions cannot discriminate between wavelength and intensity. A given frequency of nerve impulses in the optic nerve fibres may be initiated by the appropriate intensity of any wavelength. This observation is also likely to be true for any other single group of receptors so long as they are responding alone, whether they be rods or cones, and whatever the nature of the photochemical activator.

When, however, a second group of receptors, whose spectral sensitivity differs from that of the first group, responds simultaneously, it is at least theoretically possible for differences in wavelength to be appreciated as well as differences in intensity provided that the information obtained from the two sources is not completely "pooled" before reaching the centre in the brain where colour sensations originate. The following observation indeed seems to indicate that this can apply to the rods and the cones as the two groups with different spectral sensitivities.

If one-half of an observation field subtending about 4 degrees at the eye is illuminated with light of any wavelength between yellow and violet, but of such a low intensity that the colour is indistinguishable to a well dark-adapted eye, it is generally believed that the rods alone are being stimulated and that the light is below "cone threshold." Nevertheless it is found that at these very low intensities, if the other half of the field is illuminated by a yellow, orange, or red light of just enough strength to evoke a colour sensation from this half, it also evokes a blue sensation from the other half. The blue disappears if the stimulus to the rods is removed by turning off the original light. The rods must clearly contribute to this sensation of blueness, and the particular blue which they induce can, by binocular matching, be found to give rise to the same sensation as a spectral band between 460 mμ and 470 mμ. This experiment is most easily interpreted as indicating that the rods give rise to a colourless sensation when functioning alone, but are concerned in the perception of blue when responding in juxtaposition to active cones—that is, under conditions when a comparison between two separately stimulated pathways is possible. It does not exclude the possibility that there are other conditions of stimulation in the eye which the brain interprets as blue.

An eye which has no hue discrimination, as distinct from brightness discrimination, and which has only one group of receptors or one pathway to the colour centre, is described as monodic and the resulting vision is monochromatic or achromatic.

If there are two types of receptor and two pathways differing in spectral sensitivity the eye is diodic, and though some colour-vision is certainly possible it will be dichromatic in character and thus defective as compared with that of the normal subject. It will be possible to match all the spectral colours by mixtures of only two primaries, if these are suitably chosen. Conversely, if it is possible for an eye to match all spectral colours by mixtures of red and violet then its visual mechanism is diodic (or monodic) and it is unlikely to have more than two independent pathways, or at least the information received by the brain must be treated as arriving through two separate pathways only.

A Third Factor

In order to prevent the confusions characteristic of the diodic system, some third factor must be present in the normal eye. This may take the form of a third receptor and pathway whose spectral sensitivity is different from those of the other two, or it might take the form of a local modification of one of the existing receptors, or even of both, in such a way that the spectral sensitivities are altered in a particular area of the retina and the nerves from this particular area are separately connected to the brain. Such a situation might be brought about by screening some of the receptors, as, for example, behind macular pigment. Alternatively, the products of the breakdown of their own photosensitive pigments may act as colour filters for certain receptors—for example, the rods might be screened in daylight by a filter of the yellow breakdown products of rhodopsin. It is not necessary, therefore, to assume as an absolute essential the existence of three morphologically distinct groups of receptors provided that there is some mechanism by which three pathways, or separate groups of nerve fibres, receive stimuli which are different from each other at least in those parts of the spectrum in which vision is trichromatic in character.

Moreover, owing to the connexions and cross-connexions which bring about both summation and inhibition in the retina, the actual responses in the pathways may bear very little resemblance in the frequencies of their nerve impulses to the frequencies which might be expected from the sensitivities of the actual photosensitive receptors. An eye, for example, which depended on only two primary receptors might have at least five sets of nerve fibres each transmitting a different frequency of impulses. Fibre 1 might send impulses corresponding to the spectral sensitivity of receptor A, fibre 2 impulses corresponding to the spectral sensitivity of receptor B; on fibre 3 impulses from A might be inhibited by those from B; on fibre 4 those from A might antagonize those from B; and on fibre 5 impulses from A and B might summate. Each of these fibres, and an endless series of others relaying other combinations of response, would probably show a different spectral sensitivity of response from all the others, but, since the fibres are not independently stimulated and depend only on recombinations from the two primary receptors, such an eye would be essentially diodic or dichromatic and would be able to match all spectral colours by means of two primaries only.

It is important to remember at this point that all the nerve impulses which have been recorded from the eyes of vertebrates have been recorded from fibres in which there is every likelihood of such combinations having already occurred in the retinal synapses. It is therefore very dangerous to attempt to correlate directly the spectral sensitivities of such pathways with the spectral sensitivities of the primary receptors, except in the relatively simple case of those dependent only on the known pigment, rhodopsin. More subtle methods have to be used to work back from the impulses recorded to the receptors stimulated.

The Trichromatic System

When the eye is treated as a whole—that is, when relatively large fields are used for the investigation of colour—any spatial differences of activity in the retina tend to be eliminated, and under these conditions the normal eye is definitely a triodic or trichromatic system. It is therefore necessary, in exploring colour-vision, to seek either for three independent receptors or for two main receptors and, in addition, for another factor which will modify the activity of some of these receptors in such a way that they may act as a separate group.

This trichromatic character of normal colour-vision, however, vanishes when vision is restricted to small fields in certain areas of the retina and when the intensity of the light used in the small fields is not so high that the stimulus spreads to neighbouring regions. Under these conditions the extreme periphery of the eye in most subjects is achromatic or monodic. Only light is perceived in this zone, and there is no sensation of colour. A zone rather less far out in the periphery is diodic, and in this zone all spectral colours can be matched with mixtures of two primaries. In the blue-green region of the spectrum there is a colourless or neutral point, and on either side of this point sensations are aroused of blue on one side and of yellow on the other. Thirdly, there is a region in the very centre of the fovea, at the point where form vision reaches its maximum precision, where another form of dichromasy occurs. Spectral colours when flashed momentarily on this area at very low intensity are seen in terms of blue-green, colourless, or orange; with "continuous" vision, yellow is matched with white and all spectral colours can be matched with mixtures of red and violet; at threshold levels, only red and violet remain coloured, all other colours appearing grey at the threshold. Provided that the fields are small enough and are held still enough on the eye, this form of dichromasy may occur elsewhere on the eye also, but it has been less fully investigated under such conditions. The reduced colour-vision which occurs in dim light is also not unlike this type.

Main Types of Colour-blindness

It is pertinent now to ask how these forms of local dichromasy or partial colour-blindness in the normal eye compare with those occurring naturally in colour-blind subjects. Secondly, how are they related to retinal structure? And, thirdly, how do the various types of colour-blind subjects behave under similar conditions? To these questions only very partial answers can at present be given, the chief reason for this being that there are many types of colour-blindness and there is as yet no histological evidence regarding any peculiarities in their retinal structure. Nevertheless, some progress can be made, and the approach will become clearer if the main types of colour-blindness are first briefly reviewed.

Colour-blind subjects can be divided into three main groups, each of which has several subdivisions.

Achromats or Monochromats.—These have no colour sense whatever and can match any colour with any other colour provided that the intensities are equalized. Some of these are maximally sensitive in the green region of the spectrum at about 500 mμ; a second group are most sensitive at 540 mμ, and a third group between 560 and 570 mμ. Once again it must be emphasized that monochromasy does not necessarily imply only one type of receptor. It may arise even if three or more receptors are present and the information which they provide is pooled before reaching the brain—that is, if there are not separate pathways each capable of being stimulated somewhat selectively by the various receptors. It is not known, therefore, whether these maxima represent those of three different types of receptor or result from some combination of receptors. The maximum at 500 mμ is thought to indicate the presence of rods only, and it is interesting to note that such subjects, though they may be photophobic, are not blind in daylight.

Dichromats.—These are able to match all the colours of the spectrum with mixtures of red and violet, and they may be divided into at least three clear groups. There are the protanopes (sometimes called red-blind), who have low sensitivity to the red end of the spectrum and are most sensitive at 540 mμ. They match a point in the blue-green region (about 490 mμ) with white. Secondly, there are the deuteranopes, and these form a more heterogeneous group. On the one hand the spectral sensitivity curve may not differ from that of the normal subject, and on the other it may have its maximum displaced towards the red end of the spectrum to about 575 mμ. The neutral point—that is, the point in the spectrum which can be matched with white—varies between 500 mμ and 520 mμ. Both these types of colour-blindness are congenital.

Tritanopes.—These are much rarer, and very often, if not always, tritanopia results from pathological changes in the eye. It is characterized by a neutral point at 570 mμ and generally a low sensitivity to blue and violet, though the maximum sensitivity is within the normal range.

In each of these groups the subjects habitually make certain well-defined colour confusions, and indeed it is upon these confusions that many established tests for colour-blindness depend. Protanopes and deuteranopes can match red with green on a 2-degree field. In general they seem to separate colours into blues, corresponding to wavelengths between violet and the neutral point, and yellows from the neutral point to the red end of the spectrum, and it is interesting to note that the maxima of their sensitivity curves correspond rather closely to the maxima of those found in the monochromats.

There is another group of subjects who cannot match all the spectral colours by means of only two primaries—that is, they are trichromats, but in making matches of yellow, for example, with mixtures of red and green, they require different proportions of these colours from those required by normal people. Probably the majority of these "anomalous trichromats" have some degree of true colour-blindness—that is, they are tending towards protanopia, deuteranopia, or tritanopia, but are not sufficiently abnormal to be able to dispense with the third primary altogether.

Finally, when the Ishihara plates are used as a test for colour-blindness, some individuals are found who would be diagnosed as red-green blind—that is, as either protanopes

or deuteranopes—but on further testing they are able to distinguish all the spectral colours correctly and cannot match red with green or even with yellow on a 2-degree field. These subjects apparently associate colour in a different way, and there is some instability in their colour sensations. For example, an orange field may be correctly named if standing by itself, but will be called green if placed next to a red, or red if next to a green field. On the Ishihara plates the various spots are recognized as different and are often correctly named, but they may be grouped quite differently from the way in which they are grouped by normal subjects. Consequently the plates are read incorrectly or not at all, but for a quite different reason.

Normal Vision and Colour-blindness Compared

The behaviour of normal subjects when different parts of their retina are investigated by means of small fields may now be compared with that of colour-blind subjects both when using the whole eye and also when their vision is similarly restricted. The dichromatic zone in the periphery at about 60–70 degrees from the optic axis exhibits a type of deuteranopia. Its neutral point lies in the blue-green or green region of the spectrum, and there is no evidence of any markedly decreased sensitivity to red as compared with green when the eye is maintained in a steady light-adapted condition.

Structurally the retina is much simpler in this region than it is towards the centre, and attention may be called to the limited number of ganglion cells and thus to the limited number of separate pathways to the brain from this area. A detailed analysis of these ganglion cells and their connexions would probably prove of great interest. There are certainly two main histologically distinguishable classes. Some very large cells with well-defined Nissl's granules are interspersed among numerous much smaller cells with less-granulated Nissl's substance. In the extreme periphery the ganglion cells are still less abundant while the receptors themselves are not much reduced, so the achromasy of this zone probably results from the paucity of optic-nerve fibres. These peripheral regions of the eye in all probability represent parts which have not evolved so far as the more central regions, and may therefore offer clues concerning the evolution of the colour-vision mechanism.

In contrast to the deuteranopia of the peripheral zone, the foveal centre of the normal subject behaves as a tritanopic system and makes the confusions characteristic of this type of dichromasy. Its neutral point is in the region of 570 mμ. It thus behaves as if it possessed only two pathways and as if the pathway sensitive mainly in the violet region of the spectrum was absent or physiologically inactivated.

Foveal Centre of Those who are Red-green Blind

If the foveal centre is investigated in the same way in those dichromats who are red-green blind—the protanopes and the deuteranopes—it is found then to be completely colour-blind or monochromatic. That is to say, when the field of vision of the protanopes and deuteranopes is confined to the foveal centre all sense of colour goes and any spectral colour can be matched with any other when there is equality of brightness. The area behaves as if one pathway alone was functional. In the protanopes this pathway has its maximum sensitivity at 540 mμ. In the deuteranopes the most sensitive region ranges between 555 mμ and 580 mμ, of which the former does not differ from that of the normal observer.

When the deuteranopes are investigated further the possible meaning of this divergence becomes clear. If, for simplicity, it is assumed that the normal eye has three receptors, R, G, and B, so lettered as to indicate the region of the spectrum (red, green, or blue) in which they are most sensitive, then the foveal centre behaves as though B were absent or suppressed, thus leaving only R and G functional. Now red-green dichromats might be expected to have reduction of the R receptor (protanopes) or of G, or they might well possess both R and G receptors but have no differentiation of the pathways arising from them. The foveal centre of the red-green blind might therefore have a sensitivity corresponding to R, to G, or to R + G. By adapting or fatiguing the eye to selected wavelengths it should be possible, by studying the effects of such adaptation on the ensuing sensitivity, to decide whether the foveal centre of dichromats contains one or two types of receptor.

A study of some twenty deuteranopes in this way has given a very clear indication that they tend to be divisible into two classes. In the first class, the spectral sensitivity is normal and the effects of selective adaptation are identical with those found in the normal subject. Since, however, these dichromatic subjects are monochromatic in the central fovea, they presumably have receptors R and G, but their effects must be combined on to one pathway—that is, they behave as R + G. At the other extreme, five subjects have been investigated in whom there is no selective adaptation. In them it is immaterial what wavelength is used for the adapting light; the thresholds for violet, or blue, and red are always raised equally by adapting lights of equal subjective brightness. These subjects have their maximum sensitivity at about 575 mμ and probably possess receptors of the R type only, so their spectral sensitivity curve probably represents the spectral sensitivity of the R receptor of the normal eye. The shape of this sensitivity curve is very similar to that of the visual purple absorption spectrum, but the curve is shifted towards the red. Moreover, it is of special interest to find that the sensation which these subjects record from the foveal centre is "colourless," just like the sensation aroused by rods only, but it becomes coloured when comparisons are possible. Between these two extremes there are other deuteranopes who show intermediate stages with regard both to the adaptation effects and to the position of the luminosity curves.

Insufficient protanopes have so far been examined by the method of selective adaptation to say whether the maximum sensitivity of their fovea at 540 mμ corresponds to the action of the G receptor only or whether more than one receptor enters into the formation of this pathway. The first experiments indicated that perhaps two receptors were involved, but later experiments throw some doubt on this interpretation, and the point is not yet settled.

Once again, detailed examination of the structure of the foveal centre, not only with regard to the receptors but also with reference to the bipolar cells, ganglion cells, and their central connexions through the lateral geniculate body, is required in order to establish the nature of these pathways. There are, for example, some indications that the very large ganglion cells of the periphery are not present among those connecting with the central foveal elements. The "mop" bipolar cell, which relays mostly from rods, is also scarce in or absent from this area. Moreover, there are indications of at least two types of cone in the foveal centre of monkeys, and the participation of rods, among which histology reveals two separable groups in monkeys and frogs, cannot now be so confidently excluded from daylight vision as was done by earlier investigators. In fact, one of the main problems in vision to-day is the question of what the rods are doing under photopic conditions.

Conclusion

Enough has been said to indicate that the rigid trichromatic theory and the dogmatic assertion of the presence of three types of cone in the fovea of the normal eye are not entirely satisfactory. The study of specific retinal areas, functionally by the use of small fields, structurally by the use of reliable histological methods, and electrophysiologically in other animals, is now the obvious method of approach. Further work on the same lines with colour-blind subjects can almost be guaranteed to yield further dividends. In particular, a more enlightened approach to the evolution of visual mechanisms may well give clues on the nature of the mechanism for colour-vision: thus, there are many indications that the colour-sense may have arisen when a central apparatus was evolved for comparing and evaluating the information already reaching the brain through separate channels previously developed for other purposes—for example, for night and day vision, for increased visual acuity, etc. The time has now come, therefore, for a more biological and comparative approach to the subject. The working of the human eye cannot be treated in isolation as a purely physical or psychological problem; it must be studied in relation to the evolutionary history of vision as a whole.

INFLUENCE OF ASCORBIC ACID ON THE HEALING OF CORNEAL ULCERS IN MAN

BY

T. A. S. BOYD, M.B., Ch.B., D.O.M.S.
Assistant Ophthalmologist, Stirling Royal Infirmary

AND

F. W. CAMPBELL, M.B., Ch.B., D.O.M.S.
Lecturer, Institute of Physiology, Glasgow

It is accepted that the repair of collagenous tissue is dependent on an adequate supply of ascorbic acid (Höjer, 1924; Menkin, Wolbach, and Menkin, 1934; Wolbach and Howe, 1926). Furthermore, ascorbic acid has been shown by Schmid and Bürki (1943), Henkes (1946), and Pirie (1946) to exist in a relatively high concentration in the cornea. The cornea is largely composed of collagen. It is, moreover, avascular. Thus vitamin C may play an unusually important part in the metabolism of this special tissue and possibly also in the resolution of corneal lesions.

Galloway, Garry, and Hitchin (1948), working with guinea-pigs, found that the healing of superficial injuries made with a dental burr and involving only the epithelium was not delayed even when the guinea-pigs were in a subscorbutic state. In their experiments, however, healing may have been effected predominantly by a sliding of epithelial cells from the corneal margin (Arey and Covode, 1943; Buschke, Friedenwald, and Fleischmann, 1943; Mann, 1944). In such injuries there was no occasion for new formation of collagen.

Campbell, Ferguson, and Garry (1950), using heat injuries to the epithelium alone in scorbutic guinea-pigs, confirmed the findings of Galloway, Garry, and Hitchin (1948); but they showed that deeper burns, involving the anterior two-thirds of the corneal stroma, took approximately 30% longer to heal in scorbutic guinea-pigs than in those fully saturated with ascorbic acid. Furthermore, even after epithelial healing was complete, structural weakness of the wound persisted for as long as three weeks after the injury in the scorbutic animals, while in the saturated guinea-pigs the strength of the cornea was restored in 11 days.

These results suggest that ascorbic acid may be of value in the treatment of human corneal lesions. In order to test this possibility we undertook the present investigation. Our study was restricted to the healing of small corneal ulcers in man so as to simulate the animal experiments conducted by Campbell, Ferguson, and Garry (1950). Suitable cases can readily be collected in sufficient numbers to justify statistical analysis.

Such an investigation on human beings can never hope to be so clear-cut as that on the guinea-pigs, in which the experimental group was reduced to a subscorbutic state and the control group had an ample intake of vitamin C. All our patients were eating a more or less normal diet, the intake of vitamin C probably reaching 50 mg. daily in some cases. Therefore, in order to produce blood levels in sufficient contrast with the group on a normal diet, we gave half our patients very massive doses of vitamin C.

Method

The patients studied in this investigation were in attendance at the out-patient department of the Glasgow Eye Infirmary between November, 1949, and March, 1950.

Approximately half the patients received 0.5 g. of ascorbic acid three times daily; the remaining patients received control tablets containing no ascorbic acid, but of identical appearance and taste. Thus the patients in the principal group probably received 30 to 50 times as much ascorbic acid as the patients in the control group, who received ascorbic acid only in their diet. Administration was continued until healing was complete.

The clinical examination of the patients was carried out by one of us (T. A. S. B.), who throughout the experiment was unaware of the type of tablet administered to each patient.

A detailed clinical history was obtained from each patient. This was followed by a careful examination of the lesion, and such details as its size and position on the cornea were noted.

To assess the extent of the ulcer one drop of a 2% aqueous solution of sodium fluorescein was instilled into the conjunctival sac. After one minute exactly, excess fluorescein was washed off with a stream of isotonic sodium chloride solution delivered from a pipette. The intensity of fluorescence of the ulcer was then measured in a dark room by placing alongside the patient's eye a series of standard strips of filter paper impregnated with varying concentrations of sodium fluorescein. Fluorescence was induced by exposure to a mercury vapour lamp fitted with a Wood's glass screen, and situated about 2 feet (60 cm.) from the patient.

Our standard consisted of five strips, 1 by ½ in. (2.5 by 1.25 cm.), of No. 1 Whatman filter paper impregnated with fluorescein so that the intensity of fluorescence increased in approximately linear steps (Campbell and Boyd, 1950). Table I gives details of these standard strips.

As healing of a corneal ulcer progresses, the intensity of the fluorescence decreases and finally ceases when epithelization is complete. The time of healing was recorded as the interval between the first examination of the ulcer and the cessation of fluorescence. Observations were carried out daily.

TABLE I.—*Relation of the Concentration of Sodium Fluorescein to the Intensity of Fluorescence from the Standard Strips of Filter Paper for Clinical Use*

Intensity of Fluorescence	Concentration of Fluorescein in μg./cm.² of Filter Paper
0	No fluorescein
1	0·5
2	1
3	2
4	4
5	8

Before the patient's final discharge the cornea was examined by slit-lamp and biomicroscope. The depth of the lesion was assessed by measuring the fraction of the thickness of the cornea now occupied by opacity.

Results

Analysis of the time taken for the corneal ulcers to epithelize showed that the mean healing time for the group of patients who had received ascorbic acid (22 cases) was 4 days, whereas for the control group (29 cases) the mean was 4.82 days. The difference, 0.82 days, is not significant. However, several factors which may have affected these times of healing were at work simultaneously. We therefore broke down our groups under the following headings.

1. Depth

The two groups above were further divided into subgroups of patients with "superficial" and with "deep" ulcers. Ulcers were considered to be "superficial" if, after healing, the residual opacity occupied a quarter or less of the corneal thickness as judged by slit-lamp and biomicroscope. The remainder were considered to be "deep."

Under normal circumstances one expects superficial ulcers to heal more rapidly than deep ulcers. This was indeed the case in the control group, in which the difference in healing time was highly significant (Table II, B D) ($P<0.0001$).

TABLE II.—*Relationship of Mean Healing Time to Depth of Corneal Ulcers*

Depth of Infiltration	Mean Healing Time in Days: Principals (Receiving 1·5 g. Additional Ascorbic Acid Daily)	No. of Cases	Controls (No Additional Ascorbic Acid)	No. of Cases
Superficial ..	A 3·63 (±0·54*) C	11	B 3·80 (±0·50) D	15
Deep	4·36 (±0·40)	11	6·15 (±0·50)	13

* Standard error of mean.

In the group of patients receiving 1.5 g. of ascorbic acid daily the superficial ulcers also healed more rapidly than the deep ulcers, but this difference was not significant (Table II, A C). In other words, there is a suggestion here that depth of lesion has less effect upon the healing time when there is an abundant intake of ascorbic acid.

2. Ascorbic Acid

The difference between the mean healing times of the groups of patients with and without additional ascorbic acid is not significant in the case of superficial lesions (Table II, A B), but is significant in the case of deep lesions (Table II, C D) ($P<0.05$). This means that there is evidence that the administration of large doses of ascorbic acid does not influence the rate of healing of superficial ulcers, but that it does accelerate the healing of deep ulcers.

The significant difference between the time necessary for epithelization of "deep" ulcers in the principal and control groups is further substantiated by an examination of the course of healing in these two groups. Information on the course of healing was derived from daily estimation of the degree of fluorescence from each ulcer. In Fig. 1 the mean intensity of fluorescence on each day of observation has been plotted for the "deep" ulcers in the principal and control groups. Although by chance the group receiving ascorbic acid started with a higher degree of fluorescence, epithelial healing occurred rapidly, and so their "fluorescence gradient" was much steeper than that of the controls. In contrast, the "superficial" ulcers in principal and in control groups healed at similar rates (Fig. 2).

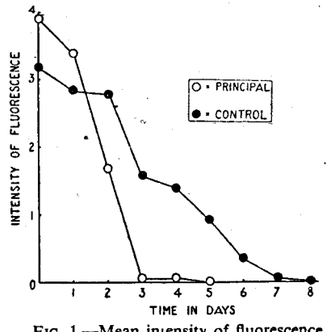


FIG. 1.—Mean intensity of fluorescence of deep corneal ulcers treated with (principals) and without ascorbic acid (controls) plotted for each day during healing. The figures on the ordinate correspond to the strip intensities described in the text.

It is thus clear that the course and time of healing were appreciably influenced by ascorbic acid only in deep ulcers; but can it be said that the deeper the lesion the more pronounced is the effect of ascorbic acid?

This question was investigated by a further subdivision of the deep and superficial groups. The deep group was broken down into a group in which the ulcers infiltrated one-half of the corneal thickness and another group affecting one-third. Similarly, the superficial group was divided into groups affecting one-quarter and one-fifth.

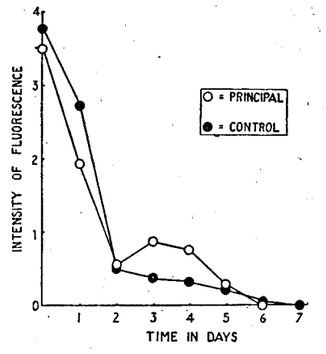


FIG. 2.—Mean intensity of fluorescence of superficial corneal ulcers treated with (principals) and without ascorbic acid (controls) plotted for each day during healing. The figures on the ordinate correspond to the strip intensities described in the text.

Fig. 3 shows diagrammatically the mean healing time of principals and controls in each of the four groups. The influence of depth upon the control groups is clearly shown by the progressive lengthening of healing time with increase of depth. There is a similar influence at work in the

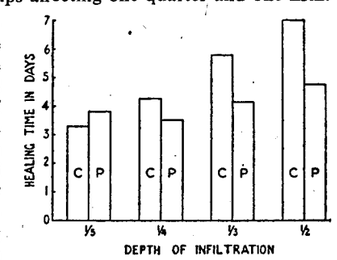


FIG. 3.—Mean healing time related to depth of infiltration in corneal ulcers treated with (P) and without ascorbic acid (C).

principal groups, but it is much less marked. It can thus be said that the deeper the lesion the more pronounced is the effect of ascorbic acid.

3. Site and Size

A priori, one might expect the area of the ulcers and their location on the cornea to have some effect on the rate of healing. We found only a slight tendency for central ulcers to heal more slowly than marginal ones, but analysis indicated that this difference could easily have arisen by chance.

As one would expect, the larger ulcers healed more slowly than the smaller ones, but the difference between the healing times of large and small ulcers in the series we examined was not significant. This was probably due to the comparatively small size of the ulcer diameters (0.25 to 2.5 mm.) in the cases included in this survey.

4. Local Therapy

All the cases received either gutt. sodium sulphacetamide 10% or gutt. penicillin 1,000 units per ml., three times daily; it was found that there was no significant difference between the healing times of sulphacetamide- and penicillin-treated cases. It is of interest, however, to note that, compared with sulphacetamide, penicillin significantly shortened the duration of conjunctival discharge.

5. Pyorrhoea

During the routine examination of our patients we noticed that a considerable number had pyorrhoea, and so decided to investigate its incidence. Pyorrhoea was said to be present only if the gums showed marked retraction with ulceration, or if pus could be expressed from the parodontal sulci.

Pyorrhoea occurred in these patients with corneal ulcers most frequently in the 20–40-year age group. Younger patients were usually free from infection, while many of the teeth of the older patients had been extracted. Since age appeared to affect the incidence of pyorrhoea, we collected a control group with the same age distribution from out-patients attending with non-infective ocular complaints and examined them for the presence of pyorrhoea.

Pyorrhoea was more common in the group with corneal ulceration (Table III). The χ^2 test showed that this difference in incidence was significant ($P<0.01$).

TABLE III.—*Incidence of Pyorrhoea in Patients Suffering from Corneal Ulcers Compared with a Control Group with Non-infective Eye Conditions*

	No. of Patients With Pyorrhoea	No. of Patients Without Pyorrhoea
Patients with ulcers	20 (69%)	9 (31%)
Patients without ulcers (control group)	8 (28%)	21 (72%)

$\chi^2 = 8{\cdot}4$. $P<0{\cdot}01$.

Discussion

Superficial Lesions of the Cornea

The absence of a significant effect of large doses of ascorbic acid on the healing times of superficial ulcers is in keeping with the results of Galloway, Garry, and Hitchin (1948), who inflicted mechanical wounds on the corneal epithelium, and of Campbell, Ferguson, and Garry (1950), who used thermal injuries. These workers considered that ascorbic acid is not required for a purely epithelial repair. The ulcers classified as superficial in the present series were not confined to the epithelium, but did involve a certain amount of stroma. The effect of this involvement of stroma on healing time appears to be masked in the superficial group. However, it becomes apparent when deep lesions are considered.

Deep Lesions of the Cornea

Large doses of ascorbic acid in man, however they act, do promote epithelization of deep corneal ulcers as judged by our fluorescein test. It may be that the slower rate of epithelization in the deep ulcers, where no addition of ascorbic acid had been given, was due to the absence of a suitable substratum of collagenous tissue. This is in keeping with the hypothesis of Hartwell (1929), who studied skin epithelization in cases of scurvy. This is not to say that there must be complete filling of the crater of the ulcer with collagenous tissue before the epithelium can spread across.

We can only conclude that in the patients receiving very large doses of ascorbic acid some changes had taken place in the exposed collagen of the bed of the ulcer to permit rapid overgrowth of the epithelium.

Action of Ascorbic Acid

The question now arises: "Why should massive doses of ascorbic acid accelerate the healing of corneal lesions in patients whose vitamin-C intake seemed normal?" We would like to stress that after careful questioning on dietary habits we found that there were very few patients who did not eat potatoes and vegetables daily. As no patient showed signs of scurvy it seems that this intake was sufficient for normal purposes, but our findings suggest that it was not optimum for the healing of corneal lesions. We therefore suggest that ascorbic acid, in such massive doses as 1.5 g. daily, has a value in therapy apart from its normal role as a vitamin at accepted levels of intake.

The nature of this action remains obscure at present. It may well be that there is a local deficiency at the site of any collagenous tissue lesion. If this be so, then benefit would accrue from the increased rate of diffusion which would arise from a temporary increase in the blood level of ascorbic acid. Moreover, in the case of avascular cornea this accelerated diffusion would tend to be of greater value than in vascular granulation tissue surrounding lesions elsewhere.

It is of interest to note that Campbell and Ferguson (1950) found that during the healing of heat injuries in subscorbutic guinea-pigs there was a greater tendency to corneal vascularization than in control animals with an adequate intake of ascorbic acid. The stimulus for this neo-vascularization may have been the increased metabolism of the healing tissue. It is possible that the guinea-pigs were unable to satisfy this increased demand from their reduced levels of ascorbic acid.

The original object of this study was to investigate whether the conclusions drawn by Campbell, Ferguson, and Garry (1950) from experiments on guinea-pigs could be applied to human beings. Therefore the study was restricted to small ulcers of a type which would be expected to heal with the usual treatment within a week or 10 days. It is unnecessary, of course, to give ascorbic acid normally to cases of this type. Our findings, however, greatly strengthen the clinical reports of Lyle and McLean (1941), and of Summers (1946), who reported on the effect of massive doses of ascorbic acid on a variety of serious corneal conditions.

We now feel that our results justify a critical study of a carefully controlled series of some of the graver but less common corneal conditions.

Summary

Fifty-one cases of small acute corneal ulcers were examined, and healing time ascertained by instillation of sodium fluorescein under standard arbitrary conditions.

Approximately half the patients received 1.5 g. of ascorbic acid daily; the remainder were given control tablets.

Deep ulcers healed significantly more slowly than superficial ulcers.

The administration of large doses of ascorbic acid had no significant effect upon the healing time of superficial ulcers, but significantly accelerated the healing of deep ulcers.

It is suggested that there may be a localized area around the site of regenerating corneal collagen where the ascorbic acid level falls below the optimum for rapid healing. Raising the general ascorbic acid level with massive doses increases the local rate of replacement.

Pyorrhoea occurred significantly more frequently in patients with corneal ulcers than in others with non-infective eye complaints.

We wish to thank Drs. J. Pendleton White, J. Hill, A. Wright Thomson, and A. Mellick, of the Glasgow Eye Infirmary, for permission to examine their patients. We also wish to express our gratitude to Professor R. C. Garry and Dr. J. B. deV. Weir for their kindly criticism and encouragement. We are indebted to Roche Products Ltd. for a liberal supply of control tablets and of tablets of ascorbic acid, and to the Rankin Medical Research Fund of the University of Glasgow for defraying the cost of this investigation.

References

Arey, L. B., and Covode, W. M. (1943). *Anat. Rec.*, **86**, 75.
Buschke, W., Friedenwald, J. S., and Fleischmann, W. (1943). *Bull. Johns Hopk. Hosp.*, **73**, 143.
Campbell, F. W., and Boyd, T. A. S. (1950). *Brit. J. Ophthal.* In press.
—— and Ferguson, I. D. (1950). Ibid., **34**, 329.
—— —— and Garry, R. C. (1950). *Brit. J. Nutrit.*, **4**, 32.
Galloway, N. M., Garry, R. C., and Hitchin, A. D. (1948). Ibid., **2**, 228.
Hartwell, S. W. (1929). *Arch. Surg., Chicago*, **19**, 835.
Henkes, H. E. (1946). *Ophthalmologica*, **112**, 113.
Höjer, J. A. (1924). *Acta pediatr., Stockh.*, Suppl., **3**, 8–278.
Lyle, T. K., and McLean, D. W. (1941). *Brit. J. Ophthal.*, **25**, 286.
Mann, I. (1944). Ibid., **28**, 26.
Menkin, V., Wolbach, S. B., and Menkin, M. F. (1934). *Amer. J. Path.*, **10**, 569.
Pirie, A. (1946). *Biochem. J.*, **40**, 96.
Schmid, A. E., and Bürki, E. (1943). *Ophthalmologica*, **105**, 65.
Summers, T. C. (1946). *Brit. J. Ophthal.*, **30**, 129.
Wolbach, S. B., and Howe, P. R. (1926). *Arch. Path.*, **1**, 1.

Courses of instruction on medical aspects of atomic warfare at the Royal Naval Medical School, originally started for medical officers of the Royal Navy, have been made available to wardmaster officers in the Royal Navy, to medical officers of the R.N.V.R., and to certain civilian members of the nursing profession. These courses were started in 1948. At first they were intended only for Naval medical officers, but soon it was decided that medical officers of the R.A.M.C. and R.A.F. should attend. In January, 1949, the doors were thrown open to civilian medical officers nominated by the Ministry of Health. The medical officers' standard course lasts five and a half days, and the subjects dealt with include atomic physics, effects of radiation in the human body, monitoring and defence organization, and treatment of casualties. The lectures are supplemented by films. Early this year shorter courses lasting three days for nursing officers of the three fighting Services were started, and these were also opened to members of the civilian nursing profession nominated by the Ministry of Health. In August the Admiralty decided that it was desirable that medical officers of the R.N.V.R. should be given an opportunity of attending similar courses of instruction, and these started in September. About the same time it was decided that dental officers of the R.N. and R.N.V.R., who, especially in wartime, play an important part in all medical defence organizations, should attend these short courses. There is a permanent staff of lecturers at the Royal Naval Medical School, and in addition lectures are given on special subjects by outside lecturers.

INTRAPERITONEAL INTESTINAL ANASTOMOSIS IN COLECTOMY

BY

W. GARDEN HENDRY, M.B., F.R.C.S., F.R.C.S.Ed.
Surgeon, Highlands Hospital, Winchmore Hill

Below is presented a short series of 15 cases of strictures and ulcers of the colon (mostly carcinomas) treated by excision with intraperitoneal end-to-end anastomosis, both with and without colostomy.

A good deal has been written about these methods in the American literature from 1942 onwards, representative papers being those of Stone and McLanahan (1942), Wangensteen (1945), Waugh and Custer (1945), and Lahey (1946). In the British literature, however, there is a singular dearth of information on this subject in the last eight years—that is, since the new chemotherapeutic agents have altered the principles of colon surgery.

It is probable, therefore, that the extraperitoneal methods of Paul and Mikulicz are still in vogue up and down the country in cases that would be eminently suitable for an intraperitoneal method. I would at once agree that the latter method requires a certain standard of surgical skill in making an anastomosis, especially in accurate mucosal apposition, but where this exists I suggest that the end-to-end anastomosis is a much better procedure mechanically Risk does not seem to be great in reasonably selected cases It can, of course, be a good deal more radical than an extraperitoneal excision.

In contrast it might be said that a good deal of trouble can be associated with the extraperitoneal methods, not always reflected in textbooks and writings on the subject. Every practical surgeon will know how difficult it can be to get satisfactory crushing of a spur because of the interposition of painful mesenteric structures or the repeated slipping of the enterotome. An extraperitoneal closure in the presence of a partially crushed spur is always difficult and unsatisfactory, and may leave some degree of stricture. At all events, a colon firmly fixed to the abdominal wall can hardly function as well as a mobile colon in its correct anatomical position and with a properly constructed end-to-end anastomosis. So long as the risks of the two procedures were so different these facts were of no account; but now I believe that the difference in risk is slight in selected cases, and these facts should be given full weight in any decision on the correct line of treatment in a particular case.

The period in hospital for a primary colectomy need be no longer than for any other "clean stitch" case—approximately 14 days. If a colostomy has been done this will add another two weeks; the stay should therefore seldom exceed a month. Many a patient subjected to an extraperitoneal method will have been in hospital a good deal longer than this, and probably has had to undergo multiple attempts at spur-crushing and colostomy closure This inevitably leads to a serious loss in his earnings as the weeks go by.

Selection of Suitable Cases

I wish to exclude rectosigmoid lesions from this discussion, as I have had no experience in these primary anastomoses, but there seems to be no good reason why any lesion of the colon should not be resectable by this method at one operation or be made resectable after the establishment of a simple colostomy to overcome the acute

Presentation of Cases in Tabular Form

Case	Date First Seen	Sex	Age	Type and Site of Lesion	Brief Clinical Findings	Operative Treatment	Type	Abdominal Complications	Histology	Result August, 1950
1	Aug. 1946	M	37	Carcinoma of descending colon. Acute colonic obstruction	Three weeks' gradual increase in abdominal pain terminating in colonic obstruction	Transverse colostomy for obstruction; 20 days later resection of descending colon, with aseptic end-to-end anastomosis	Operable	Faecal fistula L.I.F. Now has Devine defunctioning transverse colostomy and reconstructed left colon	Adenocarcinoma of colon. No involvement of mesenteric nodes	Alive and well. No evidence of recurrence
2	Apr. 1947	M	49	Carcinoma of transverse colon. Adherent small gut with small gut obstruction	24-hour emergency with obvious small-gut obstruction and a mass in the right epigastrium	Resection transverse colon and loop of small gut, with double end-to-end open anastomoses. Added caecostomy	Operable	*Nil.* First-intention healing: caecostomy healed spontaneously	Columnar-celled carcinoma with simple adenitis of both mesenteries	Alive and well 2 years later. Now untraced
3	Mar. 1948	F	38	Carcinoma of sigmoid colon. Acute colonic obstruction	Colonic obstruction 7 days. Gross distension	Laparotomy—caecostomy; 6 weeks later resection of sigmoid colon with open end-to-end anastomosis	Operable	Organic small-gut obstruction fifth day from adherence to anastomosis. Operative relief	Tubular columnar-celled carcinoma of sigmoid colon. No involvement of lymph nodes	Died Oct., 1949. Carcinoma of ovaries, probably 2nd primary
4	Nov. 1948	F	71	Carcinoma of descending colon Chronic colonic obstruction	Abdominal colic and increase in constipation—6 to 8 weeks. Barium enema diagnosis	Resection of left colon with open end-to-end anastomosis between left transverse and mid-sigmoid. Added caecostomy	Operable	*Nil.* First-intention healing; 5 weeks later, extraperitoneal closure of caecostomy	Undifferentiated polygonal and spindle-celled carcinoma of colon. Nodes not involved	Alive and well
5	Dec. 1948	F	67	Carcinoma of descending colon. Non-obstructive	Refractory anaemia whilst under treatment for fractured tibia. Mass L.I.F. Barium enema diagnosis	Resection of left colon with open end-to-end anastomosis between left transverse and mid-sigmoid	Inoperable; liver secondaries	*Nil.* First-intention healing	Tubular columnar-celled mucous carcinoma of colon	Died June, '50. Multiple secondaries
6	Feb. 1949	F	73	Carcinoma of caecum. Chronic obstruction	R.I.F. pain 7 weeks, with occasional abdominal colic; bloody diarrhoea 7 weeks. Loss of weight 1 stone (6·35 kg)	Right hemicolectomy, with open end-to-end ileo-transverse anastomosis	Operable	*Nil.* First-intention healing	Ulcerated tubular polygonal-celled carcinoma of colon. Nodes negative	Died of cerebral haemorrhage, early 1950
7	May 1949	F	61	Carcinoma of caecum. Chronic obstruction	Pain right lower abdomen 5 months; 1 month colic with borborygmi; vomiting 2 weeks; diarrhoea 1 month. Mass R.I.F.	Right hemicolectomy, with open end-to-end ileo-transverse anastomosis	Inoperable because of involved nodes to root of mesentery	*Nil.* First-intention healing	Columnar-celled carcinoma of colon with involvement of lymph nodes	Died July, '50, jaundice. Lymph spread to liver
8	June 1949	M	78	Carcinoma of transverse colon. Acute and chronic colonic obstruction	Central abdominal colic 8 weeks; vomiting at intervals 6 weeks; increasing constipation 3 months, relieved diarrhoea. Barium enema diagnosis	Caecostomy; 16 days later resection of transverse colon, with open end-to-end anastomosis	Operable	*Nil.* First-intention healing; extraperitoneal closure; caecostomy 15th day	Tubulo-papillary columnar-celled carcinoma of transverse colon. No node involvement	Alive and well
9	July 1949	F	68	Diverticular stricture, lower end sigmoid	Occasional abdominal colic-1 to 4 days 2 or 3 times a year for 8 to 9 years; constipation for 6 weeks. Barium enema: stricture sigmoid Carcinoma could not be excluded	Resection of sigmoid, with open end-to-end anastomosis between mid-descending colon and lower sigmoid	—	Stricture at anastomosis, with diarrhoea for 20 to 24 days. First-intention healing	Diverticulitis	Alive and well
10	June 1949	F	44	Carcinoma of mid-sigmoid. Colonic obstruction	Onset 3 months previously with abdominal colic and diarrhoea; since then aching lower abdominal pain; occasional colic P.R.—hard mass high in pelvis	Resection of sigmoid with open end-to-end anastomosis	Inoperable; widespread peritoneal metastases	*Nil.* First-intention healing	Tubular columnar-celled carcinoma of colon	Died Nov., '49. Carcinoma cachexia
11	Oct. 1949	F	68	Carcinoma of transverse colon. Colonic obstruction	Colic and increasing constipation 6 months; absolute constipation 2 days; angina of effort 2½ years; colonic distension Barium enema diagnosis after caecostomy	"Blind" caecostomy; 8 days later, resection of transverse colon, with open end-to-end anastomosis	Inoperable; liver metastases	*Nil.* First-intention healing; extraperitoneal closure of caecostomy 16th day	Tubular columnar-celled carcinoma of colon	Died May, '50
12	Nov. 1949	F	60	Carcinoma of caecum. ? Acute appendix	13 hours pain R.I.F.; nausea; vomited once; bowels loose since onset; bowel habit normal; guarding and tenderness R.I.F.	Right colectomy with open end-to-end anastomosis between ileum and mid-ascending colon	Operable	*Nil.* First-intention healing	Columnar-celled carcinoma of colon. Inflammation of related nodes	Alive and well
13	May 1949	M	72	Carcinoma of iliac colon. Colonic obstruction	Right hemicolectomy 15 years ago, with gross pararectal incisional hernia; colonic obstruction relieved by ileostomy. Barium enema diagnosis	Resection of iliac colon with open end-to-end anastomosis between descending colon and mid-sigmoid	Operable	*Nil.* First-intention healing; later unilateral exclusion for ileostomy	Tubular and columnar-celled carcinoma of colon. Nodes not involved	Alive and well

Presentation of Cases in Tabular Form (Cont.)

Case	Date First Seen	Sex	Age	Type and Site of Lesion	Brief Clinical Findings	Operative Treatment	Type	Abdominal Complications	Histology	Result August, 1950
14	Oct. 1949	M	45	Carcinoma of caecum presenting as probable appendicular abscess	Tender mass R.I.F.; treated conservatively; partial resolution. Barium meal and enema. Bilateral pulmonary T.B. with upper right thoracoplasty; considered quiescent	Explored for probably appendicectomy; right hemicolectomy for carcinoma of caecum with end-to-end ileo-transverse anastomosis	Operable	Died 2nd day, pulmonary insufficiency. P.M.: abdomen satisfactory; chest active	Tubular columnar-celled carcinoma of colon	Died 2nd day
15	July 1950	F	56	Constricting carcinoma below splenic flexure. Partial colonic obstruction	18 months previously abdominal colic 1 week; 1 month previously recurrence of colic with constipation for 1 week, relieved by aperient. Barium enema diagnosis	Left hemicolectomy with open end-to-end anastomosis between mid-transverse and upper sigmoid colon	Operable	*Nil.* First-intention healing	Alveolar tubular columnar-celled mucinous carcinoma of colon infiltrating to serosa. Lymph nodes negative	Alive and well

obstructive element. It is obvious that a safe anastomosis cannot be made in an acutely dilated thin-walled proximal gut with highly infective contents. In these conditions no sulphonamide therapy is possible, and, even if it were, in my opinion an anastomosis within the peritoneum would not be permissible. On the other hand, the presence of chronic obstruction is not always an absolute bar, as in Case 7. Here, owing to hypertrophy and dilatation of the distal ileum from a stenosing growth at the ileo-caecal valve, an anastomosis between the ileum and transverse colon was technically easier than usual because of the similarity of the lumina. In general it may be said that those lesions disclosed in the early stages by barium enema will be suitable for primary resection after adequate pre-operative preparation, while those presenting with some clinical degree of colonic obstruction will require proximal colostomy, barium enema to locate the lesion, and resection after preparation.

Influence of Site of Lesions

Again, I consider that no particular site precludes a primary resection or an end-to-end anastomosis. In the main the accepted resections have been performed with ileo-transverse anastomosis for right colon lesions, transverse-transverse anastomosis for transverse colon lesions, and transverse-sigmoid anastomosis for left colon lesions.

These procedures are perhaps the best, as the blood supply to both ends is more assured, and one is joining two pieces of bowel entirely covered by peritoneum. The mobilization for the transverse-sigmoid anastomosis has to be extensive; but this is the whole secret of the operation, or, for that matter, of any operation on the colon. However, on both the right and the left colon I have done less than the classical resection (see Cases 3, 10, 12, and 13), and performed a successful anastomosis with both the ascending and descending parts of the colon. It would seem, then, that even the retroperitoneal parts of the colon can confidently be used for this procedure.

Type of Anastomosis

Excluding Case 1, all these patients have had an open end-to-end anastomosis, in some cases with crushing-clamps and in some without any type of clamp whatever; the technical minutiae of my ideal anastomosis, however, are dealt with in detail below. To my mind the important thing is accurate mucosal apposition, and I have therefore avoided the aseptic methods. An end-to-end anastomosis undoubtedly seems the method of choice, as it leaves no blind ends to leak or later "blow out." It restores continuity in anatomical manner with no mesenteric overlap. It is applicable to all parts of the colon, be they completely peritonized or not, and marked difference in the two lumina is no contraindication. This can either be dealt with by partially closing the larger piece of gut or, better still, by cutting the smaller so obliquely that they fit. In Case 12 I anastomosed a contracted ileum to the mid-ascending colon (difference of lumina of about three times) by cutting the ileum extremely obliquely. The lines of section must always leave a shorter antemesenteric border to ensure blood supply (Fig. 1). This device also allows of a larger anastomosis and obviates stricture formation.

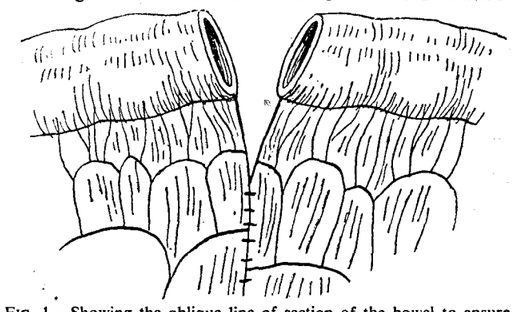


FIG. 1.—Showing the oblique line of section of the bowel to ensure its antemesenteric blood supply.

Effect of Chemotherapy

Undoubtedly the sulphonamide drugs administered in an insoluble form pre-operatively are an important added safety factor in this operation, and have given one a confidence in the intraperitoneal method which the older generation of surgeons can never have had. If, however, one exposes a colonic lesion by exploratory laparotomy the fact that no insoluble sulphonamide preparation has been given is no contraindication to a successful resection by the intraperitoneal method (see Cases 2 and 12). In these cases parenteral sulphonamide was given in the immediately post-operative days, and later the insoluble sulphonamide when feeding was resumed. With streptomycin now generally available I would add this drug in a dosage of 1 g. thrice daily, intramuscularly, and no doubt it will find a place as a further safeguard in the routine care of these cases.

Routine Management

Pre-operative Care

Diet: Low-residue high-calorie diet, with more than adequate amounts of fluid, and glucose to the limit of tolerance. *Sulphonamide Therapy:* Phthalyl sulphathiazole 1 g. thrice daily for five days. *Vitamins:* One "multivite" tablet is given thrice daily. A depot injection of 100 mg. of vitamin K is given intramuscularly, as deficiency in this vitamin can occur, especially with prolonged debacterializing of the gut with sulphonamide therapy. In these circumstances haematoma in the mesentery or suture line may be disastrous and lead to faecal fistula or peritonitis. *Activity:* The patient should be reasonably ambulant during this preparation. Routine breathing and leg exercises are given. *Blood Examination:* This is routine. Any anaemia is corrected by transfusion a few days before operation or, in the presence of a cardiac lesion as in Case 11, by intravenous iron ("ferrivenin," 5 ml. alternate days). *Enemata:* The lower bowels are emptied by a saline enema every second day, one being given the night before operation. *Aperients:* No pre-operative aperient has been given to these cases.

In cases with colostomy the preparation is the same, and sulphonamide by mouth will adequately debacterialize the distal colon by spillage.

Anaesthesia

Premedication: Omnopon 1/3 gr. (22 mg.); scopolamine 1/150 gr. (0.43 mg.), or if over 60 years morphine 1/6 gr. (11 mg.) and atropine 1/100 gr. (0.65 mg.). *Method:* Induction by intravenous thiopentone followed by cyclopropane and oxygen, with intravenous curare added if further relaxation is required.

Operative Procedure

The Approach.—Various incisions have been used during the series. I find a right paramedian rectus-displacing incision best for right hemicolectomy where the anastomosis is near the midline, while for the left colon a left lower oblique muscle-cutting incision is probably better, as the anastomosis is to be in the left iliac fossa region.

Steps of Operation.—(1) General exploration, including local examination of the lesion and lymphatic drainage and examination of the liver and peritoneum. (2) Mobilization of the lesion; and again I wish to stress that the secret of easy colectomy is adequate mobilization, with the lateral aspects of the colon displaced towards the midline. (3) V-shaped mesenteric incision to the root of the mesentery, generously including the lymphatic drainage. (4) Closure of the mesenteric wound up to 1 to 1½ in. (2.5 to 3.75 cm.) of the mesenteric angle (Fig. 2). (5) Application of crushing-clamps on the side of the bowel to be removed, both placed obliquely as in Fig. 1, but one more so than the other to allow the cut lumina to be equalized (Fig. 2). (6) Application of proflavine pads to exclude wound edges, and small pad brought through the defect in the mesentery to protect it. (7) Application of occlusive clamps to the bowel 2–3 in. (5–7.5 cm.) above and below the lines of section. (8) Section of bowel and removal of specimen. (9) A continuous all-coats stitch, starting at the antemesenteric border, is inserted. It runs down the posterior edges and, turning in the mesenteric angles, comes back anterior to finish again at the antemesenteric border (Fig. 3). The stitch is a simple over-and-over one. (10) Mesenteric proflavine pad and the wound pads removed; the hands are thoroughly washed and rinsed in biniodide of mercury; closure of the mesenteric wound is completed; and interrupted seromuscular stitches of medium linen thread or Chinese silk are placed to cover the first layer completely. (11) The anastomosis is now dusted with proflavine–sulphonamide powder, and the wound closed in layers without drainage. If, however, there is the slightest doubt about the security of the union a small soft tube placed down to this area for five days does no harm.

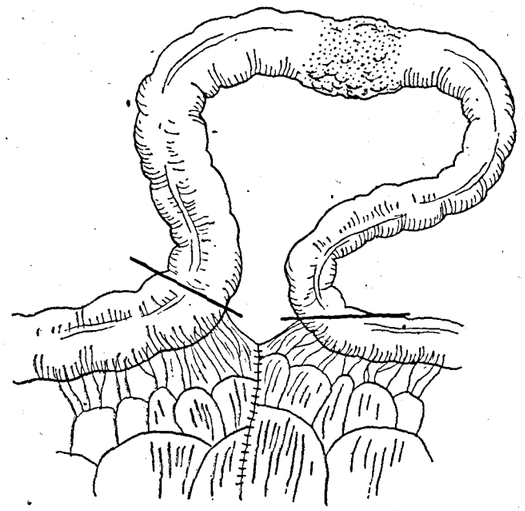


FIG. 2.—Demonstrating the differing obliquity in the lines of section to equalize lumina for suturing. (The mesentery of the loop for excision has been omitted for clarity.)

Post-operative Care

Diet.—It is necessary to avoid anything by mouth until intestinal activity is audible subsequent to the post-operative paresis, usually after 48 hours. During this time fluid balance will require to be maintained by intravenous or subcutaneous saline. Thereafter clear fluids should be given by mouth—1 oz. (28 ml.) for four hours, 2 oz. (57 ml.) for four hours, then stepping up fairly rapidly. Nourishing fluids will be taken 24 hours after this, and phthalyl sulphathiazole therapy resumed; next day a light diet with little roughage will be started, being continued for approximately ten days, until the bowels are well opened. Thereafter the diet can become more varied.

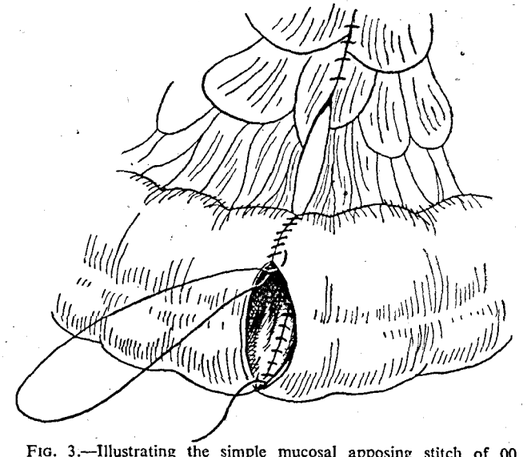


FIG. 3.—Illustrating the simple mucosal apposing stitch of 00 chromic catgut. This is applied first, as the anastomosis can be rotated for the insertion of the interrupted seromuscular stitches behind.

Activity.—The patient should be lifted from bed for five minutes on the day after operation. This routine is continued each day for gradually increasing periods in the bedside chair. Leg and breathing exercises are continued.

Care of Bowels.—A rectal examination on the fifth to seventh day will often reveal a rectum full of soft faeces, and a glycerin suppository will aid evacuation. This can be repeated every second day until spontaneous evacuation is obtained. I have used a simple aperient in syrupus sennae ½ dram (1.75 ml.) twice daily, on the ninth to tenth day to ensure a spontaneous evacuation. In cases with colostomy the problem is not so urgent, but is dealt with in the same manner.

In my submission penicillin is not needed for these cases unless some definite indication presents.

Illustrative Cases

Case 7: Carcinoma of Caecum: Primary End-to-end Intraperitoneal Anastomosis in Presence of Chronic Obstruction

This patient, a woman aged 61, was first seen in May, 1949, complaining of pain in the right side of the lower abdomen of five months' duration. She vomited on one occasion, and latterly had had a good deal of malaise. For the last four weeks she had colicky lower abdominal pain, which was relieved after audible borborygmi. Vomiting was fairly frequent over the latter period. There had been anorexia for two weeks and diarrhoea for a month, with a loss of weight of 10 lb. (4.5 kg.).

Examination showed her to be a spare old lady. Her tongue was dry, the pulse 100, blood pressure 190/100 mm., and haemoglobin 84%. The abdomen was slightly distended, showing visible peristalsis and a tumour in the right iliac fossa.

Operation.—This was carried out through a right mid-paramedian incision under a general anaesthetic. A posterior carcinoma of the ileo-caecal region was found to be penetrating into the retroperitoneal tissues, closely related to the right bladder fundus. There was some free fluid. Involved nodes to the root of the mesentery; the ascending colon and hepatic flexure, and the growth, were mobilized; the bladder was entered and repaired. Right hemicolectomy with end-to-end ileo-transverse junction was done by the open method. In this case the ileum was grossly hypertrophied and dilated, making the anastomosis easy. The wound was closed in layers, with a soft drain to the anastomosis from a stab incision in the loin, and an indwelling catheter was placed in the bladder.

Histology.—The growth was a columnar-celled carcinoma of the caecum with involvement of lymph nodes.

Post-operative Course.—Smooth. Drain removed fifth day; no leak. Bowels opened sixth day. Indwelling catheter removed seventh day. The patient was fit for discharge on the eighteenth day. She received phthalyl sulphathiazole in the post-operative period only.

Follow-up.—This patient was seen at regular intervals, and for 18 months remained tolerably well, though she occasionally complained of vague pains at the operation site for which no physical signs could be found. At the end of June, 1950, she was readmitted with a two-weeks history of jaundice and increasing drowsiness, and died on July 9, 1950, of liver insufficiency.

Necropsy revealed obstructive jaundice from large lymphatic glands compressing the common bile duct. Lymph nodes were involved with the columnar-celled carcinoma.

Comment

Although this case was inoperable from the start, the patient was given a further 18 months of tolerable comfort before her very short fatal illness.

Case 15: Carcinoma of Descending Colon: Primary Open End-to-end Intraperitoneal Anastomosis

A woman aged 56 was first seen in July, 1950, giving the following history. Eighteen months previously she had had colicky lower abdominal pain lasting a few days. Thereafter she was symptomless until one month before admission, when she had a recurrence of the colicky abdominal pain with constipation, which refused to respond to purgatives for one week. After this she began to pass loose stools, and the colicky pain gradually subsided. General, abdominal, and rectal examinations were negative. A barium enema revealed a 2½-in. (6.25-cm.) stricture of the colon just below the splenic flexure.

Operation.—General anaesthesia. Long left paramedian incision. Mobilization of transverse colon, splenic flexure, descending and upper sigmoid colons. A large subsplenic growth was found, with soft nodes in the peripheral group spreading as far as 6 in. (15 cm.) from the growth; no spread to the root of the mesentery. Removal of mobilized colon specified, with mesenteric closure. Primary open end-to-end anastomosis between mid-transverse colon and mid-sigmoid Wound closed in layers without drainage.

Histology.—Alveolar and tubular columnar-celled mucinous carcinoma of the colon, infiltrating to the serosa. Slight chronic inflammation of lymph nodes.

Post-operative Course.—Smooth. Patient required parenteral fluids for the first two days, and during this time was given 1 oz. (28 ml.) water by mouth hourly. On the third post-operative day bowel sounds were heard; fluids by mouth were slowly increased to 4 oz. (114 ml.) hourly. Phthalyl sulphathiazole recommenced by mouth. On the fourth day nourishing fluids were given. On the sixth day a rectal examination revealed soft faeces in the rectum. A glycerin suppository now produced an evacuation. Light diet was started. Thereafter convalescence was uninterrupted, and the patient was ambulant from the second post-operative day.

Discussion

This small series suggests that the procedure described can be accomplished with a good degree of safety. There were no faecal leaks apart from Case 1, not anastomosed by the recommended method, and it would be fair to say that on the whole convalescence has been really smooth and has given little anxiety. When it is remembered that seven of these patients were over 65 years of age and four of them were over 70, it may well be considered that the powers of colonic healing are greater than we have been led to believe in the past.

Two complications are worthy of mention. In Case 3 a small-gut obstruction occurred from adherence of a loop of small gut to the anastomosis. This required a re-exploration on the fifth day and separation of the small-gut loop In Case 9 a stricture occurred at the recto-colonic junction owing to the technical error of not cutting the end for anastomosis obliquely enough to give an adequate lumen The patient suffered from chronic colonic stasis with overflow diarrhoea for some ten days before normal bowel function gradually became restored. This condition was no doubt due to the local oedema at the anastomosis subsiding and natural dilatation occurring through the passage of faeces.

One remaining point I wish to note is the beauty of the operation for cases such as 5, 10, and 11, which were obstructing carcinomas and irremovable metastases. These patients had "clean stitch" operations, and were allowed to leave hospital in a reasonable time to enjoy what life was left to them without the added burden of a colostomy

Summary

A series of 15 cases of intraperitoneal end-to-end anastomosis after colectomy is presented.

Extra- and intraperitoneal methods are compared.

Factors influencing the choice of operation and the type of anastomosis are discussed.

The detailed management of an intraperitoneal colectomy is given.

Results and complications are discussed.

I wish to thank Sir Henry Souttar for permission to treat these cases and for much helpful advice and criticism, and Dr. Joan Martinez for the skilful anaesthesia which contributed so much towards their recovery.

References

Lahey, F. H. (1946). *Surg. Clin. N. Amer.*, **26**, 610.
Stone, H. B., and McLanahan, S. (1942). *J. Amer. med. Ass.*, **120**, 1362.
Wangensteen, O. H. (1945). *Surg. Gynec. Obstet.*, **81**, 1.
Waugh, J. M., and Custer, M. D. (1945). Ibid., **81**, 593.

The illustrations were redrawn by Miss Sylvia Treadgold from sketches supplied by the author.

EXERCISES IN THE BATH

BY

Sir LEONARD HILL, F.R.S.

The function of the heart is to deliver blood to the capillaries: aided by the valves in the veins and the suction and belly-compressing action of the respiratory pump, and in the active animal by the contraction of skeletal muscles and the frequent changes of posture overcoming the influence of gravity, the blood is returned to the heart by the great veins and without effort on its part. All parts of the body secure an adequate circulation and supply of oxygen, and waste substances are removed. In the sedentary man, inactive, with legs dependent, and gravity acting against the return of blood, the conditions are not so good. Parts of the body may be less well oxygenated and waste products not so well removed by the circulating blood. More work is thrown on the heart by less aid being given to the return of venous blood, and this may possibly contribute to heart disease in the elderly. In recumbency, with the turning movements that take place in sleep, there is a more even circulation, with removal of fatigue. Immersed in water a 10-stone (63.5 kg.) man weighs only 10 lb. (4.5 kg.). The economy of energy needed for muscular movement carried out under water is then immense.

Mr. T. R. Togna has developed a system of exercise and massage in the bath which set him free from minor troubles of health, and has kept him in such good condition that at the age of 77 he can easily run 81 yards (74 metres) in 12 seconds.

The oxygen pulse (that is, the volume of oxygen used per pulse beat) given by several observers for various adults doing exercise in air ranged from 7 to 13 c.cm. of oxygen intake per beat with a pulse frequency ranging from 120 to 174. The marathon runner De Mar, with a pulse of 118, had an oxygen intake per pulse beat of 17 c.cm. This figure is equalled by Mr. Togna, when doing his exercise with autonomous massage in the bath, with a pulse frequency of 66 beats, 6 beats above his basal.

The exercises performed in water are associated with a large absorption of oxygen per pulse beat—a sign of a higher degree of efficiency of circulation throughout the body. Togna tells me that in his youth he followed scientific and literary studies of a general nature and was always especially interested in problems of health. At the age of 52, while in his bath, he noticed that, by performing vigorous contractions which were bringing into play the body skeletal muscles, his pulse rate did not increase according to his experience in air and when swimming. This fact impressed him. He became intrigued with the meaning of it, and started studying textbooks on the physiology of activity. By making a habit of the activity its beneficial effects became obvious to him.

His theory was established in effect by the experiments of Professor G. P. Crowden in September, 1933, which were reported in the proceedings of the Physiological Society (*J. Physiol.*, 1935, **84**, 31P).

TABLE I.—*Results of Observations Carried out on Mr. Togna*

(a) Conditions When Tests were Taken	(b) Volume of Air Breathed (c.cm./min.)	(c) Oxygen Consumption (c.cm./min.)	(d) Carbon Dioxide Production (c.cm./min.)	(e) Pulse Rate (Beats per min.)	(f) Oxygen Consumption per Beat (c.cm.)	(g) No. of Movements (per min.)	(h) Blood Pressure	(i) Respiration Rate (per min.)
Basal (reclining)	12,800	282	192	60	4·7	—	140/58	15
Standing run	37,000	1,848	1,860	124	14·9	72	170/78	24
Bath exercise:								
Type I—arm and leg bending	21,000	890	736	72	12·3	42	132/58	15
Type II—*trunk raising*	24,500	970	840	68	14·3	46	132/54	15
Type III—head, face, neck, and back massage, with simultaneous expansion and contraction of chest and abdomen and leg bending	27,800	1,135	1,080	66	17·2	30	132/55	15
One hour after (reclining)	12,600	400	342	66	6·0	—	142/54	16
Two hours after (reclining)	10,100	330	274	64	5·2	—	146/56	18

TABLE II.—*Exercise in the Bath Performed by Healthy Subjects for the First Time*

(a)	(b) Volume of Air Breathed (c.cm./min.)	(c) Oxygen Consumption (c.cm./min.)	(d) Carbon Dioxide Production (c.cm./min.)	(e) Pulse Rate (Beats per min.)	(f) Oxygen Consumption per Beat (c.cm.)	(g) No. of Movements per min.	(h) Blood Pressure	(i) Rate of Respirations per min.
Basal Metabolism								
Mr. O. G. (46)	7,470	262	209	78	3·36	—	118/78	13
Miss M. M. (28)	12,500	250	200	72	3·5	—	122/74	16
Miss J. C. (21)	8,400	231	168	76	3·0	—	118/70	15
Exercise in Bath								
Mr. O. G.	18,000	684	630	75	9·1	—	112/66	15
Miss M. M.	14,250	527	399	66	8·0	—	110/66	24
Miss J. C.	9,500	466	366	70	6·66	—	106/56	25
1½ Hours After Resting								
Mr. O. G.	9,500	370	314	82	4·5	—	112/70	12
Miss M. M.	9 750	302	214	70	4·3	—	110/64	16
Miss J. C.	9,000	297	225	72	4·1	—	108/56	18

No pecuniary interest is attached by Togna to his concept, but he has a profound conviction of the benefit of exercises in the bath to his family, his friends, and himself, and a desire to make it known by publication of pamphlets and a book illustrated by photographs. I myself have acquired the habit of these exercises and found them of benefit at my age, now 84, in keeping my body supple and fit in all parts.

There can be no doubt, I think, that these exercises offer a valuable means of bringing at bay the decadence of the ageing processes by keeping up bodily energy, and quite possibly warding off heart disease.

Recently I have had a fresh series of observations carried out on Mr. Togna by the Clinical Research Association to ascertain : (*a*) the oxygen consumption under basal conditions ; (*b*) the increase in oxygen consumption during three types of bath exercises ; (*c*) the rate of oxygen consumption up to two hours after the exercises ; and, for comparison, (*d*) the oxygen consumption while performing mild exercises (standing run) in the air.

The values obtained and the physical conditions are shown in Table I. The results of tests on three subjects exercising for the first time are shown in Table II.

Comment

It will be seen that the criterion by which the value of the exercises must be judged is the oxygen consumption per pulse beat (column *f*) when taken in conjunction with the blood-pressure reading (column *h*). On this basis it will be seen in the case of Togna that with the standing-run exercise in air the oxygen consumption per beat is 14.9 c.cm. : this is accompanied by a marked rise in both the pulse rate and the blood pressure. The exercises in the bath, however, produce a high rate of oxygen consumption per beat (in the case of Type III exercise, more than the standing run in air), and this increased oxygen consumption is obtained with only a slight increase in the pulse rate and accompanied by a drop in the blood pressure. In my case the oxygen consumption per pulse beat increased from 4.0 to 6.2 and the blood pressure fell from 192/96 to 168/86.

The values obtained one and two hours afterwards are interesting ; it will be seen that the oxygen consumption per beat is still increased over the basal value, showing that the increased oxygen consumption is maintained for some time after the tests.

General François Daubenton, of the Netherlands, has been appointed to the post of chief of the W.H.O. Office for Africa. Dr. Daubenton was formerly public health consultant to the W.H.O. Regional Office for the Eastern Mediterranean, and headed the W.H.O. mission in Ethiopia. The newly created W.H.O. office for Africa will be located at Geneva until a permanent regional organization for Africa has been established. Three such organizations have already been set up by W.H.O.—in New Delhi, for South-east Asia ; in Alexandria, for the Eastern Mediterranean ; and in Washington (Pan-American Sanitary Bureau), for the Americas. In addition, a temporary office for the Western Pacific is functioning in Hong Kong, and Geneva is the seat of the W.H.O. Office for Europe. Dr. Daubenton was born in Rotterdam in 1888 and studied in Utrecht, Lausanne, London, and Johannesburg. Before joining the World Health Organization he was Director-General of Medical Services for the Royal Netherlands Army. Before the second world war Dr. Daubenton spent over 20 years in Africa, mainly as chief medical officer to a large Witwatersrand gold-mining group. He was later appointed to various public health posts and acquired a wide knowledge of health problems of the African Continent.

Medical Memoranda

Influenzal Meningitis Treated With Chloramphenicol

Haemophilus influenzae is an important cause of meningitis in Malaya, accounting for 16% of the cases (Green and Mankikar, 1949b). Influenzal meningitis occurs mainly among Indian and Chinese children aged from 2 months to 2 years, the majority being under 1 year. These infections have almost invariably proved fatal, and in our experience the strains of *H. influenzae* isolated have been consistently insensitive to penicillin.

Streptomycin treatment of influenzal meningitis has not been entirely encouraging, and it involves the technical difficulties and infective risks of repeated intrathecal injections as well as the evolution of streptomycin-resistant strains of *H. influenzae*.

Woodward *et al.* (1948) have shown that chloramphenicol given orally reaches a concentration of 20 to 80 μg. in the blood, and according to Smadel *et al.* (1949) it attains about half this level in the cerebrospinal fluid. *In vitro* experiments (Green and Mankikar, 1949a) showed that Malayan strains of *H. influenzae* were readily susceptible to chloramphenicol in concentrations theoretically obtainable in the cerebrospinal fluid when this antibiotic is given by mouth.

With the above findings in view, the use of chloramphenicol was considered to be justified in the following case.

Case Report

A Chinese female infant, aged 4 months and weighing 14 lb. (6.4 kg.), was admitted to hospital in October, 1949, having had continuous fever for the past three weeks and cough and convulsion for the past four days. The head was retracted, the limbs were spastic, and the fontanelle was tense. The cerebrospinal fluid contained pus cells and pleomorphic forms of *H. influenzae* which grew in pure culture. This strain was found sensitive to chloramphenicol and "aureomycin." The sugar in the cerebrospinal fluid was below 15 mg. per 100 ml., indicating, according to Alexander *et al.* (1942), a severe infection.

The contents of one chloramphenicol capsule (250 mg.) were given just before each four-hourly feed, small quantities of the powder being put intermittently into a teaspoon, which was then filled with milk and tipped into the mouth. (The solubility of chloramphenicol is relatively slight—about 2 mg. per ml.) No apparent difficulty was encountered in swallowing or retaining these medicated feeds despite the bitterness of the drug. After five days there was occasional vomiting, with some transient diarrhoea on the tenth day. The amount of chloramphenicol given daily over a period of eleven days varied from 1 to 1.5 g.

The temperature (101° F.—38.3° C.) fell within 24 hours, but rose to 99° F. (37.2° C.) subsequently at intervals during treatment. After two days the spasticity of the limbs lessened, but it remained more pronounced on the left side and there were occasional twitchings of the right hand and the right side of the face. The head retraction was not so marked, and the fontanelle was less tense. There was deviation of the eyes to the left. On the third day no pus cells and no bacteria were seen in the cerebrospinal fluid, which was sterile on culture.

By the eighth day the right leg and arm were being moved freely, but spasticity, though lessened, remained in the left leg and arm. Some distension of the abdomen was present, but this disappeared by the tenth day. By the fourteenth day—three days after chloramphenicol treatment had ceased—there was evidence of general improvement, but there were also indications of what was regarded as residual inflammatory infiltration of the infected meninges* ; that is, the left arm and leg were still somewhat spastic and, when excited, the child's eyes turned strongly to the left. On the sixteenth day the cerebrospinal fluid was found clear and sterile on culture.

After three weeks the left arm and leg were being moved freely, and the deviation of the eyes had ceased. Movements of the left arm and leg became more frequent, and by the twenty-second day movements of the limbs appeared normal with the exception of slight spasticity of the left hand. By the end of the fourth week the spasticity of the left hand had disappeared and recovery was apparently complete.

R. Green, M.D., D.Sc.
D. S. Mankikar, M.B., B.S.
J. S. Millett, M.B., B.S.
Institute for Medical Research, Kuala Lumpur, Malaya.

References

Alexander, H. E., Ellis, C., and Leidy, G. (1942). *J. Pediat.*, **20**, 673.
Green, R., and Mankikar, D. S. (1949a). *British Medical Journal*, **1**, 308.
—— —— (1949b). *Trans. R. Soc. trop. Med. Hyg.*, **43**, 57.
Smadel, J. E., Woodward, T. E., Ley, H. L., jun., and Lewthwaite, R. (1949). *J. clin. Invest.*, **28**, 1196.
Woodward, T. E., Smadel, J. E., Ley, H. L., jun., Green, R., and Mankikar, D. S. (1948). *Ann. intern. Med.*, **29**, 131.

Spontaneous Intraperitoneal Haemorrhage due to Haemangioma of Liver

Haemangioma of the liver is common, but few cases give rise to any symptoms. The following case is exceptional in that it caused an acute abdominal emergency.

Case Report

The patient, a man aged 61, was admitted to hospital as an emergency on July 28, 1949. Two and a half days previously he had complained of acute pain in his upper abdomen, which had radiated to his left shoulder. For the past 36 hours he had been vomiting. His bowels had not acted for 24 hours. He gave a long history of "chronic dyspepsia," but investigation elsewhere had on more than one occasion proved negative for peptic ulceration and no definite diagnosis had been made. He had a right inguinal hernia satisfactorily controlled by a truss. There was no history of injury.

On admission his temperature was 101.4° F. (38.55° C.), pulse 124, and respirations 28. His tongue was dry and furred. The heart and lungs showed no appreciable disease. There was acute tenderness with guarding in the epigastrium and right hypochondrium, and this extended into the right flank and down to the right iliac fossa. The left side of the abdomen was relatively free. Bowel sounds were not heard ; there was no palpable tumour and no cutaneous angiomata. Examination per rectum revealed some tenderness on the right side only. A provisional diagnosis of perforated duodenal ulcer was made.

Operation.—A right paramedian incision was made, and on opening the peritoneum blood welled out. This was readily seen to be coming from a dark mass at the edge of the left lobe of the liver. The spleen, stomach, duodenum, gall-bladder, and appendix were normal. The sucker was in continuous use withdrawing blood. The diaphragmatic surface of the left lobe of the liver was seen to be covered by a thin-walled angiomatous formation with a clear-cut margin which did not extend to the right lobe. At the anterior edge there was a small perforation through which the blood was escaping. Dr. Stewart Smith, the pathologist, kindly came to the theatre and confirmed the diagnosis of haemangioma of the liver. A wedge biopsy of the growth was taken, including the perforated area, and haemostasis was achieved by mattress sutures over "calgitex" gauze. The wound was closed in layers with drainage.

The patient made a good recovery. He received three pints (1.7 litres) of blood, and, except for a slight discharge from the site of the drainage tube, had an easy convalescence. The report on the histopathology, dated August 5, showed "a capillary haemangioma in the liver with a central large organizing thrombus."

In view of the danger of a recurrent haemorrhage from this growth, a further operation was performed on August 31, with the intention of performing a formal resection of the left lobe of the liver. However, on opening the abdomen through a transverse incision, the left lobe was found to be adherent to the diaphragm and it was thought best to leave well alone. The second incision healed with some delay owing to infection. The patient was discharged on September 22.

*The following morbid processes were envisaged in relation to the symptoms: the original inflammation of the pia-arachnoid had been followed by the development of purulent exudate in the subarachnoid spaces, especially at the base, and also along the posterior surface of the spinal cord and possibly surrounding the nerve roots.

Comment

When a haemangioma of the liver gives rise to symptoms it usually presents in one of three ways : (1) a mass which is otherwise symptomless is found at laparotomy to have this origin (Morris, 1940, Shumacker, 1942) ; (2) there are signs of obstruction (Wakeley, 1924–5) ; or (3) vague dyspeptic symptoms are the complaint, and on laparotomy for some other suspected lesion a haemangioma is found, without any other pathological lesion (Shumacker, 1942).

Very rarely does spontaneous rupture occur, though haemorrhage at operations may be fatal (Mantle, 1903) or exceedingly troublesome (d'Errico, 1946). Ewing (1928) states that it may occur as the tumour slowly increases in size, and that it is usually fatal. When spontaneous rupture does occur the diagnosis of acute appendix, ruptured ectopic, or peritonitis has been made (Marckstradt, 1938). When treatment has been undertaken the tumour has been resected, and the danger of incising the tumour itself has been repeatedly stressed (Mantle, 1903 ; d'Errico, 1946). Most of the tumours resected have, however, been pedunculated, or it has been possible to form a pedicle.

The above case had the indefinite digestive troubles for which no other cause was found at operation, with the superimposition of the acute surgical emergency. At the first operation resection of the growth would have necessitated removal of the whole left lobe of the liver, a procedure which the patient's condition would not at the time warrant. While cutting the wedge biopsy haemorrhage was controlled by compressing the free edge of the lesser omentum and hepatic pedicle, and on tying the mattress sutures over the haemostatic gauze no further leak occurred. This was probably owing to the capillary nature of the growth as compared with the cavernomata, into which category the reported troublesome tumours fell, and to some extent to the haemostatic qualities of the gauze.

However, at the second operation an attempt to separate the adhesions between the diaphragm and the liver would probably have caused severe haemorrhage, while their presence, on the other hand, greatly reduces the risk of any further spontaneous haemorrhage.

I wish to thank Mr. A. C. Gairdner for permission to publish this case, and Dr. Stewart Smith for the pathological investigation.

K. P. S. Caldwell, M.A., M.B., F.R.C.S.

References

d'Errico, G. (1946). *G. ital. Chir.*, **2**, 267.
Ewing, J. (1928). *Neoplastic Diseases*, 3rd ed. Saunders, Philadelphia.
Mantle, A. (1903). *British Medical Journal*, **1**, 365.
Marckstradt, K. O (1938). *Disch. Z. Chir.*, **250**, 37.
Morris, J. H. (1940). *Ann. Surg.*, **111**, 147.
Shumacker, H. B. (1942). *Surgery*, **11**, 209.
Wakeley, C. P. G. (1924–5). *Brit. J. Surg.*, **12**, 590.

Reviews

PROBLEMS OF MENTAL DEFICIENCY

The Biology of Mental Defect. By Lionel S. Penrose, M.A., M.D. Preface by Professor J. B. S. Haldane, F.R.S. (Pp. 285; illustrated. £1 1s.) London: Sidgwick and Jackson.

This is not a textbook of mental deficiency, nor is it a monograph dealing exhaustively with a particular aspect of the subject. It will be useful to those who are reading for a diploma in psychological medicine, but covers only a part of their field. Furthermore, sections of it are more suited to the research worker. Professor Penrose writes with the background of twenty years of experience; he writes about the things that have interested him and about the subjects to which he has himself contributed. The data used for illustration are to a large extent his own. Much of the book is a single closely argued sequence. What has interested him particularly is historical development in thought, problems of definition and classification, and, above all, problems of causation. Genetics bulks large because heredity is important in determining mental deficiency; but other factors are important, too, hence the more comprehensive title.

After a brief but admirable historical chapter Professor Penrose passes on to incidence, definition and measurement, and the principles of classification. The next chapter, on problems of causation, describes the genetic and early environmental background of development into which the aetiology of mental defect must be fitted. It is in the following chapter that the more general reader will begin to run into difficulties, for this deals with methods of analysis in human genetics. The research worker, on the other hand, will feel that it does not say enough. But it is a very difficult task to write such a chapter, and most other writers would probably have fared worse. Professor Penrose then turns to the genetics of intelligence, and then to rare dominant, recessive, and sex-linked defects, with a particularly interesting chapter on defects of obscure origin and environmentally determined disabilities. This includes a very good section on mongolism, to which he has himself made many important contributions. It is perhaps a little surprising, though welcome, to find in this part of the book detailed descriptions of the genetics of conditions not ordinarily associated with mental deficiency, such as Huntington's chorea, von Recklinghausen's disease, Friedreich's ataxia, and retinitis pigmentosa. But these are among the things that have interested Professor Penrose, and the book would be poorer without them. The final chapters deal briefly with mental disorders chiefly in relation to mental deficiency, and with the principles of treatment.

Within the limits laid down by the selection of topics and by the method of approach, which I have tried to indicate in the opening paragraph of this review, the book should make a wide appeal. Perhaps it should be regarded mainly as a book by a research worker for research workers, but many others, even if they do not discover in it all they want to know, will find it up to date, well presented, clear in its conclusions, and, above all, stimulating. Not all workers will agree with everything the author says, but the papers of the next few years will be the better for the reasoned arguments that others will be forced to produce if they are to join issue with him.

The only criticism of substance that one feels inclined to make is that when Professor Penrose touches on subjects that do not interest him, or which he regards as not particularly important, he seems to show some impatience, even carelessness. For example, on page 23 he makes it clear that he does not regard it as of much importance that the numbers of persons of various levels of test intelligence, down to very low limits, are just those expected if the distribution of intelligence conforms to the normal curve On pages 24–5 he writes:

"The distribution of Binet scores, expressed in terms of intelligence quotients, is usually found to be fairly symmetrical. This was demonstrated by Terman (1916) and has been confirmed more recently by Roberts, Norman, and Griffiths (1935). A sample of 192 subjects from a survey made in an urban centre, embracing the complete child population of certain age groups, was analysed. Roberts considered that the distribution of I.Q. was Gaussian, with mean value 100 and standard deviation 15 points. The Gaussian form of the distribution was thought to extend as far as about three times the standard error on either side of the mean."

The reader may well be astonished that anyone should talk about what is happening three standard deviations from the mean on the basis of a sample of 192. Should he then turn to the paper quoted he will find no reference to the subject. In the paper, not included in the bibliography, which did deal with this point, nothing was said about a mean of 100 or a standard deviation of 15. It was shown that for a particular population the mean, based on the equivalent of 710 observations, was 98.785; the standard deviation—on the equivalent of 495—was 15.201; and the negative tail of the curve based on 3,361 observations was normal down to about I.Q. 45, or three and a half times the standard deviation (not three times the standard error). There were no data, as is suggested, on the positive side of the curve. I hasten to add that this is the only point in the book where I feel some slight sense of personal grievance. Again, while the genetics of various special conditions are admirably described, some of the clinical descriptions are curt almost to the point of inaccuracy. Thus, oculogyric crises (p. 217) are defined as "transitory inability to move the eyes or eyelids." But such defects, which could easily be corrected in a new edition, are a minor matter in an original and valuable book which represents a notable contribution to the subject.

J. A. FRASER ROBERTS.

LIPID METABOLISM

Lipidoses: Diseases of the Cellular Lipid Metabolism. By S. J. Thannhauser, M.D., Ph.D. (Pp. 605; 125 figures. 96s.) London: Geoffrey Cumberlege. 1950.

The first edition of this classic work was published in 1940. The author has found it necessary to make some important alterations, notably in regard to xanthomatous biliary cirrhosis. Thannhauser and Magendantz (1938) thought that this clinical syndrome might be due to xanthomatous scar tissue resulting from xanthoma of the larger bile ducts. Thannhauser has altered his opinion because early biopsies and necropsies have not revealed xanthomatous changes of the lining of the bile ducts. He thinks that the assumption is justified that there is a special type of cirrhosis which MacMahon and Thannhauser designate anatomically as "pericholangiolitic biliary cirrhosis." The section on the Hurler-Pfaundler syndrome (gargoylism) is new, as is also that on infantile amaurotic family idiocy. A very important section is that on eosinophilic xanthomatous granuloma, which is synonymous with Schüller–Christian's syndrome. Not the least interesting addition is the account of the adult form of Niemann–Pick's disease, the existence of which is now definitely proved—thanks largely to the important study of Rutishauser, Dusendschow, and Pfändler on the cases of two brothers, of which Thannhauser has made good use. Thannhauser writes:

"The adult and infantile forms of Niemann–Pick's disease are as clinically different from each other as are the adult and infantile forms of Gaucher's disease. Both infantile Gaucher's and infantile Niemann–Pick's disease terminate in early death after a rapid and disastrous clinical course involving the entire organism. The adult form in contrast is not manifested by any spectacular complaints. Usually the patients are unaware of their disease until a physician examining them for an intercurrent disease finds an enlarged spleen."

It is specially noteworthy that in the adult form of Niemann–Pick's disease an erythraemic condition and splenomegaly may suggest the diagnosis of the Vaquez–Osler type of polycythaemia or of Ayerza's disease. In Thannhauser's opinion the heart failure and the erythraemic condition in one of the brothers was the result of pulmonary fibrosis, which was revealed by *x*-ray examination and was due (as shown by necropsy) to an intensive involvement of the lung with Niemann–Pick's cells (resulting in fibrosis).

The sections on idiopathic hyperlipaemia and many others have been greatly enlarged.

This review gives no adequate idea of the value of Thannhauser's work, but it may serve to emphasize the interest and importance of the alterations and additions that have been made in the second edition.

F. PARKES WEBER.

BIOLOGY FOR ENJOYMENT

The Human Species: A Biology of Man. By Anthony Barnett. (Pp. 280; 72 illustrations. 18s.) London: MacGibbon and Kee. 1950.

This book, according to the jacket, is addressed "to the general reader and to those beginning the study of biology, for their information and enjoyment." For this public Mr. Barnett has written a book which covers in a small space a great variety of subjects. He ranges from genetics, through embryology, anthropology, and evolution, to agriculture, nutrition, public health, and the study of population problems. The text is clear and concise, and he gives an interesting and stimulating account of many of the main facts, though the first few chapters may contain slightly tougher material than would be conducive to the general reader's "enjoyment." There is a good index, and a bibliography of suggested further reading. The illustrations, on the other hand, are often unsatisfactory. Some of the diagrams are over-simplified to the point of being obscure or misleading, while others are either too complicated or insufficiently explained in the legends. There are two lurid and inaccurate figures of the male and female genital apparatus; surely more suitable diagrams of these could have been found. In spite of a number of corrigenda, cross-reference between illustrations and text is occasionally faulty.

In a book as short as this it is inevitable that there must be a certain bias in the selection and interpretation of facts; in this case the bias is towards the political left. This does not make the book any less entertaining, but it does lead to the occasional appearance of statements such as the unqualified assertion that the Russian atomic explosion in 1949 was part of a vast irrigation project. The evidence available to the general public on this point is hardly as clear-cut as this statement would imply.

D. C. SINCLAIR.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Practical Food Inspection. By C. R. A. Martin. Vol. 1: Meat Inspection. (Pp. 322. 18s.) Vol. 2: Fish, Poultry, and Other Foods. (Pp. 308. 18s.) 4th eds. London: H. K. Lewis. 1950.

Peptic Ulcer. By A. C. Ivy, Ph.D., M.D., D.Sc., LL.D., and others. (Pp. 1,144. 96s.) London: J. and A. Churchill. 1950.

Toxaemias of Pregnancy. Edited by J. Hammond, M.A., D.Sc., F.R.S., and others. A Ciba Foundation Symposium. (Pp. 280. 21s.) London: J. and A. Churchill. 1950.

Carotenoids. By P. Karrer and E. Jucker. (Pp. 384. 65s.) London: Cleaver-Hume Press. 1950.

The Effects of Atomic Weapons. Prepared for and in co-operation with the U.S. Department of Defense and the U.S. Atomic Energy Commission, under the direction of the Los Alamos Scientific Laboratory. (Pp. 456. 25s. 6d.) London: McGraw-Hill Book Company. 1950.

Significance of the Body Fluids in Clinical Medicine. By L. H. Newburgh, M.D. (Pp. 76. 15s.) Oxford: Blackwell Scientific Publications. 1950.

Postgraduate Lectures on Orthopedic Diagnosis and Indications. By A. Steindler, M.D., F.A.C.S. Vol. 1. (Pp. 289. 55s.) Oxford: Blackwell Scientific Publications. 1950.

Bone and Joint Diseases. By J. Vernon Luck, M.S., M.D., F.A.C.S., F.I.C.S. (Pp. 614. 120s.) Oxford: Blackwell Scientific Publications. 1950.

The Human Mind. By Professor S. P. Adinarayan, M.A. (Pp. 195. 7s. 6d.) London: Hutchinson's University Library. 1950.

The Individual's Relation to Reality in Our Culture. By E. F. Hellersberg, Ph.D. (Pp. 128. 25s.) Oxford: Blackwell Scientific Publications. 1950.

Psychological Factors of Peace and War. Edited by T. H. Pear. (Pp. 262. 16s.) London: Hutchinson. 1950.

Carbon Dioxide Therapy. By L. J. Meduna, M.D. (Pp. 236. 36s.) Oxford: Blackwell Scientific Publications. 1950.

Enzymes, Growth and Cancer. By Van R. Potter, Ph.D. (Pp. 64. 12s.) Oxford: Blackwell Scientific Publications. 1950.

On the Experimental Morphology of the Adrenal Cortex. By H. Selye, M.D., Ph.D., D.Sc., F.R.S.C., and H. Stone, B.Sc. (Pp. 105. 16s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

The Trial of Peter Griffiths: The Blackburn Baby Murder. Edited by G. Godwin. Notable British Trials Series, No. 73. (Pp. 219. 15s.) London: William Hodge. 1950.

Les Formes de Début des Cholécystites Chroniques non Lithiasiques. By G. Albot and others. (Pp. 55. No price.) Paris: Vigot. 1950.

Bad Gleichenberg, seine Heilquellen und Kuren. By A. G. Brusselle and others. (Pp. 134. 13s.) Vienna: Springer. 1950.

Die Hemmkörperhämophilie. By E. Deutsch, M.D. (Pp. 112. 27s. 6d.) Vienna: Springer. 1950.

Zur Geschichte der Direkten Untersuchungsmethoden der Oberen Luft- und Speisewege. By C. V. Eicken. (Pp. 14. No price.) Berlin: Akademie-Verlag. 1950.

Das Autogene Training. By Professor J. H. Schultz. 6th ed. (Pp. 325. M. 27.) Stuttgart: Georg Thieme. 1950.

Untersuchungstechnik des Chirurgen. By Professor P. Rostock. (Pp. 330. M. 24.) Stuttgart: Georg Thieme. 1950.

Hygiene und Körperschulung der Frau. By Professor F. A. Wahl. (Pp. 166. M. 16.80.) Stuttgart: Georg Thieme. 1950.

Kallikrein Padutin. By Dr. E. K. Frey and others. (Pp. 209. M. 20.) Stuttgart: Ferdinand Enke. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY NOVEMBER 18 1950

DISPLACED REGISTRARS

One of the difficulties of a State-sponsored medical service is that the political party in power will always be tempted to promise more than it can perform. Mr. Bevan and those speaking for him foresaw a big expansion in the consultant and specialist services of this country, and in one of the early debates on the Health Service it was suggested that the number of consultants and specialists would have to be increased by 50%. Even as late as four weeks ago, Lord Haden-Guest stated in the House of Lords that there were not enough doctors to do the work that was necessary, and in the same debate Lord Moran observed that the consultants now numbered only 56% of the number thought by the Minister to be necessary. The Ministry of Health circular on registrars printed in this week's *Supplement* will therefore come as a shock and a severe disappointment to the many young men and women rash enough to take the Government at its word. The Ministry estimates that there are now approximately 2,800 senior registrars and registrars and that the number for whom training posts can be found is only 1,700. The Ministry suggests, in effect, that 1,100 registrars shall be put into the discard. This is a harsh decision and one which reflects discredit on all those who have allowed this state of affairs to come about.

To gull the public and beguile the medical profession, the Government between 1945 and 1948 held out promises which it must have known could not be fulfilled. The path of the would-be consultant was made attractively easy when compared with the old way and the hard way trodden by his predecessors. Financial disabilities were largely removed by the proposals made in the Spens report, and ahead lay an extended hospital and consulting service in which every patient from John o' Groats to Land's End could receive at any moment the expert medical and surgical assistance the Government promised him. On top of this there were many discouraging features in the proposals for the general-practitioner service, and the young man who thought he could make the grade looked upon the career of a specialist as at least one way of avoiding the rough-and-tumble of a general practitioner's life. The war, of course, resulted in the accumulation of medical men and women who wanted to be consultants. This factor alone increased the number of those who sooner or later had to receive a set-back to their expectations. The medical profession itself was partly to blame in that it did not caution the would-be consultant against hoping for too much, and it could have done this by making much more stringent the conditions for taking higher qualifications.

The National Health Service has now been in existence for nearly 2½ years, but the Ministry has still not made public what are to be the establishments of the hospitals in this country, another factor which makes it difficult to assess accurately the Ministry's estimate of the number of registrars required. But if we accept the figure of between 5,000 and 6,000 as representing the number of consultants and specialists in the country, and the Government's own rough estimate of 50% as being the amount by which the number of consultants should be increased, the present total of 2,800 registrars would seem to be feasible. What must obviously limit the number of registrars at the moment is the number of posts available for them. This number cannot be increased unless there is an extension of existing hospitals and the building of new ones—and, what is as important, enough men and women of suitable competency to man them. This is surely so obvious that the Ministry of Health cannot fail to have been aware of it, and therefore aware of the grave injustice being done to those who have been allowed to train as registrars and are now told—1,100 of them—that they are not wanted. Or at least not in the National Health Service, because in a brief little note at the end of the Ministry circular, under the heading "Other Openings," is information to the effect that there are about 700 vacancies in His Majesty's Forces and in the Colonial Medical Service—in the former of which terms and conditions of service are inferior to those in the N.H.S. It should be pointed out that the Joint Committee has, in its discussions with the Ministry, stressed the need for more consultants. On this point everyone is agreed. Yet the Ministry, apparently on instructions from the Treasury, refuses to do this, refuses in other words to fulfil the promises made by the Government to the people of this country.

The most curious paragraph and one which deserves the closest scrutiny by both registrars and by general practitioners is No. 11 (b). Here is laid down what the Ministry describes as "a long-term method of meeting staffing difficulties in the senior registrar field." This paragraph in the circular begins by noting that "a reduction in the numbers of persons in training in hospitals may necessitate the appointment of other practitioners as assistants in their place." To fill such vacancies, the Ministry's "long-term method" is to appoint general practitioners to work on a part-time basis as clinical assistants and to receive remuneration for this. Such practitioners will normally be expected to have high qualifications and experience as registrars. It will be some time before the full implications of this proposal become manifest. It might of course be argued that this is one way in which the Ministry could increase the reward of the experienced general practitioner, and one way, too, in which general practitioners could expect to enter the ranks of consultants. It is certainly desirable that facilities for such movement from general practice to consultant work should exist. But can this view of things be expected to appeal to the 1,100 registrars who have been encouraged to believe that they will have the chance of becoming consultants and specialists, provided of course that they satisfy those who are training them that they are so capable? And will this proposal really satisfy those who rightly insist that the general practitioner must find his proper place in the hospital life of this country? The Ministry has no doubt been instructed by the Treasury to discover every possible device for cutting down the cost of the Health Service, and the present proposal looks like a most disingenuous method of securing the registrar-type of service at cut rates, the dispossessed registrars themselves being politely invited to work in the armed Forces under conditions which the Government refuses to make attractive.

If during the 2½ years of its existence the National Health Service has not broken down, it is principally because the medical profession has gone on doing its job in spite of all the irritations and frustrations that come from the fact that such a gigantic scheme, introduced at once instead of by stages, could not possibly be operated efficiently. This is not being wise after the event, because this view was stated plainly enough in these columns and elsewhere before the Service began. The medical profession is prepared to go on doing its job, but if it is to be treated in this summary fashion, and if the Ministry breaks faith with the profession, then it will have to insist upon a different kind of service in which it can work in harmony.

THE "DRYING" OF TUMOURS

Much interest was aroused when in March, 1949, Professor W. E. Gye[1] described some experiments on the transmission of mouse tumours by means of tissues simply frozen at −76° C. or dried from the frozen state. He concluded in this paper, and in subsequent publications along with colleagues, that tumour cells could not survive freezing and drying, and that "a continuing cause" of cancer had been disclosed, "probably viral in nature." Few people were convinced that mere freezing would necessarily kill the cells, for, after all, trypanosomes were known to survive at −76° C., and there was in the literature much other evidence of a similar kind. Many pathologists, however, felt it unlikely that mammalian cells could survive thorough drying. In discussing the work, we asked, "Is it reasonably certain that frozen, pickled, and above all dried tumour tissue does not contain any living mammalian cells at all?"[2] In the last eighteen months this question must have been frequently in the minds of those most interested; and more and more doubts grew about whether drying need kill mammalian cells. In June, 1949, Dr. J. Craigie, who soon afterwards succeeded Professor Gye as Director of the Imperial Cancer Research Fund's laboratories, gave an interesting demonstration at a meeting of the Royal Society of Medicine at Mill Hill. His histological preparations showed how dried tumour tissue lost all its visible structure, but how the normal architecture seemed completely restored on rehydration, the appearance being very little different from that of undried tissue. Craigie in a lecture in November, 1949,[3] made it plain that he was not then prepared to accept his predecessor's sweeping conclusions about the significance of the drying experiments "in the absence of adequate quantitative knowledge concerning . . . ability of the cells to survive under various conditions." In particular, information was lacking about the degree of dryness when the cells were dried, as had been done, in the presence of 5% dextrose. Polge, Smith, and Parkes[4] were able to show that spermatozoa would survive freezing and "drying" in the presence of glycerol.

In the opening pages of this issue we publish three papers by Professor R. D. Passey and his colleagues in Leeds. In the first of these the authors again show that "dried" tumour, seeming to be quite structureless, has its architecture restored by rehydration. They freely admit, however, that "the microscope cannot with certainty reveal if tumour cells are alive or dead." In the second paper the Leeds workers describe how tumour cells grow out in tissue culture after being dried for up to 75 minutes. (They write, however, "It is realized that dehydration is not complete."). Finally, Dr. L. Dmochowski and Mr. A. Millard show by histological study that frozen and dried sarcoma cells embedded in clots and grafted into mice grow out and multiply. These results add to the growing conviction that the methods of freeze-drying hitherto used need not kill all mammalian cells. Neither the papers by Gye and his colleagues nor those in this issue by Professor Passey and his co-workers give full information on the completeness of desiccation attained. The reader remains unconvinced that every particle of tumour, every cell, was quite dry; especially so since none of the workers have done what bacteriologists are doing all the time—drying material and testing it after keeping it in the dried state for days or months. It may be imagined that in this type of work almost any result might be obtainable, according to the

[1] *British Medical Journal*, 1949, **1**, 511.
[2] Ibid., 1949, **1**, 531.
[3] Ibid., 1949, **2**, 1485.
[4] *Nature, Lond.*, 1949, **164**, 666.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY NOVEMBER 18 1950

DISPLACED REGISTRARS

One of the difficulties of a State-sponsored medical service is that the political party in power will always be tempted to promise more than it can perform. Mr. Bevan and those speaking for him foresaw a big expansion in the consultant and specialist services of this country, and in one of the early debates on the Health Service it was suggested that the number of consultants and specialists would have to be increased by 50%. Even as late as four weeks ago, Lord Haden-Guest stated in the House of Lords that there were not enough doctors to do the work that was necessary, and in the same debate Lord Moran observed that the consultants now numbered only 56% of the number thought by the Minister to be necessary. The Ministry of Health circular on registrars printed in this week's *Supplement* will therefore come as a shock and a severe disappointment to the many young men and women rash enough to take the Government at its word. The Ministry estimates that there are now approximately 2,800 senior registrars and registrars and that the number for whom training posts can be found is only 1,700. The Ministry suggests, in effect, that 1,100 registrars shall be put into the discard. This is a harsh decision and one which reflects discredit on all those who have allowed this state of affairs to come about.

To gull the public and beguile the medical profession, the Government between 1945 and 1948 held out promises which it must have known could not be fulfilled. The path of the would-be consultant was made attractively easy when compared with the old way and the hard way trodden by his predecessors. Financial disabilities were largely removed by the proposals made in the Spens report, and ahead lay an extended hospital and consulting service in which every patient from John o' Groats to Land's End could receive at any moment the expert medical and surgical assistance the Government promised him. On top of this there were many discouraging features in the proposals for the general-practitioner service, and the young man who thought he could make the grade looked upon the career of a specialist as at least one way of avoiding the rough-and-tumble of a general practitioner's life. The war, of course, resulted in the accumulation of medical men and women who wanted to be consultants. This factor alone increased the number of those who sooner or later had to receive a set-back to their expectations. The medical profession itself was partly to blame in that it did not caution the would-be consultant against hoping for too much, and it could have done this by making much more stringent the conditions for taking higher qualifications.

The National Health Service has now been in existence for nearly 2½ years, but the Ministry has still not made public what are to be the establishments of the hospitals in this country, another factor which makes it difficult to assess accurately the Ministry's estimate of the number of registrars required. But if we accept the figure of between 5,000 and 6,000 as representing the number of consultants and specialists in the country, and the Government's own rough estimate of 50% as being the amount by which the number of consultants should be increased, the present total of 2,800 registrars would seem to be feasible. What must obviously limit the number of registrars at the moment is the number of posts available for them. This number cannot be increased unless there is an extension of existing hospitals and the building of new ones—and, what is as important, enough men and women of suitable competency to man them. This is surely so obvious that the Ministry of Health cannot fail to have been aware of it, and therefore aware of the grave injustice being done to those who have been allowed to train as registrars and are now told—1,100 of them—that they are not wanted. Or at least not in the National Health Service, because in a brief little note at the end of the Ministry circular, under the heading "Other Openings," is information to the effect that there are about 700 vacancies in His Majesty's Forces and in the Colonial Medical Service—in the former of which terms and conditions of service are inferior to those in the N.H.S. It should be pointed out that the Joint Committee has, in its discussions with the Ministry, stressed the need for more consultants. On this point everyone is agreed. Yet the Ministry, apparently on instructions from the Treasury, refuses to do this, refuses in other words to fulfil the promises made by the Government to the people of this country.

The most curious paragraph and one which deserves the closest scrutiny by both registrars and by general practitioners is No. 11 (b). Here is laid down what the Ministry describes as "a long-term method of meeting staffing difficulties in the senior registrar field." This paragraph in the circular begins by noting that "a reduction in the numbers of persons in training in hospitals may necessitate the appointment of other practitioners as assistants in their place." To fill such vacancies, the Ministry's "long-term method" is to appoint general practitioners to work on a part-time basis as clinical assistants and to receive remuneration for this. Such practitioners will normally be expected to have high qualifications and experience as registrars. It will be some time before the full implications of this proposal become manifest. It might of course be argued that this is one way in which the Ministry could increase the reward of the experienced general practitioner, and one way, too, in which general practitioners could expect to enter the ranks of consultants. It is certainly desirable that facilities for such movement from general practice to consultant work should exist. But can this view of things be expected to appeal to the 1,100 registrars who have been encouraged to believe that they will have the chance of becoming consultants and specialists, provided of course that they satisfy those who are training them that they are so capable? And will this proposal really satisfy those who rightly insist that the general practitioner must find his proper place in the hospital life of this country? The Ministry has no doubt been instructed by the Treasury to discover every possible device for cutting down the cost of the Health Service, and the present proposal looks like a most disingenuous method of securing the registrar-type of service at cut rates, the dispossessed registrars themselves being politely invited to work in the armed Forces under conditions which the Government refuses to make attractive.

If during the 2½ years of its existence the National Health Service has not broken down, it is principally because the medical profession has gone on doing its job in spite of all the irritations and frustrations that come from the fact that such a gigantic scheme, introduced at once instead of by stages, could not possibly be operated efficiently. This is not being wise after the event, because this view was stated plainly enough in these columns and elsewhere before the Service began. The medical profession is prepared to go on doing its job, but if it is to be treated in this summary fashion, and if the Ministry breaks faith with the profession, then it will have to insist upon a different kind of service in which it can work in harmony.

THE "DRYING" OF TUMOURS

Much interest was aroused when in March, 1949, Professor W. E. Gye[1] described some experiments on the transmission of mouse tumours by means of tissues simply frozen at −76° C. or dried from the frozen state. He concluded in this paper, and in subsequent publications along with colleagues, that tumour cells could not survive freezing and drying, and that "a continuing cause" of cancer had been disclosed, "probably viral in nature." Few people were convinced that mere freezing would necessarily kill the cells, for, after all, trypanosomes were known to survive at −76° C., and there was in the literature much other evidence of a similar kind. Many pathologists, however, felt it unlikely that mammalian cells could survive thorough drying. In discussing the work, we asked, "Is it reasonably certain that frozen, pickled, and above all dried tumour tissue does not contain any living mammalian cells at all?"[2] In the last eighteen months this question must have been frequently in the minds of those most interested; and more and more doubts grew about whether drying need kill mammalian cells. In June, 1949, Dr. J. Craigie, who soon afterwards succeeded Professor Gye as Director of the Imperial Cancer Research Fund's laboratories, gave an interesting demonstration at a meeting of the Royal Society of Medicine at Mill Hill. His histological preparations showed how dried tumour tissue lost all its visible structure, but how the normal architecture seemed completely restored on rehydration, the appearance being very little different from that of undried tissue. Craigie in a lecture in November, 1949,[3] made it plain that he was not then prepared to accept his predecessor's sweeping conclusions about the significance of the drying experiments "in the absence of adequate quantitative knowledge concerning . . . ability of the cells to survive under various conditions." In particular, information was lacking about the degree of dryness when the cells were dried, as had been done, in the presence of 5% dextrose. Polge, Smith, and Parkes[4] were able to show that spermatozoa would survive freezing and "drying" in the presence of glycerol.

In the opening pages of this issue we publish three papers by Professor R. D. Passey and his colleagues in Leeds. In the first of these the authors again show that "dried" tumour, seeming to be quite structureless, has its architecture restored by rehydration. They freely admit, however, that "the microscope cannot with certainty reveal if tumour cells are alive or dead." In the second paper the Leeds workers describe how tumour cells grow out in tissue culture after being dried for up to 75 minutes. (They write, however, "It is realized that dehydration is not complete.") Finally, Dr. L. Dmochowski and Mr. A. Millard show by histological study that frozen and dried sarcoma cells embedded in clots and grafted into mice grow out and multiply. These results add to the growing conviction that the methods of freeze-drying hitherto used need not kill all mammalian cells. Neither the papers by Gye and his colleagues nor those in this issue by Professor Passey and his co-workers give full information on the completeness of desiccation attained. The reader remains unconvinced that every particle of tumour, every cell, was quite dry; especially so since none of the workers have done what bacteriologists are doing all the time—drying material and testing it after keeping it in the dried state for days or months. It may be imagined that in this type of work almost any result might be obtainable, according to the

[1] *British Medical Journal*, 1949, **1**, 511.
[2] Ibid., 1949, **1**, 531.
[3] Ibid., 1949, **2**, 1485.
[4] *Nature, Lond.*, 1949, **164**, 666.

completeness of the desiccation. Despite these criticisms, most will agree with the authors' final conclusion "that surviving cells and not a virus were responsible for the results attained by Gye and his colleagues."

ANTIBIOTIC SYNERGISM AND ANTAGONISM

It has long been recognized that two, or even more, chemotherapeutic agents acting together may produce effects of which any one of them is incapable in the same dose. For example, there are good grounds for combining penicillin and sulphonamides in treating certain conditions. An extreme instance—no longer of practical interest since the advent of chloramphenicol—is typhoid fever, which according to McSweeney[1] responds to large doses of sulphathiazole and penicillin, although either drug alone is useless. Apart from securing or enhancing therapeutic effect combinations of drugs have been used with the object of suppressing the development of bacterial resistance. In *in vitro* studies Klein and Kimmelman[2] used three, and Carpenter and his colleagues[3] no fewer than four, antibacterial agents together to secure this effect. Its best-known practical example is the use of *p*-aminosalicylic acid with streptomycin.

Much less attention has been given to the possibility that one such drug, so far from aiding another, may interfere with its action. Some interesting examples of such antagonism *in vitro* have recently been observed by Bigger,[4] whose earlier work on sulphonamide–penicillin synergism is well known. In his own opinion these are unlikely to have their counterpart in the therapeutic field, either because these particular combinations of drugs—e.g., sulphathiazole and boric acid—are unlikely to be used or because the concentrations in which antagonism is demonstrable are not reached in the body. A much more serious warning against mutual interference by chemotherapeutic agents is afforded by the recent work of Jawetz, of San Francisco. He and his colleagues[5 6] first showed that the limited and often not complete bactericidal action which is exerted by penicillin on enterococci (*Str. faecalis*) is accelerated by the addition of streptomycin in a concentration which, acting alone, has little effect, but actually diminished by adding chloramphenicol. The acceleration caused by streptomycin, culminating in complete sterilization, of which penicillin alone is incapable, is paralleled in the clinical field by the combined action of the two drugs in enterococcal endocarditis: they will cure this infection when penicillin even in very large doses has failed to do so. The opposite effect of chloramphenicol has also been shown by Jawetz and Speck[7] to operate *in vivo*, at least in the experimental animal. In mice inoculated with *Str. pyogenes* and treated with a single dose given one hour later of either 30 μg. of penicillin or 800 μg. of chloramphenicol the mortality was 20%. When both drugs were given it was 60%. Several variations of this experiment consistently gave the same kind of result: for example, when the dose of penicillin was kept constant and that of chloramphenicol varied, the larger the latter—up to 800 μg.—the higher was the mortality. When the variation was reversed, the larger the dose of penicillin with a constant dose of chloramphenicol the lower was the mortality; but it remained higher than that with penicillin alone. These authors conclude with a warning that "shotgun" antibiotic therapy may sometimes defeat its object.

A possible explanation of this effect is one which has been suggested before by several authors in other but similar connexions. Penicillin is rapidly bactericidal only to multiplying bacteria. If another agent is introduced which inhibits multiplication its bactericidal action may well be prevented. This in fact applies to sulphonamide–penicillin combinations, at least over a certain period of time. Why the ultimate effect here is nevertheless synergic is a complex question, the answer to which is probably to be found in the observations of Klein and Kalter.[8] On this hypothesis it should be a general principle, to which there may be exceptions, not to combine a bacteriostatic with a bactericidal agent of the penicillin type. Of the four chief antibiotics now in use, penicillin and streptomycin are bactericidal, and aureomycin and chloramphenicol are bacteriostatic (or, more correctly, bacteriofrenic, if we are to adopt Bigger's new word for growth restraint). Will it prove that either of the two latter interferes with the action of either of the former? This is a possibility to be borne constantly in mind in any therapeutic attempts with combinations of these drugs.

1 *Lancet*, 1946, **2**, 114.
2 *J. Bact.*, 1947, **54**, 363.
3 *Proc. Soc. exp. Biol., N.Y.*, 1945, **60**, 168.
4 *Lancet*, 1950, **2**, 46.
5 *Science*, 1950, **111**, 254.
6 *J. Lab. clin. Med.*, 1950, **35**, 488.
7 *Proc. Soc. exp. Biol., N.Y.*, 1950, **74**, 93.
8 *J. Bact.*, 1946, **51**, 95.

SURGICAL TREATMENT OF PARKINSON'S DISEASE

The severe disability accompanying advanced bilateral Parkinson's disease causes much suffering in patients and excites the compassion of their relatives and friends. The suggestion that this disability may be relieved by surgery not unnaturally raises the hope of cure, especially in the lay mind. It must be emphasized at the outset that there is no surgical treatment of paralysis agitans. But when rigidity, restriction of movement, and psychological changes are relatively mild and tremor is severe, the latter can be relieved by various forms of surgical attack. Such relief can be gained only at the cost of a loss of power in the affected limbs—varying in severity from a hemiplegia to a mild paresis. This is because tremor is transmitted from the Betz cells in area 4 through the large fibres of the pyramidal tract. Apparently destruction of the substantia nigra or the globus pallidus removes an inhibitory influence and the abnormal movements of paralysis agitans are a consequence. It is clear that very careful selection of cases is necessary, for surgery should be reserved for the small group of cases which can be benefited by it.

Myers[1] has discussed the ideal operation, pointing out that the technique should be capable of standardization and that the treatment of patients with bilateral disturbance should be completed at one operation. Further, the operation should benefit rigidity and restriction of movement as well as tremor, and it should not lead to more impairment of function than was present pre-operatively. Its risk must be small. Several types of operation have been tried, the surgical attack being directed at the cerebral cortex, basal ganglia, or spinal cord. Cortical excision was introduced by Bucy,[2] who removed areas 4 and 6. This relieves tremor satisfactorily but causes a severe loss of power. Further, it is an operation of some severity for an elderly patient and, like other cortical excisions, may be followed by epilepsy. Myers has had success in the relief of tremor by excising the head of the caudate nucleus and division of extra-pyramidal fibres in the anterior limb of the internal capsule. Putnam[3 4] introduced section of the lateral pyramidal tract (pyramidotomy). This he performs at the 2nd cervical segment, and he finds that it relieves tremor in two-thirds of the patients. In one-third, however, the operation caused substantial weakness. Oliver[5] has modified the spinal pyramidotomy by first carrying the incision further anteriorly into the cord—with, as a consequence, some contralateral hypo-algesia—and more recently he has reported section of the whole of the lateral column of the cord.[6] This has increased the proportion of successful results and, surprisingly, has not in every case caused a hemiplegia. Ebin[7] suggests that for maximum improvement the anterior pyramidal tract on the opposite side to that on which the crossed pyramidal tract is cut should be sectioned, and he has devised a technique for doing this. He considers that the results of pyramidotomy are thus improved and that rigidity as well as tremor is diminished.

There are several points of interest in this recent work on the surgical treatment of Parkinsonism. In the first place it appears that in a small proportion of patients the disability caused by severe tremor can be reduced—though frequently at the price of a hemiparesis. Secondly, these and other methods of surgical treatment throw light upon the nerve pathways which are involved in the abnormal movements of paralysis agitans. Thirdly, it is surprising to learn that the lateral column of the cord may be sectioned in its entirety without causing a persistent hemiplegia. This finding suggests that short neurone chains may play a more important part in the transmission of impulses through the cord than has been realized in the past.

1 *Ass. Res. Nerv. Ment. Dis. Proc.*, 1942, **21**, 602.
2 *Arch. Neurol. Psychiat., Chicago*, 1939, **41**, 721.
3 Ibid., 1940, **44**, 950.
4 Ibid., 1950, **63**, 357.
5 *Lancet*, 1949, **1**, 910.
6 Ibid., 1950, **1**, 847.
7 *Arch. Neurol. Psychiat., Chicago*, 1949, **62**, 27.

GLUTAMIC ACID AND INTELLIGENCE

In 1944 Zimmerman and Ross[1] reported an experiment which appeared to show that maze-learning ability in the rat is significantly improved after administration of glutamic acid. Stimulated by this result, many workers have been led to study the possible effects of glutamic acid upon human intellectual capacity. Thus Zimmerman, Burgemeister, and Putnam, in a series of studies published between 1946 and 1949, have reported that the intelligence quotients of mentally retarded children and adolescents may show great increases after six months of glutamic-acid treatment. In one investigation[2] the mean increase in I.Q. for a group of 60 subnormal children on the Stanford–Binet scale was 7.7 points. Prolongation of the therapy for a second period of six months led to a further, though relatively slight, increase in mean I.Q. Zimmerman and his colleagues were therefore led to conclude that glutamic acid in some way accelerates mental function and that the greatest improvement occurs within the first six months of treatment.

Some further evidence about the effects of glutamic acid upon intellectual performance has recently been published. In a study of 85 cases of young borderline and high-grade defectives treated over a period of a year, Zimmerman and Burgemeister[3] report a gain in I.Q. of 10 points or over in 27 cases and 5–9 points in 31. Thus 68% of the defectives showed an I.Q. increase of at least 5 points. In 34% this increase brought the I.Q. up to average or low-average level. It is interesting that children presenting marked behaviour problems, or indications of organic abnormality, showed the least improvement. Quinn and Durling,[4] reporting on a smaller number of cases but using a wider variety of tests, find a comparable, though less marked, effect of glutamic acid on low-grade defectives. They noticed an average increase of 3.9 I.Q. points in 25 cases treated for six months, but found no further increase in I.Q. after a second six-months period of treatment. The general conclusion from these studies would appear to be that an increase in I.Q. from 3 to 10 points may be expected in a majority of defective children after a six-months course of glutamic-acid therapy.

A marked shortcoming of the investigations hitherto reported is the lack of satisfactory control experiments. In a recent study of the effects of repeatedly testing the same subjects with the same intelligence tests Heim and Wallace[5] have shown that mere repetition of a given test, without giving any tuition or information about results, may lead to startling increases in test scores in both normal and defective subjects. These workers report that 12 mentally deficient boys, who were not at the time undergoing any form of treatment, showed a gradual improvement in test score on 10 successive weekly performances of the same test. There appeared also to be some transfer of improvement to other tests which had not been taken previously. In the light of these findings it may be surmised that part at least of the improvement shown by individuals treated with glutamic acid can be ascribed to

1 *Arch. Neurol. Psychiat., Chicago*, 1944, **51**, 446.
2 Ibid., 1946, **56**, 489.
3 *N.Y. St. J. Med.*, 1950, **50**, 693.
4 *Amer. J. ment. Defic.*, 1950, **54**, 321.
5 *Quart. J. exp. Psychol.*, 1949, **1**, 151; and 1950, **2**, 19.

this contingent factor of test repetition. At all events, until proper control studies are available the beneficial effects of glutamic acid upon intellectual functions must be regarded as unproved. Moreover, even if they are established, their implications for intelligence in its practical and social aspects will require well-designed clinical investigation.

DENTAL NURSES IN NEW ZEALAND

For nearly 30 years there has been in existence in New Zealand a scheme for the care of children's teeth by women who are given a two-year course of training. These "dental nurses," as they are called, should not be confused with "dental hygienists." The Dentists Act of 1921 made provision for the performance in certain circumstances of "minor dental work" in this country by unregistered persons, and, since the scaling and polishing of teeth is agreed to be minor dental work, it is done to a limited extent in Great Britain by "dental hygienists." But the filling and extraction of teeth cannot be regarded as minor dental work, and therefore in the present state of the law those operations may not be done in this country by unregistered persons. The New Zealand dental nurses, however, do fill and extract teeth, and in the early part of this year a mission consisting of five distinguished dentists visited New Zealand in order to obtain first-hand information about the training and work of the dental nurses. The members of the mission were appointed by the Minister of Health, the Secretary of State for Scotland, and the Minister of Education, and they have now submitted to those ministers a unanimous report[1] in which they express the opinion that "the training of the New Zealand school dental nurse has resulted in a high standard of technical efficiency . . . and that, subject to the staffing limitations, the dental nurse system in New Zealand meets an urgent need."

The breakdown in the school dental service in this country has caused much concern, and if it should ever be decided to amend the law so as to permit the introduction of a similar scheme here those responsible could scarcely be accused of trying to secure a dental scheme "on the cheap." The New Zealand scheme cost £322,000 for the year 1948–9, but there is little in the mission's report to indicate what results are being obtained for this expenditure. True, it records the number of extractions and fillings carried out in 1949, but it gives no information about the dental condition of the children leaving school or of adolescents, except for the statement that "one of our number had an opportunity of examining children aged 15–17 in a technical school, and the new caries rate in permanent teeth, which had been conserved for a number of years, was found to be high." The dental nurses devote a substantial amount of their time to dental health education, and yet it seems to be agreed that the incidence of dental caries in New Zealand is exceptionally high. If dental health education has really improved the dental health of New Zealand schoolchildren and adolescents it is a pity that no evidence on that point has been provided. Those responsible for the working of the scheme have secured the good will of the New Zealand dental profession. Development, however, has been so slow that even now all the children in the higher age groups do not benefit. It has therefore not been necessary to consider whether the dental nurses shall be allowed to fill and extract the teeth of adolescents and adults, but some day this issue will have to be faced. It will be interesting to see then whether the good will of the dental profession is conditional on the nurses being restricted to the care of children's teeth.

[1] *New Zealand School Dental Nurses*, Report of United Kingdom Dental Mission, 1950, H.M.S.O., London.

PULMONARY COMPLICATIONS OF PERTUSSIS

The association between whooping-cough and pulmonary collapse and bronchiectasis has been known for more than a century, but it remained for the routine use of radiography during whooping-cough to show how commonly this disease gives rise to serious, and often permanent, chest complications.[1] A number of workers have taken chest radiographs during the course of whooping-cough in order to assess the frequency of pulmonary complications and to study their subsequent course. Kohn and his colleagues[2] found that the incidence of pulmonary abnormalities detected radiologically varied directly with the severity of the disease; in severe infections the proportion of lung complications was as high as 86%. This investigation also showed quite clearly that the cause of pulmonary collapse in pertussis was not, as had often been supposed, enlargement of the hilar lymph nodes but retention of viscid secretions in the bronchi. Last year Nicholson[3] reported a series of 44 unselected cases of whooping-cough in which collapse was detected in 39, but he did not confirm previous suggestions that the high incidence was related to the severity of the disease. Elsewhere in this issue of the *Journal* Dr. A. W. Lees describes a similar investigation. Chest radiographs were taken at weekly intervals during the course of the disease in 150 consecutive cases, and those patients over the age of 1 year in whom pulmonary collapse had occurred were examined by bronchography. In all, 43% of the cases showed radiological evidence of pulmonary collapse at some stage of the illness, usually between the second and fifth weeks. The lower lobes of the lungs were most commonly affected: in fact collapse of the upper lobes and the right middle lobe was rare. This is very different from the distribution of pulmonary collapse in primary tuberculosis reported by Macpherson and Lutwyche,[4] who found that the upper lobes and right middle lobe were usually affected. Both findings therefore help to confirm the opinion that whooping-cough is the commonest cause of basal bronchiectasis and lower lobe collapse in childhood.[5 6] Lees makes the interesting observation that the collapse seldom lasted for more than a few weeks, for re-expansion had occurred in less than eight weeks from the onset of collapse in all his cases. This contrasts sharply with Nicholson's observation that 21% of patients had persistent collapse for more than a year and gives little support to the view that whooping-cough is a common precursor of chronic lower-lobe disease.

[1] *British Medical Journal*, 1949, **2**, 588.
[2] *Amer. J. Dis. Child.*, 1944, **67**, 463.
[3] *Arch. Dis. Childh.*, 1949, **24**, 29.
[4] *Thorax*, 1950, **5**, 1.
[5] Franklin, A. W., *Proc. R. Soc. Med.*, 1944, **37**, 576.
[6] Oswald, N. C., ibid., 1947, **40**, 736.
[7] Tannenberg, J., and Pinner, M., *J. thorac. Surg.*, 1942, **11**, 571.
[8] Lander, F. P. L., and Davidson, M., *Brit. J. Radiol.*, 1938, **11**, 65.
[9] —— *Thorax*, 1946, **1**, 198.
[10] Raia, A., *Amer. J. Dis. Child.*, 1938, **56**, 852.

The reason for difference between the two findings is not apparent, but it might well be due to a difference in the severity of the two epidemics.

The importance of pulmonary atelectasis in pertussis lies in its association with bronchiectasis. It is known that when pulmonary collapse takes place there is a coincidental dilatation of the bronchi in the affected portion of the lung. Experimental work has shown that in early stages this bronchial dilatation is purely mechanical, the elastic bronchi dilating to compensate for the shrinkage of the lung within the closed rigid cavity of the thorax.[7 8] For a certain time after the lung has collapsed the bronchiectasis is reversible; cases have been reported in which return to normal has taken place after collapse and bronchiectasis have been present for four to six months.[9 10] Lees's report shows that this sequence of events often takes place in the pulmonary atelectasis accompanying whooping-cough. All his cases of bronchial dilatation reverted to normal during the period of observation, the process taking somewhat longer in those with a severe degree of collapse. Probably two factors operate in rendering the bronchiectasis permanent—the duration of the collapse, and the severity of the ensuing bronchial infection. In the treatment of whooping-cough both collapse and infection must be controlled as rapidly and effectively as possible by encouraging pulmonary re-expansion and by the use of antibiotics. Lees has used artificial pneumothorax to prevent bronchial dilatation, and this method of treatment requires careful consideration.

HYPERTENSIVE AND ISCHAEMIC HEART DISEASE

Although the span of life may be little shortened in hypertension, death in patients with this complaint is most often from heart failure. The widespread arterial and arteriolo sclerosis of chronic hypertension are usually found also in the coronary arteries and their branches; and in the final affairs of the hypertensive heart it has been natural to think that myocardial ischaemia from coronary sclerosis might play the determining part. It has also been supposed that a thickening myocardium could outgrow its blood supply, thus becoming ischaemic, and that increased work for the heart muscle could bring on its premature ageing. Harrison and Wood[1] have made a fresh approach to these matters in a combined clinical and pathological study which included post-mortem injection and subsequent stereoscopic radiography of the coronary arteries, with results of great interest. Using an arbitrary clinical and electrocardiographic division they divided their cases into two groups: fifteen patients with cardiac ischaemia and evidence of angina or myocardial infarction and with various blood pressures, and twenty-seven in whom hypertension was the primary sign. Many additional clinical cases were also reviewed.

Only four of the twenty-seven hypertensive patients died without cardiac symptoms. In all the others cardiac failure had appeared, though in twelve of them death was from some other cause. In the hypertensive group there was no case in which the blood pressure was observed to drop as a result of heart failure, except terminally; and only one hypertensive patient had to be transferred later to the ischaemic group because of angina or infarction.

The pathological techniques showed that moderate atheroma did not necessarily cause narrowing of the coronary lumen, and that a paraffin section gave little or no indication of the real size of the lumen during life. In hypertension a striking feature was the enlargement of the coronary arteries, which was found to parallel the degree of cardiac hypertrophy. In the ischaemic group it was common to find in the skiagrams of coronary arteries points of narrowing which were healed recanalized thrombi, often difficult or impossible to distinguish from atheroma. This finding confirmed earlier observations of Duguid[2 3] which in themselves stimulate a fresh approach to atheroma.[4]

The axiom that a big heart fails sooner than a small one was given a fresh turn by the finding that the cardiac hypertrophy which occurred both in hypertension and in ischaemia without hypertension was to be correlated in particular with the duration of the cardiac failure.

From these studies the separation of common but distinctive diseases is made sharper, and it is evident that the weight of a hypertensive heart varies more with the duration of cardiac failure than with the height of the blood pressure. Since the size of the coronary vessels increases in step, myocardial ischaemia can no longer be accepted so often as a cause of failure.

[1] *Brit. Heart J.*, 1949, **11**, 205.
[2] *J. Path. Bact.*, 1946, **58**, 207.
[3] *Lancet*, 1949, **2**, 925.
[4] Annotation, *British Medical Journal*, 1949, **2**, 1343.

SPENS AWARDS AND CHARITY

As was foreseen in these columns[1] some heart-burning is already being caused by the distribution of the Spens merit awards to consultants, and the fact that the names of many of the recipients are already widely known makes nonsense of the secrecy that has been imposed. Not only that, but the semi-secrecy which now exists adds to the distaste felt by those who have already given expression to this in the correspondence columns of this *Journal* and of the *Lancet*.

In a letter this week Dr. Katharine Lloyd-Williams, who is the dean of the Royal Free Hospital School of Medicine, informs us that some consultants are refusing to accept the awards that have been made. She makes the excellent suggestion that, instead of sending this money back to the place where it comes from, those consultants who reject these payments should instead make them over to one of the medical charities. This proposal receives the support of no less a person than Lord Webb-Johnson,[2] who points out that if the subscriber to a charity enters into a seven-years covenant the income-tax can be recovered by the charity in whose favour the covenant is drawn.

Consultants and specialists generally have accepted the Spens awards as a method of supplementing the income of those working in the National Health Service. Those who have accepted the majority decision but reject the principle may nevertheless feel justified in devoting the money to the most worthy cause of medical charity. They will, however, in later years be faced with the dilemma of what to do with the pension which is due to them on the basis of the money awarded.

[1] *British Medical Journal*, 1948, **1**, 1140; 1949, **2**, 745, 1400; 1950, **1**, 295.
[2] *Lancet*, November 11, 1950, p. 540.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

ADDISON'S DISEASE

BY

S. LEONARD SIMPSON, M.A., M.D., F.R.C.P.

Consultant Endocrinologist, St. Mary's Hospital; Endocrinologist, Paediatric Unit, St. Mary's Hospital

Thomas Addison, of Guy's, when he read his paper before the South London Medical Society in 1849 (at the age of 56), or published his more significant monograph *On the Constitutional and Local Effects of Disease of the Suprarenal Capsules* in 1855, could hardly have fully realized that he had founded the science of clinical endocrinology or that the isolation and synthesis of the many vital hormones secreted by the adrenal gland would occupy some of the best biochemists of the New and the Old World in the middle of the twentieth century. This brief revision article, however, is limited to the disease of adrenal insufficiency, so appropriately called Addison's disease, and so adequately described in clinical and pathological terms by Addison in 1855.

As to the pathology of Addison's eleven cases, six showed destruction of the adrenal glands by tuberculosis and three by secondary carcinoma, one only showed atrophy and fibrosis, and one a carcinomatous nodule blocking the adrenal vein. A more extensive series of cases shows bilateral tuberculosis to be the cause in some 70% of cases, idiopathic atrophy or necrosis in 25%, and malignant destruction and other causes to be comparatively rare. Pulmonary tuberculosis is only rarely complicated by Addison's disease; but glandular or bony or genital tuberculosis not infrequently has been present some years previously and may be clinically healed before the onset of adrenal insufficiency. There is no clue to the cause of the non-tuberculous atrophy, which is therefore called idiopathic, but it is not unreasonable to postulate a virus infection comparable to the influence of the virus of mumps on the testicles.

Essential Hormones Secreted by Adrenal Cortex

It is generally held that the practitioner is not much concerned with physiology and biochemistry, and I would agree that his busy life limits his interest in the more technical and abstract aspects of these subjects. Nevertheless, in endocrinology, if not so much in other branches of medicine, the fundamentals of these subjects throw considerable light on symptomatology, diagnosis, and treatment. I will therefore consider briefly the essential hormones secreted by the adrenal cortex, the medulla playing little or no part in the deficiency disease of the adrenals.

1. Deoxycortone, or "sodium hormone."—This controls the plasma concentration and excretion of sodium, chloride, and potassium. In the adrenalectomized animal, or the patient with Addison's disease, there is increased urinary excretion of sodium and chloride and retention of potassium, so that the plasma sodium and chloride concentrations tend to be low and the plasma potassium tends to be high. The injection of deoxycortone corrects these changes in mineral metabolism.

2. The corticosterone (11-oxysteroid) group or diabetogenic anti-insulin hormones.—The adrenalectomized animal, or the patient with Addison's disease, manifests a tendency to hypoglycaemia, more evident under conditions of fasting or stress, and in contrast a patient with an adrenal tumour secreting an excess of 11-oxysteroids, as in Cushing's syndrome, may show clinical diabetes mellitus.

3. The adrenals secrete androgens, oestrogens, and progesterone, which hormones may be grouped together as sex hormones.

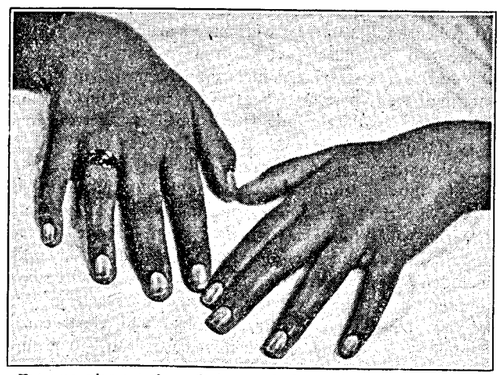
4. When these groups of hormones have been extracted there remains an amorphous fraction, which is more potent weight for weight than the crystalline hormones in maintaining the life of adrenalectomized animals and which also favourably influences renal function.

5. Knowledge is accumulating about an adrenal fat-controlling hormone, excess of which causes a general deposition of fat in the tissue; in contrast the tissues of adrenalectomized animals are almost devoid of fat.

6. Pigment-controlling hormone which seems to have some co-ordinating action with pituitary, in so far as the excessive deposition of melanin in the skin is very marked in Addison's disease, but is slight or absent in Simmonds's disease, in which, however, the adrenal cortex is atrophied and is functioning poorly as judged by carbohydrate and mineral metabolism abnormalities. It is difficult to study the pigment factor in adrenalectomized animals.

Clinical Manifestations of Addison's Disease

The main features are muscular weakness and tendency to fatigue, loss of appetite, loss of weight, low blood pressure, and pigmentation of the skin and mucous membranes. Anorexia may be particularly marked with fatty foods, and may be associated with nausea, vomiting, and intermittent diarrhoea. Abdominal pain and colic are met with



Extreme pigmentation of the hands in a girl of 18 with acute Addison's disease, showing excessive deposition of melanin especially on the dorsal aspect of the finger-joints. (This illustration, from the author's *Major Endocrine Disorders*, is reproduced by permission of the Oxford University Press.)

and the diaphragm may be irritated by the underlying diseased adrenal, with resulting costal or referred shoulder pain. Hiccup, yawning, conjunctivitis, grimaces, involuntary cries, negativism, contrariness, and apathy constitute an interesting group of associated symptoms of clinical and diagnostic significance. Sensitivity to cold, with curling up under the bedclothes, and a subnormal temperature are features which may be associated with a low basal metabolism. Menstruation may be quite normal, and pregnancy may occur, but amenorrhoea and impotence are met with.

Hypoglycaemic symptoms may or may not be present, but in some patients hypoglycaemic coma can come on with great suddenness and lead to death if undiagnosed. The pigment is an increase of the normal melanin in the basal layers of the epidermis, and is found in the skin exposed to air or sunshine, for example, on the face and backs of hands (see Figure), and to pressure or friction, for example, in the axillae, groin, and under the waistband. Pigment may also be present on the gums and lips and in the buccal and anal mucous membranes. In a fair patient, who in health tends to go red rather than brown in summer, pigmentation may be slight or absent. The same is true when the adrenal insufficiency is of acute onset. Pigmentation may occasionally be of leucodermic type, as in one of Addison's patients, and in a case of mine that came to necropsy. This is probably explained by adrenal insufficiency being superimposed on, and accentuating, a previous or coincident tendency to leucoderma.

Diagnosis

Addison's disease may occur at any age, but is very rare before puberty or after 60. It is most frequent in the second and third decades. Diagnosis is not difficult if the above symptomatology is met with, but dramatic missed diagnoses may be seen if the disease is not kept in mind. Thus in one teaching hospital a man aged 36 was operated upon for a supposed perforated duodenal ulcer and nothing was found. At necropsy both suprarenal glands were seen to be destroyed by tuberculosis and pigment was obvious on the skin and buccal mucous membranes. In crisis the picture of Addison's disease closely resembles surgical shock, and it was this resemblance that stimulated Loeb to the discovery of the salt loss in Addison's disease. An opposite but less serious error was the diagnosis of Addison's disease in a case of normal early pregnancy associated with physiological pigmentation in a dark-skinned person and some vomiting and malaise. This was more easily understandable, since there is an extra demand upon the adrenal cortex in pregnancy, and some cases of Addison's disease are first revealed by a pregnancy, and may temporarily clear up for a while after it.

Addison's disease may be very acute and severe and quickly fatal, or may be mild and chronic, one such patient being alive and well after eight years, the only treatment being moderate amounts of salt by mouth. Such mild chronic cases may nevertheless be associated with deep and intense generalized pigmentation. In a crisis, not only is the blood pressure very low and the pulse almost imperceptible, but there is considerable haemoconcentration and collapse of the veins, which latter may be very difficult to enter with a needle, making venous blood difficult to withdraw. In the more chronic phases blood pressure may be normal, or occasionally high, if there has been a pre-existing hypertension. Similarly the fasting blood sugar may be normal, though it tends to fall in crisis.

In Simmonds's disease there is also weakness, anorexia, loss of weight, low blood pressure, low blood sugar, and subnormal temperature. Pigmentation is absent or mild and patchy. Amenorrhoea in Simmonds's disease is almost invariable, and complete loss of pubic and axillary hair is the rule, to which, however, there are definite exceptions. Bradycardia and a pronounced lowering of the basal metabolic rate in the absence of crisis favour a diagnosis of Simmonds's disease. If the condition has followed parturition associated with haemorrhage or infection, or if there is evidence of a craniopharyngioma or chromophobe adenoma of the pituitary, the diagnosis is Simmonds's disease and not Addison's disease. For all practical purposes, and excluding racial pigmentation, mucous membrane pigmentation is pathognomonic of Addison's disease, but is by no means an essential feature.

As to biochemical data, normal plasma or serum values are: sodium, 320–350 mg. per 100 ml. (or 141 milli-equivalents); chloride, 355 mg. expressed as Cl or 585 mg. expressed as NaCl per 100 ml. (or 100 milli-equivalents expressed either as Cl or NaCl); potassium, 18 to 20 mg. per 100 ml. (or 5 milli-equivalents). A milli-equivalent is milligrams per litre, divided by the atomic weight for monovalent elements. In Addison's disease, particularly in crisis, the sodium may be, for example, 290 mg., the chloride (as NaCl) 485 mg., and the potassium 28 mg. per 100 ml. In the more chronic phases a normal mineral chemistry does not exclude Addison's disease and the sodium values are more likely to be lowered than the chloride values. As to the potassium, this is elevated only in severe adrenal insufficiency. The blood urea is raised appreciably in severe insufficiency or crisis.

The Kepler test is a quotient arrived at by the study of blood and urine chloride and urea concentrations and water excretion. In Addison's disease the quotient is less than 30 and usually less than 15. (Blood for estimation of minerals must be taken into a special "pyrex" tube and the serum separated immediately after clotting; it is not essential to collect under liquid paraffin.)

The blood count may show a leucopenia, relative lymphocytosis, and eosinophilia. This eosinophilia is rarely depressed more than 30% by the injection of 0.3 mg. of adrenaline subcutaneously, or 25 mg. of A.C.T.H. intramuscularly, and is usually not affected at all by such injections, there being no adrenal cortex left that can respond. The measurement is made before and four hours after the injection, and is suggested by Thorn as an additional diagnostic test, patients with normal adrenals showing a consistent 50% fall in eosinophils. The sedimentation rate is often raised whatever the pathological lesion of the adrenals may be. The urinary 17-ketosteroids are decreased, particularly in women.

Treatment

The logical treatment of adrenal insufficiency is replacement therapy with an adrenal extract which contains all the essential hormones, and such therapy must be continued for life as with insulin for diabetes mellitus. Unfortunately available extracts are neither comprehensive in their content nor concentrated enough to make therapy completely adequate. Nevertheless, cortical extract can be used with good clinical results, the average patient requiring some 10 ml. daily, injected intramuscularly. With more severe insufficiency as much as 30 ml. is required daily. These extracts have some action upon both mineral and carbohydrate metabolism. Occasionally a patient reacts allergically to such injections, either locally or generally, and continued therapy is not possible. Where there is some pain at the site of injection, the addition of 0.2 ml. of 2% procaine hydrochloride to the contents of the syringe is helpful.

Deoxycortone acetate influences only mineral metabolism and does not correct hypoglycaemia, at least directly. Nevertheless, by increasing well-being and appetite it may be useful even in this direction also. It is prepared in ampoules of 5 mg. and 10 mg. in 1 ml. of oily solution. The average patient requires 5 mg. daily injected intramuscularly, and

because of the small bulk patients prefer this to cortical extracts. Further, deoxycortone can be implanted subcutaneously, one tablet of 100 mg. being used for each 1 mg. of injected material. Thus the average patient receiving 5 mg. daily would have implanted 500 mg. of deoxycortone tablets (five tablets of 100 mg. each). Before calculating this dosage it is advisable to maintain the patient for several weeks on injections, as the ultimate daily maintenance dosage may be appreciably less than the initial dosage.

As the effects of overdosage are severe and potentially fatal, I subtract 100 mg. from my calculated implantation dose, and for further safety I rarely do an initial implantation of more than 300 mg. The implantation calculations I have given are the ones I initially recommended, but are only half of the equivalents given by an American authority.

The effects of overdosage are seen both with the injection method and with the implantation method, but the former is much easier to correct than the latter, which necessitates removal of tablets. Overdosage leads to excessive retention of fluid and sodium, with increased excretion of potassium and low potassium serum concentration, resulting in weakness and paralysis of muscles, including the cardiac muscle. Other characteristic manifestations are superficial oedema of face and limbs, crepitations in the lungs, and enlargement of the heart, with or without pericardial effusion. The oedema, however, may not be conspicuous, and the excessive weakness or paralysis may be wrongly regarded as due to inadequate treatment. The blood chemistry may be deceptive in that the sodium and chloride may be normal, but the serum potassium is always low—for example, 12 mg. per 100 ml. Hypertension may be present initially with excessive fluid retention, but with cardiac failure this gives place to hypotension. Apart from the oedema of the cardiac muscle, multiple foci of necrosis in the heart have been found at necropsy. Electrocardiographic changes, with low serum potassium, are low-voltage QRS complexes, lowering or inversion of the T waves, depression of the S-T segment, and prolongation of the QRS interval. Occasionally some patients show a more insidious chronic dry hypertension with this treatment, but in the absence of the other features this is not usually important and may tend to correct itself. (Such low potassium concentrations are also met with in diabetic coma treated with intravenous salines and glucose, in infantile diarrhoea, and in surgical operations where there have been diarrhoea, intestinal drainage, and/or excessive intravenous saline.)

The best treatment of overdosage in Addison's disease is removal of the implanted tablets, but as a preliminary emergency measure 100 ml. of 2% potassium chloride may be injected intravenously. If the dosage is properly calculated, however, implantation therapy is excellent, and since the effects last some eight months many patients prefer it to all other methods of treatment. As the effect of therapy wears off the administration of salt by mouth may permit the postponement of further implantation from the sixth to the tenth month. Salt is also given by mouth without any other therapy in mild cases of Addison's disease. The dosage is up to 12 g. daily (three teaspoonfuls) in divided doses in a tumblerful of water or lime juice, or with porridge or potatoes. A mixture of sodium chloride, phosphate, citrate, and bicarbonate may prove more palatable. Sodium chloride in 1-g. capsules can also be obtained. Additional salt should be given with caution if deoxycortone is also used, for fear of excessive water and salt retention.

Such overdosage effects of deoxycortone as described above are not usually met with if cortical extracts are used, especially if the daily dose of the latter is less than 20 ml. In the U.S.A. a concentrated lipoid-extract of hog's adrenals has been prepared which is five times as potent as an aqueous extract, particularly in regard to the effect on carbohydrate metabolism. The extract is not yet available in this country. Linguets of adrenal cortical extracts for dissolving under the tongue, as prepared for some American investigators, have proved adequate for prolonged therapy, but those available to me have not proved sufficiently constant in action. Testosterone or methyl testosterone is indicated where the urinary 17-ketosteroids are less than 5 mg. a day, but if implanted the augmentation thereby of the sodium and fluid retention of deoxycortone must be reckoned with. In crisis, or in the acute phase of adrenal insufficiency, treatment differs from the more chronic phase only in its intensity and the advisability of using both cortical extract and deoxycortone. Intravenous saline is called for if the patient has been allowed to become very collapsed, and it is often necessary to cut down on a vein. If severe hypoglycaemia is suspected—and this is more likely in a patient who has been treated previously with deoxycortone and not cortical extract—intravenous glucose is necessary.

Course and Prognosis

Even if adequately treated, as judged by biochemical data, the more severe cases of Addison's disease lead a precariously balanced existence, and are liable to go into crisis, with or without a precipitating cause—for example, infection, trauma, strain—and to have phases of hypoglycaemia, sometimes acute and dramatic. They tend to lose weight and body fat over a period of years, and the pubic and axillary hair may become thinned. Apathy and inertia are not infrequent, and there is often a sensitivity to cold and infection. Nevertheless, one of my patients had two successful pregnancies under treatment, and is a good mother to the children and an efficient wife. Another seemed to have a sustained remission during her climacteric, and then partially relapsed again.

BRONCHOSPIROMETRY

SEMON LECTURE BY DR. PAUL FRENCKNER

The annual Semon Lecture was delivered at the Royal Society of Medicine on November 2 by Dr. PAUL FRENCKNER, of the Karolinska Institutet, Stockholm. His subject was "The Development and Present Use of Bronchospirometry." Dr. E. R. BOLAND, Dean of the Faculty of Medicine, London University, was in the chair.

Dr. FRENCKNER began with a tribute to Sir Felix Semon, whom he described as one of the greatest laryngologists of all time, with whose work and discoveries, he said, he had come into contact in his own first laryngological studies, on paralysis of the vocal cord, 25 years ago.

Dr. Frenckner described his first experiments in 1929 in what he called bronchial catheterization. His purpose was to work out a method of clinical examination with which it would be possible to judge the function of each lung separately, in the same manner as it was possible to form an opinion on each kidney by ureteral catheterization. By bronchial catheterization was meant the passing of a tubular instrument, flexible or rigid, into a predetermined bronchus, an airtight closure between the bronchial wall and the instrument being obtained by means of a special fixture at its distal end, so that it was possible to transmit to or from the area of distribution of the airway in question a gaseous or fluid substance for diagnostic or therapeutic purposes. In association with Jacobaeus and others in Sweden the concept of bronchospirometry was created. Various instruments had been used during the development of the investigation, but the work took a big step forward with the introduction of Carlens's double catheter, which was made of rubber of about the same rigidity as the ordinary urethral catheter. This was introduced, without fluoroscopy, under mirror guidance over a curved metal stylet.

Investigation of Miners' Lungs

The lecturer went on to describe an investigation on the labourers at certain gold and copper mines, who were much exposed to arsenic fumes and sulphur dioxide. Despite protective arrangements, these workers showed pronounced atrophy of the respiratory tract mucous membrane from the nose to the bronchi. The object of the spirometric examination was to ascertain whether there was any disturbance of pulmonary function which could be ascribed to emphysema or epithelial damage, and, if so, whether both lungs showed the same degree of impaired function. Dr. Frenckner gave an account of the results from the 75 cases so far examined.

Carlens's rubber catheter was introduced under local analgesia and attached to an oxygen-filled double spirometer. The recording went on for eight minutes while the subject breathed with maximal inspiration and expiration; forced breathing followed for a quarter or half a minute, and then the residual air was determined. The volumetric values of particular interest were those indicating total capacity, vital capacity, and oxygen consumption. Variations in the total capacity for each lung were often considerable. The average value in the cases taken was 2,600 ml. for the right lung and 2,400 for the left, but this average was found in only a small percentage of the cases, and there were deviations of as much as 500 ml. above or below. Impaired function of one or both lungs was demonstrated in a number of cases.

The vital capacity values were on the average very much below normal, and some of the deviations were considerable. The oxygen absorption was also noted, and, in the cases where it was low on the spirometer reading, bronchoscopy showed the mucous membrane to be extremely atrophic, although, owing to some other observations, he was unwilling to admit at present more than a suspicion that atrophy and poor oxygen consumption might be related. His general conclusion was that the recorded values for oxygen consumption might possibly indicate decreased lung function, which in certain of the cases was considerably more pronounced in one lung than in the other. It was possible that this decreased oxygen absorption might be due to epithelial damage.

Exchange of Respiratory Gases

Estimation of the respiratory gas exchange had been made with the help of the "residual quotient," the "equilibrium quotient," and the "ventilation equivalent" at rest and on forced breathing, in addition to oxygen consumption. The residual quotient $\left(\frac{\text{residual air}}{\text{total lung capacity}}\right)$ showed high values throughout, indicating a decreased lung function with poor emptying ability. In some few cases the difference between right and left lungs was marked, probably indicating unilateral damage. The most likely cause of the impaired function was emphysema, but epithelial damage caused by poisonous gases could not be excluded.

The equilibrium quotient $\left(\frac{\text{supplemental air + residual air}}{\text{total lung capacity}}\right)$ in the majority of cases was within normal limits, the increased residual air values being compensated by very low values for the supplemental air. The ventilation equivalent in this investigation had been calculated according to the formula $\frac{\text{minute ventilation}}{\text{oxygen consumption/min.}} \times 10$, and should be the most important factor in estimating the condition of the alveolar epithelium. The values obtained indicated that the alveolar epithelium had been damaged and that the damage had affected the right and left lungs unequally.

Routine Examination in Lung Disease

Dr. Frenckner said that bronchospirometry was also useful in the routine investigation of certain lung diseases. It was often helpful to be able to estimate the oxygen consumption, and to determine the residual quotient and ventilation equivalent, of each lung separately, particularly in cases where operation or irreversible collapse therapy was likely to be performed.

Finally the lecturer spoke of a new method of recording which would permit of a more careful analysis of the breathing phases. The ingoing and outgoing air from each lung was passed over a small sensitive antenna made of the finest platinum wire. This wire was in an electric circuit, and, on being cooled by the passage of air, variations in voltage took place, and were registered by an oscillograph. Interesting details were brought out in the curves obtained. Delay in one lung might be recorded with precision to 0.1 sec. Inhalation and exhalation gave typical recordings, and certain diseases such as asthma appeared to have characteristic curves.

Dr. Frenckner said that he himself was not a lung physiologist; his purpose was to find a method of clinical examination which would make it possible to appraise the functional capacity of the lungs under normal and pathological conditions. Apparatus was still far from perfect and needed to be critically tested and improved.

The lecture, which was followed by a film, was greatly appreciated by the large audience of laryngologists and others assembled.

OPENING OF THE NEW LABORATORIES OF THE PNEUMOCONIOSIS RESEARCH UNIT

[BY A SPECIAL CORRESPONDENT]

The new research laboratories of the Medical Research Council's Pneumoconiosis Research Unit at Llandough Hospital, near Cardiff, were opened by Mr. Herbert Morrison, the Lord President of the Council, on October 28.

This Unit was set up by the Medical Research Council in 1945 at the request of the Ministry of Fuel and Power to investigate coal-miners' pneumoconiosis. Dr. C. M. Fletcher was appointed director of the Unit, and the staff now consists of 12 medical and 8 non-medical scientists, with their technical and administrative assistants.

The new building, designed by Mr. A. Steele, A.R.I.B.A.—at the time chief architect to the Cardiff Corporation—and constructed under the supervision of Mr. G. Griffiths, A.R.I.B.A., houses the whole Unit with the exception of a pathologist working under Professor J. Gough in the Department of Pathology of the Welsh National School of Medicine. It is a long single-story building with a flat roof, connected to Llandough Hospital by a covered way. The windows are arranged in long continuous strips extending over several rooms to give the maximum amount of light. The building comprises 37 laboratories, 18 offices, *x*-ray and out-patient departments, animal quarters, dark-rooms, workshops, stores, garage, kitchen and refectory, and a large conference room also used as a library. There are some 90 rooms in all. Both sides of the north corridor are devoted to laboratories for the study of the concentration and composition of airborne dusts by chemical, physico-chemical, and petrological methods. There is also a large laboratory containing a wind tunnel in which artificial dust clouds may be generated for the testing of dust-sampling apparatus. The physiological laboratories are at the west end of the south corridor with the administrative block and conference room in the centre, and the offices of the epidemiological section are at the eastern end of the same corridor. There are five basement rooms containing a photographic department, a constant-temperature store-room, and a calorifier which is supplied with steam heat by the hospital.

The Unit also possesses a mobile *x*-ray van and an office van for use in radiological surveys at mines. These are being used at present for a large-scale survey of pneumoconiosis and tuberculosis in the Little Rhondda Valley (Rhondda Fat Scheme).

Research Programme

The following problems are at present being investigated by the Pneumoconiosis Research Unit:

1. The natural history of pneumoconiosis, and in particular the effect of further dust exposure on its progression. This has been studied by the re-examination of men who have been examined by others in the past. It is now being studied by following up men who have been examined in the course of radiological surveys in the field. The knowledge obtained in this way should be of use in preventing the progression of pneumoconiosis, by means of periodic *x*-ray examinations.

2. The social consequences of pneumoconiosis and problems arising in the re-employment in other industries of men disabled by the disease.

3. Methods of medical treatment and rehabilitation, including in the special case of silicosis the use of aluminium therapy.

4. Methods of improving the reliability and accuracy of the radiological diagnosis of pneumoconiosis.

5. The nature of the disturbance of lung function which causes dyspnoea on exertion in cases of pneumoconiosis and other related disorders.

6. The effect of exposure of animals to dusts of various compositions, including samples of airborne dust obtained from the mines.

7. The measurement of the concentration and composition of airborne dusts in mines in Wales and other parts of Great Britain and their relation to the incidence of disease at the same mine as estimated by *x*-ray surveys.

8. The relationship between pneumoconiosis and tuberculosis. This is at present being investigated by submitting the whole population of part of the Rhondda Valley to radiological examination in order to find and isolate all infective cases of tuberculosis. The effect on the development of pneumoconiosis in the valley will be observed.

The Inaugural Ceremony

In welcoming the Lord President, Dr. Fletcher paid tribute to the assistance he and his colleagues had received from many quarters—from the Welsh National School of Medicine, from the University of South Wales and Monmouthshire, from the miners and their leaders, and from officials of the National Coal Board at every level. He paid special tribute to Professor Gough's pathological work, to the Pneumoconiosis Medical Panels for allowing the Unit access to their medical and radiological records, and to the United Cardiff Hospitals for the beds at Llandough. He then gave a brief account of the work of the Unit.

The Lord President, in declaring the new building open, spoke of the serious incidence of the disease and of the steps which were being taken to overcome it. He said that coal-mining had always been regarded as a hazardous occupation, but rather from the point of view of accidents than from the fear of disease. In the past the coal dust which the miners inhaled had been considered harmless to their lungs, and it was not until about 30 years ago that attention had been drawn to the existence of a serious lung condition among South Wales miners, now known as pneumoconiosis.

Mr. Morrison said that the disease now constituted almost as great a threat to the industry as accidents. During the last 20 years 36,000 miners had been certified as having pneumoconiosis, and during the same period the number of fatal and serious accidents had been 75,000. He pointed out that it was necessary to do everything possible to eliminate the disease, for three reasons: first, to alleviate the suffering which it causes; secondly, because the country could not afford to lose 3,000–4,000 miners a year; and, thirdly, because of the cost of compensation. The cost of research was equal to only one-thirtieth of the annual cost of compensation. He explained that the problem was being dealt with in two ways—by medical research and by dust suppression in the mines—and he ended his speech by declaring that the Government would do all that it could to safeguard those who worked in the mines.

Mr. Alfred Robens, M.P., Parliamentary Secretary to the Ministry of Fuel and Power, said that he had frequently visited the Pneumoconiosis Research Unit, and was greatly impressed by the enthusiasm with which Dr. Fletcher and his team were tackling the problem. Mr. Robens emphasized the need for periodic examinations of all underground workers. He hoped to see at least a pilot scheme introduced in the near future.

Mr. Gilbert Shepherd, chairman of the board of governors of the United Cardiff Hospitals, proposing a vote of thanks to the Lord President and Mr. Robens, stated that his board recognized the urgent necessity of providing hospital beds for research into coal-miners' pneumoconiosis despite the present shortage of beds.

Mr. Alfred Davies, president of the National Union of Mineworkers, South Wales area, said that since last February alone his union had paid out death benefits to the dependants of between 170 and 180 pneumoconiosis victims in South Wales. He was pleased at what had already been done, but he was dissatisfied that there was still no special treatment centre for sufferers from pneumoconiosis in the area.

After cutting the tape across the entrance of the new building, the Lord President and the visitors to the Unit made a tour of the building, where a number of demonstrations had been prepared. In a small museum there was a demonstration of the standard films now used in the Pneumoconiosis Research Unit to improve the accuracy of radiological diagnosis. There was also a demonstration of sections prepared by Professor Gough and Mr. Wentworth, of the Department of Pathology, Welsh National School of Medicine, and charts indicating some of the main lines of research carried out by the Unit. An apparatus for the simultaneous recording of a spirogram and tracings of thoracic and diaphragmatic movement was on view in the *x*-ray department, together with the results of some experimental investigations into the definition obtainable by the various types of miniature radiographic technique. On the physiological side, methods of measuring lung volume, speed of gas replacement in the lungs, and maximum breathing capacity were on view. The maximum-breathing-capacity machine was being worked by an "artificial lung" designed to deliver a known "respiratory" volume with a respiratory pattern similar to that of a normal man. The epidemiological section displayed the results of radiological field surveys together with an apparatus for the rapid counting of Findex cards. The various instruments used for underground dust sampling were displayed in the dust-tunnel room, together with some samples of dust which were being submitted to analysis. In the animal house was shown apparatus for the exposure of small animals to constant concentrations of various dusts over long periods.

Finally, the visitors saw the ward in Llandough Hospital, where the Lord President inspected the products of occupational therapy and spoke to the patients, some of whom were carrying out remedial exercises. The party then adjourned to tea at Llandough Hospital, kindly provided by the board of governors of the United Cardiff Hospitals.

Reports of Societies

INDUSTRIAL HEALTH IN THE SERVICES

Three short communications on industrial health in the Services were given on November 2 at a meeting of the Services Section of the Royal Society of Medicine, Sir H. LETHEBY TIDY presiding.

Occupational Health in the Royal Navy

Mr. A. D. FREDERICK discussed occupational health risks to which Service and civil personnel in the Royal Navy and in Admiralty establishments were exposed. He mentioned, for example, the health risks attending the operations undertaken for the preservation of ships before passing them into reserve. Other risks attended the care and maintenance of refrigerators and cooling machinery operating on methyl chloride and of fire-fighting equipment containing carbon dioxide and other substances. Painting was carried out on a very large scale, by both civilian employees and Service personnel. Application by brush was now being supplanted by the use of compressed-air sprays, which had the advantage of allowing otherwise inaccessible places to be reached comparatively easily, but their operation in confined spaces meant an added health

R. D. PASSEY AND L. DMOCHOWSKI: FREEZE-DRYING OF MOUSE TUMOURS

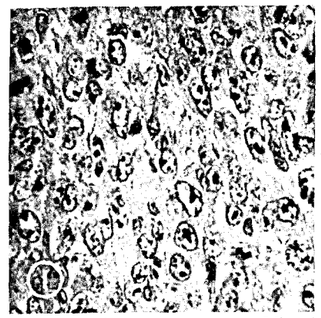


FIG. 1.—Crocker sarcoma. Minced tumour tissue before freezing. H. and E. (× 500.)

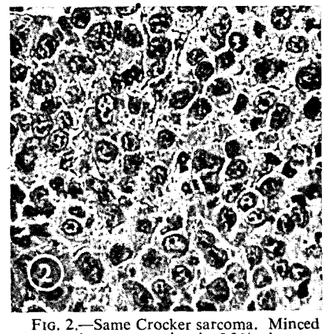


FIG. 2.—Same Crocker sarcoma. Minced tumour tissue suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 22 days; desiccated; reconstituted in equal quantities of 1:500 neutral solution of cysteine and 5.3% glucose. H. and E. (× 500.)

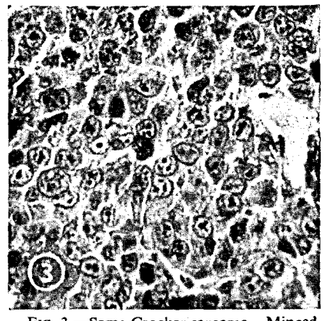
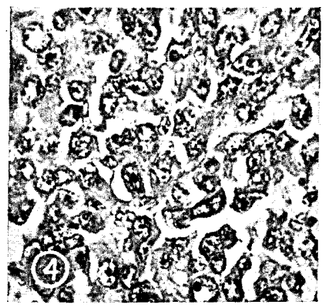
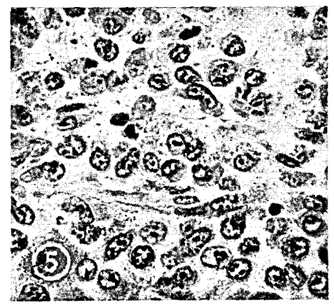
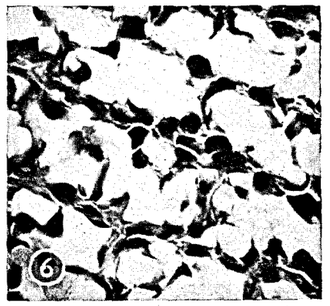
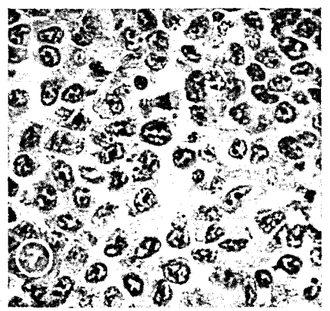


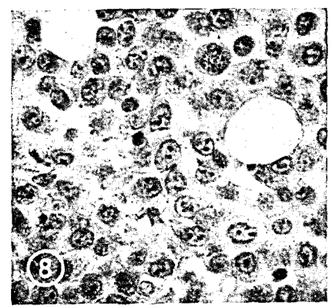
FIG. 3.—Same Crocker sarcoma. Minced tumour tissue, suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 22 days; desiccated; reconstituted in cysteine and glucose. Some damaged cells seen. H. and E. (× 500.)

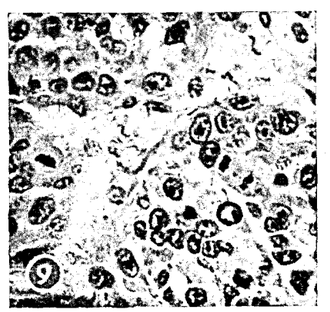


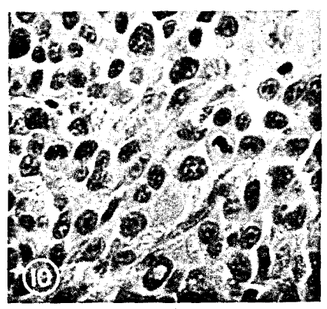












FIGS. 4–8.—37S sarcoma. Minced tumour tissue. H. and E. (× 500.)

FIG. 4.—Before freezing.

FIG. 5.—Suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 18 days.

FIG. 6.—Suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 18 days; desiccated.

FIG. 7.—Suspension in 5.3% glucose; frozen at −79° C. for 18 days; desiccated; reconstituted in 5.3% glucose.

FIG. 8.—Suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 18 days; desiccated; reconstituted in 5.3% glucose. Some damaged cells seen.

FIGS. 9–10.—C48 (I.C.R.F.) methylcholanthrene-induced sarcoma. H. and E. (× 500.)

FIG. 9.—Tumour tissue before freezing.

FIG. 10.—Minced tumour tissue; suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 51 days; desiccated; reconstituted in cysteine.

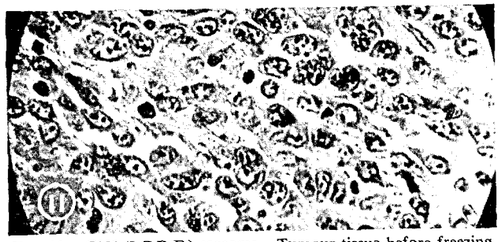


FIG. 11.—C3H (I.C.R.F.) sarcoma. Tumour tissue before freezing. H. and E. (× 500.)



FIG. 12.—Same C3H (I.C.R.F.) sarcoma. Minced tumour tissue; suspended in 5.3% glucose; frozen at −79° C. for 29 days; desiccated. H. and E. (× 500.)

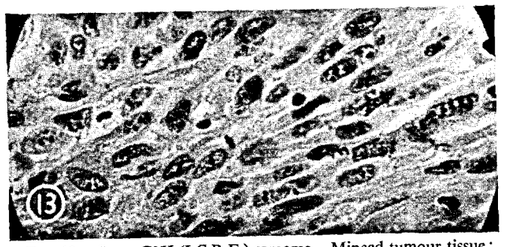


FIG. 13.—Same C3H (I.C.R.F.) sarcoma. Minced tumour tissue; suspended in 5.3% glucose; frozen at −79° C. for 29 days; desiccated; reconstituted in 5.3% glucose. H. and E. (× 500.)



FIG. 14.—Same C3H (I.C.R.F.) sarcoma. Minced tumour tissue; suspended in 5.3% glucose; frozen at −79° C. for 29 days; desiccated; reconstituted in 5.3% glucose; centrifuged for two minutes at 7,000 times gravity. Sediment. H. and E. (× 500.)



FIG. 15.—C3H transplantable breast carcinoma tissue before freezing. H. and E. (× 500.)



FIG. 16.—Same C3H transplantable breast carcinoma. Minced tumour tissue; suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 38 days; desiccated. H. and E. (× 500.)

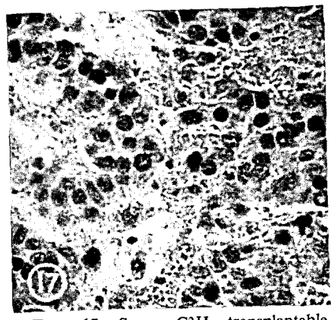


FIG. 17.—Same C3H transplantable breast carcinoma. Minced tumour tissue; suspension in 5.3% glucose; frozen in CO_2 at −79° C. for 38 days; desiccated; reconstituted in cysteine and glucose; centrifuged for three minutes at 7,000 times gravity. Sediment. Damaged cells seen. H. and E. (× 500.)

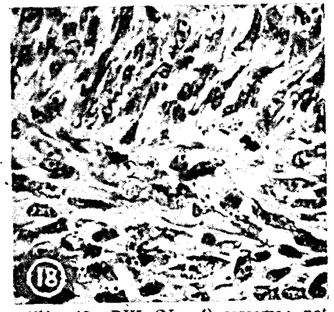


FIG. 18.—RIII (No. 4) sarcoma; not frozen and not desiccated. Control. H. and E. (× 500.)



FIG. 19.—Same RIII (No. 4) sarcoma. Frozen in 5.3% glucose at −79° C. for 87 days; desiccated for 3½ hours. H. and E. (× 500.)



FIG. 20.—Same RIII (No. 4) sarcoma. Frozen in 5.3% glucose at −79° C. for 87 days; desiccated for 3½ hours; reconstituted in 5.3% glucose. H. and E. (× 500.)

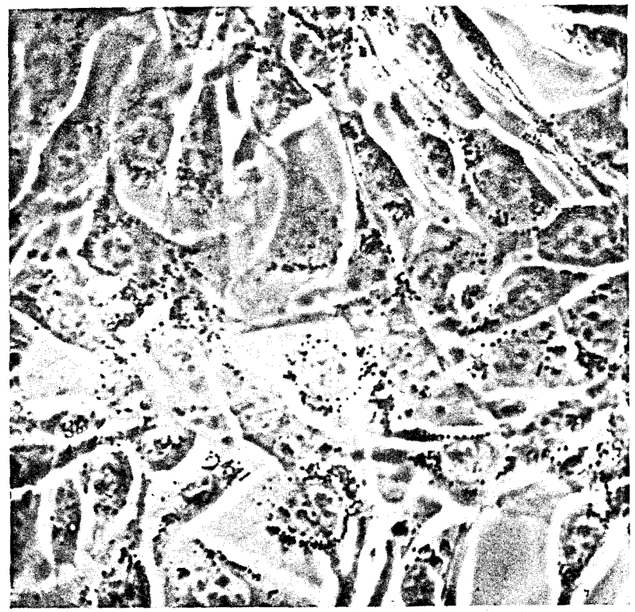


FIG. 1.—C3H sarcoma; not frozen and not desiccated. Control culture. Growth *in vitro* after 24 hours. Liquefaction. Phase-contrast photomicrograph. (× 690.)



FIG. 2.—C3H sarcoma; not frozen and not desiccated. Control culture. Growth after 24 hours. Haematoxylin. Photomicrograph. (× 350.)

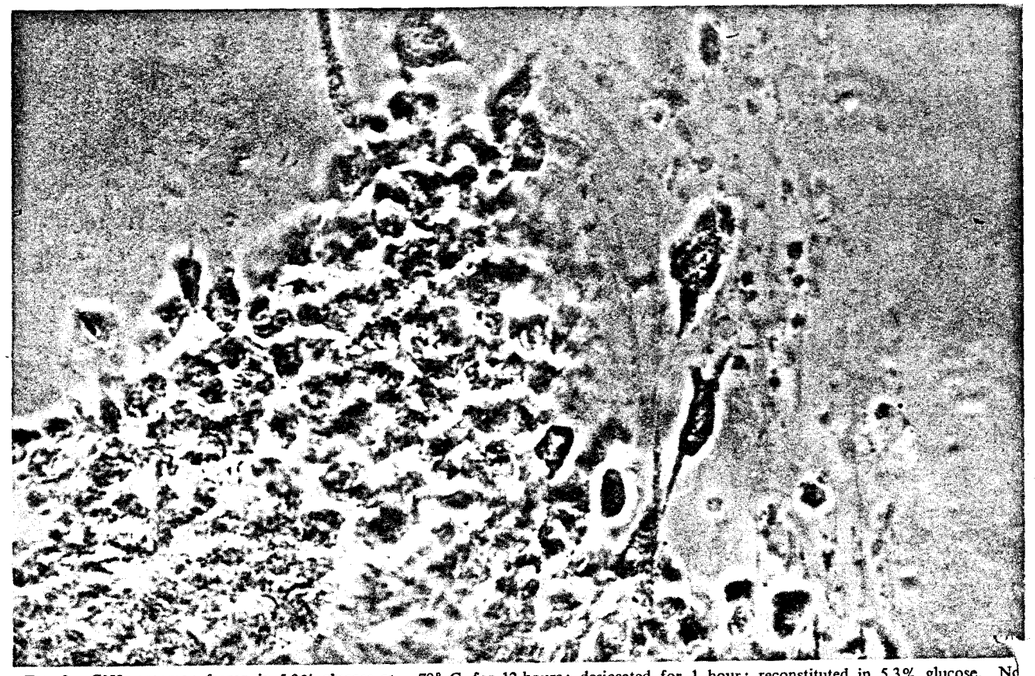


FIG. 3.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. No growth *in vitro* after 24 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 4.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. Growth *in vitro* after 24 hours. Phase-contrast photomicrograph. (× 690.)

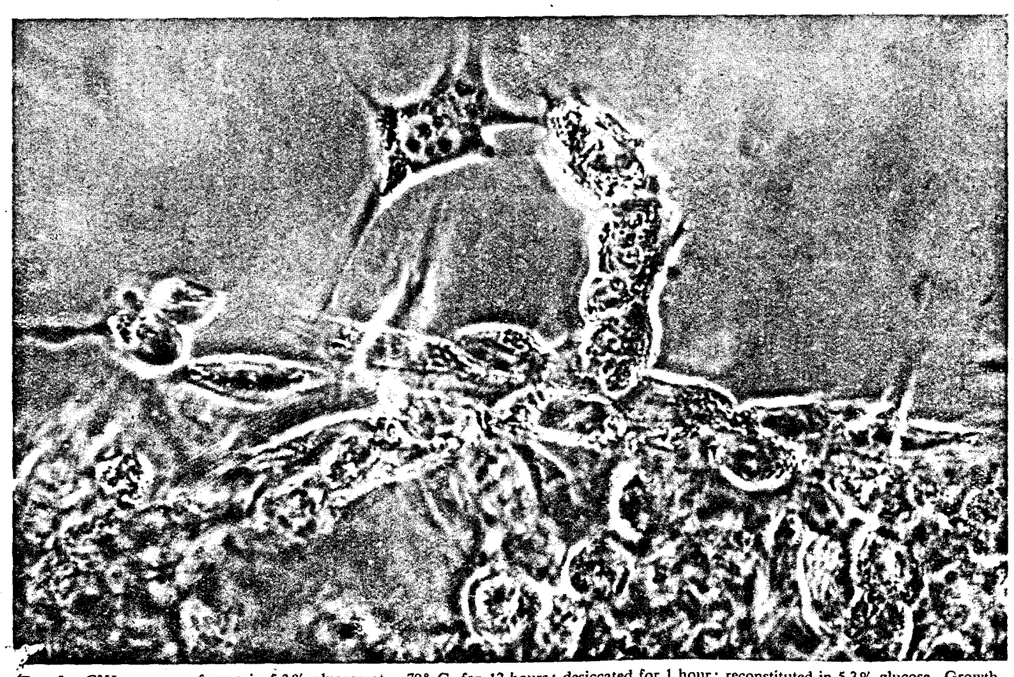


FIG. 5.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. Growth *in vitro* after 24 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 6.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. Growth *in vitro* after 48 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 7.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. Growth *in vitro* after 48 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 8.—C3H sarcoma; frozen in 5.3% glucose at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose. Growth *in vitro* after 48 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 9.—C3H sarcoma, frozen in 20% glucose at −79° C. for 12 hours; desiccated for 1¼ hours; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Haematoxylin. Photomicrograph. (× 330.)



FIG. 10.—C3H sarcoma; frozen in 20% glucose at −79° C. for 12 hours; desiccated for 1¼ hours; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 12.—C3H sarcoma; frozen in 20% glucose at −79° C. for 12 hours; desiccated for 30 minutes; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Phase-contrast photomicrograph. (× 690.)



FIG. 11.—C3H sarcoma; frozen in 20% glucose at −79° C. for 12 hours; desiccated for 30 minutes; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Growing edge of culture. Haematoxylin. Photomicrograph. (× 330.)



FIG. 13.—C3H sarcoma; frozen in 20% glucose at −79° C. for 12 hours; desiccated for 30 minutes; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Growing edge of culture with cell division. Haematoxylin. Photomicrograph. (× 700.)



FIG. 14.—C3H sarcoma; frozen in 20% glucose at −79° C. for 12 hours; desiccated for 1¼ hours; reconstituted in 20% glucose. Growth *in vitro* after 48 hours. Growing edge of culture with cell division. Haematoxylin. Photomicrograph. (× 700.)

L. DMOCHOWSKI AND A. MILLARD: TRANSMISSION OF SARCOMATA WITH FROZEN-DRIED TISSUES



FIG. 1.—C3H sarcoma. Minced tumour suspension in 5.3% glucose; frozen at −79° C. for 12 hours; desiccated for ½ hour; reconstituted in 5.3% glucose; clotted in rat and fowl plasma and chick embryo extract. Appearance of clot *6 hours* after grafting into mouse. H. and E. (Low power, approx. × 150.)

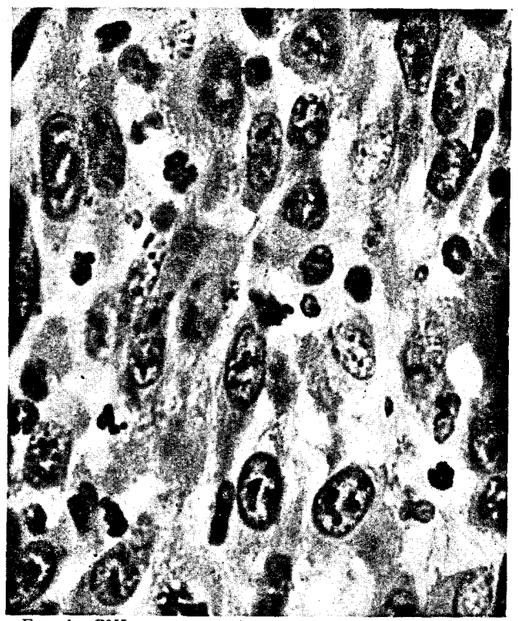


FIG. 4.—C3H sarcoma. Minced tumour suspension in 5.3% glucose; frozen at −79° C. for 12 hours; desiccated for 1 hour; reconstituted in 5.3% glucose; clotted in rat and fowl plasma and chick embryo extract. Appearance of clot *5 days* after grafting into mouse. H. and E. (× 1,100.)

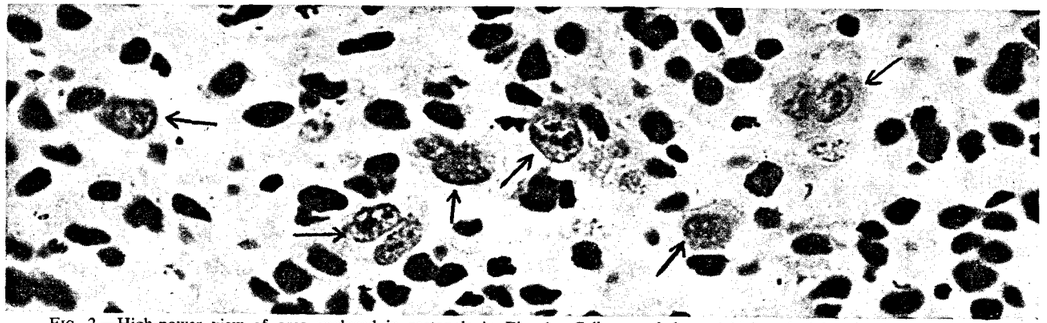


FIG. 2.—High-power view of area enclosed in rectangle in Fig. 1. Cells regarded as viable marked by arrows. (× 740.)

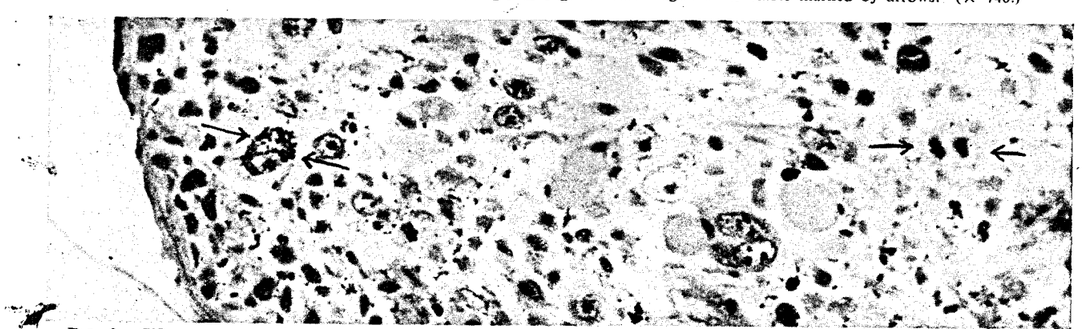


FIG. 3.—C3H sarcoma. Minced tumour suspension in 5.3% glucose; frozen at −79° C. for 12 hours; desiccated for ½ hour; reconstituted in 5.3% glucose; clotted in rat and fowl plasma and chick embryo extract. Appearance of clot *18 hours* after grafting into mouse. Mitoses seen. Cells in mitosis marked by arrows. H. and E. (× 650.)

risk. Following upon the decision to supply spray-painting equipment to all ships, the Admiralty set up a committee to draw up regulations for the protection of the operator, and this committee had nearly completed its report. A point not always appreciated was that spray painting entailed explosion and fire hazard.

Arising out of another inquiry in the dockyards a committee had been appointed with representatives of the three Services and other Government departments to select the most suitable type of respirator for processes giving rise to toxic vapours or dusts. It was well to remember, however, that in such circumstances respirators were really the second line of defence, the first line being such measures as exhaust ventilation, enclosure of operation, or other means to reduce the concentration of vapour or dust to which the workman was exposed.

Mr. Frederick also mentioned the special health hazards in submarines, in particular the danger from exhaust discharge from the engines. The Royal Navy included in its personnel many divers. These men, when wearing the conventional diving-suit, were liable to compressed-air illness if the descent was too rapid or to nitrogen narcosis if working at great depth. Even at shallow depth with their self-contained equipment they might suffer from severe oxygen poisoning.

Industrial Health in the Army

Colonel M. R. BURKE said that many of the industrial hazards which might be encountered in the Army were similar to those met with in civil life, but there were some hazards peculiar to the Service. Most of the ordinary industrial hazards concerned were met with at base installations, such as bakeries, petrol, oil, and lubricant installations, laundries, and workshops of various sorts, but they were also encountered in operational units. Many of the skilled trades in civil industry had their counterpart in the Army, but there were some occupations peculiar to the Service, such as work on searchlights. A large number of civilians were actually employed in the Army, particularly in base installations.

The Army health organization as a whole extended from the War Office, with ramifications at home and overseas so as to cover the whole Army, even down to the smallest unit, but in peacetime, owing to shortage of personnel, the coverage was not nearly as extensive as in war. It might not be generally appreciated that the provisions of the Factories Act and of the various orders and regulations made thereunder applied to the Army in the United Kingdom, subject to certain exemptions which might be authorized by the Secretary of State during public emergency. Army workshops (which were classified as factories under the Factories and Workshops Act) were open to inspection by factory inspectors, and the inspectors concerned were available for advice on technical matters. The situation in the commands overseas was somewhat difficult, because naturally the provisions of the Acts and the orders and regulations had no statutory force outside the jurisdiction of H.M. Government; but every effort was made to conform to them and also to any local government ordinances in force in the civil community.

Various industrial risks were made known from time to time through Army Council instructions. A fairly recent one was on beryllium poisoning. Circulars and technical memoranda were issued drawing attention to hazards and preventive measures, and these were circulated through departmental channels. Standard codes of practice were issued by the engineers in respect of electrical installations, and posters were used to encourage the proper care and maintenance of machinery.

Great importance was attached in the Army to medical examination of personnel, both military and civil. "Pulheems"* was designed to provide an assessment of the individual's capacity for work and to assist in passing men to the employment for which they were most suited. It was believed that the Pulheems classification, if properly carried out, enabled the right peg to be fitted into the right hole. Civilians employed by the Army, unless in casual employment for less than six days, had to be examined by a medical officer before starting work and to be passed fit for the employment in which they were engaged.

Colonel Burke also referred, as the first speaker had done, to the committee working on respirators: as many as 200 different kinds of respirators had been in use in the Army. Another committee had published a series of monographs on industrial health, and a handbook had been compiled which would be of use to all three Services. Every Army medical officer had to render a monthly report, including a special section on industrial health, and by this means quite a number of points had come forward for further research. Probably the commonest industrial hazard in the Army was dermatitis, usually in such forms as oil dermatitis and bakers' itch, but also as a disability among those handling certain textiles. Equipment returned from overseas had to be carefully dealt with from this point of view.

The Royal Air Force

Group Captain C. CROWLEY addressed the Section on aspects of industrial hygiene in the Royal Air Force. He said that there were industrial health problems peculiar to the specific functions of the different commands. Thus with air crews account had to be taken of such things as the effect of noise, of high altitudes, of cold, and of fatigue. Specially trained medical officers who were themselves pilots dealt with problems peculiar to aviation. In the maintenance commands, on the other hand, they were faced with the varied problems found in industry as a whole. In those commands Service and civilian employees were engaged in industrial work in units scattered throughout the country, and each unit might be regarded as a factory. Much had been done to bring the conditions in such units into line with modern industrial requirements, but in some cases almost insurmountable difficulties were encountered. He did not wish to give the impression that the conditions in Air Force workshops did not meet the requirements laid down in the Factory Acts, but those requirements referred to minimum permissible standards only. In fact he believed the hygienic and amenities provision in Air Force establishments compared favourably with those of industry generally.

The speaker then reviewed a number of industrial operations entailing special risk. The types of welding carried out were oxy-acetylene and electric. The hazards in this occupation were largely due to the effect of the short ultra-violet rays on the unprotected eye, resulting in keratitis and conjunctivitis. Shields and goggles were provided to meet this risk. Burns on the arms could occur during welding, and this danger was met by the provision of leather gloves. He also mentioned the dangers of "doping," at one time the cause of a number of cases of toxic jaundice. The danger was in the inhalation of the toxic solvent used in the manufacture of the dope. Amyl acetate fumes if inhaled would cause headache, gastric upset, dizziness, and irritation of the eyes, and butyl acetate caused similar symptoms. He described the means of preventing the worker from inhaling the fumes, and discussed other precautions against recognized dangers.

*See *British Medical Journal*, 1949, **1**, 83.

After studying the medical services in Korea and the Far East Command, Major-General Raymond W. Bliss, Surgeon-General of the U.S. Department of the Army, stated that a truly remarkable record was being accomplished in the protection of health and saving of life by members of the military medical services in the Far East. In the second world war, he said, three out of every four wounded men admitted to hospital were returned to duty. Outstanding as this record had been, present indications were that it would be surpassed. Admissions to hospital for disease in Korea were only slightly higher than for wounds and non-battle injuries. The disease record there became almost spectacular, he said, when one remembered that Korea had been the point of origin of some of the most extensive epidemics the world had ever known, including those of cholera, plague, dysentery, typhus, and typhoid fever. Although the soldiers frequently were forced to spend long hours, even days, in rice paddies fertilized with human excreta where the water was highly contaminated, the number of cases of dysentery had been held at a minimum.

Correspondence

Distinction Awards for Charity

SIR,—I should like to add my support to Dr. E. C. Warner's excellent letter (November 4, p. 1060). Lord Moran is certainly mistaken in thinking that the number of uneasy agnostics among consultants is inconsiderable. The idea of "distinction awards" caused great uneasiness from the outset, though, as a profession, we were perhaps not active enough in our opposition to the suggestion.

Nevertheless, many committees as well as many individuals, as a protest against the system, refused to help in the invidious task of grading their colleagues. They presumably took this course because they felt that the principle of secret awards was wrong, and surely a principle, once it has been accepted, should stand above financial considerations.

The hospital consultants have nevertheless been graded, whether they wished it or not, into classes A, B, C, or Nil. Many individuals do not wish to profit by a system for which they have shown their dislike by refusing to assist in recommendations to the grading committees. Some of them have merely refused the awards; to others the suggestion of transferring the money to a benevolent fund appeals as being more practical. An annotation in the *Journal* (November 11, p. 1106) shows how welcome contributions to these funds would be.

It is surprising and most undesirable that secret awards of this kind can be made from public funds. In the eyes of many of us they confer no distinction on the recipient.

Those who feel that this system of awards is another step in the direction of consultants becoming full-time servants of the Ministry of Health rightly remember the old tag: *Timeo Danaos et dona ferentes*.—I am, etc.,

London, W.C.1. KATHARINE LLOYD-WILLIAMS.

Employment of Epileptics

SIR,—In his interesting and useful article, "Management of the Epileptic" (November 4, p. 1047), Sir Charles Symonds discusses briefly the choice of occupation for these unfortunate people. He says that "occupations or professions for which a medical examination is required are generally barred." This statement needs amplifying. Some occupations—for example, transport driving, work with moving machinery, building and constructional work, or active service with the armed Forces—are obviously unsuitable, but the epileptic whose fits can be controlled by drugs or only occur at night and whose mental capacity is adequate can undertake a wide variety of jobs. Lennox and Cobb in 1942 in a survey of 1,000 epileptics found that 25% were unfit for ordinary employment, while 30% showed some degree of mental retardation or deterioration. Experience in placing epileptics who are registered disabled persons suggests that about half are unfit for open employment, and there is no doubt that frequent major fits occurring without warning render the individual able to work only under sheltered conditions—for instance, in a Remploy factory.

Nevertheless, many epileptics can and do work in industry and the professions on equal terms with others, and where pre-employment examinations are required these people are helped rather than hindered in obtaining suitable work. Unfortunately the epileptic, like the person with tuberculosis, conceals his disability and thereafter lives in dread of dismissal if he should have a fit while at work. Employers are loath to engage epileptics because, apart from the danger, even the most minor seizure causes disturbances in the workshop. Both management and men need to be told how to deal with the worker who has a fit, and here the doctor can be of great service.

The aim of pre-placement examinations is to fit people into suitable work, *not* to turn them away on account of some physical or mental disability. It would seem, therefore, that, far from being a bar to employment, such examinations are eminently desirable in the case of epileptics, who require even more care in placement than the majority of disabled persons.—I am, etc.,

Edinburgh. CATHERINE N. SWANSTON.

Special Centres for Child Health

SIR,—The interest and importance of Professor Alan Moncrieff's address (October 7, p. 795) may be measured by your own editorial comment and by the correspondence that has followed. The subject he covers with such practical grasp, knowledge, and wisdom is more than a field of medicine, it is a continent of changing life. How difficult and troublesome are the problems he raises; but how important, and touching the core of national health and well-being.

He urges that in the future there must be changes in the infant-welfare and school medical services to meet the changing emphasis and needs of their clinical work; and, giving examples of the present defects, he suggests remedies. To his list I add another, which has been partly tried and seems worthy of discussion. This is that the chain of infant-welfare and school medical clinics of the larger local authorities should include a principal clinic of special composition and functions. This special clinic based on a maternity hospital, which the babies (or a proportion of them) born in that hospital would continue to attend after discharge and throughout infancy and childhood, would give plenty of clinical material for the following purposes: routine continuous supervision and care of infants and children; the study of normal physical and mental development and their underlying physiological and psychological processes; the study and treatment of the great mass of minor and chronic disorders at this time of life; a training school for their own staffs (health visitors and medical men and women), social workers, and medical students; and a consultative clinic for the other clinics of the chain. The leaders and staff (nursing and medical) in this central clinic would be experts in the special field of social medicine, and would require no assistance in the special field from hospital paediatricians; and from such clinics manned by specialists in child-welfare there might be expected a flow of published studies that would advance knowledge in this field. The rest of the clinics (infant-welfare and school medical) would be largely in the hands of expert health visitors, with a medical check or ready access to the special clinic for consultation.

The provision in many areas of facilities for the deep study of this great range of preventive problems in child medicine, and the interest of their clinical application, would powerfully attract young medical men and women of talent. Such clinics would refresh and stimulate the interests of their nurses and doctors, would raise more rapidly the standard of child health, and would maintain and increase the prestige of the local authorities. So at least it appears to my enthusiastic mind; and also to fill in the meaning of Professor Moncrieff's own enthusiastic phrase about "the magnificent opportunity" that awaits a reorganization of these services. Without the attraction of work and study of this kind, I do not believe that our ablest men and women will look at a career in the infant-welfare and school medical services in their present structure and activities.—I am, etc.,

East Lothian, Scotland. CHARLES MCNEIL.

Useless Routine Medical Examinations

SIR,—Dr. Thomas Gibson's remarks (October 28, p. 1001) on useless medical examinations in children are no less applicable to adults. The main defect is that those who demand them rarely have any clear idea of what they are looking for and why. There are, of course, notable exceptions such as life offices and armed Services. When a pointless medical is demanded by an organization it becomes misleading as well as costly, because its results are used by those who are not qualified to interpret it. I recall the anxiety of a gardener summarily dismissed from county council employment because he had mild hypertension. That was the "regulation." Many firms now pay for "a medical" without any object in view other than a vague urge to do the right thing and be up-to-date. It seems churlish to greet this good will with intransigent questions of what they want: is it to be assured that the candidate will live long enough to pay for his widow's pension, or die soon enough to save retirement annuity, or be healthy enough to need no sick pay?

The worst sinners are the Ministries, because their mistakes are magnified a thousandfold. All hospital employees under the N.H.S. must go through the initiation ceremony of a medical examination. At first each had to be certified as being "free from any physical defect or disease which now impairs his capacity satisfactorily to undertake the duties of the post for which he is a candidate, or appears likely to prevent continuous effective service in the future." The last clause was soon deleted, possibly because examinations revealed that some would fall sick and all would die. It is difficult to see any point in the certificate as it now remains, or what a medical examination has to do with it.

Our masters are now concerned with the cost of it all, and we may be permitted to concern ourselves too. Clearly no medical examination should be called for unless the originator can answer two questions: (1) What are you looking for? (2) What difference will it make anyway?—I am, etc.,

London, W.1. J. B. HARMAN.

SIR,—As an A.C.M.O. of fairly recent appointment, I should like to add my views in favour of the routine school medical inspection. On completing two and a half years of various junior house appointments, including nine months at a children's hospital, I was left with an impression that the dullest of all occupations would be that of school M.O. Four years of this and infant-welfare work have proved my error. I can understand anyone who has never done routine medical inspections thinking them a waste of time, but those who have and who still look upon them as time wasted should not be doing public health work.

Unlike the interest and drama involved in hospital work, where the diagnosis can be proved by pathological and mechanical means if necessary, at routine medical inspections one has to base one's reasons for suspecting ill-health on experience gained from observing large masses of healthy children in the nude, and from having the time to listen to the sometimes meandering talk of parents. At the same time one has the opportunity of following up the child at the local school clinic, and also after working in the same area for several years of getting to know the families. Few general practitioners have time for this under existing circumstances, so why try to prevent the school medical officer from acquiring the experience? If he waits at the school clinic for children to be sent at the discretion of others, he will just be confronted with the otorrhoeas and mouth-breathers and puny children for whom he will have no basis for comparison, and many children in borderline health will be missed, together with the loss of opportunity of advising parents.

I think that the greatest defect in the child-welfare service is not the time spent in routine medical inspections, but the complete lack of contact between the general practitioner and the public health medical officer, which seems to breed a feeling of distrust between them. As the practitioner himself cannot carry out also the functions that are fulfilled by the school and infant-welfare officer, then I suggest that arrangements should be made whereby they could meet periodically and inform each other of the few children who need special attention and discuss points of treatment. One is often handicapped at a clinic by knowing that a child would benefit from some form of treatment, and yet one cannot ensure that it is carried out, as the general practitioner may have different views. A private chat would help a lot in mutual understanding.

I should also like to add, in reply to Dr. T. Gibson (October 28, p. 1001), that I find the new medical cards, if used with common sense, very time-saving so far as the actual medical section goes, and for a healthy child can be completed in about 30 seconds. As for the graph cards, we have not got them in our area, and the heights and weights are recorded in figures. I do agree, however, that wholesale weighing and measuring is a waste of time and should be restricted to special cases.—I am, etc.,

Gatley, Cheshire. AITOLIA ENGLISH.

SIR,—As a school medical officer of many years' experience who now devotes his time in this work almost exclusively to boys in the secondary and grammar schools, I should like to voice my complete disagreement with the views expressed by Professor Alan Moncrieff (October 7, p. 795) and Dr. T. Gibson (October 28, p. 1001). Only too often these examinations are conducted by a bored staff who either are not given sufficient time to take any interest in the job or entirely fail to comprehend that there can be intense interest in the variations of the human form when seen in large numbers. Of course the mere recording of heights and weights is a waste of time, like everything else connected with the work, if no use is to be made of the data, but I would ask those in authority to allow their school medical officers more time, which they can utilize for interesting research, to allow them to think not only in terms of tonsils, hearts, and lungs, but to broaden the scope of these routine examinations.

In my inspections tests for colour blindness, inspections of ear drums by electric auroscope, examinations for undescended testicles and hernia, together with an intelligent use of the age, height, and weight data by the over-despised Tuxford index, are done in every boy examined, and the results, as judged by the interest of the boys themselves and their parents, have definitely shown that the extra time taken is well worth while. When I inform a parent that his 15-year-old boy still has both testicles undescended and suggest that further advice be sought; when a partially colour-blind boy comes to me and asks whether it is any use his swotting for an examination for the Services or should he give up the idea; when a young boy as a result of my talking to all in his class finds he is not the only one who thought ghosts were following him up the stairs at night and now goes up to bed alone without fear; or when I ask the parents to let me know if their boy shows any apparent falling off in his usual robust health, since his Tuxford index at 15 is greatly below what it was on entry to the school, for which I can find no cause, and all the other boys in his form show a big increase in this index figure (these are all actual instances and could be multiplied many times over)—can it be said that I am wasting my time? I think not.

The real value does most emphatically lie in the routine examination and the re-examination of all the children, but this must not be scamped, and there is a real need for encouragement to be given to school medical officers to look upon the value of the excellent opportunities they have in the mass of their material, to take up some particular feature, to know their children, and to make sure themselves that they are doing a job of really useful work.—I am, etc.,

Brecon, Wales. W. F. W. BETENSON.

SIR,—Dr. Cecilia Galton (October 28, p. 1001) has stressed the value of routine school medical inspections as a means of health education. Surely she is right. How often in general practice is one called in to an illness largely caused by years of neglect of the rules of health; especially, I would say, by faulty diet. How often has one said to oneself: "If only I, or another doctor, had been there at the beginning." The school doctor *is* there at the beginning and can advise the mother, who as Dr. Galton says might hesitate to harass a busy practitioner until the child is really ill. Especially I think does this apply to children from not-so-good homes, whose mothers do not realize the child's subnormal health or the reasons for it, and who are in great need of help. The medical inspection is of course followed up by visits from the school nurse, for friendly supervision and continued education in the matters of diet and hygiene.

Surely the school doctor is part of a team: midwife, health visitor, clinic doctor, school doctor, school nurse, general practitioner, specialist, all have their part to play, and each part is important. Each player in the team must of course be continually conscious of his fellow players and of his particular job in the team. For instance, in the case of the school doctor it is essential that he be in friendly contact with the child's general practitioner, and that the mother should know this is so. In cases needing the family doctor's attention it is well to say: "Go and have a talk with Doctor," and send a letter to the doctor, saying: "I am sending Tommy Jones to see you.

What do you think about his heart, or chest, or stomach ? "—leaving the treatment where it should be, in the hands of the family doctor, but ensuring that he sees the cases that would otherwise not go to him, and strengthening his hands by continued advice to the mother about the primary laws of health and the needs of the child's body.—I am, etc.,

Kendal, Westmorland. FRANCES M. TAYLOR.

The Position Assumed by a Dead Body in Water

SIR,—I have lived most of my life on the banks of the Thames, and my many riverside friends, boat-builders, lock-keepers, and the like, all tell me that a woman after death floats face downwards, but a man floats on his back. I confirmed this statement when I was working in the Mortlake mortuary by visiting the Thames River Police, who had a station quite close. I made friends with the congenial Yorkshire coxswain of the police launch, who assured me that women invariably floated face downwards, and he added, " If ye see a roomp sticking oop, sirr, ye may know well it's a 'ooman. . . . "

I have recently been delighted to find that John Speed (1552–1629) says quite a lot about this in that entertaining but sadly neglected work *The History of Great Britaine*, first published in 1611, and his explanation is intriguing. He tells us that the women-folk of the ancient Britons at one time painted and tattooed their bodies, but gradually as they became more modest they began to clothe themselves lest " they expose to view that which nature most endeavoured to hide as knowing it least worth the viewing," and he goes on to say that it has been observed " that women being drowned naturally swimme with their face and foreparts downwards whereas men doe contrary, as if the impression of modesty were not to leave a woman even after death."

These observations were made by one, Cornelius Agrippa, in his book *De Laude Feminarum*, which he dedicated to Margaret, Duchess of Burgundy, who unfortunately was so impressed by his observations on modesty that she elected to die when she broke her thigh in a fall from her horse, rather than expose it to the gaze of her chirurgeon. Agrippa (1486–1535) was a physician, occult philosopher, and magician in the service of the Emperor Maximilian I. He is well known to all of us as " The Tall Agrippa " of *Struwwelpeter*, who punished the naughty little boys for teasing a blackamoor by dipping them in his inkpot.—I am, etc.,

Weybridge. ERIC GARDNER.

Mongolism in One of Twins

SIR,—Dr. Robert Dawson reported a case of mongolism in one of twins in a letter in your issue of August 19 (p. 461). Subsequently Dr. Dawson kindly sent me blood samples from all the members of the family. The twins have different rhesus groups as shown below:

Father	cde/cde (rr)
Mother	CDe/cde (R_1r)
Brother	CDe/cde (R_1r)
Mongol	cde/cde (rr)
Mongol's twin	CDe/cde (R_1r)

These results prove conclusively that the twins are not identical.—I am, etc.,

London, W.C.1. SYLVIA D. LAWLER.

Diagnosis and Treatment of Placenta Praevia

SIR,—In the excellent and instructive discussion on placenta praevia, reported in the *Journal* of November 4 (p. 1055), stress was laid on the great importance of modern *x*-ray methods in diagnosis. Professor F. J. Browne said that to explain the good results which had been reported the greater use of transfusion, penicillin, and the sulphonamides, together with caesarean section, must be remembered. While I agree that *x* rays should be used when possible and when occasion demands, students must still be taught that clinical observation is above everything else. Many students who are studying obstetrics will not have the chance to use *x* rays, and in domiciliary midwifery both in this country and abroad diagnosis will and must be made from the symptoms and signs.

In the last report of my mastership at the Rotunda Hospital, 1932–3, I said that with proper treatment there should be no mortality. During six of my seven years there was no mortality in 118 cases; in 1930–1 there were two deaths, one of which was caused by rupture of the uterus following the injection of pituitary extract after version by an energetic young assistant: this was an avoidable death. In other words, there were two deaths in 138 cases, many of these being *in extremis* on admission. We had to rely entirely on clinical methods of diagnosis; transfusion was never used before the birth, penicillin and the sulphonamides were unknown, and caesarean section was practised only eight times. Submammary saline was our sheet anchor. I am stating these facts to show that excellent results for the mother were obtained without modern methods. In my opinion, caesarean section should nearly always be done nowadays, in the interests of the child.

To sum up, modern methods of diagnosis and treatment must be used, but the clinical approach should be the predominant factor.—I am, etc.,

Dublin. BETHEL SOLOMONS.

Treatment of Occipito-posterior Presentations

SIR,—H. R. MacLennan states (October 7, p. 800): " Buist's pads have been advocated, and recently by no less an authority than Farquhar Murray, but we in Glasgow have been unsuccessful with this treatment." Buist was one of my teachers at the Maternity in Dundee and I cannot remember him ever demonstrating his method. I did not know that he advocated two pads. I have practised and advised the use of one pad—the size of a rolled-up serviette—placed vertically in the sulcus between the uterus and the loin muscles on the right side outside the child's back. This is retained in position by a binder, and the patient stays in bed for 24 hours and keeps her bladder empty. I use this technique not earlier than the 36th week, when the baby's head is usually either above the brim or just dipping into it. In two cases so treated one Sunday morning the baby's head was deeply engaged as an L.O.A. on the Monday morning. I consider that the two pads as used by my Glasgow colleagues must be mutually neutralizing, and hence their disappointing results as recorded.—I am, etc.,

Newcastle-upon-Tyne. FARQUHAR MURRAY.

2,665 Cases of Abortion

SIR,—May I be permitted briefly to reply to some of the questions raised on my article in the *Journal* of July 15 (p. 123) ? Professor A. M. Claye (September 9, p. 627) finds himself " incapable of believing that of 2,665 patients only 13 had a retroverted uterus." The figure is, however, correct for this series, though it includes only those cases where the retroversion was considered the cause of the abortion. It is true that retroversion is present in probably 10% of all parous women, but as a cause of abortion it is comparatively rare, a fact well demonstrated in these figures. He also apparently objects to my manipulation of the pregnant retroverted uterus into anteversion, saying that this is the simplest way to make the patient miscarry. I would point out that this procedure was only used when the retroversion was regarded as the cause of the threatened abortion, and then naturally with the greatest gentleness. It is true that the majority of simple retroversions correct themselves spontaneously during pregnancy, but in my view those referred to above definitely call for replacement, albeit with the provisos stated, though, as the figures show, the ultimate success rate is low. Professor Claye does not think my conclusion that " there is a definite though necessarily limited indication for hysterectomy in post-abortal peritonitis " is justified by the evidence given. He misread this conclusion as being arrived at on the basis of one successful case, but the basis was the comparatively large series published by Falk, H. C., and Blinick, G. (*Amer. J. Obstet. Dis. Wom.*, 1947, **54**, 314). Few surgeons can have had much experience of this drastic procedure: my point was that it was worth definite consideration in some desperate cases.

I have no quarrel with the contention of Drs. Melvin Ramsay and J. Vahrman (August 5, p. 367) that the presence of pathogenic bacteria in the uterus is not necessarily indicative of active infection. I merely described the presence of these organisms as found in the course of a search for inclusion bodies in 50 cases, and am happy to accept the conclusions of these writers, for their experience is unrivalled in this field.

Mr. Hugh McLaren (August 5, p. 367) questions the advisability of injecting " pitocin " into the uterus, on the grounds that it occasionally causes circulatory collapse. I have seen this alarming complication on several occasions, but always in older women, and when the preparation used contained " pitressin." My feeling is that pure pitocin may safely be used in younger women whose blood volume has not been grossly attenuated by excessive bleeding.

Dr. Eustace Chesser (September 9, p. 627) finds my indications for therapeutic abortion too restricted, and the number of cases so treated too small. If Dr. Chesser thinks my interpretation of the law somewhat narrow, I can only reply that I believe it to be the correct one, and his arguments do not convince me to the contrary.—I am, etc.,

London, W.1 ALBERT DAVIS.

Mercury and Pink Disease

SIR,—Professor W. S. Craig has given an interesting and vivid account of the typical signs and symptoms of pink disease (September 30, p. 773). It was inevitable, with our lack of knowledge of the aetiology and treatment, that the discussion of these aspects of the disease should have been short. The suggestion of Warkany and Hubbard that mercury might be an aetiological factor cannot, I think, be ignored without proof to the contrary. During the last fifteen months I have come across 16 cases of pink disease in various stages of development. Of these only four were " typical." The greater number presented as cases of marked irritability, anorexia, tachycardia, and hypertension. I have recorded systolic blood pressures of 160 mm. Hg in infants. Accurate analyses (by Mr. D. Gray, of the South African Council for Scientific and Industrial Research) have shown appreciable quantities of mercury in the urines of these children, ranging from 14 to over 2,000 μg./litre. In controls mercury has been found present from 0 to 80 μg./litre. In South Africa " teething powders " are frequently used. While the most popular powder contains no mercury, there are large numbers of other powders on the market with considerable quantities of calomel. Some of my controls are children who have had such teething powders but presented no symptoms of pink disease.

The most interesting result of my investigations has been the response to B.A.L. On account of its toxicity and method of administration I have restricted its use to the worst cases, those that required hospital admission. I have treated four such cases, with very encouraging results. In one the improvement was dramatic. The infant, who for two months previously had been very fretful, suffering from extreme anorexia, marked photophobia, and seriously ill, became transformed after four days' treatment with B.A.L. into a smiling infant with improved appetite able to tolerate our bright sunshine without attempting to cover her eyes. The remarkable change in this case stimulated me to follow up my cases and make some controlled observations. I hope to publish my results on the completion of my study.—I am, etc.,

Pretoria. BEN EPSTEIN.

Hookworms in the Throat

SIR,—You may find the following case of interest.

The patient, a girl of 21, gave a history of burning pain at one spot in the throat, associated with a persistent though slight cough, all of two weeks' duration. The burning sensation had become worse on the evening I was asked to see her. On examining the throat I could see far down on the posterior pharyngeal wall and a little to the left of the mid-line a small red wriggling worm. It was easily removed on a cotton-wool swab at the end of a thin stick, and on closer inspection appeared to have two heads. As it was impossible to identify by the naked eye, I placed the swab with the worm in alcohol and next morning examined it microscopically, when it was easily seen to be a male and female *Necator americanus* in the act of copulation.

The interesting features of the case are: the unusual site of attachment of the hookworm; the length of time (two weeks) that one or both worms must have remained attached to the pharynx in spite of regular meals having been taken; and the fact that two worms were found together in the aberrant situation. I might add that after the worm had been removed there was no evidence, to the naked eye, of damage to the pharyngeal mucosa.—I am, etc.,

St. Lucia British West Indies. A. V. WELLS.

Mantoux Conversion

SIR,—During the past fifteen years routine monthly Mantoux testing with purified protein derivative of all negative reactors on the staff of the Cheshire Joint Sanatorium has provided us with many opportunities of observing Mantoux conversions. In almost all of these cases the development of a clear-cut and definite positive Mantoux reaction is the first proof that infection has taken place.

In about 10% of the conversions, representative of all clinical types, we have observed a reaction which strongly suggests that a positive will develop, but which subsides slowly with complete absence of induration. It differs markedly from the traumatic inflammatory reaction which subsides rapidly, and it is not of the Arthus-type anaphylactic reaction which might be ascribed to hypersensitization by repeated injections of tuberculoprotein. We have seen the reaction in people who have never had a previous injection of tuberculoprotein. At this stage no radiological or clinical changes are manifest, but in some cases the E.S.R. may be raised. When this reaction has been observed subsequent monthly tests give the same equivocal reaction. It has always been followed by a typical positive Mantoux reaction in eight to twelve weeks. The time elapsing between the initial infection with tubercle bacilli and the development of a positive Mantoux is generally accepted as from four to six weeks. Our observations suggest the possibility that in some cases the period may be longer, and that particular care should be exercised when interpreting Mantoux reactions prior to B.C.G. inoculation.—We are, etc.,

Market Drayton, Salop. LESLIE J. CUTBILL.
A. CLARK PENMAN.

Radiology and the Diagnosis of Miliary Tuberculosis

SIR,—The article on the early diagnosis of miliary tuberculosis (September 23, p. 702) by Drs. J. L. Emery and J. Lorber, with its extensive bibliographical references, is very revealing. So far, however, the true revelation does not appear to have been apprehended, which is the fact that really satisfactory chest radiography is still rather the exception than the rule. Dr. J. E. Bannen (October 21, p. 951) has gone part of the way in explaining the failure of radiology in early diagnosis, but even he has not mentioned the one all-important factor in the production of satisfactory chest skiagrams. We may have the whole gamut of fine-focus tubes, optimum kilovoltage and current, adequate distance, fine-detail intensifying screens, co-operative patient, etc., but we shall still produce an indifferent skiagram unless we have a suitable time factor. Without this, there is bound to be a varying degree of loss of detail due to movement. The movements due to cardiac pulsation and respiratory causes are well recognized, but what about that which is transmitted to the *x*-ray tube by people walking on a non-rigid floor, or that due to the passage of heavy transport ? Vibration from these latter causes will completely offset the advantages of a fine-focus tube unless the time of exposure is extremely short.

Although 1/50 second is nearer the ideal, most apparatus now designed for chest work will permit of an exposure of 1/25 second, which will usually give satisfactory results. If any longer exposure time is used one must expect a considerable proportion of skiagrams which cannot be described as

satisfactory according to modern standards. As an example of technical excellence I would mention the extremely fine changes which often accompany pneumoconiosis due to the more inert forms of dust. The resultant markings on a really good skiagram are considerably less than 1 mm. thick and afford proof that miliary tubercle should be recognized at a very early stage.

I suppose the truth is that the supreme importance of the time factor is still not fully appreciated, especially among those whose aim appears to be the production of perfect studies in black-and-white rather than in a translucent grey, which is rich in diagnostic detail for those who have eyes to see. Like Dr. Bannen, I am disturbed by the statement, "It is clear that x-ray examination cannot be relied upon for the early diagnosis of miliary tuberculosis," not only because I do not believe it, but because I have an instinctive dislike of so dogmatic a statement in medical matters.—I am, etc.,

Stoke-on-Trent. C. BELLAMY.

The Naming of Drugs

SIR,—From their student days, doctors suffer from jargon till they become so hardened to it that no one has thought to protest against the extraordinary and insufferable jaw-crackers the British Pharmacopoeia Commission now expects us to memorize. These coiners of words to enrich the language do not seem to realize that their terms have to be remembered and written down accurately at the bedside, often when one is tired, always when no glossary is at hand.

Admittedly, good monosyllables such as soap, glass, and beer are mostly already in use, though the industrialist who gave us "lux" seems able to keep it up with "wisk." But no industrialist who wants his product used goes beyond two. We have nylon, bakelite, petrol, castrol—all easy to remember. The Forces soon reduced aeroplane to aircraft, radiolocation to radar; for the human mind is irritated by long words. Even the drug manufacturer, who naturally flatters the doctor's super-intellect, sticks to three, and gives us "benadryl," "seconal," "pentothal."

But the Commission thinks nothing of phenylpropanolamine, and thinks it easy to pronounce tripennamine (may one say "tripe" for short?). Its principle is to combine syllables from the organic chemical names, but practising doctors usually know little organic chemistry and care less. It carefully avoids any therapeutic suggestion, though this is just what the clinician wants for easy memorizing. After all, there are precedents: antiseptic, anaesthetic, expectorant—we know what these words mean and have no difficulty with them. But by what Pelmanism can one associate hexamethonium bromide with the reduction of hypertension? Depressin would be a much better name. Apart from memory, words such as succinylsulphathiazole cannot even be written in one line on a prescription form unless a magnifying glass is used.

Far from discouraging terminal capital letters, let us have them. A, B, and C have never been bettered as names for vitamins, in spite of gallant attempts. Why not call the series of antihistamines anthist-A, anthist-B, and so on, instead of antazoline, chlorcyclizine, and diphenhydramine—words with no mental association at all, which merely tax an already overloaded memory? Must we continue to suffer?—I am, etc.,

Ashtead, Surrey. W. EDWARDS.

Indwelling Tube for Gastric Haemorrhage

SIR,—During the last three years there have appeared in the pages of the *British Medical Journal* articles on haemorrhage from gastric and duodenal ulcer by Avery Jones, Norman Tanner, Needham, Ogilvie, and others, and an editorial on the subject appeared in the issue of July 15 (p. 153). This series provides a remarkably informative account of the problem, but it makes no mention of a part of the treatment which is very useful and in some cases of vital importance. I refer to the use of an indwelling gastric tube with hourly or half-hourly aspiration. After each aspiration the tube is washed through with a little water to prevent blockage by clot. The aspirations are carried out immediately before feeding. I know that some clinicians think, or perhaps feel rather than think, that the tube may in some way disturb the bleeding point. But this is highly unlikely and easily outweighed by the advantages of the tube.

In gastric ulcers, and those duodenal ulcers which bleed back into the stomach, the appearance of bright blood provides direct and immediate evidence of the continuance of the bleeding, and the clinician planning treatment, perhaps operation, need not wait for these too-long-delayed and easily vitiated indirect signs such as the vomit of blood, melaena, and alterations in blood pressure, pulse rate, and haemoglobin value. In collaboration with the attending physician I have been able to arrange operation, in patients with haemorrhage from a large artery exposed in the floor of the ulcer, at a much earlier and more favourable stage when frequent gastric aspiration has been practised.

At operation the stomach and intestines are very often found filled with altered blood, decomposing and with a foul odour, and sometimes forming a jelly-like cast of the stomach and intestines. Absorption from this possibly contributes to uraemia. The prevention of this accumulation is highly desirable.

Distension of any part of the gastro-intestinal tract by blood or air or secretions (and this is particularly important when there is a complicating stenosis) causes a vascular congestion by compressing the small veins more than the small arteries. Such congestion encourages haemorrhage. The surgeon sees the proof of this at every laparotomy for intestinal obstruction. Aspiration tends to prevent this distension and congestion. Even when the patient is sleeping, perhaps under the influence of morphine, local treatment of the stomach can be continued by injections down the tube. Hyperacidity, gastritis, and erosions are sometimes of importance in gastric bleeding. It is my practice to give the patient an hourly dose of aluminium hydroxide.

I have had a few patients who have bled for some days in whom the commencement of gastric aspiration was followed by an improvement in the general condition and a decrease and subsequent cessation of haemorrhage.

—I am, etc.,

Sydney, N.S.W. V. J. KINSELLA.

Precordial Pulsation in Children

SIR,—Dr. Paul Wood's valuable account (September 16, p. 639) of his work on congenital heart disease is most stimulating and helpful to the medical profession. I have been particularly interested in his description of precordial pulsations which may be seen in cases of congenital heart disease. Here he states that "when the right ventricle is enlarged there is a diffuse lift in the third and fourth space between the sternum and the nipple line. This lifting outflow tract . . . is probably the best clinical evidence available of an enlarged right ventricle." In his paper, however, no mention is made of the age group to which this observation refers. For this reason the following fact may be of practical value. This "lift," which presumably involves the rib between the third and fourth intercostal space, is highly suggestive of an enlarged right ventricle in adults and in infants under the age of 1. This sign, however, is frequently found in children over the age of 1 without there being any electrocardiographical or radiological evidence of cardiac disease. Such cases are more common among children in the 2 to 7 years age group than in the older age groups.—I am, etc.,

Edinburgh. R. A. MILLER.

Squatting Position in Labour

SIR,—The following instance may prove of interest as an example of the great value of the squatting position in certain circumstances.

A woman aged 34 had lost her first child following a cerebral haemorrhage, as a result of (according to the mother) a twelve hours' second stage during which no medical aid was sought. A second child, therefore, was very much desired. The second labour proceeded normally and easily until the cervix was fully dilated; half an hour later the membranes presented at the vulva and were ruptured. The liquor contained a large amount of meconium, and it was then noticed that the foetal heart rate had dropped to 100 per minute. As the scalp was just showing, and the perineum was very lax, it appeared that a few good contractions would deliver the baby. However, the pains became gradually weaker and the head, after twenty minutes, had made no advance. An episiotomy was performed, but it proved of no assistance, as the head was just too high to extend the perineum during the contractions. The foetal heart rate, twenty minutes after the original measurement, had fallen to 96, and meconium was still being passed. Preparations were therefore made for immediate forceps delivery. While the instruments were boiling, however, it was thought worth while to try the effect of the squatting position. The mother was assisted into this position on the bed, supporting herself on the shoulders of two assistants. To the gratification of all present the baby's head almost shot out of the vagina with the next pain, and was with difficulty restrained. An easy delivery followed. The child, after the removal of mucus from its throat, appeared quite fit.

It is reasonable to suppose that the adoption of this position in all probability saved the child's life, or at least prevented a cerebral haemorrhage. The mother stated afterwards that she noticed an immense improvement in the quality of her bearing-down efforts as soon as she had adopted this position.—I am, etc.,

Southampton. S. R. SAUNDERS.

Recurrent Obstruction of an Obturator Hernia

SIR,—I was most interested to read Mr. B. W. T. Pender's account of a case of recurrent obstruction of an obturator hernia (November 4, p. 1038), as I have recently seen a similar example of this rare condition.

A woman, aged 67, was admitted to hospital in November, 1949, with the signs and symptoms of acute intestinal obstruction. She complained of pain in the right thigh and knee. No hernia could be palpated, but there was tenderness in the right Scarpa's triangle. The abdomen was opened through a right paramedian incision and it was found that a strangulated obturator hernia was present on the right side, a loop of ileum being imprisoned in the sac. The hernia was easily reduced by gentle traction from within the abdomen. No attempt at repair was made, and the abdomen was closed after it had been noted that a sac was also present in the left obturator canal.

In September, 1950, the patient was admitted to hospital again with exactly the same condition. This time when the abdominal cavity was opened reduction could not be performed until the constriction had been enlarged from within the abdomen. In view of the history it was felt that repair must be attempted, but sufficient tissue could not be found for closure of the canal by simple suture. The right broad ligament was therefore sewn over the gap with interrupted silk sutures, and this appeared to give a firm repair. The defect on the left side, being small, was easily closed with silk sutures. Whether the repair on the right side will prevent further recurrences remains to be seen.

Having had this experience I would endorse Mr. Pender's view that repair in these cases seems to be important, especially as the mortality rate of strangulated obturator hernia is stated to be over 30% (Aird, *A Companion in Surgical Studies*, 1949). It is of interest that in both these cases reduction was easy at the first operation and difficult at the second.

I wish to thank Mr. J. H. Conyers and Mr. J. K. Willson-Pepper for permitting me to treat this case.

—I am, etc.,

York. P. R. R. CLARKE.

Lupus Erythematosus—an Auto-antibody Disease?

SIR,—In following up our work on auto-antibodies in the pathogenesis of disease (Gear, 1946) we are systematically investigating cases of illness which we suspect may have what may be called an auto-allergic basis. In this study one line of investigation is the testing of their sera for irregular agglutinins and auto-antibodies, and their red cells by the direct Coombs test for the presence of immune globulin. The results of the tests on the blood from patients suffering from a variety of conditions will form the subject of a comprehensive paper. It is the purpose of this short note to record the fact that in two cases of lupus erythematosus the direct Coombs test for sensitization of the red cells gave a positive result. One of these cases was the chronic discoid type. The other was of the acute disseminated type and ended fatally. The findings of the post-mortem examination confirmed the diagnosis.

A positive Coombs test indicates the presence of a circulating auto-antibody, thus confirming the observations of Wiener (1950) using the trypsin test for sensitization of red cells. It may well be that this auto-antibody plays an important role in the pathogenesis of lupus erythematosus and related conditions. If it does, then treatment with drugs or hormones which inhibit the antigen-antibody reaction should be beneficial. Sodium salicylate and acetyl-salicylic acid have been credited with this action. It seems also that one of the effects of the administration of cortisone and A.C.T.H. is to diminish the amount of antibody produced. It certainly is worth further study.—We are, etc.,

Johannesburg. A. ZOUTENDYK,
J. H. S. GEAR,
South African Institute for Medical Research.

REFERENCES

Gear, James (1946). *Trans. R. Soc. trop. Med. Hyg.*, **39**, 301.
Wiener, A. S. (1950). *British Medical Journal*, **2**, 163.

Latent Amoebic Dysentery

SIR,—The contribution by Dr. Angus Everard (October 7, p. 818) contains the comment, "It seems very improbable that this was a case of indigenous amoebic dysentery, and much more likely that it was a relapse from a previously unrecognized infection contracted abroad." I would like to support this concept, seeing that during my period of military service in India I was able to review several patients whose symptom complex simulated that of dyspepsia, gastric ulcer, chronic appendicitis, or chronic hepatitis. These conditions occur in temperate climates and are unrelated to any tropical infection.

In the early part of my tropical experience, treatment was given on similar lines to those adopted in this country for such conditions, but an increasing knowledge of diseases endemic in India caused a revision of opinion, and on careful examination these patients revealed *E. histolytica* or the cysts of this organism in the stool; showed typical entamoebic ulceration of the rectum and colon on sigmoidoscopy; and those which did not show the organism in the stool even after a preliminary course of sulphaguanidine responded to a course of treatment for amoebiasis as laid down in Dr. Everard's memorandum.

In the short space of six weeks in the autumn of 1944, 24 patients were assessed for abdominal symptoms, the final diagnosis being amoebic hepatitis. All these patients showed no *E. histolytica* or cysts in the stool at any time and no evidence of intestinal amoebiasis by sigmoidoscopic examination, yet all responded favourably to the specific treatment for amoebic infection. The findings may be tabulated as follows:

No. of cases with previous history of amoebic dysentery ..	8
" " " " " bacillary dysentery ..	3
" " no previous history of dysentery ..	13
Total	24
No. with symptoms relating to probable gastric lesion ..	7
" " " " " appendix lesion ..	4
" " " " " hepatic lesion ..	2
Total	13

It would be fair to postulate that infection had occurred during the preceding two years but had remained latent, and the insidious character of *E. histolytica* caused one to feel justified in one's diagnosis, which was confirmed by subsequent investigation and treatment. In fact, it is a matter of surprise that more cases similar to Dr. Everard's have not been reported in the literature since the termination of the war in the Far East and the return home of the Servicemen from that theatre.—I am, etc.,

Maidstone, Kent. D. L. PUGH.

Troubles of being Biped

SIR,—Dr. Marjory W. Warren states (October 21, p. 921). "Anatomically and physiologically man has been designed for an active existence in the upright and vertical position." Is this generally accepted? I doubt it. Is it not a fact that varicose veins in various parts—legs, scrotum, and lower bowel—uterine prolapse, cystocele, rectocele, enteroptoses, etc., are all the result of our ancestors in the years of very long ago being so foolish as to decide to walk on two legs instead of four?—I am, etc.,

Glenfield, Leicester. FILMER COLEMAN.

Refusal to Appear in Court

SIR,—In common with many practising solicitors I have been under the impression that it is an advantage, when acting for a man appearing before the magistrates to answer an affiliation summons, to call medical evidence of blood tests performed on the interested parties and on the infant.

During the last couple of weeks I endeavoured to secure this evidence, as I have such a case in hand. I met with a complete lack of co-operation from the medical profession and a complete refusal from each pathologist I approached, explaining that after making the requisite tests his attendance would be required in court to give evidence of his findings. I applied to various London teaching hospitals as well as to other hospitals and private laboratories.

I am writing to inquire if you can explain the reason for this reluctance to attend court to give evidence of the result of these blood tests, and, if possible, to know who in the London area is prepared to attend a trial in a magistrates' court to give the requisite assistance.—I am, etc.,

London, N.W.2. A. A. WALFORD.

Care and Management of Laboratory Animals

SIR,—In 1943 we were seeking information about the care and management of laboratory animals and were able, through the hospitality of your columns, to make contact with many scientists using laboratory animals. Thanks to this help and to that of certain expert writers we were able to issue in 1947 the *UFAW Handbook on the Care and Management of Laboratory Animals*, edited by Professor A. N. Worden, M.R.C.V.S. As some time has now elapsed since this book appeared we should be most grateful if we might again appeal to all persons interested in laboratory animals to send us suggestions for the improvement of the *Handbook* and any additional information which has come to their notice. The subjects concerning which information is required are as follows:

The training of animal technicians, animal houses and animal rooms, rabbits, guinea-pigs, rats, mice, voles, hamsters, hedgehogs, ferrets, frogs, and other amphibians, fish, anthropoids, dogs, cats, goats, poultry, canaries, pigeons, or any other species of animals used for scientific purposes. Subject matter can be conveniently forwarded to us grouped under the headings of anaesthesia, euthanasia, supply and breeding, feeding and watering, general management and hygiene, transport by sea, land, and air, animal behaviour and psychology.

All the information which reaches us will be most gratefully acknowledged.—*I am, etc.*,

284, Regent's Park Road, London, N.W.3. F. JEAN VINTER.

POINTS FROM LETTERS

Arteriovenous Shunts

Dr. I. H. J. BOURNE (Hornchurch, Essex) writes: The arteriovenous shunt has recently been demonstrated in the stomach by Professor Bentley, of Newcastle. . . . The shunt would seem to be the basic mechanism not only of Raynaud's disease, the Trueta kidney, and gastric disorders: one is tempted to forecast that this mechanism will be found to operate in all parts of the body. . . . In the case of the stomach, the shunting of blood away from the mucous membrane causes lowering of the vitality of the membrane and greater liability to abrasion or irritation. This shunt can be initiated via the nervous paths, or by direct injury, such as manipulation during operation. Of other as yet unexplained disease processes in the body, fibrositis may be taken as a good example. . . . If for any reason the blood supply to muscle fibres is cut off, the damage results in swelling of those fibres. This swelling would take place after an interval of time has lapsed. This point may be substantiated by quoting a recent theory concerning the aetiology of sterno-mastoid tumour in newborn infants. If the blood supply to a part of the sterno-mastoid muscle is cut off by pressure during the second stage of labour, the damaged muscle fibres are seen to swell after an interval of ten days. These muscle fibres have been killed, and are replaced in time by fibrous tissues. One can visualize lesser degrees of damage occurring in muscles affected by fibrositis. . . . In these cases the arteriovenous shunt system may be stimulated by the sympathetic nerves as a result of mental conflict.

Obituary

J. H. ANDERSON, C.M.G., C.B.E., M.D., F.R.A.C.P.

Colonel J. H. Anderson, who from 1924 onwards was physician at Ruthin Castle Clinic, died at Ruthin on November 4, aged 67 years.

John Hubback Anderson was born at Urana, New South Wales, where his father, the late Dr. J. F. Anderson, was in practice. The family moved to Tasmania, and Anderson was educated at Longford Grammar School. On leaving school he took a position in a lawyer's office at Launceston, but in 1904 he went to Ormond College, Melbourne University, to study medicine. He graduated M.B., B.S. in 1908, and proceeded M.D. two years later. After qualifying he became senior demonstrator in anatomy at Melbourne University under Professor R. J. A. Berry, and was later appointed honorary out-patients' physician at St. Vincent's Hospital, Melbourne. He went into practice at Benalla in 1914, but at the outbreak of war joined the A.I.F. After serving in Gallipoli, where he had a bad attack of dysentery, he had to be invalided back to Egypt. Later he went to France, and was gassed during the Somme offensive. He was twice mentioned in dispatches. Anderson then joined the headquarters staff in London, under General Sir Neville Howse, V.C., at Horseferry Road, where he became known to most of the young medical men from the Australian Commonwealth. For his distinguished services he was appointed C.B.E. in 1918 and C.M.G. a year later. He returned to Melbourne after the war and re-joined the anatomy school of the university. He gave the anatomy lectures in 1920, while Professor Berry was on leave, and later continued as senior demonstrator.

In 1923 Anderson returned to this country, and a year later became physician at Ruthin Castle Clinic in association with the late Sir Edmund Spriggs and Dr. S. W. Patterson. He soon made himself known as a sound clinical physician, and many old patients of the Clinic have paid tribute to his kindliness and helpfulness. In 1946 he became a member of Council of the B.M.A. as representative of South Australia, Tasmania, Victoria, and Western Australia. It interested him greatly to keep in touch with the advances of medical policy in this country and their repercussions on medicine in Australia. He was the London correspondent of the *Medical Journal of Australia*. During the second world war he served as Assistant Director-General of Medical Services in the Australian Army Staff in London.

Dr. S. W. Patterson writes: Anderson took an active part in the discussions on the N.H.S. Bill both centrally and in N. Wales. He was a very competent chairman of the Denbigh and Flint Division of the British Medical Association from 1938 to 1941, and besides being a member of Council he was also a member of the Dominions and Colonies and Dependencies Committees. His mind was always an orderly one; he found great difficulty in adjusting himself to changes of policy at Headquarters, and remained unconvinced of the usefulness of the National Health Service as at present constituted. Anderson associated himself with many local affairs in Denbighshire. He was commissioner for the Scouts, took an outstanding interest in the British Legion activities, and was for many years president of the county branch. He succeeded the late Sir Edmund Spriggs as chairman of the juvenile court in Ruthin, and he was High Sheriff designate of Denbighshire for next year. Dr. Anderson, whose wife died in 1937, is survived by his son and daughter.

D. S. STEVENSON, M.B.E., M.B., F.R.F.P.S.

Dr. Douglas Stuart Stevenson, physician to the Western Infirmary, Glasgow, died in Glasgow on October 21. He studied medicine at Glasgow University and graduated M.B., Ch.B. in 1917. He at once entered, through the Navy, the early but rapidly developing medical branch of what later became the R.A.F. His services were recognized by awards of the M.B.E. and the Belgian Croix de Guerre. When he returned to Glasgow after the war Stevenson graduated into pure consulting medicine, like many of his generation, as a family physician. He was in fact for years the trusted physician and adviser of many families round about Glasgow, who will not fail to remember his skill, courtesy, and friendship. This initial phase made Stevenson, when he obtained his wards at the Western Infirmary, an ideal practising consultant physician. He was never greatly interested in research, but rather in the care of his patients and also in the situation, domestic or otherwise, created by their illness. Thus Stevenson was a splendid teacher of medical students intending to become general practitioners, and such men are becoming rarer every day. He was an honorary lecturer in clinical medicine of Glasgow University, and he became a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow in 1932. For a number of years he was consulting physician to the Ayr County Hospital and to the Glasgow Orthopaedic and Rheumatic Clinic. Stevenson served again during the second world war, becoming a brigadier and consulting physician to the Army in Scotland. His duties entailed much travel and fatigue, but he seemed to enjoy the responsibilities to the full. The war years told on his health, however, and not long after his demobilization he was gradually compelled to give up some of his more strenuous physical activities. Fortunately he was able to continue his hospital and consulting work to the end. He made occasional contributions to the medical journals, including a paper, "Famine Oedema in Prisoners of War," in this *Journal* in 1944. Stevenson's death is a great loss to medicine in Glasgow and the West of Scotland, where he was well known in many circles, not all connected with his profession. The sympathy of many friends and grateful patients will go out to his widow and his schoolboy son.—*J. W. McN.*

C. N. GROVES, C.B.E., M.D.

Dr. Charles Nixon Groves, a general practitioner in the West End of London for 50 years, died suddenly at his home on November 8.

Born in 1871, he was educated at Bradfield College School and Keble College, Oxford. He completed his medical education at the London Hospital, graduating M.B., B.Ch. in 1878 and proceeding M.D. in 1901. After holding the posts of house-physician and house-surgeon at the London Hospital—he was the last house-surgeon to Sir Frederick Treves—he became resident medical officer at the Royal National Hospital for Diseases of the Chest. Groves then entered general practice in the West End of London and quickly built up a reputation as a sound clinician. Only those who had the privilege of working with him could realize on what solid foundation the confidence of his patients was based. During the first world war Groves was civilian medical officer in charge of the Darell Hospital for Officers, and he was twice mentioned in the lists of the Secretary of State for War. In 1920 he was appointed C.B.E. In later years many of the great names in the Army and Navy were among his patients. He was a Fellow of the Harveian Society and of the Medical Society of London, having been at one time a member of the council of both bodies. He remained a busy and vigorous doctor until just before he died, setting out on his round of visits at an early hour every day. His was an example we should all be proud to follow.—H. S.

Sir AUGUSTUS DANIEL, K.B.E., M.B.

Sir Augustus Daniel, who died in London on November 7 at the age of 83, devoted his life to the study of art after taking a medical degree. He was director of the National Gallery from 1929 to 1933.

Augustus Moore Daniel was the son of Dr. E. M. Daniel, of York. He was educated at Repton and Trinity College, Cambridge, where he took the Natural Science Tripos, obtaining a first in both parts. He played association football for the university in 1888 and 1889. At Guy's Hospital, where he studied medicine after leaving Cambridge, he was a dresser to Mr. Arbuthnot Lane, as he then was. After graduating M.B., B.Ch., Daniel immediately turned to the study of art, though at the same time he took an active part in local government affairs, in which he gained useful administrative experience. In 1900 he was appointed assistant director of the British School in Rome, where his talent for organization proved of lasting value. He became a trustee of the National Gallery in 1925, and he was appointed to succeed Sir Charles Holmes as director in 1928. In 1931 Cambridge University bestowed on him the honorary degree of Litt.D., and a year later he was created K.B.E. Towards the end of the first world war Daniel used his medical knowledge to good effect as chairman of the board of management of the Scarborough Hospital.

Dr. JOHN MCCREA died on October 23 at his home in Wargrave, Berkshire, aged 78. His father was Dr. John McCrea, of Belfast, and John McCrea, jun., studied medicine at Queen's College, Belfast, graduating M.B., B.Chir. in 1900. He then went out to South Africa during the Boer War as a civil surgeon attached to the Field Force, and he was awarded the Campaign Medal with three clasps. In 1904 he joined his brother, Dr. Hugh McCrea, in practice at Wargrave, and after a year or two, when his brother moved to London, he carried on the practice single-handed until Dr. Black joined him in partnership in 1947. He was a great example to the younger generation of practitioners, and as an upholder of the ethics of the medical profession no one could have been more scrupulous. He took an active part in the affairs of the British Medical Association, and was vice-chairman of the Reading Division in 1916–17. For many years he was a member of the executive committee of the Division, which he represented at the Annual Representative Meetings held in London in 1917 and 1942. He was one of the original members of the old panel committee for Berkshire, being chairman for many years. For a period he was also chairman of the Berkshire Insurance Committee, and he served on numerous subcommittees of that body. He represented Berkshire on the Panel Conference for several years. At his death he was vice-chairman of the Berkshire Executive Council and chairman of the Berkshire Local Medical Committee. He also took an active part in local community affairs, and Wargrave will miss his wise counsel. He was a well-known freemason, being a past grand deacon of the Grand Lodge of England and a life governor of the Royal Masonic Hospital. It was surprising how McCrea had time for all his many activities while carrying on a large country practice single-handed, but his happiness lay in giving service to his fellow men. He felt the death of his wife three years ago very deeply, and, although his ready Irish wit was still there, it did not bubble over as it had done in the old days. The sympathy of his friends and colleagues goes out to his two daughters and son.

Medical Notes in Parliament

The Ravages of Tuberculosis

During the debate on the address replying to the King's Speech Mr. WILLIAM REID on November 2 said he was perturbed about the absence from the King's Speech of any references to the ravages of tuberculosis. In Scotland there were 41,000 tuberculosis cases and more than 3,500 deaths per annum. Among young women the death rate was double that in England. Dr. Horace Joules, medical superintendent of the Central Middlesex Hospital, had said at a conference in Edinburgh on October 28 that the tuberculosis rate in Glasgow was as bad as that in Madrid. Mr. Reid declared that the whole population of Glasgow should be radiographed within the next month. That was the considered opinion of one of the greatest tuberculosis authorities in the country. Glasgow had 12,000 tuberculous persons on the registers of the public health department, although it had one of the most efficient health departments in the United Kingdom. He appealed to the Secretary of State for Scotland and the Minister of Health to consider a crisis expansion of the tuberculosis services. In Glasgow alone 1,000 additional beds and 300 additional nurses were needed. He suggested that care of the aged, the chronic sick, and the infirm should be removed from the regional hospital boards and that accommodation less elaborately equipped and less expensively staffed should be provided for them. To find sufficient nurses for all needs he suggested an appeal to churches of all denominations and to British Red Cross V.A.D.s to assist in an emergency nursing service, under the supervision of qualified nurses.

Experiments on Animals

On the Motion for the Adjournment on October 31 Mr. PETER FREEMAN said medical science had apparently adopted only one method of research in regard to cancer, and that was vivisection of living animals performed under the Cruelty to Animals Act, 1876. Vivisection had led to the introduction of dangerous medical treatments and a deplorable waste of public money, while health-promoting measures had been neglected. In 1904 there had been 8,290 experiments on animals for cancer research. The figure increased almost every year, and reached 75,343 in 1949. About two-thirds were conducted without any anaesthetics. No inspection was permitted to anyone except a few officials appointed by the Home Office, all of whom he believed to be trained vivisectors. The money spent on this purpose was estimated at between £10 m. and £20 m. during the last half-century, and meanwhile deaths from cancer in Great Britain had risen from 26,721 in 1900 to 80,732 in 1949. All experiments had turned out to be blind alleys and there should be no further delay in abandoning animal experimentation and concentrating on the study of cancer as it occurred spontaneously in man and its relationship to every aspect of his daily life.

Dr. CHARLES HILL said the assertion that animal experimentation was futile was flying in the face of the facts. Mr. Freeman had not told the house that as a result of animal experimentation at least one form of cancer had been successfully studied and now was curable. He had ignored the enormous benefits to humanity in this and other fields from animal experiments, and preferred his woolly assertions to the calm and cold findings of science. Dr. Hill said he preferred to see animals used in attempts to induce cancerous growth than to have human beings used for the purpose. He hoped that the remarks which Mr. Freeman had made would receive the contemptuous fate which they deserved.

Mr. G. DE FREITAS, in replying for the Home Office, explained the working of the Act of 1876. He also pointed out that the comparative mortality index in the Registrar-General's Statistical Review, which allowed for the effect of changes in the age distribution of the population, showed that from year to year over the last thirty years the death rate from cancer had remained fairly constant, and each year there had been a slight reduction in the mortality of women.

On November 1 Mr. PETER FREEMAN presented a petition against the practice of experimenting on living animals. He said the petition represented that such experiments were continually being extended, and prayed that their practice should be prohibited by law. The petition was ordered to lie on the table.

Name and Identity of Hospitals

Dr. CHARLES HILL asked on November 9 whether Mr. Bevan knew that in some areas, particularly recently, hospital management committees had over-emphasized their own names on notice boards, notepaper, and the like at the expense of the hospital's local name, which had meant so much to the hospital and to the area.

Mr. ANEURIN BEVAN said that probably one jealousy was driving out another. He was anxious for the local hospital to preserve its identity and its tradition within the National Health Service.

Mrs. E. M. BRADDOCK said some hospital management committees were anxious to get rid of the names by which the hospitals were called because under Public Assistance the hospitals had a very bad reputation for the treatment of patients.

Mr. BEVAN said he had known people anxious not to be sent into a particular hospital because it was called the Old Infirmary.

Fate of Kingston Victoria Hospital

Mr. J. A. BOYD-CARPENTER, on November 9, asked Mr. Bevan his decision as to the future of the Kingston Victoria Hospital.

Mr. BEVAN said this hospital was to be used as a gynaecological unit. The Surbiton Annexe hospital was to be converted to give alternative facilities to general practitioners.

Mr. BOYD-CARPENTER asked when the Surbiton Annexe was to be converted, and what was to happen to the 37 seriously ill patients before the conversion was completed.

Mr. BEVAN said arrangements were naturally being made for the patients. The Surbiton Annexe would be furnished as soon as the Ministry was aware that the general practitioners were prepared to make use of it.

Mr. BOYD-CARPENTER gave notice that he would raise the matter at the earliest opportunity.

Doctors' Prescriptions

Mr. GEORGE JEGER, on November 9, pointed out that doctors were having difficulty in resisting the demands of patients for prescriptions for medicinal preparations advertised direct to the public.

Mr. BEVAN said the responsibility for prescribing should rest solely on the judgment of the doctor. Sir Henry Cohen's Committee on Prescribing, therefore, recommended that publicly advertised preparations should not be prescribed under the National Health Service. This recommendation had been sent to all doctors, who had been asked to observe it. Any doctor who refused importunate demands had his full support.

Mr. HENRY STRAUSS asked whether it was a fact that far less than 1% of prescriptions had been for nationally advertised medicines.

Mr. BEVAN said he had not such precise information and would like to know its source.

Mrs. JEAN MANN asked if Mr. Bevan knew that many doctors were greatly perturbed at the wide latitude allowed for over-prescribing and that many asked for the reintroduction of the old procedure whereby prescriptions were properly scrutinized.

Mr. BEVAN believed this to be so, but remarked that it was a different question.

Food-poisoning.—5,329 cases of food-poisoning were notified to medical officers of health in the period January 1 to September 30, 1950.

Tricycles.—The number of persons waiting to be supplied with motor-propelled tricycles is 2,474. The average time of waiting is eight to ten months, but special action is taken to meet urgent needs Output exceeds the current demand.

Tuberculosis Sufferer's Rations.—The priority food rations are three eggs a week and a double ration of butter or margarine, which at present gives an extra four ounces. Before June this year the weekly allowances were three eggs, an extra three ounces of butter or margarine, and an extra ounce each of cooking fat and bacon. When milk was controlled the priority supply was 14 pints a week.

Universities and Colleges

UNIVERSITY OF OXFORD

An Act of Congregation of the University of Oxford passed on October 31 altered the existing regulations so as "to include original work among the requirements for the degree of Master of Surgery and to adjust the requirements to meet the needs of a candidate who has specialized in any branch of surgery."

Congregation also agreed to accept a decree authorizing the acceptance of a grant of £2,240 from the Medical Research Council for research into the effect of injection of radioactive substances. This work will be in the hands of Dr. Janet Vaughan, Principal of Somerville College and chairman of the Oxford Regional Hospitals Board; it will be carried out in the Department of Pharmacology. A further £1,000 was accepted for research in penicillin and similar substances by Dr. W. H. Wilkins, St. Peter's Hall, in the Department of Botany.

UNIVERSITY OF CAMBRIDGE

The Council of the Senate has appointed Sir Lionel Whitby as one of the representatives of the University at the Home Universities Conference to be held on December 15 and 16.

UNIVERSITY OF EDINBURGH

Professor Ian Aird, professor of surgery in the University of London and director of the Surgical Unit, Postgraduate Medical School of London, will deliver a Macarthur Postgraduate Lecture on "The Surgical Exposure of the Pancreas" in the surgery lecture theatre, University New Buildings, Edinburgh, on Friday, December 15, at 2.30 p.m. Senior students and graduates in medicine are invited to attend the lecture.

SOCIETY OF APOTHECARIES OF LONDON

A course of ten postgraduate lectures on "Modern Methods of Diagnosis and Treatment" will be delivered in the Hall of the Society (Black Friars Lane, Queen Victoria Street, E.C.) from December 4 to 8 (both dates inclusive), at 3.30 p.m. and 5 p.m. each day. The fee for the full course is £2 2s.; for any two lectures on the same afternoon, 10s.; and for a single lecture, 7s. 6d. Details will be published in the "Societies and Lectures" column of the *Journal*.

The Services

The following have been mentioned in recognition of gallant and distinguished services in Malaya during the period January 1 to June 30, 1950: Colonels C. P. Chambers and P. F. Palmer, O.B.E., late R.A.M.C.; Lieutenant-Colonel K. H. Clark, Lieutenant-Colonel (Temporary) T. M. W. D'Arcy, Majors R. Paul and P. A. P. Webberley, M.B.E., and Captain (Temporary) V. J. Logan, R.A.M.C.

A *Supplement* to the *London Gazette* has announced the following awards:

Three Clasps to the Territorial Efficiency Decoration.—Colonel D. L. Kerr, O.B.E., T.D., R.A.M.C.

Two Clasps to the Territorial Efficiency Decoration.—Colonel R. Rutherford, O.B.E., T.D., and Major E. C. Ellis, T.D., R.A.M.C.

2nd Clasp to the Territorial Efficiency Decoration.—Major (Honorary Colonel) W. Barclay, M.C., T.D., R.A.M.C.

1st Clasp to the Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) G. M. Warrack, D.S.O., O.B.E., T.D., R.A.M.C.

Territorial Efficiency Decoration and Three Clasps.—Major-General P. H. Mitchiner, C.B., C.B.E., T.D., K.H.S., R.A.M.C.

Territorial Efficiency Decoration and Two Clasps.—Major L. C. Lade, R.A.M.C.

Territorial Efficiency Decoration and 1st Clasp.—Lieutenant-Colonels S. G. de Clive-Lowe and T. H. Dockrell, Major R. H. Webber, M.B.E., and Captain (Honorary Major) L. F. Evans, R.A.M.C.

Territorial Efficiency Decoration.—Lieutenant-Colonel G. A. G. Mitchell, Majors A. F. Alsop, E. E. Evans, and I. C. A. D. P. Graham, and Captain (Honorary Major) D. J. A. Alban-Jones, R.A.M.C.

Medical News

World Health Organization

Dr. C. H. Hampshire has been re-elected chairman of the Expert Committee on the Unification of Pharmacopoeias. Other officers are Dr. R. Hazard (France), as vice-chairman, Dr. H. Flück (Switzerland), and Professor E. Fullerton Cook (U.S.A.). The main task of the committee, which has met regularly since 1947, is to prepare an international pharmacopoeia with a unified nomenclature. The *W.H.O. Pharmacopoeia*, which contains descriptions of over 200 drugs, has now been completed, and the French and English editions will be in circulation by the beginning of next year. A Spanish translation will follow.

Manchester Lectures on History of Medicine

The University of Manchester has for a long time wished to interest its students in the history of medicine, and the Medical Faculty has had its good intentions stimulated from time to time by requests which have come from the students themselves. The desire to give a course of lectures on the history of medicine was to some extent in conflict with a strong reluctance to add anything to the already overloaded medical curriculum, but an experimental scheme has now been started. It is proposed that four or five lectures should be given each session, some by members of the university and some by distinguished visitors. The lectures are not to be compulsory, and medical students in all years may attend, as well as members of the university staff. No attempt is being made to give a comprehensive course in the history of medicine, or a series of lectures, but each lecturer is invited to speak on a branch of medical history which is of particular interest to him. In the course of six years of medical study students should thus be able to listen to lectures on many aspects of medical history, and those who have a liking for this kind of knowledge will be stimulated to find out more for themselves. The inaugural lecture has been given by Dr. Charles Singer, whose subject was "Leonardo da Vinci as Anatomist, Physiologist, and Man of Science." It was very well attended and much appreciated. Other lectures during the session will be by Dr. William Brockbank, Mr. Geoffrey Keynes, and Sir Geoffrey Jefferson, F.R.S.

Liverpool Medical Institution

An ordinary meeting of the Liverpool Medical Institution was held on October 26, with the president, Dr. D. Johnston, in the chair. Professor J. H. Biggart read a paper on "Rheumatic Fever." Dr. C. Astley Clarke, Dr. I. Ansell, and Dr. S. E. Keidan contributed to the subsequent discussion.

William Hyde Award

The Research Board for the Correlation of Medical Science and Physical Education has awarded the William Hyde award to Mr. H. H. Newell, the engineering superintendent in charge of the rehabilitation workshop of Vauxhall Motors Limited. The award is in recognition of his skill and resource in developing a form of engineering occupational therapy. William Hyde, in whose memory the award was instituted by the Nuffield Trust, died in 1945. His concern for the future of the hospital services to a large extent led to the establishment of the Nuffield Provincial Hospitals Trust.

Ulster Paediatric Society

The Ulster Paediatric Society met on October 6 in Armagh, with Dr. Robert Marshall in the chair. A discussion on "The Care of the Child in the First Year at School" was opened by Professor A. C. Stevenson, Dr. Kathleen Corbett, and Professor F. M. B. Allen, who presented several aspects of the subject, upon which other members commented. After the meeting members and guests visited the Armagh observatory by invitation of the astronomer.

Leeds Joint Council on Industrial Health

The Leeds Joint Council on Industrial Health—the first joint council to be established in the country—has issued a brief annual report for 1949–50. Dr. Vaughan Jones, representing the Leeds Division of the B.M.A., is chairman of the council, and among the other participating organizations are the Leeds Chamber of Commerce, the Leeds Trades Council, and a number of trade associations and trade unions. Following a conference of joint councils held at Derby last year, at which Dr. Vaughan Jones was chairman, the Leeds Council have under consideration a proposal to carry out a survey to determine the likely implications of a full occupational health service; this project has been deferred, however, until the report of the Dale Committee on Industrial Health is available. The Leeds Council has also been preparing new model by-laws aimed at improving food-handling.

Innervation of the Kidney

The third general meeting of the Renal Association was held at the Ciba Foundation in London on October 26, when microscope slides were demonstrated and two papers read. Dr. de Muylder described his findings with Cajal's reduced silver staining, chiefly working with embryo and newborn mice and human foetal material. He said that he had found various types of swellings on nerve fibres which ran alongside the renal venules, and these swellings sometimes projected into the lumen of the vessel or even crossed it completely, so that blood was separated from nerve fibre by only a thin endothelial sheath. In older animals he had never found these structures, however; it was possible they had some chemosensory function. He said that he had virtually never found nerve cells within the kidney. Dr. El Asfoury, working with the adult rat and human necropsy material, was convinced that nerve cells, often grouped in microganglia and showing synaptic junctions, were present in profusion in the kidney, and offered the demonstrable persistence of nerve fibres and even the growth of new ones in nerve degeneration (section) experiments as supporting evidence. He attributed the difference between his results and those of some other workers to his use of special staining techniques which did not show up the collagen reticulum—a potent source of confusion—to careful and extensive photomicrography, and to the establishment of very precise criteria for the recognition of nerve cells and fibres. The papers were followed by a short discussion.

Sécurité Sociale—the French National Health Scheme

Dr. J. A. Huet, mayor of Asnières (Seine), spoke on October 24 at the Institut Français in London on the development since the end of the war of the French concept of a national health service. In spite of strong opposition from the medical profession (as many as 12,000 out of the 28,000 doctors in France had voted against it) a service was now functioning in a majority of the Departments in which doctors agreed to charge on a scale of fees judged equitable by a national commission, and the patients claimed back from the health service up to 80% of the charge to them of medical attention and treatment. Dr. Huet said the scheme was successfully balancing its budget and had been able to finance centres for lung and heart surgery and other specialties, to organize a blood transfusion service, and to equip many hospitals to a better standard than hitherto known in France. But while the care and facilities for treatment of the severely ill patient had thus been improved, the service had not benefited the "benign" illnesses in the same way; the emphasis was on hospital and clinic development rather than home care and the individual family doctor. Medicine had evolved from charity to group responsibility, and from the practice of individual workers to that of the team. He thought that the undeniable faults in the service would be eliminated in time.

Distribution of Cortisone in U.S.A.

An American firm manufacturing cortisone—Messrs. Merck—announces that it will be made available in the U.S.A. from about November 1 in general as well as hospital practice. The price is being reduced to $35 a gramme.

"Fifty Years of Medicine"

The issue of the *British Medical Journal* for January 7, 1950, was devoted to a historical survey of the progress of medicine in the last 50 years. Many readers suggested that this symposium should be republished in book form. It will soon appear as a well-designed book of about 330 pages, royal octavo in size, bound in cloth boards, and with 33 pages of illustrations on art paper. It will be on sale from the end of the month through booksellers, or direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, price 15s., post free.

Wills

Dr. V. J. Duigan, of Gorleston-on-Sea, left £9,368; Dr. R. M. Galloway, formerly M.O.H. for Bolton and for Dewsbury, £6,782; Sir Arthur Bagshawe, C.M.G., formerly Director of the Bureau of Hygiene and Tropical Diseases, £12,953 (he left £100 to the Royal Medical Benevolent Fund); Dr. T. G. Laslett, of Farnworth, Lancs, £18,573; Dr. F. M. Burnett, formerly of Sevenoaks, £12,283; Dr. A. G. E. Wilcock, of Ringwood, Hants, £9,426; Dr. R. J. Hutchinson, of Haslemere, Surrey, son of the late Sir Jonathan Hutchinson, £20,214; Dr. E. J. Martin, of Kirkby Lonsdale, Westmorland, £11,840; and Dr. S. E. Critchley, of Bolton, £27,555.

COMING EVENTS

Empire Rheumatism Council

The Empire Rheumatism Council (Tavistock House North, Tavistock Square, London, W.C.) has arranged a week-end postgraduate course to be held at the Hall of the Society of Apothecaries of London, Black Friars Lane, Queen Victoria Street, E.C., on Friday, Saturday, and Sunday, November 17, 18, and 19, with the following programme: November 17, 4.30 p.m., Dr. W. S. C. Copeman, "Fibrositis"; 5.30 p.m., Dr. Oswald Savage, "Cortisone and A.C.T.H. in the Rheumatic Diseases." November 18, 10 a.m., Dr. E. G. L. Bywaters, "Juvenile Rheumatism"; 11.15 a.m., Dr. G. D. Kersley, "Gout"; 2 p.m., Dr. H. J. Gibson, "Pathology of the Rheumatic Diseases"; 3 p.m., Dr. H. F. West, "Rheumatoid Arthritis"; 4.30 p.m., Dr. F. Dudley Hart, "Ankylosing Spondylitis." November 19, 10 a.m., Dr. H. A. Burt, "The Aims of Physical Medicine in the Treatment of Rheumatism"; 11.15 a.m., Mr. W. D. Coltart, "Orthopaedic Aspects of the Rheumatic Diseases." The fee for the course (limited to 100) is £2 2s., payable to the general secretary of the council at the above address.

British Tuberculosis Association

A meeting of the British Tuberculosis Association will be held at 26, Portland Place, London, W., on Friday, November 24, at 3.15 p.m., when there will be a discussion on "The Use of Mass Radiography." The speakers will include Dr. Peter Kerley, on the development of mass radiography schemes in Great Britain; Dr. Norman Smith, on dry bones and how to clothe them; and Dr. Owen Clarke, on the wider application of miniature radiography.

International Haemophilia Society

A general meeting of the society will be held on Sunday, November 26, at 34, Eccleston Square, London, S.W.1, at 2.30 p.m. Anyone interested, and particularly patients and their relatives, are welcome to attend.

Christian Medical Fellowship

The London Committee of the Christian Medical Fellowship has arranged a meeting to be held at the Royal Empire Society, Northumberland Avenue, London, W.C. (Craven Street entrance), on Tuesday, November 28, at 7.45 for 8.15 p.m., when Mr. H. J. Seddon will speak on "The Christian Heritage in Medicine." Further particulars may be obtained from Mr. D. F. Ellison Nash, 10, Kingswood Drive, Dulwich, London, S.E.19.

The Ophthalmological Society

The annual congress next year of the Ophthalmological Society will be held at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, on March 29–31. The presidential address will be delivered by Mr. Maurice Whiting on March 29 at 10 a.m. The subject for discussion will be "The Association of Ocular and Articular Disease," which will be opened by Mr. L. H. Savin, Professor G. W. Pickering, Dr. F. Dudley Hart, Mr. A. B. Nutt, and Professor E. J. Wayne. Members who wish to take part in the subsequent discussion are advised to intimate their intention before the opening of the congress. No member may speak for more than ten minutes. The Bowman Lecture will be delivered by Sir Henry Dale, O.M., F.R.S. Members wishing to read a paper are asked to send the title, together with an abstract, to Mr. A. J. B. Goldsmith not later than December 31. Full particulars may be obtained from the society at 45, Lincoln's Inn Fields, London, W.C.2.

St. Mary's Hospital Medical School

The St. Mary's Hospital Medical School dinner for past and present students will be held at the Savoy Hotel (Embankment entrance), London, W.C., on Saturday, December 2, at 7 for 7.30 p.m., with Professor C. A. Pannett in the chair. Tickets, price 30s., may be obtained from the Medical School, Paddington, London, W.2.

Art Therapists in Clinics and Hospitals

A conference of art therapists in clinics and hospitals will be held on December 2, 1950, at 2 p.m., at 39, Queen Anne Street, London, W.1. The meeting will be short and will be mainly concerned with plans for future co-operation and training standards. The size of the conference is limited to 50. Applications will be dealt with in rotation by the conference secretary at this address.

Contraceptive Technique

A lecture and demonstration (on living models) on contraceptive technique will be given by Marie C. Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W., on Thursday, December 7, at 2.30 p.m. Tickets must be obtained in advance, as space is limited.

SOCIETIES AND LECTURES

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

Friday

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., November 17, 2.15 p.m., radiotherapy section meeting. Discussion: "*Radium Beam Therapy*," to be opened by Drs. Constance Wood and A. A. Charteris.

Monday

HUNTERIAN SOCIETY.—At Apothecaries Hall, Blackfriars Lane, Queen Victoria Street, London, E.C., November 20, 8.30 p.m., discussion: "*That Heredity is more Fateful than is Environment*," speakers, for the motion, Mr J. H. Doggart and Mr. J. F. Eastwood; against the motion, Dr. J. A. Fraser Roberts and Professor J. B. S. Haldane, F.R.S.

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 20, 5 p.m. "*Epilepsy*," by Dr. D. Williams.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 20, 5.30 p.m., lecture-demonstration for postgraduates by Dr E. Stengel.

KING'S COLLEGE, Strand, London, W.C.—November 20, "*Surface Reactions and Their Significance in Biology*," by Professor E. K. Rideal, F.R.S.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 20, 3.45 p.m., "*Progressive Circulatory Failure*," by Professor R. J. S. McDowall.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 20, 5 p.m., "*Paralytic Squint and Its Treatment*," by Mr. T. K. Lyle.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—At the Concert Hall, the Y.W.C.A., Shakespeare Street, Nottingham, November 20, 5 p.m., "*Accident Prevention in the Home*," public lecture by Dr. C. A. Boucher.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 20, 4.45 p.m., "*Aspects of Protein Structure*," by Dr. A. Elliott and Dr. W. E. Hanby.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 21, 5.30 p.m., "*Blood Groups*," by Dr. R. R. Race, Ph.D.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 21, 5 p.m., "*Cutaneous Tuberculosis*," by Dr. G. B. Dowling.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 21, 5.30 p.m., "*Some Aspects of Diseases of the Uveal Tract*," by Mr. A. G. Leigh.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 21, (1) 11 a.m., "*Cultivation and Identification of Pleuropneumonia-like Organisms: Principles of Bacterial Chemotherapy*," by Dr. S. R. N. Bushby; (2) 5 p.m., "*Stricture of the Urethra*," by Mr. J. F. Semple.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 21, 3.45 p.m., "*The Development of the Pharyngeal Derivatives and Endocrine Glands*," by Professor J. D. Boyd.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 21, 5 p.m., "*Science and Art of Refraction*," by Dr. T. H. Whittington.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 21, 5.15 p.m., "*Chemical Transmitters*," by Dr. W. S. Feldberg, F.R.S.

Wednesday

●BRITISH MEDICAL ASSOCIATION.—At B.M.A. House, Tavistock Square, London, W.C., November 22, 6.30 p.m., "*Can Disease Be Prevented?*" Sir Charles Hastings Lecture by Sir Lionel Whitby.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 22, 5 p.m., "*Medical Mycology*," lecture-demonstration by Dr. R. W. Riddell.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At Whittington Hospital, Highgate, N., November 22, 10.30 a.m., ward round by Mr. A. C. Morson; (2) at St. Paul's Hospital, Henrietta Street, London, W.C., November 22, 11 a.m., "*Local Diseases of the Penis*," by Dr. A. H. Harkness; (3) at St. Paul's Hospital, Henrietta Street, London, W.C., November 22, 3.30 p.m., museum specimens, by Mr. D. I. Williams; (4) at St. Paul's Hospital, Henrietta Street, London, W.C., November 22, 5 p.m., "*Prostatic Calculi*," by Mr. H. K. Vernon.

RESEARCH DEFENCE SOCIETY.—At University College (Physiology Lecture Theatre), Gower Street, London, W.C., November 22, 5.30 p.m., "*Experiments on the Nervous System*," Stephen Paget Memorial Lecture by Professor E. D. Adrian, O.M., F.R.S. Followed by annual general meeting of the society.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 22, 3.45 p.m., "*Sensations Associated with the Stomach*," by Professor W. R. Spurrell.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 22, 4 p.m., "*Clinical Ophthalmology*" (Revision), by Mr. R. A. Burn and Mr. R. P. Crick; 5.30 p.m., "*Ophthalmic Neurology*," by Mr. L. H. Savin.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 22, 3.30 p.m., "*The Advantages and Disadvantages of the Prefabricated House*," by Mr. A. C. Bossom, F.R.I.B.A., M.P.

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE, Anatomy Lecture Theatre, Charterhouse Square, London, E.C.—November 22, 5 p.m., "*The Reactions of Bacteria to Chemotherapeutic Agents*," Kettle Memorial Lecture by Professor L. P. Garrod.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At National Institute for Medical Research, The Ridgeway, Mill Hill, London, N.W., November 22, 6.15 p.m., meeting of Microbiological Panel. "*Recent Aids to the Study of Microbiology*." Papers by Sir Alexander Fleming, Dr. W. J. Elford, Mr. D. A. Tanfield, and Dr. W. H. Hughes.

Thursday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 23, 5.30 p.m., "*Blood Formation*," by Dr. J. V. Dacie.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, (Anatomy Theatre), Teviot Place, Edinburgh, November 23, 5 p.m., "*Differential Diagnosis in Acyanotic Congenital Heart Disease*," by Dr. R. M. Marquis.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 23, 5 p.m., "*Pigmentary Conditions of the Skin*," by Dr. I. Muende.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 23, 5.30 p.m., "*The Anatomy of the Ocular Muscle*," by Dr. F. Stansfield.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 23, 3 p.m., "*The Rhinencephalon*," by Professor F. Goldby.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 23, (1) 11 a.m., "*Chancroid*," by Dr. W. N. Mascall; (2) 5 p.m., "*Injuries, Fistula, and Foreign Bodies of the Urethra*," by Mr. H. G. Hanley.

LIVERPOOL MEDICAL INSTITUTION.—At Royal Liverpool Children's Hospital, Myrtle Street, Liverpool, November 23, 3.30 p.m., clinical demonstration.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 11, Chandos Street, London, W., November 23, 3 p.m., film: "*Thrombosis and Embolism*," by Mr. Maurice Lee.

LONDON UNIVERSITY, Senate House, Bloomsbury, W.C.—November 23, 5.30 p.m., "*The Biological Aspects of War: Conduct*," by Professor F. A. E. Crew, F.R.S.

MEDICO-LEGAL SOCIETY.—At 26, Portland Place, London, W., November 23, 8.15 p.m., "*The Case of Stanley Setty*," by Dr. F. E. Camps.

ROYAL ARMY MEDICAL COLLEGE.—At Lecture Theatre, John Islip Street, London, S.W., November 23, 5 p.m., "*Some Clinical Experiences During the Burma Campaign*," by Professor G. A. Ransome.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 23, 3.45 p.m., "*The Application of Biochemistry to Clinical Problems*," by Dr. N. Martin.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 23, 5.30 p.m., "*Operative Surgery*," by Miss J. M. Dollar.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 23, 4.30 p.m., lecture-demonstration on psychiatry by Dr. D. Curran.

TORQUAY AND DISTRICT MEDICAL SOCIETY.—At Torbay Hospital, November 23, 8.30 p.m., "*Medical Aspects of Hypertension*," by Dr. E. C. Warner.

Friday

KENT AND CANTERBURY HOSPITAL, Canterbury.—November 24, 8 p.m., clinical meeting.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—November 24, 5 p.m., clinical neurological demonstration by Dr. Marion Greaves.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, London, W.—November 24, 8 p.m., "*World Health and Treponematoses*," by Dr. T. Guthe.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 24, 4.15 p.m., "*Pathology*," by Miss M. Savory.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—November 24, 8 p.m., "*Congenital Heart Disease*," dissertation by Mr. Ralph Shabetai.

Saturday

ROYAL DENTAL HOSPITAL OF LONDON: SCHOOL OF DENTAL SURGERY, Leicester Square, W.C.—November 25, 10 a.m. and 2 p.m., annual clinical "At Home"; 7 p.m., annual dinner at Savoy Hotel.

APPOINTMENTS

ALFORD, K. F., M.B., Ch.B., D.P.H., Deputy County Medical Officer, Norfolk

BATES, T. J. N., M.B., B.Ch., D.P.M., Non-resident Whole-time Psychiatrist, Winwick Hospital, Liverpool Regional Hospital Board.

HAWKINS, C. F., M.D., M.R.C.P., D.A., Assistant Physician to United Birmingham Hospitals.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—*House-physician (Junior Registrar Grade)*, D. A. H. Trythall, M.D., M.R.C.P. *House-surgeon (Junior Registrar Grade)*, Irene M. S. Cade, M.B., B.S. *Junior Resident Anaesthetic Registrar (Junior Registrar Grade)*, J. A. Clarke, M.B., B.Ch.

INGRAM, H. VERNON, O.B.E., T.D., M.B., B.S., D.O.M.S., Ophthalmic Surgeon and Head of the Department of Ophthalmology, United Newcastle-upon-Tyne Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Eadie.—On November 10, 1950, at Brighton General Hospital, to Beryl (formerly Roberts), M.B., B.Ch., wife of Ronald Eadie, M.R.C.O.G., a daughter—Sarah Ann.

Eedy.—On October 31, 1950, at 86, Laurel Avenue, Forest Town, Mansfield, Notts, to Mrs. Eedy (formerly Chanu), wife of Dr. B. N. Eedy, a brother for Bernardine—Patrick.

Gilsenan.—On November 6, 1950, at 46, Waverley Road, St. Albans, to Tessa, wife of Dr. B. M. C. Gilsenan, a daughter—Clare Margarita Maria.

DEATHS

Blair.—On November 10, 1950, at 3A, Eton Terrace, Edinburgh, David Blair, M.D.

Briggs.—On November 2, 1950, at Auckland, New Zealand, Isaac George Briggs, M.R.C.S., L.R.C.P., aged 58.

Daniel.—On November 7, 1950, at 2, Hampstead Hill Gardens, London, N.W., Sir Augustus Moore Daniel, K.B.E., Hon.Litt.D., M.B., aged 83.

Fletcher.—On November 4, 1950, at Rustington, Henry James Fletcher, M.B., C.M., Lieutenant-Colonel, R.A.M.C., retired, aged 90.

Groves.—On November 8, 1950, at his home in London, Charles Nixon Groves, C.B.E., M.D.

Harrison.—On October 26, 1950, Alexander Thomas Harrison, M.B., B.S., of Park House, Shiburn, Durham.

Haworth.—On November 4, 1950, Henry Dean Haworth, M.D., D.P.H., of Edgefield, Nelson, Lancs, aged 69.

Ilderton.—On November 7, 1950, at Homefield, Meopham, Kent, Colin Ilderton Ilderton, M.B., B.S., aged 66.

Jameson.—On October 31, 1950, at Eldoret Hospital, Kenya, Ernest Tooke Jameson, M.D., of Chemeya, Turbo, Kenya.

Kilner.—On November 5, 1950, suddenly, at R.A.F. Hospital, Fayid, Egypt, Hugh Pomfret Kilner, M.B., B.Chir., Flying Officer, R.A.F., aged 26, son of Professor T. Pomfret Kilner and the late Olive Mary Kilner, and stepson of Mrs. T. P. Kilner, White Lodge, Old Headington, Oxford.

MacLachlan.—On October 26, 1950, at the Western Infirmary, Glasgow, John Thomson MacLachlan, M.D.

Smith.—On November 10, 1950, at Leages Hospital, Newcastle-upon-Tyne, Andrew Smith, L.R.C.P.&S.Ed., L.R.F.P.S.Glas., of Leven House, Swalwell, Co. Durham, aged 68.

No. 43

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 28.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	32	2	15	1	—	26	2	7	—	2
Deaths		—	—				1	—		
Diphtheria	40	3	17	2	1	101	11	33	4	4
Deaths	1	—	—	—	—	—	—	—	—	—
Dysentery	241	19	144		—	139	13	55	—	—
Deaths		—			—				—	—
Encephalitis, acute	9	1	—		—	1	—	—	—	1
Deaths		—		—			—			
Erysipelas			22	9	2			15	11	5
Deaths							—			
Infective enteritis or diarrhoea under 2 years			1	40 4	16 1	31	—	7	55 6	—
Deaths	7									
Measles*	6,632	471	116	95	98	995	63	27	129	45
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	27	1	8		1	39	4	7	—	—
Deaths										
Paratyphoid fever	14	1	—		—	14	1	1 (B)	2 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia influenzal	435	24	1		8	303	18	—	4	4
Deaths (from influenza)‡	17	6	—	—	—	11	2	3	—	—
Pneumonia, primary	141	24	115	¶ 8	9	136	15	133	10 7	7
Deaths										
Poliomyelitis, acute	253	14	25	3	5	367	55	5	5	4
Deaths§	12	—		—		21	2			
Puerperal fever			12				—	6		
Deaths										
Puerperal pyrexial‖	78	12	7		1	72	4	6	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,141	98	200	87	48	1,972	169	224	99	159
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	1	1	2	2	7	—	—	2	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,077	295	307	82	29	749	31	45	50	39
Deaths	1	—	—	—	—	2	—	—	—	—
Deaths (0–1 year)	212	37	25	15	7	233	30	38	23	6
Deaths (excluding stillbirths)	4,360	707	555	191	92	4,466	710	577	157	118
Annual death rate (per 1,000 persons living)			11·1					11·6	9·7	
Live births	6,561	1080	814	352	236	6,699	1051	820	376	177
Annual rate per 1,000 persons living			16·4					16·4	23·3	
Stillbirths	169	24	32			150	20	29		
Rate per 1,000 total births (including stillborn)			38					34		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending November 4 were: paralytic, 147 (182); non-paralytic, 57 (71); total, 204 (253). The figures for the previous week, compared with which there was a drop in the total notifications of 49, are in parentheses. Notifications for the corresponding week in 1947 and 1949 were 243 and 330.

Total uncorrected notifications for 1950 to and including the week under review are 7,747. The corresponding figures for 1947, 1948, and 1949 are 8,265, 2,050, and 5,589 respectively. Biggest decreases compared with the preceding week in county areas were as follows: Devon, 7; Durham, 6; Lancashire, 8; Norfolk, 5; Northumberland, 5; Worcester, 7. Any increases in notifications were comparatively insignificant and were widely scattered. In 24 counties there were no notifications at all. The weekly decrease in notifications is well maintained.

Discussion of Table

In *England and Wales* increases were recorded in the number of notifications of measles 756, whooping-cough 403, dysentery 72, and decreases were reported for scarlet fever 86 and acute poliomyelitis 25.

The largest increases in the number of notifications of measles were Yorkshire East Riding 129, London 105, Glamorganshire 96, Surrey 83; the only large decrease was Yorkshire West Riding 93. The largest fluctuations in the trends of scarlet fever were a decrease of 34 in Lancashire and an increase of 17 in London. The chief feature of the returns for diphtheria was an increase of 5 in the notifications in Yorkshire West Riding due to an outbreak of 4 cases in Rotherham R.D. The largest rises in the local trends of whooping-cough were Lancashire 98, Surrey 72, and London 44.

The chief centres of dysentery were Leicestershire 38 (Leicester C.B. 37); Yorkshire West Riding 31 (Huddersfield C.B. 15); Cumberland 27 (Penrith R.D. 25); Essex 26 (Romford M.B. 19); London 19 (Chelsea 8); Lancashire 18 (Liverpool C.B. 7); Kent 13; Yorkshire North Riding 12 (Middlesbrough C.B. 12); Gloucestershire 11 (Cheltenham M.B. 9); Durham 11.

The largest returns for acute poliomyelitis were Lancashire 22 (Liverpool C.B. 4); Devonshire 17 (Plymouth C.B. 4); Warwickshire 16 (Birmingham C.B. 13); Yorkshire West Riding 16 (Leeds C.B. 5); London 14; Gloucestershire 12 (Bristol C.B. 9); Staffordshire 11; Durham 10.

In *Scotland* decreases were recorded in the number of notifications of measles 24 and acute primary pneumonia 26, and an increase of 33 was reported for dysentery. The largest returns of dysentery were from the cities of Glasgow 69, Edinburgh 25, and Dumfries 11. The notifications of acute poliomyelitis were 4 fewer than in the preceding week; the largest returns were Glasgow 7 and Dundee 4.

In *Eire* an increase occurred in the number of notifications of whooping-cough 28 and diarrhoea and enteritis 12, and a decrease was reported for measles 19. In Dublin C.B. a rise of 11 for scarlet fever was recorded.

In *Northern Ireland* an increase of 42 in the notifications of measles and a decrease of 11 for diarrhoea and enteritis were the chief features of the returns. The largest rise in measles was 27 in Armagh county.

Week Ending November 4

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,108, whooping-cough 3,087, diphtheria 49, measles 7,815, acute pneumonia 433, acute poliomyelitis 204, dysentery 260, and paratyphoid fever 5.

Dr. T. M. Montford, of Castle Donington, near Derby, deputy chairman of the Leicestershire and Rutland Executive Council and ex-chairman of the local medical committee, has been re-elected from the Midland Division for the third year in succession to the management committee of the Association of Executive Councils.

Any Questions?

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

Pressure Cooking and Vitamins

Q.—*Is it true that essential vitamins are destroyed to a greater extent in pressure cooking than in the usual method of cooking food?*

A.—The chief factors in cooking which affect the retention of the less stable vitamins, such as vitamins B_1 and C, are the temperature, the time, the presence of air, and the amount of cooking water. The higher temperature reached in pressure cooking would tend to increase the loss of these vitamins, but the shorter time, the rapid elimination of air, and the small amount of cooking water would tend to decrease the loss. Only by experiment has it been possible to determine what the total effect is. One series of such experiments was reported in the *Journal* by Chappell and Hamilton (1949, **1**, 574), and these were the subject of a leading article (*Journal*, 1949, **1**, 582). These authors found that, with careful pressure cooking, there was less loss of vitamins B_1 and C in vegetables than with the most careful method of ordinary cooking. Similar results were found by Thomas *et al.* (*J. Amer. diet. Ass.*, 1949, **25**, 39) for vitamins B_1 and C and riboflavin, and by Hewston *et al.* (*Misc. Publ. U.S. Dep. Agric.*, No. 628, 1948) for vitamin C.

The short answer to the question, then, is that the vitamins are destroyed to a *lesser* extent in pressure cooking than in the usual methods of cooking.

Cervical Erosion

Q.—*What local treatment, other than cauterization, would you recommend for cervical erosions?*

A.—Cervical erosion in itself is not necessarily pathological and may not require any treatment. There is evidence that it is present at birth in about one-third of female babies, and it can presumably persist to adult life. This is a possible if not probable explanation of its occurrence in virgins. If erosion develops only in relation to pregnancy, it not infrequently disappears spontaneously during the months following delivery. Only when there are good grounds for believing that the erosion is secondarily infected, or is definitely producing symptoms, is treatment really necessary, and the best is cauterization. The use of chemical caustics such as silver nitrate or zinc chloride has been largely abandoned, and the actual cautery or diathermy coagulation is generally preferred. In bad cases diathermy conization or knife excision of the affected area is occasionally justified.

Endocrine therapy or the local application of antiseptics and astringents is of little, if any, value.

Athleticism and Longevity

Q.—*Is there anything known about the effects of athleticism on longevity? I have heard it stated that athletic people degenerate early and are more prone to heart trouble, etc., in middle life.*

A.—There is no support for the idea that strenuous athletics in youth lead to degenerative changes in the cardiovascular system in later life. Accepting as criteria the maintenance of unimpaired health and longevity, there is considerable evidence to the contrary.

J. Plesch (*Lancet*, 1932, **1**, 385) in an article on the subject of arteriosclerosis asserted that most athletes die before the age of 50 and that they are seldom capable of great physical exertion when they attain middle life. In the course of an ensuing correspondence Plesch explained that he had in mind certain pathological conditions and that under the term "athlete" he comprehended occupations which carried

hazardous associations—e.g., copper mining—an elasticity of terminology which was surely inadmissible. He referred also to an excessive mortality among stage acrobats, which might very well be true.

On the other hand, a great deal of information relating to athletes in the true sense of the word is available to allay such misgivings. Taking the university boat race (which represents an extreme form of violent exertion), John Edward Morgan, the Manchester physician, published in his work *University Oars* (1873, Macmillan) his elaborate inquiry into the after-histories of those who had rowed in the race between 1829 and 1869. In all, 294 were investigated, 40 having died. It emerged from this study that the life expectation of those who had taken part in the race was nearly five years longer than that of those accepted for life insurance.

Meylan in 1904 (*Harvard Graduates Magazine*, 1903–4, **12**, 362, 367, and 543) undertook a similar investigation among Harvard oarsmen between 1852 and 1892 with almost identical results. More recently Cooper and his colleagues (*Med. J. Aust.*, 1937, **1**, 577) found that, of 100 oarsmen at Ormond College, Melbourne University, 17 had died from natural causes during the succeeding 50 years. The expected mortality of men of the average age of 21 over the same period was, as quoted by the Australian Mutual Provident Society, 31.8%. Hartley and Llewellyn (*British Medical Journal*, 1939, **1**, 657), from a study of those who rowed in the Oxford and Cambridge boat race from 1829 to 1928, concluded that the expectation of life of the university oarsmen was appreciably better than that of the assured lives of their own generation, but that more recently this superiority had tended to diminish. Unfortunately no such investigations appear to have been conducted upon track athletes.

Without wishing in any way to put forward a case that athleticism contributes to longevity, it suffices for the present purpose dogmatically to deny the reverse.

Saccharin and Cancer

Q.—*There is a widely held opinion that saccharin is a carcinogen. Is this true?*

A.—There is no evidence that saccharin is a carcinogen for either man or animals. "Dulcin" (paraphenetyl-urea), one of the other artificial sweetening agents, has been shown to cause cancer of the liver in animals when the food contained 0.1% (*Fed. Proc.*, 1950, **9**, 272).

Harvesters' Lung

Q.—*What is the condition known as "harvesters' lung"?*

A.—Harvesters' or farmers' lung is a pneumonic process occurring in persons handling hay or grain. It is due to infection of the lungs by fungi (aspergillus or penicillium moulds). The incidence is seasonal and appears to be related to the occurrence of mould in the hay or grain which develops as a result of inclement weather. J. M. Campbell (*Journal*, 1932, **2**, 1143) describes five cases occurring in Westmorland in the summer of 1931. Owing to unusual summer rainfall this was a poor season for hay-making. The persons affected were farmers or farm labourers previously in good health. They were aware of slight shortness of breath for several weeks. After definite exposure to moulds, such as when cleaning out hay from a barn, they experienced a sudden onset of extreme dyspnoea, cyanosis, cough, and mild pyrexia (100° F.—37.8° C.).

R. Fawcitt (*Lond. Hosp. Gaz., clin. Suppl.*, June, 1940) reports similar symptoms in hay-workers and grain-workers. Examination of the chest revealed diffuse areas of dullness to percussion, with crepitations, rales, and rhonchi in both lungs. Haemoptysis occurred occasionally, and micro-fungi were found in the sputum.

Results of treatment with sulphonamide drugs and antibiotics have been disappointing. The majority of cases are cured by rest in bed and the administration of potassium iodide in increasing doses up to 300 gr. (20 g.) daily. A few cases progress to cavitation and bronchiectasis with copious purulent sputum.

Rectal Prolapse

Q.—*Is there any treatment which can help a rectal prolapse of 40 years' duration in a man of 76?*

A.—The advice given on the treatment of this case depends upon how large the prolapse is—whether it is a complete prolapse of the whole thickness of the rectal wall or whether of the mucous membrane only. Also, in a man of this age, treatment will depend upon the presence or otherwise of urinary obstruction, which, if present, would have to be dealt with. If there is prolapse of mucous membrane only, then submucous injections of 5% phenol in oil is often a good palliative treatment. If the prolapse is a complete one, but only small (not more than 1 in. (2.5 cm.) in extent), then the insertion of a silver wire around the anus (Thiersch's operation) might afford relief.

Falling Hair and Lactation

Q.—*Why does the hair of some women fall out easily and almost cease to grow during lactation? Can this be prevented?*

A.—There are no doubt different reasons for the fall of hair in different patients during lactation. The fall in oestrogen level after parturition is probably a major factor, though stress and strain, anaemia and debility, which are also commonly present, may play some part.

Treatment of the contributing factors is symptomatic, but it is probably unwise to interfere with the oestrogen balance at this stage. The falling of the hair is almost a normal happening, and recovery is the rule.

Herpes Simplex

Q.—*How should recurrent herpes simplex be treated?*

A.—Herpes simplex is due to a virus. It seems probable that the virus resides in the skin or mucosae and, although it may give rise to an eruption without any obvious exciting cause, fever often stimulates it to activity. Some patients have recurrent attacks over many years. Treatment is ineffectual, although some claim the eruption heals more rapidly if alcohol is applied to it. Untreated, the lesion disappears in about a week. The only prophylactic measure worth trial is vaccination with killed vaccinia virus, repeated three times; this has been successful in preventing the recurrent variety.

NOTES AND COMMENTS

Red Perspiration.—Dr. A. L. LEIGH SILVER (Porton) writes: I think it worth while noting that apparent red perspiration ("Any Questions?" November 4, p. 1072) can be caused by dye from outer garments, even if these are not red. This may be due to a selective action by sweat on this pigment. Secondly, a true red perspiration may be caused by the excretion of certain industrial chemicals. Trinitrotoluene gives sweat a reddish colour and this may show quite a bright red on clothing if there is a little residual alkali on it. I do not think that staining from untreated fungal infections is common. I have never noted it in trichomycosis (yellow, black, or red varieties).

Agents for Publishers.—Messrs. H. K. Lewis and Co., 136, Gower Street, London, W.C.1, state that they are the London agents for the Yearbook Publishers, publishers of *The Antihistamines*, by S. M. Feinberg, M.D., which was reviewed in the *Journal* of November 4 (p. 1040).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111 TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the ASSOCIATION. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 25 1950

SCIENTIFIC METHOD IN MEDICAL RESEARCH*

BY

Sir HENRY DALE, O.M., G.B.E., M.D., F.R.C.P., F.R.S.

It was as long ago as December, 1949, that I was honoured by an invitation to give this lecture, as an introduction to the series then being planned. "Scientific Method in Medical Research" was suggested to me as a title; and, having no alternative of my own ready to offer, I accepted the suggestion with a procrastinator's easy optimism. Only more recently did I begin to recognize that, to deal adequately with the multitudinous applications of such a theme, a variously qualified syndicate would be required—a greater company of experts, indeed, than those who are to deliver the 40-odd lectures of this series on the "Scientific Basis of Medicine." My task, however, is to offer some kind of general introduction, and not to attempt a speculative review of what the following lectures will present in detail. And I should, further, not wish to be precluded from the discussion of some of the conditions of medical research which concern rather its general direction, or its more immediate aims, than its scientific methods. I hope that I may be allowed, therefore, some freedom in interpreting the title which I accepted. "Methods and Aims in Medical Research" would perhaps more accurately indicate the scope of what I have in mind to put before you.

The Beginnings of "Modern Science"

It will be one purpose of this lecture to bring to your notice the effective and still progressive penetration of the methods and the standards of scientific research into medical thought and practice, as a remarkably recent development; and the more remarkable in that for its origin we have to go back to the very beginning of experimental science in this country. It is not without significance, I think, that the great movement which brought about the new birth, in the sixteenth and seventeenth centuries, of the method of investigating Nature by direct observation and experiment which we call "modern science" had as its pioneers in this country two physicians—William Gilbert and William Harvey. Gilbert's *De Magnete*, published in 1600, provided a real starting-point for the development here of experimental physics some 60 years later, through the work of Boyle, Hooke, and other early Fellows of the Royal Society; and with Harvey's *De Motu Cordis*, in 1628, came the real beginning of experimental physiology and medicine for all the world. You remember Harvey's fervid advocacy of the experimental method—veritable battle-cries of his attack on a medicine which, till then, had been based upon the study and interpretation of ancient authorities—"Not from books, but from dissections"; "To search and study out the secrets of Nature by way of experiment"; and, again, "Nature is herself to be addressed, the paths she shows us are to be boldly trodden; for thus only, and while we consult our own senses . . . shall we penetrate at length into the heart of her mystery."

It is noteworthy that Francis Bacon, who was Harvey's patient, paid so little attention to the great practical demonstrations which were given by these two, his English contemporaries, of what could be achieved by the method of direct appeal to Nature, which Bacon, himself no experimenter, was bent on proclaiming as the basis of a new philosophical system. The point of chief interest for our purpose, however, is that Harvey's great example and emphatic injunctions should have had so little apparent effect on his fellow physicians in England during the following 200 years. The unaided observational and descriptive study and naming of diseases as practised by Sydenham, whose career overlapped Harvey's, and by the many who followed him during this long period made very important additions, of course, to that aspect of medical knowledge; but they left problems of aetiology to crude and even fantastic speculation; while it is not surprising that the treatment of diseases should have so long remained so rarely effective and so often detrimental and dangerous. Such, however, was to be the general course of medicine for centuries. Harvey's experimental method passed, meanwhile, almost entirely into the hands of non-medical investigators. When the nature and mechanism of the circulation of the blood had been made clear, the next great step required for the advance of medicine—as Harvey himself had foreseen, though he made no real approach to it before he died—was the discovery of the nature of the respiratory process. This was very nearly achieved before the end of the seventeenth century by the group round Robert Boyle—Hooke, Mayow, and Lower, of whom only Lower had studied medicine—but science was then led astray by the dangerously plausible phlogistic speculation of Stahl, a physician, to be brought back to the true line of advance by the experimental chemist Lavoisier a century later.

Progress in the Nineteenth Century

In this long period, and well into the nineteenth century, Harvey's experimental method seems, indeed, to have commended itself to surgeons more than to his fellow physicians. John Hunter was passionately devoted to the making of experiments; his pupil, the country surgeon Edward Jenner, followed Hunter's suggestions and promptings in the experiments from which came not only a practical protection against smallpox but a seed of knowledge from which were to germinate, much later, the progressive

*An address given on October 10, 1950, in opening a course of lectures on "The Scientific Basis of Medicine" arranged by the British Postgraduate Medical Federation.

experimental sciences that now deal with specific immunity and with the viruses. You remember Hunter's letter to Jenner, with its provocative questions: "But why think? Why not try the experiment?" As late as the 1830's, such advancement of medical knowledge as was due to experiment seems still to have been largely in the hands of the surgeons. Charles Bell, in that decade, recognized afferent and efferent nerve fibres, and the different functions of the spinal nerve roots—an observation which was confirmed and extended, indeed, by the almost simultaneous researches of the French physiologist Magendie, in Paris. Of comparable importance, indeed, was the experimental work on reflex action of a physician, Marshall Hall, published by the Royal Society in its *Philosophical Transactions* in 1833, but received with scepticism and ridicule by leaders of contemporary medical opinion. It was an American Army surgeon again, William Beaumont, who in that period made the first systematic experimental studies of the secretory functions of the stomach and the digestive properties of its juice, using with a brilliant opportunism a gunshot accident which gave him a co-operative patient with a permanent traumatic gastric fistula.

From the middle years of the nineteenth century onwards the advancement of essentially medical knowledge by researches in the experimental laboratories was to provide one of the main currents in the gathering flood of general scientific discovery which characterized that period. First came the great revival of experimental physiology, due to the researches and the inspiring influence of Magendie's great pupil and successor in Paris, Claude Bernard, and, a little later, to the great school of Karl Ludwig, in Leipzig—a movement which, somewhat later again, was to spread to this country, largely at the hands of men who had been the pupils of these Continental pioneers. Then bacteriology, with its later outlet to immunology, was opened up to experimental research as an essentially new domain by the work of Louis Pasteur —who, though not medically qualified, had studied under Claude Bernard—and in Germany by that of Robert Koch, and then by the great host of those who followed the lead thus given; and among the early followers was Joseph Lister, who transformed the whole prospect in surgery by researches based on the analogy between surgical infection and putrefaction, the microbial origin of which had been demonstrated by Pasteur.

Discoveries by British Medical Men

Meanwhile, however, this outburst of activity, this great ferment and expansion of ideas, in the experimental sciences so nearly contiguous in their interests to medicine, would appear to have had much more effect on practical developments in public health administration and of technical aids to diagnosis than on the attitude of clinical authority to experimental research as a method by which medical knowledge could be advanced. British medicine of the middle and later nineteenth century could point, indeed, with justifiable pride to the discoveries then being made by keen observation of disease at the bedside, and by correlation of signs and symptoms with morbid changes in particular organs as seen post mortem. The skill and insight displayed in researches conducted on these slow observational lines by men like Richard Bright, Thomas Addison, or, on the surgical side, James Paget, and the scientific interest and importance of the discoveries thus made, would have justified a claim to distinction in medical research for any period in any country. Nor is it to be doubted that there are important discoveries still to be made by this patient method, which waits for Nature to make the experiments, in directions unpredictable and under conditions of unknown complexity, and contents itself with a faithful record and correlation of results.

One aspect of Harvey's injunction it obeys, in addressing its inquiry direct to Nature. On the other hand, it may be suspected that the very successes achieved by this purely expectant observational method, in this period of the middle and later years of the nineteenth century, may have been among the influences which kept clinical medicine so long aloof, made it seem, indeed, to drift further away from the widening stream of experimental discovery which was fulfilling the other, and major, principle of Harvey's policy. And meanwhile there were changes in the social status of practical medicine which would not, I think, have been conducive to the maintenance of a lifelong devotion, such as Addison had shown, to research by any method. William Gull, Addison's pupil, having won early fame by his work on thyroid defect and myxoedema, achieved it in another direction with the revelation, after his death, of the size of the fortune which an immense and various consulting practice had enabled him to accumulate. Whatever the reason, the cleavage between clinical practice and the experimental researches contributory to medical knowledge tended to become deeper.

In one department of medicine, indeed, that of neurology, this cleavage seems always to have been little if at all effective. Clinical knowledge here was conscious of its need for the analysis of nervous functions, which only the experimental laboratories could provide; while there were responses, especially on the sensory side, of the higher nervous centres which could be studied only by applying an experimental method to the reactions of a co-operative human patient. And so we find a Ferrier or a Horsley working always in the laboratories as well as in the wards, while the clinical researches of Hughlings Jackson were making an essential contribution to the physiology as well as to knowledge of the disorders of the central nervous system. And I have no doubt that cases here and there could be discovered, by search in the more general fields of medicine and surgery in that period, of such conscious co-operation and reciprocal fertilization of ideas between experimental research in the laboratories and practice and observation in the wards. G. R. Murray's discovery, in 1891, of the treatment of myxoedema by administration of thyroid gland comes to mind as an example; its inspiration came even more clearly from Horsley's experiments on monkeys than from Gull's clinical observations; but the very fact that it so readily suggests itself indicates to me that this was a rather conspicuous exception.

Aloofness to Experimental Research

I do not believe that I misunderstand or exaggerate the position in suggesting that, in medicine and surgery as a whole, including most of their special departments, there was in the period under discussion a growing tendency to this aloofness of interests and aims, this progressively dominant assumption that experimental research, and indeed the attempt to apply scientific criteria of evidence with any rigidity, was a matter for the laboratories; and that the practice of the wards, on its part, must be based upon a separate empirical art, ready on occasion to incorporate technical contributions from the research laboratories into the routine of diagnosis or treatment, but basing itself essentially on a body of esoteric experience, trained skill, and acquired instinct—an art, a craft, almost a priesthood, not properly a science of any kind, and least of all one seeking to advance knowledge "by way of experiment."

Perhaps there was a connexion between this attitude and the tradition, still current in my student days, that a physician should use no apparatus which could not be carried in his pocket or in his conveniently rigid and capacious tall hat. Even the clinical thermometer was under suspicion, indeed, of causing the loss of a special skill. The earlier physicians, it was claimed, had been able to discriminate among the causes of a fever by the quality of the feeling of heat communicated by the patient's skin to the experienced hand. I believe that that great observer Thomas Addison had been the first to claim that the skin in pneumonia gave a peculiar sensation of a tingling heat. Far be it from me to deride such a claim as incredible; my only concern is to emphasize the absence of any impulse to raise it above the level of such empirical observation. Scientifically, such clinical lore was, indeed, little better than the practice of a prescientific manufacture, depending for its test of the quality or consistency of a product on the experienced eye, nose, or thumb of the old foreman. The clinical attitude threatened to become, indeed, not merely unscientific, but even explicitly antiscientific.

When I say "explicitly" I have in mind the injunction which met me on the threshold of such clinical experience as I was destined to obtain. "When you enter my wards," said Dr. Samuel Gee, "your first duty is to forget all your physiology. Physiology," said he "is an experimental science—and a very good thing, no doubt, in its proper place. Medicine is not a science, but an empirical art, and it is as such that you may learn something of it here." He added that some day medicine, too, might become an experimental science; but that this would not be in his time.

Now Samuel Gee was a fine and scholarly physician—a late representative, and a very good one, of a tradition which then showed no sign of losing its authority. He had made his own distinguished contributions to medical knowledge by the accepted, observational method; his description of the condition which he named the "coeliac disease" was, I believe, as perfect as could be given until the experimental discovery and differentiation of the vitamins provided what was necessary to complete the aetiological picture. Like other honest physicians of his period he was cynically sceptical about most of the medicinal treatment then available; but he prescribed with judgment those few remedies in which his own experience gave him confidence. A case of "Barlow's disease" was admitted to his ward—infantile scurvy, in the first recognition of which, indeed, he had himself been associated with Thomas Barlow—and Gee ordered, not any drug, but raw meat juice and as many oranges as the child could suck. The empirical fact that such a treatment was effective in scurvy had, of course, been discovered, forgotten, and rediscovered in each of several previous centuries, and even made the basis of regulations by the Admiralty and the Board of Trade; but without the authority of the controlled experiments which have more recently established it on a basis of rational scientific meaning it might still be subject to these alternations of recognition and oblivion.

When every physician depended on his own experience, in most cases quite vague and unorganized, each was entitled, of course, to treat a condition of doubtful aetiology according to his own fancy. The situation was similar in the case of rickets. The treatment of this condition with cod-liver oil had been mentioned as early as 1840; in the period of which I am speaking, at the very beginning of this century, it was current gossip that the eminent Bart's surgeon Sir Thomas Smith had recommended it for the rickety lion cubs at the Zoo. Yet in default of controlled experimental evidence the physician could still pick and choose among the suggested causes of rickets, and vary his treatment accordingly. The favoured aetiologies then, so far as I remember them, were an intestinal infection and a defective absorption of fats; the latter being based, possibly, on some vaguely apprehended analogy with Gee's "coeliac disease." Meanwhile, in such a confusion of competing speculations and unorganized experience, rickets continued to flourish in our industrial communities, with nothing effective done to treat it, and nothing at all to prevent it. Well might the community have cried aloud, with John Hunter, "But why think? Why not try the experiment?" The experiments, however, which would at last give definite evidence concerning the origin of rickets, and provide a basis for the action which would practically eliminate it, were not to be made till some 15 years later by Sir Edward Mellanby, who is to give the first of the special lectures of this series.

To what, then, are we to attribute this aloofness, even antagonism, of the predominant clinical attitude of those days to the same application of the experimental method to problems in the field of medicine as had been so successful in other departments of natural science? Instinctive defence of authority from subversive intrusion would no doubt account in part for the reaction. A priesthood does not readily share its privilege, or accept additions to or corrections of its doctrine from outside the pale; while the advocates of the scientific method, on their part, would inevitably, with Harvey, react against authority as inimical to its spirit. But I think that we may find a further clue to this antagonism in a warning which, as late even as 1932, was given to his students in a lecture, and repeated with emphasis, by one who was assuredly no opponent of the proper use of the scientific method in medical research —the late Wilfred Trotter. "A practical art," he warned them, "which pretends to be an applied science does not show itself to be progressive, it only shows itself to be quackery." And I think it can hardly be doubted that such shallow pretence to find direct application, in the clinic, for experimental results, even when their soundness and their meaning were still largely matters of conjecture, was too obvious in the practice of some physicians early in this century; and contempt for such posturings must surely have sharpened the reaction of the sound physician of the old school, conscious that, within its own limitations, his cautious if unduly complacent empiricism had really more of the true spirit of science, in spite of his emphatic disclaimer.

A Change in Outlook

Our proper concern to-day, however, is not with the causes contributory to the position half a century ago, but rather to inquire into the causes of the remarkable change, the veritable transformation, which began not many years later, leading to to-day's increasingly co-operative relation between genuine research in the wards and researches in a large and still growing number of the natural and experimental sciences. How has it now become possible and natural to plan for such a series of lectures as will follow this one, dealing with so many aspects of "the Scientific Basis of Medicine," and to refer, without apology or hesitation, to "Scientific Method in Medical Research"? We cannot expect to recognize or to evaluate all the various factors which have contributed to this change. I must be satisfied to draw attention to a few.

We ought first to note the rapid spread—thinking of Harvey, we ought to call it a revival, perhaps—of the belief that a direct study of disease in the human patient can

partake of the nature of a genuinely scientific research. It may be purely observational, it may be experimental in its method; but, in either case, it is ready now to accept the controls and submit to the discipline of the scientific method, and no longer seeks escape from these on a plea that medicine is, and, by implication, can be content to remain, an empirical art and not a science. What has brought about the change? It has had enthusiastic advocates, like the late Sir Thomas Lewis, who insistently claimed for clinical research the status not merely of a science but of a separate *experimental* discipline, as independent, in its aims and its methods, of the physiology and pathology of the laboratories as these of other experimental sciences. I am sure that Lewis, with his burning conviction, did invaluable service to the encouragement in this country, lagging behind some others in that respect, of interest in clinical research as a career, and of enterprise in the provision of opportunities for it. It seems to me, on the other hand, that, with his own research activities concentrated on the physiological analysis of symptoms, he tended to exaggerate the possibilities of experiment on the human subject. There are obvious and natural limitations to experiments directly on man, in researches on aetiology, for example, and even, until a final and confirmatory stage, on therapeutics. Overemphasis of the scope of the experimental method in the clinic may tend, I think, to obscure the most important feature of the new and more general development, which so many of the lectures of this series will illustrate—namely, the progressive obliteration of the earlier deep division, the reciprocal aloofness, between the researches directed to the advancement of medical knowledge in the clinics and those making equally essential contributions to it from the experimental laboratories.

We must recognize, further, that the approach to this easier understanding has been made from both sides. Not only has there been a rapidly increasing readiness on the part of the clinics to adopt, or to interpret, as Wilfred Trotter would have it, the new knowledge pouring from the experimental laboratories; an increasing number of researches in a widening range of the experimental sciences have been undertaken with a conscious orientation towards the advancement of biological and ultimately of medical knowledge. But the most important result, I believe, of this more intimate understanding has been a growing recognition of the need and the duty to interpret the evidence produced, whether it comes from clinics or laboratories, whether from opportunist observations or from deliberately framed experiments, by common and rigid standards of scientific validity and significance.

I spoke of researches in the experimental sciences which have had in view the possibility of service to medical knowledge; it seems hazardous, however, if not impossible, to predict of any scientific discovery to-day, however remote its immediate or conscious objective, that it can never find medical application. Who would have foreseen that the effect of a magnetic field on the path of an electron, or the fission of heavy atomic nuclei under neutron bombardment, would have any special bearing on medical researches? Yet the electron microscope and the newly available radioactive isotopes seem, so far, to have found their readiest and perhaps their most important applications in researches contributory to medicine. Plenty of other examples could be found, and many, indeed, will be furnished by special lectures of this series. I must be content, however, to mention a few of the more general developments in experimental science which seem to me to have exercised an especially potent influence on the course of medical research and on the growth of the newly co-operative relations between the clinics and the laboratories.

The Influence of Biochemistry

I think that I should place first, for influence in that direction, the rapid penetration, by chemical ideas and chemical methods, of experimental physiology, pathology, therapeutics, and, indeed, a much wider range of the biological sciences. Biochemistry, as we know it to-day, is essentially a creation of the present century. When I was a student at Cambridge, chemical physiology, as we called it, was in relatively low esteem even with the physiologists, and in lower still with the chemists—a Cinderella in the scientific household. "Tierchemie ist Schmierchemie"—animal chemistry is a chemistry of messes—was an aphorism widely quoted and attributed to the great Emil Fischer, then the recognized European leader in organic chemistry. Yet Fischer, by applying the methods of exact chemistry to attack the complex structures of the sugars, and then of the proteins, was himself becoming one of the pioneers of a development which in a few decades was to give to the new biochemistry a place of central importance among the medical and biological sciences.

And then, just before the new century began, the late Frederick Gowland Hopkins came to Cambridge, where, by the influence of his own researches and teaching, and by his steady championship of its potential significance and scope, he was to play a leading part in the movement which has enabled biochemistry so rapidly to permeate and to give a new orientation to ideas and methods in medical research, in the clinic as well as in the experimental laboratories. And, in years more recent, the results which biochemistry was thus achieving by use of the more fundamental chemical disciplines have brought a major and progressive part of organic chemistry, with great new resources of knowledge and of methods acquired in other studies, back to its original aim—the investigation of substances of biological origin and interest—and thus into contacts, now ever more numerous and intimate, with medical research and with clinical medicine.

Look at the list of the lectures of this series, and observe how large a proportion of them deal with medical advances involving applications of exact methods and fundamental principles of chemistry—lectures dealing not only with problems of animal and human nutrition, metabolism, excretory and respiratory functions, with hormones and vitamins, but with conditions of bacterial growth, tissue defences, immunity reactions, and with the chemotherapy of infections. I make only a quick selection as I glance at the list.

Immunology and Chemotherapy

In connexion with advances in immunology and chemotherapy, which have produced in recent decades so conspicuous a revolution in the methods of preventing and treating infections, we may note again how dominant was the influence of chemical knowledge and chemical conceptions on the pioneer investigations, and, indeed, on the whole of the experimental strategy, of the late Paul Ehrlich and of those who have followed his inspiring lead. And could we find anywhere a more complete illustration of the influence of chemical ideas and discoveries on the progress of medical knowledge, or of effective co-operation between researches in the clinics and in the laboratories, than that offered by the recent work of Hench and Kendall, of the Mayo Clinic, on the remedial effects of cortisone and A.C.T.H. on rheumatoid arthritis, on rheumatic conditions in general, and on a still widening range, apparently, of abnormal protective or allergic reactions? Dr. Hench is, in fact, lecturing on that subject at this moment at the Royal Society of Medicine. Clearly no approach to a discovery so brilliant in its immediate achievement and in its promise of further developments could have been made without the years of systematic laboratory researches by Kendall and others on the difficult and complex chemistry of the hormones of the adrenal cortex, or without other experimental knowledge of the effects of chemically differentiated specific hormones of the pituitary anterior lobe on the activities of different ductless glands. But, on the other hand, to bring all this wealth of discovery from the laboratories to this particular focus and practical trial evidence was required, which only expert clinical researches could have supplied, concerning the remissions of rheumatic or allergic conditions occurring regularly in circumstances which had been shown to raise the output of the adrenal cortical hormones—an observation made possible, once again, by the application of chemical knowledge and chemical methods to material made available by the use of clinical opportunities. Those of you who attend the full series of these lectures will have the opportunity of observing many other examples of the part thus played by chemical methods and ideas in medical research as we now know it.

Biophysics

Good cases could be made, no doubt, for the significance, in the development which we are considering, of advances in other departments of fundamental science. Physics, for example, was very early represented by the rapid exploitation of the *x* rays in diagnosis; more recently it has offered many applications of the modern resources for amplifying and recording small variations of electrical potential, as in electrocardiography and electroencephalography. I think, however, that it can fairly be suggested that such advances in physical knowledge and technique have hitherto been largely used in medicine as devices for record and diagnosis, and that physical ideas in themselves have so far not so powerfully affected the general direction and outlook of medical research as have those derived from biochemistry. The fundamental physiology of muscular and nervous activity has, of course, been immensely enriched by use of the methods which modern physics provides. These have enabled us to recognize, to record, and to measure fleeting and otherwise imperceptible changes and to make proximate analyses of natural complexities of these into unitary components; but always with the presumption that the electrical changes thus detected and analysed are but signals of ultimately biochemical phenomena. The coming generation may, nevertheless, find biophysics rivalling or even replacing biochemistry in its influence on the course of medical research and the directions of medical thought.

The Science of Statistics

If, however, I were asked to choose one other among the more fundamental scientific activities as a competitor with biochemistry in these recent decades, for depth and range of influence on thought and practice in medical research, I should name the science of statistics. Quietly but irresistibly, it seems to me, statistical methods and principles have been exercising and establishing their corrective influence, substituting a numerical measure of the evidential significance of data obtained in ward or laboratory, whether from opportunist observations or deliberately planned experiments, for the vague and speculative methods of appraisement which formerly prevailed.

Two lectures of this series, by Professor Bradford Hill, will furnish detailed illustration of this salutary influence of statistics on medical research. This bracing discipline was as badly needed in the laboratories as in the wards; and from both sides came signs of shivering discomfort, as an early reaction to the cold jet of statistical reason. It must indeed have been painful to a mind proudly reliant on the experience of half a lifetime to submit to the imposition of control experiments and statistical evaluation of results as a protection against an unconscious bias of its judgment. To name an example of topical interest, it may be regarded as practically certain that uncontrolled clinical testimony would, but a few decades ago, have given an extended currency, at least, to confidence in the proved value of the antihistaminic substances as suppressive remedies for the common cold.

On the other hand, the value of a statistical criticism of methods and results has been at least as obvious in the experimental laboratories of medical science. It was especially needed, I think, in connexion with the common type of experiment in which an attempt is made to determine the smallest quantity of a remedy, or other preparation, producing death or some other limiting reaction—what my former colleague, Professor Gaddum, conveniently termed a "quantal response." The problem was first presented in its true perspective, I believe, in a paper in which results obtained by the late Sidney Rowland with a plague-bacillus toxin were analysed by the late Professor Major Greenwood, to whose influence and teaching during many years medical science has been immensely indebted for the clarification of its ideas in this direction. Professor R. A. Fisher's investigations and writings have also achieved the authority of classics in a wider range of biology; while as contributors, in this country, to the building of a scientific statistical basis for the procedures involved in the "biological standardization of remedies," the names of Trevan, Gaddum, Emmens, and, most recently, Perry are worthy of special recognition.

Earlier to-day I was waiting at a multiple bus-halt at which buses of every line due to stop there seemed to arrive in rapidly repeated succession, except that which I wanted. And it occurred to me that a conclusion, that my line had somehow been eliminated, could have been based on reasoning not very different from that which passed muster not only in the wards, but often in the experimental laboratories, in my early days as student and research worker. And when I had despairingly departed in a taxi my successor at the halt would probably have concluded that buses of the line for which I had waited in vain predominated among those stopping there; and so we should have had the familiar and discouraging conflict of scientific evidence.

Even now I suspect that there may still be found, here and there, authors of medical publications, both clinical and experimental, whose tentative sips at the Pierian spring of statistical method have produced in them little more than a conviction that the occurrence of a particular event—death, say, or recovery—in two out of three instances will become scientifically precise and significant if they record it as a percentage—66.6%.. In general, however, I am sure that the calm and ruthless logic of the statistical method has had an influence of inestimable value, in giving a higher level of scientific authority to the planning of investigations and the appraisement of their results, over the whole field of medical research; and that, in thus imposing common standards of scientific validity and quantitative significance on researches in the field, in the wards, and in the laboratories, it has been a most potent factor in the newly co-operative relationship.

Opportunities for Research Work

Let me now make brief reference to the important part in promoting this growth and integration of scientific activities in medical research played by the great changes which have occurred in the source and the scale of the material provision available for its support. Those of us who wished to try our hands at research in the medical field at the opening of the century competed hopefully for the rare crumbs of brief opportunity, which then fell infrequently from a few small private endowments. You know how profoundly that position has been altered. With much larger funds available from private generosity, and with even more important and steadily expanding grants of public money, administered by the Medical Research Council or dispensed through the University Grants Committee, no man with a genuine impulse and with an adequate equipment of training and temperament for medical research need fail now to find an opportunity to prove his aptitude, and, if the result be favourable, to give medical research then at least a prominent place in his life's plans and ambitions. I am one of a great number who have reason to be grateful for the opportunities which have been created under this new dispensation.

There have been and may still be some, however, who, while they would acknowledge that the results, so far, appear to have been broadly beneficial, are doubtful and suspicious concerning the ultimate effects of this predominant support from public funds on the freedom of medical research, and therewith on its long-range effectiveness, as well as on its scientific spirit. Up to a point I can understand this anxiety, considering what might happen under an administration less wise and sympathetic, less expert and independent, than that which has hitherto been responsible for the effective decisions.

The anxiety in question is not unconnected, I think, with a more general discussion, now current, of the proper aim of research in all departments of science. You will no doubt have heard it argued by some that the proper aim of research is to discover truth for its own sake, and by others that it is to discover means for the material improvement of the lot of mankind. If you follow the arguments in detail, however, you will find that those who advocate the pursuit of knowledge for its own beauty and excellence often support their claim by evidence that this has led to the widest and most beneficent of practical developments; while those who insist that material benefit is the proper aim justify encouragement of the most abstract researches as an eventual contribution to that practical end. One begins to wonder, indeed, whether there is much to choose between these rival creeds. It has to be remembered however, that the advocacy of material human benefit, as the only acceptable aim, has associations with a particular political philosophy, and thus with plans for a central, authoritative direction of research. Theories, like people who seem innocent in themselves, may prove to be dangerous through the company they keep.

The Ultimate Aim

In dealing with medical research, in particular, material benefit to human life and health must surely be accepted as the ultimate aim; I can find no other meaning for the word "medical" in such a connexion. And our chief concern must be to ensure that the public funds directly granted for medical research continue to be administered and allotted, as hitherto, by a Council composed predominantly of experts who know the meaning of research, and who can be trusted to recognize the ways in which its truly scientific pursuit can most effectively be encouraged, without either facile enthusiasm or obstinate caution. Such administrators will know from their own experience that, while the consciousness of the ultimately philanthropic purpose must be retained, and may even provide a valuable stimulus, success in medical research very often depends on an investigator's freedom to seize and to follow an unexpected clue, even when it appears to lead far from the original objective, and in a direction offering no visible likelihood of practical developments. They will be aware of the danger of short cuts, taken in the hope of reaching some dramatically practical result, without submission to the full and exacting discipline of science; and they will know how to hold and adjust the balance between the claims of researches undertaken to develop existing knowledge for medical uses and of those which plan bolder adventures into the unknown. While the administration remains safely under such expert and independent control, the support of medical research from the public funds, now an indispensable condition of its pursuit in this country on the present progressive scale, will continue to be protected from any serious danger to its freedom and integrity. Such danger could arise only if the distribution of the available funds were to become subject to political pressure, seeking to influence its direction in order to satisfy some popular clamour or sentiment, to meet some official convenience, or to enhance some Minister's prestige.

LABORATORY AND CLINICAL EXPERIENCE WITH TERRAMYCIN HYDROCHLORIDE

BY

W. D. LINSELL, M.D.
Lecturer in Bacteriology

AND

A. P. FLETCHER, M.D., M.R.C.P.
Senior Medical Registrar

(From the Department of Bacteriology and the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School and St. Mary's Hospital)

A comparatively recent addition to the field of chemotherapy is the new antibiotic "terramycin hydrochloride," first reported in America by Finlay *et al.* (1950). This substance was obtained as a pure amphoteric compound from the growth of a soil actinomycete, *Streptomyces rimosus*.

There is already an extensive American literature, and much is in course of publication, on the physical, chemical, bacteriological, and clinical properties of terramycin (Finlay *et al.*, 1950; Hobby *et al.*, 1950; Welch *et al.*, 1950; Herrell *et al.*, 1950; Bliss *et al.*, 1950).

Terramycin hydrochloride is a sulphur-coloured compound with a bitter taste. It is sparingly soluble in water at *p*H 7, but can be readily dissolved by the addition of NaOH to *p*H 8.3–8.5, forming the sodium salt, or by adding HCl to lower the *p*H to 2, when the hydrochloride becomes soluble.

Stability

In contrast to "aureomycin," terramycin is a relatively stable antibiotic in solution. We have found that the acid solution at *p*H 2 maintains its potency for up to 30 days when kept at 0° C. as judged by assay against a standard staphylococcus. The alkaline solution maintains its potency for about seven days at 0° C., but it slowly deteriorates thereafter, turning dark brown in colour, and forms a precipitate due to hydrolysis. This precipitate when redissolved still possesses considerable activity.

The stability of the hydrochloride in human serum was found to parallel closely that of the aqueous solution. The terramycin level in sera kept at 0° C. showed no appreciable fall in seven days. The effect of heat is shown in Fig. 1. A temperature of 100° C. is necessary to

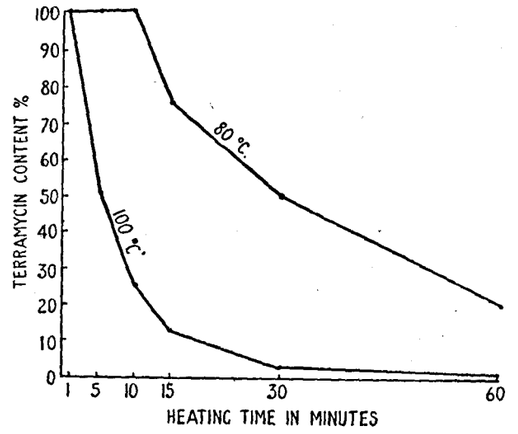


FIG. 1.—Effect of heat on solutions of terramycin of strength 160 μg./ml. at *p*H 7.

inactivate completely a terramycin solution of 160 μg./ml. in 60 minutes at *p*H 7, there being little deterioration in 10 minutes at 80° C. The latter temperature and time suffice to sterilize contaminated fluids such as urine prior to assaying its antibiotic content. A lower concentration of 16 μg./ml. was completely inactivated in 30 minutes at 100° C. The relatively stable character of terramycin hydrochloride solution makes it a much more satisfactory antibiotic than aureomycin from the point of view of the laboratory worker.

Laboratory Assay

The standard techniques for the assay of other antibiotics have been tried with equal success for terramycin hydrochloride. In practice an inoculum of 10 c.mm. of an overnight broth culture of the Oxford staphylococcus to 10 ml. of digest broth was used to assay the antibiotic in aqueous solution, serum, urine, or filtrates of faeces. The microcapillary technique of Fleming and Smith (1947), while very convenient, was found to give growth at slightly lower dilutions than with the tube dilution method which was used as a routine. The familiar "filter-paper disk," "cork-borer hole," and "ditch" techniques applied to other antibiotics can also be used for rough sensitivity tests with terramycin. In practice the organisms isolated from patients treated with the antibiotic were all assayed by the serial dilution method in broth and read at 24 hours to give as accurate a picture as possible of their sensitivity and to observe any development of resistance. The standard solutions of terramycin hydrochloride used in these series of investigations were all prepared at strengths of the order of 2,500 μg./ml. and dissolved in dilute HCl at *p*H 2 and kept frozen solid. Dilutions for assay were made from these stronger stock solutions and were replaced approximately every three weeks. This has been found to be more satisfactory than using the less stable though highly soluble alkaline solution at *p*H 8.5.

Blood serum levels were assayed using the Oxford staphylococcus in tubes in broth as mentioned above; urine was first diluted 1 in 10 and then used similarly. Faeces concentrations were estimated after emulsifying 1 g. in 10 ml. of distilled water, centrifuging, and heating the supernatant at 80° C. for 10 minutes for sterilization

Bacterial "Spectrum"

As with chloramphenicol and aureomycin, terramycin hydrochloride is a "broad-spectrum" antibiotic. Table I shows the range of sensitivity of some of the commoner micro-organisms so far tested. It will be seen that the antibacterial activity follows aureomycin closely. In general it is highly active against Gram-positive cocci and Gram-negative cocci. The intestinal group of Gram-negative bacilli are usually sensitive to concentrations below 10 μg./ml., with the exception of *Proteus vulgaris* and some strains of *Pseudomonas pyocyanea*. However, most strains of *Ps. pyocyanea* have been found to be relatively sensitive to concentrations as low as 5–15 μg./ml. (Of a total of 35 strains tested, 24 were sensitive to concentrations below 15 μg./ml.)

TABLE I.—*Sensitivity of Some Commoner Micro-organisms to Terramycin Hydrochloride*

	Lowest Inhibiting Concentration (μg./ml.)
Staph. aureus	0·25
Haemolytic streptococcus Group A	0·125–0·25
" " " B	0·5
Str. pneumoniae	0·25
" faecalis	0·5
" viridans	0·25
C. diphtheriae (mitis)	0·25
Cl. welchii	0·5
N. gonorrhoeae	0·25
Bact. coli	1·0–20·0
" " *	1·25
" friedländeri (Kl. 41)	3·0
H. influenzae	5·0
Salm. typhi	1·0
" typhi-murium	1·0
Sh. flexneri	1·0
Pr. vulgaris	200+
Ps. pyocyanea	5·0–200
B. anthracis	0·25
" subtilis	0·25
" cereus	0·25
M. tuberculosis H37Rv†	12·5
" phlei	4·0

* Mutant resistant to 500+ μg. of streptomycin per ml.
† Ten days' incubation, Dubos medium at 37° C.

American investigators (Hobby *et al.*, 1950; Snyder *et al.*, 1950) report marked activity against the brucella and rickettsia. It is also reported to have a highly potent *in vitro* effect against *Entamoeba histolytica* (Most *et al.*, 1950), but little or no activity against viruses (Quilligan *et al.*, 1950).

Development of Bacterial Resistance.—During the treatment of the cases described, no resistant mutants of originally sensitive strains have appeared; particular attention in this respect has been paid to strains of coliform bacilli in urinary infections. *In vitro* experiments indicate that with some coliform strains a slow step-like resistance can be evoked, but there has so far been no occurrence of any "streptomycin-like" resistance.

Toxicity.—American reports (Pan *et al.*, 1950) show that the LD50 doses of terramycin hydrochloride for mice are 140 mg. per kg. intravenously and 2,240 mg. per kg. orally. This suggests that its behaviour in this respect is very similar to that of aureomycin, the corresponding figures of which are 134 mg. per kg. intravenously and 2,500+ mg. per kg. orally (Harned *et al.*, 1950).

Experimental Administration

Intravenous administration of terramycin in saline was undertaken, a rabbit of 2,400 g. weight being used. Fig. 2 shows the results of periodic serum and urine assay following a dose of 40 mg. per kg. body weight. This was the largest dose used during these investigations, and it gave rise to

slight incoordination and twitching, coming on two minutes after injection ; these signs lasted about one minute. These symptoms may well have been due to the use of an

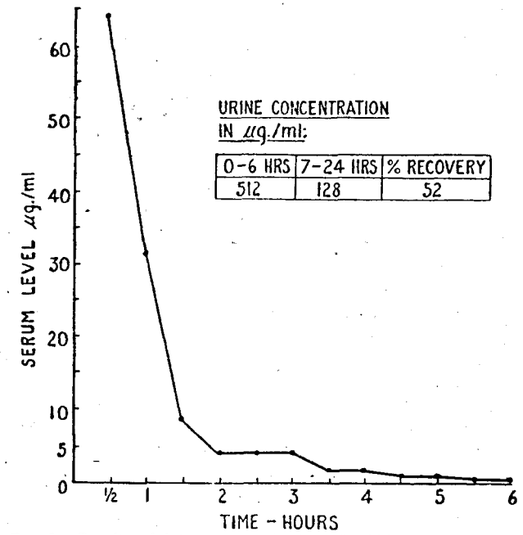


FIG. 2.—Results of intravenous injection of rabbit with 40 mg. of terramycin hydrochloride per kg. body weight (total 100 mg.).

unbuffered solution. There were no side-effects observed when smaller doses of the order of 20 mg. per kg. body weight were given intravenously to the same animal.

Administration of Single Doses to Man

The response of human volunteers to oral administration varied. Fig. 3 shows the average serum level obtained after a single dose of 250 mg. to healthy young males and the average response to a single dose of 1,000 mg.

It had been noted previously (Herrell *et al.*, 1950) that the levels of terramycin obtained in blood and urine bore little apparent relation to the dose ingested, though on the whole the higher doses resulted in the production of higher levels. These observations were usually concerned with single-dose administration, though some of them recorded multiple-dose levels.

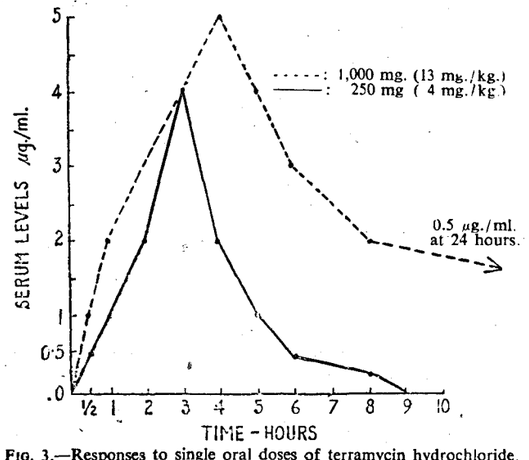


FIG. 3.—Responses to single oral doses of terramycin hydrochloride. Each point is average of four investigations.

Early experiments showed that urine and serum levels tended to rise for the first 24 hours on six-hourly dosage, but thereafter rose no further. We accordingly determined serum and urine levels, after the first 24 hours, on 27 patients who were having courses of terramycin lasting from 5 to 10 days (Table II).

TABLE II.—*Showing Oral Dosage and Concentrations Attained in Serum and Urine of 27 Patients (μg./ml.)*

Dose mg./kg.	No. of Cases	No. of Serum and Urine Observations	Average Serum Level	Range Average Serum Level	Average Urine Level	Range Average Urine Level	Ratio Urine/ Serum
0–10..	1	2	0	—	25	—	—
10–20..	1	4	0	—	100	—	—
20–30..	Nil						
30–40..	2	8	1·25	0–2·5	100	50–150	
40–50..	4	30	5·7	3·5–8·7	165	100–325	29
50–60..	1	2	10·0	—	260	—	26
60–70..	4	18	7·7	4·5–10·0	205	120–250	27
70–80..	6	20	6·8	5·0–9·0	230	120–500	34
80–90..	4	16	8·1	3·5–10·0	240	100–400	29
90–100	4	16	6·9	5·0–11·25	490	250–750	71

Several sets of observations were made with samples of serum taken at various times during a single-dose period—that is, usually six hours—and these, though showing some variation, maintained a moderately stable level. It was concluded from these findings and our earlier experimental observations that, except perhaps for ease of administration, dosage need not be more frequent than six-hourly.

Doses were calculated on a basis of mg. terramycin per kg. body weight. Analysis of the original data showed that on a particular dose schedule some persons maintained higher blood and urine concentrations than others ; it was noted that a high blood concentration usually ran *pari passu* with a high urine concentration. It has not yet been possible to relate these differences to increase or decrease of faecal excretion, as our data on this point are incomplete

To compensate for the different number of estimations on serum and urine in individual patients, the figures for each patient were averaged before incorporation in Table II This table shows the average and the range of the serum and urine levels obtained at various dose levels. Figs. 4 and 5 show the average of the serum and urine concentration for each case plotted against dose, with the average put in at each 10 mg. per kg. step. The wide variations in the levels are well seen from these graphs, but they also illustrate that, with a sufficient number of cases, levels tend to rise progressively with the dose.

The sharp rise in urine values and the urine/serum ratio at the highest-dose level is of considerable interest, and seems to indicate that, if absorption from the gut increases with greater doses, higher blood levels will not be reached owing to spill-over into the urine. This suggestion gains weight from the fact that, though we have on occasion administered high doses experimentally, we have never recorded a serum level greater than 12.5 μg./ml., though this level has been reached several times.

These dose curves suggest that even for severe infections a total dosage of 70 mg. per kg. daily at six-hourly intervals will give maximal blood levels, while numerous patients will attain such levels on about 50 mg. per kg. daily ; lower dosage than these would need control by blood-level determinations.

The study of the urine levels related to dosage shows that terramycin is excreted in high concentrations and that adequate levels can be attained on very small dosage. As will be seen from the earlier data and, later, from the clinical section, most of the common urinary pathogens are susceptible to less than 10 μg./ml. ; no dose that we have

yet administered has given levels as low as this. Certainly it would seem from these data that 50 mg. per kg. daily would be more than an adequate dose for most urinary infections, and half this dosage would probably be satisfactory. It is, however, one thing to consider this question

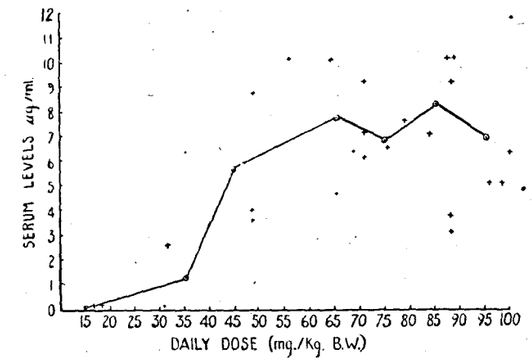


FIG. 4.—Relation between serum level and dose (oral). + Average serum levels for each case. ⊙——⊙ Average serum level as calculated from Table II.

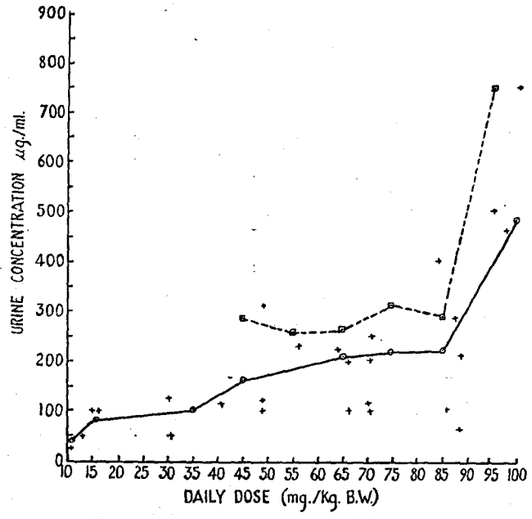


FIG. 5.—Relation between urine level and dose (mg./kg. body weight). + Average urine levels for each case. ⊙——⊙ Average urine levels as calculated from Table II. ⊡----⊡ Ratio urine/serum × 10 as calculated from Table II.

from an *in vitro* angle and quite another to deal with an infection *in vivo*, and we should like to emphasize at this stage that our clinical experience has been mostly with 50 mg. per kg. or greater.

Passage through Serous Membranes

Our experience of terramycin levels other than in the serum, urine, and faeces has been small, but in view of the comparatively recent discovery of the drug the following incomplete data may be of interest.

In one case of Reiter's syndrome with effusion into a joint, after 48 hours' treatment analysis of the joint fluid showed 2.5 μg. of terramycin per ml., the serum level being 5 μg./ml. In one case of pleural effusion after 24 hours' terramycin administration the pleural fluid level was 2.5 μg./ml., whilst the serum level was 5 μg./ml. One case with a biliary fistula showed a very high level (50 μg./ml.) in the bile with quite moderate serum levels.

American experience indicates that terramycin passes into the cerebrospinal fluid in low concentration only, at least in normal persons. It seemed to us that a more useful approach might be to test the passage of terramycin into abnormal meninges, since the intrathecal passage of the drug would be only of therapeutic interest in such persons.

We accordingly selected six cases suffering from tuberculous meningitis ; these cases would have abnormal meninges, and we were in addition interested to see whether bacteriostatic concentrations to the tubercle bacillus (probably 10–20 μg./ml.) could be produced in the theca.

Owing to the fact that these cases were having streptomycin and it was not possible to stop this during the experiment, we had to use a highly streptomycin-resistant but terramycin-sensitive *Bact. coli* as the test organism. Under such conditions it was not possible to detect the presence of less than 1 μg. of terramycin per ml.

In all of these cases the meningitis had largely settled down. In no case after 24 hours, despite serum levels between 5 and 10 μg./ml., was there a detectable C.S.F. level ; and after 72 hours, during which these high serum levels were maintained, only three out of five cases had approximately 1 μg./ml. present in the C.S.F.

Probably in bacterial meningitis these figures would be improved, but we have as yet no data to support this assumption.

Effect on Intestinal Flora and Concentration in Faeces

The effect on the normal intestinal flora was investigated in eight cases receiving 1 g. of terramycin six-hourly. Specimens of faeces were examined the day before administration began, and daily specimens were examined during the four days in which the drug was ingested and after administration ceased.

After 24 hours' administration the colonies of coliform bacilli and faecal streptococci were diminished, and were eliminated entirely in all cases by the third day. The normal flora became replaced by a heavy growth of *Pr. vulgaris* in four cases, *Pr. morgani* in two, and in two a heavy growth of a yeast appeared ; one of these also produced a few colonies of an atypical coliform which was found to be resistant to 200+ μg. of terramycin per ml. Transient appearance of a few colonies of relatively resistant strains of *Ps. pyocyanea* was noted in two cases ; these disappeared as administration proceeded. Our observations show that with three days' oral administration of terramycin complete alteration of the flora results. One case of ulcerative colitis produced a sterile specimen of faeces after three days' treatment.

Fourteen observations on the concentration of terramycin in the faeces were made on six cases receiving doses between 66 and 87 mg. per kg. daily. The results after the first 24 hours ranged from 500 μg./g. faeces to as high as 4,000 μg./g. Most of the estimations were grouped round 1,250 μg./g. Such high concentrations as these fully explain the remarkable effects produced on the bacterial flora of the gut, since all gut organisms with the exception of various strains of Proteus are susceptible to concentrations many times less than those obtained (see Table I).

Faecal excretion does not tend to rise after the first 24–48 hours. Terramycin is usually present in the faeces in moderate concentration for one to two days after cessation of treatment. There was no appreciable absorption

from the rectum, since two trials of 2 g. administered rectally as a buffered solution at *p*H 8 in the form of sodium salt gave no detectable blood levels.

We cannot yet say whether this high faecal concentration is wholly the result of a proportion of the ingested dose being unabsorbed or whether some part of the terramycin is excreted into the gut by means of the bile or in other ways.

Clinical Experience

So far our clinical experience has been limited to the treatment of 29 cases; the results in four could not be assessed.

Urinary Infections

Thirteen cases of urinary infection have been treated; seven of these were uncomplicated by demonstrable anatomical abnormality of the urinary system, while the other six had complications such as hydronephrosis, vesical diverticulum, prostatic obstruction, or urethral stricture. Ten cases had been treated previously with sulphonamides or antibiotics, and the organisms all showed resistance to one or more chemotherapeutic agents. All cases were given doses at six-hourly intervals to a total amount of 50–80 mg. per kg. daily.

The pathogenic bacteria involved in the seven uncomplicated cases were either *Bact. coli* or *Str. faecalis*, or both. Sensitivity of these organisms ranged from 1 to 10 μg. of terramycin per ml.

All cases showed a rapid response, catheter samples being sterile at the end of either 24 or 48 hours; treatment was continued for at least 48 hours after the first sterile specimen, and no relapses have so far been seen. Constitutional symptoms were also rapidly controlled.

The results in all the cases with complicating mechanical factors show several features of interest. One case with unilateral hydronephrosis, urethral stricture, and diabetes showed a heavy urinary infection with *Bact. coli* and *Str. faecalis*. Numerous agents had been administered for the control of this infection without success; after one week's treatment these organisms disappeared, becoming replaced, however, by *Pr. vulgaris*. This occurrence did not interfere with the complete symptomatic relief afforded.

Two cases of post-prostatectomy infection and one of prostatic obstruction, all infected with *Ps. pyocyanea* and other organisms, were treated. The sensitivities of the strains of *Ps. pyocyanea* ranged from 3 to 10 μg. of terramycin per ml. All three cases showed very heavy infection; one case was cured after a week, one case responded rapidly but relapsed after treatment ceased, with the appearance of *Pr. vulgaris* and recurrence of *Ps. pyocyanea*. The third case responded rapidly until a resistant atypical coliform organism appeared for the first time, requiring chloramphenicol for its control. Unfortunately these cases were treated at a time when there was a temporary shortage of the drug; longer treatment with higher dosage would probably have been even more effective. Further work is in progress on the important question of *Ps. pyocyanea* infection, as, despite earlier American reports that most strains are resistant, nearly three-quarters of the strains isolated in these laboratories are sensitive to therapeutic concentrations of terramycin. Observations made upon urinary *p*H during treatment did not suggest that the control of this factor was of any great importance in producing cure.

Superficial Infections

A case of erythema multiforme bullosa with pyodermia showed a rapid response to treatment. This was a severe case in a frail old lady infected with *Staph. aureus, Bact. coli*, and *Str. faecalis*. These organisms were inhibited by 0.5–5 μg. of terramycin per ml. but showed high resistance to all other antibiotics except aureomycin. A heavy nasal infection with *Staph. aureus* was also present. A course of 14 days' treatment was given; at the end of six days nasal swabs were sterile and skin swabs gave a very scanty growth of *Staph. aureus*. An immediate clinical effect was seen; the lesions dried and the heavy purulent discharge ceased, while skin-healing began and proceeded rapidly.

Another case of severe superficial sepsis was seen in the case of a girl of 12 who had had burns involving about one-third of the body surface two months previously. The child had experienced a very stormy illness, and long courses of penicillin, streptomycin, and chloramphenicol had failed to control the infection. Swabs showed *Staph. aureus* sensitive to 6 μg. of terramycin per ml. and *Ps. pyocyanea* sensitive to 15 μg./ml. After seven days' treatment *Ps. pyocyanea* had disappeared and only scanty colonies of *Staph. aureus* were seen. The appearance of the infected areas had undergone a complete change; the raw areas seemed healthy, the skin edges were advancing fast, discharge was minimal, and the patient's general condition had greatly improved. Skin-grafting was later possible.

A further case of *Ps. pyocyanea* infection was seen in a woman aged 23 suffering from spina bifida with neurological complications. Following pneumonia three months previously she had developed on each buttock a large indurated undermined ulcer which had defied all treatment. Swabs had always shown *Ps. pyocyanea*, and the sensitivity of this organism was 7 μg./ml. Under cover of systemic terramycin administration one ulcer was excised with success; the other healed under the influence of the drug.

A long-standing wound infection with *Ps. pyocyanea* (sensitivity 32 μg./ml.) was controlled by local application of a solution of strength 1,000 μg./ml., whilst a reasonable response was seen in the treatment by systemic means of a deep-seated ulcer with surrounding cellulitis situated in the natal cleft and infected with *Ps. pyocyanea* (sensitivity 15 μg./ml.) and *Bact. coli*.

Post-operative Infection

Four cases of post-operative complications were treated: one case of pneumonia with effusion following lobectomy for bronchiectasis (*Bact. friedländeri* and a pneumococcus), one of oesophageal abscess following oesphagoscopy (*Staph. aureus* and *Bact. coli*), one of post-operative peritonitis after hysterectomy (*Bact. coli* and *Str. faecalis*), and the last a case of pelvic cellulitis following vaginal hysterectomy (*Bact. coli*). All organisms were sensitive to less than 10 μg. of terramycin per ml.

The assessment of therapeutic effect on such cases is always difficult, as by the nature of the diseases other measures are employed concurrently. It can be said that all cases recovered completely, as fast as would be expected with the aid of efficient chemotherapy.

Miscellaneous Cases

Two patients with ulcerative colitis were treated. The first case, that of a man aged 39, had had long courses of streptomycin and chloramphenicol without benefit. A course of terramycin apparently produced great improvement, and he has remained well for three months after discharge.

The other case was not really suitable for assessment, as two months' hospital treatment had already caused a remission. Terramycin was administered in an attempt to clear his stools of blood, but without success.

One case each of dermatitis herpetiformis, Behcet's syndrome, and Reiter's syndrome, with arthritic involvement and joint effusion but with cessation of discharge, were treated with inconclusive or unsatisfactory results.

Toxic Symptoms

Of 33 patients who had courses of the drug lasting five or more days, 20 had no toxic symptoms. Thirteen patients, on direct questioning, admitted to feeling nauseated at times, usually at the beginning of the course; eight of these vomited one or more times. In the case of one very ill lady, vomiting was severe during the first 24 hours and the drug was stopped.

One case developed a sore throat, a severe substernal pressure sensation, and respiratory distress on the third day. The symptoms regressed 12 hours after the drug was stopped and further administration later did not reproduce this syndrome. No diagnosis was made of the cause of the symptoms, which may have been coincidental.

One old lady with very numerous disabilities developed an erythematous rash on the tenth day of treatment, and on the next day the Hess capillary test was very strongly positive. Two days later, while the normal faecal flora was still absent, the Hess test became normal. In her case all blood studies were normal; patch and prick tests to the drug were negative. Subsequently a further five-day course of terramycin was administered; the rash did not recur and the Hess test remained negative.

On the second and third days of treatment nine cases developed transient looseness of bowels; in three cases this was of moderate severity, but in none was it necessary to stop the drug.

In view of the profound changes in bacterial flora produced by the drug, a watch was kept for possible signs of vitamin deficiency: none was seen. It was felt that the case which developed the positive Hess test could not be regarded as one of vitamin deficiency, since the increased capillary fragility returned to normal whilst the usual bacterial flora of the bowel was still absent.

We noted that, as with aureomycin, the incidence of gastro-intestinal upset was greatly reduced by administering the drug with milk, and we were able to show that this procedure exerted no detectable effect upon the serum levels. It is perhaps of interest to state that with the one case in which the drug had to be discontinued owing to vomiting no milk was given.

Though the incidence of gastro-intestinal upset reported here is considerable, we used doses at the upper end of the scale, and with the exception of one case were able to continue with the drug. In three cases, however, in which vomiting occurred several times, very low serum and urine levels were recorded, which suggested that the oral route in these patients was unsatisfactory.

A suitable preparation of the drug for intravenous use has now been developed; this is claimed to be well tolerated and to circumvent gastro-intestinal symptoms in susceptible patients.

Conclusions

Our clinical experience has shown terramycin to be an antibiotic of low toxicity which is readily absorbed from the gut and which rises to satisfactory levels in serum, urine, faeces, and probably in most serous cavities. It is unfortunate that the blood–brain barrier is penetrated only poorly, but, as experience with other antibiotics has shown, this is not necessarily a bar to the efficient treatment of meningeal infections.

Our limited clinical results bear out expectations founded on the *in vitro* activity of the drug.

We would draw particular attention to the high levels of the drug in the urine and to our observations that the urinary *p*H seems to be immaterial in procuring successful results. The table of bacterial sensitivities shows that all the common urinary pathogens, with the exception of *Pr. vulgaris* and some strains of *Ps. pyocyanea*, are sensitive to concentrations many times less than those obtained therapeutically. It appears likely that with high dosage, leading to urinary levels of 300–400 μg./ml., practically all cases infected with *Ps. pyocyanea* will be amenable to therapy. Further, the fact that a number of strains of *Pr. vulgaris* are sensitive to chloramphenicol and streptomycin means that we now have efficient agents for the treatment of nearly all urinary bacterial infections.

In addition to our findings with the treatment of *Ps. pyocyanea* infections of the urinary tract, our preliminary data with regard to superficial infections with this organism show that terramycin offers real promise in controlling pyocyanea infections by local or systemic administration.

The striking changes in bacterial flora produced by terramycin and the high residual concentrations in the faeces will still further increase the scope and safety of gastro-intestinal surgery and enhance the medical management of intestinal infections.

We have noted in several cases that terramycin has produced clearing of abnormal nasal flora and considerable change in the bacterial content of sputum in cases of bronchiectasis; these findings indicate additional therapeutic uses.

We have not yet observed any striking difference in antibacterial activity between terramycin and aureomycin, with the one exception of *Ps. pyocyanea*, against which terramycin is more effective. Terramycin is also much more stable in solution than aureomycin, which is particularly advantageous in laboratory work.

We wish to express our grateful thanks to Professor Sir Alexander Fleming for much advice in these investigations and for enabling us to obtain supplies of terramycin, generously provided by Messrs. Chas. Pfizer and Co., of New York. We acknowledge the help and advice of Professor Robert Cruickshank and the valuable technical assistance of Mr. D. Stratful in the routine laboratory work. We also wish to thank the members of the consultant staff of St. Mary's Hospital for granting us access to the cases described.

Bibliography

Bliss, E. A., Warth, P. T., Chandler, C. A., and Long, P. M. (1950) *Bull. Johns Hopk. Hosp.*, **87**, 171.
Finlay, A. C., Hobby, G. L., Pan, S. Y., Regna, P. P., Routien, J. B., Seeley, G. M., Shull, G. M., Sobin, B. A., Solomons, I. A., Vinson, J. W., and Kane, J. H. (1950). *Science*, **111**, 85.
Fleming, A., and Smith, C. (1947). *Lancet*, **1**, 401.
Harned, B. K., Cunningham, R. W., Clark, M. C., Cosgrove, E., Hine, C. H., McCauley, W. J., Stokey, E., Vesey, R. E., Yuda, N. N., and Subba Row, Y. (1950). *Ann. N.Y. Acad. Sci.*, **51**, 182.
Hendricks, F. D., Greaves, A. B., Olansky, S., Taggart, S. R., Lewis, C. N., Landman, G. S., MacDonald, G. R., and Welch, H. (1950). *J. Amer. med. Ass.*, **143**, 4.
Herrell, W. E., Heilman, F. R., Wellman, W. E., and Bartholomew, L. G. (1950). *Proc. Mayo Clin.*, **25**, 183.
Hobby, G. L., Dougherty, N., Lenert, T. F., Hudders, E., and Kiseluk, M. (1950). *Proc. Soc. exp. Biol., N.Y.*, **73**, 503.
King, E. Q., Lewis, C. N., Welch, H., Clark, E. A., Johnson, J. B., Lyons, J. B., Scott, R. B., and Cornely, P. B. (1950). *J. Amer. med. Ass.*, **143**, 1.
Melcher, G. W., jun., Gibson, C. D., jun., Rose, H. M., and Kneeland, Y. (1950). Ibid., **143**, 1303.
Most, H., and Van Assendelft, F. (1950). *Ann. N.Y. Acad. Sci.*, **53**, 427.
P'an, S. Y., Scaduto, L., and Cullen, M. (1950). Ibid., **53**, 238.
Proceedings of the Terramycin Conference (1950). Ibid., **53**, 221.
Quilligan, J. J., jun., Francis, T., jun., Rowe, R. J., Traggis, D. J., Adcock, J. D., and Kurtz, H. (1950). Ibid., **53**, 407.
Snyder, J. C., Fagan, R., Wells, E. B., Wick, H. C., and Miller, J. C. (1950). Ibid., **53**, 362.
Welch, H., Hendricks, F. D., Price, C. W., and Randall, W. A. (1950). *J. Amer. pharm. Ass.* (Sci. ed.), **39**, 185.

SUPRANUCLEAR BULBAR PALSY (PSEUDOBULBAR PALSY) IN MITRAL STENOSIS

BY

KENNETH W. G. HEATHFIELD, M.D., M.R.C.P.
Chief Assistant, Neurological Department, St. Bartholomew's Hospital

AND

ERIC C. O. JEWESBURY, D.M., M.R.C.P., D.P.M.
Neurologist, Royal Northern Hospital, North Middlesex Hospital, Chase Farm Hospital, and Luton and Dunstable Hospital

During the latter half of last century reports of cases referred to as "labio-glosso-pharyngeal palsy" began to appear in the English, French, and German literature. They were a heterogeneous group and included both the form now known as progressive bulbar palsy and other varieties in which bulbar palsy had been produced by bilateral lesions confined to the cerebral hemispheres. Oppenheim and Siemerling (1886) first attempted to differentiate between these groups, which they described as true bulbar paralysis and pseudobulbar paralysis. They added a description of the emotional lability which led to the latter condition being sometimes called "the laughing sickness."

The term "pseudobulbar palsy" has long been recognized as being unsatisfactory. Tilney and Morrison (1912) criticized it as giving no indication of either the site of the lesion or the nature of the disease. The synonym "supranuclear bulbar palsy" is more accurate, but "notwithstanding this," as Tilney and Morrison then commented, "pseudobulbar palsy, although a purely conventional term, has gained a fixed place in the literature." The traditional title dies hard and unfortunately has still not been displaced by the more appropriate and descriptive name of supranuclear bulbar palsy. The occasional combination of nuclear and supranuclear lesions shows how further confusion may arise if the terms "true" and "pseudo" are retained.

It is unnecessary to give an account here of the distinctive clinical features of supranuclear bulbar palsy, as they are fully described elsewhere. Oppenheim's (1911) early account is of interest, and good recent descriptions have been given by Langworthy and Hesser (1940), Alpers (1946), and Wechsler (1947). Kinnier Wilson (1924) has discussed the interesting related problem of pathological laughing and crying.

Supranuclear bulbar palsy most commonly results from arteriosclerosis which has produced bilateral areas of cerebral softening. In many cases, therefore, there is a history of an attack of weakness on one side of the body, followed later by an attack on the other side, the bulbar symptoms developing acutely after the second attack. In its sudden onset, its frequent association with double hemiplegia, its irregular non-progressive course, its lack of lower motor neurone involvement, and in its associated disturbance of emotional control, supranuclear or pseudobulbar palsy is distinct from progressive bulbar palsy (in which local bulbar involvement may be part of motor neurone disease). Supranuclear bulbar palsy may occasionally occur in the course of other pathological conditions (such as disseminated sclerosis, cerebral metastases, or agenesis) in which there are scattered bilateral lesions involving the corticobulbar tracts. It is a clinical syndrome and not a disease entity.

Several of the early descriptions of what we now regard as supranuclear bulbar palsy referred to young or middle-aged subjects with bilateral cerebral thromboses, probably of syphilitic origin. Two cases produced by cerebral embolism, however, were described by writers in the last century. Barlow (1877) published the clinical and post-mortem findings in "a case of double hemiplegia with symmetrical lesions." This referred to a boy, aged 10, with congenital heart disease and infective endocarditis. First a left and then a right cerebral embolism occurred, after which he developed the characteristic features of supranuclear bulbar palsy, including both emotional lability and urinary incontinence. Kirchhoff (1881) described the case of a man, aged 24, with mitral stenosis, who apparently developed bulbar paralysis from bilateral cerebral embolism. This resulted in drawling speech, dribbling of saliva, an almost immobile tongue, and bilateral facial weakness.

There seem to have been no further accounts of supranuclear bulbar palsy resulting from bilateral cerebral embolism, and we have been unable to find any modern reports of the condition occurring in rheumatic heart disease. Recently, however, we have seen three cases of mitral stenosis in which well-marked supranuclear bulbar paralysis was apparently produced by successive cerebral emboli. It may therefore be of interest to place the following examples on record.

Case 1

A trained nurse aged 47 was admitted to the Royal Northern Hospital on January 5, 1950. She had had rheumatic fever and chorea in childhood and heart trouble since then. She was known to have been in hospital in recent years with mitral stenosis and auricular fibrillation, and her pulse had remained irregular. She had felt well that afternoon, but on stretching to close a window she suddenly became faint and dizzy. She did not lose consciousness, but developed a headache and vomited. The left side of her face and the left upper and lower limbs seemed numb and she had difficulty in using her left arm.

On examination she was alert and her speech normal. Auricular fibrillation was present, with a pulse rate of 70 a minute and a systolic blood pressure of 120 mm. Hg. A diastolic and a systolic murmur were heard at the mitral area. Optic disks were normal. Detailed examination of the central nervous system was made next morning, when, apart from slight weakness of flexion of the left hip, there were no significant motor, sensory, or reflex abnormalities of the limbs. The only other development was weakness of the internal rectus muscle of each eye. It was thought that her attack was the result of a transient right-sided cerebral embolism, and that the subsequent ocular signs were probably the result of another small embolus involving part of the mid-brain.

During the night of January 8 she had another attack. Her pulse rate fell to 40 a minute and she appeared faint and confused. Next morning she was found to have a right hemiparesis with upper motor neurone type of weakness of face and limbs. A further cerebral embolism, this time involving the left side of the brain, had presumably occurred.

After this episode the whole clinical picture changed and she presented the characteristic appearance of a patient with supranuclear bulbar palsy. Her speech was rapid, spastic, and indistinct, and she had difficulty in swallowing and coughing. The tongue was spastic. She showed gross emotional lability, bursting into either tears or laughter without adequate cause. She became incontinent of faeces and urine. At this stage she had a pronounced jaw-jerk and a bilateral extensor plantar response. There was no sensory impairment. Lumbar puncture on January 11 showed normal cerebrospinal fluid (C.S.F.). The Wassermann reaction and Lange curve were negative.

The power of the right side of the body began to improve within two days and sphincter control was regained in two weeks. After about four weeks she was beginning to get about and walked with the short spastic steps reminiscent of the double hemiplegia of cerebral arteriosclerosis. The defective ocular movements had by this time almost gone. The spastic dysarthria and emotional lability improved gradually. When last seen, at the end of February, she no longer wept or laughed involuntarily, but still smiled and laughed in a slightly spastic fashion and with little retraction of the angles of her mouth. Some weakness of flexion of the hips, especially the right, persisted, and, though her walking had improved, she still took short spastic steps on a rather wide base. Her auricular fibrillation was unaltered. She felt well and was discharged to convalescence.

Case 2

A man aged 32 was referred to the neurological clinic of the Mid-Herts Hospital on October 20, 1949, for speech therapy. He had had rheumatic fever when aged 9, and since then was known to have had mitral stenosis. At the age of 29 he had had an attack of cardiac asthma.

He said that 18 months ago he had suddenly lost consciousness at 6.30 one morning. His wife had noticed jerking movements of his hands at the time. He recovered his senses by about 9 a.m., and then found that the right side of his face and the right upper limb were paralysed and the right lower limb was weak. He was drowsy, aphasic for a few days, and incontinent of urine. The hemiparesis and speech defect improved, and after about two weeks he noticed only clumsiness of the right hand.

Three weeks after this episode he had another attack in the early morning. His pulse was said to have been slow and irregular at the time. He developed sudden weakness of the whole of the left side of the body but did not lose consciousness. He became completely anarthric, his tongue was stiff and immobile, and he could not cough voluntarily. There was dysphagia with nasal regurgitation of liquids and dribbling of saliva. Incontinence of urine was followed by precipitancy and increased frequency. The left hemiparesis and the dysphagia improved during the next few weeks. He became able to speak in a whisper after three months and in a feeble voice after five months.

When seen in October, 1949, he noticed residual weakness on the left side and was subject to occasional involuntary flexion spasms of the left leg. He still had a little difficulty in chewing and swallowing, and said that his tongue felt stiff. Urgency of micturition persisted. His wife said that he had become easily tearful and irritable.

On examination he was alert but slightly emotional. There was no dysphagia, but he spoke in almost a whisper, with his teeth hardly separated. His speech was spastic, indistinct, and tended to accelerate. There was also a tendency to diminuendo repetition of the end of a sentence (palilalia). There was some bilateral weakness of the lower part of the face, although emotional movements were overactive. Eye movements and optic disks were normal. His tongue moved slowly and stiffly. A brisk jaw-jerk was obtained. All his limbs were slightly hypertonic and his movements slow. Power was slightly impaired on the left side and he walked slowly, dragging his left foot. Sensation was normal. The arm reflexes were brisk and equal and finger-jerks were obtained. The knee-jerks and ankle-jerks were also brisk, particularly on the left side. Abdominal reflexes were feeble. The right plantar response was equivocal and the left extensor. His pulse rate was 80 a minute and the rhythm regular. His blood pressure was 120/80 mm. Hg. The heart was slightly enlarged; a loud systolic and a mid-diastolic murmur were heard at the apex, and the pulmonary second sound was accentuated. On subsequent examinations, however, auricular fibrillation was sometimes present.

He was last seen some nine months later, when no further change was evident.

Case 3

A woman aged 20 was admitted semi-conscious to St. Thomas's Hospital on August 9, 1949. She had had chorea when aged 11 years and had begun to be easily breathless at 16. She had been attending the out-patient department since the age of 18 on account of rheumatic heart disease, and had signs of mitral stenosis with normal cardiac rhythm. During the two years that she continued under observation as an out-patient she was troubled by several attacks of nocturnal dyspnoea. She was of poor intelligence, but there were no other abnormal findings and her pulse had remained regular. When seen on the morning of August 9 no change in her physical signs was noted. That afternoon, however, her left hand and arm began to shake. Her husband said that she laughed and then suddenly fell unconscious in her chair. Her left arm appeared limp. She was brought into hospital about one and a half hours later.

On admission she was stuporous but reacted to painful stimuli. Her pulse rate was 70 and the rhythm regular. Eye movements, pupils, and optic disks were normal. Her lower jaw tended to hang open and the limbs were flaccid. The tendon reflexes were brisk and equal, and both plantar responses were extensor. The C.S.F. was entirely normal. The next day she was more conscious. She was dysphasic, but said a few words in a spastic and indistinct fashion. She was liable to outbursts of uncontrollable weeping and laughter and often made loud spastic cries for no good reason. She was incontinent of urine. Slight right facial weakness of upper motor neurone type was evident and there was some defect in conjugate deviation of the eyes to the right. Her palate moved poorly and she had difficulty in swallowing. On trying to drink she would dribble fluid from her mouth and sometimes through her nose. Power in the limbs was diminished, particularly on the left side, and she had to be fed. The tendon reflexes were brisker on the left side than on the right. The abdominal reflexes were absent, and both plantar responses were extensor.

During the next few days the power in her left side improved and she regained control of her bladder. Her speech, which was at first almost unintelligible, improved more slowly. She continued to show pronounced emotional lability and would laugh and cry in a spastic fashion for little or no cause. She got up after about two weeks and was discharged a week later. She then talked and walked fairly well. Both plantar responses remained extensor.

Though much improved when last seen, six months later, she was still easily moved to spastic laughter or tears and spoke with a nasal dysarthria. Her soft palate moved poorly and there was occasional slight dysphagia. Eye movements were normal. There was a residual right facial weakness. The tone of the limbs was normal. The left upper limb was slightly weaker than the right and there was some weakness of flexion of both thighs. She was unable to use her hands normally but she walked without difficulty. The tendon reflexes were brisk, more so on the left side than on the right. The plantar responses were equivocal and attempts to elicit them made her weep. She had full control of her bladder. There had been no further symptoms directly referable to the cardiovascular system.

Discussion

Each of these patients had a previous rheumatic history. All three had mitral stenosis and two of them showed auricular fibrillation.

In Case 1 the history suggested the occurrence of several emboli in the course of three to four days. First the right and then the left side of the brain was involved. With the development of the bilateral cerebral lesions the picture changed to that of a supranuclear bulbar palsy, uncontrolled laughing and crying being a prominent feature. Within two months the emotional symptoms had almost completely disappeared, though some spasticity of speech and gait remained

Case 2 also had two acute cerebral attacks: the first resulted in a right hemiparesis, and the second, three weeks later, in a left hemiparesis. Supranuclear bulbar palsy developed with the second attack and disturbance of articulation was the most striking feature.

In Case 3 it seems likely that several small cerebral emboli affected both sides of the brain almost simultaneously. Typical supranuclear bulbar palsy immediately resulted and the spastic laughter and tears were very evident. Although emotional control improved considerably it was not complete six months later.

All three cases had marked dysarthria and dysphagia and all were temporarily incontinent of urine. The onset of supranuclear bulbar palsy was in each case abrupt, but all three showed considerable improvement.

In supranuclear bulbar palsy resulting from cerebral arteriosclerosis the vascular degenerative changes are likely to be diffuse and multiple. Bilateral pyramidal-tract signs are usually present and there may be a history of double hemiplegia, though there is often an interval of months or years between the involvement of the two sides. Sometimes the supranuclear bulbar features are accompanied by only a hemiplegia or hemiparesis. More rarely there is no limb paralysis at all, though the plantar responses may be extensor. In addition to the involuntary laughter and crying, progressive dementia is seen in the arteriopathic group and occasional extrapyramidal features have been described. The course of the disease is irregular and may be prolonged.

When supranuclear bulbar palsy is produced by bilateral cerebral embolism, however, there is usually a history suggesting sudden vascular occlusion on one side of the brain, followed quite rapidly by the same process on the opposite side, so that bilateral interference with the cortico-bulbar and cortico-spinal pathways immediately results. The embolic form of supranuclear bulbar palsy may occur in young subjects. Dementia is not a feature of the condition, and, if the emboli are small, rapid resolution of symptoms may occur.

Summary

Supranuclear bulbar palsy (so-called pseudobulbar palsy) most often results from diffuse cerebral arteriosclerosis, with or without a history of double—that is, bilateral—hemiplegia.

Three cases of mitral stenosis are described in which bilateral cerebral emboli resulted in the abrupt development of the characteristic syndrome of supranuclear bulbar palsy with bilateral pyramidal-tract signs.

We should like to express our thanks to Professor E. P. Sharpey-Schafer, Dr. J. W. Aldren Turner, and Dr. E. D. Mackworth for permission to describe these cases, originally admitted to hospital under their care.

References

Alpers, B. J. (1946). *Clinical Neurology*, p. 433. Philadelphia.
Barlow, T. (1877). *British Medical Journal*, **2**, 103.
Kirchhoff (1881). *Arch. Psychiat. Nervenkr.*, **11**, 132. See also Ross (1882).
Langworthy, O. R., and Hesser, F. H. (1940). *Arch. intern. Med.*, **65**, 106.
Oppenheim, H. (1911). *Textbook of Nervous Diseases*. English ed., **2**, 1021. Edinburgh.
—— and Siemerling, E. (1886). *Berl. klin. Wschr.*, **23**, 791.
Ross, J. (1882). *Brain*, **5**, 149.
Tilney, F., and Morrison, J. F. (1912). *J. nerv. Ment. Dis.*, **39**, 505.
Wechsler, I. S. (1947). *A Textbook of Clinical Neurology*, 6th ed., p. 363. Saunders, Philadelphia and London.
Wilson, S. A. K. (1924). *J. Neurol. Psychopath.*, **4**, 299. Reprinted in *Modern Problems in Neurology*, p. 260. London, 1928.

Dr. L. Leslie has been made vice-chairman of the Berkshire Executive Council in place of the late Dr. J. McCrea.

MORTALITY IN GERIATRIC SURGERY*

BY

LOUIS CARP, M.D., F.A.C.S.

(From the Second Surgical Division, Goldwater Memorial Hospital, New York)

The life-span has been increasing markedly, as is shown by Chart 1. According to the National Office of Vital Statistics (1950), it is 67.2 years in the United States. Chart 2 indicates that those aged 65 and over constitute 7.6% of the population. The Royal Commission on Population (1949) reports that in 1947, in Great Britain, those who were 60 years and over constituted 15% of the population.

More attention is being focused on problems of ageing. It is our function to apply our art not only to save life but to add years to life and life to years, and to reduce mortality. The surgeon has come to play a most important part in the attainment of these goals. We have had an unusual opportunity for the practice of geriatric surgery at the Goldwater Memorial Hospital, in New York City. This 1,500-bed municipal hospital was opened in 1939 for the care and study of chronic disease. Most of the patients are old and are substandard risks. They are afflicted with chronic and degenerative diseases and with nutritional deficiencies. Nevertheless, we do not hesitate to meet surgical indications if there is a chance to save life or to prevent invalidism.

Only patients over the age of 60 are included in this report. Table I (Carp, 1946) shows comparative operative mortality statistics from a number of clinics. At our clinic, from 1939 to 1944, the mortality rate in 450 major

TABLE I.—*Comparative Operative Mortality Statistics (Carp, 1946)*

Source	Age Groups	No. of Major Operations M.	F.	Total	Mortality % M.	F.	Average
Goldwater Memorial Hospital*, 1939–44	61–70	152	50	202	15·78	22·0	18·89
	71–80	148	47	195	24·18	27·6	25·89
	81–90	38	12	50	44·73	25·0	34·86
	91–100		2	2			
	101–110		1	1			
	Total	338	112	450			22·66
Bailey (1934)	60–84			185			7·6
Parsons and Purks (1942)	60 and over			100			17·0
Clagett (1943)	60 ,, ,,			1,204			9·0
Hay (1940)	70 ,, ,,			536			16·6
Evans and Key (1942)	60 ,, ,,			83			7·2
	Grand total			2,558	Grand aver.		13·1

* The emergency operations were 12·88% of the total number.

TABLE II.—*Goldwater Memorial Hospital: Major Operations on Substandard Risk Patients Over 60 Years of Age. Post-operative Mortality Rates Within 30 Days*

Period	No. of Major Operations Total	Emergency	% Emergency of Total	Post-operative Deaths Within 30 Days Total	Emergency	% Mortality Rate Total	Emergency
1945	166	32	19·4	40	23	24·1	71·9
1946	131	32	24·4	25	16	19·1	50·0
1947	162	44	27·2	23	12	14·2	27·3
1948	193	41	21·2	25	11	12·9	26·8
1949	199	56	28·1	34	18	17·1	32·1
1945–9	851	205	24·1	147	80	17·3	39·0
1939–44	450	59	13·0	102	26	22·6	44·0

*Read before the Section of Geriatrics at the Annual Meeting of the British Medical Association, Liverpool, 1950.

TABLE III.—*Analysis of Causes of Death in 100 Consecutive Necropsy Protocols in Patients Over 60 Years of Age Who Died Within One Month After Operation (Carp, 1948)*

	Principal Causes	Important Contributory Causes
Bronchopneumonia	28	10
Cardiac dilatation	27	3
Peritonitis	18	1
Thrombosis and embolism	7	2
Sepsis	7	1
Pyelonephritis	6	15
Coronary occlusion	3	2
Anaesthesia	2	—
Lung abscess	1	—
Metastatic carcinoma	1	12
Decubitus ulcers	—	5
Pulmonary tuberculosis	—	3
Bronchiectasis	—	2
	100	

operations, 13% of which were emergency cases, was 23%. During 1945–9 the mortality rate in 851 major operations (Table II) has been reduced to 17%, with the emergencies constituting 24%. There is also a 5% drop in mortalities from emergency surgery when the years 1939–44 are compared with the years 1945–9. Table III (Carp, 1948) shows that the major causes of death in 100 consecutive necropsies on patients over 60 who died within one month after operations were bronchopneumonia, heart failure, and peritonitis. The major contributory causes were pyelonephritis and metastatic carcinoma.

Some Common Problems

Disease in the aged may be complex, varied, and confusing, contributing to diagnostic error and presenting problems in treatment.

Emergency Surgery.—This produces an inordinately high mortality rate. It is about two and a quarter times that of elective surgery. Cutler's (1947) figures from our service showed that among patients whose average age was 74 years there were 84 deaths following 188 emergency operations — a mortality rate of 44%. If no attempt at surgical relief had been made nearly all these patients would have died. Recent mortality in emergency cases is 32% (Table II). The risk is greater when patients come to operation late, especially in cases of spreading infections and obstruction in various systems. Deterioration is then very rapid. Valuable time may be lost because differential diagnosis is difficult; pre-operative preparation may be prolonged; the patients are considered "too sick or too old"; and hope for improvement is too long entertained. If the mortality in acute cases is to be reduced there must be quick supportive therapy, with the earliest and simplest operation to effect relief and measures to prevent post-operative complications.

Early Cholecystostomy.—This is the operation of choice for acute cholecystitis and/or cholelithiasis. The patients in this group were desperately ill. Old people are especially susceptible to sudden gall-bladder catastrophes. The largest

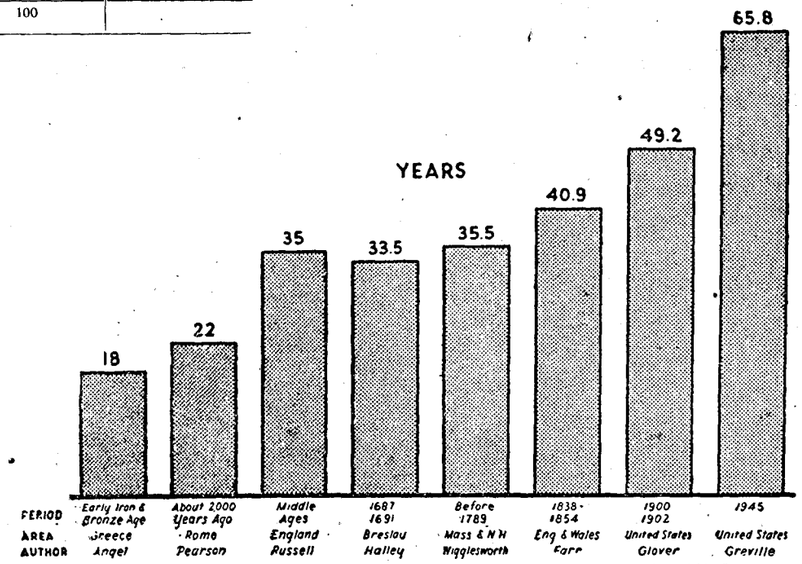


CHART 1.—Showing average length of life from ancient to modern times (Metropolitan Life Insurance Company, 1947).

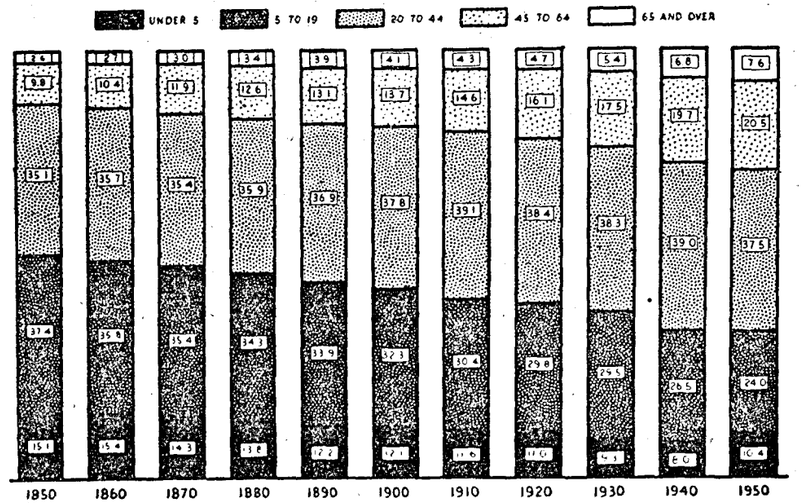


CHART 2.—Percentage distribution of total United States population by age, 1850 to 1950 (Metropolitan Life Insurance Company, 1949). 1850 to 1940 from U.S. Census data; 1950 estimates published by Bureau of the Census, 1949.

percentage of gall-stones are found in the sixth and seventh decades (Jaffé, 1933). Rosenthal (1944) showed that of 300 routine necropsies at the Goldwater Memorial Hospital on patients between the ages of 60 and 100, 23% of 133 men and 40% of 87 women had diseased gall-bladders with stones. At first, cholecystostomy was the operation of choice. However, with improvement in anaesthesia, and with supportive and antibiotic therapy, and influenced by the propaganda for cholecystectomy, we undertook this procedure instead. Almost 50% mortality ensued from pneumonia, heart failure, or peritonitis. Cutler (1949) reported from our service 34 acute cases, whose average age was 73 years. He concluded that such cases should come to surgery as soon as is consistent with adequate preparation, and he recommended cholecystostomy as the safer emergency procedure. With the readoption of cholecystostomy the nine succeeding cases (average age 79.3 years) showed a mortality of 22%. In common-duct obstruction by stone, cholecystostomy is done if a free flow of bile results. If subsequent indications arise a patient is then in better condition to withstand cholecystectomy or choledocotomy.

Intestinal Obstruction.—This calls for immediate tube decompression, for methods to increase blood volume and to restore fluid and electrolyte balance, and for quick operative relief. In treating intestinal obstruction there has been a tendency to prolong the use of tube decompression. Clinical results have convinced us that in the aged such a policy will lead to a mortality of 60%. Surgical relief within 24 hours cuts mortality to 39%. Cutler (1950) has supplied these figures after a study of 120 cases. A patient may improve rapidly with tube decompression and parenteral therapy, encouraging postponement of surgery. Undue postponement will turn the tide against him. Location of the obstruction can be aided by rapid *x*-ray examination. Relief of the obstruction by the simplest appropriate procedure is indicated. More radical therapy, if required, can be undertaken at a later date when the patient is in better condition.

Acute Appendicitis.—This is a difficult diagnostic problem and its mortality is high. Frequently the clinical picture of appendicitis in the aged is confused and the history and physical signs are atypical. Patients, as a rule, come to operation too late. Accompanying disease and diminished resistance to infection increase the incidence of gangrene and perforation, and raise the post-operative morbidity and mortality (Darling and McIver, 1950). We have had 26 patients of over 60 diagnosed as suffering from acute appendicitis. The mortality rate in 19 proved cases was 36%. In another six patients (23%) the diagnosis was incorrect. In three of these no accountable pathology was found, one had a carcinoma of the caecum, one had a fibrotic appendix, and one had a calculous pyonephrosis. The average age of the proved cases was 75 years. Ten of the appendices perforated. At the four necropsies among the seven patients who died the causes of death were found to be pneumonia and cardiac failure in one case, general peritonitis in two cases, and shock in the other.

Hernia.—Surgical therapy under local analgesia is advisable for symptom-producing inguinal and femoral hernia. When hernia is accompanied by pain, a disabling mass, or recurrent incarceration, operative relief, especially under local analgesia, is gratifying. Patients walk within 24 hours after operation. Strenger (1949) has reported from our clinic on 95 operations for hernia, including 78 inguinal and 10 femoral. Three patients died after emergency surgery for strangulation. One elective case died of brain tumour. There were no fatalities in 44 additional cases. The patients' average age was 71 years. Four of them had strangulation, but in no case was resection necessary.

Tourniquets.—The use of the tourniquet for amputations is not approved. We hold that the trauma of tourniquet constriction will further damage affected blood vessels. We have abandoned its use in the past three years. Previously, 15 patients had mid-thigh amputations for arteriosclerotic gangrene under crymo-anaesthesia (refrigeration) with tourniquet. All the stumps were closed and eight of them broke down. Five patients died. In three of these there was found massive thrombosis in large blood vessels in the abdomen or thorax. We believe that the tourniquet was the main predisposing factor in thrombosis and stump breakdown. While preparing the patient for amputation, however, the tourniquet is useful in limiting the swift ascent of infection in acute cellulitis.

Mid-thigh Amputation Stumps.—Closure of mid-thigh amputation stumps in layers is advisable for diabetic or arteriosclerotic gangrene, except when ascending infection is present or when the circulation of the amputation site is seriously impaired. The practice of leaving stumps open does not seem justified. Wounds take much longer to heal, asepsis and nitrogen balance are difficult to maintain, and the stump may be unsatisfactory. Unless there is ascending infection or thrombosis of the femoral vessels we close muscle, fascia, and skin, with the free use of antibiotics. Sixty patients (average age 68) had closure of stumps. Of these, 23 had diabetic and 37 arteriosclerotic gangrene. In 20 of the diabetic patients (87%) the stumps healed nicely. In 22 of the arteriosclerotic patients (60%) there was good union. Four other patients in this group had delayed union. Of the 15 patients in both groups who had crymo-anaesthesia with tourniquet, eight (53%) had wound breakdown. We believe that factors in the breakdown were the anoxia and the thermal injury to the tissues. In 16 patients (average age 72) stumps were left open and traction was applied. In 75% the indication was ascending infection. The average healing-time in the 11 patients who survived was 50 days.

Suggested conclusions are : (1) the interdiction of the tourniquet and crymo-anaesthesia, except in sepsis and swift ascending infection ; (2) careful haemostasis ; (3) traction on stumps which are left open ; and (4) early and frequent wound inspection to detect infection.

Decubitus Ulcers.—Prophylactic care will minimize the incidence of decubitus ulcers. The factors in the physical decline that accompanies decubitus ulcers are toxic absorption, sepsis, and nitrogen loss. Decubitus ulcers were the contributory cause of death in 5% of our necropsies. Maintenance of a positive nitrogen balance, the relief of local pressure, early ambulation, repeated change of position, cleanliness, skilful nursing, and keeping the skin dry constitute the best treatment. We have tried operative closure of some of the decubitus ulcers without success.

Ambulation.—Early out-of-bed care and ambulation are beneficial. Early ambulation is indicated in the old patient. It induces better breathing, appetite, and urinary and bowel function. It seems to reduce the incidence of pneumonia, heart failure, thrombosis and embolism, and decubitus ulcers.

Chemical Balance

Adequate chemical balance helps to maintain comparatively normal homoeostasis and physical reserve. In the aged, physical deterioration is accompanied by rapid and marked chemical imbalance. Our principles for supportive therapy are :

1. Food is preferable to parenteral therapy. A high-calorie, high-protein, and vitamin-rich diet is important. The edentulous should be given cooked ground meat.

2. The daily water requirement of 2.5 litres may have to be doubled, with additional sodium chloride, in patients who have been dehydrated.

3. The daily requirement of 1 g. of protein per kilogram of weight may have to be doubled or trebled after operation, or in depleting diseases or infection.

4. Starvation produces both nitrogen and potassium loss. Low blood potassium may produce asthenia, flaccid paralysis, respiratory distress, and ileus. Bodansky (1950) gives potassium as beef broth or meat juices, or potassium chloride, 2–4 g. daily. Randall *et al.* (1949) recommend a mixture of 1 g. each of potassium acetate, bicarbonate, and citrate in 8 ml. of water: 4 ml. may be taken three times daily. For intravenous use, 2–4 10-ml. ampoules of 15% potassium chloride may be given in 24 hours. Repeated blood potassium determinations are required.

5. Patients with diminished cardiac reserve tolerate best a hypodermoclysis of 2.5% glucose in 0.45% solution of sodium chloride. If diuresis is poor, 50–100 ml. of hypertonic (25–50%) dextrose solution intravenously is recommended.

6. In alkalosis Bodansky (1950) has used a 2% ammonium chloride solution intravenously.

7. A controlled diet and insulin are indicated for the diabetic. In emergencies 5% glucose in saline intravenously, with one unit of insulin for each 2 g. of carbohydrate, is recommended.

Other Problems

Heart Disease.—An ageing heart, coronary sclerosis with myocardial fibrosis, and valvular defects do not necessarily contraindicate operation. Pre-operative digitalization is advisable unless there is a definite contraindication. In 100 necropsies, 27% of the post-operative deaths were found to be caused by heart failure and 3% by coronary occlusion. All the necropsies revealed varying degrees and types of cardiac pathology. Master *et al.* (1950) have stated that "patients with severe heart disease tolerate even major operations if adequate precautions are taken to avoid anoxaemia and coronary insufficiency." Our experience supports these observations. We have used digitalis to strengthen the myocardium, unless there was a contraindication. Irregular cardiac action on the operating table can be controlled by the intravenous use of 5 ml. of a 1 or 2% solution of procaine for ventricular arrhythmias or auricular tachycardia ; oxygen and digitalis for interference in the conduction system ; intravenous quinidine for ventricular fibrillations ; and adrenaline and cardiac massage for cardiac arrest (Collins, 1950).

Anaesthesia.—Improvement in anaesthesia is a major factor in the increasing success achieved by geriatric surgery. Recent advances in anaesthesiology have contributed to reduce morbidity and mortality. Anaesthetists plan the anaesthesia for the individual patient and supply supportive therapy during operation. Pre-operative sedation should be minimal. Cyclopropane is the preferable general anaesthetic. Intravenous sodium thiopentone is favoured for short anaesthesias, with curare as an adjunct for long procedures. Local analgesia, without adrenaline, is very useful in selected cases. Intratracheal anaesthesia is used in thoracic and some oral surgery, and in prolonged upper abdominal surgery. Our service has had but one anaesthetic death in ten years.

Psychological Approach.—Sick old people respond to kindness and understanding. A frank, tactful, and optimistic manner, patience, and kindness will help understanding and inspire confidence. They can convert an uncooperative or frightened patient to a more reasonable and hopeful frame of mind. Ministers in the various religious groups have been most helpful. A proper psychological approach can mean the difference between co-operation and a will to live, and frustration and a hope to die.

Summary

With scientific advance, improved techniques and anaesthesia, and better understanding of the degenerative processes accompanying old age, it is possible for geriatric surgery to provide more comfort in disabling diseases and to prolong life when it is threatened.

Our mortality statistics show a decline (5%) in elective and emergency surgery when the years 1939–44 are compared with 1945–9.

In emergency surgery the mortality rate will be from two to two and a quarter times that of elective surgery.

Our clinical and necropsy experience has pointed to methods of reducing mortality. Some of them are briefly discussed.

REFERENCES

Bailey, F. W. (1934). *Amer. J. Surg.*, **24**, 487.
Bodansky, A. (1950). *Med. Clin. N. Amer.*, **34**, 395.
Carp, L. (1946). *Ann. Surg.*, **123**, 1101.
—— (1948). *Int. Abstr. Surg.*, **87**, 1.
Clagett, O. T. (1943). *Minn. med.*, **26**, 884.
Collins, V. J. (1950). *N.Y. Med.*, **6**, No. 6, 16.
Cutler, C. W., jun. (1947). *Ann. Surg.*, **126**, 763.
—— (1949). *Surg. Clin. N. Amer.*, **29**, 361.
—— (1950). To be published.
Darling, A. P., and McIver, M. A. (1950). *Ann. Surg.*, **131**, 307.
Evans, R. L., and Key, S. N. (1942). *Penn. Med. J.*, **45**, 818.
Hay, A. W. S. (1940). *Canad. Med. Ass. J.*, **43**, 531.
Jaffé, R. H. (1933). *J. Lab. clin. Med.*, **18**, 1220.
Master, A. M., *et al.* (1950). *N.Y. St. J. Med.*, **50**, 553.
Metropolitan Life Insurance Company (1947). *Statist. Bull. Metrop. Life Insur. Co.*, **28**, 10.
—— (1949). Ibid., **30**, 5.
National Office of Vital Statistics (1950). *Statistical Bull.*, March.
Parsons, W. H., and Purks, W. K. (1942). *Sth. Surg.*, **11**, 525.
Randall, H. T., *et al.* (1949). *Surgery*, **26**, 341.
Rosenthal, J. (1944). *Ann. intern. Med.*, **20**, 933.
Royal Commission on Population (1949). Report. London.
Strenger, G. (1949). *Ann. Surg.*, **129**, 238.

THERMAL COAGULABILITY OF SERUM PROTEINS AND THE DIAGNOSIS OF MALIGNANT DISEASE

BY

HAROLD JACKSON, M.B., Ch.B., M.Sc., Ph.D.

(From the Christie Hospital and Holt Radium Institute, Manchester)

The publication from a reputable source of any laboratory test which may be of value in the diagnosis of malignant disease is a matter to be examined seriously.

Huggins *et al.* (1949) published the results of their investigations on the altered thermal coagulability of serum proteins in malignant disease. They described a test involving the use of iodoacetic acid which was said to increase the sensitivity of the discrimination between the sera of patients with malignant disease and those of healthy individuals and subjects with non-cancerous diseases. While these authors stated that the deficiency revealed in the serum in malignant disease was not specific, and that similar results were obtained in pulmonary tuberculosis and some acute inflammatory processes, their results were striking enough to demand further investigation. Some other groups of American workers have recently described their experience with this test. A series of tests was carried out at the Christie Hospital during the last year, the results of which are given below.

The iodoacetate test consists in exposing a given concentration of serum to increasing concentrations of iodoacetate in buffer at *p*H 7.4 and heating to 100° C. for 30 minutes. Iodoacetic acid reacts with certain linkages in the protein molecules and interferes with the coagulative process which normally occurs on heating. The end-point is found by estimating in which of the series of tubes the contents have just failed to remain fluid, and the quantity of iodoacetic acid thus required is related to the amount of protein present in the serum as an "iodoacetate index." Huggins and his co-workers at first described a certain technique; from this they later evolved a modified test in which the estimation of the end-point did not depend so much upon the personal opinion of the observer.

A trial of this later method (55 cases) convinced us that it was unreliable, and so in most of our tests their original technique has been used.

Blood for the tests was run into sterile tubes, allowed to clot for an hour or so, refrigerated overnight, and the serum removed aseptically and kept in the refrigerator for use. Each test was carried out in duplicate—the second test being made either concurrently or in the course of a few days. The interpretation of the end-point was made by one individual throughout, working entirely in ignorance of the origin of the serum. With few exceptions the duplicates gave reasonable correlation—either complete agreement or differing by one tube. The mean results were calculated when differences between duplicates occurred. In some tests the end-point was difficult to ascertain and in a few quite impossible (seven tests out of a total of 224). These latter occurred in individuals in whom the serum protein was high (8.2% or more) and the coagulation took place in floccules interspersed with clear fluid. The total serum proteins were calculated from the total nitrogen figures estimated by the micro-Kjeldahl technique.

All cases of malignant disease examined were new and untreated, and the pathology was confirmed histologically except in a few instances in which there was no doubt on clinical examination. No attempt has been made to relate the test to the clinical stage of the condition.

Results

The collected figures from our tests are shown in Table I and in histogram form in Fig. 1. In addition, a group of cases have been chosen to illustrate the relationship of the test to various clinical conditions (Table II). The distribution of the total serum proteins in the three groups—normal, malignant, and non-malignant pathology—is shown in Fig. 2. It is commonly stated that the serum proteins diminish in malignant disease, but in the individuals we have studied the general distribution pattern is normal.

TABLE I

	Normals		Non-malignant Pathology		Cancer	
	No. of Cases	Test +ve(%)	No. of Cases	Test +ve(%)	No. of Cases	Test +ve(%)
Huggins *et al.* (1949) ..	100	0	95	16	85	100
Bodansky and McInnes (1950)	68	0	68	6	137	26
Homburger *et al.* (1950)	47	27·5	108	70	102	93
Homburger (modified technique)	46	0	30	23	51	78
Cliffton (1949) ..	42	23	99	65	54	83
Jackson ..	38	26	63	80	61	64
Jackson (modified technique)	27	59	0	0	28	57

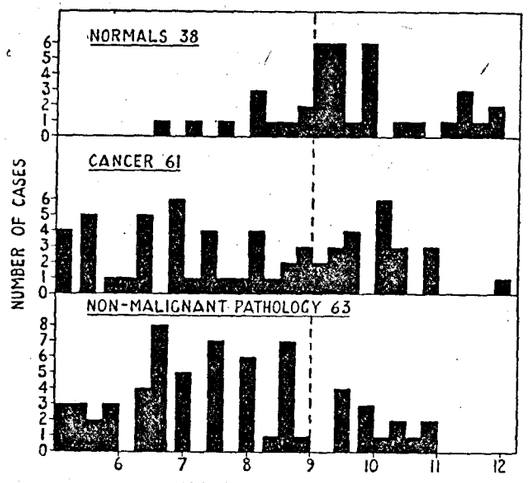


FIG. 1.—Serum coagulation test.

TABLE II

	Test Positive in
Carcinoma of tongue	3/5
Basal-cell carcinoma	1/6
Carcinoma of breast	4/11
Carcinoma of cervix	2/3
Leukaemias	6/7
Hodgkin's disease	3/4
Carcinoma of lung	8/9
Tuberculosis of lung	8/8
Pneumonias	10/10
Non-malignant pathology associated with haemorrhage	8/8
Total ..	53/71

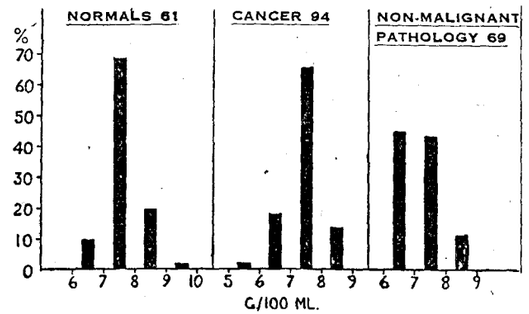


FIG. 2.—Total serum proteins.

Discussion of Results

Huggins *et al.* (1949) selected an iodoacetate index of 8.99* as a dividing-line between normal and abnormal. Not one of their series of 100 normal sera gave an index less than this figure. Of 85 cases of proved malignant disease all except three were found to have an index of less than 8.99. The three exceptions were patients with carcinoma under treatment, stated to be apparently well controlled. Of the group of non-malignant pathology, 16 out of 95 cases gave a "cancer positive" test (Table I). All these "false positives" were stated to have serious disease. No further information was given of the types of malignant disease tested or of the varieties of non-malignant pathology included in the group, except that there were seven cases of pulmonary tuberculosis, all of which gave a positive test.

*A difference in end-point of one tube makes an alteration of 1 unit in iodoacetate index.

Cliffton (1949) compared the results he obtained using three "cancer tests"—namely, an antiproteolytic reaction and thermal coagulation tests. Using the iodoacetate test he found no significant difference in results whether the original technique of Huggins *et al.* or their later modification was applied. These results are shown in summarized form in Table I. In his entire series (235 cases) the overall accuracy in cancer diagnosis was only 55.5%.

Bodansky and McInnes (1950) found the original technique recommended by Huggins *et al.* unreliable and adopted their own modification of the second method described. Their results are summarized in Table I.

Homburger *et al* (1950) published an account of their investigations and included a detailed list of cases. They used both techniques described by Huggins *et al.*, and, as we have done, made an attempt to assess the reliability and reproducibility of the test. They condemn the original method of Huggins *et al.*, maintaining that reproduction of the test by different investigators is impossible. They consider the modified method easier to reproduce and less complicated, but find the results so obtained at considerable variance with those from the former method (Table I).

Finally, Kiefer *et al.* (1950) carried out the modified technique of Huggins *et al.* on 700 apparently healthy men and women. All except six gave values higher than 9.3. These latter were found to give figures greater than 9 on repetition. Of 25 cancer cases run as controls, 76% gave a positive test. According to these workers "the thermal coagulation end-point is striking and reproducible," and "in no instance did multiple determinations of the end-point upon the same specimen vary more than one tube."

The results of the six groups of investigators clearly show no consistent correlation, so that the conclusion is inevitable that the test as such is valueless. The figures obtained by Cliffton (1949), Homburger *et al.* (1950), and ourselves, all using the original technique, are directly comparable, and contrast sharply with the results quoted by Huggins *et al.* (Table I).

We had hoped that the test might have some application in the diagnosis of malignant disease in the chest or abdomen. In our experience, however, strongly positive tests were nearly always obtained in acute and chronic inflammatory lesions of the chest and in haemorrhagic states in the alimentary tract not associated with malignancy (Table II).

The conclusion, therefore, is that the change in serum proteins manifest as altered thermal coagulability is not invariably present with malignant disease, even in clinically advanced lesions, and also occurs in a high proportion of cases with non-malignant pathology and even in apparently healthy individuals. The cause of such a change is not necessarily related to an alteration in the total serum proteins. The nature of the change is as yet obscure.

Summary

The thermal coagulability of serum proteins in the presence of iodoacetic acid has been examined in 65 normal individuals, 89 cases of malignant disease, and 63 patients with other diseases.

An "iodoacetate index" has been calculated for each serum; this has been used to assess changes in the coagulability of serum proteins in relation to disease. The distribution pattern of the figures so obtained leads to the conclusion that the determination of such an index is useless in the diagnosis of malignant disease. Not only may serum from apparently healthy individuals furnish iodoacetate figures falling into the index range suggested for cancer cases, and vice versa, but most cases of non-malignant disease gave values in the "cancer range."

The test also reveals no consistent correlation between "iodoacetate index" and the severity of the malignant condition; even advanced cases of cancer may give figures in the "normal range."

REFERENCES

Bodansky, O., and McInnes, G. F. (1950). *Cancer*, **3**, 1.
Cliffton, E. E. (1949). *J. nat. Cancer Inst.*, **10**, 719.
Homburger, F., Pfeiffer, P. H., Page, O., Rizzone, G. P., and Benotti, J. (1950). *Cancer*, **3**, 15.
Huggins, C., Miller, G. M., and Jensen, E. V. (1949). *Cancer Res.*, **9**, 177.
Kiefer, L., Sullivan, B. H., and Littlefield, W. (1950). *Proc. Soc. exp. Biol., N.Y.*, **73**, 29.

KELL-CELLANO BLOOD GROUP SYSTEM IN PREGNANCY AND TRANSFUSION

BY

J. B. COCHRANE, M.B., M.R.C.O.G.
(From Nottingham City Hospital)

R. H. MALONE, M.D., D.P.H.

AND

I. DUNSFORD
(From the Sheffield Blood Transfusion Centre)

Coombs, Mourant, and Race (1946) described a new antigen-antibody system (Kell) unrelated to the Rh system but nevertheless capable of producing haemolytic disease of the newborn. More recently, Levine *et al.* (1949) found another antibody (Cellano) which also caused haemolytic disease of the newborn, and showed that the Kell and Cellano genes are alleles. They suggested that the symbols K and k, previously employed to represent Kell-positive and Kell-negative, be used to indicate the presence of the Kell and Cellano genes respectively, and calculated that the three genotypes, KK, Kk, and kk occur with frequencies of 0.2%, 8.6%, and 91.2% respectively among white Americans.

Six examples of anti-Kell are noted in their paper and at least a dozen others are known at the present time (R. R. Race—personal communication). The Kell antibody in the case described here was discovered at the Sheffield Blood Transfusion Centre in 1948 (Dunsford, 1949), and is exceptional in reacting in saline but not in human serum or bovine albumin.

Case History

The patient, aged 38, was first seen on March 12, 1948, when she was admitted to hospital at the 33rd week of gestation in her third pregnancy, on account of intrauterine foetal death. Her previous obstetrical history, which was somewhat chequered, was as follows.

1. On March 1, 1929, she gave birth in her own home to a living female mature infant weighing 9¼ lb. (4.3 kg.). Postpartum haemorrhage occurred and she was removed to a non-obstetrical general hospital, where two blood transfusions were given on the day of admission, each transfusion, apparently of one pint (570 ml.) and each from a separate donor. Septicaemia supervened, but full recovery occurred after four weeks, when she was discharged. Unfortunately the transfusion records could not be found and so the donors could not be traced.

2. A stillborn male mature infant was born at home on January 21, 1932; weight unknown. Foetal movements were not felt by the patient for six weeks before delivery. No investigations were made. She divorced her husband in 1936, but remarried in June, 1947. The first husband, unfortunately, cannot be traced, and so no investigations on his blood are possible.

3. On March 16, 1948, a stillborn macerated male foetus was delivered; gestation 34 weeks. She had booked for home

confinement with her third pregnancy (the first by her second husband), and delivery was due in the last week of April, 1948. At the third month she had a threatened abortion, treated by her own doctor with rest in bed at home, and from then onwards until March 1, when she failed to feel the foetal movements, there were no further complications. Her past history yielded no illnesses of note. Examination on March 12 showed her to be a normal healthy woman, no abnormality in blood pressure or urine being present. The Wassermann reaction and Kahn test were negative. The fundus was small for 33 weeks' gestation, and the foetal heart sounds were absent. A skiagram of the foetus showed a well-marked Spalding sign, and so induction of labour by the insertion of a stomach tube into the lower pole of the uterus was performed on March 16, and 21 hours later a male stillborn macerated foetus weighing 3 lb. 8 oz. (1.6 kg.) was delivered without event. Her recovery was spontaneous and she was discharged on March 26. At the post-natal examination on April 27, when recovery was complete, she was advised to report immediately to the hospital antenatal clinic if any further pregnancy occurred.

4. On November 13, 1949, she gave birth to a living male mature infant. She reported on June 1, 1949, when she stated that her last menstrual period had begun on February 1 and she thought she was pregnant. Examination showed her to be 16 weeks advanced in pregnancy and her general condition to be wholly normal. Her antenatal progress to term was smooth and no obstetric complications occurred. On November 13, as she had not gone into labour spontaneously and had exceeded the calculated date of delivery by some five days, a surgical induction of labour (low rupture of membranes) was performed, and six hours later she delivered herself spontaneously of a living male mature infant, weighing 6¼ lb. (2.8 kg.). The placenta and membranes showed no abnormality, either macroscopically or microscopically, and the infant was at no time jaundiced or anaemic. Both mother and infant made normal progress and were discharged 10 days afterwards. At the post-natal visit one month later the infant was making excellent progress and the mother was overjoyed at the successful outcome of her pregnancy.

Serological Investigations

The patient's blood was first tested in October, 1947, when she was 14 weeks pregnant: no abnormal antibodies were found, but the laboratory recorded "? weak reactions with two cells (C_1 and C_2)." C_2 was known to be Kell-positive, but the Kell type of C_1 was unknown, and no particular significance was attached at the time to these doubtful reactions. (C_1 subsequently proved to be Kell-positive also.)

Blood collected from the mother at the delivery of a stillborn child in March, 1948, was found to contain anti-Kell active at 37° C. in saline and demonstrable with anti-human globulin, but inactive in human serum or bovine albumin. This is of interest, as it was the first saline agglutinating Kell antibody reported, and Sanger *et al.* (1949) had noted that all three examples of the Kell antibody reported up till then had been of the incomplete type, and that this fact was probably not without clinical significance.

The patient became pregnant again in February, 1949, and was delivered of a normal full-term child in November, 1949. Her blood was examined three times during this pregnancy—at the 20th, 28th, and 35th weeks—as well as at delivery and on the 14th day post partum, and on each occasion saline agglutinating anti-Kell could be demonstrated. The titres in saline on these occasions were 1, 4, 1, 2, and 2 respectively, and the corresponding titres with anti-human globulin were 2, 64, 32, 8, and 32. On no occasion did her serum agglutinate Kell-positive cells suspended in human serum or bovine albumin, and the Coombs test after inactivation of her serum at 70° C. for 10 minutes was consistently negative.

The patient was Group O Rh-positive (CDe/cDE), M, P, Le^a-negative, Kell-negative, Cellano-positive (presumably kk).

Her second husband was Group B Rh-positive (CDe/CDe), MN, p, Le^a-positive, Kell-positive, Cellano-positive (presumably Kk).

The baby was Group O Rh-positive (CDe/CDe), MN, P, ? Le^a-positive, Kell-negative, Cellano-positive (presumably kk). The direct Coombs test was negative.

Discussion

In the absence of records of the bottles of blood transfused in 1929 and because of our inability to trace her first husband, it is not possible to say with certainty whether the patient had been immunized against the Kell factor by blood transfusion, pregnancy by the first husband, or pregnancy by the second husband, who is known to be Kell-positive. However, in view of the fact that the second child of her first husband was stillborn but mature, and her third child, the first child of her second husband, was stillborn, macerated, and only 34 weeks in gestation, the probabilities are that she was immunized before her second marriage and by the blood transfusion in 1929 rather than by her first or second child. It would be a remarkable coincidence if her first husband and her second were Kell-positive, the odds being about 130 to 1 against such an event occurring.

This investigation supports Levine's view that the genes for the Kell and Cellano factors are allelomorphic, in that the husband was Kk, the wife kk, and the child kk. It also draws attention to the fact that an increasing titre of an antibody during pregnancy does not necessarily indicate that the foetus carries the corresponding specific antigen. In this case the foetus was Kell-negative, yet the titre of the maternal anti-Kell increased during pregnancy. This phenomenon has been observed on many occasions in the case of Rh antibodies, and is believed to be of the nature of an anamnestic reaction, the foetus providing a non-specific stimulus.

This Kell antibody is peculiar in reacting in saline and with anti-human globulin but not in human serum or bovine albumin. Indeed, albumin seems to suppress its activity instead of enhancing it.

During these investigations, with the use of the patient's antibody, the cells of two unrelated persons were observed to give much weaker reactions than the other Kell-positives, and another cell was not agglutinated in saline suspension but was sensitized, as evidenced by a positive reaction with anti-human-globulin serum. This suggests that variants of the gene K exist, some of which may behave in a manner similar to D^u cells in the Rhesus complex.

The patient generously donated blood containing this valuable antibody, which has been used, together with anti-Cellano serum kindly supplied by Dr. Philip Levine, for determining which Kell-positives are homozygous. Systematic search is now being made for the Kell antibody in pregnancy and in cases in which a transfusion reaction has occurred. The results of these investigations will be published in another paper, but they already demonstrate (in confirmation of the work of other investigators) two points of practical significance: (1) the Kell antibody is of considerable clinical importance as a cause of transfusion reactions and of haemolytic disease of the newborn; and (2) its presence can be demonstrated by means of the indirect Coombs test but will not usually be detected by routine cross-matching techniques ordinarily employed in hospitals.

References

Coombs, R. R. A., Mourant, A. E., and Race, R. R. (1946). *Lancet*, **1**, 264.

Dunsford, I. (1949). *Nature*, **163**, 962.

Levine, P., Wigod, M., Backer, A. M., and Ponder, R. (1949). *Blood*, **4**, 869.

Sanger, R., Bertinshaw, D., Lawler, S. D., and Race, R. R. (1949). *Rev. Hémat.*, **4**, 32.

Medical Memorandum

Vaginal Hysterectomy for Complete Rupture of Uterus during Labour

The following case is recorded, in spite of the fatal termination, because the operative procedure described might be of value to other obstetricians confronted with the same complication under similar working conditions.

Case Report

A Yoruba multipara aged 23, who had not attended the antenatal clinic, was admitted at term on April 6, 1950, having been in labour for nine hours, the membranes having ruptured at the beginning of the uterine contractions. Before admission she had been bearing down in the customary kneeling position for some three hours without advance, and this was followed by absence of uterine contractions for the next three hours. She had had no sudden abdominal pain, fainting, or shoulder pain, and no bleeding per vaginam.

On examination her temperature was 99° F. (37.2° C.), pulse 120, respirations 28, and blood pressure 80/40 mm. Hg. There was some degree of anaemia, and she seemed restless, with mild continuous lower abdominal discomfort. The abdomen was tense, and markedly tender below the umbilicus, up to which the bladder extended. Foetal parts were difficult to define except in the epigastrium, where the breech was located. The foetal heart was not heard.

Rectal examination revealed that the cervix was fully dilated, and a marked caput could be felt in low mid-cavity. Under thiopentone and open ether anaesthesia, and after catheterization, vaginal examination revealed that the head was arrested deeply in the left transverse (L.O.T.) position, with a marked caput. The sacral promontory was acutely projecting forwards, the diagonal conjugate was 4½ in. (11.4 cm.), the upper half of the sacral bay was straight, and the pelvic outlet was normal. On withdrawing the hand there was a free loss of blood. On re-examination a complete rupture of the uterus was found at the utero-vaginal (syn. cervico-vaginal) junction, extending along the whole of the anterior surface from half-way along the left lateral margin to the right antero-lateral margin of that junction. The foetal body and limbs and the placenta and membranes had been extruded into the peritoneal cavity, and the uterus, which was lying in the right iliac fossa, was freely mobile.

In view of the presence of active bleeding, which might have been arising from the left uterine artery, it was considered wiser to act at once, because there was no possibility that the operating theatre would be available for at least two hours, and blood donors and a qualified anaesthetist were not available. Moreover, the patient's general condition was now poor—pulse 140, blood pressure 80/30 mm. Hg.

After an unsuccessful attempt at manual rotation it was considered unwise to rotate and deliver with Kielland's forceps, which might have extended the tearing. The head was pushed up, and an intraperitoneal podalic version was easily performed, followed by a breech extraction of a fresh stillbirth, weight 6 lb. 3 oz. (2.8 kg.). The placenta and membranes, weighing 19½ oz. (0.55 kg.), were manually removed from the peritoneal cavity through the uterine rent. It is the routine here at operations to have four sponge-holders placed on the instrument trolley for post-partum inspection of the cervix. While the uterus was being pushed into the pelvis to reveal and facilitate clamping the free margins of the tear, it was found that the uterus was so mobile that it descended to the vaginal outlet. A vaginal hysterectomy was then regarded as possible, whereupon two fingers were hooked into the uterine cavity and with further suprapubic pressure the fundus of the uterus was delivered under the symphysis pubis. The Fallopian tubes, ovarian vessels, round ligaments, and broad ligaments were clamped and divided in the usual fashion, and ligated with No. 2 catgut, followed by reconstitution of the vaginal vault. In view of the difficulty of ligating the lower end of the tear on the left in the region of the utero-vaginal junction, two clamps were left *in situ*. Haemostasis being ensured, the vagina was then packed with gauze soaked in 1 in 1,000 acriflavine, and an indwelling catheter inserted into the bladder.

Immediately after the operation the pulse was imperceptible and the blood pressure was 40/0 mm. Hg. Some 30 minutes after an injection of ¼ gr. (50 mg.) of ephedrine intramuscularly, 1.7 ml. of nikethamide, and 8 min. (0.48 ml.) of adrenaline hydrochloride (1 in 1,000) the blood pressure was 80/40 and the pulse 150. The patient continued to make excellent progress, and was given antibiotics, antitetanus serum, and the antimalarial quinine sulphate.

Fifteen hours later, when the temperature was 99.6° F. (37.55° C.), pulse 112, and blood pressure 112/58 mm. Hg, the packing, clamps, and catheter were removed, after which there was no bleeding. Early removal of the packing and clamps is considered to be essential in tropical climates because of the danger of sepsis. Progress continued to be good, with minimal distension and no vomiting, until on the third day, 68 hours after operation, she suddenly collapsed and died within 30 minutes.

Post-mortem examination revealed a large quantity of free blood in the peritoneal cavity, with some localized plastic peritonitis around the left ovario-pelvic ligament, from which the secondary haemorrhage appeared to have arisen. There were no other abnormalities and no bleeding per vaginam. It was of interest to note the firmness and effectiveness, against subsequent prolapse of the bowel, of the reconstituted vaginal vault, which was sloping downwards and backwards from behind the bladder and symphysis pubis towards the hollow of the sacrum.

Comment

There is no doubt that laparotomy performed some two hours later would have been fatal, should the patient have survived that interval of time until the operating theatre had been vacated. Alternative procedures would have been to displace the head or to perforate and extract and to attempt to secure the free margins of the uterine rent with clamps, and then to perform a laparotomy at the first available opportunity. This would have necessitated a second anaesthetic, haemostasis might not have been successfully secured by the clamps, and blood donors would still not have been available.

Until the patient's sudden death the post-operative condition (after the first half-hour) was good. This fact is worthy of note, because the convalescence has been stormy in our cases of ruptured uterus that have survived laparotomy.

The operation was simple and rapid, under conditions in which irritating delays can lead to a fatal issue. The uterus, which weighed 26½ oz. (0.75 kg.) and was 6½ in. (16.5 cm.) in length, 5 in. (12.7 cm.) broad, and 3 in. (7.6 cm.) in thickness, was easily made to traverse the pelvic cavity.

In future, silk sutures rather than catgut, as used in this case, would be preferable for ligating the enlarged vessels associated with pregnancy, and also because of the added danger of infection in the Tropics. Perforation and extraction might be preferred to the procedure of extraction adopted, with less risk of infection and trauma.

The operation of vaginal hysterectomy is therefore advocated for the type of rupture here described, which was an extensive one at the utero-vaginal junction, producing unusual mobility of the uterus; and particularly is it recommended in this form of rupture when the facilities for immediate laparotomy and resuscitation are not available.

A. H. C. Walker, M.R.C.O.G.,
Professor of Obstetrics and Gynaecology,
University College, Ibadan, Nigeria, West Africa.

Reviews

EYE SURGERY

Ophthalmic Operations. By Seymour Philps, F.R.C.S. (Pp. 397; 510 figures. £2 10s.) London: Baillière, Tindall and Cox. 1950.

Eye Surgery. By H. B. Stallard, M.B.E., M.D., F.R.C.S. Second edition. (Pp. 683; 550 illustrations. £2 12s. 6d.) Bristol: John Wright and Sons. 1950.

Since the war, perhaps because of it, ophthalmology has been enriched with a number of excellent textbooks on ophthalmic surgery. They have appeared from America, France, Spain, and Italy, and Great Britain has its own notable contributions to add. Philps's *Ophthalmic Operations* is the linear descendant of that well-known companion of a previous generation by Grimsdale and Brewerton (2nd ed., 1920) and is a product of the same hospital; it is a striking tribute to the revolutionary progress that ophthalmic surgery has made. Within its limitations Philps's book is thoroughly good. It is a record of the techniques employed personally by an outstanding surgeon of considerable experience, without discussion or description of alternative methods and without bibliographical references. It therefore cannot serve as a reference book; but there is much to be said for this method of presentation, particularly as a practical guide for surgeons starting ophthalmic work.

The volume covers ophthalmic surgery systematically. Chapters on general considerations and anaesthesia are followed by a systematic description covering the whole field of operations on the eye and its adnexa. The author discusses each procedure under the headings of indications, anaesthesia, instruments required, technique, and (where applicable) special nursing and complications. Each section is clearly illustrated, mainly by unusually satisfactory photographs (all the author's own) supplemented by diagrams (all drawn by the author); these are a feature of the book, and it would seem that the hands of the ophthalmic surgeon are allied to those of an artist. The writing is clear, the teaching sound (perhaps a little dogmatic on occasions), and the technical production of the book unusually good. It is a creditable addition to the literature and will make and maintain an assured place for itself.

It is good to see Stallard's *Eye Surgery*, originally published in 1946, reach its second edition. The book is so well known among ophthalmic surgeons that a detailed account of its manner of treating the subjects is unnecessary. The new edition, however, has been very much enlarged—by almost 200 pages—increasing its bulk by one-third, and by 212 new illustrations. These are useful, and the author's apology in his preface that they are practically all his own work is quite misplaced modesty. The added material includes all the important innovations introduced into the practice of surgery during the last five years, while the author pays particular attention to such subjects as corneal grafting and keratectomy; recent operations for glaucoma such as goniotomy, cyclodiathermy, and the insertion of drains into the anterior chamber; scleral resection for retinal detachment; and the new techniques for the insertion of implants after enucleation. Each procedure is discussed with the meticulous detail characteristic of all the author's work. As in the previous edition, the section on the lids and their plastic reconstruction is unusually elaborate; indeed, it receives more space than is allotted to the surgery of the lens, choroid, retina, and glaucoma together. The whole book is enriched with personal case reports and good photographic records drawn from the author's practice. There is no doubt that this second edition will perpetuate and enhance the reputation of its predecessor.

STEWART DUKE-ELDER.

MODERN KNOWLEDGE OF MENSTRUATION

Menstruation and its Disorders. Proceedings of the Conference held under the auspices of the National Committee on Maternal Health. Edited by Earl T. Engle. (Pp. 358; illustrated. 37s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

This book records the proceedings of a conference on menstruation organized by the National Committee on Maternal Health in the U.S.A. and, like so many works of this kind which have appeared in recent years, makes fascinating reading. The title is in some ways misleading, for there is no attempt at a complete account of menstruation, the 13 contributions dealing only with the "growing points of knowledge" and serving to indicate modern trends in thought and research. Each aspect is presented by one or more experts in a particular field to an audience of experts, and the reports of the discussions add to the value of the work.

Here will be found in a concise and easily understandable form the latest intricate work on the histochemistry and histophysiology of the cervix, endometrium, and ovary; on uterine and peripheral vascular changes in relation to menstruation; on endometrial pathology in some forms of functional uterine haemorrhage; on menstrual toxin; on early fertilized human ova; and on some aspects of myometrial activity. The list of contributors is in itself sufficient to attract many readers, and includes such names as Wislocki, Gomori, Hertig, Okkels, Markee, Olive and George Van S. Smith, Shorr, TeLinde, and Woodbury, with Engle editing the volume. The general standard of the chapters does not fall below the high level which is to be expected from workers of such eminence; indeed, each deserves separate review. All those who wish to keep abreast of modern developments in the study of uterine function, and those who aim at research in this field, cannot fail to find in this book both information and inspiration.

T. N. A. JEFFCOATE.

THE TIME OF OVULATION

Die Physiologie der Zeugung des Menschen. By Dr. Hermann Knaus. 3rd revised edition. (Pp. 485; 104 illustrations, 43 tables. M. 50.) Vienna: Wilhelm Maudrich. 1950.

Mosaic law enjoins the faithful to restrict sexual intercourse to the second week after menstruation, the period during which we now know ovulation is most likely to occur. Thus does modern research substantiate ancient precept. The credit for this comparatively recent discovery must go almost exclusively to Ogino and Knaus, and the latter, in this book on the physiology of human reproduction, has now collected in one volume the results of nearly twenty years' work in this field. The book makes fascinating reading, for, though much of its content is familiar through the author's many previous publications, the co-ordination has been carried through with characteristic German thoroughness, so that one has for the first time a complete survey of a complex and intricate subject.

The book is mainly about the establishment of the exact time of ovulation, and the various methods used in its determination—animal experiment, hormonal estimation, endometrial and vaginal biopsy, temperature-shift recording, and biological research—are exhaustively described and individually discussed. It is, in fact, a scientific apologia for the author's main thesis—the "safe period." Though many a disgruntled parent may be doubtful of the veracity of the adjective, Knaus's pioneer work remains of paramount scientific interest.

ALBERT DAVIS.

HEALTH SERVICES

The Health of the People. By S. Leff, M.D., D.P.H. (Pp. 288. 12s. 6d.) London: Victor Gollancz. 1950.

In the first half of this book the author gives a historical survey of the condition and needs of the people from mediaeval times to the present day and of the medical services provided to meet those needs. There is ample room in literature for such a survey, and Dr. Leff provides a thoughtful and excellent summary of the birth and growth of the health services. The book is well written and well documented. His account includes maternity and child welfare, poor-law, municipal, and voluntary hospitals, and dispensaries and contract practice. The social and political background of the people, an essential to any health survey, is fully considered. The general reader, medical and lay, will find this part of the book of absorbing interest, and it should not be missed in particular by those whose duty it is to teach medical students, health visitors, and sanitary inspectors.

The second part of the book adds to the growing list of publications on the national health services. Here again is a careful and informative review of these services, together with a sound running commentary about them. I should have welcomed more information and more consideration in relation to general practice than is given in a short chapter, for, as the author himself says, "The general practitioner is in the front line in the battle against disease."

Those who are concerned with the industrial medical services will be much interested in the chapter on this subject—a difficult one which is becoming more and more controversial. Most medical practitioners will welcome Dr. Leff's suggestion that the problem could be solved by employing general practitioners in a part-time capacity in the factories: he properly rejects the idea of an increase in the whole-time industrial medical staff.

This book is easy to handle and easy to read. It should find a place on the book-shelves of all interested in the present health services and their development. Its undoubted value would be enhanced by the provision of an index, a criticism which could be met in the next edition, which will no doubt be required at no distant date.

C. METCALFE BROWN.

TEXTBOOK OF PAEDIATRICS

Lehrbuch der Kinderheilkunde. By R. Degkwitz, E. Glanzmann, Fr. Goebel, J. Jochims, K. Klinke, Ff. Klose, E. Rominger, and B. de Rudder. Edited by E. Rominger. Fourth and fifth editions. (Pp. 971; illustrated. M. 49.80.) Berlin, Göttingen, Heidelberg: Springer-Verlag. 1950.

Professor E. Rominger, of Kiel, has edited what is curiously described as the fourth and fifth editions of the *Lehrbuch der Kinderheilkunde*, there being no clue to this nomenclature, and mention of a second edition in 1942 in the preface makes it even more difficult to understand. Whatever the explanation, this volume can be welcomed as an exposition of the German school of paediatrics, well produced, with excellent illustrations in the text, including some in colour, of which those depicting varieties of stools are of doubtful practical use. Early sections on growth and development, on constitutional factors and hereditary disease, are rather heavy going. But with the succeeding chapters, in which clinical aspects of, for example, the infectious fevers and tuberculosis are discussed, the traditional careful attention to detail and the well-written descriptions of bedside observations show that there are available to-day worthy successors of the giants of the past. It is sad that one of the eight contributors, Professor Goebel, of Düsseldorf, has recently died and that Professor Degkwitz has moved to the United States.

There are inevitable gaps in the book and uneven patches, due, without doubt, in part to Germany's being cut off for several years before, during, and after the war from the easy intercourse of international gatherings and the free flow of scientific literature. The sections on the newborn are rather disappointing, and the account of rhesus incompatibility in the section on diseases of the blood is too brief. A list, running to over 30 pages, of medicaments used in childhood is dominated by proprietary names, which lessens its usefulness outside Germany. But these are not major blemishes, and it is good to see that paediatrics in Germany is recovering its place.

ALAN MONCRIEFF.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Recent Advances in Physical Medicine. Edited by F. Bach, M.A., D.M., D.Phys.Med. (Pp. 490. 27s. 6d.) London: J. and A. Churchill. 1950.

Acute Head Injury. By J. P. Evans, M.D., Ph.D. (Pp. 115. 16s. 6d.) Oxford: Blackwell Scientific Publications. 1950.

The Esophagus and Pharynx in Action. By W. Lerche, M.D. (Pp. 222. 40s.) Oxford: Blackwell Scientific Publications. 1950.

Selected Papers from the Royal Cancer Hospital (Free) and the Chester Beatty Research Institute. Vol. 5. (Pp. 483. 16s.) London: Royal Cancer Hospital. 1950

Cleft Palate and Speech. By M. E. Morley, B.Sc., F.C.S.T. 2nd ed. (Pp. 160. 12s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

Juniors. By G. H. Pumphrey. (Pp. 162. 8s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

The Rationalist Annual, 1951. Edited by F. Watts. (Pp. 88. 2s. 6d. paper covers, 4s. 6d. cloth covers.) London: Watts. 1950.

The Sex Hormones. Ciba Handbook No. 4. (Pp. 186. Free of charge.) Horsham: Ciba Laboratories Limited. 1950.

John Hunter. By S. Roodhouse Gloyne, M.D (Pp. 104. 15s.) Edinburgh: E. and S. Livingstone. 1950.

Amputation Prosthetic Service. By E. H. Daniel. (Pp. 327. 54s.) London: Baillière, Tindall and Cox. 1950.

A History of English Public Health, 1834-1939. By W. M. Frazer, O.B.E., M.D., M.Sc., D.P.H. (Pp. 498. 35s.) London: Baillière, Tindall and Cox. 1950.

Textbook of Physiology and Biochemistry. By G. H. Bell, B.Sc., M.D., F.R.F.P.S.G., F.R.S.Ed., and others. (Pp. 918. 45s.) Edinburgh: E. and S. Livingstone. 1950.

British Encyclopaedia of Medical Practice. Edited by Lord Horder, G.C.V.O., M.D., F.R.C.P. Vol. 3. 2nd ed. (Pp. 669. 60s. per volume.) London: Butterworth. 1950.

Pediatric X-Ray Diagnosis. By J. Caffey, A.B., M.D. 2nd ed. (Pp. 862. $22.50 or 169s.) Chicago: The Year Book Publishers; London: H. K. Lewis. 1950.

Semaine d'Etude sur le Problème Biologique du Cancer. A symposium. (Pp. 348. No price.) Rome: Pontifical Academy of Sciences. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY NOVEMBER 25 1950

INQUIRY BY QUESTIONARY

It is the results rather than the methods of Professor Bradford Hill's inquiries into the doctor's work and pay that have commanded the interest of the medical profession. But in giving his inaugural address[1] (briefly reported at page 1218) on November 22 as president of the Royal Statistical Society he dwelt rather on the techniques he had used, for he had had to elicit facts by questionary from people whom he had not met, whose accuracy might be questioned by the Government, and whose reticence or eagerness to co-operate might have resulted in the subjects rather than the investigator deciding what was or was not relevant. That both Spens Committees and the Government accepted Professor Hill's tables as an accurate plan by which to dispose many millions of pounds of public money is a tribute to his methods. The fact that negotiations are still proceeding with those original maps on the table is not from any doubt of their accuracy but due rather to argument about how far they refer to the changed country we know to-day. Professor Hill was addressing an audience of statisticians, but concluded his address in the hope that his inquiries would "offer something of *general* interest, and especially in the statistical field of survey work—indeed in its most dangerous and treacherous form, the inquiry by *questionnaire*." Interest in the methods should in fact be more general than he suggested. Many doctors doing clinical research but not claiming to be statisticians carry out investigations that require a sceptical care in appraising the evidence: no technical skill can bring sharp definition to a photograph that was taken out of focus, though some handsome retouching is occasionally attempted both in photography and in research. Commonly enough a doctor treats a series of cases and then follows them up, perhaps a year later, by means of a postal questionary. He is lucky if all his patients can be traced, or if traced reply, or if replying write objectively; luckier still if they can be found and will reply five years later. Some of the methods Hill used are applicable in such an investigation and are worth studying in detail when his address is printed in full.

[1] To be published in the *Journal of the Royal Statistical Society*.

In the first inquiry he was asked by the B.M.A. to find out how many services of various kinds insurance practitioners gave to their N.H.I. patients. They included attendances, visits, operations, injections, certificates, and reports. Because of seasonal fluctuations in illness the inquiry had to cover a year. The "universe" of N.H.I. practitioners was known; a randomly selected sample was chosen so large (over one-third of the total body) that the doctors taking part did not need to keep records for the whole year or of all the services on which information was sought. Sub-samples were then allotted to each month of the year, and the doctors in each sub-sample kept records for one month only. Having thus reduced the task for each doctor to one month's duration, Hill then lightened the burden further by splitting the sub-samples into groups, and asking doctors in each group to supply special information on those topics that were of subsidiary interest. All the doctors in each sub-sample therefore kept records of attendances and visits, while doctors in each group within the sub-sample kept records special to that group —of operations, or injections, or certificates, and so on. Thus the number of doctors who neglected to make a return was very small, as Hill pointed out, "by virtue of the experimental design." Given the opportunity of designing a questionary the investigator is apt to forget that data are easier to assimilate than to produce. He may avoid frightening his subjects into silence by spreading the work among them in some such way as this. The results were carefully checked for consistency by the usual methods, and their uniformity suggested that the samples were good and the records efficiently kept.

Professor Bradford Hill's second inquiry was into the professional income and expenditure of general practitioners in 1936-8. It was carried out in 1945 for the B.M.A. so that accurate evidence could be presented to the Spens Committee on remuneration of general practitioners. Here again there was a ready-made "universe," obtainable through the Central Medical War Committee; but it had a serious defect, for the sample drawn from it could contain, of the doctors practising in 1938, only those still alive in 1945. The incomes of doctors who had died between those years could not be included; their omission affected the figures for the older doctors, and gave incorrect weightings to the older age groups if all ages were combined. The response was disappointing and only two-thirds of the required sample was obtained. Failure by doctors to answer requests to take part in the inquiry was not related to age, but refusal to co-operate was, being more prevalent among the older. Though the circumstances of this inquiry militated against a wholly successful result, for the information required was nearly 10 years old and at least 1,000 of the doctors approached were in the

armed Forces, the Spens Committee accepted the figures as sufficiently accurate. No doubt it did so mainly because every care had been taken to choose the sample by random methods. Though they could not be wholly successful, any departure from them would have vitiated the results. No juggling with a sample will make it random once it has been drawn, but probable departures can be discovered, as they were here, and some allowance made for them.

After the general practitioners came the consultants with their Spens Committee. An initial problem was that no defined "universe" existed from which a sample could be drawn. With the help of the Central Bureau of Hospital Information and medical officers of health, Hill succeeded in identifying about 6,000 possible subjects for the inquiry. Replies were received from 4,793 doctors, but about half of these were not relevant to the inquiry because they were not engaged predominantly in consultant or specialist practice in 1938-9. In the general-practitioner inquiry it was thought that some doctors had refused to co-operate because they were asked to sign their returns. This objection was now overcome by asking the consultant to give the required information, unsigned, on one form, and to state on another form, over his signature, that he had filled in the first. The two forms were sent to separate addresses and thus could not be linked.

Requiring a small sample, which could be followed up if necessary, to use as a check against the large mass of returns, Hill had to adopt a special, and indeed ingenious, device to enable him to separate the forms in this sample from the bulk of them when they were returned to him unsigned. At the bottom of 90% of the forms the instruction "[P.T.O." was set; in 10% of them, which were to constitute the special sample, the bracket was omitted. The names in the sample, as in the main group, were known to the secretaries of the committee collecting evidence, but they saw no income returns; only these, and whether or not they were in the special sample, were known to Professor Hill. If a doctor in the sample did not respond, that would be known to the committee, and he could be asked again; Hill knew only how many of the sample doctors had failed to reply, not which ones. By using both halves of the information secrecy was maintained and defections were followed up. Cross-checks between sample and main group on such features of the investigation as failure to reply, distribution of specialists by specialty, and mean net income indicated that the special sample had been a useful device and that the figures of the main inquiry could be accepted "without serious qualms."

Such in brief were some of the methods used. They depend for their efficacy not on abstruse mathematical procedures but on the realization that a sample from which generalizations are made must be unbiased. Neither the investigator nor the subjects he is investigating must allow their preconceptions, albeit unconscious, to influence the composition of the sample. Such perfection is rarely possible in inquiry by questionary; checks must therefore be introduced to test departure from it. The methods require clear thought, not elaborate technique, and they are such as any medical man can apply when carrying out an investigation, however slight.

TERRAMYCIN

If "aureomycin" and "chloromycetin" (chloramphenicol) may be described as the newer antibiotics, then the newest is "terramycin," at least among those with any assured therapeutic future. The clue to American success in producing this series of valuable antibiotics is to be found in their names. Each of these from streptomycin onwards is derived from a soil actinomycete, and several American firms have for some time been engaged in examining samples of soil from all parts of the world in the hope of discovering new organisms of this type forming hitherto unknown antibiotics. Laboratories so engaged have examined many thousands of such samples and screened immense numbers of cultures from them. The more promising are submitted to closer investigation, including, in particular, tests of toxicity of the antibiotics formed by them. It has been said that several hundred thousand cultures may be examined in order to find one or two worthy of going forward to the pilot-plant stage—that is, production on a scale adequate for thorough experimental and possibly clinical trial. Such work involves a large and continuous outlay, which may or may not reap a gigantic reward. To those manufacturers whose efforts have been fortunate must now be added the name of Pfizer and Co.—familiar to many as the makers of much of the penicillin used in the Army and elsewhere during the latter part of the war—for terramycin is their product. Its existence was announced in the early part of this year,[1] and since then it has undergone extensive therapeutic trial. The main source of information on this product is the report[2] of a conference devoted to it which was held by the Section of Biology of the New York Academy of Sciences in June last. The authors of the 32 papers include many of those who have done pioneer work in the clinical study of other antibiotics from penicillin onwards, and their combined contributions give a good general picture of what terramycin may be expected to do.

[1] See annotation in the *British Medical Journal*, 1950, **1**, 1309.
[2] *Ann. N.Y. Acad. Sci.*, 1950, **53**, 221–460.
[3] Ibid., p. 253.
[4] Ibid., p. 309.
[5] Ibid., p. 266.
[6] Ibid., p. 297.
[7] Ibid., p. 448.

In this country the first report on terramycin comes from Drs. W. D. Linsell and A. P. Fletcher, whose paper appears in this issue at page 1190. Besides describing the pharmacological properties and range of antibacterial activity of this antibiotic, they also record its clinical effects in a preliminary series of 29 cases. Terramycin is an amphoteric substance, solutions of the sodium salt having an alkaline and of the hydrochloride a strongly acid reaction. It differs from aureomycin, which otherwise it closely resembles, in that solutions of its hydrochloride are comparatively stable. Both salts and the parent compound itself have been shown to be active against experimental infections. For the treatment of human disease the hydrochloride has generally been used and has been given in capsules by mouth in doses totalling usually 4 g. daily. Although the drug remains detectable in the blood for as long as 24 hours after a single dose its concentration begins to fall off after about six hours, and this interval between doses has therefore been generally adopted. Larger doses do not give correspondingly higher blood levels, there being apparently a limit to the amount which can be absorbed. Whatever the dosage, much of the drug remains in the bowel, attaining high concentrations in the faeces and suppressing most of the normal flora: here again its behaviour is like that of aureomycin. A point of difference from aureomycin is its minimal penetration into the cerebrospinal fluid, but it reaches serous effusions and the foetal circulation and has been found in high concentrations in the bile. The concentrations attained in the urine, according to Welch,[3] are higher dose for dose than those of either aureomycin or chloramphenicol, though those found in the blood are intermediate between the levels attained by these two drugs—those of chloramphenicol being the highest.

Terramycin has a broad "antibacterial spectrum," resembling that of aureomycin in the generally higher order of sensitivity among Gram-positive species. *Proteus* is highly resistant and *Ps. pyocyanea* variable in its sensitivity. That the more sensitive strains of this species can be controlled by the drug is shown in some of the cases treated by Linsell and Fletcher. *Myco. tuberculosis* has a degree of resistance which seems unpromising. Steenken and Wolinsky[4] nevertheless obtained distinct therapeutic effects in tuberculosis of both guinea-pigs and mice, hampered in the former by the exceptional toxicity of the drug to this animal. The action of terramycin is predominantly bacteriostatic, but higher concentrations acting on smaller numbers of bacteria are bactericidal.[5] Resistance, when acquired *in vitro*—it does not so far appear to have been observed in treated patients—is that of the "penicillin type," gradual in development and moderate in degree; the greatest increase obtained artificially by Gocke and his colleagues[6] was 64-fold. Herrell and his colleagues,[7] in similar studies, have made the important observation that organisms made resistant to terramycin also regularly become resistant to both aureomycin and chloramphenicol but not to streptomycin; indeed, sensitivity to the latter may be slightly increased.

Clinical trials of terramycin have ranged over a wide variety of conditions, and their results in infections due to sensitive bacteria have generally been very similar to those given by aureomycin. With few exceptions the two drugs appear to be practically equivalent alternatives. There are favourable reports of the action of terramycin in pneumonia, septicaemia, and urinary tract infections. It is highly effective in undulant fever, and of little or no value in typhoid fever and the typhoid carrier. It has a beneficial action in amoebiasis and is recommended for peritonitis and for pertussis. The resemblance extends to the field of virus and rickettsial infections: terramycin has a marked effect in primary atypical pneumonia, but the original suggestion of a possible action on the influenza virus seems to have been based on a non-specific action exerted by high concentrations in the chick embryo, and a therapeutic effect in this disease is not to be expected. Several other viruses are known to be unaffected by the drug, but it possesses very marked antirickettsial activity, exceeding that of either aureomycin or chloramphenicol-under certain experimental conditions, particularly against *R. burneti*—a fact which will render clinical trial in Q fever of particular interest. The indications for terramycin in specific diseases are thus already well defined, but, as we are reminded by the clinical part of Linsell and Fletcher's paper, there remains a great variety of wound, post-operative, and other infections in which only experience illuminated by careful bacteriological study can assess the potentialities of a new antibiotic. Presumably supplies of terramycin will be much restricted here for some time to come, but possibly further opportunities may be afforded of conducting trials in this country, if only for limited purposes.

DURHAM AND THE DOCTORS

The action of the Durham County Council in making trade union membership a condition of employment has provoked prompt reaction on the part of the teaching and medical professions. On November 10 the county M.O.H., on the instructions of the Durham County Council, asked all medical officers employed by it to supply him on or before November 22 with evidence of membership of "an appropriate trade union." He informed them that for doctors membership of the British Medical Association would meet the requirement. Anyone failing to produce such evidence by November 22 would cease to be employed by the county council. Those not members of a union (or in the case of doctors of the B.M.A.) would be offered re-employment on condition they did become members of an appropriate union or of the B.M.A. As soon as information was heard of this piece of bureaucratic blundering, the Secretary of the B.M.A., Dr. Angus Macrae, asked the Durham county medical officer of health for full information. After receiving a letter from the clerk to the county council, Dr. Macrae informed him of the policy of the B.M.A., protested strongly against the action taken, and demanded that the county council should receive a deputation from the Association. Each one of the medical officers employed by the Durham County Council was written to and urged not to comply with the county council's request and offered full support if he or she followed the Association's advice. The number of medical men and women involved is fifty-three. The British Medical Guild, from its present financial resources, will undoubtedly come to the help of any one of the medical officers in Durham who might suffer financially as the result of acting upon the principle laid down by the British Medical Association and supported, incidentally, by no less a person than the Minister of Health. This opportunity for action by the Guild should be noted by those who have hitherto had some doubt about its usefulness.

The Public Health Committee of the B.M.A. held an emergency meeting on November 16 to consider the situation and decide what action should be taken. It condemned the action of the Durham County Council and on the basis of policy laid down by the B.M.A. and the Society of Medical Officers of Health is urging the Durham medical officers not to comply with their county council's request. The chairman of the Public Health Committee, Dr. C. Metcalfe Brown, followed this up by attending personally a meeting of the officers concerned in Bishop Auckland on November 18, where both he and Dr. E. Grey Turner, assistant secretary of the B.M.A., addressed those present. An account of this meeting appears in this week's *Supplement*.

It may be recalled that the Trade Disputes and Trade Unions Act of 1946 repealed the Act of 1927, Section 6 of which made it illegal for any local or public body to require as a condition of employment that any person should, or should not, be a member of a trade union. The first repercussion of this on the medical profession was a notice of dismissal issued by the medical officer of health for Willesden in December, 1946, to those nurses and doctors in two of this authority's hospitals who did not comply with the local council's resolution that employment was conditional upon membership of a trade union. At the Willesden Municipal Hospital the sister tutor and deputy matron thus served with dismissal had been working in the hospital for 24 years, and the night sister for 26 years; but to satisfy local doctrinaire stupidity these devoted women were given a month's notice. They refused to comply with the council's requirement and it subsequently had to withdraw from an untenable position.[1] Shortly after this the Ministry of Health sent a circular to all local authorities in which the Minister reminded them that their primary duty was to maintain the efficiency and smooth running of the health service and to ensure the welfare of the patients for whom they were responsible. It was stated that the Minister was anxious that doctors and nurses should join a trade union or appropriate professional association, but considered that this matter should not be decided by unilateral action of local authorities.

The British Medical Association is resolutely opposing this fresh attempt to interfere with the private concerns of medical men, not because it fears it will lose members—membership of the B.M.A. is regarded as fulfilling the requirement demanded by the local authority—but for the simple reason that membership of the B.M.A. is voluntary and the strength of the Association depends upon this fact. Not only that, but in times when there is so much compulsion to do this or that, and to sign this document or the other, it is essential to preserve free institutions and the freedom which such institutions have to criticize without fear official bodies, whether central or local. There is another and perhaps more important point. The Medical Acts confer the right to practise medicine on men and women who, having passed certain tests, have their names placed on the *Medical Register*. To introduce another qualification such as membership of the B.M.A. or of a medical trade union is nothing less than an impertinence. As Dr. Hill observed when he raised this question in the House of Commons: "I think sometimes that we are losing our capacity for anger at such interference with the freedom of the individual." There can be no question that the majority of medical men and women in this country will do all they can to support those medical officers in Durham who have decided to refuse to comply with the demand of their county council. The many who will be indignant over what has happened may feel like following this up by making a donation to the British Medical Guild so that it will always be in a position, as it is on this occasion, to offer financial help to medical men who decide to take a stand on a matter of principle.

[1] *British Medical Journal*, 1946, **2**, 864.

INDICATIONS FOR THE NEWER ANTIBIOTICS

Major advances in antibiotic therapy have so far taken place at intervals of four years. Penicillin was first shown to be a chemotherapeutic agent and employed as such in 1940. The discovery of streptomycin, which made possible the treatment of tuberculosis, plague, and a variety

of infections due to Gram-negative bacilli, dates from 1944. The year 1948 marks the discovery of "aureomycin" and "chloromycetin," which have extended the scope of antibiotic therapy even more widely. The action of both in various forms of typhus and of the latter in typhoid must rank as their main achievements, taking precedence over all others in parts of the world where these diseases are common. To us, among whom typhoid fever is rare and rickettsial infections—but for a problematic number of cases of Q fever—are unknown, this chemotherapeutic advance has only a restricted, albeit very welcome, application. These, however, are only the outstanding uses of these two drugs: they have many others, of which we may hope to take advantage when supplies become freely available.

Three categories of use, in particular, are likely to lead to a very large demand for one or the other. It has been recognized for some years that penicillin is to some extent losing its hold on staphylococcal infections owing to the increasing prevalence of resistant strains. When penicillin fails for this purpose, aureomycin should take its place: staphylococci are uniformly susceptible to it and there is so far not much evidence of any serious tendency for them to become resistant. Staphylococcal osteomyelitis, septicaemia, pneumonia, mastitis, and severe carbuncles, if due to penicillin-resistant organisms, should therefore be treated with aureomycin. Whether less serious conditions than these should so be treated in present circumstances is doubtful. A still wider field is the treatment of urinary tract infections, for most of which aureomycin is very effective. Chloromycetin (chloramphenicol) is also effective, particularly in coliform infections, and the relative merits of these two drugs for this purpose have not yet been clearly assessed. This is another form of use in which we are not in a position to indulge indiscriminately during the present scarcity.

Perhaps the most difficult field in which to distribute exiguous supplies to the best advantage is that of lung infections. It has repeatedly been pointed out in American journals that aureomycin is the nearest possible approach to a cure-all in pneumonia: at least it has a specific effect on all recognized bacterial and virus causes of this disease. Two recent American studies supply evidence that in ordinary pneumococcal pneumonia the effect of aureomycin is at least equal to that of penicillin. Gocke, Collins, and Finland,[1] describe 33 cases—some having very unfavourable features, and 11 having bacteriaemia—in which the response to aureomycin, usually given by mouth but sometimes intravenously, was almost uniformly good and rapid. Salient features were the prompt disappearance of the organism from both blood and sputum, the equally good effect when treatment was started late, and the absence of suppurative complications. In a second paper the same authors[2] describe 13 cases of pneumonia complicating influenza, in which the sputum contained haemolytic streptococci, staphylococci, or (in one case each) *H. influenzae* or *Bact. friedländeri*. The response to aureomycin was again good. (It would be unwise to conclude from these findings that the drug has any effect on the virus of influenza itself. There is no evidence of any such action or of any effect on the common cold.) Dowling and his colleagues[3] go even further when discussing the effect of aureomycin on pneumococcal pneumonia, though their conclusions are commendably guarded. They have treated 131 cases with this drug, and from the fact that bacteriaemia was detected in 32 (24%) they may be presumed to have been of average severity. There were only two deaths, giving a mortality of 1.5%, as compared with 5.2% in a previous series of 686 cases treated with penicillin. These authors also observed that in the aureomycin-treated patients the temperature fell more rapidly. They therefore conclude that the drug is "at least as effective" as penicillin, adding, "There is a possibility that it may be even more effective."

The efficacy of aureomycin in the common forms of pneumonia is thus well established. It is also known to be effective in those due to Gram-negative organisms, in the virus infections psittacosis and primary atypical pneumonia, and in Q fever. A perfectly simple and most satisfactory policy would thus be to give aureomycin to all patients with pneumonia of whatever kind, not, indeed, troubling to find out of what kind it is when this presents any difficulty. This we cannot at present afford to do. The drug is obtainable for patients with virus pneumonia, but to decide whether application for it for this purpose is justified in any given case must often be difficult. The mere absence of pneumococci and other pathogenic bacteria from the sputum is no proof that the disease is due to a virus, particularly when chemotherapy of other kinds has already been employed, and the serological tests whereby the diagnosis can be confirmed lead to considerable delay. In isolated cases a precise aetiological diagnosis must often be retrospective, and it is only during an epidemic that the nature of the infection can be assumed with any confidence. Study of the effect of aureomycin on this group of infections should provide a clearer picture of the incidence and character of each.

[1] *Arch. intern. Med.*, 1949, **84**, 857.
[2] Ibid., 1949, **84**, 875.
[3] *J. Lab. clin. Med.*, 1950, **35**, 215.

MENTAL ILLNESS IN WEST AFRICA

The Colonial Office report entitled *Studies in Mental Illness in the Gold Coast*, by Dr. G. Tooth, directs attention to psychological stresses caused by the unequal rates of evolution of different sections of Africans under European influences. Constant exposure to tropical diseases may also predispose to mental illness: not only can organic diseases affect mental stability but a high infant mortality may be the root cause of certain social and sexual behaviours which become, during evolution, a source of mental conflict when they contravene Western conventions. The attitude towards mental illness varies in different parts of the Gold Coast: there is veneration in the northern territories, fear among the forest dwellers, and shame in the coastal areas. These differences influence the treatment of lunatics and also the form of lunacy in separate areas. Organic diseases, delusional states, schizophrenia, and affective states form the chief mental abnormalities. Less than 10% of mental patients receive asylum treatment: the remainder lodge in family compounds, board with native doctors, or roam at will, but their lot compares favourably with that of those in the asylum. Consequently, with the present limited medical resources, it seems reasonable to develop this type of home or community care, possibly by the establishment of observation compounds staffed by local attendants, with farm land available for the use of the inmates. Central mental-hospital accommodation could then be reserved for rehabilitation of patients with acute and recoverable mental illness or for restraint of those with antisocial or dangerous tendencies, instead of being used as at present mainly to house chronic and irrecoverable dements. It is also suggested that in view of the complexities of the West African background the care of the insane might well remain in local lay hands until sufficient African psychiatrists are trained.

Studies in Mental Illness in the Gold Coast, 1950. London: H.M.S.O.

Tooth suggests that trypanosomiasis is the commonest cause of mental derangement throughout large areas of West Africa, and he appears to believe that mental symptoms are early manifestations of this infection. Although he agrees that the diagnosis of trypanosomiasis can be confirmed only by finding trypanosomes, he suggests that this procedure is often impracticable and consequently that increased knowledge of the mental changes may result in more frequent early recognition of the infection. It would have been of value if Tooth could have indicated clearly the incidence of mental changes in Africans with normal cerebrospinal fluids but with trypanosomes in the blood or gland juice, and then compared this incidence with that of mental disease in Africans in whom trypanosomiasis could not be proved. As it is, it is difficult to evaluate his conclusions on the mental changes in trypanosomiasis, especially since he adds that "it is not unlikely that similar mental changes occur in other tropical diseases." Investigations by experts of special problems among tropical populations are obviously of great value, and the Colonial Social Service Research Council is to be congratulated on initiating this inquiry. Future reports might have an even greater value if such investigations were carried out by a team of critical experts, including a specialist in tropical diseases.

JOULES AND CALORIES

In his elementary physics course the medical student learns, and later forgets, that a calorie is the amount of heat required to raise the temperature of 1 g. of water from 14.5° C. to 15.5° C. Later, in physiology, he hears of the "big calorie" of dietetics, one thousand times the unit learned in physics, and more properly called the kilocalorie (kcal.). This may satisfy physicians, dietitians, and other biologists, but has been worrying physical scientists for some time. There are in fact a number of calories in use—the 15° calorie, the International Steam Table calorie, the Mean calorie, and so on, and, since these are all different quantities of heat, confusion ensues. Further, heat is a form of energy and ought to be measured in the units of energy (ergs) without reference to a particular substance, such as water, or to any particular temperature. The calorie was a unit invented about a century ago for convenience because the early research work in calorimetry was mostly done by observing the change of temperature of a water bath; to-day, however, electrical heating and measuring are the rule. The Royal Society has now decided, in concert with various international scientific bodies, not to use the calorie any more in its publications but the joule instead (the joule is the name given to 10^7 ergs, and there are 4.1855 joules to each 15° calorie), and scientific journals are expected to follow suit. For a time at least heat values will be given in joules with the calorie equivalent in parentheses afterwards, but it is suggested in the Royal Society's pamphlet that for nutrition studies it may be as well to go on with the old unit, since the general public is calorie-conscious.

DIAGNOSIS OF CANCER

The need for a reliable test for cancer is still as urgent as it ever was, for in spite of intensive research there is still no test which will satisfy all the necessary requirements. A test which has attracted much attention during the last year has been the so-called Huggins reaction[1] (or iodoacetate test), and many workers have investigated its usefulness in the diagnosis and prognosis of cancer.[2-5] Unfortunately the lay press in the U.S.A. reported the original work in enthusiastic terms before it had been properly studied, and the results of careful investigations have since clearly underlined its limitations. Huggins himself never claimed the test to be diagnostic, and indeed various workers have found that the proportion of false-positive results in non-malignant conditions ranged from 35 to 70%. The fact that these figures are higher than those reported by Huggins may be due to the well-recognized difficulty in reading the end-point, though the most recent modification in technique has improved the test.[6] Though Huggins and his colleagues originally claimed that the test was positive in 96% of the cases of malignant disease which they studied, other workers have reported figures in the neighbourhood of 70–80%—an indication of only mediocre accuracy. Furthermore, results are not easily reproducible.

The paper by Dr. Harold Jackson appearing elsewhere in this issue serves to confirm the conclusions of the American investigators about the uselessness and inconsistency of the test. Even to choose between the original and the modified methods is not easy. Jackson preferred the original method, with which he obtained fewer false positives in the normal group. Nevertheless, many of his patients with diseases other than cancer gave positive results (he tested no comparable cases by the modified technique), and most of the other workers prefer the modified method—for instance, in Homburger's[3] cases the proportion of false positives was decreased, though the proportion of false negatives increased. There is no known test for cancer which can claim to be diagnostic, but one other test at least—the polarographic serum test based on the methods of Brdička—does appear to be worth investigating further. In the meantime the best that can be said for the iodoacetate test is that a positive result perhaps gives some indication of an abnormal condition.

[1] Huggins, C., *et al.*, *Cancer Res.*, 1949, **9**, 177.
[2] Bodansky O., and McInnes, G. F., *Cancer*, 1950, **3**, 1.
[3] Homburger, F., *et al.*, ibid., 1950, **3**, 15.
[4] Finnegan, J. V., *et al.*, *J. Lab. clin. Med.*, 1950, **35**, 708.
[5] Gilligan, D. R., *et al.*, *New Engl. J. Med.*, 1950, **242**, 807.
[6] Huggins, C., *et al.*, *J. Amer. med. Ass.*, 1950, **143**, 11.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MENSTRUAL DISORDERS AND THE MENOPAUSE

I. PHYSIOLOGICAL BASIS AND DIAGNOSIS

BY

P. M. F. BISHOP, D.M.

Endocrinologist, Guy's Hospital and Chelsea Hospital for Women; Senior Lecturer in Endocrinology, Department of Obstetrics and Gynaecology, Postgraduate Medical School of London

From the menarche to the menopause the endometrium undergoes a series of changes which periodically culminate in uterine bleeding. They consist of growth, secretion, shrinkage, and shedding. This sequence of events depends on the rhythmical rise and fall of ovarian secretion, which is controlled, in its turn, by the cyclical activity of the gonadotrophic hormones of the pituitary gland.

The Menstrual Cycle

The crucial event of the ovarian cycle is ovulation; on it depend not only the release of the ovum but the formation of the corpus luteum and the secretion of progesterone. Before ovulation takes place the endometrium is solely under the influence of the oestrogenic hormone, which stimulates growth and proliferation. After ovulation the combined effect of oestrogen and progesterone leads to glycogen production and secretion of mucus by the endometrial glands, and to conversion of the stroma into the decidua that is essential for the embedding of a fertilized ovum. These changes therefore constitute the prelude to pregnancy and are described as "progestational." Thus we may refer to the pre-ovulatory phase of the endometrial cycle as "proliferative," and to the post-ovulatory phase as "secretory" or "progestational."

Unless conception sets in motion the complex chain of endocrine reactions that leads to maintenance of the corpus luteum, the latter degenerates in due course and deprives the endometrium of the sustaining influence of the ovarian hormones. The premenstrual endometrium is thick, succulent, and oedematous. It is richly supplied with elaborately coiled vessels. Withdrawal of oestrogen results in dehydration, and as the endometrium shrinks the vessels become kinked, engorged, and congested. At the same time withdrawal of both ovarian hormones leads to necrosis of the glands and stroma. This is accentuated by the subsequent ischaemia, which may last for some hours before vasodilatation finally ensues, with rupture of the vessels, haemorrhage, and piecemeal shedding of the superficial layers of the endometrium.

Effect of Oestrogen and Progesterone on Uterine Bleeding

Normal menstruation is due to deprivation of both oestrogen and progesterone. Each of these hormones, however, has a specific effect on uterine bleeding.

The effect of oestrogen is perhaps best explained by the hypothetical conception of the "bleeding threshold" (Fig. 1). Let us suppose that there are three levels of effective oestrogen concentration. (It is important to refer to "effective oestrogen concentration," for this takes into account not only the concentration of oestrogen in the blood but also the degree of endometrial responsiveness to oestrogen.) One of these levels is the bleeding threshold, and whenever the effective concentration of oestrogen lies within this range bleeding will occur. If the effective concentration is below this level, as it is in most cases of amenorrhoea due to a refractory endometrium or to ovarian or pituitary failure, "subthreshold amenorrhoea" will be the result. Normal menstruation is due to oestrogen (and progesterone) deprivations, and consequently to a fall in the effective concentration from superthreshold to threshold levels. Similarly, the administration of oestrogen in cases of amenorrhoea usually leads to bleeding a few days after the course is completed ("oestrogen withdrawal bleeding"), and is due to the drop from superthreshold to threshold levels. On the other hand, bleeding may be arrested if the effective concentration is raised to superthreshold levels with high doses of oestrogen, or if the effective concentration is lowered, either by opposing the action of oestrogen with androgen or by rendering the endometrium less responsive to oestrogen with progesterone.

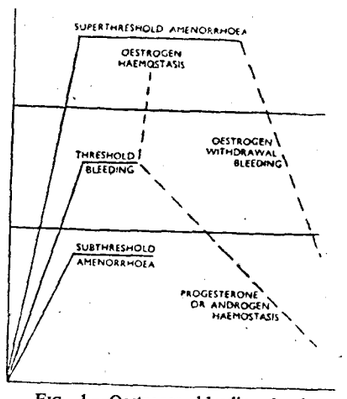


FIG. 1.—Oestrogen bleeding levels.

Though the individual roles of oestrogen and progesterone in the production of uterine bleeding are not clearly understood, something is known of their characteristic bleeding patterns. Oestrogen withdrawal bleeding, for example, is nearly always brief, scanty, and painless. Bleeding can also occur while the endometrium is still under the influence of oestrogen—for instance, in the course of prolonged and continuous oestrogen therapy. Another example is metropathia haemorrhagica, in which ovulation fails to take place and the endometrium is built up, under the constant and unopposed action of oestrogen, to a polypoid, oedematous, and haemorrhagic structure. The resulting bleeding is apt to be prolonged and variable in quantity, sometimes amounting to flooding, sometimes consisting of a mere trickle. These protracted episodes of bleeding are usually associated with incomplete shedding of the endometrium. On the other hand, progesterone-deprivation bleeding from an endometrium previously primed with oestrogen has all the characteristics of a "normal" menstrual period with regard to the duration and amount of loss, and is accompanied by complete shedding of the endometrium.

Mechanism of Ovulation

Rupture of the Graafian follicle and discharge of the ovum are not due simply to the mounting tension on its walls of increasing quantities of follicular fluid, but is almost certainly brought about by the activity of the gonadotrophic hormones. During the early days of the menstrual cycle the follicle-stimulating hormone (F.S.H.) controls the development of the Graafian follicle, which in due course begins to secrete oestrogen. This, in turn, inhibits F.S.H. secretion, and its concentration wanes. Luteinizing hormone (L.H.) now begins to be elaborated by the pituitary, and ovulation probably takes place only when the falling level of F.S.H. and the rising level of L.H. reach a certain ratio.

Effect of Ovarian Hormones on Uterine Muscle

It is now generally accepted that oestrogen increases the general tone of the uterine muscle and induces relatively frequent contractions of low amplitude, whereas progesterone induces less frequent contractions, but of greater amplitude. Indeed, in some cases the strength of the contraction may exceed the blood pressure in the uterine vessels, giving rise to painful ischaemia of the uterine muscle.

Abnormal Bleeding Patterns

Ovarian failure, according to its severity, gives rise to different bleeding patterns, of which the following are characteristic.

Ovulatory Oligomenorrhoea.—The length of the cycle is increased, though ovulation does eventually take place about 14 days before the onset of bleeding. The prolonged pre-ovulatory phase may be due to inadequate F.S.H. secretion in the early days of the cycle, or failure to achieve the necessary F.S.H./L.H. ratio within the usual period of time. Bleeding is normal in amount and duration when it does appear.

Menorrhagia.—This means heavy bleeding, often prolonged, and sometimes associated with short cycles. Ovulation is usually found to be taking place, though the post-ovulatory phase of the cycle may be shorter than 14 days, and an endometrial biopsy taken on the first day of bleeding may show signs (such as persistence of undifferentiated stromal cells) of inadequate progestational development. Menorrhagia is probably due to slight deficiency of progesterone secretion, so that the endometrium tends to be incompletely shed, with increase in the duration and amount of bleeding. This condition represents the mildest type of ovarian failure.

Metropathia Haemorrhagica.—Here no semblance of a menstrual cycle remains. Episodes of irregular bleeding—sometimes amounting to alarming flooding and sometimes consisting of a mere trickle—may last from a week to several months, and alternate with phases of amenorrhoea of equally uncertain duration. Ovulation fails to take place and the endometrium is under the constant and sole influence of oestrogen. As soon as the endometrium has been built up to a thickened, oedematous, and haemorrhagic structure, irregular shedding takes place, which is incomplete, however, because of the absence of progesterone. Finally, so much endometrium is denuded that bleeding ceases, and once again, under the continuous influence of oestrogen, the endometrium is reconstructed to form an exaggeration of the normal proliferative pattern with widely dilated glands ("Swiss cheese" appearance), reduplication of glandular epithelium, and an oedematous and haemorrhagic stroma.

Amenorrhoea or Non-ovulatory Oligomenorrhoea.—This represents the severest type of ovarian failure. Not only is no progesterone secreted, not only does ovulation fail to occur, but the oestrogen level is too low (or only occasionally high enough) to lead to uterine bleeding.

Other Menstrual Patterns.—The significance of intermenstrual "spotting" is often not apparent. It may result from a fall in the effective oestrogen concentration at the time of ovulation. Though it may be a matter of inconvenience and anxiety to the patient, it is seldom of sinister significance (unless it is due to organic causes) and does not easily respond to available therapeutic measures.

Premenstrual "trickling" may be associated with mild progesterone deficiency, but endocrine therapy is equally ineffective.

Hypomenorrhoea (scanty periods) is usually of no significance. If ovulation takes place the amount of bleeding does not matter, unless it is inconveniently excessive.

Aids to Diagnosis

(1) *History Taking: Menstrual Charts.*—To distinguish clinically between these various bleeding patterns an accurate menstrual history must be taken. This is not easy. The patient is often uncertain of her recent menstrual dates, and is apt to confuse the issue with misleading statements such as, "My periods come every three weeks," when she means that the interval between the end of one period and the beginning of the next is three weeks; or, "I see my periods twice in a month," when she means that one period started on the second day of the month and the next on the thirtieth. The doctor, on the other hand, can usually ill afford the time to unravel this vague and badly expressed story. Even if he succeeds he may still fail to paint a sufficiently vivid mental picture of the bleeding pattern to enable him to make a clinical diagnosis by merely entering a list of the dates of recent periods in the patient's clinical notes. The use of some form of menstrual chart (see Fig. 2) is therefore almost essential to the gynaecologist or endocrinologist constantly dealing with cases of functional menstrual disorder. Even the practitioner, conscientiously determined to understand his patient's menstrual problems, may wish to use such charts in cases of this nature. In spite of one's best endeavours, however, one may fail to make any sense out of the patient's history. In that case, she should be instructed to go home and keep an accurate note of her bleeding dates, and possibly also of her basal temperatures, and bring it back in two months. This period of observation has the added advantage that it prevents officious endocrine therapy in cases in which the menstrual disturbance is merely transient and of no serious significance. Spontaneous remission not infrequently occurs during this time, and unwarranted claims are often made for endocrine therapy administered coincidentally with the onset of a period of remission. On the other hand, if a clear-cut diagnosis of metropathia, for instance, has been made it may obviously be unwise to delay treatment.

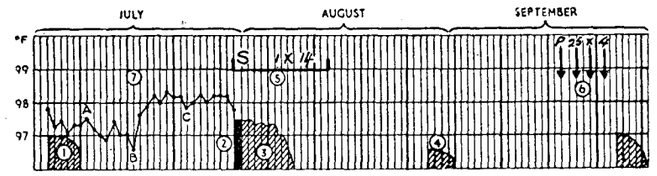


FIG. 2.—Menstrual Chart.* 1. Normal period. 2. Dysmenorrhoea denoted by blacked-in line. 3. Heavy period. 4. Scanty period. 5. Oral treatment for 14 days—stilboestrol, 1 mg. daily. 6. Injection treatment—progesterone, 25 mg., every other day for four injections. 7. Basal temperature records: (A) pre-ovulatory temperature, (B) pre-ovulatory "dip," (C) post-ovulatory temperature.

(2) *Basal Temperature Records.*—There is evidence that the body temperature rises in the presence of progesterone. Thus, if the early morning oral temperature is recorded daily throughout a normal cycle it will show a higher level after ovulation than before (see Fig. 2). This "biphasic temperature pattern" indicates that the cycle is an ovulatory one. Furthermore, it is possible to determine when ovulation takes place—namely, on the day when the

*Menstrual charts of this type (extending over two, four, or eight years) can be supplied by Messrs. Ash and Co., Holyrood Street, London, S.E.1.

temperature rises. Sometimes there is a "pre-ovulatory dip" which heralds the ovulatory rise: indeed, in a few cases, in which the post-ovulatory temperature is not appreciably raised, this dip is the only indication of ovulation.

(3) *Endometrial Biopsy or Curettage.*—In the presence of a biphasic temperature pattern it is practically certain that the cycle is ovulatory. These temperature studies have therefore made it possible to dispense on many occasions with an endometrial biopsy. On the other hand, absence of a typical biphasic pattern does not so surely indicate that ovulation has not taken place. Furthermore, some patients are not intelligent or co-operative enough to take their temperatures accurately, and a biopsy may then be necessary. In any event, it is at least desirable, if not essential, to perform a biopsy or even a thorough diagnostic curettage, especially in cases of irregular, excessive, or intermenstrual bleeding, to exclude an organic cause before embarking upon endocrine therapy. These procedures are of course beyond the scope of the practitioner, though he should know, in explaining to his patient what is involved, that a biopsy can be taken in about 50% of cases without an anaesthetic and with little discomfort. In most cases the biopsy specimen should be obtained on the first day of bleeding.

Endocrine Preparations

Oestrogens

There are too many oestrogenic preparations on the market, and the practitioner will be well advised to select only three or four upon which he can rely. Stilboestrol is probably the least variable in effect, and has been the most widely used. We are therefore more familiar with its therapeutic performance at different levels of dosage than with any other oestrogen. Moreover, it is cheap and highly potent when given by mouth. It has the disadvantage, however, that the lower limit of its toxicity range overlaps the upper limit of its therapeutic range, and nausea and occasionally vomiting will therefore be experienced in some cases, especially if the doses are unnecessarily large. Ethinyl oestradiol is the most potent oestrogen at present available, being 20 to 25 times more effective than stilboestrol. Unless this fact is fully appreciated there is considerable danger of overdosage. It is given by mouth, and, though it is less likely to produce toxic effects, these may occur, especially if the dose is unnecessarily large.

Conjugated equine oestrogens (an extract of oestrogenic material, mainly in the form of oestrone sulphate, from the urine of pregnant mares) constitute a highly active natural oestrogenic preparation (half as potent as stilboestrol) with minimal tendency to produce unpleasant side-effects. Finally, if it should be necessary to use oestrogens in very large doses without any risk of toxic effects, oestradiol benzoate may be administered by intramuscular injection (50,000 i.u. given twice a week is probably equivalent to 2 mg. of stilboestrol daily by mouth).

Progestogens

Progesterone is usually given by intramuscular injection, whereas ethisterone has progestogenic properties when administered orally. No direct comparison of their potencies has been made, but it is usual to give 30 mg. of ethisterone daily by mouth in those cases in which 20–25 mg. of progesterone would be injected on alternate days.

Androgens

It is seldom necessary to use testosterone propionate by intramuscular injection, and methyl testosterone in oral tablets of 10 mg. daily is usually effective for therapeutic purposes.

Gonadotrophins

These compounds have led to disappointing results. Unt more potent or effective preparations are available fo clinical use the practitioner would be wise to avoid them

BRITISH ORTHOPAEDIC ASSOCIATION

ANNUAL MEETING, 1950

The annual meeting of the British Orthopaedic Association was held in London on October 26, 27, and 28, under the presidency of Mr. S. L. HIGGS.

Femoral Lengthening in Leg Equalization.—Mr. D. WAINWRIGHT (Newcastle) discussed the problem of leg equalization in such conditions as poliomyelitis, congenital short femur, and premature epiphysial fusion. He considered that femoral lengthening had a definite place in treatment. Twenty-five patients had been operated upon. The average gain in length was two inches. Complications included: delayed union, one case; stiffness of the knee, two cases; and temporary nerve paralysis, two cases. There were no vascular complications. Mr. F. G. ALLAN (Birmingham) agreed that knee stiffness presented a real problem.

Immobilization Osteoporosis.—Dr. HARWOOD STEVENSON (Stanmore) had studied the radiographs of 100 patients submitted to prolonged immobilization for various diseases and had found that the process of osteoporosis followed a typical pattern irrespective of the nature of the primary disease. Osteoporosis developed rapidly and might be obvious within six weeks, but if mobility was maintained disease might be present in a limb for many months without leading to marked osteoporosis. These observations suggested that osteoporosis was a consequence of immobilization as such rather than of disease. Dr. H. A. SISSONS (London) had studied the gross and microscopic structure of bone obtained from osteoporotic limbs and from the site of prematurely fused epiphyses. Examination of trabecular structure was aided by radiographs of thin bone sections. In areas of bone atrophy osteoclasis and osteoblastic new bone formation proceeded concurrently. Hyperaemia was not evident. In sections from areas of premature epiphysial fusion there was disruption of the epiphysis into the diaphysis and bony bridging of the epiphysial line. The evidence suggested that the process of atrophy occurring during immobilization was one of osteoporosis in the strict sense of the word, and was not simply a halisteresis. The process was not due to hyperaemia alone. Mr. H. JACKSON BURROWS (London), discussing the two preceding papers, said that in normal bone there was a continual and balanced process of absorption and laying down of bone. In disuse atrophy there was diminished replacement of bone and increased absorption. The stimulus responsible was unknown. Vascularity had little to do with it. It was noteworthy that a general stimulus might affect only local areas of bone.

Curve Patterns in Idiopathic Structural Scoliosis.—Mr. J. I. P. JAMES (London) recalled that recent work in America had shown that the pattern of the curve in idiopathic scoliosis was the key to the prognosis. He reported a study of the typical features and prognosis in two curve patterns—infantile idiopathic scoliosis and primary lumbar idiopathic scoliosis. In the former the prognosis had been assessed from an analysis of 33 cases. Exceptionally a curve that was initially slight might disappear; a few might remain stationary; but most curves progressed and led to severe deformity. Treatment was very unsatisfactory. Primary lumbar idiopathic scoliosis had a benign course; correction was not required. But pain, developing in middle life from osteoarthritis, was much more common in this than in other patterns of scoliosis. If not relieved by a suitable corset, fusion (without correction) might be required. Mr. H. OSMOND-CLARKE (London) said that although a study of the curve patterns simplified prognosis it did not simplify treatment. Infantile scoliosis was a problem to which no solution was known. All such patients should be segregated in specially equipped clinics.

Experimental Production of Congenital Defects.—Dr. P. K. DURAISWAMI (Liverpool) illustrated experiments in which insulin had been injected into the yolk of fertilized hens' eggs. A high proportion of the chickens developed congenital deformities, which often affected the skeleton (see *Journal*, August 12, p. 384).

Sprung Back.—Mr. P. H. NEWMAN (London) described recent investigations into the pathology of a common clinical type of low back pain characterized by an onset in young adults, often preceded by injury, increase of pain on flexion and relief with extension, local midline tenderness and a palpable depression between two adjacent lower lumbar spinous processes, but with no other objective findings. He believed that the underlying pathology was a disruption of the posterior intervertebral structures by a flexion injury. Healing by fibrosis occurred, but full stability was not regained. Once the back had been sprung painful recurrences might occur whenever the protective extensor muscles were off their guard.

Reconstructive Surgery in Infantile Paralysis

Mr. NORMAN CAPENER (Exeter), introducing a symposium on reconstructive surgery in infantile paralysis, recalled that disability might depend upon many factors which must all be born in mind when approaching the problems of reconstruction. It was important that there should be a full understanding of the applied physiology of muscle and joints if the most efficient use of the remaining muscle power was to be achieved. Mr. J. P. CAMPBELL (Nottingham) discussed the role of soft-tissue reconstructive operations in poliomyelitic paralysis involving the foot and calf. Tendon transplants alone, or as supplements to joint stabilization, were of definite value.

Reconstructive Surgery in Childhood.—Miss M. FORRESTER-BROWN (Bath) recalled that some years ago she had pleaded for the early stabilization of deformed feet in children, but it had been argued against her proposal that either fusion was not obtained or feet so stabilized did not grow. She had found these criticisms to be unfounded, for fusion was in fact obtained, and, provided that only the articular part of the cartilage was removed, growth continued.

Subtaloid Arthrodeses.—Mr. T. T. STAMM (London) reviewed the important part played by tarsal fusion operations in stabilizing paralysed and deformed feet. Any foot could be stabilized by triple tarsal fusion. Because the foot was hinged behind its centre it was usually desirable to displace the foot backwards (as in the Naughton Dunn operation) as part of the triple fusion operation to prevent the tendency for the forefoot to drop downwards. For simple drop-foot the Lambrinudi type of tarsal fusion, in which an anterior wedge is removed from the subtaloid joint, was very satisfactory. Reversed drop-foot or calcaneus deformity was well corrected by a reverse type of Lambrinudi procedure in which most of the bone wedge should be taken from the calcaneum. The late results in 32 cases of tarsal arthrodesis were presented by Mr. A. J. DREW (London). From the point of view of function the results were highly satisfactory, but the appearance of the foot was often less pleasing. There was freedom from pain in 74% of cases.

Elmslie's Operation for the Calcaneus Foot.—Mr. J. A. CHOLMELEY (Stanmore) reviewed the important features of Elmslie's operation for calcaneus deformity of the foot. At the first stage cavus deformity of the foot was corrected by soft-tissue stripping and talo-navicular arthrodesis, and the foot was immobilized in plaster in extreme dorsiflexion. At the second stage the posterior part of the subtaloid joint was arthrodesed through a posterior approach; a longitudinal strip of the tendo Achillis was attached to the back of the tibia to give a tenodesis effect with the foot in 20 degrees of equinus; and the calf muscles were reinforced by transfer of tibialis posterior, flexor digitorum longus, flexor hallucis longus, and peronei longus and brevis to the back of the calcaneum.

In the discussion that followed this symposium Mr. S. A. S. MALKIN (Nottingham) said that two of the greatest problems in the reconstructive surgery of poliomyelitis were paralysis of the gluteus medius and paralysis of the quadriceps. In gluteus medius paralysis he had been dissatisfied with the results of the various tendon transfers. In quadriceps paralysis the merits of hamstring transfers had been the subject of controversy but in his opinion they were of definite value. He did not consider that any reconstructive operation could be regarded as entirely satisfactory unless the need for appliances was reduced or eliminated as a result of the operation. Mr. ERIC LLOYD (London) had studied the late results in two series of cases operated upon many years ago for calcaneus deformity. In the first series the Elmslie operation had been used; in the second the reverse Lambrinudi operation. There was very little to choose between the results in the two series. He considered neither operation should be done in children under the age of 10 years. Mr. H. H. LANGSTON (Winchester) felt that the better care now being given to patients in the early stages of poliomyelitis might reduce the proportion of cases requiring reconstructive operations. Mr. E. S. EVANS (Alton) referred to the use of lumbar ganglionectomy as a means of improving the peripheral circulation and reducing such troublesome complications as chilblains. He considered that ganglionectomy had too often been condemned because too much was expected of it. It was true that the dramatic initial improvement in the circulation was not maintained, but the circulation never returned to a state so bad as it was before operation.

Virus Encephalitis of Mice

Mr. KINGSLEY SANDERS (Oxford) had studied the behaviour of a virus causing encephalitis in mice, with particular reference to its transport and multiplication in the body. Since the lesions produced by the virus, and certain other features of its behaviour, were closely similar to those of the virus of poliomyelitis, he believed that his researches might have a bearing on the transport and multiplication of the poliomyelitis virus itself. In some early experiments encephalitis virus was introduced into a muscle of the lower limb in mice: flaccid paralysis developed in the lower limb muscles of the same side. Similarly, if the sciatic nerve was steeped in a solution containing the virus, paralysis developed in the corresponding limb. In further experiments the development of paralysis after muscle inoculation and after steeping of the sciatic nerve in virus-containing solution was prevented by interruption of the nerve fibres proximal to the application of virus. Any of the methods of nerve fibre interruption—section, crushing, freezing, cauterization—gave protection. These results, taken together, suggested that the virus travelled to the central nervous system along the nerve fibres. Using similar methods it had been possible to assess the rate of travel of the virus along the nerve fibre after its introduction into the muscle or nerve. Proximal travel began almost immediately after muscle inoculation and proceeded at the rate of about half a millimetre an hour.

Multiplication of the virus after its entry into the central nervous system had been studied in the hypoglossal nuclei after injection of the virus into the tongue. The nuclei were examined and assayed for virus concentration at various time intervals after injection. It was thus possible to assess the rapidity of multiplication of the virus. It was found that immediately after arrival of the virus in the central nervous system there was an initial decline in the virus concentration. After a latent period there was a very rapid multiplication of virus concentration. It was further shown that during the latent period virus was still present in the nuclei, and that multiplication depended upon the integrity of the nerve cells.

Miscellaneous Subjects

A Dangerous Type of Fracture Dislocation of the Foot.—Mr. W. GISSANE (Birmingham) called attention to the risk of circulatory arrest in the foot after dislocation of the tarso-metatarsal joints with multiple metatarsal fractures—the Lisfranc fracture-dislocation. He believed that the bone injury was caused by excessive rotational violence rather than by direct violence. He advocated immediate operative reduction, the first step in which should be to secure accurate reduction of the medial and middle cuneiform-metatarsal joints.

Fractures of the Radial Head with Inferior Radio-ulnar Dislocation.—Mr. P. ESSEX-LOPRESTI (Birmingham) described the

features of an uncommon forearm injury of which he had observed two cases. The injury was a comminuted fracture of the head of the radius, associated with upward displacement of the radius relative to the ulna which manifested itself at the wrist by dislocation or subluxation of the inferior radio-ulnar joint. It was caused by a force acting longitudinally in the axis of the forearm. Although the injury was uncommon, its recognition was important, because if the head of the radius was excised the radio-ulnar subluxation was liable to persist or increase. Reconstruction of the head of the radius after reduction of the subluxation was probably the treatment of choice.

Light Metal Elbow Crutch and Walking-stick.—Mr. F. G. BADGER (Birmingham) demonstrated new types of elbow crutch and walking-stick which have been developed at the Birmingham Accident Hospital.

Pigmented Villonodular Synovitis.—Mr. G. R. FISK (London) had studied six cases of pigmented villonodular synovitis. The condition affected a single joint, usually the knee. It occurred in two forms, generalized and localized. The former was often preceded by injury and was characterized by persistent swelling and effusion of the joint, which might resemble a tuberculous infection. Treatment was by synovectomy, and, provided removal was complete, the prognosis was good. The localized form occurred as a circumscribed nodule, often near the joint line. If pedunculated it might cause recurrent locking of the joint suggestive of a cartilage tear. Treatment was by excision of the nodule.

Actinomycosis of Bone.—Mr. V. ZACHARY COPE (London) reviewed the characteristic features of actinomycosis with particular reference to bone infection. He emphasized the facts that the actinomyces found so commonly in the soil seldom cause human or animal disease and that the causative organism was almost invariably derived from the human digestive tract. The bone most commonly affected was the mandible. In the spine, any area of which might be affected, actinomycosis usually attacked the superficial parts of the bone; but unlike tuberculosis it commonly involved the transverse or costal processes as well as the vertebral body. Collapse of the body was exceptional and the intervertebral disk was resistant to infection, so deformity was slight. Early diagnosis was important; for if left untreated the disease proved fatal within two or three years, whereas if it was treated efficiently by very large doses of penicillin or streptomycin, supplemented by blood transfusion and general therapy, there was a good prospect of permanent cure.

Internal Fixation of the McMurray Osteotomy with a Trifin Nail.—Mr. ROBERT ROAF (Liverpool) had devised a simple method of internal fixation of the femoral fragments after displacement osteotomy of the McMurray type. It consisted in driving a long trifin nail from the tip of the greater trochanter downwards and medially into the upper part of the shaft fragment.

Controlled Pseudarthrosis for Fracture of the Neck of the Femur.—Mr. E. MERVYN EVANS (Swansea) described a method of treatment for ununited fractures of the neck of the femur which was applicable to very frail patients. He recalled that when osteotomy failed to stimulate union of the fracture a relatively painless pseudarthrosis might develop at the site of fracture and might give reasonable function. He had attempted to produce such a pseudarthrosis deliberately by encouraging movement after osteotomy while ensuring fixation and union at the site of osteotomy by internal fixation.

Generalized Bone Decalcification.—Dr. C. E. DENT (London) gave an account of some of the rarer forms of generalized bone decalcification, particularly the uncommon cases of rickets or osteomalacia which were resistant to vitamin D. He considered that the primary cause in all these cases was impaired reabsorption by the renal tubules. In one type there was simply impaired reabsorption of phosphates; in a second this abnormality was accompanied by a lowered renal threshold for glucose with consequent glycosuria; and this merged into a third type in which there was also impaired reabsorption of amino-acids which appeared in the urine (Fanconi type; cystine rickets). These conditions were inherited. A further type, distinct from the above and not inherited, was that in which the renal tubules were unable to make ammonia and excrete an acid urine. Acidosis occurred and calcium might be deposited in the kidneys. The skeletal changes were the same whatever the nature of the tubular insufficiency.

Clinical Demonstration

Clinical cases were shown at the Royal National Orthopaedic Hospital. Mr. D. M. BROOKS (London) showed representative cases illustrating reconstructive surgery in paralysis of the upper limb. Mr. R. J. FURLONG (London) showed some excellent results from digital flexor tendon reconstructions. Mr. A. W. LAW (London) showed examples of cup arthroplasty of the hip and spinal osteotomy. Dr. D. S. MCKENZIE (London) presented patients with congenital short limbs who had been fitted with prostheses designed to accommodate the deformed limb without amputation. Mr. J. I. P. JAMES (London) showed patients with scoliosis treated by correction and fusion, and illustrated typical curve patterns in idiopathic scoliosis.

THE DOCTOR'S DAY AND PAY

A PRE-HEALTH-SERVICE STATISTICAL INQUIRY

Professor A. Bradford Hill, the new president of the Royal Statistical Society, in his inaugural address to that body on November 22 took as his theme the statistical inquiries which he had made during the last ten years on behalf of the British Medical Association into the services given by insurance practitioners under the old National Health Insurance Act, and, more recently, following the setting up of the two successive Spens Committees, into the pre-war earnings of general practitioners and of consultants and specialists.

The description of the selection of samples and testing for bias had its chief interest for the statistical expert; moreover, as the lecturer said, with the advent of the new Health Service much of this work belonged to a vanished world. Nevertheless, the structure of the new era was partly based upon the figures of the old, so that the data had an interest not only for the historian but for the economist and also for all members of the medical profession working in the new Service, especially in view of the inquiries which were now proceeding into practitioners' incomes and practice expenses.

The fixing of the capitation fee troubled the entire course of National Health Insurance. One of the factors taken into account in adjusting it from time to time had been the number of items of service which a practitioner on the average was called upon to provide for the insured persons on his list; but this had proved very difficult to ascertain. The British Medical Association, through the panel committees, had had access to the records of a generous sample of practitioners, and at the court of inquiry in 1937 it brought forward evidence to show that during 1936 the practitioners in this sample had paid an average of 1.33 visits and had had an average of 3.80 attendances at their surgeries for each insured person on their lists, making a total of 5.13 such services. The Ministry of Health disputed these figures and cited the entries made by practitioners on medical record cards, which gave an average of 0.76 visits and 2.90 attendances, a total of 3.66 services, or only some 70% of the B.M.A. figure. The Ministry's figures, however, were admittedly an understatement, because by no means all the services had been recorded on the cards. It was at that point that the lecturer had been called in.

A Random Sample

It might be considered an easy matter to select a random sample from the total list of insurance practitioners and request those selected to keep accurate records for twelve months. But the record keepers would have an onerous task; there would be many refusals to co-operate and many more lapses from co-operation as the year went on. To overcome this difficulty, 6,000 names had been selected at random from the 17,734 insurance practitioners—principals only—and had been divided into 12 groups, each of 500. Each doctor had been asked to keep a record for one prescribed month of the year from July, 1938, to June, 1939, and in this way, by spreading the groups over the whole year, the calendar was covered, a random sample of the "universe" was obtained for each month, no doctor was assigned too arduous a task, and the total number taking part was sufficiently large, being in fact rather more than one-third of those engaged in the Service.

One point of trivial interest (though perhaps not so trivial in view of the tendency to sample by a selection of surnames beginning with the same initial) might be mentioned. Insurance practitioners whose names began with M had numbered 2,388, or nearly one in seven of the total. The next most-favoured letters of the alphabet, B and S, were far behind, each accounting for only some 1,500 names.

In addition to asking about attendances and visits, five other questions had been asked: (1) the number of special, extra, or night visits; (2) the operations, major or minor, performed; (3) the injections given; (4) the insurance certificates issued, and (5) the reports made. Of the 500 practitioners who had been allocated to each month of the year, each group of 100 had been requested to make an additional return in respect of one of these five items. Every third name had been taken from an alphabetical list of all insurance practitioners and assigned to a month and to one of the five groups. Thus the third, sixth, ninth, twelfth, and fifteenth names had been assigned to January, and to each of the groups in turn; the eighteenth, twenty-first, twenty-fourth, twenty-seventh, and thirtieth to February, and again to each of the groups, and so on.

Of the 6,000 doctors thus selected less than 1% had refused to participate, some because they were too busy and others because they had unprintable views about the B.M.A., the Ministry of Health, or statisticians, or all three; a number of others who had agreed to co-operate had failed to send in returns, and some had fallen out during the year by reason of retirement or death. Altogether the total who had made returns was 5,418, of whom 50% had lists of less than 1,000, while nearly 7% had lists of 2,500 or more. The average list was 1,148, and the number of insured persons covered in the survey was 6,218,752.

Items of Service

In the result the number of attendances per insured person for the year was found to average 3.69, and the number of visits, 1.12, making a total of 4.81 items. This was inevitably an understatement for certain reasons, the principal being that 5% of the 6,000 practitioners had retired or died during the year, and, although their places were taken by other practitioners, the services of these were not counted. On another method of calculation the average of attendances was 4.13, and of visits 1.26, a total of 5.39. The truth evidently lay somewhere between those two totals, 4.81 and 5.39, and sufficiently near to the original (and contested) B.M.A. figure of 5.13 in 1936.

The figures had been worked out for the seasons, months, and days of the week. The trends were well shown—the autumn rise, the fall in Christmas week, the peak during the first three months of the year, and then the downward tendency until the end of the summer. The inquiry into special services had yielded the following result: for every 100 persons for whom the practitioner was at risk the services given during the year were:

Special, extra, or night visits	11
Operations, major or minor	12
Injections	8.5
Certificates (N.H.I.)	139
Reports and correspondence	24

These special services rendered per doctor per week were, respectively, 2.77, 3.00, 2.12, 34.10, 6.02. Monday was uniformly the doctor's busiest day.

The Income of the General Practitioner

In view of the reference, in the inquiries of the Spens Committee, to normal financial expectations of general medical practice in the past, the lecturer had been asked by the British Medical Association to undertake a statistical inquiry into the pre-war earnings of general practitioners. At that time (1945) there were some 21,700 general practitioners according to a card register which had been kept by the Central Medical War Committee, and it was decided to take a one-in-four sample, asking each practitioner to state his professional income (gross and net) for each of the years 1936, 1937, and 1938, based on accounts accepted by the inspector of taxes. The response to this inquiry had been disappointing, and eventually only about 3,000 returns had been collected in a satisfactory form. From these certain eliminations had to be made to give a homogeneous group, and there were left some 2,300 tabulations relating to gross incomes for each of the three years. Those who sought closely detailed comparisons should refer to the *Report of the Interdepartmental Committee on Remuneration of General Practitioners*.[1] Professor Bradford Hill in his address reproduced the gross and net incomes in different age groups for each £200 of income. Below are a few figures:

Gross Incomes in 1936–8 of Male General Practitioners

Income	Ages				
	65 and Over	55–64	45–54	35–44	34 and Below
Under £1,000 ..	154	178	170	284	291
£1,000 to £2,000 ..	174	441	778	1,480	853
£2,000 + ...	56	290	609	928	238

The figures for the net income showed that of the gross amount 37.4% on the average was swallowed up by expenses.

Net Incomes in 1936–8 of Male General Practitioners

Income	Ages				
	65 and Over	55–64	45–54	35–44	34 and Below
Under £1,000 ..	283	449	642	1,138	836
£1,000 to £2,000 ..	96	411	770	1,376	501
£2,000 + ...	4	49	142	172	33

Of the 41 practitioners who were making net incomes of over £3,000, eight had incomes of between £3,500 and £4,000, and four of between £4,000 and £4,500. All these figures concerning income related, of course, to the entire professional earnings of the general practitioner, not to his earnings under National Health Insurance alone.

The Global Sum

It would be recalled that with the coming of the National Health Service the Government abolished the buying and selling of practices. Thus it became necessary for the purposes of compensation to estimate the aggregate capital value involved, and on the assumption that 17,900 principals would enter the Service it was finally placed at £66m. Professor Bradford Hill gave a careful description of the basic calculations.

The first step was to calculate the total gross income of practitioners in 1938, then to take the number of years' purchase applicable to that value, and to add a betterment factor to take into account the increased values between 1938 and 1946. Two methods were taken for arriving at the gross income, one giving a total of £29m., and the other of £26,560,000. A mean figure was taken of £28m., and this was used in the subsequent calculations of compensation. With some 17,560 principals—the adjusted figure—the amount implied an average gross income of slightly less than £1,600 a year, or, deducting practice expenses, a net income of about £1,000 in the immediate pre-war years. One point which would be noted from the figures was that even at the age of maximum earning capacity (35 to 54) 42% of the net incomes recorded were below £1,000 a year.

Professor Bradford Hill spoke of the practitioners who refused, or, at all events, failed, to send in returns. He speculated on what motive might lie behind refusal to co-operate. "If doctors with small incomes deliberately withheld information, fearing to prejudice the future, how greatly they erred! Let it be a warning to all who neglect for ulterior motives to return their *questionnaires*." At all events, the Spens Committee had found the figures sufficiently accurate for its purpose.

[1] Cmd. 6810. H.M.S.O., 1946.

The Income of the Specialist

In the latter part of his address Professor Bradford Hill turned to the more difficult inquiry into specialist income—more difficult because there was no list of persons who before the war were engaged exclusively or predominantly in consultant or specialist practice. This had been overcome with the help of the secretaries of voluntary hospitals and medical officers of health, and some 6,000 names were obtained of those who must be asked whether they were exclusively or predominantly engaged in consulting and specialist practice in 1938–9. Professor Bradford Hill gave an account of the various precautionary measures which were taken to ensure reliability in what he called "survey work in its most dangerous and treacherous form—that of inquiry by *questionnaire*." Many eliminations had to be made, as was foreseen, of those who were not exclusively engaged in consulting and specialist work. There were also a considerable number of refusals, most pronounced in the oldest age group of 60 and over.

Again the more detailed results were set out in the *Report of the Interdepartmental Committee on Remuneration of Consultants and Specialists*.[1] The tables given in the presidential address were not exactly in the same form as to age groups in the case of consultants and specialists as in the case of general practitioners, but the following extracts from them are of interest:

Gross Incomes in 1938–9 of Male Consultants and Specialists

Income	Ages				
	60 and Over	55–59	45–54	35–44	34 and Below
Under £1,000 ..	32 (9)	16 (1)	12 (2)	53 (6)	68 (15)
£1,000 to £2,000 ..	41 (15)	48 (13)	108 (24)	165 (33)	82 (17)
£2,000+	79 (10)	114 (12)	343 (58)	390 (63)	78 (17)

The figures in brackets indicate those who were not exclusively engaged in specialist and consultant work, although that was their predominant interest. This was a relatively small group in the sample—about one-sixth of the total number—and not actually relevant to the problem under study. These persons did not appear in the other tables.

The figures for net incomes were as follows:

Net Income in 1938–9 of Male Consultants and Specialists (Exclusively Engaged in Such Practice)

Net Income	Ages				
	60 and Over	55–59	45–54	35–44	34 and Below
Under £1,000 ..	55	41	60	119	106
£1,000 to £1,500 ..	24	31	86	113	57
£1,500 to £2,000 ..	18	37	78	109	32
£2,000+	50	69	240	263	32

From these net figures it could be seen that nearly one-third of those consultants and specialists who were at the peak of their earning capacity—namely, the age period of 45 to 54, had a pre-war income of under £1,500, after deduction of practice expenses. At the other end of the scale, however, there were glittering prizes to be won, though not so very many of them. One-sixth of the consultants and specialists of the same age period—that is, 45 to 54—had a net income of £4,000 or more. Taking all ages together, 10 had a net income of over £10,000. In four of these cases the income was between £10,000 and £11,000; in three, between £11,000 and £12,000; in two, between £14,000 and £15,000, and in one, between £15,000 and £16,000.

A comparison with general practitioners on this ground of remuneration was instructive. At the most productive age period of 35 to 54, less than 10% of general practitioners had a net income of £2,000 or above, whereas very nearly half the consultants and specialists reached that level.

Of the specialties of those participating in this inquiry, 23% were surgery, 18% medicine, 10% ear, nose, and throat work, and 15% ophthalmology.

[1] Cmd. 7420. H.M.S.O., 1948.

Practice Expenses

An interesting point arose concerning the practice expenses of general practitioners and consultants and specialists respectively. The tables again were not set out in exactly comparable form. Just over 2,400 incomes of general practitioners out of a total of nearly 7,000 showed practice expenses between 30 and 39% of gross income. Some 1,900 were below and some 2,600 above that level. The numbers included practitioners with and without assistants. Of some 1,600 consultants and specialists, just over 1,000 returned their expenses as between 15 and 34% of gross income. In 120 the expense ratio was below that range, and in about 470 above it. In the case of general practitioners with smaller incomes—below £1,500—the expense ratio was higher. Of 3,000 incomes of general practitioners falling within that income range, 1,200 returned practice expenses as absorbing 40% or more.

Professor Bradford Hill concluded his survey by pointing out that the inquiries, of course, fell within a narrow field. He himself was interested in their content because he had lived all his life with doctors and was interested in their ways of living and thinking. Yet he felt that such field inquiries held also something of general interest to the economist and statistician.

THE DEVELOPMENT OF MICROBIOLOGY

FIRST LEEUWENHOEK LECTURE OF THE ROYAL SOCIETY

The first Leeuwenhoek Lecture of the Royal Society was given on November 9 by Sir PAUL FILDES, lately director of the Medical Research Council's Bacterial Chemistry Research Unit at the Lister Institute. He spoke on "The Development of Microbiology." The Leeuwenhoek Lecture, to be given annually in the field of microbiology, has been established as a result of a legacy to the Society by the late Mr. G. H. Gabb, "the father of the scientific antiquaries" in his own description, whose collection of old instruments was begun as long ago as 1885 and is now in the National Maritime Museum. In accordance with the terms of the bequest, a portrait of Antonj van Leeuwenhoek was displayed to the audience during the lecture.

It was through a series of letters to the Royal Society, published in the *Philosophical Transactions*, that Leeuwenhoek's discoveries were made known. He described the appearance of green algae, rotifers, ciliate protozoa, and bacteria—the latter in 1676 in his eighteenth letter. "My method," he wrote, "I do not impart to others"—and it is still a problem how with a simple microscope, and magnification by 250, he managed to see bacteria. It has been suggested by Dobell that he may have used some form of dark-ground illumination. That he did see them is proved by his account of micro-organisms which, from the conditions of the experiment, must have developed under anaerobic conditions. They were seen in pepper during an attempt by Leeuwenhoek to discover what made pepper hot.

Leeuwenhoek viewed his "little animals" as one might watch the antics of a puppy, and took pleasure from "this new world known to himself alone." He felt a community with them, and wrote that "all the people in the United Netherlands are not so many as I carry in my mouth this very day"—an allusion to the dental scrapings from which so much of his material was obtained. He was elected a Fellow of the Royal Society in 1680, although he was a foreigner, had never attended the meetings of the Society, and was a tradesman (a draper of Delft, in Holland) at a time when the independence attributed to "gentlemen, free and unconfined" was considered a valuable qualification. He was also one of the first working scientists to take exception to casual visitors. He saw visitors only by appointment, and showed them a set demonstration which he kept available for the purpose. To Linnaeus, in 1767, bacteria were "a dubious species under the Order Vermes, Class Chaos"; and the long interval—more than one hundred years—before they were again observed with certainty was a measure of Leeuwenhoek's greatness.

By the beginning of the eighteenth century the study of the very small (but not including bacteria, apart from Leeuwenhoek himself) had become so prevalent among the new philosophers that supporters of the old were moved to object. In its later development from simple interest towards a modern science the course of microbiology was largely influenced by three controversies—on spontaneous generation, on fermentation, and on infectious diseases—of which the first provided the foundation of much of present technique. The use of heat for sterilization, for example, goes back to the work of Spallanzani in the eighteenth century; while, as a survivor of the opposite viewpoint, Charlton Bastian remained until well into the twentieth century as a supporter of spontaneous generation. Through Pasteur, and particularly his work on fermentation and a disease of cultivated silkworms, micro-organisms were recognized by men as factors associated with their daily lives. From his hint to Lister there developed the great contribution of the latter to the controversy on infectious diseases, in which the technical advances introduced by Robert Koch were to make possible more extended progress. The overall effect has been to increase the span of human life—and microbiologists working to-day may be excused for forgetting how recent is their subject.

In his introduction to the lecture—with microbiology presented as a single subject—Sir Paul Fildes referred to the link which had been provided by biochemistry between the separate branches of bacteriology, protozoology, mycology, and even virology. Proceeding, now, to the discovery of bacteriophages by Twort and d'Hérelle, he gave as their distinguishing quality the fact that they were too small to house more than a fraction of the enzymes needed for their multiplication. Reviewing the sequence of size seen in the newest of Leeuwenhoek's protégés, he pointed out that the larger viruses tended to be indistinguishable from bacteria, and the smaller to be akin to "substances." Were viruses living at all? Yes, but like all living things they were composed of lifeless chemical substances. "It is the arrangement that counts to give the attributes of life."

In conclusion, he recalled the eightfold increase in population which had taken place since the beginning of the eighteenth century. Interference with the normal relationships of two biological groups, man and micro-organisms, had produced a set of political difficulties: their solution, through a greater production of food, depended on a greater use of microbiology for this further purpose.

The lecture was illustrated by a film, made by Professor R. J. V. Pulvertaft, showing some of the vast and varied activity of micro-organisms which Leeuwenhoek had so much enjoyed. Water from St. James's Park provided the fauna for one sequence.

The enterprising Department of Student Health at Queen's University, Belfast, has issued its second annual report covering the academic year 1949–50. In addition to a general account of the year's work and details of the clinical findings in the students examined there is a survey of the living conditions of first-year students. All the first-year students (558) at the university had a routine examination which included mass miniature radiography of the chest. One case of active pulmonary tuberculosis was found and 42 inactive cases. Mantoux testing was carried out on 496 of these students, and the negative reactors were offered B.C.G. vaccination. In all, 125 were vaccinated, with 100% conversion and no untoward reactions. In addition to the special first-year examinations, the students of all years had their chests *x*-rayed (it is remarkable to learn that there were no defaulters from this examination). Out of 2,477 examined, there were 7 cases of active pulmonary tuberculosis and 185 inactive cases, of which 151 were healed primary lesions. A large number of students consulted the medical officer during the year, sometimes on their own initiative and sometimes after reference from their doctors. Great care was taken to establish cordial relations with the local practitioners to prevent any misunderstanding about the nature of the student health service, and as a result there was a fruitful co-operation between the medical officer and his professional colleagues.

Reports of Societies

MANCHESTER MEDICAL SOCIETY

INAUGURAL MEETING

The amalgamation of all the existing Manchester medical, surgical, and allied societies into one society, originally suggested 31 years ago, was finally fulfilled at the inaugural meeting of the Manchester Medical Society on October 4.

In the afternoon the first president of the new society, Mr. WILSON HEY, gave his inaugural address on "The Story of the Manchester Medical Societies" in the presence of the vice-chancellor of the university, the Lord Mayor, the Presidents of the Royal Colleges of Surgeons and of Obstetricians and Gynaecologists, the representative of the President of the Royal College of Physicians, the President of the Royal Society of Medicine, the President of the Liverpool Medical Institution, and about 500 Fellows of the new society.

Mr. WILSON HEY, after welcoming the distinguished visitors, described the development and influence of the various medical, surgical, and allied societies in Manchester from the time of the Literary and Philosophical Society in 1781, which was almost entirely medical in character. In 1834 the original Manchester Medical Society was formed with 91 members, while to-day there are approximately 1,000. A hundred and seven years ago its Transactions were printed in the *Provincial Medical and Surgical Journal*, now the *British Medical Journal*. Later they were continued in the *Medical Chronicle*, which was published 1884–1916. After various residences the society moved to Owens College, now the Victoria University of Manchester. The library had incorporated with it the university departmental libraries, and was the largest in the country outside London: it had almost 100,000 books. In 1929 it was given to the university and now every member of the society had the privilege of using the other libraries in the university.

In 1879 the microscopical section of the society was formed, but six years later it was apparent that the microscope dealt with only a minute part of pathology, and consequently an independent pathological society was formed and had flourished until the present day.

The president then referred briefly to the formation of the old Clinical Society (which had ceased to exist in 1925), the Surgical Society (founded in 1922), the Society of Anaesthetists, the Obstetrical Society, the Dermatological Society, the Ophthalmological Society, the Otolaryngological Society, the Odontological Section, and numerous others that had developed from these or been founded by Manchester men. In all, Mr. Hey said, 22 medical societies had thus been formed.

Amalgamation, which had first been suggested in 1918 but for various reasons postponed, was now achieved. The new society had taken its pattern from the Royal Society of Medicine, each of the old societies becoming a section with its own president, who was *ex officio* a vice-president and an honorary secretary of the society. There was only one honorary treasurer, and for the first time there was a whole-time paid secretary. Monthly diaries were being issued, and soon the society would have its *Proceedings and Transactions*.

Plans for a General-practitioner Section

The general practitioner was the chief thought of the council of the society, and it had the formation of a special general-practitioner section in mind. The percentage of practitioner members of the various societies which had now amalgamated had diminished as a result of the Acts of Parliament which came into force in 1911 and 1948; they had converted the practitioner into a "form-filling, regulation-bound doctor." This decline had been assisted by two wars and to some extent by the intermittent postgraduate classes.

Addresses of Welcome

Colonel S. P. DAWSON, Lord Mayor of Manchester, expressed his pleasure at being present and congratulated the president

on his address; he spoke about the admission of women to the earlier societies, and then wished the society every success.

Sir JOHN STOPFORD, vice-chancellor of the University of Manchester, referred to his close and long association with the old society and the university, and also to the 80 years' association of Owens College, later the university, with the Medical Society. In his positions as vice-chancellor, as chairman of the joint advisory board, and as chairman of the Manchester Regional Hospital Board he had excellent opportunities to be thrilled by the new things that he saw happening in medical research and medical education. He referred to the great need and opportunities for even closer co-operation than at present between all branches of medicine, including general practice.

Lord WEBB-JOHNSON, President of the Royal Society of Medicine, London, had no need to remind Fellows of his close association with the Manchester Medical School. After telling his audience about the formation of a new section of general practice in the Royal Society of Medicine, he announced that he had the honour to bring to the Manchester Medical Society greetings from the President and the Council of the Royal Society of Medicine on behalf of its 9,000 Fellows. Thus speaking, he presented to the President of the Manchester Medical Society an illuminated parchment which said:

"The President and Council of the Royal Society of Medicine, on behalf of its nine thousand Fellows, extend Greetings to the Manchester Medical Society on the occasion of the reconstitution of the Medical Societies of Manchester as the Manchester Medical Society.

"The greetings of the Council of the Royal Society of Medicine are the more cordial since the Manchester Medical Society, in uniting an important group of Medical Bodies with similar Objects, has followed the principles which guided the Royal Medical and Chirurgical Society, when in 1907 it happily brought about the fusion of most of the leading Medical Societies of London to reconstitute itself as the Royal Society of Medicine.

"The history of the Royal Society of Medicine since that date gives its Council great confidence in wishing the Manchester Medical Society the greatest possible success in its future life and development. The Royal Society of Medicine is proud to think that it has contributed by example to the formation of a Body whose bright future cannot stand in doubt and whose constitution has been moulded on that of the Royal Society of Medicine.

"It is hoped that, in the abundant activity which will undoubtedly characterize the life of the Manchester Medical Society, place may be found for frequent and friendly liaison with the Royal Society of Medicine.

Webb-Johnson	*President*
A. T. M. Wilson J. C. Ainsworth Davis	*Honorary Secretaries*
Geoffrey R. Edwards	*Secretary.*"

This totally unexpected and very kind thought of the President and Council of the Royal Society of Medicine gave the greatest pleasure to the President and Fellows of the Manchester Medical Society.

Sir CECIL P. G. WAKELEY, President of the Royal College of Surgeons, brought the congratulations and best wishes of the Royal College of Surgeons and said how pleased he was to come again to Manchester.

Professor HILDA LLOYD, President of the Royal College of Obstetricians and Gynaecologists, offered the best wishes of her College and referred to the admission of women into the societies. She paid tribute to the excellent work of Manchester medical men and women in obstetrics and gynaecology.

Professor CRIGHTON BRAMWELL, on behalf of the President of the Royal College of Physicians, brought the hearty congratulations and best wishes of that Royal College.

Dr. DAVID JOHNSTON, President of the Liverpool Medical Institution, concluded with his best wishes and referred to the close liaison between the Liverpool Medical Institution and the Manchester Medical Society in the past in the organization of the annual joint meetings that had been such a source of pleasure and good will to all.

In the evening the president and Mrs. Hey received the Fellows, guests, and visitors at the society's reception in the Whitworth Art Gallery (by the kind permission of the governors) and thus concluded a most happy and successful inauguration of the new Manchester Medical Society.

Correspondence

Displaced Registrars

SIR,—Publication of the circular from the Ministry of Health (*Supplement*, November 18, p. 204) regarding the drastic reduction in numbers of middle and senior registrars employed in the hospital service must have struck a chill into the heart of many a doctor. At the same time this grim document must surely have roused the fighting spirit of those most threatened by its high-handed phrases and dictatorial statements. Let it be hoped that that fighting spirit will not be stilled by further idle promises or sops, which no doubt will in due course be handed out to hundreds of highly trained doctors who will shortly be unemployed.

Let there be no mistake: no one will save those so threatened but themselves, and only concerted action can spare us from a plight which will cut across the path of human endeavour, waste years of highly trained skill, breed bitterness, disillusionment, and frustration, and deprive the hospital service and teaching centres of the country of assistance which they can ill afford to lose.

Feelings of sympathy and even of anger and disgust have been expressed by our chiefs and teachers, who have endeavoured to place us by their strong support in posts which they feel we merit by dint of long training and experience in general medicine or a special branch. For this support and encouragement we are grateful, but it is not enough. Nor have we the right to expect our sponsors to fight our battles for us to the end. It is up to us to fight the toughest and final engagement ourselves before it is too late and we are overwhelmed without even the sign of a struggle.

All are agreed that heavy reduction in the numbers of registrars must be made unless the Government can appreciate that further expansion of consultant services is needed in the public interest. No fair-minded person, however, could agree that the precipitate dismissal of large numbers of highly trained young specialists is either just or sensible, and an economy axe falling on medical skill would be the greatest tragedy in the development of the National Health Service. Before it is too late and doctors who are recognized to be worthy of consultant status are dismissed the Service wholesale, three questions should be asked and faithfully answered by all who are concerned in this crisis:

(i) Will the care and standard of the treatment of the patient suffer?

(ii) Will undergraduate or postgraduate teaching be in any way impaired, either in the opinion of those at home or abroad, whence hundreds of doctors come to our shores for instruction?

(iii) The pursuit of some form of clinical research should be regarded as an essential part of the training of any consultant, and at the present time the field of opportunity that offers itself is wide. Will the high standard of medical research carried out in our great hospitals fall off, with fewer opportunities for trainee consultants, because of lessened research activity from reduced numbers, and because directors of research units will be deflected from the path of original thought and action by unending routine work, a surfeit of teaching duties, and the frequent calls of more direct clinical responsibility?

If these questions can be answered by an honest "no" by those whose opinions we respect and by those responsible for our fate, then we must submit with good grace, but with bitter disappointment in our hearts, and fade quietly from the scene. If, on the other hand, the answer to any of these issues—and particularly the first—is in the affirmative, and this verdict is expressed by any body of opinion, either public or professional, then the Ministry of Health's policy should be amended forthwith, and registrars should fight hard to see that it is.

It is suggested that registrar groups throughout the hospital service, particularly in the teaching centres, should meet as a matter of urgency and pass their own verdict on the points raised above, and on any other important issue they consider likely to lead to amendment of the circular. Contact with hospital groups can soon be established if people are really concerned about their fate, which otherwise appears to be sealed. Besides, when a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully.

The opportunity will not recur, and the sands are running out. The need of doing, therefore, is pressing, since the time of doing is short.—I am, etc.,

London, W.12. DAVID LEWES.

SIR,—The position with regard to registrar appointments is in need of clarification, and an administrative problem of considerable magnitude undoubtedly exists. We and our colleagues are anxious to do all we can to assist the Minister in arriving at a reasonable solution, and have certain suggestions to offer which are outlined below.

Having stated this, we are unable to refrain from expressing our surprise and disgust at the cynical manner in which the memorandum is worded (*Supplement*, November 18, p. 204). We refer in particular to para. 12 of the document, which manifestly expresses direction of experienced medical men.

Furthermore, we wish to state with full emphasis, and in the light of our long collective experience of the working of large non-teaching hospitals, that it will be impossible to prevent an important deterioration in the standard of medical care of hospital patients if these essential members of the medical staff are displaced. We regard the senior registrars and registrars as the backbone of the hospital service in the day-to-day care of the patients.

We offer the following suggestions:

(1) The necessary reduction in establishment for registrars should be reached gradually without hardship to individuals by allowing posts to become vacant at the termination of the normal tenure of the holder. Many of these registrars at present are men of over 35, with family responsibilities, whose careers have already been set back five or six years by war service.

(2) We recommend the creation of a new grade of assistant consultant, with a salary scale intermediate between that of consultant and senior registrar.

(3) There is a great need for the preparation of a scheme whereby men with some hospital experience can be absorbed into general practice at a level justified by their special training if it is found that they are unable to proceed further in their specialist career.

—We are, etc.,

London, N.19.

CECIL D. COYLE.
T. ST. M. NORRIS.
H. E. S. PEARSON.

SIR,—In this slow and painful initiation of the Health Service it is to be deplored that sudden changes of policy should occur. Under conditions of war remustering from "trades" which became redundant was accepted in the fighting services as a necessary evil. Under the present circumstances, however, there can be no excuse for the abrupt decision to reduce the registrars of this country by nearly half.

Surely it is fatuous to suggest that the newer trained registrars can acquire, in the four years suggested, the knowledge and the experience which many of us have been gradually acquiring over a period of six, ten, or even more years. Specialties are becoming progressively more advanced and cannot be learnt except by years of careful apprenticeship. Furthermore, after all these years most of us are quite unfitted to revert to general practice.

If the Government has made the unfortunate mistake of training more specialists than it requires it would seem penalty enough for the unfortunate victims to be sentenced to a long spell in the top registrar grade. The rate of pay is certainly not enough to satisfy these people, who have not attained these positions without much toil and sweat.

If the number of registrars is to be reduced, it is only fair that this should be done gradually. Now that we know, for the first time, that the number of consultants is not to be increased, it will not be long before there are less registrars. But meanwhile fully qualified and fully trained men—on whom the State has expended vast sums of money—should surely not be sacked so that more can be trained.

It must be conceded that an annual review of all registrars is a reasonable method of ensuring that their work reaches a satisfactory standard. Apart from this I consider it quite intolerable that any registrar should be directed to relinquish his appointment.—I am, etc.,

Nottingham. CYRIL C. SLACK.

SIR,—The imminent reduction in the registrar establishment prompts us to make the following observations, for we believe that this action, said to be in the interests of the registrar class, is, in fact, contrary to their wishes.

(1) Registrars are prepared for each to be in open competition with his fellows, believing this to be the most certain method of determining the individual best suited for selection to consultant status. He is willing to accept the risk that no consultant post may be available for him on completion of his registrar appointments, but believes that, the better doctor he can become before entering either general practice or some special branch of the Service, the better for the future efficiency of the Service.

(2) The decision who will become consultants will in future be made too soon after qualification—i.e., before there has been adequate time for all-round experience to be gained, or assessment of his capabilities to be made.

(3) The registrar is at present vital in a service which deals not only with the training of consultants but also with the treatment of patients. The long-term consultant establishment problem may be solved by a 40% reduction in the hospital registrars, but this will be accompanied by a reduction in the efficiency of the Service. A great deal of the large volume of work at present being done by registrars will in future have to be done by senior house-officers who are not qualified to do so. If they are sufficiently qualified they should receive the salary of a registrar.

We consider that it is against the democratic traditions of this country that an irrevocable decision affecting a large segment of the medical profession should be made without any reference to their views on the subject. We would suggest, therefore, that hospital residents and registrars throughout the country should meet to decide their attitude to this proposed change and that the Minister should thereafter take a referendum of their views.—We are, etc.,

Bradford.

D. P. GORDON.
R. C. GLEDHILL.
T. G. EVANS.
J. B. WILSON.
J. BRECKENRIDGE.
T. R. DAVISON.
J. M. B. MUIRHEAD.
A. R. WEBSTER.
M. ROSEN.
A. M. EMMERSON.
D. C. SIMPSON.
R. M. DEAN.
H. MICHAELSON.
P. PRATT.
W. S. LOCKE.
G. BRADSHAW.
W. BARUCH.
H. A. KARRACH.
H. A. BARKER.
D. F. O'NEILL.
D. H. MCMILLAN.
M. B. TAYLOR.
W. P. FULLERTON.
D. A. L. DICK.
D. MATHIESON.

Beds for the Tuberculous

SIR,—There are at present approximately 11,000 cases of pulmonary tuberculosis awaiting admission to sanatoria, and many of these will have to wait six to twelve months for a bed. The Minister of Health stated in Parliament on July 27, 1950 (see *Journal*, August 5, p. 371), that on December 31 last 5,000 beds suitable for tuberculous patients were unoccupied, 4,000 being closed for lack of staff.

It must be true of every sanatorium that there are several patients who are retained in the sanatorium longer than is medically necessary because of difficulties connected with their disposal, such as overcrowding and the need for rehousing, the presence of uninfected children in the house, or lack of any home to go to in the case of people who live in lodgings. These patients do not require nursing, as they are invariably up all day, and, in effect, they are mere lodgers in the sanatorium until the difficulties connected with their disposal can be overcome. They are, however, blocking urgently needed beds for

patients requiring active treatment, and they should not, therefore, be accommodated in a ward which is staffed and equipped for treating active cases. All sanatoria with empty beds should make some of these available for this type of patient, and this can be done without materially increasing the demands on the existing staff, as these patients are fully able to make their own beds and keep their room clean and tidy. This annexe system is already a feature in some sanatoria, and provides a valuable link between full institutionalization and a return to the outside world.

An extension of this system to all sanatoria with empty beds would seem to be an immediate practical possibility and should be put into effect forthwith, for every bed counts and time is not on our side.—I am, etc.,

Leeds. M. B. PAUL.

When is Disablement Not Disablement?

SIR,—A patient, a factory porter, having taken much advice about a prolapsed disk, wearing a heavy brace, has been kept by me on the sick list for some months. He is on the Ministry of Labour disabled list and has been seeking sedentary work for some time. He was examined on October 17 and again on November 2 by persons from the Divisional Medical Officer's Department and was informed on November 10 that he was struck off sick pay from November 3. There is no dispute about the medical aspect of the case, he is fit for light work.

Now I have two patients on the sick list, one a professional pianist who has lost two fingers of each hand (not due to an accident), whose corns prevent him from digging. He is, however, fit for light work such as holding horses' heads and acting as a shop steward. Do I sign him off?

The other is an agricultural worker whose feet are crippled with rheumatism. He has a good head for "the odds" and would do well as a bookmaker's clerk (sedentary). There are no bookmakers near. Do I sign him off as fit for work?

One can think of many such cases which my colleagues may have. What, Sir, is your advice?—I am, etc.,

Cricklade, Wilts. T. R. THOMSON.

Problem of the Therapeutic Convulsion

SIR,—In his article (November 11, p. 1092) Dr. T. D. Power suggests that there may be a reversal of psychic evolution and a reliving of past experience during and after therapeutic convulsions.

The following observation may be of interest. I am at present treating with deep psychotherapy a patient who received a concentrated course of E.C.T. eighteen months ago (12 fits in ten days). During the earlier weeks of my treatment when referring to the period of shock therapy she said, "It was like dying and being born again," but she had complete amnesia for the whole of the ten days. After about three months' psychotherapy she said that she could remember one occasion when she was obstinately refusing to get into a bath. After a further period of about ten sessions she suddenly said, "I was in Australia all the time I was having E.C.T.," and she elaborated this with a description of some of the scenery. Australia was in fact the scene of several of the happiest years of her early childhood.

This was her most recent reference to the subject, so that it is at present impossible to state what further fantasies occurred at the time. However, one may legitimately conclude that it is in some cases possible to penetrate the post-E.C.T. amnesia in the same way that one does a childhood amnesia, and that such an exploration may confirm Dr. Power's suggestions on the psychological effects of convulsion therapy.—I am, etc.,

Oxford. OLIVER LYTH.

SIR,—The attention drawn by Dr. T. D. Power (November 11, p. 1092) to the relevance to psychiatry of the teachings of Hughlings Jackson is most welcome, and may herald the adoption of that unity of concept the absence of which has been deplored in recent correspondence (see November 4, p. 1057, and earlier).

It is significant that E.C.T. is only efficacious in certain mental illnesses—viz., acute mania, depressive states, and, to a lesser extent, in paranoid states and in schizophrenia. It is of no value in hysteria, anxiety states, and obsessional neuroses.

The manifestations in mental illness can be ranked in order according to the distance in consciousness at which they arise. Hysterical disorders lie so close to consciousness as to arouse a frequent suspicion of malingering. Anxiety states spring from deeper layers of the mind and their causative factors are rarely so obvious. The symptoms of acute mania and of the depressive states are even less compatible with normal mental functioning and come from deeper levels. At a greater distance still from consciousness, there is the schizophrenic series, ranging from the paranoid cases with fair preservation of the personality, through paraphrenia, to those forms showing great disintegration of personality and eruption of the contents of the unconscious into consciousness. Thus there can be traced from hysteria to schizophrenia a progressive extent of failure of repression, and in the reverse direction an increasing success of integration.

It would therefore appear that E.C.T. is capable of restoring integration at certain levels of the mind, not at more superficial levels, and not at the deepest levels, but at those middle levels whence spring the symptoms of mania, melancholia, and the paranoid group. These divisions recall Hughlings Jackson's teaching that the central nervous system is organized in three levels. The lowest level from the tuber cinereum to the conus medullaris contains centres representing the body in detail. The middle level comprises the Rolandic area where the parts of the body are re-represented. The highest level he places in the prefrontal lobes, and here he assumes concomitance of psychical states with the nervous states of at least the highest layers of this level. They are the physical basis of mind.[1] Jackson does not understand "unconscious states of mind"; for him mind and consciousness are synonymous, although he allows that there may be activities in lower layers of the highest centres without attendant psychical states, which yet lead to activities of those layers whose activities do have attendant psychical states.[2] In the light of our later knowledge of psychopathology his doctrine of concomitance may perhaps be taken further than he felt was warranted.

Physical methods of treatment of the more superficial mental disorders, the neuroses, produce dissolutions in the highest nervous levels—e.g., narco-analysis, continuous narcosis, modified insulin treatment. For the deepest disorders of the mind, the schizophrenias, we use insulin coma, in which partial dissolution is carried as far as Jackson's lowest level. At the middle levels E.C.T. is used to produce a temporary dissolution.

Dissolution at any level is not necessarily complete: Jackson speaks of local dissolutions in connexion with the insanities.[3] This concept can be most usefully applied in diagnosis, with its corresponding implications for treatment. Mental illnesses do not occur in pure form, and in most cases symptoms can be found arising at different levels. The best example of this is the psychoneurotic or reactive depression which one day presents as a depressive state and the next day impresses the clinician with its wealth of neurotic features. The adoption of a "more-or-less" attitude rather than one of "either-or" leads to better understanding and treatment.

This brief note by no means exhausts the possibilities of applying Jackson's concepts to psychiatry, and it is hoped that Dr. Power's article will stimulate others to similar studies.—I am, etc.,

Nottingham. W. L. JONES.

REFERENCES

1 Taylor J. (editor), *The Selected Writings of John Hughlings Jackson*, London, 1932. 424
2 Ibid., 2, 85.
3 Ibid., 2, 77

Antihistaminics for Enuresis

SIR,—Dr. D. Hubble's very helpful article (November 11, p. 1108) prompts me to report our experiences with the antihistaminics in this disorder. A proportion of cases of enuresis present a superficial resemblance to allergic disorders in that intervals of freedom vary considerably and relapses are often associated with emotional upset, certain articles of diet, change of climate, etc.

On this analogy I first made some trials with "benadryl" some three years ago, and have found that at least 60% of cases show immediate and progressive improvement. The average dose used for children between 3 and 5 years old is benadryl 20 mg. thrice daily. Other antihistaminics are also effective.

In a single practice far less experience is gained with adult enuresis, but we have a lad of 17 who averaged five wet beds a week and now keeps dry by taking one tablet of "thephorin" daily; he relapses at once if he stops the treatment.

We have also a woman, now aged 27, who averaged five wet beds per fortnight. She was treated most thoroughly with the usual drugs for some eight months and did not improve beyond two lapses per fortnight. As soon as she began to take benadryl 50 mg. three times a day she improved to about one lapse per two months; in spite of trials with other antihistaminics she has maintained this state for the past two years. She is now taking "phenergan" 25 mg. at night and is well satisfied with the improvement.—I am, etc.,

Bath. CHARLES HAGENBACH.

*** A letter in the *Journal* of October 7 (p. 836) describes the use of antihistaminics in treating nocturnal frequency.—ED., *B.M.J.*

Sea-sickness

SIR,—In the correspondence (see, for instance, November 11, p. 1117) following Professor Burn's article (*Journal*, September 23, p. 691) no reference appears to have been made to the use of "benzedrine" (amphetamine sulphate) as a cure for travel-sickness. In 1949 I was told of this action of the drug by a colleague in the Colonial Medical Service. Since then I have tried it on myself and have given it to other sufferers with (so far as I was able to judge) excellent results.

The dosage is one-half to one tablet (2.5–5 mg.), given after the person has started to feel ill. It is not necessary to use the drug prophylactically, since it appears to work so well as a "corpse-reviver." In fact I withheld the drug deliberately in many instances because I wished to be quite sure that (*a*) the person concerned really was going to develop sea-sickness, and (*b*) the benzedrine was not merely acting as a placebo.

Benzedrine has none of the disadvantages of the hyoscine preparations, the soporific effect of which is shared by the antihistamine group. It does, of course, tend to interfere with sleep, but this effect can be countered by a barbiturate.

As I have never had the opportunity of carrying out a properly controlled trial of the drug it should be noted that the foregoing is only a personal impression. It would, however, be interesting to hear other people's experiences with the use of benzedrine for this purpose.—I am, etc.,

ALAN ROBINSON,
Lee-on-Solent. Surgeon Lieutenant-Commander, R.N.

SIR,—The recent correspondence (October 21, p. 946; November 11, p. 1117) has prompted me to write a few facts noted during my two years' experience as a senior medical officer in troop transports (1945–7). As my duties were often combined with those of ship surgeon my patients included both sexes and many nationalities. There appeared to be three types of sea sickness: (1) Actual vomiting, which was the most common type and was occasionally accompanied by haematemesis. (2) Sudden loss of consciousness with cold, clammy sweating, rapid thready pulse, and marked fall in blood pressure. (3) Severe intractable headache, unrelieved by the more common analgesics, which always cleared up on disembarkation. In these cases there was no apparent organic cause or anxiety state. It was infrequent, in my experience, for children under the age of 7 years to be sea-sick.

As regards treatment for adults, I found a combination of 1 gr. (65 mg.) phenobarbitone and hyoscine hydrobromide 1/100 gr. (0.65 mg.) most effective in the large majority of cases under even the most adverse conditions. This could be repeated six-hourly if necessary, to a total of 3 gr. (195 mg.) phenobarbitone and 3/100 gr. (1.95 mg.) hyoscine hydrobromide in 24 hours.

For children aged 10 to 14 years (provided they were of reasonable physique) I prescribed 1/200–1/100 gr. hyoscine hydrobromide with good effect.

Naturally in some cases during treatment there was some drowsiness, but I found the large majority of sufferers preferred drowsiness to sickness. In several instances (expectant mothers, cardiac cases, acute anxiety states, etc.) where there had been persistent vomiting and where there was no hope of reaching land within three to four days I was forced to give a hypodermic injection of 1/3 gr. (22 mg.) "omnopon" with 1/150 gr. scopolamine. Rectal administration of drugs proved impracticable for various reasons. Other remedies, bromides, chloretone, phenobarbitone by itself, and even champagne, were of little use.

I had no experience of amphetamine, and of course at that time the various antihistamine drugs were not available.—I am, etc.,

Oxshott, Surrey. J. D. M. LYTLE.

Nail-plate for Intertrochanteric Fractures

SIR,—Few orthopaedic surgeons to-day would disagree with Messrs. G. P. Arden and G. J. Walley for their advocacy (*Journal*, November 11, p. 1094) of the nail-plate as the ideal form of treatment of the intertrochanteric fracture of the femur. But as a result of their experience they conclude that certain modifications of their method are necessary:

"More blood transfusion at operation, to control shock." If the patient is anaemic before the operation I would agree, but otherwise it is unnecessary. When a postero-lateral incision is employed haemorrhage is negligible and the operation upsets the patient no more than the ordinary pinning operation for subcapital fractures:

"Modification of the nail-plate." (Four fins, to prevent bending of the nail; a single Egger-type slot in the plate, to encourage early union; a serrated spring compression washer or lock-nut, to prevent the nut becoming loose, and thus prevent a varus deformity.)

The first and last of these are necessary because of the defects in the type of nail used (McKee plate, 35 cases; McLaughlin plate, two cases). I suggest that a change-over to the Capener-Neufeld plate will obviate further trouble. The latter V type of nail rarely bends unless poorly tempered, and it has no nuts to work loose.

I entirely fail to see the value of the Egger slot in the plate to encourage early union. I cannot recall a case of delayed or non-united intertrochanteric fracture. The nail does not obtain a rigid grip in the neck of the femur. Impaction of the fragments occurs as a result of muscle pull or weight-bearing, which cause the nail to slide further inwards. For this reason a long nail should not be used (3¼ in. (8.3 cm.) is about the average length), otherwise the slight impaction that frequently occurs will cause the nail to penetrate the cartilage of the head of the femur.

—I am, etc.,

Exeter. F. C. DURBIN.

SIR,—I published a small series of cases (17 consecutive cases in six months) of intertrochanteric fractures of the femur in the *Lancet* in January, 1944, describing the use of a trifin nail and plate in the treatment of these fractures. Since then I have done over 150 cases, and I should like to confirm all the advantages claimed by Mr. G. P. Arden and Mr. G. J. Walley (November 11, p. 1094). I have also experienced the same complications, and have adopted almost the same measures to avoid them.

Penetration of the Head of the Femur by the Nail.—This complication is particularly liable to occur when a plate is used in connexion with a nail, the plate preventing the nail from coming out when absorption takes place at the fracture site, the result being that the nail tends to travel farther into the head. My technique to stop this consists in allowing at least ½ in. (1.3 cm.) clear between the upper end of the nail and the outline of the femoral head, but before this final position is obtained I release all traction on the limb and impact the fragments, so that there is no gap between them to start with.

Bending of the Nail.—The nail can be made stronger either by having a four-flanged nail as suggested in the recent article in the *British Medical Journal*, or by having it made of stouter steel. I have not met with much success in trying to develop a nail of tougher material, and it is obviously not desirable to have a nail of too great a cross-sectional area. There are, however, some modifications in technique which lessen the strain on the nail. First of all, the nail should be placed as vertically as possible. Secondly, if the fracture is low so that the nail simply holds the upper fragment and the plate holds the lower one, then the use of slots instead of holes in the plate will allow subsequent taking-up at the fracture site, so that the fragments remain in contact and no gap

will occur. Thirdly, the release of distraction and firm impaction as a final procedure gives initial consolidation of the fracture and considerably diminishes subsequent strain on the nail.

Since using these measures I seldom see any bending of the nail, so I can vouch for their effectiveness in practice.

Bending of the Neck of the Blade-plate.—The neck of the plate is its weakest part and was particularly liable to bend, but it has been considerably strengthened in later models, so much so that it is advisable to use a vice to hold the plate in order to adjust the angle to the exact requirements before it is inserted.

Loosening of the Nuts.—This complication did occur in my early cases when I used a screw, but since then I have been using a special type of self-locking nut made for me by Mr. Drew, of Down Bros. The nut is firmly tightened by a stout box spanner, and I have not seen one come loose for several years.

Using these modifications, my impression is that a more accurate reduction can be maintained. The operative mortality and the immediate post-operative mortality have become almost negligible since a light unilateral spinal anaesthetic of "nupercaine" has been used.

Finally, I should like to mention that I have used stainless steel plates with vitallium screws for the last five years and I have not been troubled by any electrolytic reaction. In fact, in the few cases where I have removed the apparatus several years after its insertion there has been less reaction than when stainless steel screws and a stainless steel plate were used.—I am, etc.,

Norwich. G. K. McKEE.

Proper Use of Anticoagulants

SIR,—Drs. J. A. Tulloch and A. Rae Gilchrist in their excellent article (October 28, p. 965) give heparin by interrupted intravenous injections at intervals of eight hours in most of their cases. They assess adequacy of dosage by estimation of clotting time one hour after the injection. As the clotting time would be practically normal in three to four hours, this method affords no protection against a further thrombosis in the four hours preceding the next injection. This is more than a theoretical consideration and may account for at least some of those cases in which further thrombo-embolic phenomena occurred.

Drs. Tulloch and Gilchrist state that they have been disappointed with depot-heparin and heparin-retard, partly on account of the intense and persistent local pain after the intramuscular injection and partly on account of irregular absorption, but have found "Heparin-Evans" to be more satisfactory. Nevertheless, I believe that intravenous heparin will always be preferable to intramuscular heparin, because in the case of the latter the rate of the absorption will always vary to some degree and the clotting time at any given moment will, therefore, be unpredictable. Moreover, the heparin effect can never be wholly neutralized by protamine sulphate, which will instantaneously flocculate the whole of an intravenous dose.

There are several simple and efficient methods of administering heparin intravenously without the necessity of employing a continuous drip, with its many disadvantages, or of subjecting an ill patient to the discomfort of repeated injections through the skin. Perhaps the most popular is the use of the Gordh's needle, but, if the administration of heparin is to be continued for longer than 24 hours, polythene tubing can be inserted into one of the antecubital veins through a wide-bore transfusion needle. The latter is then withdrawn and a Gordh's needle fixed tightly into the free end of the polythene tubing. If such a needle is unavailable a satisfactory substitute can be easily improvised by fitting about 1½ in. (3.7 cm.) of rubber tubing from a blood transfusion set to an ordinary hypodermic needle. When communication has been established with a vein, either directly or through polythene tubing, the distal end of the rubber tubing is closed by a clip; injections can then be made directly into the rubber tubing, which seals automatically when the needle is withdrawn.

As a general rule 5,000 units of heparin at 3-hourly intervals, or 10,000 units at 4-hourly intervals, will be found to suffice. The dosage, however, may have to be increased or diminished depending on the length of the clotting time, which is taken three or four hours after the second injection, corresponding to the interval chosen. A much larger initial dose may be administered, and, in addition, allowance must be made for the volume of dead space in the apparatus used.

Now that "tromexan" is generally available there is no possible justification for the use of "dicoumarol." The action of tromexan is more easily controllable, and if an overdose should be given the patient is in danger for only a matter of hours. As Drs. Tulloch and Gilchrist advocate, tromexan should be given in small divided doses throughout the day. Unfortunately the smallest tablet manufactured is 100 mg., and this is not easy to split up. As some patients require a maintenance dose of as little as 150 mg. daily it would be convenient if smaller 50 mg. sugar-coated tablets were put on the market. Also there are patients who require very much larger daily maintenance doses; for example, in one of my cases I had to give 1,200 mg. daily in order to produce a satisfactory rise in prothrombin time.

Because of this wide variation in individual requirements I would like to conclude by reiterating Drs. Tulloch and Gilchrist's warning of the importance of a careful and efficient technique for the estimation of prothrombin times.—I am, etc.,

London, W.6 C. HOUGIE.

Diagnosis of Placenta Praevia

SIR,—In the report on the discussion on the diagnosis and treatment of placenta praevia at the Royal Society of Medicine (November 4, p. 1055) I was surprised to read of the emphasis placed on abstinence from vaginal examination in the diagnosis of this condition. How can the certain diagnosis of placenta praevia be made without the insertion of a finger through the os? From the history of the case one suspects the presence of praevia, and by abdominal palpation one can diagnose the presence of a low-lying placenta—but surely this is quite a different thing from diagnosing placenta praevia of such a degree as to necessitate the performance of a caesarean section. Even in the few cases in which a vaginal examination appears superfluous, the insertion of a finger through the cervix may well disprove an apparently certain diagnosis. The following case is an example.

On the evening of October 8 I was called to see a woman aged 30 who was in the 37th week of her fourth pregnancy. While rising from the bridge-table she had suffered a sudden painless haemorrhage, sufficient in amount to cause a trail of blood spots across the floor and a sizeable pool on the lavatory floor. I estimated the blood loss at 10–15 oz. (300–450 ml.). On examination, the general condition was good, there were no signs of toxaemia, the uterus was of normal consistency, the presentation was vertex, and the foetal head was freely mobile. Even gentle palpation of the abdomen caused an increase of the slight trickle of vaginal bleeding which had persisted. A provisional diagnosis of central or marginal placenta praevia was made and the patient transferred to hospital. The blood group was determined, compatible blood made available, and the patient taken to theatre prepared for caesarean section. Under anaesthesia, a vaginal examination was performed. Gentle palpation through the fornices revealed the head to be easily felt, and did not occasion any gross bleeding. A finger was then inserted through the os and the lower segment explored. No placental tissue could be felt over the os or within 1 or 2 in. (2.5 or 5 cm.) of it. There was no further bleeding. The membranes were ruptured, using Kocher's forceps, the head was pushed into the pelvis, and a binder applied. Contractions commenced three hours later, and after a short labour lasting four and a half hours a live child weighing 6 lb. 1 oz. (2.7 kg.) was delivered. Following the birth of the placenta, the uterus did not contract well and a sharp post-partum haemorrhage of over 20 oz. (600 ml.) occurred, necessitating a blood transfusion.

The puerperium was uneventful. Examination of the placenta and membranes was inconclusive, and no certain cause for the antepartum haemorrhage was found, although one presumes that it was due to a lateral placenta praevia.

I feel that greater emphasis should be given to Professor Browne's statement that the largest group of cases of antepartum haemorrhage are those in which the cause is not known. If this is kept in mind, fewer series of cases showing a caesarean section rate of 70% will be produced. In my view, a careful vaginal examination performed in the theatre with all the preparations made for operation and compatible blood at hand cannot increase the risk to the patient. No matter how skilled the surgeon, the operation of caesarean section does carry a mortality rate, and it is only justified if the condition for which it is performed has first been diagnosed with certainty.—I am, etc.,

Taunton, Somerset. J. M. THOMSON.

The Clinician and Cancer Records

SIR,—In *The Times* of November 2 a leading article was devoted to cancer records (see also *Journal*, November 4, p. 1046), and it was mentioned that such records on a national scale were started by the Radium Commission. As one of those members of the Commission who helped in that work, and who has been interested in cancer records for many years, I would like to point out that the real difficulties with which hospital record departments have to contend are the clinician's notes. A busy clinician is inclined to jot down such notes as he thinks will be useful to him when he sees the patient again a few weeks later while the treatment and other points are still fresh in his mind. He forgets that an analysis has to be made from his notes five years later and that this is the foundation on which the interim report just published by Dr. Percy Stocks depends. Something must be done to improve the clinician's notes, preferably by having printed headings, if the final reports are to be accurate and worth compiling.—I am, etc.,

London, W.1. MALCOLM DONALDSON.

An Author Defends His Book

SIR,—May I be allowed to comment on the review (November 11, p. 1100) by Sir Stewart Duke-Elder of my book? The principles this work sets out to establish are those of general physiology applied to the eye, so that the conditions governing its component tissues differ in no way from those which obtain elsewhere for similar tissues and analogous situations.

This conception of physiological harmony and conformity is apparently distasteful to Sir Stewart, for he says, "The sections on physiology should be read critically, for seldom will there be found so many sweeping conclusions based on premises so slender and sometimes of questionable validity." In the light of such criticism I draw attention to the mechanism of accommodation. According to established convention the vascular choroid functions as counterweight to the lens, and the unstriated ciliary muscle is actuated by a single nerve. These two tissues are in consequence unique, not merely in mammalia but in the whole range of the animal kingdom. Nowhere else can a vascular structure be found subjected to constant stress, or unstriated muscle actuated except by two nerves and functioning accordingly. To dispense with such anomalies and substitute a mechanism in accord with physiological, anatomical, and mechanical principles is the solution.—I am, etc.,

Nottingham. THOMSON HENDERSON.

POINTS FROM LETTERS

Syphilis and "Chloromycetin"

Dr. NORMAN MELLOR (Cereal, Alberta) writes: I was interested to read Professor L. P. Garrod's article in the Refresher Course (September 23, p. 722) regarding the activity of "chloromycetin" and "aureomycin," and would like to draw his attention to the makers' claim for the former drug in the treatment of syphilis. . . . Messrs. Parke, Davis and Co. state that "chloromycetin offers considerable promise as a means of treating those individuals with syphilis in whom more established therapeutic measures are not applicable." This statement is made after citing investigations by sundry workers (*Sth. med. J. Bgham, Ala*, 1949, **42**, 988; *Science*, 1949, **110**, 639; *Amer. J. Syph.*, 1949, **33**, 509; *S. Afr. med. J.*, 1949, **23**, 1043) who, while admitting that the drug has a low antitreponemal action *in vitro*, claim that remarkable healing of the primary lesion occurs in a very short time. This would appear to be a direct contradiction of Professor Garrod's statement that the drug has no useful action on *T. pallidum* and that it is incapable of masking syphilis. Surely, if a drug is effective in healing the primary lesion, therein lies its danger should its therapeutic value be limited to this stage of the disease.

Eccentric Nozzles for Syringes

Dr. J. P. ANDERSON (Stockton-on-Tees) writes: Can the manufacturers of syringes give any reasons why syringes are still made with concentric rather than eccentric nozzles? Surely there are no disadvantages likely to be encountered if *all* nozzles are eccentric. The reason for this question is, of course, the important fact that all syringes are probably used (from necessity) at some time for intravenous work. A concentric nozzle is a great handicap in any syringe above the 2 ml. size, and becomes increasingly so as the size increases.

Obituary

NEIL F. SINCLAIR, F.R.C.S.

Mr. Neil Sinclair, who was a well-known surgeon on the staff of several hospitals in and around London, died at his home in London on November 14 at the age of 65.

Neil Frederick Sinclair was born in Jamaica, the son of a leading medical practitioner, being the eldest of six children. After receiving his early education on the island, he came to England at the age of 16 and began his medical studies at the London Hospital in 1903. After a successful career as a student—he gained the Anderson and Dressers' prizes—he qualified in 1908. For several years thereafter he devoted his time to the principal resident appointments at the London Hospital. He was house-surgeon to the late Sir Frederick Eve and to Mr. Furnivall, and in 1911 was president of the residents' mess when holding the post of senior resident accoucheur. He served in the first world war as a captain in the R.A.M.C., and many of his old friends will remember him during this period by the affectionate name of "Bulgie." He took the F.R.C.S.Ed. diploma in 1916 and subsequently became surgical registrar at the West London Hospital. After becoming a Fellow of the Royal College of Surgeons of England in 1920 he was appointed to the staff of the West London Hospital as an assistant surgeon. In 1930 he became a full surgeon to this hospital, and in 1936, on the death of Mr. Tyrrell Grey, he became its senior surgeon. He played an active part in the postgraduate teaching at the West London Hospital and for a time was the dean of its postgraduate school. He was a member of the surgical staff of a number of other hospitals and continued as senior surgeon on the staff of King George Hospital, Ilford, and the Northwood District Hospital to the time of his death.

Sinclair took a special interest in the work of the West London Medico-Chirurgical Society and held the post of secretary and later of president of this society. He was also a very keen member and a past secretary of the Medical Society of London. He completed a full term as a member of the court of examiners of the Royal College of Surgeons of England and became known as a very fair and wise examiner. His publications were concerned chiefly with abdominal surgery, and he gained a considerable reputation as an abdominal surgeon. He was also particularly interested in the surgery of the thyroid gland.

Mr. A. M. A. Moore writes: Mr. Neil Sinclair possessed sound surgical judgment and great technical skill, and his very many friends will remember the pleasure of seeing him at work in the operating theatre. He became a great personal friend of many of his patients and never at any time failed to appreciate all their human problems. Many of England's younger surgeons owe much to the interest and drive of this remarkable man, and the country is all the poorer by his passing. His memory will always be cherished in the hospitals in which he worked and in the hearts of his host of friends. He leaves a widow, a daughter, and a son, who is at the moment a student at his father's old medical school. The deepest sympathy is extended to them in their bereavement.

Mr. G. P. Grant Batchelor writes: Neil Sinclair was outstanding. Under a modest exterior lay a keen intelligence backed by decisiveness of character yet tempered by kindliness and human understanding. Although the

best that was in him was devoted to surgery, his active mind probed into a wide diversity of subjects from religion and architecture to fishing and philately. He enjoyed discussion and argument—a pastime in which his natural friendliness and approachability enabled him to indulge freely. He entered the lists of surgery while in the R.A.M.C. in the first world war and savoured to the full the grim fruits of trench warfare. This marks him as belonging to the era of general surgeons which preceded the more restricted specialization of to-day. Whatever he did he did extremely well, and few excelled the neatness, steadiness, and precision of his technique. On the academic side he wrote comparatively little, but more than made up for this by the breadth of his devotion to teaching and the very active support he gave over the years to many learned societies. As dean of the Postgraduate College at the West London, before postgraduate gave way to undergraduate teaching in the middle 'thirties, and thereafter as lecturer in surgery, many a student must remember him with gratitude for his kindly help and interest. Neil Sinclair practised surgery in many hospitals, but the West London claimed first place in his affection, and the standing and prestige which the hospital enjoys to-day bears his stamp upon it. Up to within a few days of his death he was working and teaching there. His host of friends and colleagues will long cherish the memory of his kindliness, his friendliness, his ability, and, not least, his courage and stoicism in his last illness.

P. H. P. writes: As an old student of the West London Hospital I should like to add a tribute to the memory of Neil Sinclair. He was, of course, a brilliant surgeon, and he could make the most difficult operation appear simple by the calm smoothness of his technique. He once said he planned his operations to avoid any unnecessary movement, and, indeed, he achieved this end. He had the ideal temperament for a surgeon—a calm confidence, imperturbability, and deep humility. To his work he brought a wide understanding of human nature, and by his kindly manner gained the confidence of all his patients, rich and poor. His passing leaves a gap which none can fill.

HELEN M. SEXTON, M.B.

Dr. Helen Mary Sexton died in London on October 10, in her 89th year. She was born in this country, but went to Australia as a tiny child, where her father, an architect, died as a young man. After the death of her mother (who opposed any idea of medical training) Helen Sexton became one of the first women students at Melbourne University and graduated M.B., B.S. in 1892 at the age of 30. Within a short time she was elected as the only woman on the staff of 12 at the Gynaecological Hospital, Melbourne, where appointment was by vote of the subscribers. She retired through ill-health in 1912, after founding the Victoria Hospital for Women (now 600 beds) with five other medical women. Soon after the outbreak of the first world war Dr. Sexton took a small field hospital to France, the gift of herself and other women doctors. She served with the French with the rank of *majeur*, and when the hospital was disbanded she was given a temporary appointment at the great Val de Grâce in Paris. In 1917 she finally retired and afterwards spent many years in satisfying her delight in travel and in European art, making her home in Italy for 10 years. During the last decade of her life she was almost totally helpless, though her splendid smile still shone, and the few words that she could speak were always concerned with somebody's well-being. Both in Australia and in this country her colleagues held her in high esteem.—A. G.

J. H. ANDERSON, C.M.G., C.B.E., M.D., F.R.A.C.P.

Professor Richard J. A. Berry writes: It is with more than ordinary regret that I have just read of the death of Dr. J. H. Anderson (whose obituary notice appeared in last week's *Journal*), much better known to me as "Jock"; and who of his contemporaries and friends knew him by any other name? He was known to me personally and professionally for the whole of his medical lifetime, and there are few men for whom I had a greater personal esteem or in whom I consistently reposed a greater trust, for I knew he was worthy. It was in Anderson's senior year, as a student of anatomy in the University of Melbourne, that he first came under my notice, and from that time our lifelong friendship dates. He and his fellow students—such men as the late Alan Newton, Victor Hurley, Bill Upjohn, Ike Jones, to mention only a few and to give them not their well-earned more dignified professional titles but those by which they were affectionately known, unknown to themselves, by their professors and teachers, of whom I was fortunate to be one—these were the men who so largely helped in building up the Melbourne Medical School and in raising it from what it was in Anderson's third year to what it has since become. And what it is only those who have seen it can realize. In this pioneer work Anderson was pre-eminent, and I at least shall not readily forget it, nor, I think, will many others.

Dr. JOHN THOMSON MCLACHLAN died on October 26 in Glasgow. Born in the Vale of Leven, he was educated at Dumbarton Academy and Glasgow University, where he studied medicine. He graduated M.B., C.M. in 1888, and proceeded M.D. in 1896. He had a varied career as a general practitioner. After working for two years as assistant medical officer in an asylum in Lanarkshire, he went into practice in Dornoch, Sutherlandshire. After some years he moved to Glasgow, and among other appointments he held that of surgeon to the central police district. He gave up general practice when 70 years of age, and then worked as a locumtenent, chiefly in mental hospitals. McLachlan's main interest in life was medicine, and he wrote easily about all aspects of it. Numerous letters of his appeared in this *Journal*; his last, written a few months ago, was on the subject of medical education. He was twice married, and leaves no family.—J. H.

Dr. THOMAS ALFRED MAYO, who practised in Cowes for 37 years, died at his home in Cowes on November 1, aged 75 years. A native of Mildenhall, Suffolk, he was educated at Epsom College, Clare College, Cambridge—to which he won a senior scholarship and where he gained a first in the natural sciences tripos—and St. Bartholomew's Hospital. He qualified in 1898, graduating M.B. a year later. In 1900 he became a Fellow of the Royal College of Surgeons. Mayo went to Cowes in 1902 and became a partner of Drs. William and Edgar Hoffmeister. He was later in partnership with Dr. S. Hartill, of East Cowes, and lastly with Dr. G. M. Balfour. During the time he practised in Cowes he was a member of the honorary medical staff of the Frank James Cottage Hospital, and was afterwards consultant surgeon to the same hospital and also to the Kind Edward VII Convalescent Home at Osborne. For some years he was medical officer of health and police surgeon for Cowes. During the first world war he served with the R.A.M.C., chiefly in Malta, and during the last war was one of the examining doctors on the local medical board. He was chairman of the I.W. Local Medical War Committee and continued in this position until his death. Over a long period he was actively connected with the work of the British Red Cross Society. In 1938–9 he was chairman of the Isle of Wight Division of the B.M.A. He retired in 1939, after 37 years of devoted service to the community, during which time he won the respect and gratitude of his patients by his reassuring manner and kindliness of heart. His colleagues mourn the passing of a leader in our profession whose kindness and consideration to junior medical men were outstanding. He leaves a widow and a married daughter, to whom sincere sympathy is extended.—H. S. H. W.

Medical Notes in Parliament

Compulsory Trade Union Membership for Doctors

Dr. CHARLES HILL on November 15 drew attention to the action of Durham County Council in passing on November 1 a resolution requiring every member of its staff at all levels to produce evidence of trade union membership, under threat of dismissal. He added that the requirement was not to belong to a particular trade union and that in the case at least of doctors it was interpreted as one to belong to their professional association, if they preferred that to belonging to a union. It seemed to him that this was wrong in three or four respects. To secure members under duress was to damage the organization which secured them. A body from which a member who was dissatisfied with its officers, its policy, or its work could not voluntarily resign without losing his job was an unhealthy one. The role of the local authority was to employ the best-qualified persons to do its work, whether they belonged to this or that organization or not. It was utterly wrong for a man's job to be at the mercy not only of the employing authority but also of the trade union to which he belonged. For the loss of membership for some offence within the trade union organization to involve the loss of a man's job was utterly wrong.

Mrs. JEAN MANN asked whether that argument applied to the British Medical Association and the doctors.

Dr. HILL replied that the British Medical Association was a voluntary body. The Durham County Council had ordered the doctors to join the trade union or the British Medical Association as they chose, but the attitude of the British Medical Association was that no doctor should be required to join any body, not even the B.M.A.

Mrs. MANN asked whether Dr. Hill knew of any doctors who had dared not to join the B.M.A.

Dr. HILL replied that the membership of the British Medical Association was between 75% and 80% of the profession, and there was no compulsion on any man to join that body. He sometimes thought that the nation was losing its capacity for anger at such interference with the freedom of the individual. The battle for the right of association had been magnificent and necessary. As one who had spent many years in collective bargaining he desired men and women to belong to their appropriate trade unions and professional associations. It seemed to him utterly wrong that a local authority should adopt the attitude of the Durham County Council. The issue had not been raised prominently since 1946, which was the time of the Willesden incident. The Minister had taken action in that case which Dr. Hill hoped he would take in this one (see *British Medical Journal*, 1946, 2, 924).

Dr. H. B. W. MORGAN said the local authority asked its employees to belong to some representative organization with which the authority could negotiate regarding remuneration or conditions of work. It did not ask the doctors to join the B.M.A. They could join the Medical Practitioners Union, which was registered as a trade union and affiliated to the T.U.C., which the B.M.A. was not. It was reasonable when trade unionism was so widely recognized that an organization should say, "We think you should for our convenience, and for your own, join one organization, and we demand that as a condition of employment." The point was the convenience of the negotiating body, which was spending public money or money granted by Parliament.

Dr. HILL pointed out that the Whitley structure for negotiation existed.

Dr. MORGAN said that freedom of the individual had nothing to do with the matter. If individuals need not belong to a recognized body, what was the Durham County Council to do? Was it to negotiate with the trade unions and leave isolated individuals outside to get the advantages of negotiation by the trade unions? That was not right.

Mr. E. R. BOWEN said the Minister of Labour had expressed views diametrically opposed to everything that had been said by Dr. Morgan. In December, 1946, he had said that compulsion by employers to join trade unions was likely to be detrimental to harmonious industrial relations. Over half the working population of the country consisted of people who were not members of trade unions affiliated to the T.U.C. That indicated the range of people who might be affected by the action of the Durham County Council. People had been employed by the Durham County Council for 20 or 30 years. Were they now to be told that a new condition of employment had been introduced, and that unless they were prepared to conform with that condition they were to be sacked?

Mr. GORDON LANG said he found himself in agreement with Dr. Hill. If it was to become a feature of public administrative life that a local governing body could order people to join a trade union he could conceive of occasions when there might be an instruction that no employees of certain bodies were to belong to any trade union. It was not the duty of a local body to impose its will in that way upon its employees. Liberty was dwindling in this land and he regretted it.

Mr. C. H. GAGE said it was for the trade unions themselves to realize that the days of these restrictive practices were over.

Mr. FRED MESSER said that trade unionism as a condition of employment had been in operation for many years. In many industries a man must show before he could start work that he was a member of his trade union. The Durham County Council had been democratically elected. It had not done anything which was against the law. It would be very dangerous if instructions were to come from Whitehall to local authorities who believed that, being elected by the people, they had a right to speak in the name of the people.

Sir RICHARD ACLAND said the trade unions ought to respect the genuine feelings of large numbers of people and not seem to seek greater power over individuals.

Mr. A. BLENKINSOP replied for the Ministry of Health. He said that the circular issued by the Ministry to local authorities on December 6, 1946, was still the view of the department and of the Government on this question. The Ministry regretted the resolution passed by the Durham County Council. At the same time it was anxious that employees of local authorities as well as other workers in regular employment should join their respective trade union or professional body and should be at liberty to do so. In January, 1948, Mr. Bevan in reply to a question had said that he hoped that persons employed in the National Health Service would be encouraged to belong to their appropriate organizations, but it would not be a condition of employment and there would be no pressure on anyone to belong to any organization, whether professional or trade union. That view had also been expressed by the Minister of Labour.

The House should remember that the Ministry was concerned merely with advising local authorities on matters of this kind, but it would take measures to ensure that the attention of the Durham County Council was drawn to the circular issued in 1946 and to the reply of Mr. Isaacs in 1948.

Dr. HILL asked whether this action would be taken with the least possible delay, because Wednesday, November 22, was the date by which proof of trade union membership had to be given.

Mr. BLENKINSOP said the only attitude which the Ministry could take up was one of adviser to the authority on this point. The Ministry appreciated the point made by Mr. Messer that the county council was the locally elected authority and had full power in this matter.

Sir HUGH LUCAS-TOOTH asked that the advice given by the department should be in the strongest possible terms, and Mr. BLENKINSOP made it clear that the action taken was deplored by his Minister.

The Trade Union Bill, "to prohibit local and other public authorities from making membership or non-membership of a trade union a condition of employment or of continuance in employment," was presented on November 17 by Mr. Nigel Davies, who had been successful in the ballot for private members' Bills. Its second reading was set down for April 6.

Medicine in the Colonies

In the debate on November 9 on the second reading of the Colonial Development and Welfare Bill Mr. EDWARD DAVIES said that the worst obstacle to health in the Colonies was undernourishment: the people had not the energy to produce more foods or goods.

Mr. S. S. AWBERY said the need for welfare schemes in Nigeria was shown by the fact that it had one doctor for every 133,000 people. It had one hospital bed for every 3,700 people, as against 1 for every 250 in the United Kingdom. Nigeria had 10 dentists for 23 million people. Its infant mortality was 110 per 1,000 and T.B. was the cause of 10% of the deaths.

Mr. G. H. C. BING said that when medical skill fell behind engineering ability a series of terrible tragedies resulted. Ceylon had been able to maintain a population of 20 million by an irrigation system of dams: those dams did not breed malaria owing to the irrigation level being continually altered. War came, the levels remained the same, mosquitoes bred, and in a generation the population of Ceylon fell from 20 million to less than 2 million people. We now knew how to control malaria, but were likely to find difficulties from it when we came to deal with those wholesale schemes for irrigation which were essential in Africa. In Africa at the moment malaria was endemic and the people needed a sufficient level of education for them to take some anti-malaria drug such as paludrine or mepacrine. Two other great difficulties would have to be faced in any system of irrigation for development of African agriculture. The first was the presence of bilharzia and tsetse-borne diseases, sleeping sickness, and the nagana disease which affected cattle. The Egyptian Government had been encouraged in the disastrous course of substituting irrigation from dams for the Nile floods. Previously there had been an incidence of bilharzia in some villages as low as 2%, but there was now an incidence of something like 75%. The elimination of the tsetse fly was a problem not only of medicine but of town planning and administration and engineering. Antrycide had not turned out to be anything like the short cut to the elimination of the fly that people had first thought. Even if it had been as good as was hoped they would still have had to train African personnel in the veterinary services and face a considerable amount of expenditure.

Mr. L. D. GAMMANS said that in West Africa there were nearly a thousand posts, normally filled from the United Kingdom, for which applicants could not be found.

Mr. DOUGLAS HOUGHTON referred to a report, *Development and Welfare in the West Indies*, which had drawn attention to the excessive rate of population growth. It estimated that the population would increase by 45% in 25 years. The rapid growth of the child population imposed a great strain on the health visitors and health services. The mortality rate had practically halved in the last 50 years, but the birth rate was still very high throughout all the Colonies in the West Indies, and if there was no enlightenment on family limitation then family increase would replace some tropical diseases by diseases of malnutrition and poverty. The West Indies Royal Commission of 1938–9 had recommended public enlightenment on birth control. Why did the medical services of Jamaica discourage the use of contraceptive devices? The only birth control clinic in Kingston, Jamaica, was a voluntary one and was in serious difficulties from lack of support.

Dr. H. B. W. MORGAN said that if the Government wished to fail at the next election they had only to include birth control in any welfare scheme.

Mr. E. B. WAKEFIELD said the problem was not simple. In India plague, cholera, and dysentery had been controlled by the devoted work of doctors; and by the development of roads and railways plague and famine were countered. Now the population had grown so rapidly that all Britain had succeeded in doing was to lower the average standard of life. It was wrong to suppose that by pouring money into the Colonies they would raise the standard of living. Those who had been in Johannesburg knew the appalling conditions of labour in that city. He himself had seen appalling results in Arabia, where oil had been discovered and gold poured in.

Private Patients in Hospital

Captain M. BULLOCK on November 9 asked Mr. Bevan to consider allowing patients who occupy private wards, if they so desired, to have deducted from the charges made for such private wards the amount which would be chargeable to public funds if they were to receive treatment in a public ward. He further asked whether the Minister was aware of the different amounts charged by each hospital in the country for treatment in their private wards, and whether there was any possibility of the charge being made more uniform.

Mr. BEVAN answered that under the National Health Service Act, 1946, the charge for a private bed at any hospital must be such as to cover the whole cost of the accommodation and services provided for the patient at that hospital. He had no power to remit any part of this cost or to introduce uniform charges at hospitals.

Payment in Maternity Cases

The Hon. Mr. M. L. ASTOR on November 9 asked Mr. Bevan to make arrangements whereby in maternity cases, when either the matron of a hospital or a patient's doctor certified that the birth was imminent but no bed was available under the National Health Service, the patient could be reimbursed for expenses incurred in obtaining medical care privately.

Mr. BEVAN replied that the primary use of hospital maternity beds must be for mothers needing institutional confinement. The domiciliary maternity services were available without charge to the remainder. He had no power to make payments in the manner suggested.

Compensation for Doctors

Mr. H. CHANNON asked on November 9 at what date Mr. Bevan proposed to apportion the £66m. among doctors on their retirement in compensation for the goodwill of their practices.

Mr. ANEURIN BEVAN said that apportionment would not be possible until the claims of all doctors had been received and assessed. The final date for the submission of claims had been extended to December 31, 1950, or, in special circumstances, February 28, 1951.

Mr. CHANNON said many doctors had waited over two years and perhaps suffered hardship.

Mr. BEVAN said these cases were always met by making a grant of a substantial portion of the sum needed.

Mr. E. FERNYHOUGH asked whether any doctor who left the Health Service had a claim on this £66m.

Mr. BEVAN replied that he certainly had.

Free Treatment when Abroad

Asked by Colonel E. R. G. HEATH on November 9 whether British citizens when abroad could receive Health Service benefits without payment, Mr. BEVAN stated that arrangements for varying degrees of reciprocity had been or were being made with the Isle of Man, the States of Jersey and Guernsey, Belgium, France, Luxembourg, and the Netherlands.

Colonel HEATH pointed out that many merchant seamen paid contributions but for nine months in the year could not get benefits.

Mr. BEVAN said the Government was trying to arrange reciprocity, but other countries had not our facilities.

Colonel HEATH also asked the Minister of Health to make regulations so that foreign residents visiting this country would have to pay a charge for using the Health Service.

Mr. BEVAN said he was keeping this under review, but was not at present satisfied that there was enough evidence of abuses to justify action, since the expense of administration would be far more than the gain to the Health Service.

The fourth Annual Congress of the International Scientific Film Association was held at Florence on October 14–22, Britain being represented by a delegation of 10 members. It was decided to set up in Brussels an international reference film library of scientific films, and a standard system of recording was adopted.

Universities and Colleges

UNIVERSITY OF OXFORD

On November 18 the honorary degree of D.Sc. was conferred on Dr. Oscar Vogt, director of the Berlin Institute for Brain Research.

UNIVERSITY OF CAMBRIDGE

In Congregation on November 11 the following degrees were conferred:

PH.D.—*Mary E. P. Hele, M.B., B.Chir., Joan E. Keilin.
M.B.—S. E. Birdsall.

*By proxy.

UNIVERSITY OF WALES

The following candidates at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

TUBERCULOUS DISEASES DIPLOMA.—K. Chandar, P. J. Galvin, Marjorie S. Oxley.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At the annual meeting of the College held on October 25 the following were elected to the Council of the College: Professor R. C. Alexander, Mr. K. Paterson Brown, Mr. John Bruce, Mr. Arthur J. C. Hamilton, Professor C. F. W. Illingworth, Mr. James S. Jeffrey, Sir James R. Learmonth, Mr. Robert Mailer, Professor Walter Mercer, Mr. T. McWalter Millar, Mr. Douglas Miller, and Mr. R. Leslie Stewart.

The names of the officers of the College elected for the ensuing year were published in the *Journal* of November 11 (p. 1123).

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Professor Ian Aird, professor of surgery in the University of London, will deliver the Dr. John Burns Lecture on "Lymphoedema" in the Hall of the Faculty (242, St. Vincent Street, Glasgow) on Wednesday, November 29, at 5 p.m. All medical practitioners are invited to attend the lecture.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The Diploma in Obstetrics of the College has been granted to the following successful candidates: G. H. I. Anderson, W. J. R. Anderson, Beryl G. Bailey, R. J. Balfe, A. W. Banks, W. W. Bardiger, P. J. H. Barron, Luise Beer, W. G. M. Bell, S. Blaxland, S. W. Bowden, J. R. Bowker, R. McC. Boyce, Marjorie C. Bremner, J. H. Brenner, A. T. Bromley, Kathleen A. S. Brosnan, M. L. Bynoe, Irene F. Callender, K. A. A. Campbell, G. A. Carnachan, Maldwyn L. Cattell, N. P. Chaliha, Helen Li-Chu Chang, D. Charles, C. R. Cheadle, C. C. Clapham, Gwen S. Clark, Helen A. Clark, Jean Cockburn, Mary P. Cole, R. N. O. G. Colley, M. B. Comerford, J. M. Crossley, C. A. Cussen, C. N. D'Arcy, Sheila P. Davidson, W. M. Davies, T. R. Davison, L. K. Dawson, Elizabeth A. De Costres, Mary Dixon, D. J. Dooley, E. R. Dunn, W. E. B. Edge, M. Ellue, R. G. Emerson, Margaret T. England, K. A. Exley, Mary A. Foley, Joan Ford, T. A. Frewin, Kathleen M. Frith, Margaret Garnett, Marianne T. Gaston, J. M. Gate, B. A. Gavourin, K. K. Ghosal, Gladys M. B. Gill, N. G. Glen, Wendy E. Greengross, S. Hamilton, J. A. R. Hanna, L. M. Harrison, Geraldine Hector, Agnes B. Johnstone, G. F. Jolly, D. A. Ll. Jones, Shireen Kazi, Gwenyth H. Kendrick, Sylvia Kershaw, Marjorie A. C. Kuck, Margaret A. Lakeman, Tamsin M. R. Lee, Margaret B. Lees, N. Lees, D. G. A. Leggett, G. A. Lewis, J. W. Lewis, Lilias H. Liston, S. E. Lyle, B. Lytton, L. McEntee, M. B. McEvedy, Mary L. Macfarlane, W. J. McKimmon, I. Macpherson, J. M. S. Manson, D. N. Menzies, J. Meyrick, M. W. Mills, R. G. Milne, S. Munir, T. J. M. Myles, S. K. Nag, P. D. Nathan, P. Nayar, R. G. Nell, P. Nirula, A. M. O'Driscoll, J. J. Owies, T. C. L. Parry, S. M. Phadke, W. R. Plews, Rosabelle J. B. Purves, W. L. G. Quinlivan, R. J. Rabett, D. Razzak, N. A. Regan, Frances M. Richards, Joan A. Robertson, D. Rossdale, R. K. Rowntree, M. H. Russell, T. J. Ryan, M. S. Sanders, D. E. Sargent, R. Sathiah, D. Scander, J. S. Scott, G. M. F. Seelig, S. K. Sharma, Esme J. Simpson, P. S. Sinclair, J. A. Smith, Jean P. Spalding, A. D. Stewart, Mary L. Stokes, P. K. Storah, J. M. Stuart, W. H. Tandy, Joyce K. Tate, N. A. Thomas, W. M. Thomas, C. H. Thomson, J. V. Thurston, Rita D. C. Tozer, J. H. S. Wakelin, Ellen Watkinson, D. J. White, P. P. Wium, Wanda H. Wodzinska, G. E. Wolffe, D. J. Woodford, Ma Hnin Yi.

No. 44

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 4.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (b) London (administrative county). (c) Scotland (d) Eire. (e) Northern Ireland.
Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.
A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	32	2	11	1	1	18	2	20	2	1
Deaths		2	1				—	—		
Diphtheria	49	5	18	5	4	86	8	34	4	2
Deaths	—	—	—	—	—	—	—	—	—	—
Dysentery	260	16	124		—	83	2	70	1	3
Deaths		—			—				—	—
Encephalitis, acute	8	1	—		—	1	—	—	—	—
Deaths		—		—			—			
Erysipelas			29	4	4			29	12	8
Deaths							—			
Infective enteritis or diarrhoea under 2 years				25	18				64	
Deaths	6		3	1	—	29	2	5	14	4
Measles*	7,815	512	131	119	71	1,082	33	32	80	68
Deaths†		—	1	—	—			—	—	—
Ophthalmia neonatorum	35	2	10		1	35	4	4	—	—
Deaths										
Paratyphoid fever	5	—	—		—	7	—	2(B)	—	1(B)
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	433	30	6		7	419	21	3	1	5
Deaths (from influenza)‡	19	4	—	1	—	17	2	2	—	—
Pneumonia, primary			137	¶				179	24	
Deaths	200	24		3	11	197	38		78	
Poliomyelitis, acute	204	12	18	2	9	330	50	3	4	5
Deaths§	19	1		—		35	5			
Puerperal fever			5				—	15		
Deaths										
Puerperal pyrexia‖	59	5	5	1	3	65	8	5	1	3
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,108	82	193	70	63	2,048	161	269	162	174
Deaths†		—	—	—	—			—	1	—
Smallpox	—	—	—		—	1	—	—	—	—
Deaths					—				—	—
Typhoid fever	—	—	2	6	2	11	—	—	—	—
Deaths	—	—	—		—	11	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,087	305	409	35	25	898	26	51	35	38
Deaths	4	—	—	—	—	2	—	1	—	1
Deaths (0–1 year)	191	21	34	13	13	249	30	34	30	12
Deaths (excluding stillbirths)	5,025	767	602	134	110	5,309	930	569	180	116
Annual death rate (per 1,000 persons living)			12·1					11·4	11·2	
Live births	6,659	1100	795	369	235	6,912	1103	886	401	213
Annual rate per 1,000 persons living			16·0					17·8	24·8	
Stillbirths	163	17	22			193	19	28		
Rate per 1,000 total births (including stillborn)			27					31		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending November 11 were: paralytic, 161 (147); non-paralytic, 64 (57); total, 225 (204). The figures for the previous week, compared with which there was an increase of 21 notifications, are in parentheses. Notifications for the corresponding week in 1947 and 1949 totalled 210 and 316 respectively.

Total uncorrected notifications for 1950 to and including the week under review are 7,972. The corresponding figures for 1947, 1948, and 1949 are 8,475, 2,113, and 5,905 respectively.

Significant increases compared with the preceding week occurred in Cheshire (10), Dorset (10), Durham (6). The more significant decreases were in Warwick (5) and Denbigh (5). In 21 county areas there were no notifications at all.

There was in the week under review a check in the steady decline in notifications of recent weeks. It is unlikely that it is more than a momentary one.

Discussion of Table

In *England and Wales* an increase occurred in the number of notifications of measles 1,183 and dysentery 19, and a decrease was recorded for acute poliomyelitis 49 and scarlet fever 33.

A rise in the incidence of measles was reported from most areas of the country. The largest rises were Yorkshire West Riding 313, Yorkshire East Riding 186, Surrey 159, and Middlesex 116. Only small variations occurred in the local trends of scarlet fever. The notifications of diphtheria were 9 more than in the preceding week; the largest variation was an increase of 5 in Lancashire. The largest fluctuations in the trends of whooping-cough were rises in Middlesex 55, Warwickshire 47, Essex 37, and a fall of 30 in Lancashire.

The chief centres of dysentery were Essex 48 (Leyton M.B. 36); Leicestershire 37 (Leicester C.B. 25); Lancashire 36 (Oldham C.B. 12, Liverpool C.B. 11); Yorkshire West Riding 19; London 16; Gloucestershire 10.

The largest returns of acute poliomyelitis were Yorkshire West Riding 16; Warwickshire 15 (Birmingham C.B. 13); Lancashire 14 (Liverpool C.B. 4); Gloucestershire 13 (Bristol C.B. 11); London 12; Devonshire 10 (Plymouth C.B. 4); Cornwall 10 (Fowey M.B. 4).

In *Scotland* increases of 102 in the number of notifications of whooping-cough and 22 for acute primary pneumonia were recorded, and there was a decrease for dysentery of 20. The chief centres of dysentery were Glasgow 48, Edinburgh 22, and Lanark county 22. The largest returns for acute poliomyelitis were Glasgow 6 and Dundee 3. A decrease of 10 was reported in the number of notifications of scarlet fever in Glasgow.

In *Eire* decreases occurred in the number of notifications of whooping-cough 47, scarlet fever 17, and diarrhoea and enteritis 15, and an increase of 24 was reported for measles. The trends of these diseases were common to the country as a whole. The six cases of typhoid were notified as isolated cases throughout the country.

In *Northern Ireland* a decrease of 27 in the number of notifications of measles and a rise of 15 for scarlet fever were the largest variations in the trends of infectious diseases. The notifications of acute poliomyelitis increased to 9. The largest returns were Londonderry county 3 and Down county 2.

Week Ending November 11

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,206, whooping-cough 3,725, diphtheria 55, measles 8,857, acute pneumonia 465, acute poliomyelitis 225, dysentery 411, paratyphoid fever 3, and typhoid fever 3.

The Ministry of Health issued a list of amendments to the National Health Service Hospitals Directory on November 13.

Medical News

Royal Society Medallists

Royal medals for the current year are being awarded to Sir Edward Appleton for his work on the transmission of electromagnetic waves round the earth and for his investigations of the ionic state of the upper atmosphere; and to Dr. C. F. A. Pantin for his contributions to the comparative physiology of the invertebrata, particularly his work on nerve conduction in crustacea and actinozoa. The Copley Medal goes to Sir James Chadwick for his outstanding work in nuclear physics and in the development of atomic energy, especially for his discovery of the neutron; the Rumford Medal to Air Commodore Sir Frank Whittle for his pioneering contributions to the jet propulsion of aircraft; the Davy Medal to Sir John Simonsen for his distinguished researches on the constitution of natural products, especially the plant hydrocarbons and their derivatives; the Darwin Medal to Professor F. E. Fritsch for his distinguished contributions to the study of algology; and the Hughes Medal to Professor M. Born for his contributions to theoretical physics in general and to the development of quantum mechanics in particular.

Central Midwives Board

At a meeting on November 2 the Board placed on record its high appreciation of the services rendered by Professor F. S. Langmead, M.D., F.R.C.P., during his five years as representative of the Royal College of Physicians on the Board, and the chairman extended a welcome to Professor A. A. Moncrieff, M.D., F.R.C.P., who succeeds him.

Calls to the Bar

C. W. Robertson, M.B., Ch.B. (Inner Temple); and H. G. Broadbridge, M.B., B.S. (Middle Temple), were called to the Bar on November 17.

Portsmouth and I.o.W. Area Pathological Service

The central laboratory of the Portsmouth and Isle of Wight Area Pathological Service, which serves all the hospitals and general practitioners in the region, was opened by Countess Mountbatten of Burma on November 13.

Child Psychiatry: International Course in London

Some 30 psychiatrists, paediatricians, and social workers from 19 countries in Europe, the Middle East, and Latin America began a course on child psychiatry in London on November 12. The programme has been arranged by the British Council, with Dr. Kenneth Soddy and Dr. Emanuel Miller as advisers. It extends over three weeks and forms part of a comprehensive "Cours de Psychiatrie Sociale de l'Enfant" arranged by the Centre International de l'Enfance between October 15 and December 15. The first part has already been held in Paris, where the Centre's headquarters are situated.

Care and Rehabilitation of Tuberculous Persons

The London County Council has sought the advice of the Minister of Health on dealing with persons suffering from tuberculosis and still infectious, but unlikely to receive further benefit from sanatorium treatment, and without a home or having home conditions which are unsuitable. The Minister is not able to accept the council's view that the provision of hostels for such persons is the responsibility of the regional hospital boards. He contemplates the provision of hostels and night sanatoriums by local health authorities as part of the future development of the tuberculosis services, but in view of present national circumstances he does not feel that this development, among others no less necessary to meet acute problems, should be proceeded with as yet. The council, however, while appreciating these considerations, believes that the problem is so urgent that some contribution should be made towards its solution now. It is to seek approval by the Minister for provision by the council of hostel accommodation if this can be done by utilizing money voted for other Health Service purposes but which would not be spent immediately. It sees the prospect of meeting one project on these lines during the current financial year.

Tuberculosis Prize

The N.A.P.T. is offering a 100-guinea prize for the best essay embodying the author's ideas and proposals for the improvement of the control of tuberculosis throughout Britain. The competition is open to doctors of ten years' standing who are working as tuberculosis officers, chest physicians, or sanatorium medical superintendents in the United Kingdom. Opinions should be based on personal experiences, and special regard will be paid to the originality of the views expressed. The competition is open until March 1, 1951, and further details can be obtained from the secretary-general, N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1.

Devon and Exeter Medico-chirurgical Society

At a meeting on October 26, Mr. George Alexander, F.R.C.S., director of the neurosurgical unit, Bristol University, talked on the increasing scope of neurosurgery. Surveying aspects of the whole field in turn, he said that the pain of trigeminal neuralgia is one amenable to surgery, and that, while the results of chordotomy and of posterior root section for painful phantom limb are apt to be disappointing, hammering the stump gives better results. Spinal tumour may masquerade as disseminated sclerosis, and should be suspected if the lesion is progressive. Spontaneous subarachnoid haemorrhage due to rupture of a congenital aneurysm often demands surgical interference, especially in young adults, and certain cases of spina bifida, of hydrocephalus, and of essential hypertension can also be helped. Of head injuries only that minority which show regressive symptoms require surgery.

Diabetes Lecturer for the Netherlands

Dr. R. D. Lawrence, physician-in-charge of the diabetic clinic, King's College Hospital, is visiting Amsterdam, Rotterdam, Leyden, and Utrecht from November 19 to 26 to lecture on recent developments in the treatment of diabetes.

New Journals

The American Academy of Neurology is to produce a new journal, *Neurology*, bimonthly to cover every aspect of clinical neurology, including diseases of the nervous system, neuropathology, and neuropsychiatry. The first issue will be in January, 1951. The new journal is being published on behalf of the Academy by Lancet Publications, Inc., Minneapolis, publishers of the *Journal-Lancet* (now in its eighty-first year), *Modern Medicine* (18 years old), and *Geriatrics*.

The *International Dental Journal*, which has recently made its appearance, is sponsored by the International Dental Federation. At present it appears in an English edition only, with summaries and news items in French, German, Italian, and Spanish. As soon as practicable the journal will be published in full in each of these languages. It is distributed in this country by Cassell and Co. and will appear quarterly, at an annual subscription of £2 5s.

From Japan we have received the first two issues (January and June, 1950) of the *Annals of Tuberculosis*. This is published in English, from the Research Institute for Tuberculosis, Tenri, Nara, Japan.

Italian Medical Film Unit

The Mario Donati Foundation for medical and surgical research has instituted a film section of the Istituto Cinematografico Educativo Scientifico (Educational and Scientific Film Institute). Its aims are to disseminate knowledge of medical and scientific films. The section will catalogue all Italian medical films, covering existing as well as new ones; organize a medical film library to be kept at the disposition of Italian and foreign scientific centres; communicate with similar foreign institutions; and organize national and international shows of medical films. The section will have its office at the Mario Donati Foundation, 6, Via S. Andrea, Milan.

Wills

Dr. William Campbell Elliott Diamond, of Gateshead, formerly of the Malayan Medical Service, left £4,472. Lieut.-Col. Francis James Palmer, R.A.M.C., of Boscombe East, left £19,358. Dr. John Edward Lovelock, the former Olympic champion, assistant director of physical medicine and director of rehabilitation at the Manhattan Hospital for Special Surgery in New York, left estate in England valued at £7,512. Major Francis Aidan Robinson, R.A.M.C.(ret.), of Dringhouses, left £22,690. Professor Charles Stapley Gibson, of Kingswood, Surrey, emeritus professor of chemistry in the University of London at Guy's Hospital Medical School, left £24,251. Col. Alfred Henry Proctor, I.M.S.(ret.), of Hexham, dean of the British Postgraduate Medical School for the first ten years of its existence, left £15,541. Mr. Robert Devereux Mothersole, of Heaton, Bolton, a former chairman of the Bolton Division of the British Medical Association and president of the Lancashire and Cheshire Branch, left £11,997.

COMING EVENTS

Osler Club

The next meeting of the Osler Club will be held on Friday, December 1, at 8 p.m., at the Medical Society of London, 11, Chandos Street, W. Professor Sir Sydney Smith will give an address on the history and development of forensic medicine.

Harben Lectures

Sir Leonard Parsons, F.R.S., emeritus professor of paediatrics and child health and dean of the faculty of medicine in the University of Birmingham, will deliver the Harben Lectures for 1950 on "Studies on Child Health" at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W., on Monday, Tuesday, and Wednesday, December 11, 12, and 13, at 4.30 p.m. In the first lecture Sir Leonard Parsons will discuss "Historical Background: The Unborn Child"; in the second, "The Newborn Child and the Infant"; and in the last lecture, "The Older Child: a Glance into the Future." The lectures are open to all medical practitioners and medical students. Admission is free, without ticket.

Congress on Tuberculosis, Uruguay

The Fourth Uruguayan Congress on Tuberculosis will take place in Montevideo on December 11 and 12. Topics for discussion will include the treatment of tuberculosis by antibiotics, and practical experience of mass radiography in Uruguay. The address of the secretariat of the Congress is: Casilla de Correo 2605, Zona 2, Montevideo, Uruguay.

Thomas Vicary Lecture

Mr. William Doolin will deliver the Thomas Vicary Lecture before the Royal College of Surgeons of England (Lincoln's Inn Fields, London, W.C.) on Wednesday, December 13, at 4 p.m. His subject is "Dublin's Surgeon-Anatomists."

Association of Sea and Air Port Health Authorities

A meeting of the Association of Sea and Air Port Health Authorities will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., on Wednesday, December 13, at 11.45 a.m. A meeting of the medical committee of the association will be held at 10.30 a.m., and a visit to London Airport at 2 p.m. is being arranged.

Wilkins Lecture

Professor F. J. Cole, F.R.S., will deliver the Wilkins Lecture on "The History of Micro-dissection" before the Royal Society (Burlington House, Piccadilly, London, W.) on Thursday, December 14, at 4.30 p.m.

Medical Society of London

The annual oration will be delivered before the Medical Society of London (11, Chandos Street, Cavendish Square, W.) by Sir Charles Symonds on Monday, May 7, at 8.45 p.m.

SOCIETIES AND LECTURES

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

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—November 27, 5 p.m., *"Basal Ganglia Syndromes,"* by Dr. J. St. C. Elkington.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 27, 5.30 p.m., *"The External Rhinostomies,"* by Mr. B. W. Rycroft.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—November 27, 8.30 p.m., *"Maintenance of Fluid Balance,"* discussion to be introduced by Dr. H. L. Marriott and Dr. N. R. Lawrie.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 27, 5.30 p.m., *"Anatomy of the Eye and Orbit,"* by Professor T. Nicol.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 27, 4.45 p.m., *"Aspects of Protein Structure,"* by Dr. A. Elliott and Dr. W. E. Hanby.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 28, 5.30 p.m., *"Blood and Bile Pigments,"* by Professor C. Rimington, Ph.D., D.Sc.

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, November 28, 5 p.m., *"The Normal Heart,"* by Professor Crighton Bramwell.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 28, 5 p.m., *"Pathology,"* by Dr. J. O. Oliver.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At St. Paul's Hospital, Henrietta Street, London, W.C., November 28, 11 a.m., *"V.D. in Relation to Pregnancy,"* by Dr. W. N. Mascall; (2) at St. Peter's Hospital, Henrietta Street, London, W.C., November 28, 3 p.m., ward round by Mr. Harland Rees; (3) at St. Paul's Hospital, Henrietta Street, London, W.C., November 28, 5 p.m., *"Gonococcal Urethritis,"* by Dr. W. N. Mascall.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 28, 5 p.m., *"Science and Art of Refraction,"* by Dr. T. H. Whittington.

Wednesday

EDINBURGH CLINICAL CLUB.—At Westerlea School for Spastic Children, Ellersley Road, Murrayfield, November 29, 4 p.m., clinical meeting by Mr. G. A. Pollock.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 29, 5 p.m., *"Medical Mycology,"* lecture-demonstration by Dr. R. W. Riddell.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—November 29, 5.30 p.m., *"Recent Advances in Ocular Therapeutics,"* by Mr. H. Ridley.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 29, (1) 11 a.m., *"Urethritis of Non-venereal Origin,"* by Dr. A. H. Harkness; (2) 3.30 p.m., *"X-rays,"* by Mr. J. G. Sandrey; (3) 5 p.m., *"Non-gonococcal Urethritis,"* by Dr. A. H. Harkness.

NORTH-EAST LONDON CLINICAL SOCIETY.—At Prince of Wales's General Hospital, Tottenham, London, N., November 29, 8.15 p.m., *"Some Medical Accidents,"* by Dr. C. Alan Birch.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 29, 3.45 p.m., *"The Application of Biochemistry to Clinical Problems,"* by Dr. N. Martin.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 29, 4 p.m., *"Clinical Ophthalmology"* (Revision), by Mr. R. A. Burn and Mr. R. P. Crick; 5.30 p.m., *"Ophthalmic Neurology,"* by Mr. L. H. Savin.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow.—November 29, 5 p.m., *"Lymphoedema,"* Dr. John Burns Lecture by Professor Ian Aird.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—November 29, 3.30 p.m., *"The Work of the Greater London Blood Transfusion Service,"* by Major A. W. Pilgrim, F.C.I.S.

ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, London, W.C.—November 29, 2.30 p.m., *"Cities Without Noise,"* by Lord Horder.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—November 29, 5.30 p.m., *"Postwar Physics,"* inaugural lecture by Professor H. S. W. Massey.

Thursday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., November 30, 5.30 p.m., *"The Mechanism of Hypertension,"* by Professor G. W. Pickering.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, November 30, 5 p.m., *"Colonic Pain and the Colon Neurosis,"* by Dr. Charles M. Seward.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—November 30, 5 p.m., *"Diseases Caused or Aggravated by Light,"* by Dr. B. Russell.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—November 30, 3 p.m., *"The Frontal Lobe,"* by Professor A. Meyer.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., November 30, (1) 11 a.m., *"Sociological Problems of V.D.,"* by Dr. R. Lees; (2) 5 p.m., *"Diseases of the Female Urethra,"* by Mr. H. G. Hanley.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool.—November 30, 8 p.m., *"Tracer and Therapeutic Studies with Radio-isotopes,"* by Mr. R. Marcus.

LONDON UNIVERSITY, Senate House, Bloomsbury, W.C.—November 30, 5.30 p.m., *"The Biological Aspects of War: Consequences,"* by Professor F. A. E. Crew, F.R.S.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 30, 3.45 p.m., *"The Control of Secretions of the Alimentary Tract,"* by Professor W. R. Spurrell.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—November 30, 5.30 p.m., *"Simple Stricture of the Oesophagus,"* by Professor G. Grey Turner.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—November 30, 5.30 p.m., *"Extraocular Signs and Symptoms of Disease of the Central Nervous System,"* by Dr. T. Rowland Hill.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—November 30, 4.30 p.m., lecture-demonstration on neurology, by Dr. A. Feiling.

Friday

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 1, 5.30 p.m., *"Ophthalmological Manifestations of Cerebral Atrophy,"* by Dr. Helen Dimsdale.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—December 1, 5 p.m., clinical neurological demonstration by Dr Douglas McAlpine.

NORTH-WEST METROPOLITAN REGION MENTAL DEFICIENCY SOCIETY.—At Leavesden Hospital, Abbots Langley, Watford, Herts. December 1, films of clinical types and abnormal movements, to be followed by discussion.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 1, 3.45 p.m., *"Some Aspects of the Renal Excretion of Water,"* by Professor E. B. Verney.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 1, 4.15 p.m., *"Pathology,"* by Miss M. Savory.

●ROYAL INSTITUTION, 21, Albemarle Street, London, W.—December 1, 9 p.m., *"Thought Transference and Related Phenomena,"* by Mr. R. H. Thouless, Ph.D.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—December 1, 8 p.m., *"Erythema Nodosum and Allergy,"* dissertation by Mr. A. J. Keay.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—December 1, 5.15 p.m., *"Chemical Transmitters,"* by Dr. W. S. Feldberg, F.R.S.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Consultant Ear, Nose, and Throat Surgeon in Norwich Area*, I. S. Young, M.B., Ch.B., F.R.C.S.Ed., D.L.O. *Anaesthetic Registrar at East Suffolk and Ipswich Hospital*, Miss E. Ruth S. Armitage, M.B., B.S.

RANGER, D., M.B., B.S., F.R.C.S., Assistant Consultant Ear, Nose, and Throat Surgeon, Middlesex Hospital, London, W.

WILSON, B. D. R., M.B., M.R.C.P., Consultant Paediatrician, St. Andrew's Hospital, Bow, London, E.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bolton.—On November 9, 1950, at Bristol Maternity Hospital, to Joyce (formerly Baker), wife of Frederick G. Bolton, M.R.C.P., a son.

Ewing.—On October 31, 1950, at St. Anne's Nursing Home, Oxford, to Evelyn, wife of Richard F. Ewing, M.R.C.S., L.R.C.P., a son—Michael Charles.

Fraser.—On November 8, 1950, to Dr. Mary E. Fraser (formerly Chalmers), wife of R. J. A. Fraser, F.R.C.S.Ed., 77, Anderson Drive, Aberdeen, a daughter.

Todd.—On November 8, 1950, at Edgware General Hospital, to Olive (formerly Gray), wife of K. R. Todd, M.B., B.S., a daughter.

DEATHS

Carling.—On November 15, 1950, at West Cottage, Alton, Hants, William Carling, M.B., B.Ch., late of Southsea and East Grinstead, aged 88.

Cooper.—On October 28, 1950, at 134, Landdrost Street, Vryheid, Natal, South Africa, Moses Kuper Cooper, M.B., Ch.B., late of 11, Arden Street, Edinburgh.

Harley.—On November 13, 1950, at 1, Park West, London, W., Thomas William Harley, C.I.E., M.B., B.Ch., Lieutenant-Colonel, I.M.S., retired, aged 73.

Low.—On November 15, 1950, Alexander Low, M.D., LL.D., Emeritus Regius Professor of Anatomy, University of Aberdeen, of 144, Blenheim Place, Aberdeen, aged 82.

Sinclair.—On November 14, 1950, at his home, Neil Frederick Sinclair, F.R.C.S., of 14, Upper Harley Street, London, N.W.

Speirs.—On November 14, 1950, at St. Dunstan's, Melrose, Roxburghshire, Henry Speirs, M.D., F.R.C.S.Ed.

Utidjian.—On November 12, 1950, at his home, 2, Draycott Close, Kenton, Middlesex, Haigouni Dikran Absolom Utidjian, M.D., of London, formerly of Nicosia, Cyprus, aged 59.

Wade.—On November 15, 1950, at 97, Windmill Hill, Enfield, Middlesex, Herbert Wade, M.R.C.S., L.R.C.P., aged 87.

Any Questions?

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

Retraction of the Foreskin

Q.—*What is the present position with regard to the retraction of babies' foreskins? I was taught, and it has been my practice, to retract them within a week or so after birth, and to give instructions to the mother to do so at weekly intervals, at bathtime. By following out this regime, it is rare to get a failure and, if the mother carries out her instructions, to get any further trouble. But recently in your columns—I refer to Dr. Gairdner's article (Journal, 1949, 2, 1433)—the feeling seems to be to leave the foreskin alone. If so, for how long?*

A.—Dr. Douglas Gairdner's article produced conclusive evidence that the prepuce is still developing in the early years of life, and that by 3 years of age 90% of boys will have a retractable foreskin if nothing whatever has been done. The remaining 10% can be dealt with by gentle manipulation. Despite this it will be seen from the question that doubts still exist, and indeed, as correspondence after the appearance of Dr. Gairdner's article showed, emotion rather than reason seems to govern the attitude of many to this problem. The simple answer to the question is to leave the foreskin alone until the age of 3 years. What the strictly scientific outlook perhaps omits to reckon with is the likely family situation during that three years. The matter will be discussed by father among his friends and by mother with the neighbours and relations. Serious effects upon procreational function will be hinted at, and confusing remarks about masturbation, cancer, and venereal disease will certainly be made sooner or later. Since popular views lag so greatly behind even modern discoveries, it is unlikely that on a subject which goes far back in history an attempt to reverse long-continued practice will meet with immediate success. For the sake, therefore, of the peace of mind of the parents (and of the doctor concerned) there is something to be said for some degree of "gentle manipulation" at an earlier age than Dr. Gairdner suggested. There is also the material point that, if nothing is done about the foreskin along such lines, there is a very real chance that someone will be persuaded to perform circumcision. To avoid this greater evil there are many doctors who feel that gentle retraction of some degree in the early days is advisable.

Sterilization of Paraldehyde

Q.—*Paraldehyde is now widely used intramuscularly, perhaps particularly in the treatment of status epilepticus. Some workers use for this purpose the sterile ampoules now being put up by certain drug houses; others use paraldehyde from the non-sterilized stock-bottle, and assert that the occasional abscesses which result are non-infective and due to tissue sclerosis. (a) Is paraldehyde self-sterile? (b) If not, how is it sterilized?*

A.—Paraldehyde behaves somewhat like alcohol, becoming germicidal only when diluted with water. A saturated (10%) solution kills vegetative bacteria rapidly, but if the bacteria are immersed in the pure substance in the dry state they are unaffected. Paraldehyde should therefore certainly not be regarded as self-sterilizing. The method prescribed for its sterilization is autoclaving in sealed tubes.

Hypertensive Encephalopathy

Q.—*What is the immediate treatment of hypertensive encephalopathy, and how may further attacks be prevented?*

A.—Hypertensive encephalopathy may complicate severe hypertension of any aetiology, and is usually attributed to cerebral vascular spasm associated with a transient exacerbation of hypertension.

The attack itself is best treated by strong sedation, a completely sodium-free diet, and the administration of tetraethylammonium bromide or methonium compounds. Tetraethylammonium bromide may be given intravenously in doses of 200–300 mg., administered rather slowly over a period of about three minutes. Pentamethonium iodide (C5) or hexamethonium iodide (C6) may be given intravenously in doses of 30–40 mg. over a period of two minutes. Subcutaneous or intramuscular injections of either C5 or C6 may be given two or three times daily. According to Smirk (*Lancet*, 1950, **2**, 477) the dose may be less if the patient is nursed propped up; in this position the dose need not exceed 15–25 mg. in the initial stages. As a rule, patients acquire tolerance to the drug and large doses may become necessary.

Prophylactic treatment should be designed to lower the blood pressure, and there is a choice of conservative measures (rest and sedatives), a low sodium diet (or the rice diet), thiocyanates, methonium compounds, or lumbo-dorsal sympathectomy. Space forbids a discussion of the relative merits of these measures.

Waxed Paper and Cancer

Q.—*There is a prevalent belief that the use of waxed paper in cooking is associated with the development of cancer. Is there any truth in this theory?*

A.—The commercial preparation of paraffin wax from shale oil is associated with a certain risk of dermatitis and skin cancer, but even workers in the industry do not appear to have a higher incidence of cancer of the alimentary canal than the average population. It seems unlikely, therefore, that the use of waxed paper as a wrapping for puddings involves an increased risk of alimentary cancer.

How to Stop Smoking

Q.—*Can you suggest any cure for smoking?*

A.—To help anyone stop smoking one must first find out why they smoke. Some smoke from habit, some because they have developed a pharmacological craving, while others claim that it is simply and solely a matter of enjoyment. In any case, one thing is necessary—to instil a desire to stop smoking which is greater than the desire to smoke. When the reasons for smoking are entirely psychological this may not be difficult, as a strong financial reason for stopping may be added to the medical ones; when there is also a pharmacological craving it is another matter. In such a case it is probably best for the patient to make a sharp break rather than for him to try to cut down gradually. The desire to smoke will be found to increase rapidly for 24 hours, but it will then begin to fall away, and, if he can refrain from smoking completely, the urgent desire will have largely disappeared within a week. During this period some people find it helpful to carry a packet of cigarettes about with them and to finger them from time to time. The presence of cigarettes in the pocket has a quietening effect and may prevent the panicky rush to the nearest shop which often follows the realization that no cigarettes are immediately to hand. If the habit appears to be impossible to break in this way, injection of nicotine (1/50 gr. subcutaneously—1.3 mg.) or pastilles (1/50 gr.) by mouth may be effective.

Eosinopenia in Cortisone and A.C.T.H. Therapy

Q.—*In reports on the therapeutic effects of cortisone and A.C.T.H. (adrenocorticotrophic hormone), one cannot but observe the association of an eosinopenia with any clinical improvement. What is the significance of this? Is the eosinopenia a factor in the improvement or merely, as it were, a by-product?*

A.—The questioner is correct in associating a production of eosinopenia with clinical improvement in such conditions as rheumatoid arthritis as a result of cortisone or A.C.T.H. therapy. The eosinopenia is not a consequence of the improvement, but the two effects are brought about by the same agent—namely, adrenal glucocorticoids, of which

cortisone is one, and the secretion of which is stimulated by A.C.T.H. In the latter case, eosinopenia is used as a guide to the capacity of the recipient's adrenal cortex to respond to A.C.T.H. Eosinopenia may be found in the absence of a clinical response, and occasionally the reverse appears to be true. The two processes may therefore be regarded as independent "end organ" responses to A.C.T.H.

Halitosis

Q.—*I have a patient, aged 28, who is troubled by his wife's complaints that he suffers from malodorous breath. I can find no local cause for his halitosis. How should this case be investigated? What are the most likely causes of the condition?*

A.—The almost invariable cause of halitosis is some infection in the mouth or respiratory tract. Such diseases as bronchiectasis and lung abscess appear improbable in the present instance; but the teeth should be carefully scrutinized by a dentist and any gingivitis or cavity treated. In many patients chronic infection of the tonsils is responsible, and this can often be convincingly demonstrated by rubbing the tonsil with the finger, which will then yield olfactory proof of the origin of the fetor. Chronic nasal disease, such as atrophic rhinitis or sinusitis, is another possible cause, and these conditions should be excluded.

Herpes Zoster

Q.—*What are the most recent views on the aetiology of herpes zoster? A woman who sustained an accident with bruising of the ribs developed herpes zoster six days later. Is it possible for the injury to have caused the herpes zoster?*

A.—Herpes zoster is due to a virus which is closely related to the virus of chicken-pox, and not infrequently an attack of zoster in an adult follows contact with a case of chicken-pox in a child. Whether or not clinical infection follows such contact will depend on the degree of specific or non-specific resistance at the time of exposure, but there seems little doubt that any previous devitalization of posterior nerve roots (it is the sensory nerve endings that are principally affected) predisposes to an attack. Thus, exposure to cold may precede an ophthalmic zoster, and it is likely that the injury to the ribs sustained by this patient was a factor predisposing to the subsequent attack of herpes zoster. The incubation period is given as 7 to 14 days.

Sterilization of Bed-pans

Q.—*In most hospitals bed-pan sterilizers are now installed of the type in which the bed-pan is first flushed in cold water, then in hot water, sterilization being effected by a jet of live steam. These machines are simple to work and so convenient to the nurses that they demand their installation.*

(a) Are these sterilizers efficient? (b) If not, how should bed-pans be sterilized? (c) Is there any record of an unchipped bed-pan spreading puerperal sepsis in a maternity hospital, or is it ever likely?

A.—(*a*) Conflicting reports on the efficiency of bed-pan sterilizers are to be explained by the existence of several models. A manually operated sterilizer used by a busy nurse may fail because she turns off the steam too quickly: an automatic model in which the application of steam is continued for a regulated period—usually 20 seconds—is dependable, provided, of course, that the steam pressure is as specified by the makers. Such exposure to steam kills all vegetative bacteria, but it does not kill spores.

(*b*) The alternative is immersion in a disinfectant solution, preferably of phenolic type (such as 2% lysol), or boiling.

(*c*) There appears to be no record of puerperal infection having been conveyed by bed-pans, but it could certainly happen, and may well have done so without the cause having been recognized.

Desensitization to Penicillin

Q.—*I have a patient, aged 54, who suffers from asthma and recurrent bronchitis. The administration of penicillin G provokes severe asthmatic attacks. How can I desensitize him to the penicillin?*

A.—O'Donovan and Klorfajn (*Lancet*, 1946, **2**, 444) desensitized a patient by giving doses of 15,000 units of penicillin by mouth four to eight times a day for a fortnight, and others have found this method successful. It is also said to be possible to desensitize by a long course of injections begun with very small doses. An asthmatic might perhaps not react so readily as an otherwise normal subject.

Before embarking on either of these tedious procedures it would be well to determine that the condition is infective and that the responsible organism is penicillin-sensitive, if this has not already been done.

Carbon Dioxide and Asthma

Q.—*Are inhalations of carbon dioxide of value in the treatment of asthma?*

A.—Carbon dioxide inhalations cause hyperventilation of the lungs but do not relieve the bronchospasm. The patient is generally encouraged to over-breathe in the wrong way—i.e., by the accessory muscles of respiration causing over-inflation of the lungs. In addition, when a patient has had severe asthma for a considerable time, the respiratory centre is fatigued and after stimulation with carbon dioxide may cease to function when the stimulus is removed. The aim should rather be to teach the patient to empty his chest by his own activities; simple breathing exercises will teach him to control his expiration, increase the mobility of the chest wall, and help him to relax the over-acting inspiratory muscles. Such exercises are well known to any qualified physiotherapist and are described in the booklet, *Physical Exercises for Asthma*, published by the Asthma Research Council and obtainable from Messrs. H. K. Lewis, price 2s.

NOTES AND COMMENTS

Tetanus Antitoxin.—Mr. J. R. ELLIOTT (London) writes: In "Any Questions?" (November 11, p. 1128) it is stated that a prophylactic dose of tetanus antitoxin should be between 1,000 and 3,000 units. I would like to draw attention to the fact that since July 1 this year the value of the International Unit (1950) has been twice that of the old International Unit (1928) and is now the same as the U.S.A. Unit. Thus the dose of tetanus antitoxin mentioned in all publications earlier than this date should be halved when the new material is ordered. In order to avoid confusion during this transition period, manufacturers are labelling their products with all three methods of notation—for example, "1,500 International Units (1950) in 1 cc. (= 3,000 I.U. (1928) = 1,500 U.S.A. Units)," and I would suggest that all references to this drug should clearly indicate which unit is required until all suppliers have no possible doubts in the matter.

Correction.—Under "Books Received" (November 11, p. 1101) we mistakenly said that Messrs. George Pulman and Sons, Ltd. are the publishers of the book *Der Muskelstoffwechsel des Herzens*, by Dr. H. Schumann. The only publishers are Verlag von Dr. Dietrich Steinkopff, Darmstadt.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 2 1950

PROTEIN STRUCTURE AND CLINICAL PROBLEMS*

BY

E. C. DODDS, M.V.O., M.D., F.R.C.P., F.R.S.

Courtauld Professor of Biochemistry in the University of London; Harveian Librarian of the Royal College of Physicians

The proteins have always been an object of interest to chemists and biologists. Their investigation, however, was for long hampered by the old vitalistic ideas which regarded protoplasm as fundamentally living and therefore beyond the scope of the chemist. Despite the fact that as early as 1746 Beccari succeeded in isolating gluten from wheat flour, and in 1859 Ritthausen had developed methods for preparing vegetable proteins in a relatively pure and stable form, the attack on animal proteins was still held back by devotion to vitalism. The decisive blow to this old doctrine was struck by Hoppe-Seyler's crystallization of the protein haemoglobin in 1866. This achievement was followed by the crystallization of a number of other proteins of animal origin, culminating in the production of crystalline egg albumin in 1892 by Hofmeister.

Experimental clinicians and biologists have been mainly interested in proteins on account of their nutritional value. It was clearly recognized that, though all proteins provide necessary nitrogen in assimilable form, they differ among themselves in nutritional value, as shown classically by the work of Hopkins and his school, and this led to the concept of "essential amino-acids." Proteins are also important in determining water balance and the osmotic pressure of the blood, and there is an increasing recognition of their significance in immunity. But our whole conception of the structure of tissues in the body, and their relationship to the internal environment, has undergone a complete change since the introduction of labelled or tagged elements into the study of metabolism. Before the introduction of this new technique, proteins, and other tissue constituents such as minerals and so forth, were considered as being in more or less static equilibrium, and a protein molecule once made and stabilized stayed in its intact state in the plasma or tissue.

We now know from a study of the metabolism of amino-acids containing labelled or tagged elements that proteins are steadily being broken down and built up, and that the whole of the protein system of the body is in dynamic equilibrium with the amino-acid content of the tissue fluids and the blood serum. Schoenheimer, in his classical experiments (Schoenheimer *et al.*, 1939; Schoenheimer, 1942), has used deuterium and ^{15}N labelled amino-acids for the study of protein turnover *in vivo*. He showed that the half-life of liver proteins in the adult rat is seven days. Sprinson and Rittenberg (1949) were able to extend these investigations and to develop an elaborate quantitative method for studying nitrogen balance and protein synthesis in the rat. By the use of suitably labelled amino-acids it was possible to study what they termed the metabolic pool in both the rat and man and to work out the rate at which amino-acids were passed out of this metabolic pool into the body. Again, they showed that in the rat the half-life of the total proteins was about 17 days, of the liver, plasma, and internal organ proteins some 6–7 days, and of the total carcass proteins 21 days. In the case of man the total turnover of protein occurred in about 80 days, while the liver and serum proteins were turned over in 10 days and the lung, brain, bone, skin, and principally muscle in 158 days. Tarver and Reinhardt (1947) were able to make some similar observations by studying the metabolism of methionine containing ^{35}S in normal and hepatectomized dogs, and they showed that the incorporation of tagged methionine into body proteins could take place without the intervention of the liver. The administration of ^{35}S containing methionine resulted in a rapid increase in the concentration of radioactive sulphur in plasma proteins, the five-hour value being twice that at two hours. The intestinal mucosa surprisingly absorbed very large quantities of the labelled amino-acids, indicating that the intestinal mucous membrane must play an important part in protein synthesis. Extensive experiments in this field have shown that the injection of such amino-acids is followed by their very rapid uptake into the body proteins, particularly the proteins of the visceral organs. It would appear that from this storehouse the amino-acids are distributed for incorporation into other tissues. A full review of this fascinating subject is given in a recent paper by Borsook (1950).

From the constitutional point of view, clinician and biologist have been content up to the present with the knowledge that proteins are composed of amino-acids joined together through the classical CO–NH linkage. The proteins possess a very large number of amino-acids joined together in this manner, and therefore are bodies of high molecular weight. It stands to reason that, if the molecular weight can vary from 10,000 to 1,000,000 or over, the disposition of the peptide chains, or strings of amino-acids, must be of considerable importance. How, in fact, are these strings orientated in space? Are they long single chains, are they branched chains arranged in a definite manner, or are they just a jumble like a badly wound ball of string? This problem has fascinated physical and stereo-chemists from the very time that the peptide-linkage theory of protein structure was accepted.

As Dr. Dorothy Crowfoot Hodgkin (1949) points out, it is difficult to know whether it is wise at the present juncture to comment on protein structure or whether it would be better to wait until all the accurate analyses now being made throughout the world on protein crystals have been received and collated. There is no doubt that the greater accuracy of these methods of measurement has revealed

*An abridged version of the Bertram Louis Abrahams Lecture delivered at the Royal College of Physicians of London on July 13.

that none of the theories so far considered will stand up, and that we are driven to the conclusion that the protein molecule consists of relatively long chains of peptides strung together by various bridges and possibly coiled or wound round in order to give a compact mass. There seems to be enough evidence to show that proteins such as haemoglobin are composed of peptide chains which are folded on each other in the manner shown in Fig. 1.

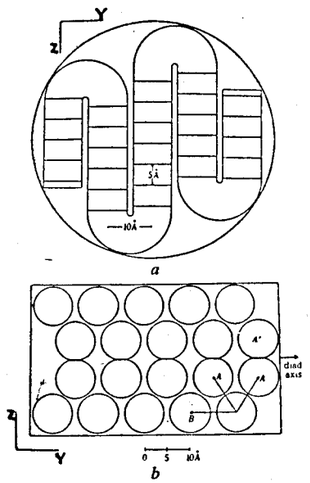


FIG. 1.—Suggested structure of haemoglobin. (*a*) Basal section showing folded polypeptide chain. (*b*) Vertical section showing packing. Taken from Perutz, *Proc. roy. Soc.*, A, 1949, **195**, 474 (Fig. 23).

Astbury and Street (1931) have pointed out that proteins can be classified as of either the fibre or the globulin type. The fibre proteins consist of silk fibroin, myosin (from muscle), and keratin (skin and hair), while the globular proteins are those in which clinicians are primarily interested—namely, globulins, albumins, and so forth.

It is proposed to take the study of the insulin molecule as the typical example of this vast and complicated subject of the configuration of the protein molecule.

Protein Structure as Exemplified by a Study of Insulin

Physical Studies.—Gutfreund (1948) has shown that the molecular weight of insulin is 47,000–48,000 and that the variable results obtained in previous estimations were due to the existence of an equilibrium between the 48,000 molecule and four apparently identical submolecules of 12,000 weight each. Further support for the 12,000 subunit in insulin comes from the finding that it passes through "cellophane" impervious to molecules of weight 21,000 and higher values.

Analysis.—Chibnall's (1946) analysis shows that the 12,000 weight subunit of insulin probably contains 106 amino-acid residues, of which 101 have been accounted for. These are: aspartic acid 5, glutamic acid 15, glycine 7, alanine 6, valine 8, leucine and isoleucine 14, phenylalanine 6, tyrosine 9, serine 6, threonine 2, lysine 2, histidine 4, arginine 2, proline 3, half-cystine 12. The remaining five residues probably are accounted for as a cumulative error in the numerous analyses. Insulin lacks methionine and tryptophan, but still contains 16 different amino-acids, and in any case methionine and tryptophan are present only in very small amounts in all but exceptional proteins.

Insulin has a high proportion of sulphur, like the keratins and certain pituitary hormones, and the cystine apparently accounts for all the sulphur of insulin, though this has been the subject of much controversy in the past (for example, du Vigneaud, 1927). Scott (1934) found that the addition of zinc, nickel, cobalt, or cadmium alone among metallic cations is necessary for the crystallization of insulin.

Main Structural Arrangement.—The most important contributions to the structural theory of insulin have come from the laboratory of Professor Chibnall, at Cambridge. Early work indicated that there were a number of peptide chains in the insulin molecule, but it was not until 1945 that Sanger, working in his laboratory, was able to demonstrate that there were four chains in the insulin submolecule, two with glycine and two with phenylalanine residues providing the free end amino-groups of the chains. The view was held that these chains were probably joined together by six cystine disulphide bridges (Fig. 2), and this has been substantiated by Sanger (1948, 1949). If these bridges are broken the separate chains can be fractionated with ammonium acetate into two distinct groups, A and B. The A fraction is obtained from the glycine chains of insulin, and each chain has a molecular weight of about 2,500 and four cysteic acid residues. The B chains contain all the lysine, histidine, arginine, phenylalanine, proline, and (in the case of bovine insulin) all the threonine of the insulin submolecule, so that the two types of peptide chain in insulin are very different in structure.

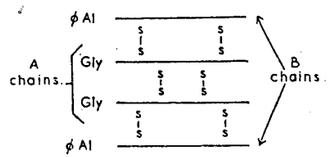


FIG. 2.—Showing the six cystine disulphide bridges joining the four chains of the insulin submolecule.

In bovine and ovine insulins the A fractions contain glycine, alanine, valine, leucine, isoleucine, tyrosine, serine, cystine, aspartic acid, and glutamic acid only, whereas porcine insulin A chains have been found to contain some threonine also (Sanger, 1949).

Amino-acid Sequences.—Sanger has obtained by analysis a series of peptides which leave no doubt that part of the amino-acid sequence is: in the A chains (amino-group of glycine terminal and free) glycyl-isoleucyl-valyl-glutamyl-glutamyl-, and in the B chains (amino-group of phenylalanine terminal and free) phenylalanyl-valyl-aspartyl-glutamyl. Some of the aspartic and glutamic residues are in the form of their amides (that is, asparaginyl and glutaminyl residues). An internal sequence in the B chains was also determined by the labelling of the ϵ-amino group of the lysine side-chains. This sequence was: threonyl-prolyl-lysyl-alanine. This is of especial interest since threonine, proline, and lysine are among the rarest amino-acids in the insulin submolecule.

Enzymic Studies

Butler *et al.* (1948, 1949, 1950) have employed crystalline trypsin, chymotrypsin, and pepsin on crystalline insulin. Trypsin was found to have only a very slight action, if any, on the protein. This is in accord with the very low lysine and arginine content of the hormone (two residues of each per submolecule); these amino-acids must be present in synthetic peptides before trypsin can exercise its hydrolytic action on them (Bergmann and Fruton, 1937: and later).

Chymotrypsin and pepsin both readily degrade insulin to peptides of unequal sizes. In both cases a large fragment of weight 4,000–5,000 is produced from each submolecule, and the rest appears as smaller trichloroacetic-acid-soluble peptides of average size tetra- or hexa-peptide, though there is evidence that one of these soluble peptides derived from the chymotryptic fission of insulin is as large as 2,000 in molecular weight.

The large precipitable fragments have been called the "core" of the insulin submolecule, since they have three or four of the six cystine disulphide bridges and, compared with insulin, are relatively resistant to digestion. The free amino-groups of the core formed by chymotryptic action (containing parts of the four original peptide chains of insulin) are those of glycine, valine, and leucine (insulin has glycine and phenylalanine).

Physical measurements on the insulin core (electrophoretic diagram by Dr. J. M. Creeth and diffusion and sedimentation by Dr. K. Pedersen at Upsala) have shown that it is in all probability a single substance of molecular weight about 5,000, whereas the core formed by the action of pepsin is inhomogeneous, the smaller material having a molecular weight of about 4,000. An intensive study of the composition of these fractions produced by enzymic action is being undertaken at the Courtauld Institute.

Many of these structural details from the work described above can be shown together in diagrammatic form. In the diagram below, amino-acids are indicated by abbreviations, and one submolecule of insulin (weight 12,000) is illustrated (Fig. 3). It has been assumed that the two "glycine" chains are alike and the two B chains also alike. The positions of the histidine (Hist) and arginine (Arg) residues and the threonine, proline, lysine, alanine sequence are not known, but they lie within the B chains. The core formed by the action of chymotrypsin is shown by the enclosed portion, since it is known to have four cystine bridges, glycine and valine (and also leucine, not shown) terminal acids, two histidine residues, four tyrosine residues, and 0 or 1 phenylalanine residue per weight of 5,000, a weight corresponding to about 45 residues. The true positions of the cystine disulphide bridges (–SS–) are unknown. The tyrosine and phenylalanine residues other than those designated by Ty or ϕAl are given as A, and these have been distributed throughout the extra-core part to conform with the fission of the molecule at these points into small peptides of average size about penta-peptides. It is not certain from the work of Lens (1948) that alanine (Al) lies at the carboxyl end of every peptide chain, as shown here.

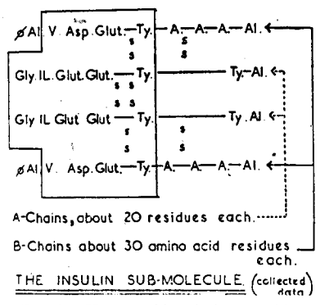


FIG. 3.—Key to abbreviations: øAl = phenylalanine; V = valine; Asp = aspartic acid; Glut = glutamic acid; Gly = glycine; IL = Isoleucine; Ty = Tyrosine; A = aromatic amino-acid residue (phenylalanine or tyrosine); –SS– = cystine disulphide linkage.

As all this information is far in excess of that available for any other protein it is too early to say how representative of proteins in general it is, but there is no reason to suppose that it is not so.

Biological Activity of Insulin

The source of the activity of insulin remains unknown. Chemical studies have provided the most useful information on this point. A paper by Fraenkel-Conrat and Fraenkel-Conrat (1950), re-examining much previous work, concludes that the cystine disulphide bridges, the carboxyl groups, and about half of the tyrosine phenolic hydroxyl groups are essential for the activity. The aliphatic hydroxyl, the imidazole, amide, and guanidyl groups appear to be dispensable.

No fragment of insulin provided by enzymic degradation with crystalline pepsin or chymotrypsin or by crude pancreatin or papain has shown any activity, whereas crystalline trypsin does not attack the protein and the activity is retained.

It is not possible to say definitely, however, whether the activity resides in a part or in the integrity of the whole molecule, for the enzymic degradations are not random processes and they may all involve fission within an active grouping (if such exists). In the enzyme inactivation quoted above, the loss of activity is approximately proportional to the loss of intact protein.

Other Protein Hormones

It must be clearly recognized that the account given of the structure of insulin is only the very barest outline of the vast amount of work in progress on this one protein. A description has been given in the hope that the magnitude of the task of determining the constitution of a single protein may be appreciated. Not only has the number of chains, etc., to be determined, and the number of amino-acids in each chain, but also the order in which they are arranged.

A number of other protein hormones await investigation. All the hormones of the anterior lobe of the pituitary are of a protein character. Many of them have been isolated as chemically pure proteins, but up to the present little or no work has been done on their configuration. The investigator is severely handicapped by the scarcity and great expense of pituitary hormones, and it may well be a considerable time before our knowledge of such bodies as the growth hormone, lactation hormone, and the gonadotropic factors can be brought up to the same standard as that of insulin. Should the importance of these hormones require any stressing, it would only be necessary to refer to the overwhelming clinical interest in the adrenocorticotropic hormone at the present moment. Until comparatively recently this hormone was known only to experimental biologists, endocrinologists, and biochemists, but to-day, in its abbreviated form of A.C.T.H., its name is on every clinician's tongue.

Recent work at the Mayo Clinic has shown that the injection of this hormone into patients with rheumatoid arthritis will produce an astonishing remission of symptoms. From the protein chemist's point of view one of the most interesting developments has arisen through the work of Li (1949), who has shown that it is possible to produce by peptic hydrolysis a low-molecular-weight fragment possessing all the activity of the intact protein. It would appear that this low-molecular-weight substance is a peptide containing 6, 7, or 8 amino-acids.

The work of Morris and his collaborators (Cortis-Jones, Crooke, Henly, Morris, and Morris, 1950) has indicated that this low-molecular-weight substance may be present in active preparations of the whole proteins even without prior hydrolysis. Morris and his collaborators have shown that it is possible to separate the clinically active low-molecular-weight fraction from inactive A.C.T.H. protein by ultrafiltration. It is obvious that if the constitution of the peptide can be determined its synthesis will go a long way towards solving the problems of the "A.C.T.H.–cortisone" situation.

During our work on insulin in the Courtauld Institute we have always hoped to find an active fraction, and the

search for such a substance still goes on despite the fact that we have so far had no success.

It will not be necessary to point out that the synthesis of proteins is at present quite out of the question. Great advances have been made in the synthesis of polypeptides, and there now exist simple and economical methods of making these substances in the laboratory. This has been reviewed recently (Dodds, 1950).

Proteins of Toxic Agents

That, in certain circumstances, proteins can act as highly toxic substances has been known for a very long time. The death produced by anaphylaxis is a well-known phenomenon and is associated with the injection of proteins. Vaughan and his co-workers (1913) showed that it was possible, by treating harmless proteins with dilute alkalis, to produce highly toxic substances capable of causing an immediate and sometimes fatal fall of blood pressure when injected into animals.

This was regarded as an entirely academic subject, and received very little attention until Sir Edward Mellanby (1946) produced his startling work on canine hysteria. Briefly, Mellanby was able to show that hysteria can be produced in dogs whose diet consists of some 60% of bread made from flour which has been subjected to a process known to the milling industry as "improvement." It has been known for over a century that flour, when stored for long periods, would give a loaf of a lighter character and better texture than one made from flour freshly milled. The storage of flour is an uneconomical procedure, and cereal chemists therefore studied the nature of this ageing problem and were able to develop methods of treating flour in order to age it artificially. Most improvers are oxidizing agents, but one of the most popular and convenient is gaseous nitrogen trichloride, used in the "agene process." Not only is the flour "improved" by this treatment, but it is simultaneously bleached. It is certainly safe to say that over 90% of the flour of Great Britain and the United States has been subjected to this treatment. Despite the fact that there has been official uneasiness about improvers ever since their introduction, it is again safe to say that any immediate danger from the treatment never entered anybody's head, official or otherwise.

To return to the experiments of Mellanby, he was able to prove conclusively that only those dogs fed on bread made from agene-treated flour suffered from hysteria. The control dogs fed on identical flour, but untreated, remained perfectly healthy and free from symptoms. This publication by Mellanby, and the showing of his film on hysteria, caused a profound sensation in nutritional circles, and also among millers and legislators.

Moran and his colleagues (Bentley *et al.*, 1950) at the Research Association of the British Flour Millers were able to prove that the agene process attacked the protein of the flour, and that powerful toxic hysteria-producing substances could be formed by the treatment of gluten with agene. Further, this toxicity could be induced not only in flour but also in such inert proteins as casein and zein; and in a brilliant series of papers from Moran's laboratory the whole nature of the process has been elucidated. Thus the toxic fraction has been concentrated and finally obtained in crystalline form, and later its constitution and synthesis have been worked out.

As the result of this work an entirely new approach to the activity of the central nervous system has been provided, and from the academic point of view a detailed study of compounds in the series of those produced in the laboratories at St. Albans should prove of very great interest.

It can thus be seen that proteins used for food can be turned into highly toxic substances, at least for animals, by processes which have been regarded for decades as quite harmless. We are not concerned here with the clinical implications of this work, but it is perhaps reassuring to be able to say that up to the present, even with enormous intakes of highly agenized flour, no toxic symptoms have been detected in the human subject.

Bacteriological Toxins

The exotoxin produced by Type A *Clostridium botulinum* forms an example of the group of bacterial toxins of very high lethal power. Like diphtheria and tetanus toxins, botulinus toxin has now been isolated and crystallized (Lamanna, McElroy, and Eklund, 1946; Abrams, Kegeles, and Hottle, 1946). Physico-chemical characterization by electrophoresis, sedimentation, diffusion, and viscosity measurements (Putnam, Lamanna, and Sharp, 1946, 1948; Kegeles, 1946; Abrams, Kegeles, and Hottle, 1946) has shown it to be a single homogeneous heat-labile protein with the solubility properties of a globulin. Serological data also show that the toxin acts as a single substance (Lamanna and Doak, 1948).

All the three toxins referred to have somewhat spectacular potencies, but botulinus toxin is the most potent by a considerable margin, and is indeed the most poisonous substance known. Some comparative data are as follows:

Toxicities of Purified Bacterial Toxins (in Terms of Minimum Lethal Dose for 20-g. Mouse; data from Pappenheimer, 1947)

Diphtheria	175 MLD per mg. toxin
Tetanus	10×10^6 MLD per mg. toxin
Botulinus	30×10^6 MLD per mg. toxin

These high potencies are of great biochemical interest when the possible modes of action of the toxins are considered. In this respect botulinus toxin is outstanding when its toxicity is examined on a molecular basis, as its molecular weight is about 1,000,000 (Putnam, Lamanna, and Sharp, 1946; Kegeles, 1946), compared with values of approximately 70,000 for the other toxins. Accordingly, it may be calculated that the lethal dose for a mouse contains only 20,000,000 molecules: toxaemia may thus be produced at a dosage level of one molecule per cell, and even at this concentration only a relatively small proportion of the tissue can actually be affected.

It is now established that the toxicity of the pure crystalline toxin is 220×10^6 LD50 per mg. nitrogen for 20-g. mice, or approximately 30×10^6 LD50 per mg. toxin. Calculated on a weight basis, it follows that the LD50 for a 75-kg. man would be 1.2×10^{-7} g., or only 0.12 μg. Alternatively, it has been computed (Pappenheimer, 1947) that 1 mg. of the toxin would be sufficient to kill more than 1,000 *tons* of guinea-pig. Considering the figure for a man again, if one takes the proportion of water in the body as 85% one may calculate that a toxin concentration of approximately 2×10^{-12} g./ml. of total body water would be lethal in 50% of cases. This figure is even more impressive when the high molecular weight of the toxin (1×10^6) is taken into account; thus the lethal concentration of toxin within the body is only 2,000 molecules per ml. of total water.

First culture of the organism gives solutions of approximately 1×10^6 LD50 (mouse) per ml. Of such a solution (which might be compared with spoilt food) only 0.04 ml would be required for a fatal dose for a man. Botulinus toxin, moreover, is unique among the bacterial toxins in that it is active by mouth.

It is difficult to visualize any direct mechanism whereby such a small number of molecules can cause death, and it has been suggested (Pappenheimer, 1947) that the toxin acts not by inhibiting an enzyme action, nor by acting as an enzyme itself, but rather by blocking the synthesis of an essential enzyme. Other workers (Putnam, Lamanna, and Sharp, 1948) have speculated on the enzymatic synthesis of a cellular poison from some normal metabolite. Characteristic of its action, as also of diphtheria and tetanus toxin, is the latent period before the onset of symptoms, the time being roughly inversely proportional to the logarithm of the dose. The suggestion (Guyton and MacDonald, 1947) that this period is associated with the slow diffusion to be expected of a large molecule may be discounted, as Burgen, Dickens, and Zatman (1948) have shown that the latent period and duration of paralysis are prolonged by lowering the temperature to an extent much greater than would be accounted for on a purely physical basis. Death generally occurs within two or three days of the onset of symptoms and is due to respiratory paralysis.

The pharmacology of the toxin has been investigated by many workers (for example, Edmunds and Long, 1923; Dickson and Shevky, 1923; Bishop and Bronfenbrenner, 1936; Guyton and MacDonald, 1947), and it has been established that the site of action is at the neuromuscular junction. In an investigation of the various factors involved in the paralysis, Burgen, Dickens, and Zatman (1948) utilized the isolated rat phrenic nerve diaphragm preparation of Bülbring (1946). It was shown that conduction in the nerve was unaffected by the paralysis, and that the block differs from that produced by curare in that motor nerve tetani are maintained. Diaphragms from rats actively immunized with toxoid were not affected by the toxin.

The oral toxicity of the substance has often been correlated with the reported resistance to proteolytic enzymes (Pappenheimer, 1947, 1948; Putnam, Lamanna, and Sharp, 1948), though the problem is then raised of how such a large molecule could be absorbed through the wall of the gut. Such resistance, however, is not well established, as so much of the work on which this conclusion was based was done on very impure toxin preparations.

The preparation of the pure crystalline toxin by the American workers has raised the possibility of new approaches to the problem of the mode of action, and investigations have been started both in this country and in the U.S.A. Already the toxin has been characterized by a complete elemental and amino-acid analysis (Buehler, Schantz, and Lamanna, 1947), but this gave no clue to its action, no abnormal amino-acid nor characteristic toxic grouping being revealed.

In this country, work has been designed to establish whether the toxin is, in fact, resistant to proteolytic enzymes and, if not, whether a toxic fragment may be split off the main molecule by such treatment. The experiments of Li and of Morris and his colleagues, already referred to, would lend a certain amount of support to the possibility that some active fraction may be split off the molecule.

The investigation is complicated by the fact that the initial culture of the organism results in a very low concentration of the toxin and the subsequent working-up tends to be rather long and involves too many precipitation steps, to which the toxin is peculiarly sensitive. Investigations on the possible utility of the modern methods of separation by electrophoresis and of concentration by ultracentrifugation are at present in hand.

Virus Proteins

The bacterial toxins mentioned in the previous section are, relatively speaking, straightforward protein poisons, though we have really no knowledge of their mode of action. An entirely different type of toxic protein has been discovered in the plant virus diseases. Largely due to the work of W. M. Stanley (1940, 1943), the causative agents of certain plant diseases, such as tobacco plant disease, bushy stunt disease, and similar conditions, have been found to be of a protein character. Stanley and his colleagues have actually prepared crystalline specimens of a number of these substances. If a plant is injected with a small quantity of these crystals, the disease will be reproduced in the plant, and analysis of the infected plant will at a later date show a great increase in this crystalline material, and we have the paradoxical phenomenon of an infective agent in crystalline form apparently reproducing itself.

At present there is no adequate explanation for this, but it would certainly be a most reasonable assumption that the crystalline protein alters the synthetic process of the cells of the plant so that they continue to produce more of this crystalline protein, and that this in turn produces the outward and visible signs of the disease.

These crystalline protein viruses have been analysed for their amino-acid content, and work is at present being conducted on a number of them in the same manner as described for insulin. It has been shown that by passage through various plants the virulence of these crystalline substances can be varied and that the variation is accompanied by a change in the chemical constitution of the protein. We do not know as yet whether the viruses of human and animal diseases such as rabies and yellow fever and so forth belong to the same family as the plant viruses, but we do know that it is possible to alter their virulence and activity by passage. An immediate classical example is the work of Pasteur on rabies and the work on yellow-fever virus. This modification of the protein structure of plant viruses leads to the question of immunity.

It is now well known that the immune bodies circulating in the blood and body fluids consist of modified globulins. The constitution of these globulins is at present unknown, and only intensive work like that on insulin will solve the differences between the immune body globulins and the normal serum globulins. When one thinks of the complexity of the insulin molecule, and when one bears in mind the fact that proteins are continuously being destroyed and built up again in the body, it becomes a matter of wonderment and astonishment that the injection of an antigen on two or three occasions will produce immunity in the animal body, lasting in some cases for a period of years and in others apparently for a lifetime, as in the case of yellow fever. What is the mechanism that teaches the cells to alter the constitution of the globulins synthesized by them so that immune bodies will be produced and, moreover, continue to be produced for years? Again, it is possible only to speculate on this, and we can only adopt the hypothesis supported by Burnet and Fenner (1949), and known as the self-marker theory, that the antigen remains for a very long period in the body cells capable of producing antibodies, and that the antigen acts on the cells so that they synthesize the immune globulins.

Conclusion

I trust that I have succeeded in indicating that this vast problem must be of immediate importance to anyone concerned with the investigation or treatment of disease. When one contrasts the great complexity of the protein molecule with the fact that millions of these substances are continuously being built up and disintegrated in the human

body, and moreover rebuilt to precisely the same structure, one cannot help but speculate about the controlling mechanism. It is rather a terrifying thought that the whole of the protein in the human body is replaced in roughly 160 days, and at the present time we can only speculate on the mechanism controlling this elaborate resynthesis, where even a single amino-acid must not be out of place if the hormone is to have its activity or the antibody its potency.

It might well be that, when the mechanism of perhaps the most complex problem in human biochemistry is understood, we shall find the answer to many problems, possibly even the mechanisms of senescence and of cancer.

I should like to express my thanks to the President and Censors of the Royal College of Physicians for the honour of giving the Bertram Louis Abrahams Lecture, and my deep appreciation of the help given to this work and the preparation of the lecture by Professor A. C. Chibnall, F.R.S. It is a pleasure also to record the great assistance given me by Dr. D. N. Baron and by my colleagues in the Courtauld Institute who work on the proteins—Dr. J. M. Creeth, Dr. D. M. P. Phillips, Mr. P. A. Charlwood, and Dr. Joan Stephen.

REFERENCES

Abrams, A., Kegeles, G., and Hottle, G. A. (1946). *J. biol. Chem.*, **164**, 63.
Astbury, W. T., and Street, A. (1931). *Philos. Trans.*, A, **230**, 75.
Bentley, H. R., McDermott, E. E., Pace, J., Whitehead, J. K., and Moran, T. (1950). *Nature, Lond.*, **165**, 150.
Bergmann, M., and Fruton, J. S. (1937). *J. biol. Chem.*, **118**, 405.
Bishop, G. H., and Bronfenbrenner, J. J. (1936). *Amer. J. Physiol.*, **117**, 393.
Borsook, H. (1950). *Physiol. Rev.*, **30**, 206.
Buehler, H. J., Schantz, E. J., and Lamanna, C. (1947). *J. biol. Chem.*, **169**, 295.
Bülbring, E. (1946). *Brit. J. Pharmacol.*, **1**, 38.
Burgen, A. S. V., Dickens, F., and Zatman, L. J. (1948). *J. Physiol.*, **109**, 10.
Burnet, F. M., and Fenner, F. (1949). *Production of Antibodies*, 2nd ed. Macmillan, Melbourne.
Butler, J. A. V., Dodds, E. C., Phillips, D. M. P., and Stephen, J. M. L. (1948). *Biochem. J.*, **42**, 116.
—— —— —— —— (1949). Ibid., **44**, 224.
—— Phillips, D. M. P., Stephen, J. M. L., and Creeth, J. M. (1950). Ibid., **46**, 74.
Chibnall, A. C. (1946). *J. int. Soc. Leather Trades Chemists*, **30**, 1.
Cortis-Jones, B., Crooke, A. C., Henly, A. A., Morris, P., and Morris, C. J. O. R. (1950). *Biochem. J.*, **46**, 173.
Dickson, E. C., and Shevky, R. (1923). *J. exp. Med.*, **37**, 711.
Dodds, E. C. (1950). *Chem. & Ind.*, No. 8, p. 135.
Edmunds, C. W., and Long, P. H. (1923). *J. Amer. med. Ass.*, **81**, 542.
Fraenkel-Conrat, J., and Fraenkel-Conrat, H. (1950). *Biochim. biophys. Acta, Amst.*, **5**, 89.
Gutfreund, H. (1948). *Biochem. J.*, **42**, 544.
Guyton, A. C., and MacDonald, M. A. (1947). *Arch. Neurol. Psychiat., Chicago*, **57**, 578.
Hodgkin, D. Crowfoot (1949). *Cold Spring Harbor Symposia on Quantitative Biology*, **14**, 65.
Kegeles, G. (1946). *J. Amer. chem. Soc.*, **68**, 1670.
Lamanna, C., and Doak, B. W. (1948). *J. Immunol.*, **59**, 231.
—— Eklund, H. W., and McElroy, O. E. (1946). *J. Bact.*, **52**, 1.
—— McElroy, O. E., and Eklund, H. W. (1946). *Science*, **103**, 613.
Lens, J. (1948). *Biochim. biophys. Acta, Amst.*, **2**, 76.
Li, C. H. (1949). *Abstracts of Communications*, 1st International Cong. Biochemistry, p. 386.
Mellanby, E. (1946). *British Medical Journal*, **2**, 885.
Pappenheimer, A. M. (1947). *Fed. Proc.*, **6**, 479.
—— (1948). *Advances in Protein Chemistry*, **4**, 123.
Putnam, F. W., Lamanna, C., and Sharp, D. G. (1946). *J. biol. Chem.*, **165**, 735.
—— —— —— (1948). *J. biol. Chem.*, **176**, 401.
Sanger, F. (1945). *Biochem. J.*, **39**, 507.
—— (1948). *Nature, Lond.*, **162**, 491.
—— (1949). Ibid., **164**, 529.
Schoenheimer, R. (1942). *The Dynamic State of Body Constituents*, 2nd ed. Harvard U.P., Cambridge, Mass.
—— Ratner, S., and Rittenberg, D. (1939). *J. biol. Chem.*, **130**, 703.
Scott, D. A. (1934). *Biochem. J.*, **28**, 1592.
Sprinson, D. B., and Rittenberg, D. (1949). *J. biol. Chem.*, **180**, 715.
Stanley, W. M. (1940). Ibid., **135**, 437.
—— (1943). *Virus Diseases*. Cornell University Press.
Tarver, H., and Reinhardt, W. O. (1947). *J. biol. Chem.*, **167**, 395.
Vaughan, V. C., Vaughan, V. C., jun., and Vaughan, J. W. (1913). *Protein Split Products in Relation to Immunity and Disease*. Lea and Febiger, Philadelphia and New York.
Vigneaud, V. du (1927). *J. biol. Chem.*, **75**, 393.

REGULATION OF SECRETION OF CORTICAL HORMONES*

BY

MARTHE VOGT, M.D., Ph.D.

(From the Department of Pharmacology, University of Edinburgh)

There are several reasons why information about the control of the rate of secretion from an endocrine gland may be of interest. One is theoretical: an understanding of the factors regulating glandular activity gives us an insight into the part the gland plays in keeping up the *milieu intérieur*. The others are practical. First, in substitution therapy, such knowledge enables us to adapt the quantity of administered hormone to the requirements of the patient, as these vary with the circumstances. Secondly, in trying, for therapeutic reasons, to enhance or inhibit the action of a normal endocrine gland we have to know the conditions which will produce the desired effects on the gland.

Before discussing the information at present available about the control of adrenocortical activity, let me remind you of two fundamental facts concerning the physiology of the adrenal cortex. First, the gland, though secreting continuously, contains practically no stores of the biologically active hormones (Vogt, 1943), and, if synthesis were stopped while secretion were allowed to proceed at a normal speed, would lose its total hormone content in about 6–12 seconds. This means that synthesis is proceeding without interruption in the living condition, and explains the gland's large blood flow and high oxygen consumption. Secondly, the adrenal cortex has no secretory nerves, so that any nervous control over its activity would have to be exerted indirectly.

Experimental Methods

The knowledge we have of the control of adrenocortical secretion is almost entirely derived from animal experiments. A few introductory words on methods will be necessary. All available methods have their uses and their limitations, and the best picture of the gland's performance will be obtained by combining the information each of those methods can provide.

The oldest method is that which determines the experimental conditions which lead to hypertrophy of the cortex. It is suited to the investigation of all stimuli which can be applied over prolonged periods.

For stimuli of short duration suitable methods are the histological or chemical (Sayers *et al.*, 1945) determination of adrenal lipids, cholesterol, or ascorbic acid. Any acceleration of cortical secretion is reflected by an initial depletion in adrenal lipid or ascorbic acid usually followed by a restoration of the stores. This restoration may occur even if the accelerated secretion is maintained, either by prolonged action of the same stimulus or by a new one. Thus depletion is, as a rule, a sign of increased cortical secretion, while full stores of lipid or of ascorbic acid may be found in the later phases of increased activity as well as in the resting condition. Errors in interpretation may therefore arise if these methods are used in the investigation of prolonged or multiple stimuli.

Finally, cortical secretion may be measured directly by assaying adrenal venous blood for its hormone content (Vogt, 1943). The main use of this method is in acute experiments on anaesthetized animals or in perfused glands. It has the advantage of providing at least a rough quantitative estimate of hormone production. Also, the interpretation of the results does not depend on the preceding history of the gland.

*Lecture delivered in the Department of Pharmacology, Oxford University, on October 23.

The Actions of A.C.T.H.

What have these different methods taught us? From the work on adrenal hypertrophy it has been known for a long time that innumerable conditions, usually but not always of a noxious character, stimulate the adrenal cortex. These conditions of "stress" include the action of infections, toxic substances, hormones, abnormal environmental temperatures, high altitude, exercise, haemorrhage —in other words, conditions which will increase the metabolic demands on either the whole body or some of its organs. The most important feature about this action of stress on the adrenal is that, in the mammal, it is abolished by hypophysectomy. The pituitary hormone released by stress and responsible for the adrenal hypertrophy is the "adrenocorticotrophic hormone" of the anterior lobe, or A.C.T.H. The actions of A.C.T.H. are twofold: (1) it maintains the normal size and structure of the adrenal cortex; and (2) it accelerates cortical secretion whenever stress is applied. This action, as shown on the perfused gland, occurs within a few minutes at the latest, and possibly instantaneously.

Since A.C.T.H. is so important for the activity of the adrenal cortex, we need to know how exclusively adrenal cortical function and adaptation of that function to variations in the requirements of the body depend on the pituitary. Obviously, some cortical function persists in the absence of the anterior lobe, or else hypophysectomy would be fatal.

Sections through the adrenal of hypophysectomized mammals show that the atrophy which follows the operation does not affect all zones of the cortex; the outer zone, or zona glomerulosa, is spared, or is possibly even larger than usual. As it is a sound biological argument that structurally different parts of an organ differ in their function, we may assume that, in the hypophysectomized mammal, certain functions of the adrenal cortex will be better preserved than others. There is indeed much circumstantial evidence that the electrolyte metabolism of the hypophysectomized animal is less impaired than that of the adrenalectomized animal. Carbohydrate, fat, and protein metabolism, however, with either procedure, are affected in about equal degree. Generalizations on this subject are, however, dangerous, as there are great species differences in the hypophysial–adrenal relationship. This is well illustrated by the fact that certain kinds of stress which no longer cause cortical hypertrophy in the hypophysectomized rat continue to do so in the hypophysectomized pigeon (Miller and Riddle, 1942).

The next question is whether this function can still be adjusted to the varying demands of the tissues. In the absence of any nervous innervation, any such regulation of the rate of cortical secretion must be mediated humorally by changes in the composition of the blood.

Blood Constituents Other than A.C.T.H.

Are there any blood constituents, other than A.C.T.H., which modify the rate of adrenal secretion? The perfused isolated adrenal of the dog has been used to investigate this problem. On that preparation a number of physiologically occurring substances were tested for their possible influence on the rate of cortical secretion.

Only two means were found to increase the rate of hormone production of the isolated adrenal preparation. One was the injection of adenosine-triphosphate (A.T.P.) and related compounds, and the other an increase in plasma potassium. A.T.P., when injected into the perfusion cannula, caused a short outburst of enhanced secretion. We know that substances carrying high-energy phosphate bonds enter into the metabolism of most cells, and experiments on the speed of uptake of ^{32}P (Gemzell, 1948) have shown that the adrenal gland is no exception, and also that its ^{32}P uptake is accelerated by A.C.T.H. The perfusion experiments suggest that these phosphates take part in the synthesis of cortical hormones. Normally they are not carried to the gland by the blood stream but are synthesized *in situ*.

The acceleration of cortical secretion by increasing the potassium content of the perfusing blood was obtained with or without simultaneous lowering of the plasma sodium. The alteration in plasma levels had to be of such a magnitude as would be expected to occur only in adrenalectomized dogs. The present methods of hormone assay are not sensitive enough for a decision whether a similar but smaller acceleration would occur if the changes in plasma electrolytes were within physiological range. If that were so, we would conclude that the regulation of cortical secretion which meets the demands of the electrolyte metabolism is entirely independent of pituitary action. It may, however, be that the direct stimulation of the adrenal cortex by excess potassium is an emergency mechanism reserved for pathological conditions only.

Causes of Changes in Pituitary Activity

We come now to the second part of our considerations. If the lion's share of control of cortical secretion is contributed by the pituitary, what, in turn, causes the necessary changes in pituitary activity? There we are still on insecure ground. We do not know whether it is the same factor which acts on the pituitary in all conditions of stress or whether there are several different factors. Two suggestions have, so far, been made for a possible common denominator of all conditions of stress which release A.C.T.H. The first one makes adrenaline responsible (Long, 1947) and is attractive for two reasons: first, adrenaline is undoubtedly secreted during many conditions of stress; secondly, the effect of adrenaline in accelerating cortical secretion is very striking. Infusions of "physiological" quantities of adrenaline—that is, quantities which may be released *in vivo* through prolonged stimulation of the splanchnic nerves—increase cortical secretion immediately, considerably (by many times the basal value), and for a period long outlasting its vascular effects (Vogt, 1944).

The site of action appears to be complex, an important factor being the release of A.C.T.H. This acceleration of cortical secretion by adrenaline constitutes an indirect control of the central nervous system over the function of the adrenal cortex. Is it all we require in order to explain the release of A.C.T.H. in stress?

Such a hypothesis can easily be put to the test, and experiments show that it is untenable. Two groups of rats are submitted to stress, the adrenals of one group having previously been denervated. Both groups of animals show a cortical response to stress—in other words, release A.C.T.H.—whether the method used for measuring the adrenal response be depletion of cortical lipids (Vogt, 1947) or of adrenal ascorbic acid. With the latter method, which gives quantitative data, we can analyse the matter further. Rats with denervated adrenals show the same fall in adrenal ascorbic acid after an injection of insulin as their normal controls. This shows that adrenaline is not indispensable for a response of the pituitary to stress, though it does not mean that adrenaline

plays no part in that response. On the contrary, the rats with denervated adrenals which have been given insulin in a dose well tolerated by normal rats are severely hypoglycaemic, comatose, or convulsing, so that we are in fact submitting the denervated animals to a much severer test instead of observing them and their controls under comparable conditions of stress. Equal depletion of adrenal ascorbic acid may actually constitute a diminished responsiveness of the denervated rat which is able to mobilize its A.C.T.H. only through the hypoglycaemia and not through the secretion of adrenaline as well. The results obtained on rats with denervated adrenals were confirmed in rats completely deprived of both adrenal medullae.

The second suggestion for a common factor releasing A.C.T.H. under all conditions of stress has been made by Sayers and Sayers (1947). Their hypothesis is as follows: in stress there is accelerated utilization of cortical hormones by the tissues, and therefore a low blood level of these hormones. This low level acts as a stimulus to the pituitary, which releases A.C.T.H. Conversely, output of A.C.T.H. is repressed when the level of circulating cortical hormones is high. This has been proved experimentally (Ingle, 1938; Sayers and Sayers, 1945) by showing that injection of cortical hormone inhibits the secretion of A.C.T.H. during stress. The stimulating effect of lack of hormone is much more difficult to demonstrate and has, so far, not been established.

Though we can be certain, therefore, that increased availability to the tissues of cortical hormones will check adrenocortical activity, we cannot be sure that lack of hormone will increase it by causing secretion of A.C.T.H. At present, however, this view is at least a good working hypothesis. It raises a number of further questions: is a low level of circulating cortical hormones the only stimulus which will induce the pituitary to give off A.C.T.H.? How does the role of adrenaline fit into the picture? Does it, too, like other forms of stress, act by increasing the utilization of cortical hormones in the tissues? Further, where are the receptors sensitive to low levels of circulating cortical hormones? Sayers and Sayers pictured them in the anterior lobe itself. For emotional stimuli, however, and for adrenaline, the work of de Groot and Harris (1950) and of Hume and Wittenstein (1950) suggests receptors in the hypothalamus. Does the whole control of A.C.T.H. secretion lie in the hypothalamus? To all these questions we can only guess the answers. And rather than by speculating, I should like to end by discussing a purely practical problem.

Conclusion

Shortage of cortisone and of A.C.T.H. has prompted the search for a treatment of rheumatoid arthritis which will stimulate the pituitary of the patient to secrete enough A.C.T.H. to obtain clinical improvement comparable to that achieved in the Mayo Clinic by injecting exogenous hormones. Insulin has been repeatedly tried, and, according, for example, to a recent report from the Oxford Regional Rheumatism Research Unit, with encouraging success (Kersley *et al.*, 1950). American authors, however, who gave insulin together with cortisone, had less convincing results (Henderson *et al.*, 1950), and Hench stated in a recent lecture at Edinburgh University that in the Mayo Clinic no benefit had been obtained from the combined use of insulin and cortisone. This apparent disagreement is easily explained in the light of the experiments referred to above, in which injected cortical hormones were shown to inhibit the pituitary response to stress. By giving the insulin along with the cortisone, the physician defeats his own ends, because he prevents the very release of A.C.T.H. which presumably constitutes the beneficial action of insulin in rheumatoid arthritis. Insulin can be expected to have the desired effect only if allowed to act without a simultaneous check on the action of the anterior lobe. In this instance, the fact that cortisone was probably not available to the British workers has proved to be of unexpected benefit to their patients.

REFERENCES

de Groot, J., and Harris, G. W. (1950). *J. Physiol.*, **111**, 12 P.
Gemzell, C. A. (1948). *Acta endocrinol., Kbh.*, **1**, Suppl. 1, p. 1.
Henderson, E., *et al.* (1950). *J. clin. Endocrinol.*, **10**, 800.
Hume, D. M., and Wittenstein, G. J. (1950). *Proc. First Clinical A.C.T.H. Conference*, p. 134. Blakiston Company, Philadelphia
Ingle, D. J. (1938). *Amer. J. Physiol.*, **124**, 627.
Kersley, G. D., *et al.* (1950). *British Medical Journal*, **2**, 855.
Long, C. N. H. (1947). *Bull. N.Y. Acad. Med.*, **23**, 260
Miller, R. A., and Riddle, O. (1942). *Amer. J. Anat.*, **71**, 311.
Sayers, G., and Sayers, M. A. (1945). *Proc. Soc. exp. Biol., N.Y.*, **60**, 162.
—— —— (1947). *Endocrinology*, **40**, 265.
—— —— Liang, T. Y., and Long, C. N. H. (1945). **Ibid.**, **37**, 96
Vogt, M. (1943). *J. Physiol.*, **102**, 341.
—— (1944). Ibid., **103**, 317.
—— (1947). Ibid., **106**, 394.

OBJECTIVE ASSESSMENT OF IMPROVEMENT IN RHEUMATOID ARTHRITIS

BY

O. JANUS, M.B., B.Sc., M.R.C.P.

(From the University Rheumatism Research Centre. Manchester Royal Infirmary)

Hench (1949) has shown that most of the manifestations of rheumatoid arthritis are potentially reversible. The introduction of cortisone and A.C.T.H. has further shown that reversal can be induced by these hormones, and that many features of rheumatoid disease can be influenced within a few hours of their administration (Hench *et al.*, 1950). In prolonged and intensive courses these changes can be observed by clinical examination and by simple tests of function as shown originally by Hench and other workers in America and more recently by Copeman *et al.* (1950) in this country; and indeed Hench considers that the patient's own assessment of his degree of improvement is one of the more reliable indices of progress. Subjective improvement and simple clinical examination are, however, both very susceptible to psychological factors, and in less experienced hands these methods have led to many false claims of which those made for deoxycortone acetate and ascorbic acid by Lewin and Wassén (1949), LeVay and Loxton (1950), and others are recent examples. These difficulties have been well illustrated by the work of Quin, Mason, and Knowelden (1950).

It would clearly be advantageous to have methods of studying rheumatoid arthritis which would provide some more sensitive and measurable indices of improvement, and if these methods were delicate enough to give a reliable index of the response to single injections of cortisone or A.C.T.H. they would provide a means of comparing the responses of a variety of unknown substances with known standard active and inert preparations all in the same patient. It would also be possible to study the responses of different patients to a single standard active injection, and to compare the responses in the same patients at different stages of the disease, thus providing much valuable information.

Methods of Study

Certain features of rheumatoid arthritis seem to be suitable for detailed study.

Joint tenderness is characteristic of active rheumatoid disease, and this can be estimated clinically by squeezing a joint with the hands or fingers. It can, however, be more accurately assessed by compressing a joint between sponge-rubber cushions and recording the pressure at which pain is first experienced. The small joints of the hand, particularly the proximal interphalangeal joints so often involved in rheumatoid arthritis, are most suitable for this purpose. In the apparatus used the joints are compressed from back to front, the fingers resting on a fixed rubber cushion and being compressed by a second rubber cushion of 1.5 cm. diameter carried on a spring-loaded piston. To avoid errors due to temperature of the kind described by Kellgren, McGowan, and Hughes (1948) the hand can be kept in a water bath at 35° C. With this apparatus pain is produced in the fingers of normal subjects only when pressure exceeds 6–8 kg. In the fingers of patients with active rheumatoid arthritis pain is produced with pressures ranging from 0.25 kg. upwards, depending on the severity of the disease, and in these patients the end-point is clearly defined, readings being reproducible to within 0.25 kg. With this technique a number of joints can be tested and an average figure obtained.

Weakness of grip, often extreme, is another frequent finding in rheumatoid arthritis. This feeble grip probably results from a combination of muscular weakness, joint pain and stiffness, and flexor tendon inefficiency produced by rheumatoid tendinitis and by the painful and impacted nodules described by Kellgren and Ball (1950). As the grip could be inhibited by local pressure on painful areas a method originally suggested by Dr. H. S. Barber was evolved. A canvas-and-rubber bag was constructed of suitable size for holding in the hand, and when connected with a mercury manometer and inflated with air to a pressure of 10 mm. Hg the bag moulds itself to a deformed or stiff hand, and by asking the patient to squeeze it the power of grip can be measured by the height reached by the mercury column. The average of three grips with each hand is recorded, the figure accepted on each occasion being the highest which the subject can attain with slow steady pressure and sustain for a period of two or three seconds. Using this technique, normal subjects can always produce a pressure in excess of 300 mm. Hg, whereas patients with rheumatoid arthritis give readings usually varying between 30 and 200 mm. Hg, according to the severity of the disease, and in these patients readings are usually reproducible to within 5 mm. Hg.

Circulatory disturbances are another feature of rheumatoid disease. Local warmth is usually found over actively diseased joints, and a plethysmographic technique was therefore devised for measuring blood flows in involved knee-joints. The plethysmograph was constructed on the general lines described by Lewis and Grant (1925) and by Barcroft and Edholm (1943). The knee segment is placed in a thermostatically controlled water bath at 35° C., the knee being separated from the water by a sleeve of latex rubber held in close contact with the skin by water pressure, and cuffs are placed immediately above and below the segment, the lower occluding cuff being inflated to above arterial pressure before and during readings and the upper collecting cuff being raised rapidly to venous pressure when readings are made. The patient wears standard clothing and lies supine with the head resting on one pillow. The room is maintained thermostatically at 18° C. With this technique it was found that blood flows in normal knees varied between 1 and 2 ml./100 ml./min., while in actively involved rheumatoid knees blood flows varying from 3 to 20 ml./100 ml./min. were found.

Although the joints in rheumatoid arthritis are warm the extremities, particularly the fingers, are often abnormally cool and may display Raynaud-like phenomena. Skin temperatures were therefore recorded by thermocouples on the finger-tips during the conditions of standard exposure used for the measurement of knee blood flow.

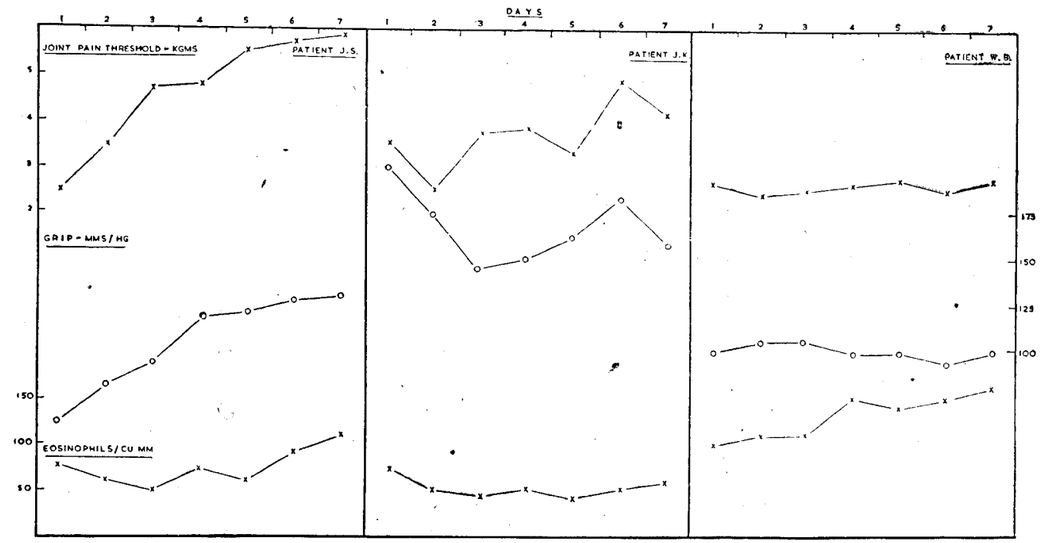


FIG. 1.—Joint-pain, grip, and eosinophil readings in three types of rheumatoid arthritis patient on a basic hospital regime of bed-rest and without treatment.

Eosinophil depression in the circulating blood following the administration of cortisone and A.C.T.H. has been widely described, and throughout these studies eosinophils were counted at appropriate intervals. The method originally described by Dunger (1910) was used and was found to be satisfactory if precautions were taken in mixing and in time of counting.

Biochemical studies were also made during the prolonged courses of A.C.T.H. and on numerous other occasions. Detailed observations were made of the E.S.R., of a modified Rose's differential agglutination test (Ball, 1950), and of urinary uric acid and creatinine excretions. Electrolyte balance studies were undertaken by Professor R. Platt, of the University Department of Medicine, and 17-kestosteroids and cortin-like substances were measured by Dr. Hain and Mr. Bassil, of the University Department of Obstetrics. The well-known changes which accompany A.C.T.H. administration were observed, but these results will not be discussed here, as they do not appear to contribute to the present discussion.

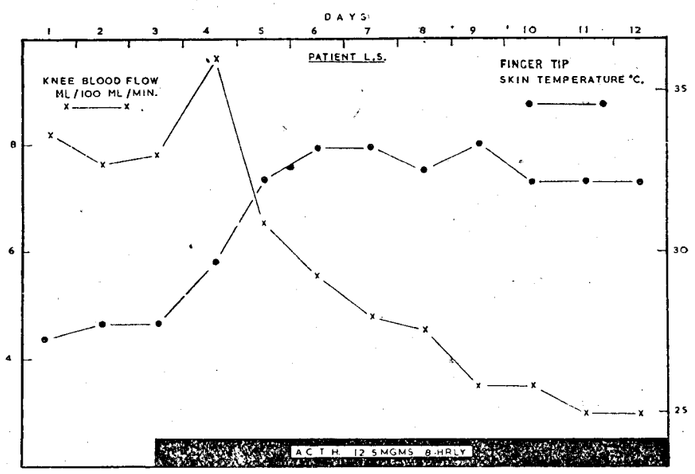


FIG. 3.—Knee blood flow and finger-tip temperature readings in a patient on 12.5 mg. of A.C.T.H. 8-hourly for 10 days.

Selection of Patients

These methods of study were applied to hospital in-patients suffering from rheumatoid arthritis in whom disability was judged to be mainly due to active reversible disease. The patients studied all had multiple joint involvement with radiological signs at least of osteoporosis ; other stigmata of rheumatoid disease, such as constitutional disturbance, raised sedimentation rate, nodules, tendon lesions, and lymphadenopathy, were also present. These patients were placed on a basic hospital regime of rest in bed, during which drugs were not given. Daily or twice-daily measurements were made, and the results compared with daily standard clinical assessments of functional capacity and of joint pain, swelling, and range of movement. Three types of patient were identified, and an example of each type is recorded in Fig. 1.

Patient J. S. showed a steady improvement in all readings from day to day, and her subsequent progress and clinical assessment confirmed that she was going into spontaneous remission on rest in bed. Patient J. K. showed marked fluctuations in all readings from day to day, and these fluctuations were more pronounced than those revealed by standard clinical assessment. Patient W. B showed only small fluctuations from day to day, and at the end of a week there had been little change in her measurements, and no change had been recorded in her general clinical assessment.

Patients of this last type, with active disease as defined above, were considered to be relatively stable but potentially reversible cases of rheumatoid arthritis and were selected for special study.

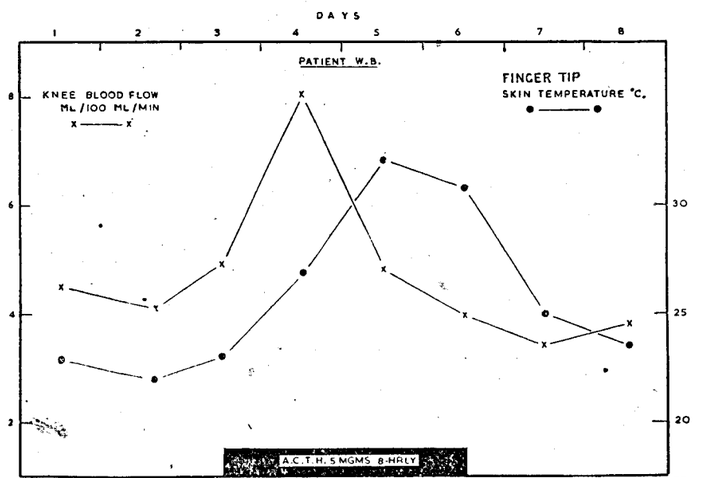


FIG. 2.—Knee blood flow and finger-tip temperature readings in a patient on 5 mg. A.C.T.H. 8-hourly for 72 hours.

Results of Studies

Having selected patients of the type described it was necessary to determine if the methods used were sensitive enough to demonstrate the effects of a single dose of an active hormone. To eliminate psychological factors patients were told that they would receive a series of injections, most of which would be inactive, and in fact injections of normal saline or other inert substances were given at frequent intervals, and studied with equal intensity. The detailed effects were observed of single injections of 25 mg. of A.C.T.H. in six patients, of 5 mg. of A.C.T.H. given eight-hourly for 72 hours in four patients, of 12.5 mg. of A.C.T.H. given eight-hourly for 10 days to two patients, and of 200 mg. of cortisone acetate given in a single injection to five patients.

After a single injection of 25 mg. of A.C.T.H. (see Fig. 4) improvements occur in joint tenderness and grip, rising to a maximum in between six and eight hours, then falling, often to a rebound level within 24 hours, and returning to around the original level within 48 hours. During this period the circulating eosinophils are depressed, the maximum depression occurring between four and six hours after injection, preceding by about two hours the changes in joint tenderness and grip. The knee blood flow shows a diphasic response, a variable initial increase at six hours being followed by a rapid decrease between 8 and 12 hours. The skin temperature shows no change. If 5 mg. of A.C.T.H. is given eight-hourly for 72 hours the joint tenderness and grip improve more slowly, rising to a maximum at the end of this period, and the eosinophils become moderately depressed and remain so throughout the period. The knee blood flow, after showing an initial increase at the end of six hours, decreases to a lower level by the end of the period, and this decrease is accompanied by a rise in skin temperature on the finger-tip (Fig. 2). When 12.5 mg. of A.C.T.H. is given eight-hourly for 10 days these changes become very large. There is complete remission in joint tenderness up to normal levels, the grip becomes much improved, and the eosinophils remain greatly depressed throughout the course. Knee blood flow decreases steadily over the period following an initial increase, and finger-tip skin temperature rises and remains high (Fig. 3). After stopping these repeated injections the changes observed do not return to their original level in 48 hours but may remain at a new level for days or weeks.

With a single injection of 200 mg. of cortisone acetate (see Fig. 4) a slower series of responses occur, presumably due to slowness of absorption. Joint tenderness and grip show no tendency to improve for at least eight hours, and then rise slowly to a maximum in between 24 and 48 hours. The eosinophil depression is maximal at about 24 hours. Knee blood flows have not shown the initial increase found with A.C.T.H., but decrease to a lower level in between 24 and 48 hours. One of the five patients tested with cortisone gave no response and was afterwards shown to be also refractory to A.C.T.H. During this series of observations no significant deviations in the curves were produced by injections of normal saline and other inert substances.

From this series of observations it was clear that with all these active agents grip and joint tenderness improved rapidly and eosinophil counts fell. The circulatory changes were interesting but more complex, the initial change in knee blood flow being either an increase or a decrease with single injections, and with repeated injection an eventual decrease in joint blood flow associated with a rise in finger-tip skin temperature. It was felt that this variable initial response precluded the use of joint blood-flow measurements as indicators of responses to single injections and that further studies would be needed to demonstrate their significance.

With the use of these techniques it was decided to make a preliminary survey of some substances claimed to be effective in rheumatoid arthritis, and simultaneously to determine if consistently positive results were obtained with substances of known potency. Suitable patients were selected by the methods already described, and they were told that they would be receiving a series of injections or tablets, most of which would be ineffective ; but all patients received at least one injection of A.C.T.H. to demonstrate that they were in fact capable of responding, and at least one injection of normal saline to demonstrate any psychological response. In many instances also the observer did not know what substance had been given. An example of one experiment is shown in Fig. 4, in which the effects of 4.8 mg. of an A.C.T.H. peptide from the chemical and

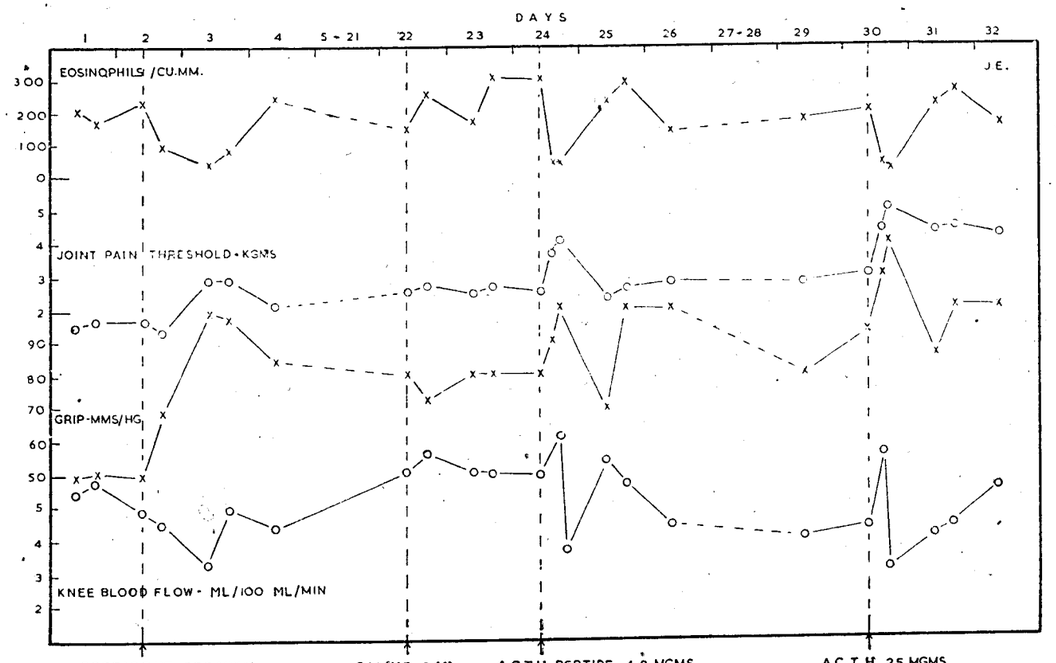


FIG. 4.—Effects of 4.8 mg. of A.C.T.H. peptide compared with those of cortisone, saline, and A.C.T.H.

biochemical laboratories at Cambridge University were compared with 25 mg. of the original A.C.T.H. from which it had been prepared, with 200 mg. of cortisone acetate, and with normal saline. The magnitude and type of response to this A.C.T.H. and its peptide are very similar, and in this case biological assays in the Cambridge Laboratories had suggested that 4.8 mg. of this peptide fraction should be equivalent to 25 mg. of the original A.C.T.H., which had a potency 1.93 times that of the Armour standard L.A.1A.

In suitable patients studies of this kind continued over prolonged periods showed that without special therapy small fluctuations occurred in grip, in joint tenderness, and in circulating eosinophils, but these random fluctuations were small and often in opposite senses, improvement in grip being accompanied by deterioration in joint tenderness while the eosinophils fluctuated independently. With cortisone and A.C.T.H. fluctuations were always larger and in the same sense, a fall in eosinophils being accompanied by improvement in both grip and joint tenderness. It is clearly desirable to summate these fluctuations after giving them each a comparable weighting. As a standard the response six hours after a single injection of 25 mg. of A.C.T.H. has been taken. In 10 patients to whom the dose was given the average increase in grip was 26 mm. Hg, the average increase in pressure required to produce joint pain was 1 kg., and the average fall in eosinophils was 77% of the original count (see Table). Defining each of these as a unit of fluctuation, the scatter diagrams in Figs. 5 and 6 have been constructed. Fig. 5 represents the result of adding together units of fluctuation in joint tenderness, grip, and eosinophil counts, and each point represents this total fluctuation in one patient during the period stated in the left-hand column. The whole diagram represents the results of trials on 18 patients, each patient having been given at least one known active injection, one control injection, and one or two trial injections on the general plan shown in Fig. 4. Certain substances could not be expected to cause eosinophil fluctuations, and Fig. 6 has been similarly constructed, each point representing the summation of fluctuations in joint tenderness and grip only Since the average deviation six hours after 25 mg. of A.C.T.H. is by definition 3 units in the case of Fig. 5 and 2 units in the case of Fig. 6, interrupted lines have been drawn in at half these values to represent the mid-point between absent response and average response.

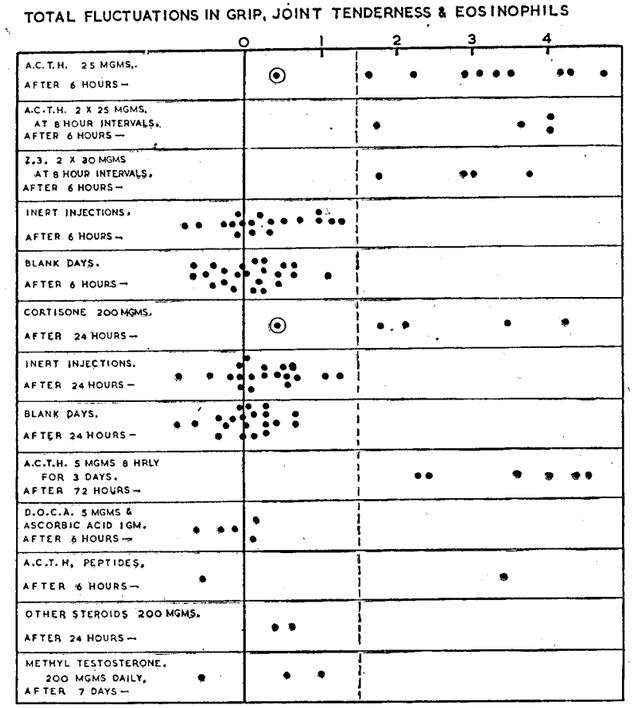


FIG. 5.

In commenting on these results, it is clear that A.C.T.H given in any of the three doses tested and cortisone given in single injections produce deviations which are outside the limits of chance deviations occurring on blank days or deviations associated with inert injections. The only exceptions are the ringed observations, all four of which occurred in the one refractory patient already mentioned Apart from the active peptide (also illustrated in Fig. 4) the only substance so far used which produced significant deviations was aspirin, and of the 10 patients tested three appeared to be sensitive and seven insensitive. It is perhaps of interest that this sensitive group showed an eosinophilia in response to aspirin—a phenomenon we have also observed in four cases of acute articular rheumatism of rheumatic fever type. The group labelled steroids includes two compounds supplied by the Chemistry Department of this University, $\triangle$5-cholene-3β 25-diol and 17α-allyl testosterone. The peptide fraction which gave no response was subsequently found to be inactive by rat assay at the Cambridge laboratories. The column labelled A.C.T.H.-Z3 contains results of preliminary trials with a new preparation of A.C.T.H.

Fluctuations in 10 Patients Measured 6 Hours After 25 mg. of A.C.T.H.

Patient	Eosinophil % Change	Pain Threshold Change (kg.)	Grip Change (mm. Hg)	Eosinophil Unit Change	Pain Threshold Unit Change	Grip Unit Change	Total Fluctuations
H.J. ..	−100	+0·9	+25	+1·3	+0·9	+1·0	+3·2
A.J. ..	−74	+0·7	+25	+1·0	+0·7	+1·0	+2·7
J.E. ..	−90	+2·1	+25	+1·2	+2·1	+1·0	+4·3
R.K. ..	−72	+1·9	+52	+0·9	+1·9	+2·0	+4·8
E.M. ..	−98	+1·5	+40	+1·3	+1·5	+1·5	+4·3
D.S. ..	−90	+0·9	+10	+1·2	+0·9	+0·4	+2·5
R.S. ..	−82	+0·8	+25	+1·1	+0·8	+1·0	+2·9
M.W. ..	−25	—	+2	+0·3	—	+0·1	+0·4
K.M. ..	−86	+0·6	+45	+1·1	+0·6	+1·7	+3·4
W.B. ..	−52	+0·4	+15	+0·7	+0·4	+0·6	+1·7
Total ..	−769	+9·8	+264				
Average fluctuations⇒ 1 unit ..	−76·9	+0·98	+26·4				

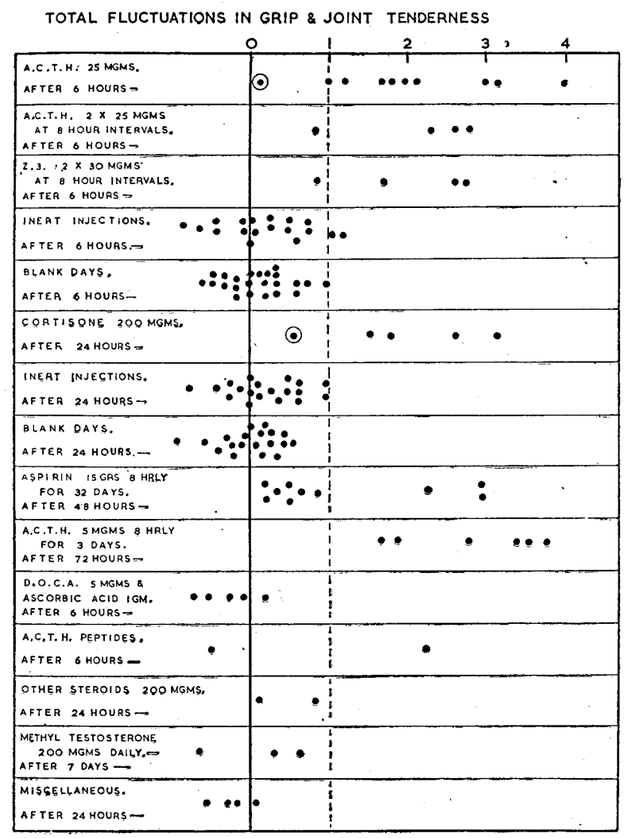


FIG. 6.

The spread in deviation from 1.5 to 4.5 units among the active substances is largely due to variations in individual sensitivity, and underlines the necessity for establishing the degree of sensitivity and for comparing drugs in the same patient at times not far separated.

Discussion

From the data presented it is clear that the response of rheumatoid patients to substances with cortisone-like or A.C.T.H.-like activity can be measured with some accuracy. Small single injections allow the patient to return to his original level in 48 hours, but repeated injections often cause prolonged changes in the patient's condition after they have been discontinued. Thus, provided that only single injections are given, the responses in a single patient may be used to compare the potencies of different preparations of these hormones, and unknown substances may be rapidly evaluated by comparison with A.C.T.H. or cortisone of known potency. Apart from such practical considerations, a study of these responses in different patients and at different stages in the disease process may produce some further information about the role of adrenocortical activity in rheumatic diseases.

The mechanism of the interesting changes induced by cortisone and A.C.T.H. in joint blood flow and in finger-tip skin temperature also requires further investigation both in the normal and in patients with the more severe Raynaud-like syndromes which are found in a variety of rheumatic and peripheral vascular diseases.

Summary

Sensitive and reliable methods for studying some of the features of rheumatoid arthritis have been evolved. These include measurements of joint tenderness and the power of grip as well as plethysmographic studies of knee blood flow.

In suitable patients these methods can be used to study in detail the response to single injections of cortisone or A.C.T.H., and the responses to these substances have been compared with those obtained from inert control injections, and with other substances of unknown potency.

In rheumatoid arthritis knee blood flow is raised while the finger-tips remain abnormally cold. Administration of A.C.T.H. and cortisone reverses these changes, the knee blood flow falling towards normal while the finger-tip temperature rises.

When more cortisone and A.C.T.H. become available much useful information may be gained by studying the responses to standard doses in different patients, and in the same patient at different stages in the disease process.

Much of the A.C.T.H. used in these studies was donated through the kindness of Dr. W. Tindall, of Messrs. Organon Ltd. Cortisone and other A.C.T.H. were supplied through the courtesy of the Medical Research Council. The A.C.T.H. peptides were provided through Professor A. R. Todd, F.R.S., and Professor F. G. Young, F.R.S., of Cambridge University. The $\triangle$5-Cholene-3β 25-diol and 17α-allyl testosterone were supplied through Professor R. E. Jones, of the University of Manchester. Thanks are due to Dr. R. Moore, who made many of the routine clinical assessments, and particularly to Dr. J. H. Kellgren for advice and criticism throughout.

REFERENCES

Ball, J. (1950). *Lancet*, **2**, 520.
Barcroft, H., and Edholm, O. G. (1943). *J. Physiol.*, **102**, 5.
Copeman, W. S. C., Savage, O., Bishop, P. M. F., Dodds, E. C., Gottlieb, B., Glynn, J. H. H., Henly, A. A., and Kellie, A. E. (1950). *British Medical Journal*, **2**, 849.
Dunger, R. (1910). *Münch. med. Wschr.*, **57**, 1942.
Hench, P. S. (1949). *Ann. rheum. Dis.*, **8**, 90.
—— Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1950). *Arch. intern. Med.*, **85**, 545.
Kellgren, J. H., and Ball, J. (1950). *Ann. rheum. Dis.*, **9**, 48.
—— McGowan, Anna J., and Hughes, E. S. R. (1948). *Clin. Sci.*, **7**, 13.
LeVay, D., and Loxton, G. E. (1950). *Lancet*, **1**, 209.
Lewin, E., and Wassén, E. (1949). Ibid., **2**, 993.
Lewis, T., and Grant, R. T. (1925). *Heart*, **12**, 73.
Quin, C. E., Mason, R. M., and Knowelden, J. (1950). *British Medical Journal*, **2**, 810.

A two years' antimalarial campaign began in British Honduras in May, with the help of a grant of $22,000 from the United Nations Children's Emergency Fund (U.N.C.E.F.). Malaria is endemic and a principal cause of sickness, being responsible for up to 20% of hospital admissions and 9% of certified deaths in the colony; and it is hoped that by spraying every single house twice a year with 5% emulsion of D.D.T. in xylol, and by distributing free prophylactic "paludrine" to selected schools as well as using the well-known routine measures, the great success achieved in similar campaigns in Cyprus and British Guiana will be repeated here.

ALOPECIA AREATA: A CLINICAL STUDY

BY

IAN ANDERSON, M.B., B.Sc., M.R.C.P.

Senior Registrar, Rupert Hallam Department of Dermatology, Royal Infirmary, Sheffield

Alopecia areata is a disease quite commonly encountered in hospital practice. It was present in 2% of the 15,000 new patients seen at this clinic in 1937–41.

This paper is based on a clinical study of 114 almost consecutive unselected cases seen in hospital during the past two years. The series was made up of 81 cases of simple alopecia areata of the type which recovers after a few months, 24 cases of alopecia totalis and universalis (the initial lesions being those of alopecia areata and therefore considered to be the extreme degrees of this condition), and 9 cases of persistent alopecia areata which had been present for a period of years.

Age, Sex, and Colour of Hair

There were approximately an equal number of male and female subjects (59 male, 55 female) and for the most part the disease seems to affect both sexes equally. Brown (1929) found that with increasing age females predominated over males, but in this series there were equal numbers even over the age of 30.

These patients do not represent a true cross-section of the cases of alopecia, as many are treated in a children's hospital in the area. However, the age at which the disease first occurred was recorded; this showed that 50 (44%) were attacked before the age of 21. There were, however, 22 (19.5%) over the age of 40 (Table I). Brown, in a series of 300 cases, found a considerably higher proportion of children (57% under 21) and only 9% over the age of 40

TABLE I.—*Age at Onset and Prognosis*

Age at Onset of First Attack	No. of Cases	% Cases in which Disease Persisted or Extended to Complete Baldness
0–10 years	23	45
11–20 ,, ...	27	33
21–30 ,, ...	23	19
31–40 ,, ...	19	
Over 40	22	23
	114	

The hair colour was recorded in 82 cases; 37 (45%) were dark haired compared with 42 (51%) in a control series of out-patients (Table II).

TABLE II.—*Hair Colour*

	Alopecia Cases	Out-patients
Fair	16	20
Medium	29	20
Dark	37	42
Total	82	82

Cockayne (1933) stated that the disease is much commoner in dark-haired subjects; in this series, at least, the difference appears to be due to the higher proportion of dark hair in the population of this city.

The Disease

The best descriptions of alopecia areata are probably those of Sabouraud (1936). The pattern that he described was shown well in most of the cases. The disease begins as one patch, and this may remain single or, after a few weeks, secondary patches may appear on other parts of the scalp. Charting of the position of this first patch revealed a significant difference between the sexes (Table III). Of the males, 35 had occipital patches and 15 fronto-vertical, while the females showed a reversed distribution—15 occipital and 31 fronto-vertical. This has not been previously recorded, to my knowledge, and may indeed be a distortion due to hospital selection (occipital patches in females passing unnoticed). Five male cases had the first patch on the beard area, and the primary patch may presumably occur on any hairy part of the body.

TABLE III.—*Position of Primary Patch*

Position	Present Series		Kinnear and Rogers Series of Scalp Ringworm; % Incidence	
	Male	Female	Male	Female
Occiput	35 (60%)	15 (27%)	56	32
Vertex	8 } (25%)	15 } (56%)	6	22
Frontal	7 }	16 }		
Parietal	4 (7%)	9 (16%)	9	17
Beard	5	—		
	59	55		

Before dismissing the primary patch it is interesting to compare the figures with those of Kinnear and Rogers (1948) for the position of ringworm of the scalp in 505 boys and 93 girls. The higher incidence of occipital primary infection in boys compared with girls (56% to 32%) was taken as evidence of barber-shop infection. Their figures are strikingly similar to the present series (Table III).

The secondary patches may appear anywhere on the scalp, beard, eyebrows, or body hair. The loss of one eyebrow has not the same bad prognosis as the fall of both eyebrows and lashes in the universalis cases.

Of the 114 cases 81 were those with single or multiple patches which run their course in four to twelve months.

The 24 cases of alopecia totalis and universalis are in no way an indication of the incidence of this condition; they were seen because the patients attended for a Health Service wig. Most of them had been bald for many years and the condition was regarded as permanent. All cases began in the same way as ordinary alopecia areata, but after the appearance of the secondary patches a general fall of the hair occurred, starting with eyebrows and lashes and followed by pubic, axillary, and body hair in most cases. It is interesting to note that areas not actually attacked at this time may grow hair in later life; one female patient without a hair on any of the usual areas had a marked post-menopausal facial hirsutism.

Only one case was followed from the primary patch through all the stages to complete and probably permanent universal baldness. Four cases were followed from their onset through to the totalis stage, but later on hair grew satisfactorily. An interesting point in many of the histories is that in recovery from a severe attack the primary patch is often the last to be covered. It is as if the first area is attacked more severely than the others and the follicles are more permanently affected.

The third type of case is that which may be called persistent alopecia areata. There are nine of these, and it is possible to divide them into: (1) small recurrent patches which heal and reappear continuously over a period of years, and (2) the slowly advancing type, which may be band-like (ophiasis) or round in shape and fronto-vertical in position. This appears to differ little from the ordinary alopecia except in its prognosis. Four of the second type

which have been observed for the past 18 months show little sign of change except for some alteration in the shape of the patches.

Recurrence Rate.—A previous attack of the disease had occurred in 32 cases (28%). Walker and Rothman (1950), in a follow-up of 120 cases for 5 to 20 years, reported an overall relapse rate of 86%, and believe that all cases will be found to relapse if followed long enough.

Family History

In 22 cases (19%) alopecia areata occurred in another member of the family. At first sight this would appear conclusive of a familial tendency; it agrees well with Brown (1929) and Sabouraud (1929), both of whom found a 20% family incidence. However, we could discover no account of the incidence of alopecia in the population as a whole, and in view of this 320 traumatic orthopaedic out-patients were interviewed. Eight had a history of alopecia areata, and it is possible that this incidence of 2.5% may be a little on the low side. One of the parents of the 22 familial cases had been affected in seven and a brother or sister in eight. It would be interesting to compare these figures with the families of normal subjects, as the incidence suggests there may be little difference. In Brown's 135 cases, a parent was affected in only 8 of the 28 familial cases. There was only one case in the present series with a multiple family history (grandparent and father).

It must also be noted that in 7 out of these 22 cases alopecia areata occurred in near relatives at the same time as in the patient. In none of these seven was there an obvious cause which may have affected the whole family. Savill (1944) mentions multiple cases in the family and finds it difficult to explain. It may be said that two other patients had intimate friends who suffered at the same time as themselves.

Precipitating Cause of Attack

The commonest precipitating cause was found to be mental shock or acute anxiety. If alopecia followed a few weeks after such an event then that was taken to be the cause. In 27 cases (23%) the alopecia had been preceded by some form of mental stress. In a control series interviewed by members of the Scientific Advisory Committee of the Empire Rheumatism Council (1950) 9% of 292 subjects reported some form of mental trauma within three months previous to the investigation. A further 26 cases were obviously suffering from various degrees and forms of mental disturbance, or what the patients themselves called "nerves." They had, however, been in this state for years, and it was not related chronologically in any way to the appearance of the alopecia.

It is concluded that the incidence of precipitating shock (23%) is too large to be due to chance. It is interesting to note that the incidence of mental disorder is no higher in cases of severe alopecia than in the series as a whole (Table IV).

TABLE IV

	Whole Series	Cases of Persistent or Total Alopecia
Total number	114	33
No. with carious teeth	17	4
,, ,, clinically infected throats ..	18	4
,, ,, precipitating shock or worry	27	8
,, ,, emotional instability not related to attack	26	7

In addition to these 53 cases of possibly nervous origin other cases included: (1) Three cases of general infection—one of influenza and two of measles. (2) One case of local infection: this followed a boil on the scalp, and was true alopecia areata and not the usual type of post-infective alopecia. (3) One case of local trauma: alopecia appeared on the area of trauma to the scalp. (4) One case of pregnancy: patches recurred at each pregnancy. (5) Four cases in which the patient felt unwell before the onset, nothing was found physically, and the cause was not apparently mental in origin.

It may be as well here to mention focal sepsis: 15% showed some degree of carious teeth, a figure which does not suggest that it is a frequent cause of the condition, and 16% had clinically infected throats. The incidence of these conditions is no higher in the severe alopecia cases than in the whole series (Table IV), and I cannot believe that they play a big part in the aetiology.

Thirty-one cases (27%) were found both physically and mentally to be in perfect health.

Prognosis

The prognosis of a case of alopecia areata seen in the early stages is difficult to judge. It seems that most cases recover, but to give a definite opinion is impossible. Later in the course of the disease a generalized fall of hair with complete loss of eyebrows and whitening or loss of eyelashes is grave, and when this generalized loss is rapid the case very rarely recovers. Cases of alopecia totalis without loss of body hair may recover even after a year or more, but alopecia universalis appears to be nearly always permanent. Even if there is some recovery it is rarely lasting and the condition relapses. Two factors in the history have been said to have an adverse effect on the outlook. A positive family history is the first of these. Yet in this series there were 19% with such a history in the 33 severe and persistent cases, compared with 20% for the 81 simple cases. Even if we accept the familial tendency it does not seem to influence the prognosis. Age of onset is another factor mentioned by some, and it will be seen from Table I that the disease appears to have the graver prognosis in children. Walker and Rothman (1950) also found that the prognosis was less favourable for children than adults (50% went on to total baldness, compared with 23% in adults). Of the 32 cases with a previous history of alopecia 6 became generalized, and of the 82 with no previous history 18 took a similar course.

From wigs provided it is estimated very roughly that the incidence of complete baldness in this district must be at least 1 in 5,000, and, presuming a disease incidence of 2–3%, we arrive at the possibility that 1 in 150 patients with alopecia areata can look forward to a permanent disability. The figures given in Table I are purely comparative and are probably far in excess of the true prognosis. Walker and Rothman (1950), however, believe that even in adults 23% of the cases proceed to total baldness, and that 75% of these remain permanently bald. I can account for these high figures only by presuming that they were dealing exclusively with very severe cases from the start.

Of persistent alopecia areata I can say little. I feel that patients with small recurrent patches usually eventually recover, while some of the ophiasis type progress to permanent complete baldness.

Associated Conditions

Five out of the 114 cases had associated vitiligo. The presence of that condition among the population is uncommon, and this incidence of 4% may, I feel, be significant. Roxburgh (1929) found no association with vitiligo

in his series of cases. Nail changes seen in alopecia are interesting and quite common: 13 out of the 24 totalis and universalis cases showed them, and three other cases with simple patches had them in a minor degree. Leuconychia was not included, as this is not uncommon in normal subjects.

Nail changes fall into two groups: (1) longitudinal striations with a serrated nail edge, and (2) the pitted nail not unlike that of psoriasis. Sabouraud (1936) described these changes and said that when they are present the prognosis is hopeless.

Discussion

The aetiology of alopecia areata has been and still is the centre of considerable speculation. Early writers attempted to find one cause for all cases, which, as seen in this series, is a difficult task. There seem to be two likely causes.

The first, and probable, explanation is that the alopecia represents the reaction of the body to stress—i.e., it is, in modern terminology, a disease of adaptation. Barber (1950), in a discussion of psoriasis, included alopecia areata in the same group as psoriasis and thought that they were examples of diseases of adaptation. Stresses which may result in alopecia in a person with the hair as a " target area " are trauma, mental stress, and infection.

The other explanation, a possibility which we must still consider, is that of a virus infection. Since Sabouraud, opinions have been much against infection, but alopecia would agree well with a virus disease. We might visualize a virus which, like herpes simplex, remains dormant in the scalp and which with stress multiplies to cause the primary patch, this being followed in some cases by a general infection and an attack on all hairy parts and the nails. Attempts to infect subjects with alopecia have always failed, but I doubt if this can be taken as conclusive evidence. Epidemics of so-called alopecia areata have also been largely discounted in recent years.

For the present we must content ourselves with the knowledge of the precipitating causes only.

Summary

Alopecia areata was found in 2% of the 15,000 skin outpatients seen in a five-year period, and 2.5% of 320 orthopaedic patients had a past history of the condition.

The present series of 114 cases consists of 81 of simple alopecia areata, 24 extensive cases, and 9 of persistent areata.

The incidence seems to be the same in both sexes, and was not related to the colour of the hair. The disease occurs at all ages but is commonest in the younger age group.

There appears to be a difference in the position of the primary patch between the sexes—male: 60% occipital, 25% fronto-vertical; and female: 27% occipital, 56% fronto-vertical. A previous history of the disease was found in 28%.

A positive family history was present in 19%, but it is doubted if this is really significant of a familial tendency. Other members of the family were affected at the same time in 6% of cases.

Mental trauma was a precipitating cause in 23%. Focal sepsis is thought to play little part in the causation and was no more prominent in extensive cases than in those which recovered. In 27% the health, both physically and mentally, was excellent.

Vitiligo was present in 4% of cases. Nail changes are common in extensive alopecia.

The prognosis is difficult to give in an individual case, but probably less than 1% suffer permanent ill effects. The prognosis is graver when the disease occurs before 10 years of age, but is little affected by other factors in the history.

The aetiology is unknown; alopecia could be either a disease of adaptation or possibly a virus disease.

I wish to thank Dr. H. R. Vickers, Dr. I. B. Sneddon, and Dr. Doris Fletcher for permission to publish this series.

REFERENCES

Barber, H. W. (1950). *British Medical Journal*, **1**, 219.
Brown, W. H. (1929). *Brit. J. Derm. Syph.*, **41**, 299.
Cockayne, E. A. (1933). *Inherited Abnormalities of the Skin*. Oxford Univ. Press, London.
Kinnear, J., and Rogers, J. (1948). *British Medical Journal*, **2**, 854.
Report by Scientific Advisory Committee of Empire Rheumatism Council (1950). Ibid., **1**, 799.
Roxburgh, A. C. (1929). *Brit. J. Derm. Syph.*, **41**, 351.
Sabouraud, R. (1929). *Maladies du Cuir Chevelu, Les Syndromes Alopéciques*. Masson, Paris. Quoted by Cockayne (1933).
—— (1936). In J. Darier, *et al.*, *Nouvelle Pratique Dermatologique*. Vol. 7, chapter 6. Masson, Paris.
Savill, Agnes (1944). *The Hair and Scalp*. Arnold, London.
Walker, S. A., and Rothman, S. (1950). *J. invest. Derm.*, **14**, 403.

TREATMENT OF THYROTOXICOSIS WITH 2-MERCAPTOIMIDAZOLE

CLINICAL IMPRESSIONS

BY

GEORGE L. FOSS, M.A., M.D.

Clinical Assistant, Department of Medicine and Gynaecological Out-patient Department, Bristol Royal Hospital

The use of antithyroid drugs of the thiouracil series is undoubtedly established; however, as with all other treatments of thyrotoxicosis, relapse occurs in some cases and there is also the possibility of toxic effects. In many cases relapse is due to an aversion to continuing adequate treatment with a potentially toxic substance or to accepting its permanent use in maintenance doses in the same way as with thyroid substitution therapy in myxoedema. Thyrotoxic subjects treated with antithyroid drugs should be under supervision at regular intervals by units organized for long-term follow-up, with all the necessary facilities and attention, as with diabetes. In this way the patients would benefit from better control, and an opportunity would be provided for careful and concentrated study of thyroid disease.

With the use of some of the more recently introduced antithyroid drugs the toxicity factor has been much reduced, but not eliminated, and Stanley and Astwood (1948), by employing radioactive iodine tests, have been able to compare the potency of these newer drugs in man. They claim that 2-mercaptoimidazole is approximately five times more potent than methyl thiouracil; and Astwood (1949—personal communication) reports that methyl mercaptoimidazole is about 10 times more potent than 2-mercaptoimidazole.

Stanley and Astwood (1948) have briefly reported the efficacy of treatment with 2-mercaptoimidazole in a series of 20 patients with thyrotoxicosis; they found that 40–100 mg. daily was an adequate therapeutic dose. Even in severely thyrotoxic subjects a dose of 20 mg. sometimes produced nearly complete inhibition of hormone synthesis lasting as long as 11 hours. In others a dose of 20 mg. was only partially effective.

In May, 1949, 2-mercaptoimidazole became available for clinical trial in this country, and this paper reports the results of treatment of a small series of cases.

Toxicity of 2-Mercaptoimidazole in Animals

The acute toxicity of the antithyroid substances varies, according to the experimental animals used, the strains selected, the diet, and other factors. Comparative data obtained in this way will not necessarily give the ratio for man. Astwood (1943a) stated that the minimal lethal dose (M.L.D.) of 2-thiouracil in rats was more than 100 times the dose required to produce a detectable thyroid effect Toxic manifestations in rats were not seen with 2-thiouracil until a daily dose of 100 mg. per 100 g. body weight was exceeded (Astwood, 1943b). Although direct comparisons are unsatisfactory, owing to variations in techniques, it would seem that 2-mercaptoimidazole has an acute toxicity similar to that of thiouracil and that methyl mercaptoimidazole is about seven times more toxic, although much more active. If this is accepted, a comparative therapeutic index may be expressed as follows:

Thiouracil	$\frac{\text{Activity}}{\text{Toxicity}}$	$\frac{1}{1}$	= 1
2-Mercaptoimidazole	„	$\frac{10}{1}$	= 10
Methylmercaptoimidazole	„	$\frac{100}{7}$	= 14

These figures of activity are those given by Stanley and Astwood (1949).

After synthesis in this country both 2-mercaptoimidazole and methyl mercaptoimidazole, which in purity were equivalent to high-grade organic analytical reagents and free from contaminants, were subjected to toxicity trials. In female mice of Schofield strain the LD50 by mouth of 2-mercaptoimidazole was approximately 2.2 g./kg. and of methyl mercaptoimidazole 0.3 g./kg. The former is of the same order of toxicity as thiouracil.

Method and Materials

A group of 18 unselected cases of thyrotoxicosis was used for this trial. Special medical record cards were prepared so that the detailed points in each case could be recorded serially. All the patients received a comp'ete clinical examination followed by measurements of arm–head circulation time (theophylline with ethylenediamine), electrocardiography (E.C.G.), *x*-ray film of chest, blood cholesterol estimation, and a radioactive iodine test. The latter was modified (Foss and Herbert, 1950) from that described by Stanley and Astwood (1948). Thyroxine synthesis was inhibited by 500 mg. of methyl thiouracil or 100 mg. of 2-mercaptoimidazole, administered one to one-and-a-half hours before a dose of 37.5 μc. of ^{131}I was given by mouth to the fasting subject. The percentage uptake of ^{131}I by the thyroid and its dissolution after a dose of 1 g. of potassium thiocyanate by mouth, given at the time of maximum concentration, were plotted against time. Figures of 12% uptake or over have been taken as evidence of toxicity, the upper limit of normal controls under these conditions being 8%. All except four of these cases had not been treated previously for thyrotoxicosis.

Treatment with 2-mercaptoimidazole was usually started with a dose of 20 mg. three times daily, and the patients were seen at intervals of up to 28 days at first and, later, when stabilized, at intervals of six to eight weeks. Each time the general clinical impression was noted, together with records of heart rate and rhythm, blood pressure, weight, neck circumference, blood cholesterol estimation, and subjective and objective evidence of toxicity or myxoedema. When necessary, further E.C.G.s were taken. In this manner a consecutive impression of the patient's reaction to treatment was formed. After progressive control of the thyrotoxicosis on the initial dose, when the patient was in a state of normal or slightly subnormal metabolism, the dose of 2-mercaptoimidazole was gradually reduced. It was intended to follow up this group for at least two years in this manner, but owing to force of circumstances this was not possible.

Of the 18 subjects originally started on this treatment three (Cases 8, 9, and 17) must be excluded, either for failing to take their tablets or for discontinuing attendance. They had all relapsed after previous courses and were not interested in further medical treatment. Brief summaries of the remaining 15 cases are shown in Table I.

Control of Thyrotoxic State

Ordinary Dosage Scheme

Twelve patients were treated with 20 mg. of 2-mercaptoimidazole three times a day, and 10 (83.3%) of these were successfully controlled (Table II). These

TABLE I.—*Case Summaries*

Case	Age	Sex	Duration of Symptoms (Mths.)	Weight Loss lb.	Thyroid Enlargement	Heart Rhythm Rate	B.P.	Eyes E	Eyes LR	Tremor	Skin	Circulation Time (secs.)	Blood Cholesterol (mg./100ml.)	^{131}I % Uptake	Remarks
1	61	F	3	27*	Slight	Reg. 130	170/100	+	+	++	H.M.	7·5	164	16	Anaemia. R.B.C. 3·6 mil. Hb 76%. Some myopathy; glossitis
2	25	F	12	7	Moderate	Reg. 90	140/80	+	N	±	C.M.	8	150	28	Irritable
3	40	F	9	0	Slight	Reg. 100	160/100	+	+	+	C.M.	10	184	20	Strong family history of thyrotoxicosis
4	54	F	18	52	Moderate	A. Fib. 270–300	230/120	N	N	+	H.M.	10	190	17·5	Irritable. Early failure
5	30	F	8	24	,,	Reg. 100	150/80	++	+	±	C.D.	9	164	21	See full case history
6	46	F	3	14	,,	Reg. 88	130/55	+	+	±	H.M.	14	75	16	Onset following hysterectomy
7	47	F	3	16	,,	Reg. 90	130/80	N	+	+	H.M.	15	125	12	Loud bruit over thyroid
10	22	M	7	7	Slight	Reg. 88	145/65	N	+	+	H.M.	14	165	23·5	Suspect pulmonary tuberculosis. Chest *x*-ray film clear. Much psychic trauma
11	26	F	3	16	Moderate	Reg. 128	155/75	N	+	++	H.M.	9	200	23·8	Onset following examination for B.A.; involuntary muscle twitching
12	49	F	12	42	,,	Reg. 134	195/90	+	+	++	H.M.	11	120	31	Early cardiac failure
13	44	F	48	35	,,	Reg. 118	180/80	N	±	+	C.M.	8	205	28·6	Much psychic trauma. Thyroid bruit +
14	63	F	36	5	Moderate adenoma	A. Fib. 140	180/100	N	±	+	H.M.	18	180	19·3	Early congestive heart failure. Large heart. Goitre all her life
15	54	F	6	5	Slight adenoma	Reg. 100	160/85	N	+	+	H.M.	12	198	13	Slight oedema of ankles. Absent axillary hair. Menorrhagia
16	19	F	60	0	Very large	Reg. 110	170/80	N	±	+	H.M.	7	140	18·3	Medical treatment intermittent for 5 years. Several relapses. Mentally defective
18	33	F	6	14	Moderate	Reg. 130	150/90	+	+	±	C.M.	6·5	155	27·3	F.H. goitre and diabetes. Pregnant one month after starting therapy

E = Exophthalmos. LR = Lid retraction. H = Hot. M = Moist. C = Cool. D = Dry. N = Normal. * In conversion to metric equivalents, 1 lb. = 454 g.

TABLE II.—*Details of Dosage and Effects on Progress*

Case	Initial Daily Dose	Time Before Dose Reduced Below 60 mg./Day	Condition at this Time	Time Before Heart Rate Steady	Duration of Follow-up	Maintenance Dose at End of Follow-up	Remarks
1	60 mg.	121 days	Myxoedemic	21 days	10 months	10 mg. t.d.s.	Very well
2	60 ,,	98 ,,	Euthyroid	84 ,,	5½ ,,	10 mg. b.d.	,, ,,
3	60 ,,	84 ,,	,,	28 ,,	8½ ,,	5 mg. t.d.s.	,, ,,
4	80 ,,	100 ,,	,,	140 ,,	6½ ,,	5 mg. b.d.	Very well. Auricular fibrillation changed to normal rhythm permanently after two days
5	60 ,,		Thyrotoxic				Treatment stopped owing to toxic signs. See full case history
6	60 ,,	56 ,,	Early myxoedema	28 ,,	9½ ,,	5 mg. daily	Very well
7	60 ,,	28 ,,	Euthyroid	21 ,,	6½ ,,	2·5 mg. b.d.	,, ,,
10	60 ,,	82 ,,	,,	98 ,,	6½ ,,	10 mg. t.d.s.	Uneventful progress
11	60 ,,	168 ,,	,,	168 ,,	6 ,,	20 mg. b.d.	Very well
12	100 ,,		Early myxoedema	56 ,,	5 ,,	20 mg. t.d.s.	Additional therapy with L-thyroxine sodium 0·3 mg. daily
13	60 ,,	84 ,,	Euthyroid	28 ,,	11½ ,,	2·5 mg. b.d.	Very well
14	80 ,,	56 ,,	,,		2 ,,		Thyroid adenoma removed. Owing to flutter treatment stopped
15	60 ,,	84 ,,	Myxoedemic	28 ,,	8½ ,,	10 mg. b.d.	Very well
16	60 ,,		Hyperthyroid	252 ,,	11 ,,	20 mg. t.d.s.	60 mg. daily inadequate with big goitre; 80 mg. daily produced euthyroid state
18	60 ,,	56 ,,	Euthyroid	56 ,,	8½ ,,	10 mg. b.d.	Very well. Pregnancy progressing. Exophthalmos appeared less with pregnancy

subjects were in a state of euthyroidism (7) or definitely early myxoedema (3) when the initial dose was reduced after 28–168 days (mean 86 days). Of the two remaining patients, Case 5 was treated for only 47 days, when the drug was stopped owing to a toxic febrile illness, but during this time no real change had occurred except for a slight fall of resting heart rate from 106 to 98 a minute. A full account of this case is given under the heading of toxic effects.

Case 16 was treated ineffectively for four months on this dosage, but rapid control was established by increasing it to 80 mg. daily, when a rise of blood cholesterol from 185 to 320 mg./100 ml., and a gain of 2 lb. (0.9 kg.) in weight occurred in a month. At this time the patient showed signs of early myxoedema. She had a very large goitre and had previously received three courses of thiouracil with relapse.

Other Initial Doses

In the following three cases 80 mg. or 100 mg. daily was given.

Case 4.—A married woman aged 54 was seen on September 15, 1949. She complained of attacks of palpitation for four months, loss of weight during the preceding 18 months, nervousness and irritability for two months, and increased perspiration for five weeks; about this time she had sudden attacks of dyspnoea at night. Her appetite was small and she was languid and tired. She was well nourished, weighing 130 lb. (59 kg.), but previously had been rather obese, weighing 182 lb. (82.5 kg.). Her face was expressionless and there were no eye signs. Her skin was fine, hot, and sweaty. She had firm generalized thyroid enlargement but a loud bruit, and a neck circumference of 13½ in. (34.2 cm.). There was a coarse vibrating tremor of her hands and face, and reflexes were brisk. Heart: apex beat in sixth space in the mid-clavicular line, and first sound loud; rapid fibrillation; B.P. 230/120. There was no congestive failure. E.C.G. revealed auricular fibrillation of 270–300 a minute. *X*-ray examination showed the heart size to be within normal limits and the lung fields clear. Theophylline–ethylenediamine circulation time was 10 seconds; blood cholesterol, 190 mg./100 ml. Radioactive iodine test showed a toxic curve—17.5% uptake of ^{131}I.

The patient was admitted to hospital and treatment started with 2-mercaptoimidazole 20 mg. four times daily on September 20. After two days she felt much better and the rhythm was restored to normal, the E.C.G. showing sinus tachycardia, rate 190 a minute. At this stage a punctate irritating erythematous rash developed on the forearms. After 20 days the dose of 2-mercaptoimidazole was reduced to 60 mg. daily, and at the end of a month her weight had increased by 9%, the cholesterol to 240 mg./100 ml., and the heart rate was 108. After 77 days the bruit over the thyroid had disappeared, steady progress had been made, and her weight had increased by 15%—that is, 19 lb. (8.6 kg.). After 100 days her skin was cool; the heart rate was 96, and B.P. 205/115, so the dose was reduced to 20 mg. twice daily, and later to 5 mg. twice daily. The only possible evidence of toxicity was the rash after two days.

Case 14.—A woman aged 63, with an adenoma in the right lobe of her thyroid, auricular fibrillation, and congestive failure, was treated in hospital. After three weeks in bed on 80 mg. daily her failure was controlled; she had gained 2 lb. (0.9 kg.) in weight in spite of loss of slight oedema, and the blood cholesterol had increased from 180 to 260 mg./100 ml. When she was discharged home her skin was cool, dry, and rough, and the dose was reduced to 20 mg. three times daily. After two months treatment was stopped owing to the development of auricular flutter with a 2:1/3:1 auriculo-ventricular block. Later the adenoma was removed surgically.

Case 12.—A woman aged 49 was given 20 mg. five times daily, as she was very toxic, having lost 42 lb. (19.1 kg.) in three months, and had sinus tachycardia of 134 a minute without congestive failure. After 10 days' rest in bed on this dose her heart rate fell to 80 a minute, but she developed an acute confusional state with rapid recovery and transient amnesia. Treatment was stopped for a few days, being then continued with a dose of 20 mg. three times daily. A few more "blackouts" and brief spells of amnesia occurred, but by 84 days there was definite general improvement, a gain in weight of 13 lb. (5.9 kg.)—that is, 9%—and early signs of myxoedema, an increase in thyroid size, and a cool dry skin.

Maintenance Dose

Once a definite euthyroid or early subthyroid state was achieved doses were gradually reduced, but no rigid level can be stated. When this follow-up ceased some patients were adequately controlled after 11½ months by 2.5 mg. twice daily, whereas others—for example, Case 16—still needed 20 mg. three times daily after 11 months, and in Case 12 the dose was reduced from 100 mg. daily to 60 mg. daily with the addition of L-thyroxine sodium, 0.3 mg.

Effects of Treatment

Heart Rate and Rhythm.—The time for restoration to a normal rate was variable, being only one month in six cases but in two others five and six months. With an initial dose of 80 mg. daily one patient (Case 4) with rapid auricular fibrillation of 270–300 a minute was restored to normal sinus rhythm of 190 in two days, but it required 140 days' treatment to reduce the rate to normal. In this case the dose was reduced to 60 mg. daily after 100 days as the patient had in general regained a euthyroid state.

TABLE III.—*Showing Changes in Weight and Blood Cholesterol*

Case	Age	Initial Weight lb	Initial Cholesterol mg %	Months After Starting Treatment: 1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	11
1	61	99	164	102 310		114 350		115			121 490		117 235		121 265			121				118 180	
2	25	109	150	112 225		114 210		117 219		118 215			119 175										
3	40	98	184	107 285		108		110 315		108 265		109 220			108 230				108 220				
4	54	130	170	142 240	143		149 215		153 218			157 190			165 186								
5	30	137	164	139 170			131 160	130 200															
6	46	134	75	143 145		152		156 144		154		154					154	153			153	104	
7	47	121	125	128 360		130 220		133 277			133 235				133 305								
10	22	140	165	145 220		145 195			149 180		152 160				154								
11	26	103	200	115 240			118		119 215		123			124 185									
12	49	140	120	145 185		145 190		153 185		161 210		164 100											
13	44	105	205	105 220		111		116 285		111 200		112		114	210	115		116			117 200		120 340
14	63	128	180	130 260																			
15	54	105	198	117 270		124		127	310		129 205			127	163		129		129 205				
16	19	108	140	108 160		109 174		112 170		114 185		115 320		113 220		107 179		108 175		107 120			
18	33	116	155	120 185		126		129 200		134		140 350		144 275					158 185				

Weight.—The increase in weight was rapid in these patients, and all except two (Cases 13 and 16) showed gains in the first month. After stabilization of the toxic state the weight either remained at a steady level or continued in a few subjects to increase by as much as 20% (Table III).

Blood Cholesterol.—Although single estimations of blood cholesterol are of little clinical value, serial readings were useful in assessing the progress of these cases during treatment. In all these subjects there were significant increases after one month, and the level became high only during the development of frank myxoedema (Table III), but the early onset of the condition was best recognized clinically.

Myxoedema.—It was usual to continue the initial dose of 2-mercaptoimidazole until a euthyroid state was maintained or there was early evidence of myxoedema. After some experience, recognition of these early signs was not difficult. Patients complained of a return of tiredness and loss of energy, a feeling of depression or irritability, sometimes nausea and sickness, or an aching in the thyroid: often a gritty sensation in the eyes, with lacrimation, was noticed. They began to feel cold, and found that hair came out easily when combed. The menstrual loss occasionally became heavier. The diagnosis of the early myxoedemic state was perhaps more readily apparent to an observer who saw the patients at regular intervals. There was slight puffiness of the face, suffusion of the conjunctivae and lacrimation, dryness of the skin, and very soon a husky timbre to the voice. Often the heart rate took several weeks to reach normal after this clinical state was evident. The hair tended to become thin and the nails were sometimes brittle.

Toxic Effects

When considering signs of toxicity one had to be cautious of symptoms due to the thyrotoxic state itself, symptoms referable to cardiac arrhythmia or early failure, anxiety, early myxoedema, or some other unrelated condition. Twelve patients were free from any complaints due to drug toxicity; many of these, however, showed symptoms of early myxoedema at some stage of observation, and one had nausea, which proved to be due to pregnancy. None of this small series complained of sore throat, nor was drug fever seen in any of those treated as in-patients. From the clinical aspect the likely toxic effects can be divided into:

1. *Possible Toxic Effects* (two cases = 13.3%).—*Rash*:—Case 4, described above, had an irritative erythematous rash over the forearms, while she was sweating profusely on the second day of treatment in bed. When the dose was continued the rash cleared. *Arrhythmia*:—Case 14, described above, had auricular flutter with an adenoma. This patient had previously had fibrillation. It was thought advisable to stop treatment, and later the adenoma was removed.

2. *Probable Toxic Effects* (two cases = 13.3%).—*Confusional state and transient amnesia*:—In Case 12, described above, the episodes lasted for only a few hours while the patient was taking 100 mg. daily, with briefer "blackouts" later when on 60 mg. daily. As she had not prevously complained of similar phenomena it was presumed that the drug was responsible.

Case 5: Polyarteritis Nodosa

A married woman aged 30 was seen on July 14, 1949. She had always been nervous, and had noticed prominence of both eyes nine months previously, during which time she had lost 14 lb. (6.35 kg.). She was extremely active and was always busy. Her appetite was very large; she preferred cold weather, but did not perspire unduly, and had only occasional attacks of palpitation. She had had scarlet fever as a child. Her menses had become scanty, lasting four days every 28–30 days. She had a daughter aged 2 years. There was no family history of thyroid disease.

She was fairly well nourished, weighing 137 lb. (62.1 kg.). There was considerable bilateral exophthalmos and lid retraction. Her thyroid was full and soft; neck circumference 14½ in. (36.8 cm.). Her skin was cool and dry, with pigmentation of the

upper lids. The reflexes were brisk and a trace of coarse tremor of the hands was seen. Heart: apex beat in fifth space in the mid-clavicular line, first sound forceful; rate 100 a minute; rhythm regular; B.P. 150/80. E.C.G. and *x*-ray film were normal; theophylline-ethylenediamine circulation time 9 seconds; blood cholesterol 184 mg./100 ml. Iodine, which had been given for seven months by her doctor, was stopped and a radioactive iodine test was carried out a month later. This gave a toxic curve; also the clinical signs of toxicity were now exaggerated. Uptake of $^{131}I=21\%$.

Treatment as an out-patient was started on August 15 with 2-mercaptoimidazole, 20 mg. three times a day. After four weeks she had gained 1% in weight, with slight general improvement; heart rate 106.

After 47 days she had a pyrexial attack with generalized aches, pain in her legs, and some swelling of the ankles. Her doctor stopped 2-mercaptoimidazole and kept her in bed for 14 days. When seen after 73 days she had lost 8 lb. (3.63 kg.) in weight. The heart rate was 98 and regular, no abnormalities were found, and there was no oedema. In view of the complaint of previous pain in the legs, her reflexes and sensation were tested and found to be normal. The E.C.G. was unchanged. Treatment was resumed with 2-mercaptoimidazole, 20 mg. three times a day.

On the 87th day her condition was unchanged subjectively; her weight was the same; her neck measured 13¼ in. (33.7 cm.); the heart rate was 90, rhythm regular, and the first sound was quieter; B.P. 130/75. She complained of slight swelling of her ankles at night. Reflexes and sensation were normal. Her urine was clear; the blood cholesterol was 200 mg./100 ml. Owing to temporary shortage of 2-mercaptoimidazole, she was given methyl thiouracil, 100 mg. three times a day, which she took for two days and then developed tingling in her fingers. Four days later she was admitted to hospital obviously ill. She had signs of peripheral neuritis, with paraesthesia of hands and feet, and some weakness of the small muscles of the hands with diminished reflexes. Her thyrotoxic symptoms were, however, under control: the thyroid was normal in size, the neck circumference 12¾ in. (32.4 cm.), and the exophthalmos unchanged. Examination showed: E.S.R., 45 mm. in one hour; Hb, 90% (13.3 g.); W.B.C., 26,000 per c.mm. (neutrophils 82%). Urine contained a trace of albumin with one or two red cells and a few granular casts. She had some pyrexia and tachycardia. A diagnosis of polyarteritis nodosa was made. The peripheral neuritis progressed rapidly and there was considerable wasting of both arms and legs, with bilateral foot-drop and loss of sensation.

No definite nodules were felt and a muscle biopsy failed to show conclusive evidence of polyarteritis. She was afebrile after three weeks, and the tachycardia settled from 110–160 to 80–90 in four weeks, but by this time her B.P. was 150/120.

When she was discharged from hospital on the 184th day (91 days after admission) there was little improvement in the motor or sensory changes. Heart rate was approximately 110; W.B.C. normal. Her thyroid was normal in size and exophthalmos was definitely less. She was last seen on the 248th day, when she had increased slightly in weight and was able to walk with aid. Her neck measurement was 13½ in. (34.3 cm.); thyroid bruit was absent; heart rate 120; rhythm regular; B.P. 170/110. There was no definite evidence of thyrotoxicosis.

White Cell Counts.—White blood cell estimations were not made as a routine, but only if patients complained of any symptoms that might be attributable to the drug, and in no case was a leucopenia found.

Discussion

The number of cases in this series is too small and the duration of treatment too short for one to form more than an impression of the efficacy of 2-mercaptoimidazole in the doses used to control the thyrotoxicosis. In most patients a dose of 60 mg. daily would seem to be adequate, 10 out of 15 cases (66.6%) were successfully controlled. In three other subjects control was achieved by 80 mg. daily, and another patient required 100 mg. daily. The remaining case was not long enough on the drug for the adequacy of 60 mg. daily to be judged, as toxic signs appeared and treatment was stopped. In general these findings agree with those of Stanley and Astwood (1948).

In Cases 5 and 14 the drug was stopped owing to possible toxic reactions, and in Case 16 it was decided to remove a very large goitre. The remaining 12 patients were adequately controlled on maintenance doses for periods of 5 to 11½ months.

It is unlikely that the rash which appeared within two days of treatment in Case 4 was due to the drug, as she was sweating profusely, and it was irritative and confined to the forearms Further, it disappeared with the continuance of treatment. The change of rhythm from auricular fibrillation to flutter is a doubtful toxic manifestation and is not mentioned in the literature.

It is interesting that the two probable toxic reactions were neurotoxic. Frawley and Koepf (1950) discuss the neurotoxic manifestations described in the literature in relation to thiouracil, methyl thiouracil, propyl thiouracil, and cyclopropyl thiouracil, although, according to Bartels (1948), they constitute only an almost negligible fraction (1.8%) of the total toxic reactions. Confusional states, aural and visual hallucinations, and even toxic psychoses have been seen after thiouracil; numbness of the extremities, vertigo, paraesthesia, and loss of taste after methyl thiouracil; and tingling in the tip of the tongue, numbness of the lips, a burning sensation in the throat, pain in the jaws and facial muscles, and emotional disturbances after propyl thiouracil.

Frawley and Koepf postulate that as thiouracil derivatives depress the peroxidase enzyme system of the thyroid, they may well interfere with other enzyme systems necessary for function of the nervous structures. These authors state that the neurotoxic manifestations may be the first, the sole, or the most pronounced evidence of intoxication with these drugs.

Although a confident clinical diagnosis of polyarteritis nodosa was made in Case 5, it was not proved by muscle biopsy. Astwood (1949—personal communication) had heard of another possible case in his series, then enlarged to 50 cases, treated with 2-mercaptoimidazole, but that case was not under his immediate supervision at the time.

Although the incidence of two cases (13%) showing neurotoxic signs is relatively high, this series is far too small for an assessment to be made, and the true perspective is probably to be obtained from Bartels's (1948) statement that the incidence is really extremely low—1.8% of all toxic reactions. Because of its high activity/toxicity ratio in animals, and this confirmation of Astwood's data, 2-mercaptoimidazole merits extended clinical use in thyrotoxicosis.

Summary

2-Mercaptoimidazole was used for treatment of 15 unselected cases of thyrotoxicosis during periods of 5 to 11½ months.

A dose of 60 mg. daily was found adequate to control the condition in 66.6%. In three other subjects control was achieved by 80 mg. daily. A fourth patient required 100 mg. daily, and the remaining case was not treated.

One patient developed polyarteritis nodosa after 47 days' treatment, otherwise toxic reactions were few and of fleeting and mild nature.

I am greatly indebted to Professor C. B. Perry for his interest, advice, and encouragement; to those members of the consulting staff of the Bristol Royal Hospital who referred cases; and to Dr. Russell Fraser for his criticism. Supplies of 2-mercaptoimidazole were kindly provided by British Schering Ltd., to whom I am also grateful for data on the animal toxicity.

References

Astwood, E. B. (1943a). *J. Amer. med. Ass.*, **122**, 78.
—— (1943b). *J. Pharmacol.*, **78**, 79.
Bartels, E. C. (1948). *J. clin. Endocrinol.*, **8**, 766.
Foss, G. L., and Herbert, R. (1950). In press.
Frawley, T. F., and Koepf, G. F. (1950). *J. clin. Endocrinol.*, **10**, 623.
Stanley, M. M., and Astwood, E. B. (1948). *Endocrinology*, **42**, 107.
—— —— (1949). Ibid., **44**, 588.

INTRAVENOUS IRON IN TREATMENT OF HYPOCHROMIC ANAEMIA ASSOCIATED WITH RHEUMATOID ARTHRITIS

BY

R. J. G. SINCLAIR, M.R.C.P.Ed.

Assistant Physician, Rheumatic Unit, Northern General Hospital, Edinburgh

AND

J. J. R. DUTHIE, F.R.C.P.Ed.

Lecturer in Rheumatic Diseases, Department of Medicine, University of Edinburgh

In a previous communication (Sinclair and Duthie, 1949) we reported the results following the administration of intravenous iron in 23 cases of rheumatoid arthritis with hypochromic anaemia. These cases have now been followed up for periods varying from 7 to 23 months. A further 28 cases have been studied in respect of the haemoglobin response and changes in the erythrocyte sedimentation rate (E.S.R.) following 1 g. of intravenous iron. Iron absorption has been measured in seven cases. In four cases large doses of ascorbic acid have been given in order to assess its effect on the utilization of iron.

Haemoglobin percentages were estimated by a photoelectric colorimeter graduated to register 14.8 g. Hb per 100 ml. as 100%. Westergren tubes were used to measure the E.S.R. Wintrobe's dry mixture of ammonium and potassium oxalate served as an anticoagulant. No correction for anaemia was made, as no reliable method is available. Davis (1946) states that correction for anaemia is usually unnecessary if the Westergren method is used, and that such correction may lead to fallacious results. The moderate degree of anaemia present in most cases of rheumatoid arthritis would be unlikely to influence the E.S.R. to any significant extent.

Results

Follow-up of First Series.—Of the original 23 cases 16 responded to intravenous iron ("ferrivenin"), and seven remained refractory. Of the 16 cases that showed a satisfactory rise in haemoglobin percentage 13 have maintained this level without further iron for periods varying from 7 to 23 months. In the remaining three cases the initial response was not maintained; but all three responded to a second course. Details are given in Table I. Of the seven refractory cases, three received a second course without effect.

Results in Second Series.—Twenty-eight new cases have been given courses of intravenous iron. All were subjected to the same basic regime as the original cases and showed no significant response to oral iron for one month. In 14 cases the preparation used was ferrivenin. A test dose of 50 mg. was followed by 200 mg. daily for five days. In the remaining 14 cases "iviron" was used. A test dose of 200 mg. was followed by 400 mg. daily for two days. Mild toxic symptoms were encountered occasionally with both preparations. These have become very much less frequent since all-glass syringes were adopted in place of glass and metal syringes. In 22 cases a good haematological response was obtained. The average haemoglobin percentage in these cases on admission to hospital was 70. After one month on oral iron it was 71.8. One month after 1 g. of intravenous iron the average figure was 84.3. At three months the average figure was 87.1. In the remaining six cases in this group the response was poor or absent.

TABLE I.—*Follow-up of 16 Cases with Good Haemoglobin Response to Intravenous Iron*

Case No.	Haemoglobin %			
	After 1 Month on Iron by Mouth	Response to Ferrivenin 1·05 g. Intravenously		
		1 Month After Injection	Final Level	Time in Months
1	79	83	96	13
2*	66	87	90	13
3	72	92	92	9
4	68	80	100	23
5	71	90	90	11
6	74	96	96	14
7*		65	84	12
8	76	88	96	17
9	65	78	82	9
10	70	82	93	7
11*	63	83	93	10
12		76	86	13
13	82	97	96	9
14	75	90	96	16
15		75	84	7
16	80	92	100	15

* Required second course.

Iron Absorption.—To ascertain whether faulty absorption of iron from the gut might explain the failure of these patients to respond to iron by mouth, serum iron values were measured after the administration of 18 gr. (1.2 g.) of ferrous sulphate in seven cases. The method used was that described by Dahl (1948). The results are shown in Table II. In all seven cases serum iron values and absorption curves fell within the normal range. In six cases the response following the administration of 1 g. of iron intravenously was satisfactory. In one case no rise in the haemoglobin level followed the administration of a total of 2 g.

TABLE II.—*Serum Iron Absorption (7 Cases)*

Time	Serum Iron Levels μg. per 100 ml.						
10 a.m. (before oral iron) ..	90*	83	66	89	90	75	94
12 noon (after 18 gr. oral iron)	200	126	—	166	150	83	146
2 p.m. ,, ,, ,, ,,	210	250	200	116	150	110	155
4 p.m. ,, ,, ,, ,,	160	83	56	106	80	96	103

* In spite of good absorption curve there was no appreciable rise in haemoglobin level following two courses of intravenous iron.

Erythrocyte Sedimentation Rate.—A fall in E.S.R. was noted in cases responding to intravenous iron in the first series of cases studied. This point has now been investigated in more detail. In 10 cases the E.S.R. was measured daily during the course of injections. The results are given in Table III. It will be noted that in six cases showing a good response the E.S.R. fell sharply, while in the four refractory cases there was no significant alteration in rate. Five cases were selected in which haemoglobin values were 80% or over but in which the E.S.R. was markedly raised. After 1 g. of intravenous iron the rate fell and the haemoglobin percentage rose in all five (Table IV). In Case 5 the

TABLE III.—*The E.S.R. in 10 Cases Responding to Intravenous Iron*

Case No.	E.S.R. (mm. in 1 Hour) Before 1st Injection	Before 2nd Injection	Before 3rd Injection	1st Day After 3rd Injection	Initial Hb%	Final Hb%	Final E.S.R.	Final Time in Days	Response
1	100	39	29	60	57	99	25	50	Good
2	37	21	4	25	78	90	12	19	,,
3	73	38	65	64	60	84	48	30	,,
4	35	33	17	24	79	96	40	67	,,
5	100	100	40	—	69	89	62	24	,,
6	45	35	34	5	76	91	28	49	,,
7	103	102	98	96	66	72	72	59	Poor
8	60	—	96	90	72	79	84	25	,,
9	78	69	69	—	72	75	72	15	,,
10	95	90	97	115	78	70	110	32	,,

TABLE IV

Case No.	E.S.R. (mm. in 1 Hour) Before Injection	After Injection	Time in Days	Initial Hb%	Final Hb%	Final E.S.R.	Final Time in Days
1	90	52	6	87	100	24	102
2	72	40	4	81	96	33	146
3	60	23	11	80	95	42	29
4	70	27	7	81	97	16	90
5	60	48	7	82	97		
5*	90	45	3	78	90	28	133

* Second course.

fall in E.S.R. was only moderate. In five weeks the haemoglobin level fell and the E.S.R. rose again. A second course brought a more marked fall in E.S.R. Haemoglobin percentage rose to 90 and has been maintained at this level.

Effect of Ascorbic Acid.—The plasma ascorbic acid in rheumatoid arthritis is often subnormal (Rhinehart *et al.*, 1937). Tötterman (1949) could find no correlation between plasma ascorbic acid values and the ability of the organism to utilize iron. It was felt, however, that the point was worthy of further investigation. Four patients were given 1 g. of ascorbic acid intravenously on three successive days. There was no significant change in the E.S.R. or haemoglobin percentage. Seven days later the same patients were given 1 g. of ascorbic acid along with each of three injections of iviron (total 1 g.). The fall in E.S.R. and the rise in haemoglobin levels were of the same order as those which followed intravenous iron alone.

Effect of Intercurrent Infection.—A patient whose response to intravenous iron had been good (haemoglobin rose from 80% to 91%) developed a large abscess in the gluteal region. The haemoglobin dropped to 79% in the course of three weeks. The abscess was opened and drained, and the haemoglobin rose to 89% without further iron. The infection recurred, and the haemoglobin again fell to 79%. When healing finally took place the haemoglobin rose to 90% and the E.S.R. dropped from 70 to 20 mm. in one hour.

Subjective Responses.—The majority of patients who eventually show a good response to intravenous iron remark on a feeling of increased well-being and improved appetite immediately after the course of injections, before there has been any change in the haemoglobin level.

Discussion

The response to intravenous iron has now been studied in 51 cases of rheumatoid arthritis with hypochromic anaemia, proved to be resistant to iron by mouth in adequate doses. A satisfactory rise in haemoglobin level was shown in 38 cases; and 13 remained refractory. Of the latter, eight have received a second course, but only two have responded.

Hypochromic anaemia is a common complication of many chronic infections, and in the past has often been ascribed to a toxic depression of the marrow. It has been presumed that the anaemia in rheumatoid arthritis belongs to this group, though the aetiology of the disease remains obscure. Anaemia due to a toxic depression of the marrow would not be expected to respond to iron given by any route. The fact that a significant number of cases do respond when iron is given intravenously in large doses suggests that the anaemia is due to an increased need of the tissues for iron. This demand apparently cannot be met by the oral administration of iron, even though absorption from the gut is normal. Vannotti and Delachaux (1949) and Tötterman (1949) have both shown that in the presence of infection iron given intravenously is rapidly removed from the blood. It is only since preparations of iron which can be given intravenously in large doses became available that it has been possible to show that haemoglobin levels can be restored to normal in some cases completely resistant to iron given by mouth. It seems reasonable to presume that it is only when the needs of the tissues have been met that an excess of iron becomes available for the formation of haemoglobin in these cases. Iron utilization does not appear to be favourably influenced by the administration of large doses of ascorbic acid.

The striking fall in E.S.R. which has been observed in those cases responding to intravenous iron requires further investigation. No readily acceptable explanation presents itself. An increase in the E.S.R. is closely related to alterations in the pattern of the serum proteins (Ham and Curtis, 1938). Detailed studies of the serum proteins before and after the administration of iron by the intravenous route may shed some light on this problem.

Summary

Intravenous iron was given to 51 cases of hypochromic anaemia associated with rheumatoid arthritis. These cases had all proved resistant to oral iron.

A satisfactory rise in haemoglobin levels was shown in 38 cases.

Thirteen cases remained refractory. Eight of these were given a second course, but only two showed a response.

Twenty-three cases have been followed for periods of 7 to 23 months. Haemoglobin levels have been maintained in 13 of these cases without further iron. Three cases which responded initially required a second course.

Iron absorption was measured in seven cases and was found to be within normal limits.

Cases responding to intravenous iron show a rapid fall in E.S.R.

Ascorbic acid does not materially improve the response to intravenous iron.

It is suggested that in rheumatoid arthritis there is a marked increase in the need of the tissues for iron. Only when this need is met by large doses of iron intravenously does iron become available for the formation of haemoglobin.

We are indebted to Professor L. S. P. Davidson for valuable criticism and advice, and to Dr. J. L. Potter, who was largely responsible for the haematological investigations. While this work was in progress the Rheumatic Unit, Northern General Hospital, was in receipt of a grant from the Nuffield Foundation. Iviron was kindly supplied by British Schering Ltd.

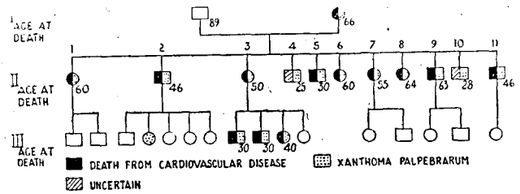
REFERENCES

Dahl, S. (1948). *British Medical Journal*, **1**, 731.
Davis, L. J. (1946). *Practitioner*, **157**, 13.
Ham, T. H., and Curtis, F. C. (1938). *Medicine*, **17**, 447.
Rhinehart, J. F., Greenberg, L. D., Baker, F., and Choy, F. (1937). *J. Amer. med. Ass.*, **109**, 1394.
Sinclair, R. J. G., and Duthie, J. J. R. (1949). *Lancet*, **2**, 646.
Tötterman, L. E. (1949). *Acta med. scand.*, **134**, Suppl. 230.
Vannotti, A., and Delachaux, A. (1949). *Iron Metabolism and Its Clinical Significance*. Muller, London.

Medical Memoranda

Xanthoma Palpebrarum and Cardiovascular Disease

The accompanying family tree, which is self-explanatory, may prove interesting. The conjunction of xanthoma palpebrarum and cardiovascular disease in three generations seems remarkable in view of the wide distribution



of cholesterol in the tissues and the variety of disease syndromes that could accompany disturbance of lipoid metabolism.

Nine members of the second generation were victims of cardiovascular disease. The two remaining brothers had heart disease, but one died from diphtheria, and the information available regarding the other is not sufficient to enable me to be definite about the cause of death.

Sir John Parkinson saw No. 8 five years before her death. He has kindly allowed me to quote from his report and from a later full review of the cardiovascular aspects of the case. I am taking advantage of his offer so as to make this patient's cardiovascular picture clear, and so give a good idea of the disease as it affected the other members. The uniformity of symptoms throughout the group is striking. Sir John notes: "For a few years Mrs. X has been more breathless on exertion, and for 18 months she has also had an upper sternal pain extending into the left arm. This is related to exertion or excitement, and otherwise she is pretty well. Signs on examination are few. The blood pressure is 150/80. Radiographs show no cardiac enlargement. The electrocardiogram does point to coronary disease." In a later review of the case he writes: "It was my opinion that your patient, Mrs. X, had angina of effort. The electrocardiogram shows in Lead I some R–T depression with a diphasic T wave; there is a corresponding S–T elevation in Lead III. This combination, with slight widening of the QRS, seen best in Lead II, points to coronary disease. There was no evidence that she had hypertension then."

Two years later her blood pressure rose and for a time remained at 200/100 and her cardiac reserve fell further, pain coming on slight exertion and sometimes wakening her at night. Her blood pressure later fell to 150/100. She died from coronary thrombosis.

Of four sibs of the third generation, one had extensive xanthoma palpebrarum, angina, dyspnoea on exertion, and hypertension. Symptoms increased slowly over 10 years. Death occurred from coronary thrombosis. Two others had cardiac disease, and both died suddenly.

Other diseases associated with hypercholesterolaemia were not in evidence, nor was any extension of the xanthoma noticed except in Case 8, in which yellow glistening patches appeared under the mucous membrane of the underside of the tongue, accompanied by superficial glossitis. Her cholesterol was 345 mg. per 100 ml., and the Wassermann reaction was negative. In a member of the third generation presenting no clinical signs or symptoms the cholesterol is 230 mg. per 100 ml.

I am grateful to Sir John Parkinson for the use of his reports, and to Dr. Vaughan Facey for reports and cholesterol estimations, and permission to use them.

P. P. MCKINNEY, M.B.

BIBLIOGRAPHY

Darier, J. (1928). *Précis de Dermatologie*, 4th ed., p. 1015. Masson, Paris.
Engelberg, H., and Newman, B. A. (1943). *J. Amer. med. Ass.*, **122**, 1167.
Jones, E. S., and Robertson, P. W. (1948). *British Medical Journal*, **1**, 1137.
MacKenna, R. M. B. (1948). *Modern Trends in Dermatology*. Butterworth, London.
O'Leary, P. A., and Montgomery, H. (1947). *Coll. Pap. Mayo Clin.*, **39**, 374.
Weber, F. P. (1948). *British Medical Journal*, **1**, 1254.

Acute Volvulus of the Stomach

Volvulus of the large intestine is fairly common, volvulus of the small intestine is much rarer, while volvulus of the stomach is very uncommon.

In 1927 Laeven summarized 40 cases of volvulus of the stomach, since when very few additional cases have been recorded. In a review of the literature the following points are stressed: (1) ptosis of the stomach with laxity of its ligaments causing a greater distance between the diaphragm and the stomach; (2) gastric disturbance associated with excessive peristalsis; and (3) congenital weakness of the left side of the diaphragm.

CASE REPORT

A man aged 42 was admitted to hospital on January 3, 1945, complaining of agonizing pain in the upper epigastric region. It had started about four hours before admission whilst he was drinking a glass of beer. He had had stomach pain and flatulence after meals for 12 months.

On examination the appearance of the abdomen was striking, it looked as if he had a football within the upper part of his peritoneal cavity. The rest of the abdomen was of normal size. As the patient was in agonizing pain, a large dose of morphine was given and arrangements were made for an immediate laparotomy. The pulse was 80 and the temperature 97° F. (36.1° C.). The swelling was resonant on percussion. Various diagnoses were made, the nearest being that of volvulus of the large intestine.

Operation.—The abdomen was opened by a left upper paramedian incision under general anaesthesia, and a large tense gaseously distended swelling the size of a football was found. The stomach was seized with ½-in. (1.25-cm.) Duval forceps and a large trocar inserted to relieve the gaseous distension. After all the gases had escaped, the gastric puncture was closed. It was then found that the pyloric end of the stomach, which was very movable, was twisted anteriorly and to the left, lying in the left flank by the spleen, whilst the cardiac end and the adjoining oesophagus was wound round the pylorus and was under the right costal margin. The stomach was twisted and obstructed at both the cardiac and pyloric ends.

After the gastric distension had been relieved the volvulus of the stomach untwisted itself in an anticlockwise direction, which brought it into its correct position. The Duval forceps which had been applied to the stomach and were lying to the left of the abdomen suddenly moved towards the right side. The volvulus had been cured by the simple process of relieving the gastric distension. The anterior part of the stomach was fixed to the anterior peritoneal wall and the abdomen was closed in layers. For several days the abdomen remained very distended and a Ryle's tube was kept in the stomach to relieve this.

Three weeks later the patient left hospital quite well. A small incisional ventral hernia had to be cured twelve months later. He has remained well ever since, has had no symptoms, and has been able to resume his work as a full-time fitter.

P. QUINET, F.R.C.S.Ed.

Reviews

RECENT PHARMACOLOGY

Recent Advances in Pharmacology. By J. M. Robson, M.D., D.Sc., F.R.S.Ed., and C. A. Keele, M.D., F.R.C.P. (Pp. 418; 46 illustrations. £1 4s.) London: J. and A. Churchill. 1950.

Pharmacology still holds an insecure place in the medical curriculum in this country. The reasons for this are varied, but probably the most important is that the people who are now senior physicians and surgeons often found their study of pharmacology unprofitable. The result is that they are anxious to-day to keep the course short and therefore superficial.

All interested in the development of medicine in Britain would do well to spend an hour or two looking at this book by Professor Robson and Dr. Keele. They would realize how closely pharmacology is bound up with the most important aspects of medical research, and how badly fitted to advance medicine is anyone whose knowledge of pharmacology is slight. They might well wonder how far teachers of pharmacology have time to cover the subject as it is dealt with in the book, and they might further wonder whether the study there outlined might not take the place of some of the matter taught in allied sciences.

It is difficult to convey the excellence of this book by mentioning the subjects considered. The last chapter illustrates the use of medical statistics by examining in detail the evidence put forward by the Medical Research Council's committee for the value of streptomycin in pulmonary tuberculosis, and also the evidence of Wright and his colleagues for the value of anticoagulant therapy of coronary thrombosis with myocardial infarction. In this chapter the medical student can learn all he needs to know about statistics. Yet at the present time in some medical schools statistics is being taught as a special subject. Those who read this chapter will see how well the pharmacologist can do it.

The great merit of the book is that all the complicated subjects which have recently come into medicine—as, for example, the use of tracer elements—are explained with great simplicity. The chapter on radioactive isotopes is an excellent short introduction to this subject, containing illustrations very well chosen. The chemotherapy of malignant disease, mutagenic substances, the haemopoietic system, the steroids of the adrenal cortex, and antimalarial substances are all described with evident care for accuracy.

Pharmacologists themselves owe a great debt to Professor Robson and Dr. Keele for this work, and it is to be hoped that they will make full use of the book in their teaching. All physicians, perhaps even professors of medicine, will find it of service, and in reading it may form a different conception of the importance of pharmacology.

J. H. BURN.

RADIOGRAPHY IN SURGERY

Unfallchirurgie im Röntgenbilde. By W. Ehalt. (Pp. 619; 1,379 illustrations, 14 tables. M. 60: schillings 180; or Swiss francs 60.) Vienna: Wilhelm Maudrich. 1950.

The author of this important work is director of the accident clinic at Graz, in Austria. He was formerly for many years assistant to Professor Böhler in his famous clinic at Vienna. For 22 years he has devoted his life to the subject of fractures and other injuries of the bones, and he here presents the results of his experience both from his own clinic and from the vast records accumulated by Böhler himself. The extent of this experience may be judged from the statement that he dealt with 200,000 injured persons and with two million radiographs.

It is essentially a surgical work, although entirely on the services which *x* rays can render to surgery, and the relationship of the radiologist to the surgeon is pleasantly shown in the thanks offered by Dr. Ehalt to Professor Böhler for teaching him how to read a radiograph. The whole volume bears testimony to the immense value of such co-operation and is indeed a triumph of that art.

Although the illustrations with which the text is profusely supplied are not so perfect as those in a recent British textbook, they are sufficiently clear for their purpose, and their value to the surgeon is enhanced by the descriptive notes by which they are accompanied. Surgeons will be interested in the use made of local analgesia, apparently almost as a routine procedure. This again requires a degree of collaboration unusual in Britain. There are many excellent diagrams calling attention to special points in the radiographs. Those of the many and difficult fractures which may occur about the wrist are particularly well conceived.

The whole volume is a masterpiece and deserves most careful study. The German is clear and easy to follow, but an English translation would, we feel, meet with immediate success.

HENRY SOUTTAR.

SURGERY FOR STUDENTS

A Short Textbook of Surgery. By C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.Ed. 5th edition. (Pp. 676; 233 figures, 13 plates. 30s.) London: J. and A. Churchill. 1950.

It is very satisfactory that a new edition of this book has been called for. Few teachers in this era of extreme specialization have a wide enough knowledge to write a textbook of general surgery, yet there is an obvious advantage to the student. There is a uniform presentation of the subject and the balance is more likely to be even than in a textbook by many authors. The problem of writing such a book is immensely increased when the author is determined to keep it to a small compass so that the student can carry it about with him and read it through several times. Professor Illingworth has faced these difficulties and overcome them successfully, as the continued popularity of the book shows.

Yet the book might be even better and more useful if some subjects such as rehabilitation, massage, gynaecology, and the surgery of the special senses had been omitted. All these subjects are taught in departments other than general surgery. There would then be more room to go into the reasons for and against different methods of treatment a little more fully. The book is a little defective in this respect, a restriction obviously imposed by the necessity for brevity.

In this edition there are new sections on surgery of the heart, portal hypertension, and infections of the fingers. We are pleased to see the revision of this last important subject. But surely it is better to give penicillin for paronychia than simply to cover it up with "elastoplast." On page 3 the author must mean saturated, not superheated, steam, which is not so effective as a sterilizing, and is often indeed a charring, agent. Curiously, in the section on thrombophlebitis the author mentions only heparin and does not seem to use dicoumarol, though this drug is mentioned on page 109.

Good features of the book are the lucid instructions for the examination of patients, and the description of the manipulation of joints. In line 26, page 290, "frail" appears to be a misprint for "flail." But one can find only minor blemishes. Students who read this book should possess or have access to a larger treatise on surgery. They will find this book extremely useful as a basis for their wider reading.

C. A. PANNETT.

PSYCHOLOGY OF KRETSCHMER

Medizinische Psychologie. By Dr. Ernst Kretschmer. Tenth edition. (Pp. 304; 23 illustrations. M. 24.) Stuttgart: Georg Thieme. 1950.

In this textbook of medical psychology, which now appears in its tenth edition, Kretschmer gives an authoritative exposition of his school of psychiatric thought. It follows the dominant trends of German psychiatry with its emphasis on descriptive and conceptual systematization, its speculative search for basic principles, its construction of specific terminologies with fine shades of differential meaning, and its preference for the typing and classifying of individual personalities and their traits.

The cornerstone of Kretschmer's system of thought is the hypothesis that a common constitutional matrix links the phenomena of the mind not only with the functions of the brain and endocrine glands, but also with the general body structure. He assumes that, if everything were known, it would be found that a particular mind could occur only in a particular organism of defined structure and physiology. It is common knowledge to-day how far he has succeeded in supporting this hypothesis when he demonstrated that extremes of bodily physique tend to be associated with specific psychological traits or characteristic psychotic syndromes. Some of his clinical findings have since stood the test of more exacting statistical investigations, but Kretschmer's vivid delineation of schematic types will have a more immediate appeal to the psychiatric student for whom the book is intended.

The bias towards typing and constitutional predestination leads necessarily to a disparagement of environmental influences. English psychiatrists may be surprised to read that the repression of previous sexual knowledge in early puberty is biologically determined, or that a psychic trauma in infancy is not a trauma at all, but an early manifestation of constitutional trends.

The form rather than the content of mental phenomena is everywhere emphasized, for the form may have a generally valid biological basis, whereas the content would be fortuitously conditioned by individual experience. When the development of mental characteristics is considered, phylogenetic speculations about the historical past of the human race are introduced, but the historical past of the individual receives hardly any attention.

The new edition has been enlarged by an account of the work of W. R. Hess on the physiology of the brain and by a description of the "orbital lobe syndrome." The latter is based on the clinical observations of Kleist which Kretschmer could confirm and supplement, but there is no reference to the extensive non-German literature on the subject which has appeared since the introduction of prefrontal brain operations in the treatment of psychoses. A brief account has also been added of a new method of treatment termed "fractional active hypnosis." It consists in a graduated training in autosuggestive exercises, and is based on principles similar to those underlying the "autogenous training" of J. H. Schultz in Germany and the relaxation treatment of Jacobson in America.

F. K. TAYLOR.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Handbook of Child Health. By A. Furniss, L.R.C.P., L.R.C.S.Ed., L.D.S., D.P.H. (Pp. 280. 25s.) London: Sylviro Publications. 1950.

John Ferriar: William Osler. By E. M. Brockbank, M.B.E., M.D., F.R.C.P. (Pp. 51. 6s.) London: William Heinemann. 1950.

The Walker Trust Lectures on Leadership, 1930-49. (Pp. 282. 15s.) London: Geoffrey Cumberlege. 1950.

The Inner World of Man. By Frances G. Wickes. (Pp. 344. 21s.) London: Methuen. 1950.

Maternity Care in Two Counties. By F. E Whitacre, M.D., and E. Whiteman Jones, M.P.H. (Pp. 165. 4s.) London: Geoffrey Cumberlege. 1950.

A Guide to Medicine. By I. Geikie-Cobb, M.D., and various contributors. (Pp. 416. 15s.) London: George G. Harrap. 1950.

Handbook for Photofluorographic Operators. Prepared by the Division of Tuberculosis of the Bureau of State Services. Public Health Service Publication No. 18. (Pp. 69. 45 cents.) Washington, D.C.: United States Government Printing Office. 1950.

L'Oxyde de Carbone et l'Oxycarbonisme. By Professor V. Raymond and A. Vallaud. (Pp. 367. 500 francs.) Paris: Institut National de Sécurité pour la Prévention des Accidents du Travail et des Maladies Professionnelles. 1950.

Einführung in die Hals-Nasen-Ohren-Heilkunde. By P. Falk, M.D. 2nd ed. (Pp. 175. M. 19.80.) Stuttgart: Georg Thieme. 1950.

Physiologie und Pathologie des Bilirubinstoffwechsels als Grundlagen der Ikterusforschung. By Tr. Baumgärtel, M.D. (Pp. 271. M. 27.) Stuttgart: Georg Thieme. 1950.

Die Sexualität bei Tuberkulösen. By H. Westermann, M.D. (Pp. 30. M. 2.70.) Stuttgart: Georg Thieme. 1950.

Die Tuberkulose der Haut. By Professor K.-W. Kalkoff. (Pp. 93. M. 7.80.) Stuttgart: Georg Thieme. 1950.

Klinische Physiologie und Pathologie. By F. Hoff, M.D. (Pp. 782. M. 39.) Stuttgart: Georg Thieme. 1950.

Lehrbuch der Inneren Medizin. Edited by H. Dennig. Vol. 2. (Pp. 1,117. M. 39.) Stuttgart: Georg Thieme. 1950.

Did Adelaide Bartlett . . . ? (Christopher Johnson, London; 9s. 6d.) is the first of a series which the publishers are bringing out under the title of "Medical Viewpoint," and it sets a high standard in entertainment. The author, whose pseudonym is said to mask the name of a well-known specialist in anaesthetics, has written a lively account of the events which led to a notorious murder trial in 1886. Adelaide Bartlett was a "small, slim, nicely bosomed brunette," whose husband—a prosperous grocer—died one night in their Pimlico flat from chloroform poisoning. Adelaide was accused of his murder, and "over every teacup and tankard in the kingdom" discussion raged about how the poison got into the victim's stomach. The case gained notoriety from the fact that a young Methodist minister formed the third person in a rather unusual triangle. The book which Gordon Gwynn has written about these real characters is much brighter than most crime fiction, for his wit illuminates the many amusing facets of Victorian life as well as enlivening the slow and inevitable march of justice in a British court. Naturally he uses his special knowledge to discuss the medical evidence which was given at the trial, but the reader feels that the pages he really enjoyed writing were those in which he describes with wicked gusto the commonplace foibles of ordinary people. The author's patients are fortunate if he can pass an endotracheal tube as neatly as he can turn a phrase.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY DECEMBER 2 1950

A FAILING POLICY

Just in what direction is the National Health Service heading? The outside observer, ignoring our capacity —which one day might be exhausted—for muddling through, would be justified in saying, "For the bankruptcy court." Not only are we facing bankruptcy because of the Utopian finances of the Welfare State. We are, as a profession, facing the bankruptcy of a policy, a policy based on the decisions of the Coalition Government during a war for survival and put into execution by a Minister of Health who could not resist the temptation to behave like a Fairy Godmother to an impoverished nation. A foreigner, past the age of being able to subscribe to the social security services, can stay in this country for a few months and then get a set of dentures, two pairs of spectacles, and a completely free medical service without having contributed a farthing's worth of work or of money. While the money spent in this way may be only a drop in a bucket leaking at the bottom and overflowing at the top, the instance nevertheless illustrates the grandiloquent irresponsibility of those who in a rash of paternalism have so thoughtlessly squandered other people's money.

There were two main themes in the National Health Service which appealed to many medical men apart from any views they may have held about the practicability of a comprehensive medical service for the nation after a long and impoverishing war, and apart from the grave doubts they may have entertained about the wholesale intrusion of the State into personal medical services for the sick.

The breathless advances of medical science had left the general practitioner, working on his own, in partial isolation. After the 1914–18 war Lord Dawson had already sensed this, and had suggested as a remedy the practice of general medicine from health centres. The idea of health-centre practice commended itself to the Planning Commission set up by the B.M.A. in the early years of the war of 1939–45. The Health Centre became, by adoption, the principal plank in Mr. Bevan's platform for general practice. From this all sorts of tempting benefits to the general practitioner were supposed to flow: regular hours, regular holidays, co-operative work in a group, all the aids of modern medicine at hand, night shifts, secretarial assistance. Here indeed was the promise of a brave new medical world in which brightly burnished *x*-ray installations in the health centre would relegate the stethoscope to the museum of medical curiosities. The general practitioner has been promised greater opportunities in the hospital life of the country: what has happened at Kingston is fitting comment on this. As to payment, a new deal was promised in the shape of the Spens Committee's recommendations, which advocated a spread of income adjusted to the current value of money, among certain proportions of general practitioners. Now, two and a half years after the appointed day of July 5, 1948, this adjustment is still the subject of miscalculation, postponement, and evasion by the Minister of Health. The financial maladministration of the Health Service has compelled the Chancellor of the Exchequer to say, "Not a penny more!" But this does not excuse the failure to define what should be the terms of fulfilment of the Spens recommendations, even though the circumstances of the country may make it difficult to meet them here and now. The medical profession does not cry for the moon. It asks simply for a clear definition of a contract. On both the medical and the economic front the Minister of Health has failed to do all those things he promised to do for the efficient supply of general medical services to the public.

The recent circular of the Ministry of Health on registrars[1] underwrites the second failure of the Minister, driven though he may be to this by a directive from the Treasury. But the failure nevertheless is his for indulging in fantasies of extravagance. What won over to the National Health Service a large body of consultants between 1945 and 1948 was the promise of an evenly distributed consultant service in the length and breadth of Britain, and an ever-widening opportunity for the young and able to man this service without the financial discouragement and disability that had prevailed in the wicked and recent past. Here was the new charter for the patient in the neglected wilds of the provinces and for the young consultant eager to win his spurs, gilt-edged with the promise of a merit award. And now, just two and a half years after these bright visions were held out before the young, 1,100 out of 2,800 registrars are told they must look elsewhere. The Minister of Health faces the bankruptcy of a policy in the consultant as well as in the general medical services. And what must astound the historian of the future is the failure in what is termed a "Health Service" to enlarge and encourage the Public Health Service, the members of which have perhaps had the hardest knock of all.

[1] *Supplement*, Nov. 18, p. 204.
[2] *The Times*, June 18, 1948.
[3] *British Medical Journal*, 1949, **1**, 293.

On all the three main fronts of the National Health Service the Minister of Health's policy is failing. The honeymoon period of the Welfare State is over. The uneasy marriage between the medical profession and the State is now undergoing the strains of an unbalanced domestic economy. The National Health Service, if it is not to fail completely in its aims, will, we are convinced, have to undergo successive modifications in the next few years. The British Medical Association, it must be recalled, expressed in the years between 1945 and 1948 its "whole-hearted desire" for a comprehensive medical service for the whole of the nation. It did not discriminate between, say, 85% of the population who might find it difficult to meet the cost of modern medicine and the 15% who might afford to do so. Just before the National Health Service was introduced the Chairman of Council publicly[2] announced that the desire of the profession was to make the service a "resounding success." This must still be its desire. So far as it is possible to judge, the public at large welcomes what limited benefits the Service brings to it—principally, perhaps, the benefit of not having to pay directly for medical aid at the time of receiving it. And the public has run riot in the chemist's shop—at what a cost it is only just beginning to discover. The shocking waste of public money over the inessentials of medicine has left little over for what is more urgently needed. Some important drugs are in short supply, not because they are not being produced in adequate quantity but because they cost dollars. Registrars are being sacked because there is not enough money to pay their salaries and, what is more important, not enough to finance the promised expansion of the consultant service.

The people of this country must face the fact that the National Health Service is heading for bankruptcy. Dr. Ffrangcon Roberts[3] foresaw this as far back as February, 1949, when, observing that "through ignorance and miscalculation in its preparation the cost of the Health Service has been grossly underestimated," he prophesied that the alternative to financial ruin would be shortage of personnel and materials. One way in which a sense of realism and responsibility can be induced is the suggestion made in the *Economist* that charges should be made throughout the whole of the Service, charges which will not prohibit the seeking of advice when it is needed. For example, if each person occupying a hospital bed were to pay as little as 5s. a week for board and lodging the total for the country would be considerable; and so would be the total if everyone were to pay, say, 2s. towards the cost of each *x*-ray film and each pair of spectacles. No medical man wants to place a financial barrier between a person and the treatment he or she needs. And no medical man, either, wants to see a financial barrier between a patient and the food he needs. There is no reason why the State should pay the whole cost of the one or the other.

We cannot escape the conclusion that the failure of the Minister of Health to provide a fully comprehensive health service, and to fulfil his obligations to the medical profession, lies in the economic mess that has come from appearing to promise the people of this country something for nothing. It is difficult to see how the National Health Service can be put on a sound footing and the full resources of modern medicine be at the disposal of the public without considerable readjustment of its economy. The medical profession is discontented and disillusioned, not because of payment, or lack of it, for this or that, but because it sees postponed indefinitely the opportunities for improving the medical care of the people.

MEASURING IMPROVEMENT IN RHEUMATOID ARTHRITIS

It is right that, as medical knowledge widens, the attitude to each progressive stride should become more critical. The science of analysis and determination must keep pace with the scientific experiment, and claims of successful treatment must be upheld by means of standardized methods of assessment. The more remarkable the claim the more searching are the analyses and tests needed to convince other physicians. Knowing this, Hench, Kendall, Slocumb, and Polley[1] took immense pains to check their original work with cortisone and A.C.T.H. in rheumatoid arthritis. Other drugs were substituted at times unknown both to clinician and patient, and various functional tests were used to assess objective improvement. This lead has been followed by rheumatologists in this country, and the tests for objective assessment have been elaborated because of the added necessity to obtain definite evidence of response while supplies of the new hormones remain meagre. These tests can therefore now be used in trying other substances which might theoretically have a cortisone-like action.

An example of this kind of work is the report from Dr. O. Janus, of the Manchester Rheumatism Research Centre, published in this issue. His careful study includes details of the method of testing joint tenderness, grip, and blood flow in knee-joints; and these, combined with the eosinophil response, have enabled him to demonstrate the effects of a single dose of 25 mg. of A.C.T.H. Because many more substances will have to be tried and the potencies of different preparations of

[1] *Proc. Mayo Clin.*, 1949, **21**, 181.
[2] *British Medical Journal*, 1950, **2**, 810.
[3] Ibid., 1950, **2**, 849.
[4] *J. Amer. med. Ass.*, 1950, **144**, 365.

A.C.T.H. assessed, this method of testing with a minimal amount of hormone is a very practical contribution. In a recent paper in this *Journal* Quin, Mason, and Knowelden[2] showed that, although subjective improvement was obtained after injections of saline in two-thirds of a series of cases of active rheumatoid arthritis, the degree of objective change measured by such tests as those described by Janus was relatively slight. Copeman and his colleagues,[3] using a small supply of cortisone for a 10-day course of treatment on five patients, confirmed the value of similar methods of assessment and showed that with cortisone the objective improvement was as remarkable as the subjective (results were compared with those obtained after injection of inert material). There is another aspect of the value of the tests which Janus describes. In order to avoid overdosage in the prolonged treatment which is frequently necessary in rheumatoid arthritis, it is important to discover the smallest amount of cortisone or A.C.T.H. which will keep the patient symptom free. Boland and Headley[4] have shown that between 32 and 65 mg. of cortisone acetate was required to control symptoms for long periods in 36 out of 42 patients. On that level side-effects occurred in only 8.3% of the patients, compared with an incidence of 33% in those on 100 mg. per day. After the initial response to high dosage there follows a difficult period of reduction to a maintenance level, for the patient, fearful of a relapse, will be unable to give an accurate assessment of his own condition. The physician, in determining whether improvement is being maintained, will find these objective measurements of the greatest help.

Owing to the scarcity and the consequent high cost of cortisone and A.C.T.H., and the difficulty of importing them into this country, there is naturally a widespread search going on for other substances with a similar effect. In trying some of these, physicians who have discarded carefully controlled methods of assessment and ignored the natural history of rheumatoid arthritis have been misled into believing that a cortisone-like response can be obtained with a number of substances which have later proved disappointing in other hands. Inconsistencies are to be expected, for in her lucid and excellent summary of what is known about the regulation of cortical-hormone secretion (see page 1242) Dr. Marthe Vogt points to certain wide gaps in knowledge and shows how this uncertainty may affect the results of clinical studies. Nevertheless Hench and his colleagues have shown that the scientific method of investigation is as applicable in rheumatoid arthritis as in any other branch of medicine. Contributions now beginning to appear from British rheumatism centres are adding strength to the foundations of this important research.

PAYING THE DOCTOR

In a recent newsletter the Medical Practitioners Union (M.P.U.) puts forward a scheme of its own for increasing the remuneration of general practitioners and altering its distribution. The M.P.U. Newsletter is written simply and without ambiguity and is attractively presented; so attractively, indeed, that one has the impression after reading it that the matter is as good as settled. It starts off with the fair assumption that "we need more money and a new scheme for its fair distribution." It claims that its proposals lead to the abolition of the basic salary, and it advocates a capitation fee which is uniform throughout Britain. It states that as more general practitioners are entering the Service each year than are retiring or dying more money should be put into the central pool in proportion to the increased number of doctors. If the Spens recommendations are to be carried out this would seem to be essential. Under the heading "What a good scheme must do" the M.P.U. lays down eight points that are at least easy to understand. It wants to make it simpler for the new entrant to establish himself in practice and looks upon a list of 2,500 to 3,000 as a size compatible with good work. It makes what seems on the face of it a sound suggestion—namely, that the capitation rate should be uniform throughout the country.

The M.P.U. introduces what it calls the "expense factor" as a method of making it possible for someone to enter practice without undue hardship. Anyone entering practice will, under the M.P.U. scheme, receive £600 a year as an expense factor for a list up to 1,000. For a list up to 2,000 the figure becomes £700, and £800 up to 3,000. The M.P.U. points out that £300 a year is quite inadequate as a basic salary. Although the M.P.U. calls its fixed annual sum an expense factor, it is nevertheless the old basic salary, but made to look more attractive by an increase in size. Not only that, but the M.P.U. is proposing that this basic salary (or expense factor) should be made universal throughout the Service. It is not possible to say how general practitioners would view such a proposal now, but certainly three years ago it regarded a universal basic salary, though small, as the first step towards a full salaried service. The increase in the basic salary (called expense factor) now recommended by the M.P.U. would, it could be argued, amount to a second step towards a full salaried service. And, indeed, when this is linked to a proposal that encourages a further limitation in the size of the list, the full salaried service seems less remote than it used to be. While it may be argued as a general rule that a large list may lead to hurried and superficial work, there are other factors to be considered. First of all, one man can think and act much more quickly than another and so get through more work; or, to put it another way, one man may be much slower than another in making up his mind about a case. Secondly, the point will come where further restriction in the size of the list will seriously interfere with the freedom of the patient to choose his or her doctor. Lastly, it will never be possible to divide equally the number of general practitioners into the total number of the population so that each practitioner should have, say, only 2,200 patients on his list. Nevertheless the M.P.U. scheme does have the merit of what the B.M.A. has proposed in relation to an increase in the pool—namely, that there should be some loading of payment for those with small lists. This in itself would tend to discourage an undue preoccupation with the counting of heads.

The M.P.U. will, we believe, be criticized for its suggestion that there should be extra remuneration for years of service. If a man happens to be a bad or an unsuccessful practitioner, a reward of £20 a year after 10 years of service would not necessarily seem to be a fitting recognition of this fact, and when we couple this with the M.P.U. suggestion that there should be no awards for higher qualifications or special skills we see once again the deadly and inequitable hand of the equalitarian who sees virtue only in numbers and turns away from any idea that quality should have its reward. The fundamental weakness of the M.P.U.'s scheme is that it is not related to the Spens recommendations: to desert the Spens Report is to sail on uncharted seas. It will be interesting to see what the reaction will be of those who have received the M.P.U. booklet and have answered its questionary.

RUTHERFORD MEMORIAL

The 13 years which have elapsed since the death of Lord Rutherford in 1937 have seen the development from nuclear physics of a new branch of applied science which has had a great impact on both medicine and biology, and must have a continuing impact through future generations. Professor P. I. Dee, of Glasgow, has quoted the tribute paid by Niels Bohr to "the one who not only discovered the nucleus of the atom but who revealed the transformations which it can undergo, and finally guided the researches which made it possible to effect those transformations." Dee pointed out that to a gathering of physicists drawn from all parts of the world Bohr had found it unnecessary in his tribute even to mention Rutherford by name. His stature has become greater rather than less with the passage of time, and there is a certain advantage that through the accident of the war and its aftermath the Royal Society should have postponed the launching of its memorial appeal until the Anniversary Meeting of the Society during the present week, for the occasion is now of a wider interest.

Through the operation of atomic piles the production of artificial radio-isotopes has become possible on a scale which could not before have been imagined, and their uses in research on metabolism and the mode of action of drugs and hormones stretch out in an apparently unlimited vista, and with no further reservation than that reasonable caution will be needed in both use and interpretation. On the treatment side artificial radio-isotopes, like radium and *x* rays, offer a means for applying high-energy radiation to the tissues, and there is an expectation, so far fulfilled only to a relatively slight extent, that they will add to the flexibility of the methods available. Finally, there is the problem of radiation damage, which, like cancer, has served to focus interest on the cell, and particularly on genetic changes. A greater understanding of these changes may be not the least of the long-term benefits from the incursion of nuclear physics into biology. In each of these three directions the effects of Rutherford's work can be more clearly seen than in 1937, and the memorial which is proposed to him should be the more widely based on that account. The scheme proposes the establishment of Rutherford Scholarships, tenable for three years by postgraduate students within the British Commonwealth for "research in the natural sciences with a preference for nuclear physics." It was as an 1851 Scholar that Rutherford himself came from New Zealand to England, and Rutherford Scholarships are to be held normally in a different part of the Commonwealth from the country of graduation. Secondly, there is to be a Rutherford Memorial Lecture, to be delivered at selected university centres in the British Commonwealth overseas, of which at least one in three will be given in New Zealand, where he was born and graduated. For these two main purposes an endowment of not less than £100,000 is considered necessary, towards which the sum of £30,000 is already available. The co-operation of each of the Dominions and of India has been secured; and, in the words of Sir Robert Robinson, as President of the Royal Society, "it is unthinkable that the appeal should fail."

DURHAM AND THE DOCTORS

The Durham County Council on Tuesday of this week reaffirmed, by a vote of 77 to 13, its decision to require of its employees membership of a trade union or appropriate body as a condition of employment. The Durham Council, which is, we believe, predominantly Labour in sympathy, thus ignores the expressed wish of the Minister of Health, the wishes of its employees, and the expressed policy of two of the principal bodies concerned—namely, the British Medical Association and the National Union of Teachers. We understand that not one of the 53 medical men and women concerned complied with the request of the Durham County Council by November 22, which was the last date for receipt of evidence of union membership. The policy of the British Medical Association remains unchanged, and the Durham medical officers will be encouraged and helped to withstand this local example of petty tyranny. There can be no doubt that, if the medical officers employed by the Durham County Council stand firm, they will eventually win the day. The B.M.A. and the British Medical Guild have both organizational and financial resources to give their colleagues in Durham firm and resolute support. The duty of the Durham County Council is to see that its citizens are properly supplied with those indispensable medical services that are made available through their medical officers. If the county council wishes to sabotage its medical service by imposing a condition of employment which has nothing whatsoever to do with the ability of its medical personnel to carry out their duties properly, then we may hope that the people who elect Durham's councillors will restore to them that common sense of public management which is supposed to be a British characteristic.

TREATMENT OF THE MALADJUSTED CHILD

Much public interest has been shown in the forthcoming inquiry, called by the Minister of Education, into the treatment of maladjusted children in so far as they come "within the educational system." The need for treatment is an important one, and the problem is harder to

define than it is in other varieties of handicap. Yet in the years 5–15, during which the child is largely in the care of the education authority, most of the behaviour problems which show themselves can be treated; and during the same period, without treatment, they can also become permanently established. In the latter event the child is doubly damaged, for not only is the valuable opportunity lost to help him during his formative years but his education as such will suffer as a result of his maladjustment. In spite of overcrowded classrooms and hurriedly trained teachers, it is not generally true to say that schools dislike the maladjusted child, though his nuisance value is high. Nearly always, however, maladjusted children tend to dislike school, where their poor performance singles them out for unwelcome attention. There are many anomalous situations which will fall to be considered by this committee. Are the child-guidance clinics of the local education authority to remain outside the N.H.S.? Some are adopted; others are not—with resulting differences of salary. Are the clinics to be staffed by educational psychologists, and if so should they confine their activities to educational problems? If they attempt to do this, who is to select the cases and what, if any, place does psychotherapy claim? Are these clinics foundering under an overwhelming load, with unmanageable waiting-lists, and, if so, what is to be done about it now that an economy drive is in full swing? Much of this work links with home care, or the lack of it, and with the problems of the broken home and parents out at work. How closely can the educational system be expected to work with parents? Shall the schools take over more, or less, of the parental function? These and many other questions will need to be met and answered. A committee of inquiry enables problems to be pooled and responsibility for solution shared. Public opinion did much to reinforce the inquiry undertaken by the Curtis Committee, and it is to be hoped that parents in general will continue to show their interest and thus help to make the work of the new committee a success.

HIGHER PAY IN ARMED FORCES

Increases in pay for medical officers in the armed Forces, which are to be retrospective to September 1, have been announced and are published in the *Supplement* at page 228. No doubt they will be received with mixed feelings—of pleasure that they have at last been made and disappointment that they are not larger. The Armed Forces Committee of the B.M.A. during the last two years has closely examined rates of pay throughout the medical branches of the Services, and has spent much time negotiating its proposals for bringing them into line with the remuneration that may be expected in the National Health Service. Though events have overtaken these negotiations, which were delayed not through any fault of the committee, the careful analysis that the committee made forms a useful comparison against which to judge the new rates.

The armed Forces have for some time found great difficulty in recruiting enough regular medical officers. Indeed, the establishments are well below strength, particularly of specialists. To remedy this the Armed Forces Committee proposed rates of pay that, so far as some incalculable factors allowed, would make the Services as financially attractive as the National Health Service to young doctors with the choice of their career before them. The Government on the other hand seems to have taken for its standard of comparison not the attractions of civil life but the new rewards obtainable in other branches of Service life. The main problem, therefore, of inducing doctors to make their career in the Services—in so far as it is a financial problem—is likely to remain unsolved. The Government may argue that it has done justice within the sphere of the armed Forces, but it seems to have limited its vision to equity rather than considered Service needs.

The increases for general duty officers are considerably lower than the B.M.A.'s proposals, especially in the middle ranks, where the Association considered that improvement was most needed. They represent in an average career a lead of about 8 to 10% over corresponding civilian remuneration. But the B.M.A.'s statement on these increases concludes: "It is probably fair to state that the new remuneration of general duty officers is not unreasonable in comparison with civilian life." It is the new rates for specialists that are most obviously inadequate. They are unlikely to attract any more to ranks already so depleted that the desperate measure of advertising for civilians at preferential rates of pay has been resorted to in the past. A second-rate, understaffed, and dissatisfied service may well be created if the pay is not reconsidered. At present the scales roughly correspond to those of senior hospital medical officers in the National Health Service. In other words this is an attempt to get specialists on the cheap. The Government may be relying on its aptly timed tocsin to registrars to frighten some of then into joining the Services, there to become specialists. But economic pressure of this kind is shoddy administration, and, by its injustice, will create more unrest and resentment.

National Service medical officers will receive the increased rates of pay only in their last six months of service, and they will not receive the full rate of marriage allowance. This decision, made in spite of the representations of the Armed Forces Committee, is likely only to increase the Government's difficulty in staffing the medical branches of the Services. These men already fill many gaps left by the absence of regular officers. In future an increasing number of them will be tempted to do their National Service before they start their medical training and thus avoid being called up as medical officers.

TEETHING TROUBLES

A simple question and answer in "Any Questions?" (October 28, p. 1013) has provoked some criticism, including a letter which is published on another page of this issue. It is easy to take the extreme view that teething produces nothing but teeth, and against the quotations from Finkelstein and Fischl quoted by our correspondent may be set one from Still[1]: "I would protest against the tendency nowadays to assume that because dentition is a physiological process therefore it is incapable of causing disturbance of health." The question which was posed read as follows, "Can any infant ailments, beyond local

[1] *Common Disorders and Diseases of Childhood*, 1927, London.

reaction, be justly ascribed to teething?" The answer stated that since the cutting of teeth appeared to be painful it led to restlessness and sleeplessness. It went on to suggest that in the child predisposed—for example, by rickets or by virtue of being an epileptic—convulsions might occur. The evidence for this is clinical observation, and Still describes the baby with occasional twitching associated with swollen gums which ceases when the tooth has come through. It is of course likely that with the virtual disappearance of rickets and a higher standard of child care this phenomenon is no longer seen by the present generation of paediatricians, but it seems difficult to dismiss the observations of such a great observer as Still.

The answer then went on to discuss what might happen when teething caused a stomatitis. It is, of course, arguable that such inflammation of the mouth is not directly the result of the dentition but due to the child pushing infected articles into the mouth in an effort to reduce the pain. Even if indirect, however, the clinical fact remains that a number of babies have what appears to be some infection of the mouth and gums during the cutting of a tooth. From such local inflammation, again perhaps more frequently in the debilitated child, local spread to the respiratory tract may occur—pharyngitis, otitis, bronchitis, and even pneumonia were mentioned in the answer, and critics have doubted this. They have also doubted the occurrence of diarrhoea and vomiting due presumably to parenteral causes. Still again is an authority for at least "bronchial catarrh" and "slight looseness of the bowels." He admits with characteristic modesty that the causal relation of dentition to various disorders rests "upon no more solid basis than the observation of many cases." For those who still persist in denying that teething can cause any symptoms of disturbance Still has a final word to say when he mentions the occasional pain and fever associated with cutting of the third wisdom tooth. With this as with the majority of healthy babies, however, disturbances are minimal, and it would be agreed that the "diagnosis" of teething is dangerous if made by the unqualified and not without its perils when made by doctors. It is too sweeping surely to go on to deny the relationship between dentition and certain upsets, rare although such disturbances may be to-day. Critics of our expert's answer might with advantage re-read Still's essay of eight pages on "Disorders associated with Dentition" in the first chapter of his book already quoted.

PROTEINS AND THE CLINICIAN

It is hardly surprising that the progress of protein biochemistry should immensely influence the progress of medicine. Not only are many hormones and many bacterial toxins protein in nature, but the protoplasm of every cell of every tissue is basically an assemblage of protein molecules of various kinds. Myosin, the fundamental contractile stuff of muscle, keratin of skin and nails and hair, all the enzymes of metabolism, haemoglobin and the albumin and globulin of blood—all are protein, all are the study of the protein chemist in his back room, and on his results depend the preparation of toxoids, the understanding of immunity, the treatment of burns, anaemia, oedema, and shock, and of metabolic disorders such as diabetes.

Elsewhere in this issue Professor E. C. Dodds discusses some aspects of the chemist's work, the possibility that he may find a simple, easily synthesized peptide to use in place of the scarce A.C.T.H., and the continued struggle to discover the secret of insulin, which because it is such a stable, easily handled protein has been the most studied of all. There are useful by-products of this kind of research even when the main goal is not attained. "Synthalin" (decamethylene diguanidine) was an early attempt at a synthetic substitute for insulin which proved unsuitable for treating diabetes but fathered a whole range of diamidines valuable for kala-azar and trypanosomiasis.[1] One strand in the development of British anti-lewisite was the study of the way arsenic is bound to sulphur in the keratin of hair.

It is perhaps in the handling of blood, however, that the chemist has so far had his greatest triumph from the clinician's point of view. The large-scale manufacture of dried plasma[2] and its fractionation[3] have yielded serum albumin for use in shock, γ-globulin which contains antibodies for passive immunization against measles and infective hepatitis, purified anti-haemophilic globulin, and concentrated Rh typing sera. The separation of fibrinogen and prothrombin from plasma has made available fibrin foam and film for various surgical uses: haemostasis, repair of the dura mater, dressing of burns and superficial wounds, removal of small renal calculi, etc. All this is based on laboratory work by protein chemists. The possibility of using animal blood for human transfusions, as yet not satisfactorily realized, is nothing more nor less than a problem of protein chemistry.

Knowledge of protein chemistry enters, or ought to enter but is all too often ignored, in another field of medicine—clinical pathology. Not only is the plasma protein level routinely measured but also the erythrocyte sedimentation rate (which depends on the state of the plasma proteins), and blood tests for cancer[4] or other diseases are often devised by clinicians. Many of the investigations of this kind would never be attempted, or would be planned differently, if their authors were more aware of modern physico-chemical knowledge of plasma proteins.[5,6] The plasma contains a complex of many proteins, all sensitive to small changes of salt concentration, *p*H, and the actions of many reagents (including traces of soap). The clinician and the clinical pathologist have drifted too far from the biochemist in this field of knowledge. It is a gap which needs bridging.

We record with regret the death in Belfast on November 26 of Sir William W. D. Thomson, professor of medicine at Queen's University, Belfast. He was 65 years of age. An obituary notice will be published in next week's *Journal*.

[1] Yorke, W. (1944). *Brit. Med. Bull.*, **2**, 60.
[2] Cohn, E. J. (1945). *Science*, **101**, 51.
[3] Janeway, C. A. (1949). *Adv. Int. Med.*, **3**, 295.
[4] Annotation (1950). *British Medical Journal*, **2**, 1213.
[5] Schmidt, C. L. A. (1944). *Chemistry of the Amino-acids and Proteins*, 2nd ed., Springfield.
[6] *Advances in Protein Chemistry* (annually). Interscience, N.Y.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MENSTRUAL DISORDERS AND THE MENOPAUSE

II. MANAGEMENT AND TREATMENT

BY

P. M. F. BISHOP, D.M.

Endocrinologist, Guy's Hospital and Chelsea Hospital for Women; Senior Lecturer in Endocrinology, Department of Obstetrics and Gynaecology, Postgraduate Medical School of London

Treatment of Menstrual Disorders

Induction of Ovulation

We have already seen that ovulation probably depends on achieving a certain ratio between the waning level of follicle-stimulating hormone and the rising level of luteinizing hormone. Moreover, in individual cases other essential conditions, such as responsiveness of the ovary to gonadotrophic stimuli, may also be absent. It is true that very large doses of chorionic gonadotrophin, such as 10,000 to 20,000 i.u. daily, will prolong the life of a normally established corpus luteum. True pituitary gonadotrophins, not yet marketed, have also been shown in isolated experiments to bring about changes in the human ovary. Nevertheless, no gonadotrophic extract at present generally available has been convincingly shown to induce ovulation in women suffering from non-ovulatory menstrual disorders.

Failure to ovulate and the consequent menstrual disturbance are often symptoms of some general metabolic, nutritional, or psychological disorder, and the ovarian failure will right itself only when the patient's normal health is restored The empirical use of thyroid extract may be justified in such cases. Failure to ovulate *per se*, however, is serious only when it is the cause of infertility, and it is only in this connexion that attempts to induce ovulation seem worth while. Crude attempts to imitate the secretions of the ovarian cycle are sometimes successful in inducing one or two ovulatory cycles, perhaps by conditioning the pituitary in some way to restore normal gonadotrophic activity temporarily. Three courses of stilboestrol (0.5 mg. daily for 21 days) and ethisterone (30 mg. daily from the 14th to the 21st day) with a week's interval between each course, during which bleeding should take place, may occasionally be followed by one or possibly two spontaneous ovulatory cycles—as judged by the temperature records—even in patients suffering from non-ovulatory amenorrhoea. If the patient and her husband have been carefully coached in the interpretation of the temperature records and told to have intercourse immediately the temperature rises from the pre-ovulatory level, there is a chance, theoretically at any rate, of conception occurring.

Oestrogen Haemostasis

It was postulated in Part I of this paper (*Journal*, November 25, page 1214) that uterine bleeding can be arrested if the effective concentration of oestrogen is either lowered beneath or raised above the "bleeding threshold." Progestogen "neutralizes" the effect of oestrogen on the endometrium, and androgen probably acts as an anti-oestrogen. These two hormones, therefore, will lower the effective concentration of oestrogen, though it may be some days before the bleeding stops, and in many instances the treatment is ineffective. To raise the oestrogen level above the threshold is a more rapid and certain way of bringing about haemostasis, and bleeding may abate or cease within a few hours to a day. Oestrogen should be given repeatedly and in high concentration to achieve this object, and toxic side-effects must be expected. It is therefore probably better to avoid using stilboestrol.

Not only is ethinyl oestradiol less likely to produce vomiting but it is the most potent orally active oestrogen available: 0.15 mg. should be given every two hours. If sickness occurs it may be worth while substituting 5 mg. of the conjugated equine oestrogens preparation (distributed in this country by John Wyeth and Brother, Ltd., under the trade name "strogene"), though in these high concentrations toxic effects may accompany the administration of even this "natural" oestrogen and make it necessary to resort to injections of oestradiol benzoate, 100,000 i.u. every four to six hours. This is, of course, "heroic" treatment, and it should be reserved for desperate cases, in which, as the result of prolonged flooding, the patient is becoming exsanguinated and the relatives distracted. An oestrogen withdrawal bleeding may take place two or three days after the treatment, but it is usually moderate in amount and should cause no trouble.

Progestogen Withdrawal Bleeding ("Medical Curettage")

The nature of the bleeding after withdrawal of progestogen with its complete shedding of the endometrium has already been discussed. If the endometrium has been previously primed with endogenous oestrogen, adequate quantities of progesterone will usually induce a "medical curettage." It is possible, therefore, to forestall an episode of metropathic flooding, which generally begins only after some weeks of amenorrhoea, by producing a progestogen withdrawal bleeding at a relatively early stage of this non-bleeding phase. The metropathic flooding can in fact be repeatedly forestalled by performing these medical curettages regularly at four-weekly intervals using injections of 25 mg. of progesterone (dissolved in 1 ml. of oil) on alternate days for four doses (see Fig. 3), or by giving 30 mg. of ethisterone daily by mouth for a week.

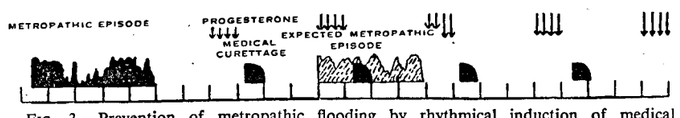


FIG. 3.—Prevention of metropathic flooding by rhythmical induction of medical curettage by progesterone.

By the use of oestrogen haemostasis and medical curettage the bleeding of a metropathic phase can be arrested and the next one prevented by superimposing a regular, though artificial, "normal" bleeding pattern on the unpredictable, irregular, and sometimes incapacitating metropathic pattern. One is not, however, attacking the cause of the metropathia, which is failure to ovulate. Nevertheless, this type of menstrual disorder is prone to undergo spontaneous remission. This is especially true in adolescent girls who have their menstrual and reproductive life before them, and in whom a hysterectomy is therefore unthinkable. It is less true of women in the pre-menopausal age, when failing ovarian function is physiologically progressive until the menopause finally supervenes. At this age, hysterectomy or the induction of a radium menopause are reasonable alternatives to irksome endocrine therapy, especially if this does not go entirely according to plan.

Between these two extreme age groups there is the woman in her thirties. If she is anxious to start a family or to have more children it is obviously desirable to persist with conservative treatment in the hope of a spontaneous remission occurring (for, of course, she will not become pregnant so long as the non-ovulatory pattern lasts). If, however, she has made her family or is a spinster the fact that she is under 40, or any other arbitrarily chosen age, should not be the deciding factor in refusing her a hysterectomy if endocrine therapy fails, or is irksome, or requires to be indefinitely continued. The social, domestic, and wage-earning factors should decide the choice of treatment, and it should be emphasized that endocrine therapy does not cure, but merely prevents, the manifestations of the condition.

If it is eventually decided to embark on hysterectomy the following considerations should be borne in mind: (*a*) one-quarter of the patients will develop menopausal symptoms within two years of the operation if there is no operative interference with the ovaries. (*b*) If some ovarian tissue is resected one-half of the patients, and (*c*) if all ovarian tissue is removed all the patients, will develop menopausal symptoms which in the case of bilateral ovariectomy may be severe, indefinitely prolonged, and not easily controlled. (*d*) One-third of the patients, even if there is no operative interference with the ovaries, will suffer noticeable loss of libido after the operation. Despite this, in over 300 patients who had undergone hysterectomy and were subsequently personally interviewed, less than 10% regretted having consented to the operation.

Androgen Treatment of Menorrhagia

It has been shown that menorrhagia is probably associated with relative failure of corpus luteum development and progesterone secretion, and that this prevents adequate "neutralization" of the oestrogenic effect in the second half of the cycle Bleeding therefore results in incomplete shedding of a poorly developed secretory endometrium and may occur early and be prolonged and excessive. It might seem logical in these cases to supplement the inadequate endogenous progesterone with exogenously administered progestogen. In practice this proves disappointing. Small doses of androgen, however, seem to diminish the amount and duration of bleeding, so that it becomes tolerable in a number of cases. How this comes about is difficult to explain: possibly the results of the disordered balance between oestrogen and progesterone caused by the relative progesterone failure are rendered less conspicuous if androgens, which may antagonize the action of both ovarian hormones, are used. Methyl testosterone, 10 mg. daily by mouth, should be given for two months.

The moderation of the bleeding pattern may persist for some months after the course of androgens is completed. In any case it is important not to give androgens longer than for two months continuously, and at least a month's interval should elapse between successive courses. Even so, undesirable side-effects very occasionally occur, for there are undoubtedly some, though probably very few, women who are abnormally sensitive to the masculinizing effects of androgens. Mild hirsutism, especially of the upper lip, acne, and, very rarely, hoarseness develop. If this occurs androgen therapy should be discontinued immediately. Fortunately these effects are almost always reversible. It has been suggested that side-effects are more likely to occur in brunettes than blondes, and in women who already show a tendency to hirsutism. Though it is, of course, important to dwell at some length on these undesirable side-effects, this should in no way detract from the use of androgens in menorrhagia, which is surprisingly satisfactory.

Inhibition of Ovulation as a Remedy for Dysmenorrhoea

It is generally agreed that progesterone may cause uterine contractions so strong as to lead to temporary ischaemia of the muscle, with pain similar to that experienced in angina or intermittent claudication. Furthermore, it seems certain that dysmenorrhoea—that is, the so-called spasmodic dysmenorrhoea—does not occur in non-ovulatory cycles, and that exogenous administration of progestogen may actually induce or increase the pain. It has been asserted that the effects of endogenous progesterone may be modified by giving oestrogens in the premenstrual phase of the cycle, but these claims have not been substantiated, and the underlying reasoning is not easy to understand. It seems well established, however, that if endogenous progesterone can be prevented from appearing, by inhibiting ovulation, dysmenorrhoea will not accompany the subsequent uterine bleeding. Ovulation is best inhibited by giving oestrogen early in the cycle. Stilboestrol, 3 mg. daily (or its equivalent), beginning on any day up to the fifth day of the cycle and continued for 14 days, will almost always inhibit ovulation and give rise to a scanty, painless oestrogen-withdrawal bleeding within two or three days of the end of the course.

In order to avoid more or less continuous oestrogen administration a subsequent course should not begin for at least a week after the completion of the preceding course. If the dose has not proved to be large enough to be effective the cycle will either be of normal length and the period painful or else the period will be delayed, usually by about a fortnight, and be painful when it takes place. This prolonged cycle is due to the fact that the dose of oestrogen has been sufficient to inhibit the secretion of follicle-stimulating hormone so that the events of the early part of the cycle are held in abeyance until oestrogen administration ceases, when the normal cycle will begin to unfold, culminating in ovulatory and therefore painful bleeding, which is, however, a fortnight late.

It will be seen that considerable care on the part of the doctor and co-operation on the part of the patient are required to achieve successful results. Furthermore, there is little reason to suppose that oestrogen therapy will affect any cycle other than the one during which it is administered, or that it will play any part in the permanent "cure" of the dysmenorrhoea. Nor, on the other hand, is there any likelihood of permanent harm resulting from this form of oestrogen therapy if at least a week's interval is allowed to intervene between successive courses.

At best this method of treatment can be regarded as a fairly efficient way of tiding the patient over until spontaneous remission supervenes, as it often does during the third decade or after childbirth. At worst the method will be considered an irritating and exacting exercise in "timing," which the impatient doctor and the casual patient will soon abandon by mutual, though perhaps tacit, agreement.

It is beyond the scope of this article to deal with the psychogenic element in dysmenorrhoea or with such therapeutic measures as sex hygiene, cervical dilatation, and

pelvic neurectomy. In spite of these other methods of treatment the doctor may find himself anxious on many occasions to give endocrine therapy a trial.

The Menopause

The reason why both patients and doctors hold such different views on the subject of the menopause, the severity of its symptoms, the need for treatment, and the efficacy of various therapeutic measures depends on the following considerations.

Variation in Severity of Climacteric Symptoms in Different Women.—Hot flushes, for instance, occur in 95% of menopausal women, but in some they are mild and unheeded, whereas in others they are drenching, exhausting, and so frequent that the patient is completely incapacitated.

Changing Attitude of Successive Generations of Women Towards the Menopause.—The Victorian stoic resigned herself to the condition as something she just had to put up with: the mid-twentieth century cynic regards it as her right to demand all possible assistance in bearing an unfair burden practically unknown to and hardly ever appreciated by the male sex.

Variation in Attitude of Individual Doctors to Their Menopausal Patients.—Some doctors consider the condition of little consequence; others have little faith in any form of specific therapy; others believe that every woman, however mild or severe her symptoms, can receive benefit from oestrogen therapy.

Variation in Emphasis on Type of Symptom of which the Patient Complains.—"Nervousness," excitability, irritability, and disturbed sleep call for sedatives; depression, loss of confidence, and emotional instability need reassurance and common-sense psychotherapy; whereas hot flushes, sweating, headaches, and giddiness may respond to oestrogen treatment.

The Doctor's Previous Experiences with Oestrogen Therapy.—Those who have found it ineffective will be less inclined to prescribe it again.

It is clear that each case must be assessed individually, and that neither the type of treatment indicated nor the response to be expected will be the same for every case.

First, one must be sure that one is dealing with the menopausal syndrome. It may appear months or even years before the menses cease; on the other hand, it may not develop until months or even years after menstruation has ceased; moreover, it may last for many years; and, finally, the diagnosis does not depend on the patient's age but on the waning function of her ovaries. It is as wrong to regard every symptom that appears during the fifth decade as menopausal as to refuse to recognize that in a woman below the age of 30 hot flushes may be due to ovarian deficiency. The syndrome is made up of a variety of vague and bizarre complaints, such as indefinite aches and pains, numbness and tingling, and formication, though the most characteristic are hot flushes, depression, emotional instability, irritability, insomnia, palpitations, giddiness, lack of concentration, failing memory, headaches, and paraesthesiae.

Treatment of Menopausal Symptoms

(1) *Reassurance and Common-sense Psychotherapy.*—The impact upon the patient of this strange multitude of complaints may upset the poise she has developed in the course of years. She may fear cancer or some chronic and crippling illness which will make her an invalid. She may, on the other hand, recognize that this is the "change" but may have learnt to dread its consequences from the grim accounts she has received from her women friends. She may fear the effect on her husband of her "lost womanhood." She may resent this blunt reminder of her matronly middle age. Her deteriorating memory and lack of concentration; the inconvenience, embarrassment, and loss of sleep caused by her hot flushes; the loss of confidence in herself, which may be aggravated by attacks of giddiness and palpitation; and perhaps the lack of sympathy which she detects in her own family circle, whom she suspects of resenting her increasing irritability, often send her flying to her doctor in search of that understanding which she so misses in her own home. She needs patient, sympathetic reassurance, with a careful analysis and explanation of her symptoms. She needs to be told that she is not suffering from cancer, that there is no fear of insanity, that her irritability and emotional instability are not her fault, and that something can be done to help her to weather this fleeting climacteric storm.

(2) *Sedatives.*—The climacteric is a time when the reaction of the woman to her environment becomes maladjusted. She becomes unduly sensitive to every little noise, and every afferent impulse is recorded in the sensorium with undue emphasis. She becomes "nervous," excitable, easily fatigued, and irritable, and she sleeps badly. All this clearly indicates the need for sedatives, mild enough to enable them to be prescribed more or less continuously. Phenobarbitone is an ideal preparation. In many cases a combination of patient, sympathetic handling, reassurance, and sedatives may be sufficient to overcome the effects of the syndrome, and more specific treatment is not required.

(3) *Oestrogen Therapy.*—It must always be borne in mind that, however strange and varied are its manifestations, the syndrome is primarily due to declining oestrogen secretion, and that not only are some symptoms, such as the hot flushes, directly due to this but that oestrogen therapy may lead to general beneficial effects. It is therefore probable that in most cases the maximal benefit will be derived from a combination of reassurance, sedatives, and oestrogens.

It might seem reasonable to argue that, if one wants to be sure of overcoming the results of oestrogen lack, it will be wise to give large doses of oestrogen. In fact, however, this is not the case, and high-dosage oestrogen therapy is probably responsible for most of the failures of this form of treatment. The woman whose ovaries are failing or who has recently undergone oestrogen deprivation is exceedingly sensitive to exogenous oestrogen and will nearly always react favourably to small doses. For instance, it is practically never necessary to give more than 1 mg. of stilboestrol (or its equivalent) daily, and results can often be obtained with as small a dose as 0.1 mg. daily. A useful dosage scheme is to give 0.1 mg. thrice daily for three weeks: if improvement occurs the optimal dose between 0.1 and 0.3 mg. daily is determined; if there is no improvement the dose is raised to 0.5 mg. daily for another three weeks, and if necessary to 0.75 mg. daily for a further three weeks. Once the optimal daily dose has been found, repeated attempts should be made to lower it so that the patient is "weaned" as soon as possible. In order to assess the results more easily the patient may be instructed to keep a daily record of the number of her hot flushes. Decrease in the number will provide semi-objective evidence of progress.

Initial large doses raise the threshold of response to oestrogens, so that larger and larger doses will be required; even then the patient may "escape" from the oestrogen control and begin to experience hot flushes again.

Side-effects are more likely to occur with large doses than with the minimal effective dose.

(*a*) *Nausea and Vomiting.*—Menopausal women are specially sensitive to oestrogens and therefore particularly liable to exhibit "toxic" effects. For instance, 1 mg. of stilboestrol, (or its equivalent) daily will induce nausea in most menopausal women. If the patient shows intolerance, even to minimal effective doses, some other oestrogen should be employed, preferably a natural oestrogen such as "strogene."

(*b*) *Uterine Bleeding.*—Although this is almost certain to take place if large doses are employed, it not infrequently occurs if small doses (even as low as 0.1 mg. of stilboestrol daily) are used continuously for a prolonged period. If this happens, treatment should be discontinued until the bleeding ceases, and then readministered in courses of three weeks with a week's interval between successive courses, during which a withdrawal bleeding may appear.

(*c*) *Other Side-effects.*—Water and salt retention is a feature of intensive oestrogen therapy. It gives rise to increase in weight, often accompanied by a bloated feeling. Pain, tenderness, and swelling of the breasts may also develop during continued oestrogen treatment, especially if unnecessarily large doses are used.

There is no convincing evidence that exogenously administered oestrogens are carcinogenic. Nevertheless, it is obviously undesirable to submit a menopausal woman, who is specially sensitive, to excessive doses of oestrogens for prolonged periods.

Artificial Menopause

Experience has shown that any interference with, or resection of, ovarian tissue increases the likelihood of precipitating the climacteric syndrome, whereas removal of all ovarian tissues renders this practically certain. Furthermore, the severity of the symptoms of the artificial menopause at whatever age it is performed is likely to be considerably greater than that of the natural menopause. Not only are the hot flushes apt to be very frequent but also so severe that the patient is repeatedly drenched in sweat and quite unable to obtain any continued sleep at nights. In addition to this it is not unusual for the symptoms of depression to be especially marked, leading in many cases to severe depressive psychoses and in some instances to involutional melancholia. Every effort should therefore be made by gynaecologists to conserve all possible ovarian tissue, and, if it is decided to abandon the conservative treatment of metropathia, hysterectomy may be preferable to a radium menopause.

THE CHEMOTHERAPY OF CANCER

EXPERIMENTS WITH NEW COMPOUNDS

A lecture on "The Chemotherapy of Cancer" was delivered to the Fine Chemicals Group of the Society of Chemical Industry at the Royal Institution on November 13 by Professor ALEXANDER HADDOW, director of the Chester Beatty Institute, the Royal Cancer Hospital.

The great majority of cases of cancer at present, said Professor Haddow, were treated either by surgery in an attempt to extirpate and remove the tumour cells, or by radiotherapy to destroy the cells *in situ*. Each of these methods had its limitations, and in any case it would clearly be advantageous, particularly as widespread dissemination was an outstanding feature of the disease, if a less local and more general control of malignancy, such as could presumably be brought about by chemical means, were possible.

This had been well recognized from the earliest beginnings of the study of cancer. Ventures in chemotherapy, of a kind, long antedated the modern developments of surgery. Thus at different times in the past there had been applied such agents as belladonna, aconite, mercury, antimony, and arsenic. Many of these chemical applications had a merely caustic action, as, for instance, in the local use of concentrated acids and alkalis and various metals and metalloids. Arsenic had an action which, though not specific, was less indifferent than the others, and the effects of arsenic in the treatment of cancer had been studied more continuously than those of any other agent.

The chemotherapy of cancer was thus of ancient date; interest in it was by no means a recent development. Nevertheless, there had been during the last few years a new burst of activity, arising very largely from a similar increase of interest in more fundamental work in the cancer field as a whole. In fact, more had been accomplished during the last 10 years than in any other period, though the greater part still remained to be achieved.

The Cancer Cell

Cancer, Professor Haddow continued, was perhaps the most difficult of all biological problems. The cancer cell was simply a modification of the normal cell. Conversion to malignancy of the normal cell might possibly be brought about by a subtle and elusive change of enzyme constitution quite unaccompanied by any grosser alterations affecting protein structure. On this account there was little or no protective reaction on the part of the body or host, such as occurred in parasitic infections. The malignant cell also appeared to be highly stable in its properties, as was shown by the manner in which its newly acquired characters were transmitted and maintained quite indefinitely. In many ways the processes of cell division were reminiscent of a self-propagating mechanism varying in the degree of control to which it was subject.

It had been suggested that the new configuration of the properties which distinguished the cancer cell from its predecessor might be expressed in terms of energy level or level of organization. The transition from normal to malignant appeared to be by way of intermediate cell types. Undoubtedly the normal cell was highly controlled in contrast to the cancer cell, in which the process of cell division might be regarded as almost autonomous. Nutritionally the normal cell might be regarded as highly dependent, and the malignant cell much less so, if not possibly in many ways autosynthetic.

The cancer cell was a unique development of a specific cell type in an adaptive response to unfavourable conditions, and this was only one of the inherent difficulties which confronted any attempt at chemotherapy. Chemotherapy was expected to undo what could almost be regarded as a natural process.

Sex Hormones

In face of these difficulties it was perhaps not surprising that such developments in this field as had taken place in recent years had been accomplished without much thought of practical application, mostly as by-products of more important work. This was certainly so in the endocrine control of cancer of the prostate, which was of great importance as the first indication that the autonomy of the cancer cell was not necessarily complete and that it was in fact open to attack by chemotherapy. This development was very largely due to Huggins and his co-workers at the University of Chicago, and followed preliminary studies on normal and hyperplastic prostate glands of dogs. It was very greatly influenced, as Huggins had told him many times, by Huggins's studies at the Lister Institute in London on phosphatase.

In the special case of cancer of the prostate pronounced therapeutic effects were produced by the administration of a natural or synthetic oestrogen, stilboestrol being the synthetic substance most frequently used. In favourable circumstances improvement consisted of a decrease in size of the primary tumour, possibly regression of metastases in bone, improvement in the blood picture, gain in weight, and relief of pain. All these changes were accompanied by an increase in the sense of well-being, and not a few patients, from being confined to bed, became ambulatory and resumed an active life.

This therapy had now been employed for a sufficiently long time to make it clear that, while cancer of the prostate certainly could not be cured by this means, there was equally no doubt that the foci of the disease became quiescent and life was

prolonged. Again, in a small proportion of cancers of the breast treated by oestrogen there was a most dramatic temporary response. In this connexion it had been interesting to learn of recent investigations in which a favourable response of cancer of the breast or of the cervix had been materially increased by an almost continuous administration of large amounts of water-soluble oestrogen intravenously. There was no doubt that if the mechanism could be elucidated it would be of great importance. A further example of chemotherapy acting through alteration of the hormonal environment of the tumour was the administration of the male sex hormone in cancer of the female breast. There was a curious relationship here—namely, that amelioration was more readily brought about by testosterone in cancer of the breast in women before the menopause, while the beneficial effects from oestrogen were relatively more frequent in post-menopausal cases.

Urethane

The lecturer next described investigations with urethane. Among other conditions in which the action of urethane had been tested and unusually gratifying responses had been forthcoming was myelomatosis. The action of urethane was characterized by an extremely high degree of chemical specificity, and investigators had been very much concerned to decipher the biochemical mechanism of its action. One of the various alternatives which might be considered was that the substance might renovate some deficiency in the chemical differentiation of the cell. The already extensive literature on the action of urethane had amply confirmed the original findings, but so far had added little to the vital problem of mechanism. There was no question that when that problem was solved it would again have very great significance for the understanding of malignant growth as a whole.

These investigations had one curious feature, namely, that while the effects of urethane were first of all observed in the plant cell and later in animal material, and while it was the latter findings which justified and led to the study of the action of urethane in cancer in man, the characteristic effects in leukaemia were detected solely as a result of clinical observation. The various leukaemias in the mouse and rat were relatively refractory to the influence of urethane, and the remarkable effect in the human might have eluded discovery if attention had been directed to the animal alone. That illustrated the hazards of such work.

The lecturer next mentioned aminopterin. Here again the clinical effects were not sufficiently lasting, yet the observation of its action was of fundamental interest and one which would certainly play some part in extending the knowledge of the nutritional basis of cell division.

Nitrogen Mustards

Professor Haddow came next to a different group of substances—the so-called nitrogen mustards, the biological effects of which on tissues in an active state of proliferation were recognized. During the war they had been tried in Hodgkin's disease and various malignant conditions, in which they had undoubtedly a limited therapeutic action, and it seemed not unreasonable to expect to improve the therapeutic effect by chemical modifications. During the last four years some 250 variants had been tested at the Royal Cancer Hospital, and a number of compounds had been prepared, some of which had perceptible advantages in reduced toxicity. He mentioned in particular the chloroethyl derivative of β-naphthylamine. Recent reports indicated that substances of this type might represent a slight advance, especially in the treatment of such conditions as chronic lymphatic leukaemia. Part of the advantage related, not to any marked increase in inherent activity, but rather to ease of administration and relative absence of serious toxic effects. These compounds, like *x* rays, could be responsible for nuclear damage, production of mutations, and other effects hitherto associated with ionizing radiations. The lecturer showed certain of these effects in mice. Quantitative comparison of various biological effects induced chemically and by radiation, both *in vivo* and *in vitro*, showed a correspondence greater than would seem likely on the grounds of chance alone. The comparison was reinforced by the more recent finding that mustards of this type, again like *x* and gamma radiation, could also under suitable experimental conditions induce both cancer and mutation. This must be regarded as an important contraindication to the use of them in younger subjects still in the reproductive phase.

Finally the lecturer touched on the recent developments concerning the effects of A.C.T.H. and cortisone in lymphosarcoma, chronic lymphatic leukaemia, acute leukaemia, and certain neoplastic disorders. Again it would seem that any therapeutic action here was subject to obvious limitations and accompanied by certain disadvantages and side-effects; but these observations marked a stage towards an eventual understanding of the different means, direct or indirect, by which the growth of the cancer cell could be affected.

Cancer was almost certainly an error of differentiation. There was very little doubt that it was in this field of cell differentiation that the eventual solution of the problem would be found. At the same time, useful progress could be achieved short of this ideal. It was true that what Lord Horder had called the distinction between prolonging life and prolonging the act of dying must be borne in mind, but when the infinite series of modifications which were within the range of chemistry were considered, together with the great resources of endocrinology and immunology as yet quite untapped, the age of miracles did not seem to be past.

THE SIR CHARLES HASTINGS LECTURE

SIR LIONEL WHITBY ON PREVENTION OF DISEASE

The first Sir Charles Hastings Lecture to be given since before the war was delivered in the Great Hall of B.M.A. House on November 22. The lecturer was Sir Lionel Whitby, regius professor of physic at Cambridge, and a former President of the Association, and the chair was taken by Dr. Charles Hill, M.P. Accompanying them on the platform were Lady Whitby, Sir William Douglas, Permanent Secretary to the Ministry of Health, Sir Henry Souttar, and others. The hall was entirely filled.

Sir LIONEL WHITBY, whose subject was "Can Disease be Prevented?", said that it was necessary at the outset to appreciate how great was the scope of preventive medicine and how many diseases could be prevented. There was indeed hardly anything in the world which did not affect health directly or indirectly; hence the ponderous size of the Ministry of Health, which had to do with drains, sewers, housing, and the huge field of industrial and occupational diseases, many of them with picturesque names such as miner's phthisis, wool-sorter's disease, chimneysweep's cancer, and the like. All these were preventable. Nor were such diseases confined to the labouring classes. They all knew of clergyman's sore throat, boxer's ear, and—a disease frequent when he was young—student's elbow.

Ancient Medicine

Medicine had been in existence for some 2,000 years. At different periods its practice had been variously based upon demonology, witchcraft, appeasement of divine wrath, folklore, shrewd observation of effects without any real knowledge of cause, and also upon proved knowledge such as was now claimed. Demonology as a basis of medicine was very ancient. It formed the background of Egyptian medicine. There was a papyrus of 1500 B.C. which contained incantations and spells for driving out the devil. Disease was believed to be due to devil-possession. Was there not some resemblance between that and the modern treatment by suggestion which was given to psychoneurotic patients? Folklore likewise was very old. It included prevention by charms, amulets, and herbs, and was the basis of herbalism as it existed to-day. Some of it was sound, some artistic, some revolting; most of it was sheer charlatanism. But the herbalist for large sections of the public satisfied the instinctive craving for the unusual, the miraculous, the search for elixirs of life and perpetual youth. Many a time when he was in practice in Harley Street he noticed among patients who came to him for professional advice that they were wearing an iodine locket around their neck, clearly desiring to "back the horse both ways."

This witchcraft type of medicine was quite unacceptable to the scientist, who demanded controlled experiments, but it might be comforting to some and do no harm and give confidence to people who lacked it.

The Jews of the Old Testament had as their general principle of medicine that God alone was healer and dealt out disease and disaster to man as a punishment for sin. Prevention was appeasement by sacrifice and burnt offering. At the same time a shrewd and observant priesthood formulated a logical code of sanitary discipline appropriate to nomadic tribes. Leviticus and Deuteronomy could be regarded as the first textbooks of preventive medicine, and Moses as the first medical officer of health. They contained instructions for dealing with leprosy—the isolation which was necessary, the burning and washing of clothes, the disinfection of houses, and the priest's inspection before the patient was allowed to return to the community. There were instructions concerning the hygiene of childbirth, disinfection after infectious disease, and food inspection. There were also instructions for field hygiene and discipline which could be applied to an army to-day.

From the First to the Twentieth Century A.D.

Preventive medicine in ancient Greece achieved a high standard. Hygienic measures affecting water supplies, drains, and markets were in some ways in advance of what we had to-day. It was worth noting in passing that the fall of Rome was partly attributable to the impact of preventable disease—for example, the introduction of malaria by soldiers returning from Asia Minor. The fall of Rome was followed by the Dark Ages, when medicine in organized form disappeared for more than a thousand years. During this time, in the fourteenth century, there occurred the Black Death—plague in its most virulent form. In London half the population died. This world-wide disaster, which was now preventable, hindered the march of civilization for centuries. Indeed, the impact of disease upon history might be as great as the impact of war.

Even in the seventeenth century it was revealing to visualize, as one could do from Pepys's *Diary* and other sources, the filthy state of this great city. There was no sanitation, and the conditions were ideal for the dissemination of typhoid and other diseases. At that time occurred the great plague of London, which killed one-fifth of the population. In the eighteenth century, though the English nation was drunken and illiterate, there was a wave of philanthropy which resulted in the voluntary hospitals. At the end of that century occurred what was until then the greatest advance in preventive medicine—Edward Jenner's experiment of vaccination against smallpox, a prophetic prelude to what was to come in the nineteenth and twentieth centuries. At that time 25% of women had their beauty disfigured by smallpox, which was now only a medical curiosity in this country. Whether it would remain a curiosity with the decline of vaccination remained to be seen.

In the early part of the nineteenth century the practice of medicine was less empirical, with many relics of mediaeval witchcraft. Physicians were clever at treating symptoms but knew nothing about causes. Then came the bacteriological studies of Pasteur and Koch. Pasteur's work on immunization against anthrax and hydrophobia was followed by Lister's application of Pasteur's principles to surgery. At the close of the century came the discovery of the cause of diphtheria and the most effective way of treating it.

With the twentieth century came legislation designed to safeguard the health of the school child, to provide facilities for maternal and infant welfare, to deal with the problems of tuberculosis, and to ensure the nutrition of the growing generation. Royal Commissions were set up to investigate such diseases as plague and Malta fever. Much of the advance in knowledge had been influenced and accelerated by three wars in the first half of the century. War was abhorrent, but it had one benefit in that it focused attention on medical problems. A thumb-nail sketch of the positive benefits of war would emphasize this aspect.

The Stimulus of War

In the Boer War more men died from typhoid fever and dysentery than from Boer bullets. In the 1914–18 war, despite the vast number of combatants, typhoid was a rare disease, and lockjaw, after the first unhappy year, also became a rarity, though dysentery again took its toll. Cholera was also controlled by means of inoculations. Between the two wars methods of immunization against diphtheria were perfected, so that this once highly mortal disease was now a rarity. In this period also was developed the first chemotherapeutic attack on such diseases as childbed fever, blood poisoning, and pneumonia. In the war of 1939–45 much of what had been learned about vitamins and the balancing of foods found practical application. Typhoid, tetanus, typhus, malaria, diphtheria, yellow fever, cholera, dysentery, and gas gangrene were now controlled. So effective was the attack on sepsis that in the second world war the chance of surviving wounds was 10 times as great as in the first. Sometimes somatic recovery outpaced psychological repair.

Ehrlich with salvarsan began the control of syphilis, which up to then had been estimated to cause as much as one-third of the morbidity of the nation. Venereal disease, especially thanks to the use of penicillin, had now been reduced, save from the moral aspect, to a problem needing nothing more than effective treatment. The sulphonamides had taken much of the sting from pneumonia, the "captain of the men of death," also from spotted fever and from the bacillary dysenteries. Penicillin, an agent which came very close to Ehrlich's dream of a completely non-toxic, active antibacterial agent, was one of the most powerful remedies against commonly mortal infections, including bacterial endocarditis. Research into the antibacterial properties possessed by other moulds had led to the introduction of streptomycin, a definite step in the treatment of the acute forms of tuberculosis, and aureomycin and chloramphenicol, the last two having an effective action even in certain resistant virus diseases. Chemotherapy had also been outstandingly successful in the prophylaxis and treatment of tropical protozoal diseases such as malaria, African sleeping-sickness, dysentery, and kala-azar. With the world supply of quinine largely in the hands of the enemy in the last war, the work on mepacrine and other antimalarial drugs could be said virtually to have won the Burma campaign.

Respiratory Diseases

Tuberculosis was an ever-present problem, always more pronounced during and immediately after a war, when adequate nutrition was sometimes impossible and when housing shortage led to close contact of infected and uninfected. Its prevention was very much a matter of hygiene. Mass radiography, if universally adopted, would promote the segregation of early cases before they became infective. Much was expected of immunization with B.C.G., while streptomycin and modern surgery could do a great deal for those who contracted tuberculosis.

The problem of preventing the common cold or influenza had not been solved, despite intensive research over many years. The reason was that these diseases were caused by ubiquitous viruses to which it was difficult to create any high degree of durable immunity. Immunity to one virus did not confer immunity to many others. A second reason was that the virus invaded the superficial cells of the respiratory tract, which had a poor blood supply and were not therefore freely bathed by the immune bodies which circulated in the blood.

It must be realized how difficult it was to make a really critical and reliable assessment of any method for the prevention and treatment of such a universal condition as the common cold.

"It is quite meaningless for this or that individual to swear by this or that remedy, from hot whisky to some patent nostrum. To test the efficiency of any remedy in the control of a common and highly infectious disease which has a range of symptoms wide in degree and in duration calls for the most carefully planned experiment involving large numbers in order to obtain results which will stand the fierce glare of statistical analysis."

Poliomyelitis was another disease to which intensive research had been directed. Why was it that no ready solution had been

found? This disease, like the common cold, was caused by a virus which again was ubiquitous and was indeed carried by a high proportion of the population. No effective means of immunization against it had yet been devised. Millions who carried the germ never developed the disease; many who developed the disease never developed the paralysis, and the factors which accounted for this relative immunity had never been solved. Once the virus had gained access to the nervous system the damage was done and it was then too late to do anything about either cure or prevention.

More Outstanding Problems

Where, then, did we stand to-day? An impressive number of infective diseases could be prevented and eradicated. Scurvy, rickets, and other vitamin-deficiency diseases now did not occur in civilized countries where the science of nutrition was appreciated. Great progress had been made in overcoming some of the deficiency syndromes which arose from within—diabetes, cretinism from thyroid deficiency, pernicious anaemia, among others. These could not be prevented, but they could be controlled. Prevention was not possible, because the trouble arose from a degeneration or failure in inherent function of living cells. The subject with diabetes or pernicious anaemia had to be maintained in health by a regular daily supply of the missing secretion or factor. The spectacular advances of the first half of this century concerned diseases such as infections which were extraneous to the human body, not those which were inherent to it. To this latter list belonged the degeneration of the arteries and vital organs, arthritic conditions, and cancerous disease. New ideas had been brought to the understanding of rheumatic and arthritic conditions with the discovery of the remarkable activity of A.C.T.H. and cortisone, but no one was likely to claim that these substances would constitute a complete cure for these disabling conditions.

As to the degeneration of vessels and organs inevitably associated with advancing age, the failing cells might be temporarily assisted by common-sense advice on habits and mode of life, but not by any simple specific remedy.

Cancer "Cures"

Turning to cancer, Sir Lionel Whitby said that here they were dealing with a vital process, a disorder in cell production, affecting cells which had hitherto multiplied in an orderly and physiological manner. It must be realized that any disease which arose from factors concerned with inherent metabolism and vitality of the living cell was not capable of easy conquest. It was well to remember the historical facts he had already described, how man over 2,000 years had experimented in witchcraft, charms, nostrums herbs, decoctions, chemicals, and secret remedies and had not found anything which would restore order to the unbridled disorder which comprised the cancer process. It needed no great mathematician to calculate the likelihood of a discovery of this kind being made by chance. The discovery when it was made would be based upon fundamental knowledge of cause, in the same way as the vast majority of other medical discoveries.

"It is for these reasons that medical men are opposed to the quack, the nature healers, and other extravagant claimants, particularly when their claims are publicized in the lay press rather than submitted freely and frankly to the profession through the cleansing fire of the orthodox medical press. Such people batten upon the public and exploit their generosity with false hopes of cure. Sometimes with pressure from high circles—and it is a curious fact that the higher the circle the more gullible it is—an official inquiry has to be instituted into the merits of such claims. Sometimes the doctors are accused of being jealous of cures which they themselves have not devised. The ideal of the profession is the abolition of illness. It would go to any length to achieve that ideal, even though, paradoxically, it would destroy its own means of livelihood. Such accusations are sheer nonsense. Members of the profession would welcome any cure, but they demand evidence, and they have the interests of the public at heart in opposing such claims until the evidence is produced."

He wished to end on a note of cautious optimism. The onset of cancer was insidious. Its elimination in the individual could frequently be accomplished in the earlier stages, before dissemination, by efficient and radical surgery. In recent years the public had been gradually educated to consult their doctors on the occurrence of any suspicious symptoms. In this field of education, with care to avoid the creation of universal cancer phobia, much more could be accomplished. There were signs, however, that the long years of patient laboratory research into fundamental principles had begun to yield hopeful dividends, if not any radical cure. The synthesis of stilboestrol and the discovery that it would influence and retard the growth of secondary cancerous deposits arising from cancer of the prostate was an important landmark and illuminating pointer for the future. New vistas had been opened up by nuclear physics. A detailed and intricate study of cell metabolism and cell chemistry had been made possible by means of radioactive isotopes. There was a reasonable prospect that the steady accumulation of knowledge on the chemistry of vital processes would lead eventually to a proper understanding of the fundamental cause of cancer.

Could disease be prevented? He hoped that his broad review had answered part of the question. Man was mortal and must eventually die. When this time came to any of them they would desire that the end should be swift and painless. But during the threescore years and ten of the allotted span, could disease be prevented? What could be done to prevent tragedy in youth and within the span of useful life? What could be done to prevent a lingering and painful death? If as much were accomplished during the second half of this century as during the first half then man indeed could take heart.

Sir WILLIAM DOUGLAS proposed a vote of thanks to the lecturer. The lecture, he said, had been true to the Hastings tradition. The whole life and training of the founder of the B.M.A. had been devoted to the cause of public health and preventive medicine. About 100 years ago Hastings was besought by the mayor and corporation of Worcester to take matters in hand when the city was threatened by plague, and his resolute action was long remembered. As for the lecturer of the evening, he had had many opportunities of appreciating Sir Lionel's qualities of mind and character. On official grounds he was glad to have been invited to propose this vote of thanks to him, because it was in the field of preventive medicine that the doctor, the scientist, the administrator, and the legislator could meet together in a not always unfruitful task.

The vote of thanks was enthusiastically accorded.

Reports of Societies

GENERAL PRACTICE SECTION

ROYAL SOCIETY OF MEDICINE INAUGURATION

A General Practice Section—the twenty-sixth on the Society's list of sections—was formally inaugurated at the Royal Society of Medicine on November 22.

Lord WEBB-JOHNSON, president of the Society, in a brief address, said that the new section was generally welcomed by the Fellows and had passed through its initial stages without the slightest difficulty or opposition. One of the values of the new section would be as a means of narrowing the gap between the general practitioner and the specialist. In recent years the gap had certainly widened in some respects, though it had narrowed in others. It had widened in surgery. When he himself started surgical practice as assistant to Sir William Thorburn in Manchester the patients were frequently in local hospitals and nursing-homes and the general practitioner remained in close touch with them. He thought that the surgery in those days was quite good, but in certain fields it had now become so complicated that it was essential for the surgeon to be on his own pitch and with his own team. There were other fields also in which the general practitioner felt that he had lost a certain amount of touch with his specialist colleagues.

In another respect, however, the gap had narrowed. In his own early experience the general practitioner would introduce a complicated case and the surgeon started from zero to work out the diagnosis. Nowadays the general practitioner almost as a rule came up with a complete dossier, and all the surgeon had to do was to say, "Yes, what about Friday of next week?"

All engaged in the practice of medicine would deplore the present tendency whereby general practitioners were deprived of opportunities which should be theirs at the local hospitals.

Another reason for the new section was to make it easier for the general practitioner or general surgeon to keep in touch with the results of research. The section would also help to keep alive in general practice the principles of academic and scientific medicine which they all learned in hospital but often found easy to forget on going out into practice. The closer the collaboration the greater would be the advantage on all sides. The membership and presence of general practitioners would be a source of strength to the Society as a whole. This should be an educative section, and it should not be a subdivision of any other. It should be a focal point for the correlation of the work of other sections in a practical bedside approach.

General practitioners would be drawn into all the activities of the Society. They would have a meeting-place, opportunities for social intercourse—at which quite possibly they would learn more than in formal meetings—and access to what he believed was the best medical library service in the world. He was well aware how isolated and individualistic many general practitioners, from the very fact of their situation, tended to become. Membership of such a section would be a wholesome corrective. He invited them to take full advantage of the facilities which the Society offered. Those facilities were at present provided under some difficulty, but plans were afoot, and as soon as the word "Go" was uttered active preparations would be made for the full provision of what in effect would be a medical club, with all the opportunity which it gave for exchange of views and mutual understanding.

The SECRETARY (Mr. Geoffrey Edwards) reported that under the by-laws the new section had been fully established. Notices had had to be sent out giving opportunity for objection by Fellows, but no objections had been received. The officers and council had been nominated necessarily in the first instance from among those who had been most active in promoting the section. The list of nominations for 1950–1 was as follows:

President—Dr. G. F. Abercrombie.
Vice-presidents—Dr. W. N. Pickles, Dr. J. D. Simpson.
Hon. Secretaries—Dr. G. O. Barber, Dr. G. M. Kerr.
Members of Council—Drs. R. Cargill, L. V. Gimson, Sir Wilson Jameson, Drs. J. H. Le Brasseur, L. C. Lyon, O. Plowright, Marion Ravell, E. B. Rayner, A. Talbot Rogers, E. P. Scott, and J. D. Wells.
Representative on Library and Editorial Committees—Dr. W. E. Chiesman.

These were unanimously elected.

Dr. ABERCROMBIE then took the chair and expressed his appreciation of the compliment. He appealed to members for papers for future meetings, preferably recording observations made in their practices. He also expressed in the name of his fellow officers and council their indebtedness to Mr. Edwards for the infinite amount of trouble he had taken in the formation of the section.

It was announced that the first scientific meeting would be held on December 20 and that the subject for discussion would be, "What is General Practice?"

A successful British Council Exhibition of nearly 200 textbooks and some 150 periodicals on medicine, engineering, and agriculture, held on the Peruvian–British Cultural Association's premises in Lima in September, resulted in more than 125 orders being placed—a satisfactory figure in view of the relatively high cost of most of the books and the fact that they were not in the buyers' native language. An article by Dr. Paz Soldan in the newspaper *La Cronica* was indicative of the professional interest aroused as well as being a tribute from the author, a leading Peruvian physician who played a major part in arranging for the visit of Dr. Douglas Guthrie, of the University of Edinburgh, some two years ago to lecture on the history of medicine.

Correspondence

Guy Fawkes Day—The Afterglow

SIR,—In previous years we have given warning in the local press of the danger of fireworks, particularly to children. We have stated that young children have no "safety sense," and consequently should not be allowed to hold fireworks, or store them in their trouser pockets. Adults should organize the display, supervise the letting off of fireworks, and see that fireworks are never thrown.

Here is the result of the neglect of these precautions from the experience of one hospital on Guy Fawkes Day, 1950. Sixty casualties were treated by us for injuries from fireworks: 35 were burns, 18 were lacerations due to explosions, and 7 were eye injuries. The circumstances of these injuries were:

29 were caused by fireworks going off in the hand.
11 were caused by fireworks exploding in the face; most of them were thrown.
4 serious burns were caused by fireworks exploding in the trouser pocket because an apparent "dud" was replaced and ignited the store.

The average age of the 49 males was 14 years, the youngest 4 and the oldest 45. There were 11 female patients, average age 13 years—the youngest a baby of 5 months, the eldest 45. We were told that the baby "cried for a firework and was given one"; it exploded, causing severe injury to her hand. Five of our patients suffered extensive full-thickness skin loss burns of the face and body and will have lifelong scars, and two will have some permanent impairment of sight.

That one hospital staff should work through Saturday night and well into the afternoon of Sunday dealing with the immediate treatment of these injuries is unimportant, yet this effort in no way represents the hospital treatment essential to this small group. We have, for example, one patient still under treatment for serious burns received on Guy Fawkes Day, 1949. What is important is the unnecessary suffering, particularly to children, and the cost of treatment to the country as a whole of casualties from this annual celebration. The Guy Fawkes Day casualty list is yet another example, if indeed another is necessary, of the meek acceptance by this generation of the inevitability of accidents. *The Times*, in a recent leader on road safety, stated that "all road users have equal obligations to share in the team-work of avoiding accidents. It is work of urgent national importance, deserving of the highest priority from every citizen." The same may be said of all types of accident. The peacetime accidents rate now stands at over one million each year, a casualty list more bloody than that of most military campaigns in our history, and "shows no signs of disappearing from the grim recurrence of official statistics."—I am, etc.,

Birmingham. WILLIAM GISSANE.

Cost of Academic Clinical Office

SIR,—In former times it was customary for aspirants to the Diplomatic Service to be asked, at their selection interview, particulars of their private means. I am surprised to find that this information is not required of candidates for academic clinical posts. Particulars of my own income and expenses will show how essential this information is to the selection committee burdened with such an appointment. I give them below without the slightest criticism of my university, which is both understanding and generous, but in this respect impotent. These figures are entirely factual and can be proved.

It might be said that some of these expenses are extravagant. I am aware that certain of my whole-time professorial colleagues do not travel by private car. I have no knowledge of their reasons for this, but in my own case I find a completely reliable car absolutely essential for the efficient performance of my work. The entertainment expenses I have included are lower on paper than in fact they are, because I have made no allowance for the domestic staff I require to enable me to entertain people in my home and to invite people

Expenses	£	£
Motor car, capital cost, spread over four years	350	
Petrol	107	
Tax, insurance, garage, repairs	250	
Societies and journals	98	
Travel (three years' average)	160	
Books	100	
Telephone	92	
Rent of bedroom in hospital	50	
Entertainment	250	1,457
Health insurance deductions		50
Superannuation		140
Income-tax deducted at source		900
Total		2,547

from abroad to stay with me. Other items, too, might be questioned, but the expenses I incur are substantially less than those of my part-time colleagues who engage in private consulting practice and are less than my own expenses were before I left private consulting practice for whole-time employment. The only real difference between expenses of part-time and whole-time consulting surgeons, apart from the question of accommodation, is that the expenses of the former are allowed by the income-tax assessor, while the expenses of the latter are not. The tax inspector affords me an overall expenses allowance of £250.

Of my gross income of £2,750 there thus remains to me a net income of £200. Expressed as a weekly wage of £3 7s. 6d., this compares not very unfavourably with the reward of the lowest-paid unskilled labour in this country. My working hours are, however, subject to no restriction other than that imposed by sleep and inanition, and they number 70 or so in the week. The hourly rate for my work is thus a trifle less than one shilling, and less even than the piece-rate of most Asiatic labourers.

This position would of course be untenable were I not, as I imagine most academic clinicians are, endowed with substantial wealth from other sources. This, however, cuts both ways, and rather painfully. Taxed as I am on my gross salary as well as on other income, I pay on that gross salary a few hundred pounds in surtax. The surtax on my salary in fact exceeds substantially my net income from it. I would be financially more comfortable if I resigned my appointment and stayed at home. I enjoy my work sufficiently, however, to regard it as a satisfying and delightful, though extravagantly expensive, hobby.

This melancholy situation could be rectified only by the proper acceptance of my expenses both by my university (which might well be sympathetic) and by the Treasury (which would not). It is comforting to recollect in this connexion the Minister's decree, promulgated some years ago and presumably after full examination of clinical university appointments throughout the country, that special awards (though not of course sessional fees) will be paid in full to university clinicians selected to receive them. This additional income, intended, one would suppose, as a reward for the clinical activities, clinical teaching, and clinical research which should occupy 95% of the academic day, will be heavily taxed, but will to some extent alleviate the present financial disorder of the academic clinician. It may also encourage men without private means to apply for academic clinical vacancies. When a clinical chair remains empty, or is filled by a part-time director (and this has already happened), those of us who have watched the slow and sometimes difficult establishment of whole-time clinical departments in universities feel great regret.

The personal details of my income which I have provided force me to ask your permission to sign myself

ACADEMICUS.

Displaced Registrars

SIR,—Your excellent summary (November 18, p. 1158) of the situation caused by the threatened dismissal of 1,100 registrars can hardly be improved upon, but I feel that no member of the medical profession should miss an opportunity of protesting against an injustice being perpetrated. Here are 1,100 doctors, many of them ex-Service men, whose professional careers have already been once disrupted, who have spent two to five years of a vital phase of their lives in hard studies with the promise of being allowed to continue training as specialists, and who now find themselves to have been "led up the garden path." There can be no argument about the rights and wrongs of the situation; there can be no argument but that justice demands a revocation of the threatened action.

I write, however, to draw attention to the concomitant impairment of medical service which must result when 1,100 partially trained doctors are discarded. In some specialties, for example psychiatry, there always has been a shortage of experienced personnel in relation to the scope of work. It is only by virtue of an influx of enthusiastic trainees that modern psychiatric needs have been met with a greater degree of adequacy. Discarding these men will undoubtedly entail a reduction of psychiatric services for the public. What makes the threatened situation more serious is that the circular R.H.B. (50) 106 does not plan practical measures for the replacement of staff that may be lost. No suggestion at all is made for the loss of middle registrars; and the idea that the already overburdened general practitioner will be able to spare the time (if he has by fortune the experience) to perform the duties of a senior registrar at cut rates does not seem proper or practical.—I am, etc.,

Basingstoke. I. ATKIN.

SIR,—Reduction in the number of senior registrars would appear to be in the best interests of the specialist aspirant. It would ensure that a man who had completed three years in this grade would be likely to get a specialist appointment. The method of introducing this change, however, is unnecessarily harsh and the scheme is too rigid. If it is applied as suggested it will throw out of employment many hundreds of senior registrars at the end of their period of office, men who deserve well since most of them have had considerable war service. We would suggest that the scheme be introduced gradually and that the term of service of these men be lengthened appropriately, so that most of them may be absorbed into the consultant ranks. Naturally the rate of production of new registrars would be slowed down for some time to allow this absorption to take place. A few years should see the whole matter adjusted at the new level. In the meantime, registrarships in excess of the new establishment would be declared supernumerary.

Consultant vacancies do not necessarily occur at regular intervals. This means that a man who has completed his term of service will often have to wait, possibly for as long as a year, and, at the end of that time, contest a vacancy, possibly unsuccessfully. During this waiting period he will have to maintain himself and his family as best he can.

The scheme takes no note of the fact that surgery is fluid and always advancing. Specialties are developing, and men have to be trained in them. In the case of urology, for instance, not enough young men are being trained in that most important procedure, per-urethral resection of the prostate. The plan fixes for all time the number of urological registrars in relation to the number of vacancies due to occur, and ignores the possibility of new appointments. The plain fact is that once again the human factor is being ignored, and an attempt is being made to squeeze a quart-sized problem into an administrative pint pot.—We are, etc.,

Birmingham. H. DONOVAN.
A. GOUREVITCH.

SIR,—The Ministry of Health circular on registrar grades contains many misconceptions, but the overriding one is the notion that the training of a specialist should be complete after five years. This may be so for some individuals in some specialties, but it is my opinion that this is far too short a period for the training of the average consultant. A general practitioner sends a patient to a consultant for an expert opinion, which he expects to be based on sound judgment, and sound judgment can be attained only by long experience. Does anyone seriously suppose that five years of training will make a consultant surgeon? Would any of the Ministry's experts who drew up this scheme submit their own bodies to the surgical judgment of a five-year specialist? I am an orthopaedic registrar and have had two years of general medicine, two years of general surgery, and three years of orthopaedics. According to the standards of the N.H.S. I should be fully trained in two years, but in my own estimation I require at least another five years before I would feel competent to give a sound judgment on any orthopaedic problem which might be presented to me. In the past specialists had to wait till they were 35 to 40 or longer before they were awarded full consultant status, and yet a specialist can now be completely trained seven years after qualifying, which means that some will complete their training for consultant posts at 30 years of age. Some may indeed be fully trained by then and be prepared to take full charge of a department, but how can any hard and fast rule be made?

Some may say that the time of training is adequate provided it is done at proper centres. This brings me to my next point. Of what should specialist training consist? From the allocation of senior registrar appointments, one gathers that the medical schools are to be the main training grounds of specialists. But it is not generally recognized that, while the teaching centres give one a good theoretical and philosophical background, it is at the far more numerous non-teaching hospitals that the most prolific practical experience is available to the young specialist. This is borne out by the fact that in the past the post of junior honorary in teaching hospitals was supplemented by posts held concurrently at non-teaching hospitals where the bulk of experience was gained. We all know how ill-suited for general practice is the academically trained newly qualified doctor. Yet it is proposed to keep this theoretical doctor in the academic aura and train him to be a theoretical specialist.

Perhaps the most surprising feature of this circular is the suggestion that suitably experienced G.P.s should take over the work of displaced registrars on a part-time basis. How does this suggestion square with the fact that specialist G.P.s who were doing this very thing before the N.H.S. have now been almost completely liquidated by the regional boards? Many G.P. specialists were expelled from hospital service, and those who were accepted for consultant status were obliged to give up their general practice. After relinquishing their practices and dissolving partnerships they are now informed that the specialist G.P. is to be reintroduced into our hospitals.

But what of the assumption that the G.P. would be willing or able to do part-time registrar work? Has the Minister any idea of the volume and scope of work done by registrars? If so, I do not think he would be so ready with suggestions for replacing them or declaring them redundant. For my own part I work a full 48-hour week, often longer, I see and treat about 70 orthopaedic and 140 fracture and accident out-patients a week, look after 30 or more orthopaedic and accident beds, and perform many minor and major operations. Owing to the shortage of house-surgeons I am almost perpetually without junior assistance. In addition it should be remembered that when consultants are on holiday or attending meetings, etc., the full work falls on the registrar, because locum consultants are non-existent. Now I do not think I work exceptionally hard and I am not complaining, but I should like to know how jobs such as mine are to be filled by a part-time G.P., unless it be by several G.P.s working in rota. Whether G.P.s with the qualifications and experience could be found I will not discuss, but what I wish to emphasize is the fact that the average registrar in my experience is doing a full-time job of work. He does not, in fact, regard himself primarily as a trainee but as a worker who is incidentally training in the school of experience. The training is continuous and forms part of his work, and there is no arbitrary time limit where his training ends and his real work begins. When the registrar thinks he is ready to shoulder the responsibilities of consultant practice let him be appointed on his merits in competition with others. If he does not succeed why should he not continue to serve as a registrar?

The idea that senior registrars should all be incubated in prescribed centres and, after a prescribed registrarship period, should all automatically be hatched out as full consultants is not in the best interests of medicine. But it also reveals a lack of appreciation of the fact that, whatever registrars may be in theory, in actual fact they are filling a very important gap. In theory they may be trainees, but in practice they are workers, as the Minister will find to his cost when he dismisses them.—I am, etc.,

Halifax, Yorks. A. W. FOWLER.

SIR,—I should like to express my congratulations on your strongly worded leading article (November 18, p. 1158) commenting on the Ministry's decision to terminate the appointments of 1,100 registrars. May I, however, draw your attention to one point of which the full implications appear to have been overlooked?

Among the measures proposed to bring about the reduction in numbers is the instruction that senior registrars' appointments should be terminated after three years as a matter of course. Now it is obvious that consultant posts will be available to a small proportion only of those senior registrars who are *at present* in their third year of appointment, and hence a goodly number of those to be—to quote your editorial—"put into the discard" will be precisely those most experienced registrars who are held to have completed their training.

In effect, a situation is being created in which youth and inexperience will be virtually the best passports to the higher ranks of the profession.—I am, etc.,

London, W.1. DAVID WEITZMAN.

Abnormalities in Developing Chickens

SIR,—Congenital abnormalities have three main groups of causes, which may act separately or in combination. The first group is genetic, which has been studied more than any other: the second group is mechanical, on which I have done a good deal of work myself: the third group is that of toxic factors, such as *x* rays, rubella, lack of vitamins, or insulin. I have been privileged to see Dr. A. K. Duraiswami's slides and specimens, and to discuss his work on this third group of factors with him (see *Journal*, October 28, p. 1002).

Dr. Duraiswami claims to have demonstrated that:

1. Certain abnormalities whose cause has so far been unknown can be produced by injections of insulin.

2. Different abnormalities can be produced according to the stage of development of the foetus when the injection is given.

3. The severity of the abnormalities is in direct proportion to the amount of insulin administered.

4. The action of the insulin can be countered and its effects aborted by administering certain substances.

Now, if these claims are correct, and they appear to me to have been most carefully checked, it is obvious that this work is of great importance, and may increase considerably both our understanding and our power of treating a very puzzling group of conditions.—I am, etc.,

London. DENIS BROWNE.

Dead Bodies in Water

SIR,—Your correspondent (November 18, p. 1172) will find this question fully discussed in Chapter 6, Book 4, of *Vulgar Errors*, by Sir Thomas Browne, which first appeared in 1646. The author notes the belief that the female body floated face downwards as being first mentioned by Pliny and in his day as "yet currant," but he himself thinks it "an assertion wherein the *hoti* or point it self is dubious: and were it true, the reason alledged for it is of no validity." He ends the matter by writing: "But hereof we cease to discourse, least we undertake to afford a reason of 'The Golden Tooth,' that is, to invent or assign a cause when we remained unsatisfied or unassured of the effect." In any case I would commend this most fascinating of bedside books to your correspondent—but perhaps he knows it already.—I am, etc.,

Halse, near Taunton. W. BALY PEACOCK.

SIR,—I read with considerable interest the letter written by Dr. Eric Gardner (November 18, p. 1172). My own experience on the Thames here is the direct opposite of that of Dr. Gardner. I have never seen a male corpse floating face upwards, either in the Thames in its tidal reaches or, during the war, in the Mediterranean or the Pacific.

In the past 18 months I have seen three male corpses, all face downwards, which are sufficiently recent to be very clear in my mind. The parts above water were the shoulders and rump, the head well bent down, arms hanging downward, and legs in similar position, giving the impression of a bather half-way off the springboard attempting a dive as close to the end of the springboard as possible.

I always understood that a woman floated face upwards owing to the flotation effect of the mammary tissues, etc., but have no personal experience in the recovery of female corpses. It is of interest that I have questioned six local watermen here in the past week, all of whom said, without any hesitation, that "males float face down, and females face up after drowning."

I note that Dr. Gardner writes from Weybridge, and it occurs to me that corpses may behave differently in fresh water as opposed to salt water. Perhaps some of your correspondents can throw further light on this very interesting matter.—I am, etc.,

Hulk "Hygeia," off Gravesend, Kent. HUGH WILLOUGHBY, Deputy M.O.H., Port of London.

Ring Round the Penis

SIR,—The treatment of cases of constricting rings and bands around the penis is usually dismissed in standard textbooks of surgery with the statement that they should be cut, although one book does state that in some cases the services of a blacksmith may have to be used. The following case is of interest because it shows the difficulty that may be experienced in removing such a constriction.

The patient, a married man aged 23, who was an electrical engineer, attended Casualty one evening, having ridden up to the hospital on a bicycle. Around the middle of the shaft of his penis was a circular ring of hardened steel. The ring had a lumen 1 in. (2.5 cm.) in diameter, and the ring was ¼ in. by ¼ in. (1.9 cm.) thick. Attached to one side was an iron rod 14½ in. (35 cm.) in length. The bar was 1½ lb. (800 g.) in weight, and the patient stated that it was a home-made poker.

There was gross oedema of the penis, which beyond the constriction measured 2½ in. (6.4 cm.) across. The difficulty was to reduce this through the lumen less than half its diameter. The patient was taken to the theatre, anaesthetized with thiopentone, gas, oxygen, and ether, and the penis was bound from the tip down to the constriction with a 1-in. bandage, and left like this for a quarter of an hour. On removal it was found that the oedema had considerably diminished, and it was possible by traction and pulsion slowly to work the ring towards the glans, keeping continual pressure on this to prevent redevelopment of the oedema. Eventually, after 45 minutes' work, the ring was removed, and apart from haematomata no serious damage appeared to have been caused. This was surprising in view of the patient's condition when he presented himself, when the problem seemed insoluble apart from amputation of the penis. If we had failed to reduce the oedema by pressure it was suggested that, after making numerous small incisions in the oedematous part, suspension in a supersaturated solution of NaCl might have reduced the oedema, though whether or not there would have been much tissue damage is not known.

The patient's penis after recovery measured in a flaccid state 7½ in. (19 cm.) in length and 1½ in. (3.8 cm.) in diameter, so it would appear to have been a not inconsiderable feat to have got it through the ring at the start.

We are indebted to Mr. R. E. Gibbins, consulting surgeon, under whose care this case was admitted, for permission to publish it.—We are, etc.,

Kidderminster. M. DRURY. K. MCKENZIE.

Transfusion and Viral Hepatitis

SIR,—Your leading article of November 11, page 1103, contains certain statements which may give a wrong impression.

Although three incidents have recently been reported from the U.S.A. in which hepatitis has followed the use of plasma or serum irradiated with ultra-violet light, it is hardly justifiable to condemn this method of sterilization out of hand, since the conditions under which the plasma or serum was irradiated are not known. The evidence presented by Oliphant,[1] Oliphant and Hollaender,[2] and by Blanchard and his colleagues[3] indicated that irradiation, under the conditions used by them, was effective, at least against a single strain of virus.

The technique of irradiation is complex; for example, slight deviations in the procedure may reduce the time or intensity of irradiation below the critical limits, thus failing to inactivate the infective agent. It is thus clear that the process must be continuously and accurately controlled and be reproducible from batch to batch of plasma before its effectiveness or lack of effectiveness can be conclusively demonstrated. Suitable methods of exercising this control are being developed. It is also clear that detailed follow-up surveys of the recipients of plasma, similar to those already made in this country, must be conducted before conclusions can be drawn regarding the relative merits of different methods of sterilization of plasma. It is to be hoped that the conditions under which the plasma or serum involved in the American cases was irradiated will be reported in the fullest detail, so that fair comparisons may be made between the effects of these and the numerous other batches of plasma which have been irradiated.

While the use of transfusion has increased since the recent war, the absolute amount of plasma used since 1946 has diminished. Simultaneously, the transfusion of whole blood, which previous surveys have shown to be associated with subsequent attacks of hepatitis in relatively far fewer cases, has grown apace, and to-day the ratio of blood to plasma used is about 10 to 1. It is perhaps worth recalling that the survey made by Lehane *et al.*[4] showed that the incidence of hepatitis after 10-bottle pool plasma (the smallest practicable pool) was only slightly greater than that following the use of whole blood (0.8%).—We are, etc.,

Virus Reference Laboratory, Colindale. F. O. MACCALLUM.
Lister Institute, Elstree. W. D'A. MAYCOCK.

REFERENCES

1 *Bull. N.Y. Acad. Med.*, 1944, **20**, 429.
2 *Publ. Hlth Rep., Wash.*, 1946, **61**, 598.
3 *J. Amer. med. Ass.*, 1948, **138**, 341.
4 *British Medical Journal*, 1949, **2**, 572.

Haemolytic Streptococcal Gangrene Treated with Streptomycin

SIR,—After reading the article by Mr. R. Marcus (August 12, p. 394) I wish to add some remarks with reference to an article I published in *N.Z. med. J.* (August, 1949, p. 380). It so happened that I encountered three cases of the condition within a few weeks of each other. Two cases were critically ill, and the literature advocates extensive excision of the wound and zinc peroxide dressings, a drastic procedure, especially for one case with a burst abdomen. All had been on intravenous glucose–saline and had had penicillin and sulphonamides in heavy doses. All presented irregular pyrexia and pulse rate, with associated exhaustion rather than toxaemia.

I was struck by Meleney's work, and felt that, if a drug could be administered capable of destroying one of the organisms in the bacterial symbiosis of *Staph. aureus* and a micro-aerophilic streptococcus, then the disease process might be stayed. As a last effort streptomycin was tried, and the results were nothing short of miraculous. All patients were improved in 24 hours, and in 48 hours clean healthy granulations were seen. All recovered. I append brief notes of the cases.

1. An obese man, aged 57, who eight days after the removal and drainage of a gangrenous perforated appendix and appendix abscess had a burst abdomen sutured. The patient became very drowsy, and gangrene appeared in the wound. He had 6 g. streptomycin in divided doses over 72 hours, with complete recovery and healing of the wound within seven days.

2. An obese female, aged 45, developed gangrene in the area of a transverse colostomy 12 days after a Paul-Mickulicz resection of the transverse and descending colon for a recurrent volvulus of the colon. Complete recovery in 48 hours after the administration of 4 g. streptomycin in divided doses.

3. A female, aged 28, developed post-operative gangrene of the wound 12 days after a subtotal hysterectomy for fibroids, at which operation the appendix was removed (a common procedure in any laparotomy). Cleared in 24 hours after the administration of only 2 g. streptomycin.

All cases were given a total of 6 g. streptomycin each over a period of 72 hours (1 g. 12-hourly).—I am, etc.,

Dunedin, New Zealand. H. M. KARN.

Unabsorbable Sutures

SIR,—There have been two recent accounts (*Journal*, September 16, p. 659, and October 21, p. 949) of unabsorbable sutures being found in the uterus some years following caesarean section. It was suggested in the first that the ligatures, being silk, were therefore unabsorbable and responsible for accompanying sepsis. The use of such sutures was therefore condemned. A very similar case is described below, and again the suture material was apparently thread and was still present in the uterus when removed 13½ years later.

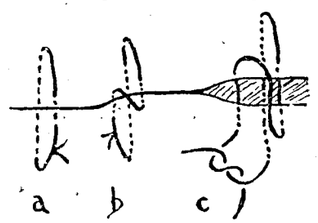
A woman aged 39 complained of vaginal discharge and pain in the left groin. The discharge was sometimes bloodstained and offensive and had been present for 13 years. She had had an upper-segment caesarean section 13½ years before, the operation being performed because of toxaemia. She was sterilized seven years ago and had had a dilatation and curettage performed four years ago. On August 3, 1949, a dilatation and curettage was performed by Mr. Mortimer Reddington, when about 4 in. (10 cm.) of thread was pulled out. The bleeding persisted and so a hysterectomy was performed and the uterus found to contain a very neat layer of sutures, except for one with a knot at the end running into the uterine cavity. There was also a small fibroid in the fundus, and the left ovary was removed at the same time.

Mr. Reddington has recalled another case which kept coming back and back with an infected wound and from which was removed finally a piece of thread about 2 ft. (61 cm.) long.—I am, etc.,

Dartford, Kent. M. NEAL RANKIN.

A Modified Skin Stitch

SIR,—The vertical mattress suture is widely used to obtain accurate coaptation of skin edges, but where thin skin overlies an excessive amount of fat, as sometimes happens, for example, in the axilla and groin, gaping of the edges tends to occur and small lobules of fat bulge through the gaps in the incision. The modification of this suture, illustrated herewith, in which the superficial portion of the stitch is reduplicated, has been found of value in holding the edges together. A small "S-bend" is produced by each stitch, but this straightens out when the silk is removed.—I am, etc.,

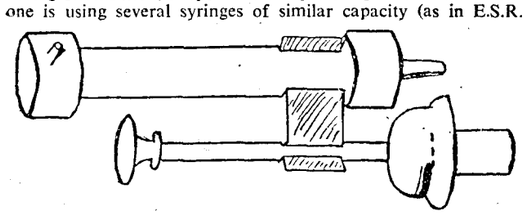


A.—Ordinary mattress suture. B.—Modified mattress suture. C.—Modified suture placed.

Birmingham. J. W. RIDDOCH.

A Clip for Syringes

SIR,—It is generally admitted that syringes and their pistons are not interchangeable. A badly fitting piston renders the syringe useless when required for aspirating fluids. To obviate this nuisance I have devised a simple double metal clip which, during sterilization, keeps the three parts together so that when one is using several syringes of similar capacity (as in E.S.R. estimations) it is impossible for them to become detached and subsequently fitted to their wrong units. The clip is so small that it does not need to be detached while the syringe is in use. Messrs. C. F. Thackray, Park Street, Leeds, can supply these clips.—I am, etc.,



Leeds. DAVID A. HERD.

Orf in Man

SIR,—I was most interested to see the letter from Drs. A. Lyell and J. A. R. Miles (November 11, p. 1119). My attention was first drawn to the condition by Dr. Ian Macquarrie when I came here as his assistant over 25 years ago. He recognized it as being an infection due to contact with sheep. A specimen of the lesion was sent for pathological examination, but its exact nature was not established. I must have seen upwards of 30 cases since then, the last a month ago.

The lesion is invariably single, and seems to confer immunity, as the condition has not occurred twice in the same person. With the exception of two cases all my patients have been males, and the lesions have been on the hand or forearm. The two exceptions were small girls who had pet lambs. In one case the lesion was on the upper lip, and in the other on the leg. At first sight the condition looks alarming, but, as mentioned in the letter, one is struck by the comparatively little pain and the absence of any general reaction. The temperature has been normal in all cases in which it was taken. The glands connected with the area of the lesion are often enlarged, but do not go on to abscess formation. Rarely has a definite history of trauma been obtained, but, as one patient said, "We are always getting pricks and scratches at farm work."

Treatment by slicing off the top of the blister, applying hot foments, and cauterizing the lesion daily with copper sulphate shortens the duration of incapacity. The condition, in my experience, is not so very rare, and, now that Drs. Lyell and Miles have proved it definitely to be orf, I think it should be added to the list of scheduled diseases.—I am, etc.,

Aspatria, Cumberland. A. K. RANKIN.

Mass Radiography

SIR,—Critics, mainly in London and Birmingham, have been scathing, almost vicious, in their denigration of mass radiography. Fortunately their efforts have not been crowned with success and the work advances. I do not wish here to defend mass radiography; it does not need it. Those who have been engaged in the work during recent years have no doubt concerning its value or of the high position that it holds in the armament against pulmonary tuberculosis.

The critics often say that the receipt of a satisfactory report on a miniature film is apt to engender a false sense of security. It is argued that as a result warning symptoms will tend to be overlooked during subsequent months. There is considerable weight in this argument and it applies equally to the satisfactory report on either a miniature or a full-size film. It depends for its validity on two factors. First, it is insufficiently realized that pulmonary tuberculosis may develop with great rapidity, cavitation, perhaps in both lungs, appearing within a few months. Secondly, that rapidly developing cases are frequently unaccompanied by any disturbance in general health. In many cases the symptoms of pulmonary tuberculosis are conspicuous by their virtual absence. In this country there is at present one at least out of every 500 adults who is suffering from active tuberculosis and in need of treatment, a potential menace to his Mantoux-negative contacts, whose general health and sense of well-being is so good that medical advice has not been sought. Some form of routine radiography of large numbers, whether on large films, miniature films, or fluorescent screen, offers the only hope of an early diagnosis.

But there is a large group of patients in whom the disease is usually more advanced, who are already attending their doctors, and, because of the triviality of their symptoms and absence of physical signs, are being treated as cases of upper respiratory tract infection. It is with these cases that there is room for improvement in the management of pulmonary tuberculosis, for failure to refer them for radiography condemns many such patients to the consequences of pulmonary cavitation which early diagnosis, adequate bed rest, chemotherapy, etc., would avert. Experience with mass miniature radiography, in spite of what they say about it, leads one to support most strongly those of your subscribers and correspondents who have been advocating that much greater attention should be paid to the symptomatology of tuberculosis and that greater use should be

made of the chest clinic *x*-ray apparatus. Any doctor who fails to send for a chest film a patient suffering from the symptoms of a respiratory tract infection of longer than three weeks' duration runs the grave risk of missing a case of tuberculosis. Your correspondents have on several occasions given lists of suspicious symptoms. It is not necessary to mention them again here. I have mentioned only those which are in my experience the commonest. Large film and screening sessions should be part of the weekly routine of a chest clinic, and doctors should feel free to send to it any case that arouses the slightest suspicion. I do not think it is far from the truth to say that one adult per 1,000 of city populations is being treated for respiratory tract infections when all the time pulmonary tuberculosis, perhaps remarkably far advanced, is the cause of the trouble.

If in the next five years we are to progress with the early diagnosis of pulmonary tuberculosis, then it is imperative that existing radiographic facilities be greatly improved and used more than they are to-day. At present emphasis is on treatment. In the near future, by the widespread use of routine radiography and B.C.G. we should shift the emphasis to where it rightly belongs—prevention.

In spite of the declining case mortality during the past 50 years pulmonary tuberculosis still remains supremely the major medical problem of the day. As a result of the appalling havoc it causes in the lives of so many tens of thousands of young adults, it should receive the respect that it deserves and which I feel it is still not receiving.—I am, etc.,

Buckhurst Hill, Essex. THOMAS PAXON.

Child Welfare—Past, Present, and Future

SIR,—Professor A. Moncrieff (October 7, p. 795) criticizes the pattern of child-welfare work under local authorities as being geared to vital statistics of thirty or forty years ago, while he himself uses the decline in breast-feeding as a stick to beat the service, which he summarizes as being "largely continued as part of a campaign to reduce deaths in infancy from digestive disorders."

About fifty years ago the prevalence of artificial feeding was considered to have contributed to the rise in deaths from diarrhoeal diseases (Tatham, 1904). In 1906 Newman stated that epidemic diarrhoea was the most destructive of all diseases attacking children under 5 years of age, and it was being shown (Matthew Hay, 1907–8) that the excessive mortality in bottle-fed babies was proportionately greater in the one-roomed houses. It was then easy to point the moral. During the next twenty years numerous investigations were undertaken to discover the cause, although we are still in doubt, but by the mid-1920's the proportion of infant deaths due to digestive disorders had fallen to 10% in the larger Scottish towns, although it remained a serious problem longer in the English towns. This has fallen steadily ever since, apart from a slight rise during the last war when, with exceptions (Glasgow, 1944), the outbreaks have been in hospitals and other places where children are congregated together. The improvement in general education, the increase in personal cleanliness, and the rise in the standard of living are probably the main reasons why deaths from digestive disorders are no longer a menace to the baby in its own home. The educational influences of the public health services are usually given some of the credit, although the child-welfare services as such were only in their infancy in the 1920's.

The decline in breast-feeding had a good twenty years' start on the child-welfare services, and although I am not convinced that child-welfare officers do not encourage breast-feeding whole-heartedly there is no justification for going all righteous about it. After all, the child-welfare medical officers and health visitors come on the scene after the hospitals, midwives, and general practitioners. The bigoted medical officer who is "whole-hearted," instead of helping the anxious mother who is having feeding difficulties, will make her feel a criminal if she is not breast-feeding, and will now be able to quote Professor Moncrieff that she is fulfilling her proper task in the community. America is held up as an example of a country which has reduced its infant mortality more rapidly than Great Britain. What is its record in breast-feeding?

Professor Moncrieff raises so many hares it is impossible to chase them all. He does not seem to have made up his mind whether he would rather have the medical part of the service run by general practitioners, assisted in the nursing of sick children by the health visitor, who is apparently to displace the present specially trained home nurse, or by specialist paediatricians as envisaged in circular 118/47; but, if the latter, is the paediatrician (who does not realize the value of routine medical inspections in getting to know the child and its mother, noting the progress made over a period and using the opportunity to assess the mother's care and standard of nutrition) going to interest himself in sanitation of schools, the present school curriculum, or even school meals and hygiene? The present school medical officers do these things, but then they are specialists in school medical work, not specialists in diseases of children.

The main idea is that the present maternity and child-welfare officers and school medical officers should disappear. This, as Professor Moncrieff says, is implicit in circular 118/47, which has a good deal to answer for in producing frustration in the service. Before it was suggested by obstetricians and paediatricians that maternity and child-welfare and school medical work was a boring routine and soul-destroying, and how much more interesting it would be if the participants did either (*a*) obstetrics or (*b*) paediatrics, the majority of medical officers did not find their work boring: they had chosen to do preventive work, and after several years' experience of it they found it absorbing. It is uncertain what proportion of doctors is equally interested in preventive and in curative work, but in my opinion it is only a minority, and if the present trend continues the amount of preventive work done will decrease.

After the issue of circular 118/47, and action which is being taken as a result of this circular, medical officers in the public health service find their status is falling. Having trained themselves to do one job they are now being told to go and do something else. No longer are they to have the opportunity of acquiring an insight into the whole field of maternity and child-welfare and school medical work, studying the family as a whole. They must specialize and keep themselves abreast of the times. It will be so much more interesting for them. At the same time they must not refer a child direct to a specialist, that is the privilege of the general practitioner; and, although the preventive services never dealt much in drugs, should the medical officer consider that a mother or child should benefit by medicine, the mother must now be sent on a second journey to the general practitioner. Is it surprising that there is frustration and that those already in the service are advising their younger colleagues to choose another branch of medicine?

Professor Moncrieff tells us that forward-looking authorities and progressive medical officers have already adopted the suggested changes. As far as maternity and child-welfare and assistant school medical officers are concerned they will presumably progress presently out of the public health service altogether into the ranks of the obstetricians and paediatricians.—I am, etc.,

Chelmsford. HILDA MENZIES.

REFERENCES

Hay, M. (1907–8). *Special Enquiries on Infant Mortality*. Appendices to Annual Reports, Medical Officer of Health, Aberdeen.
Newman, G. (1906). *Infant Mortality*. London.
Tatham, J. F. W. (1904). *Report of Inter-Departmental Committee on Physica Deterioration*. London.

Factory Doctors in the Health Team

SIR,—Various correspondents have stressed the value of school medical examinations and the need for closer teamwork between public health medical officers, general practitioners, and other health workers. No one so far has mentioned the appointed factory doctor. Since nearly a quarter of a million children enter industry each year, the importance of close liaison between the school medical service and the appointed factory doctor is clear. It must be rare for a general practitioner to know the work or conditions of employment of more than a handful of the youngsters for whose health he is responsible. They come for cure when ill, but otherwise may remain for long in subnormal health. Close team-work of the school medical officer, appointed factory doctor, and general practitioner would appear to offer great opportunities for health promotion and prevention of disease. Employers as well as parents and youngsters are often in need of advice and grateful for assistance.—I am, etc.,

Farnham Royal, Bucks. M. E. M. HERFORD.

Teething

SIR,—May I take the liberty of stating that not all paediatric teachers would agree with the opinion expressed in "Any Questions?" (October 28, p. 1013) that many ailments of an infant are connected with teething? Professor Von Pirquet and Professor Schick, of the Vienna University medical school, who were my teachers, would invariably emphasize in their lectures that there was no proof at all that any ailment could be traced to teething. They used to state that infants would get all the illnesses mentioned in the quoted reply from birth on, whether teething or not. For the general practitioner it may be a purely theoretical problem, since he will treat the little patient for the symptoms he notices. The danger lies with the mother, who will too easily consider her baby's illness as a "teething trouble" and neglect to ask for her doctor's advice in good time.

Besides that, the problem seems to be a very interesting one, deserving a thorough investigation. May I add a few abstracts from translated quotations?

"Teething is a physiological process without any disturbance." (H. Finkelstein, *Lehrbuch der Säuglingskrankheiten*, 2nd edition, Berlin, 1921, p. 646.)

"If one takes the trouble to watch the teething of healthy infants one would never be able to state with any authority that anything abnormal was related to teething." (Rudolf Fischl, *Diseases of the Mouth in Childhood*, in *Handbuch der Kinderheilkunde*, edited by M. Von Pfaundler and A. Schlossmann, 3, p. 35, 3rd edition, Leipzig, 1924.)—I am, etc.,

Plymouth. H. M. TIETZE.

Wrong Use of Fenestration Operation

SIR,—A good deal has been written and spoken lately about the surgery of otosclerosis. I greatly fear that this operation is being performed in this country on cases that are not otosclerosis. No case should be diagnosed as such in which a radiograph of the labyrinth has not been taken and the characteristic condition of the bone seen. I have quite recently been consulted about a case which was not otosclerosis, and in which both sides had been operated on without any good result.—I am, etc.,

Bath. H. NORMAN-BARNETT.

R.M.B.F.

SIR,—As Christmas Day is near at hand I would like to remind your readers of our Christmas Gifts Fund in the hope that those who have not sent their contributions will now do so quickly. We must not fail in bringing happiness and extra comforts to our beneficiaries.

Contributions should be sent to Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, S.W.15, marked "Christmas Gifts," and will be gratefully acknowledged.—I am, etc.,

C. LUTHER BATTESON,
Honorary Treasurer,
Royal Medical Benevolent Fund.

POINTS FROM LETTERS

Employment of Epileptics

Dr. H. A. JOHNSON (Cheltenham) writes: The sorry plight of epileptics needs investigation and most sympathetic help. . . . They need training and work in specialized factories, living either in their own homes or in hostels, with facilities for transport. They also need financial assistance when unable to work. Epileptics are the unwanted in our midst, living wretchedly unhappy lives. Medicine has failed to cure, but there is no denying the presence of hundreds of inarticulate sufferers and outcasts.

Exercises in the Bath

Dr. S. SHUBSACHS (Manchester) writes: Sir Leonard Hill (November 18, p. 1153) does not mention the temperature of the water. I take this to be an accidental oversight, as Sir Leonard must be more aware than most people of the effect of temperature on oxygen consumption and carbon dioxide output, which is what he has estimated.

Obituary

J. A. MURRAY, M.D., F.R.S.

Dr. J. A. Murray, one of the pioneers of experimental cancer research, died in Hove on November 20, aged 76 years. For 32 years he worked in the laboratories of the Imperial Cancer Research Fund, and for the last 20 of those years he was its director.

James Alexander Murray was born at Cramond, Midlothian, in 1873. He received his early education at the George Heriot College, and subsequently entered Edinburgh University as a science student. After graduating B.Sc. in natural science, he won a scholarship which enabled him to go to Germany and engage in zoological research work. During the summer sessions of 1895–7 he worked with Professor Theodor Boveri in the Zoological Institute of the University of Würzburg. His main problem was to study in molluscan spermatocytes the cytoplasmic structure then known as the Nebenkern and later as the Golgi apparatus. He also spent some time in Professor R. Wiedersheim's laboratory at Freiburg im Breisgau, working on the morphology of the amphibian vertebral column. On his return to Edinburgh he was appointed assistant to Professor J. Cossar Ewart in the department of zoology. At the same time he studied in the medical school of the university, and in 1899 took the degrees of M.B., Ch.B. During the next four years he had experience of general practice, and was for a period medical officer of a mental hospital. But the decisive decision of his career was made in 1903 when he accepted the invitation of Dr. E. F. Bashford to join him in the work of organizing the experimental investigation of malignant disease, a task with which the latter had been entrusted by the then recently constituted Imperial Cancer Research Fund. Here Murray found his real bent. In addition to his medical training, he brought to this work a profound interest in cellular biology, which had been stimulated by his association with Theodor Boveri, and a wide knowledge of zoology and comparative anatomy gleaned from his early student days. Murray proceeded M.D.(Edinburgh) in 1907, with the award of a gold medal. In 1915 he was appointed director of the Fund, and 10 years later he was elected a Fellow of the Royal Society. In 1936, the year after his retirement, he was awarded the Honorary Medal of the Royal College of Surgeons.



Walter Stoneman, London.

We are indebted to Dr. R. J. Ludford for the following appreciation: The initial work of the Imperial Cancer Research Fund, which was published in detail in its scientific reports, laid the foundations of experimental cancer research. It demonstrated that cancer was widely distributed among the various races of mankind and occurred also in vertebrate animals, in which it presented the same essential features. The various aspects of tumour transplantation, which had been opened up by the work of Jensen, were explored with meticulous care, and it was conclusively established that the successful transplantation of tumours in laboratory animals was dependent upon the

survival and growth of the malignant cells of the grafted tissues. Cancer was thus shown to be essentially a cellular problem. One of the most significant of Murray's contributions to cancer research, in view of later developments, was his discovery that in female mice with an immediate cancerous ancestry breast cancer was more than twice as frequent as in mice without such an ancestry. His observations extended over only three generations, but it is of interest to recall that in a paper communicated to the Royal Society in 1911 he stated, "It should be possible by continued selective mating to breed two strains of mice with a still greater difference in their liability to cancer." He lived to see this prediction amply confirmed.

Apart from his cancer investigations Murray attained distinction in other fields of scientific research. During the first world war he undertook the duties of honorary pathologist to the Zoological Society, and was elected a life Fellow of that society in appreciation of his valuable work. At the Annual Meeting of the British Medical Association in Newcastle-upon-Tyne in 1921, he was vice-president of the Section of Pathology and Bacteriology. He was an enthusiastic microscopist, and took a very active part in the affairs of the Royal Microscopical Society, being its president during the periods 1928–9 and 1946–7. Only last year he was elected to its honorary Fellowship in recognition of his distinguished services to the society and to microscopical science. As a tribute to him, the *Journal of the Royal Microscopical Society* published an issue in June this year containing seven papers by former colleagues on the staff of the Imperial Cancer Research Fund. Murray zealously maintained the highest traditions of scientific research in the academic spirit of freedom and toleration. He welcomed clear and decisive expressions of opinion, believing it was better to be proved wrong than misunderstood. He detested ambiguity, and was implacable in his opposition to anybody or anything that he considered in any way dishonest. A loyal and generous friend, he was always ready to share his scientific knowledge and experience with anyone willing to learn from him.

He married in 1927 Ethel Emily, daughter of the late L. Beere, Esq., and to her is extended the deepest sympathy of his many friends and former colleagues.

ALEXANDER LOW, M.D., LL.D.

Dr. Alexander Low, emeritus professor of anatomy in the University of Aberdeen, died in Aberdeen on November 15, aged 82 years.

Alexander Low was born of good farming stock on the estate of Grandhome on the banks of the River Don, within sight of the farms that saw the birth of Sir David Ferrier and Sir Arthur Keith. At Aberdeen University, which he entered in 1886, he first studied arts, and, after taking his M.A., he turned to medicine and graduated M.B., C.M. in 1894. He proceeded M.D. with highest honours in 1912. He became a member of the staff of the anatomy department of the University in the same year that he graduated, and was appointed professor in 1925. Although he retired in 1938 he maintained his connexion with the university and its students by serving on various committees until the last. He was a past president of the Anatomical Society of Great Britain and Ireland, of the Aberdeen Medico-Chirurgical Society, a director of the Aberdeen Royal Infirmary, a governor of the Royal Mental Hospital, and a member of the Scottish Universities Board. He had an international reputation for his research upon the development of the lower jaw. His histological technique was most accomplished, and his preparations were exquisite. Thanks to his enthusiasm the Anthropological Museum of Aberdeen University probably possesses the finest collection of the skeletal remains of the Short Stone Cist or Beaker People. For many years he made careful measurements of the growth of people born and bred in the north-east of Scotland. Certain twins and triplets he measured annually from infancy to 20 years of age.

When he retired from the chair in 1938 his former students presented him with a portrait etching, and on this occasion many touching tributes were sent by his pupils from the four corners of the world. During his office as dean of the medical faculty in Aberdeen he was responsible for welding the union of clinical professorships with ward appointments. Professor Low took an active part at several Annual Meetings of the B.M.A. At Belfast in 1909 he was secretary of the Section of Anatomy and Physiology; at Birmingham in 1911 vice-president of the Section of Anatomy and Physiology; and at Aberdeen in 1939 he was president of the Section of Anatomy and Anthropology. In the same year Aberdeen University conferred on him the honorary degree of LL.D.

We are indebted to Professor R. D. Lockhart for the following appreciation: Alexander Low had qualities that endeared him to generations of students: serious grey eyes with a pleasant twinkle set in handsome and distinguished features; an earnest purpose; attention to detail in all his work; a gentle unassuming personality; a word that could be depended upon to stand the test of time; courtesy to all people, and a kindness to his pupils in sickness or difficulty that invariably took practical form. He would find time to visit students in hospital, and, always unobtrusively left, there would be a parcel of food and sweets and cigarettes. If a man were hard up some bursary fund would be found to help, and a fine new overcoat might appear—from a "fairy godmother" for all the student knew. Many graduates will remember him as an examiner and how he would soften the blow with his characteristic, "Well, maybe, perhaps, but one usually finds . . ." No wonder he was so affectionately known as "Daddy" Low. Certainly our university will not dip her pennant in salutation to a more loyal and devoted son, and at the news of his passing the eyes of many of her graduates will be filled with wistful and happy memories.

With the passing of Dr. WILLIAM HUGH STEELE on November 1 at the age of 79 South Devon has lost a well-known figure and a remarkable personality. He was a native of Torquay and studied medicine at Edinburgh University. After graduating M.B., C.M. in 1895, he became a pioneer in radiography, and took the first *x*-ray apparatus to the relief of Ladysmith in the Boer War. After returning to this country he settled in general practice in Torquay and remained there until the outbreak of the 1914–18 war, when he again joined up and returned to radiography, serving in France and later at Plymouth. For health reasons he did not return to general practice after demobilization but took up the study of radiology and obtained the D.M.R.E. (Camb.) in 1927. He was appointed radiologist to Newton Abbot Hospital, and it is in this post that he will be best remembered by the people of South Devon and by the medical men in the district, who were always welcome and received every assistance in any problem submitted to him. His skill and kindness were outstanding qualities which testified his greatness and cannot be forgotten by a host of grateful patients and colleagues. He took a full part in all medical activities, and was a member of the British Institute of Radiology, a past chairman of the Torquay Division of the B.M.A.; and a past president of the Torquay and District Medical Society. Although he did not approve of the N.H.S. Act, he served on the house committee of Newton Abbot Hospital until his death. All his life he was a sportsman, and as a raconteur of his experiences in all

spheres he was inimitable. As a youth he played rugby football for a Torquay side, but his real loves were horses and hunting, and in the summer he delighted in trout fishing. All these pursuits he took up with an infectious enthusiasm. He married Miss Potts-Chatto, who survives him and to whom our sympathy is extended.—D. C.

Dr. JAMES KILIAN PATRICK CLARKE died at Nottingham after a long illness on November 1, aged 64. Born in Bray, Ireland, he graduated M.B., B.Ch. at the Royal University of Ireland in 1908. He settled in England in 1909 and obtained the D.P.H. in 1910. Between 1910 and 1914 he worked in mental hospitals, first at the Bethlem Hospital, Lambeth, and later at Hill End Asylum in Hertfordshire. During the 1914–18 war he served with the R.A.M.C. in Egypt, and it was in this period that he first became interested in bacteriology. After the war he was appointed lecturer in pathology at the Egyptian Government Medical School, holding also the post of bacteriologist to the Citadel Military Hospital in Cairo. In 1921 he obtained the D.T.M.&H. (Cambridge). On returning to this country in 1923 he took up research into the aetiology of dental caries, working at St. Mary's Hospital for the Medical Research Council. He published the results of this work in 1924 in a paper entitled "The Bacterial Factor in the Aetiology of Dental Caries." In 1925 he was appointed the first pathologist to the Ransom Memorial Laboratory of the General Hospital, Nottingham, a post which he held for 24 years until his retirement due to ill-health in 1949. His main interest, however, remained in the field of bacteriology, and he helped very considerably in the development of vaccine therapy while this was in vogue. At his desk or bench Clarke had a rare power of concentration upon the problem in hand. Outside the laboratory he relaxed into the most natural and friendly of men, eager to give a helping hand to anybody. One of his activities was to give pleasure to others as a topographical lecturer—a recreation in which his Irish relish for a well-turned anecdote found free play. He was a keen freemason and a member of Lodges in Nottingham, London, and Egypt. He leaves a widow, two sons, and a daughter. The elder son is a member of the medical profession.

Dr. CHRISTOPHER ROLLESTON, formerly county medical officer of health for the county of Rutland and the Soke of Peterborough, died at his home at Ketton, Rutland, on November 19, aged 73 years. Rolleston came of a distinguished medical family. His father, George Rolleston, was Regius Professor of Anatomy at Oxford University; his eldest brother was the late Sir Humphry Rolleston, and another brother was the late Dr. J. D. Rolleston, well known as a specialist in infectious diseases and as the author of many books and papers on medical subjects. Christopher Rolleston was a student at New College, Oxford, to which he won a science exhibition, and Charing Cross Hospital, where he was a university scholar. He graduated M.B., B.Chir. in 1903, proceeded M.D. in 1907, took the D.P.H. in 1909, and became a Member of the Royal College of Physicians in 1910. For a time he worked as assistant county medical officer for Berkshire, but in 1910 he was appointed county medical officer and school medical officer for Rutland. Two years later the appointment of county medical officer for the Soke of Peterborough was combined with the Rutland post. He partially retired in 1948, but he continued to act as school medical officer for the rural schools in Peterborough until December 1, 1949, his last report on school health being but recently published. Rolleston was a keen clinician, being particularly interested in tuberculosis. He was one of the earliest to undertake artificial pneumothorax treatment regularly, and was probably the first tuberculosis officer in the country to induce such treatment in the homes of his patients. The first article he published on this subject appeared in 1918, and he described the results of treating 50 cases in a paper which appeared in *Tubercle* in 1924. He was also in charge of the local V.D. clinic. He wrote on many medical subjects in this and other journals, and his annual reports usually contained some original observations about the health and social conditions of the people in his area. He was never afraid of saying what he thought—a characteristic which was not always appreciated. He was a member of the B.M.A., being chairman of the Soke of Peterborough Division in 1935–6. Apart from his work, his main interest was in literature, especially history. He was a member of the Peterborough Historical Society, before which he read a number of papers. Rolleston was twice married; he left no children.

Mr. Richard Battle writes: HUGH POMFRET KILNER, the son of Thomas Pomfret Kilner and the late Olive Mary Kilner, died suddenly in the R.A.F. Hospital, Fayid, Egypt, on November 5, aged 26 years. He was educated at Oundle School and Clare College, Cambridge. He came down to St. Thomas's Hospital in October, 1945, and graduated M.B., B.Chir. in 1949. After completing a house appointment at his hospital, he was accepted by the R.A.F. for the period of compulsory service and to his delight was posted overseas only a month or two ago. Hugh Kilner, or "Pomf" as he was known to all, was a fellow with a delightful personality. He never achieved high academic distinction, but was by contrast a really good doctor and, like his father, was intensely interested in the patients under his care and in the human side of medical practice. He took a very special interest in children, and had he been allowed to return from his Service would probably have become a paediatrician. He inherited from his mother a great talent for music, and was an accomplished pianist and a leading light in the students' Christmas show at St. Thomas's. Nobody who met "Pomf" would fail to like him, and we at St. Thomas's are much the poorer for his loss.

Medico-Legal

DEATH FROM TETANUS

A verdict of accidental death was recorded by the coroner of St. Pancras, Mr. W. Bentley Purchase, on September 22 at the inquest on Mrs. Sarah Fels, aged 50, who died in the Elizabeth Garrett Anderson Hospital, London, on August 17 from tetanus.[1]

At the inquest Mr. Bernard Fels said that in February his wife was operated upon for cancer by Mr. Vincent Nesfield. She had made a good recovery and subsequently was treated by weekly injections, usually given by a nurse. On July 19, according to Mr. Fels, Mr. Nesfield himself gave the injection at his consulting-room in Harley Street.

Some time later a swelling had developed, and on August 11 Mrs. Fels was admitted to hospital, where she died six days later from tetanus. Pus from an abscess in her leg contained *Cl. tetani*, and the same organism was recovered from the bottle from which the injections had been given.

Mr. Vincent Nesfield, who gave his qualifications as M.R.C.S.Eng., L.R.C.P.Lond., admitted to the coroner that his name was not on the *Medical Register*. He said that, after removal of Mrs. Fels's breast for cancer, he prepared an emulsion from part of the growth for injections to prevent a recurrence of the cancer. He denied that he had himself given any of the injections. On July 19 Mrs. Fels brought him the bottle of emulsion and said that it had been spilt and asked what she was to do. He saw that there was a deposit at the bottom of the bottle, so he added bi-creosol and returned the bottle to Mrs. Fels.

In recording his verdict, the coroner said that he was satisfied beyond doubt that death had been due to an injection from the bottle and that the injection had been made on July 19 by Mr. Nesfield.

Mr. Nesfield was struck off the *Medical Register* in 1932 after a charge of advertising and of being interested in the commercialization of a secret remedy had been found proved by the General Medical Council.[2]

---

[1] *Manchester Guardian*, September 23.
[2] *British Medical Journal, Supplement*, 1932, 2, 269

Medical Notes in Parliament

Fate of Registrars

On the motion for the adjournment on November 22, Dr. CHARLES HILL raised the matter of the proposed cut in registrars employed in the Health Services. In England and Wales there were 5,200 specialists, and 150 deaths or retirements from their ranks each year. There had been the hope of building a comprehensive specialist service in all parts of the country, and it seemed to him tragic that the annual increase in the number of specialists was calculated at 30 specialists a year. There were 2,800 practitioners training to be specialists, and to fit in with this policy of a tiny annual increase in the specialist establishments 1,100 of these trained or semi-trained men were to be swept out of the registrar ranks. In the only region whose case he had examined, this meant that three-quarters of the senior registrars would have to go as soon as possible after January 1, and two-thirds of the other registrars. He urged that the whole position should be re-examined, first, on the basis that if the implied undertaking that there should be a consultant service everywhere was to be carried out an increase of establishment of 30 consultants a year was insignificant; and, second, that the revised establishment of registrars was too drastic, and to take away these registrars from the hospitals would lower the quality of the hospital service for some time to come. The Ministry had calculated that the country needed 7,500 whole-time specialists. Yet it had only 5,200, most of whom were part-time, and its progress was to be at the rate of 30 specialists a year. That timid attitude would damage the hospitals from the early part of next year.

Mrs. JEAN MANN said she was glad Dr. Hill had raised this subject. The Minister's circular had come as a shock to all hospital services in the country. When she had read that circular in the *Supplement* to the *British Medical Journal* she had been shocked by its ruthless treatment of the registrars. These were blandly told there would be no promotion for them although they had served an apprenticeship, much of which had been financed by the Government. Many had taken diplomas in specialized branches, and a great deal of the expense of taking those diplomas had been borne by the Government. These registrars had been encouraged to go on by the statements of the Minister and of many Members on the Government side of the House that the Service was expanding, that everyone would be entitled to a specialist's attention, and that the country would not have nearly enough consultants and specialists to conduct the new services. Where would the Ministry get general practitioners with the expert knowledge which the senior registrars possessed? She believed that this memorandum had not been sent to the Scottish registrars. She hoped they would set the heather on fire when they received it.

Mr. NIALL MACPHERSON hoped that the Under-Secretary of State for Scotland would be able to tell the House whether the memorandum applied to Scotland. He had heard that it would apply if not from January at least in the course of next year. He added that the memorandum suggested in a callous way that surgeons and embryo surgeons, who in many cases had served long in the Forces, should go back to the Forces at a lower rate of pay than they would have received if they had stayed in the Services. They were also invited to go into the Colonial Service, which was not remunerated on the same scale.

Mr. WALTER ELLIOT said the House was entitled to know if the circular applied to Scotland, and, if not, whether the general conditions published in the circular applied in Scotland as in England.

Mrs. E. M. BRADDOCK said a lot of the difficulties of the Health Service were created when Dr. Hill was in an important position in the British Medical Association. The difficulties were due to the fact that his organization had laid down emphatically that no full-time medical service should be provided by the Bill.

The House then rose, without any reply being made for the Government.

The Tuberculosis Position

New cases of tuberculosis in England and Wales notified in 1049 were 52,041. Mr. ANEURIN BEVAN said on November 16 that he thought there had been an increase compared with 1948 but that the increase was due to the use of mass radiography. Although the increase in the notifications of respiratory tuberculosis was 5½%, there had been a decrease in the number of deaths over the last five years of 12½%. Treatment was resulting in a reduction in the number of fatalities. The general overall position was improving. Since the issue of a circular asking hospital authorities to make beds available for tuberculosis cases in general hospitals there had already been a large increase in the number of beds. He would be able before long to give a report on the progress made in making beds available.

Miss MARGARET HERBISON stated on November 14 that a visit by two officials of the Scottish Office to Switzerland for the purpose of inquiring into the treatment of tuberculosis was sufficiently encouraging to justify a further visit by clinical experts, arrangements for which were being put in hand.

Answering Mr. Walter Elliot, Mr. BEVAN said on November 16 that he was prepared to consider making use of the beds available in Switzerland, but that currency difficulties were involved.

Reducing the Doctor's List

On November 13 Mr. EDWARD HEATH raised the question of the reduction of doctors' lists of patients. He said that in the Borough of Bexley one doctor had been told that his list had to be reduced and 800 patients had to find another doctor. This was also happening all over the country. He hoped that his raising the matter would result in the welfare of the patient receiving full consideration in the administration of the regulation, which was not happening at present. As the result of this doctor declining to alter his list or to take a partner the county executive council had the job of cutting the list. It drew an ellipse round the area which included both his surgery and branch surgery so that it would take in the maximum of 4,200 patients. After that it sent a notice to every patient who lived outside the area, saying, "You are struck off Dr. Green's list seven days from to-day. You are given notice that in seven days you must find another doctor by going to the Post Office and there looking at the list of doctors in the borough." Mr. Heath said that meant that patients with a long relationship with that doctor were suddenly told that this relationship was ended. One constituent who with his family had for 26 years been attended by this doctor was told that he must find another. So was an old lady of 73 who had had this doctor for 15 years. Mr. Heath asked whether it was necessary suddenly to reduce this doctor's list of 5,000 to 4,200. He understood that the general turnover of a doctor's list varied between 300 and 600 patients, so he asked if the list could not be closed and left to reduce itself in about a year and a half to about 4,200. If the Minister insisted on suddenly reducing the list Mr. Heath suggested that those who had joined the list last should be the first to go. Members of families of long-standing patients should not be struck off: The doctor could provide the information required, and an attempt should be made to get it. In striking the patients off the list at seven days' notice the local executive council had been callous. It was wrong that administrative convenience should be placed before the welfare of a patient.

Mr. N. N. DODDS said the way this matter had been handled was an example of soulless bureaucracy and was bringing the Health Service into disrepute.

Mr. A. BLENKINSOP said he did not think the wording of the circular sent out by the executive council was the best that could have been desired. Had the doctor concerned tried to help the executive council, as most doctors had tried to help in carrying out the general decision on limitation, the Ministry would have been able to avoid a great deal of difficulty which had arisen. A doctor mentioned by Mr. Maudling, the Member for Barnet, had co-operated to the extent of suggesting those names which came latest on the lists. Not having the assistance of the doctor, the executive council in the Bexley case had taken what was on the whole a reasonable decision, to rule out those patients who appeared to be farthest away from the doctor's main centre of practice. He thought that executive councils should give the patients another list of doctors in the area. This had been left in the past to the discretion of the executive council, and the practice varied from one area to another. It would be desirable if this method were more generally used. He thought that one or two points might well be looked at further, but had the doctor in the case offered his assistance more, as other doctors had elsewhere, this problem would not have arisen.

Doctors for New Estates*

Miss P. HORNSBY-SMITH raised on November 16 the method of appointing doctors to the London County Council estate area known as St. Paul's Cray, which comprised over 3,000 houses to which a large population was being moved, with scope for more medical practitioners. She wished to bring to the notice of the House the manner in which these medical appointments were made. She had found that Dr. J. D. Paulett had been granted by the county council a house compulsorily acquired from a private owner, and that having got these premises he had applied to the medical practices committee, saying he had been granted the doctor's house on the estate and asking the committee to permit him to practise. Other doctors had submitted their names to the L.C.C. as wishing to practise on the estate, but only the name of Dr. Paulett appeared to have gone forward, and the medical practices committee had no option but to appoint him. Its position was obviously prejudiced when only one name was submitted and when the applicant claimed that he had the premises. It virtually had to accept the nomination of the L.C.C. The L.C.C., by deciding what doctors should be allocated a house from which they could practise, were choosing the doctors on the estate instead of the medical practices committee.

Mr. A. BLENKINSOP said that any doctor might apply to go on the list in any area, and could be refused only if the area was over-doctored. Vacancies were advertised only when a sitting doctor withdrew or when the area was classified as being under-doctored. A doctor had full liberty to apply to go in an area, and the medical practices committee could not refuse him unless it was over-doctored. Applications went to the medical practices committee through the local executive council, but applications for houses went to the L.C.C., and provisional permission to practise was granted contingent on accommodation being granted also.

Dr. CHARLES HILL said that the St. Paul's Cray case was a particular instance of a general difficulty. When a vacancy arose through the death or retirement of a doctor and the full procedure of advertisement and selection was followed, and if a doctor obtained by purchase or otherwise the use of the professional premises from which the practice was conducted, or of the only appropriate professional premises in the area, it was difficult to make effective choice of any other applicant. That way of short-circuiting a proper form of selection was a difficulty which the medical practices committee was trying to tackle. The L.C.C. should have followed another method, informed the official machinery of the vacancy, and asked for an advertisement to be published so that selection could be made through the proper channel; and, having done that, it could have allotted to the selected doctor the house it had built as the doctor's house on the estate. He asked Mr. Blenkinsop to look into the matter to protect local authorities from the invidious task of picking a doctor. The same system of selection should apply, whether the house had been built by the local authority or not.

Mr. BLENKINSOP said the matter was under consideration between the Ministry and the British Medical Association, to find some way of dealing with the difficulty.

Admitting Foreign Dentists

On November 16 Mr. S. S. AWBERY asked Mr. Bevan, in view of the shortage of dentists, to introduce legislation to enable qualified dental surgeons from European countries, who had a practice in their own countries before becoming domiciled here but were not qualified for registration, to practise here.

Mr. ANEURIN BEVAN replied that for the protection of the public the Ministry must ensure that foreign-trained dentists admitted to practise here were no less well qualified than British-trained dentists. Subject to this principle, he was about to discuss with the bodies concerned the question whether existing arrangements could be improved.

Merit Awards

Colonel M. STODDART-SCOTT inquired on November 23 whether the Medical Merit Awards Committee was permanent; how far the chairmanship was intended to be permanent; what sum it was proposed to pay the chairman; and how many awards the committee had made.

Mr. ANEURIN BEVAN replied that so far as he was aware this was a continuing body. The remuneration of the chairman was to be reviewed at the end of the third year, and at present he received 2,000 guineas. The committee had so far recommended 1,504 consultants for awards. It was not intended to publish a list of them.

Nurses for Sanatoria

Mr. R. J. MELLISH on November 23 raised the question of the shortage of nurses in tuberculosis sanatoria. A Ministry of Health spokesman had said that out of a total of 27,763 T.B. sanatorium hospital beds in England and Wales 4,409 were unstaffed on June 30 last. This spokesman went on to say that a waiting-list of approximately 11,000 people in England and Wales had tuberculosis and awaited entry into hospital. Mr. Mellish said he was a member of the South-eastern Hospital Board, and throughout the whole of his region there was an enormous waiting-list. Men had to wait on the average five months before they could hope to go to hospital, and women had to wait 10 to 12 months. The Minister had asked the regional boards to open wards in general hospitals for tuberculosis cases, but they could not get the staff. It ought to be obligatory on the General Nursing Council to insist that all student nurses should do three months in a T.B. sanatorium as part of their general training. The pay of these nurses ought to be increased more than that of nurses in general hospitals.

Mr. J. ENOCH POWELL said that the task was to restore T.B. nursing to the parity of esteem which it had lost. A nurse who had done a year in children's, fever, or mental nursing could offset that year against the length of her general training. That did not apply to work in a sanatorium. This definitely deterred a nurse from training in a T.B. sanatorium. He suggested that a T.B. nursing bonus of £30 should be available pro rata so that a nurse who did 11 months did not lose the bonus entirely. Prejudice against T.B. nursing existed in the senior ranks of the nursing profession, and there was a great deal to be done inside the profession itself in educating people about the value and interest of T.B. nursing.

Mr. ANTHONY GREENWOOD said there was need for adequate housing, especially for male nurses. The fear of infection was deep-seated among the girls, and to an even greater extent among their parents. Sputum mugs should be abolished and replaced by destructible cartons. Nurses should be freed from the duty of counting dirty bed linen and the soiled clothing of patients. There should be facilities for the cleaning of the clothing of patients who were able to walk about and work among the other patients. There should be facilities in all wards for boiling crockery and cutlery. That was of particular importance where tuberculous patients were treated in general hospitals. Lastly, there should be electrical appliances for cleaning wards. He suggested that the Ministry of Health should set up a T.B. Nursing Corps, and if possible secure Royal Patronage for it.

Mr. A. BLENKINSOP, replying for the Government, said the number of nurses still required for the T.B. service was about 2,900. B.C.G. vaccine was being made generally available for sanatoria and general hospital staffs, as well as in the domiciliary fields. This was especially important in connexion with possible contact. Special allowances for nurses undertaking T.B. work were a matter for the Whitley Council, which had agreed upon improved scales of general pay which would, he

*See correspondence, *Supplement*, p. 232.

hoped, make this nursing more attractive. Perhaps the most important question was the secondment of nurses from teaching and other hospitals to work in sanatoria. This was a matter for the General Nursing Council and not for the Ministry. It would be hardly practicable to make secondment compulsory, but the Ministry was undertaking consultations with the teaching hospitals to work out detailed plans for secondment from those hospitals. The Ministry was anxious to secure the greatest accommodation in general hospitals, provided that adequate and proper precautions could be taken against contacts, and so on. That required either separate blocks, or at least separate ward accommodation. Reports were being made to let the Ministry know what progress could be made in this way. The Ministry hoped that there would result a valuable increase in the number of immediate beds and a steady reduction in the waiting-list. For patients at home there was the question of the recruitment of nursing staff for domiciliary nursing and the proper information to all those who had the care of patients. Local health authorities were anxious to co-operate with hospital authorities in a joint attack upon this problem.

Other Steps for the Tuberculous

Mr. GERALD WILLIAMS took up the discussion again on November 24. People were dying without treatment, and others were left so late that there was little hope of their recovery. He had two or three minor suggestions, such as that for night hostels, which would probably require no trained nurses. Plenty of beds were available abroad in Switzerland, France, and Scandinavia. The cost over there, apart from the fare, would be little more than in Britain. Despite difficulty in obtaining exchange, the Government could be a little more lenient in allowing money for such a cause. The beds were there and it was wicked not to use them.

Mr. IAIN MACLEOD said the L.C.C. had been forbidden by the Ministry of Health, on grounds of expense, to build certain night sanatoria and certain hospitals for this disease, of which St. Peter's, Stepney, was an example. This could be justified only if the House was satisfied that the £400m. spent on the Health Service was being spent on more worthy objects.

Mr. A. BLENKINSOP replied. He said that facilities in Switzerland were under review, but all the information which the Ministry of Health had from that country suggested that the contribution it could make would be much smaller than Mr. Williams had mentioned. Close co-ordination was necessary of the local health authority, of the general-practitioner service through the executive councils, and of the hospitals to solve the tuberculosis problem. The Ministry had under consideration the administrative organization of the Health Service, both in respect of tuberculosis and other special fields.

School Dental Service.—At the beginning of June the number of dentists employed was equivalent to 734 full-time officers. For a complete service of dental inspection and treatment, in which every child was seen annually and all children who required treatment accepted and received it, a ratio of about one dentist to 3,000 children would probably be required. An additional 1,150 dentists would have been needed last June to give such a ratio. The immediate aim is to get the service back to its 1948 level, for which purpose some 200 additional school dentists are needed in England and Wales.

The Penicillin (Merchant Ships) Bill.—This will enable penicillin and certain other substances to be sold or supplied to and administered on board merchant ships which carry no doctor; it was introduced by the Government in the House of Lords on November 14.

Part-time Nurses.—The present total is 25,000, and was about 17,000 when the National Health Service began. The policy is to encourage their employment wherever there are serious staff shortages.

Aureomycin.—Imports from the U.S.A. during the nine months period ended September 30 totalled 140,075 grammes, apart from small quantities for sample and trial purposes.

Supply of Spectacles.—The Parliamentary Secretary to the Ministry of Health said on November 14 that there was now a reasonable delivery date for simple types of lenses, while delivery dates were steadily improving for bi-focals and other special types. There was sufficient capacity in the country to deal with demands for both the simple and the more complex types of lenses.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on October 28 the degree of B.M. was conferred, in absence, on Patience Proby.

UNIVERSITY OF CAMBRIDGE

Members of the committee for the appointment of the director of the Molteno Institute have been appointed for two years from January 1, 1951, as follows: *By the General Board*, Professor E. D. Adrian, O.M., F.R.S., and J. T. Saunders, M.A.; *By the Council of the School of the Biological Sciences*, Professor H. R. Dean, Dr. V. B. Wigglesworth, Professor G. E. Briggs, M.A., and Mr. K. M. Smith, Ph.D.

The Faculty Board of Biology "B" has elected Professor Adrian as a manager of the Arnold Gerstenberg Studentship until December 31, 1955.

The Raymond Horton-Smith Prize for 1949–50 has been awarded to Anthony Guy Everson Pearse, M.D., for his essay on "Cytochemistry and Secretory Cytology of the Anterior Hypophysis"; *proxime accessit*, Basil Gerald Parsons-Smith, M.D., whose subject was "The Value of Electroencephalographic Study in Cases of Cerebral Tumour."

UNIVERSITY OF LONDON

The Sanderson-Wells Lecture on "Food and Folly" will be delivered by Sir Stanton Hicks, professor of human physiology and pharmacology in the University of Adelaide, in the Senate House, University of London, Bloomsbury, W.C., on Thursday, December 14, at 5.30 p.m. The lecture is addressed to students of the University and to others interested in the subject. Admission is free, without ticket.

UNIVERSITY OF WALES

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

PATHOLOGY AND BACTERIOLOGY.—L. V. Chubb, Patricia M. Coldrick, C. W. J. Hunt, A. P. Jones, Olive C. Jones, Margaret E. Lloyd, G. K. Penn, T. B. N. Richards, Eve Wiltshaw, Isobel M. Young.

UNIVERSITY OF BIRMINGHAM

Professor C. F. V. Smout has been reappointed Sub-Dean and Tutor of the Faculty of Medicine for five years from October 1.

Professor Hilda N. Lloyd, President of the Royal College of Obstetricians and Gynaecologists, has resigned from the Chair of Obstetrics and Gynaecology in the University, as from December 31.

The title of Reader in Medicine has been conferred on Kenneth William Donald, M.D., M.R.C.P., who has been appointed Lecturer in Medicine in the Faculty of Medicine from October 1.

The title of Reader in Surgery has been conferred on Bryan Nicholas Brooke, M.Chir., F.R.C.S., Lecturer and First Assistant in the Faculty of Medicine.

Professor Edward D. Churchill, M.D., Chief of the General Surgical Services, Massachusetts General Hospital, Boston, U.S.A., has accepted an invitation to participate in the surgical work of the teaching hospitals during the Spring Term, 1951.

Mr. John A. Stallworthy, F.R.C.S., M.R.C.O.G., will deliver the Ingleby Lectures for 1951.

The following appointments are announced: *Lecturer in Bacteriology*, M. B. Conran, M.B., B.S. *University Lecturer in Minor Operative Surgery*, Alexander Innes, M.B., F.R.C.S. *University Clinical Lecturers.—Obstetrics*, Jean L. Hallum, M.D., M.R.C.O.G., D.C.H., G. S. Lester, M.B., F.R.C.S.Ed., M.R.C.O.G., L. M. Park, M.B., F.R.C.S., F.R.C.S.Ed.; *Radiology*, J. C. Bishop, M.B., Ch.B., D.M.R.D., W. H. Bond, M.B., F.R.C.S., O. E. Smith, M.B., Ch.B., D.M.R.D.; *Dental Surgery*, R. F. Pusey, M.R.C.S., L.R.C.P., B.D.S.

Isobel T. Hinde, M.B., B.Chir., and John Hardwicke, M.B., B.S., Research Fellows of the Medical Research Council, have been given the title of Honorary Research Fellow in Experimental Pathology in the Department of Pathology of the University.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—*Part II:* J. B. Fox, Z. Lachowicz.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on November 9, with Sir Cecil Wakeley, *President*, in the chair, Mr. W. Kelsey Fry was admitted as a co-opted Member of the Council.

Professor G. Grey Turner has been elected a Hunterian Trustee; Dr. Howard K. Gray, of the Mayo Clinic, a Moynihan Lecturer; and Professor Francis E. Stock, of Hong Kong, a Hunterian Professor. The re-election of Mr. F. Masina as Prophit Student was reported.

The Council received from Dr. G. M. Vevers a gift of a cast of the Cheselden Medal.

Diplomas in Child Health were awarded, jointly with the Royal College of Physicians of London, to S. Binder, F. S. W. Brimblecombe, and P. West. A Diploma in Medical Radio-Diagnosis was awarded, jointly with the Royal College of Physicians of London, to P. F. J. New.

The following hospitals were recognized under paragraph 23 of the Fellowship regulations: Waikato Hospital, Hamilton, New Zealand; Birmingham and Midland Ear and Throat Hospital (junior registrar); Royal Victoria Hospital, Bournemouth (four house-surgeons, orthopaedic house-surgeon, all for six months); Archway Group, London (registrar, two junior registrars, three house-surgeons, one orthopaedic house-surgeon, ear, nose, and throat registrar); Hackney Hospital, London (registrar, two house-surgeons, for six months).

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on November 7, with the President, Sir David K. Henderson, in the chair, the following were elected Fellows of the College: I. C. Macdonald, R. B. McMillan.

The following were elected Members of the College: B. W. Anderson, A. A. H. Gailey, S. A. Mannan, M. Mousiquddin, P. R. Mohan, A. W. Lees, W. L. H. Jackson, S. A-K. Karagulla, E. D. Levittan, J. F. McHarg, A. B. Da Costa, D. L. Murti Rao, R. F. Brooks, A. A. A. El Sherif, S. E. Large, R. J. C. Southern, R. D. Young, J. B. Clark, N. K. Smith, M. F. G. Buchanan, J. A. McConachie, R. L. Richards, I. S. Collins, T. L. Henderson, N. H. Dalal.

The Hill-Pattison Struthers Bursary was awarded to Alan Fennell Bushby.

A presentation was made to Mr. T. H. Graham on his retirement after 40 years' service as librarian of the College.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on November 6, the following officers were elected for the ensuing year: *President*, Mr. Walter W. Galbraith; *Visitor*, Mr. Andrew Allison; *Honorary Treasurer*, Mr. Matthew White; *Honorary Librarian*, Dr. Archibald L. Goodall; *Representative on General Medical Council*, Mr. Andrew Allison.

SOCIETY OF APOTHECARIES OF LONDON

At a meeting of the Court of Assistants held recently with Dr. Frank Howitt, Master, in the chair, Mr. R. Ogier Ward resigned his seat on the Court. Dr. J. P. Hedley was re-elected as the Society's representative on the General Medical Council for a further year.

The annual Master's Day Service was held at the Church of St. James, Garlickhithe, Garlick Hill, London, E.C., on October 31, by permission of the Rector, the Rev. M. F. Foxell, Chaplain to the Master.

It was reported that the Strickland Goodall Triennial Memorial Lecture is due to be delivered in 1951.

In connexion with the Festival of Britain it was decided that the Hall should be open to visitors on certain days to be arranged and that the Society should lend some of its ancient silver to an exhibition at Goldsmiths' Hall.

The following candidates were granted the diploma of L.M.S.S.A. upon examination: C. S. Paul, H. Davidson, P. S. McClure, D. J. Müller.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S.Glasg.: W. St. C. Bauld, T. L. Bowden, W. Brabbin, L. Brinberg, J. P. Capel, S. Caplan, J. T. Davidson, J. W. Davison, D. Duck, Ruth M. Eaton, R. Y. Forbes, Isabel M. Forster, M. Frieze, K. M. Graham, J. G. Green, A. I. Hutchinson, J. L. W. Johnson, Anna M. M. Lepper, Veronica R. E. Lethbridge, T. J. McCabe, R. H. G. McKay, I. T. McLachlan, A. M. Muir, D. Murray, P. A. O'Brien, A. Pollok, Anne McK. Rodger, B. Schulberg, H. B. Singh, P. I. Sless, B. D'A. Smith, L. Steen, I. S. Trotter, E. G. C. Valerio.

No. 45

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 11.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	26	3	11	2	1	20	2	10	2	—
Deaths		1	—				1	—		
Diphtheria	55	1	15	4	2	85	10	23	3	4
Deaths	—	—	—	—	—	—	—	1	—	—
Dysentery	411	61	146		6	92	12	87	4	1
Deaths		—			—				—	—
Encephalitis, acute	3	—	—		—	—	—	—	—	—
Deaths		1		—			—			
Erysipelas			25	9	3			40	4	6
Deaths							—			
Infective enteritis or diarrhoea under 2 years				42	20				55	
Deaths	17		3	1	1	20	—	10	8	1
Measles*	8,857	544	195	100	120	1,055	48	38	80	58
Deaths†		—	—	—	—		—	—	1	—
Ophthalmia neonatorum	26	4	13		—	21	1	6	—	—
Deaths										
Paratyphoid fever	3	—	1 (B)		—	7	—	4 (B)	2 (B)	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	465	20	2		16	534	18	6	1	11
Deaths (from influenza)‡	20	3	3	1	—	21	8	1	—	—
Pneumonia, primary			146	¶				173	17	
Deaths	177	23		5	13	207	44		13	8
Poliomyelitis, acute	225	11	22	1	4	316	47	2	6	—
Deaths§	9	1		—		20	3			
Puerperal fever			8					3		
Deaths							—			
Puerperal pyrexia‖	82	6	5	1	1	90	11	8	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,206	99	199	104	55	2,163	190	253	148	193
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	1	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	1	1	—	—	18	1	—	—	1
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	3,725	285	454	64	36	977	22	55	20	39
Deaths	2	1	1	—	—	5	1	—	—	—
Deaths (0–1 year)	224	30	34	13	12	258	31	45	26	7
Deaths (excluding stillbirths)	5,101	814	635	181	129	5,389	966	612	215	102
Annual death rate (per 1,000 persons living)			12·8					12·3	13·3	
Live births	6,441	1036	768	381	174	6,710	1101	848	338	216
Annual rate per 1,000 persons living			15·4					17·0	20·9	
Stillbirths	159	26	23			170	25	26		
Rate per 1,000 total births (including stillborn)			29					30		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending November 18 were: paralytic, 110 (161); non-paralytic, 39 (64); total, 149 (225). The figures for the previous week, compared with which there was a total decrease of 76, are in parentheses. Uncorrected notifications for the corresponding week in 1947 and 1949 totalled 201 and 229 respectively. Total uncorrected notifications for 1950 to and including the week under review are 8,121. The corresponding figures for 1947, 1948, and 1949 are 8,676, 2,165, and 6,134 respectively. The marked downward trend in the week under review is very satisfactory.

Discussion of Table

In *England and Wales* infectious diseases were more prevalent during the week, and the increases in the number of notifications included measles 1,042, whooping-cough 638, dysentery 151, scarlet fever 98, acute pneumonia 32, and acute poliomyelitis 21.

The incidence of measles during the autumn has been high, and the present level has been exceeded only in 1940 and 1942 since this disease was made notifiable in 1939. The largest rises in measles during the week were Lancashire 333, Lincolnshire 163, Warwickshire 111, Glamorganshire 108, Nottinghamshire 105, Yorkshire West Riding 105, while the largest falls were Derbyshire 87, Surrey 74, Yorkshire East Riding 59, and Herefordshire 43. The incidence of whooping-cough during the past weeks has been at the highest level for this period of the year since notification was started in 1939. The largest rises in whooping-cough during the week reviewed were Lancashire 131, Essex 69, and Middlesex 46. The chief features of the returns for diphtheria were a decrease of 4 in London and a rise of 9 in Warwickshire (11 of the 12 cases in this county were notified in Birmingham C.B.). The chief variations in the trends of scarlet fever were increases in Yorkshire West Riding 37 and Durham 23.

The chief centres of dysentery were Lancashire 69 (Liverpool C.B. 13, Manchester C.B. 10, Oldham C.B. 8, Southport C.B. 8), Leicestershire 62 (Leicester C.B. 58), London 61 (Lambeth 36), Northumberland 36 (Rothbury R.D. 29), Essex 28 (Romford M.B. 15, Leyton U.D. 10), Yorkshire West Riding 19 (Huddersfield C.B. 7), Kent 17 (Chatham M.B. 7, Orpington U.D. 7), Glamorganshire 13 (Cardiff C.B. 13), Anglesey 10 (Valley R.D. 8), Staffordshire 10.

The largest of the local increases in acute poliomyelitis was a rise of from 2 to 12 in Dorsetshire. The largest returns were Lancashire 14 (Liverpool C.B. 8), Cheshire 13 (Birkenhead C.B. 4), Dorsetshire 12, Yorkshire West Riding 12, Surrey 12 (Croydon C.B. 4), Gloucestershire 11 (Bristol C.B. 7), London 11, Devonshire 10, Cornwall 10, Warwickshire 10 (Birmingham C.B. 5), Durham 10.

In *Scotland* increases were recorded in the number of notifications of measles 64, whooping-cough 45, and dysentery 22. The notifications of acute poliomyelitis were 4 more than in the preceding week, and the largest returns were Glasgow 6 and Fife county 3. The largest centres of dysentery were Glasgow 57, Lanark county 40, Edinburgh 13, and Stirling county 10.

In *Eire* increases were recorded in the number of notifications of scarlet fever 34, whooping-cough 29, diarrhoea and enteritis 17, and a decrease of 19 in the notifications of measles. These trends were due to small variations in incidence throughout the country.

In *Northern Ireland* an increase of 49 in the number of notifications of measles was the only large fluctuation in the totals for infectious diseases. A rise in the incidence of measles occurred throughout the country; the largest was 16 in Armagh county. Only 4 cases of poliomyelitis, 5 fewer than in the preceding week, were notified. In Belfast C.B. the notifications of diarrhoea and enteritis increased by 9, but a fall of 7 was reported in the remainder of the country.

Week Ending November 18

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,386, whooping-cough 4,130, diphtheria 76, measles 10,132, acute pneumonia 558, acute poliomyelitis 149, dysentery 474, paratyphoid fever 1, typhoid fever 5.

Medical News

Annual Dinner of the Society of M.O.H.s

The Society of Medical Officers of Health held their annual dinner at the Piccadilly Hotel on November 23. The toast to the society was proposed by Dr. E. A. Gregg, Chairman of Council of the B.M.A., who referred to the strengthening of the link between the society and the Association. He marvelled at the moderation and patience of the Society, whose members steadfastly discharged their duties under conditions which it was unfair to expect them to accept. Dr. Gregg concluded with a tribute to Dr. Metcalfe Brown, chairman of the Public Health Committee of the B.M.A., and to other medical officers of health who had worked hard for the Association and the society. Dr. J. M. Gibson, president of the society, responded. He said that members of the society had been disturbed in recent years by the lack of recognition which was the due of the public health service. Above all, the N.H.S. Act had dulled their spirits, and they had been cheered by the support given by the B.M.A. He thought the pendulum was now swinging back and things were not so bad as they once seemed. Dr. Hugh Paul, proposing the health of the guests, delighted his hearers with a series of rapid-fire witticisms. He paid particular tribute to Sir George Elliston, who had done so much for public health, and to Dr. A. V. Kelynack for helping the members of the society to get what they wanted. Dr. Paul referred to the fact that their chief guest, Sir John Charles, now Chief Medical Officer at the Ministry, had once been a medical officer of health. In his reply Sir John said he saw no final definition of nor steady pattern in the work of an M.O.H. Legislation took away and added functions, but in general the tasks of a medical officer of health well befitted a man and constituted a man's work. Sir Cecil Wakeley also replied for the guests.

Dinner for Bart's Men

The Bart's men in South Africa have arranged a dinner to be held at the time of the B.M.A. Congress next year. It will take place on the evening of July 19, 1951, at the Rand Club, Johannesburg. Any Bart's men who may be visiting South Africa at that time, whether to attend the Congress or not, should communicate with Dr. J. Gluckman, P.O. Box 455, Johannesburg.

X-ray Photographs by Radio

X-ray photographs can be telegraphed overseas by means of the Post Office Cable and Wireless phototelegraphy service. This can be of the utmost importance when a doctor wishes to have an urgent consultation with a colleague in another country. The charge depends on the size of the photograph to be transmitted and also upon the country of destination. It ranges from £1 10s. for a small picture to Belgium or France up to £15 for a large one to the United States. A reply can be paid for in advance and express delivery can be arranged at a small additional fee. Full particulars can be obtained at any Cable and Wireless office and the large post offices, or by telephone to London: Temple Bar 1222, extension 282; Monarch 8060, extension 305.

Princess Tsahai Memorial Hospital, Ethiopia

Five members of the hospital staff, including the medical superintendent and the matron, have now been appointed, and a gynaecologist and nursing staff are being sought. Medical equipment has already been shipped out. Donations for the work of the hospital may still be made to the honorary treasurers, Lord Horder and Lord Amulree, care of Messrs. Gould and Prideaux, 88, Bishopsgate, E.C.2.

International Centre for Chemical Microbiology in Rome

The World Health Organization, with the consent of the Italian Government, has recognized the Istituto Superiore di Sanità in Rome as an International Research Centre for Chemical Microbiology. It is an active centre of research, the largest in Italy, and, mainly thanks to the initiative and outstanding organizing capability of its director-general, Professor Domenico Marotta, its laboratories are among the most modern and best equipped in Europe. The research departments include physics, therapeutic chemistry, biochemistry, malariology, and bacteriology. The Istituto Superiore di Sanità is also the main Food and Drug Control Centre of the Italian Government. Recent extensions of the Institute contain a fermentation pilot plant, with fermenters up to 18,000 litres capacity and all the processing equipment required for the isolation on an industrial scale of biologically important substances, such as antibiotics, enzymes, growth factors, etc. The International Centre for Chemical Microbiology will be under the scientific direction of Professor E. B. Chain, F.R.S., formerly of Oxford University, joint winner of the Nobel Prize for 1945 for his chemical work on penicillin, and recently elected first chairman of the newly formed Expert Committee on Antibiotics of the World Health Organization. The entire idea of the project was born as the result of a lecture tour which Dr. Chain undertook in Italy for the British Council in 1947.

New Antibiotic against Amoebiasis

At the first Medical Symposium on Tropical Diseases of the Middle East, held in Beirut under W.H.O. auspices on November 18 and 19, Dr. Hamilton H. Anderson, dean of the medical faculty of the American University, who had just returned from the United States, announced that a new antibiotic, called fumigillin and still in the experimental stage, had shown great potential value for the treatment of amoebic dysentery.

Science in Africa

According to *The Times*, the Scientific Council for Africa South of the Sahara, which has just concluded its first session at Nairobi under the presidency of Dr. P. J. Du Toit, is to investigate the preparation of regional maps dealing with climatology, vector-borne disease, geology, etc., and the sponsoring of development in field hydrology and water conservation. The council has delegates from South Africa, Madagascar, Portugal, Britain, British East Africa, French West Africa, British West Africa, Southern Rhodesia, Belgian Congo, and French Equatorial Africa, and is trying to co-ordinate and promote scientific work throughout the greater part of the continent. The first African Malaria Conference opened on November 27 at Kampala, Uganda, under W.H.O. auspices.

Aureomycin Made in Britain

At Hirwaun, near Merthyr Tydfil, in South Wales, a factory owned by the Lederle Laboratories division of Cyanamid Products Ltd. will shortly begin to produce enough aureomycin for home consumption and some export. By arrangement with the Ministry of Health, only the purification and packaging of the crude antibiotic imported from the U.S.A. will be carried out here, but the erection of a complete fermentation plant by Lederle, who hold the patents, is under consideration.

Lasker Awards

The American Public Health Association has announced that its 1950 Lasker awards have been given to three American doctors and to the International Health Division of the Rockefeller Foundation. These awards are made for work on diseases which are the main causes of death and disability, and for distinguished service in public health administration. The International Health Division receives the award for its outstanding achievements in the control of hookworm, yellow fever, malaria, and other infectious diseases. Individuals to whom the award has been made include Dr. G. W. Beadle, professor of biology at California Institute of Technology, for work on the control of transmission of hereditary factors in disease; Dr. G. Papanicolaou, of Cornell University, for outstanding contributions to the early diagnosis of cancer; and Dr. E. L. Bishop, of the Tennessee Valley Authority, for original work in public health administration, particularly in the reduction of endemic malaria.

Wills

Mr. Warwick Deeping, the novelist and medical man, left £33,675. Professor A. B. Appleton, emeritus professor of anatomy at St. Thomas's Hospital, left £6,879. Dr. Harman Taylor, of Liverpool, left £8,236; Dr. C. R. Harvey, of Bristol, £61,883; Dr. A. W. Young, of Boxmoor, £31,192. Mr. Eldred Moss Corner, consulting surgeon to St. Thomas's Hospital and to Great Ormond Street Hospital for Sick Children, left £15,680. Dr. Gerald D. Channell, who lost his life in a fire following an explosion at Brompton Hospital, left £3,281. Dr. A. de W. Snowden, formerly of Linford, Ringwood, left £22,683.

COMING EVENTS

FitzPatrick Lectures

Dr. William Brockbank will deliver the FitzPatrick Lectures on "The History of Some Therapeutic Procedures" before the Royal College of Physicians of London (Pall Mall East, S.W.), on Tuesday and Thursday, December 5 and 7, at 5 p.m. In the first lecture Dr. Brockbank will discuss the enema, and in the second cupping and leeching.

Third Legg Memorial Lecture

Sir Thomas Fairbank will give the third Legg Memorial Lecture at King's College Hospital Medical School, Denmark Hill, London, S.E.5, on Friday, December 8, at 4.30 p.m., and his subject will be "The Spine."

Suprarenal Cortex in Disorders of Childhood

Sir Stanton Hicks, professor of human physiology and pharmacology in the University of Adelaide, will deliver a lecture on "The Role of Suprarenal Cortical Function in Disorders of Childhood" at the Ciba Foundation, 41, Portland Place, London, W., on Tuesday, December 12, at 5 p.m., with Lord Horder in the chair. Admission is by ticket obtainable from the secretary of the Foundation at the above address.

Aberdeen University Club, London

The club is holding a dinner and dance on Thursday, December 14, at the Hyde Park Hotel, Knightsbridge, London, S.W., at 7 p.m. for 7.30 p.m., with dancing till 11.45 p.m. Tickets may be had from the secretary, Aberdeen University Club, Southern Hospital, Dartford, Kent, on or before Monday, December 11, at 25s. each.

Florence Tong Lecture

The first Florence Tong Lecture of the Association of British Neurologists will be delivered by Dr. E. C. Lumsden in the lecture theatre, National Hospital, Queen Square, London, W.C., on Saturday, December 16, at 10 a.m. His subject is "Basic Problems in the Pathology of Disseminated Sclerosis and Demyelinating Disease." Admission to the lecture is free.

SOCIETIES AND LECTURES

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

Friday

WHIPPS CROSS HOSPITAL MEDICAL SCHOOL, Leytonstone, E.—December 1, 8.30 p.m., *"Vitamins and Human Beings,"* by Professor J. R. Marrack.

Monday

●HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, London, E.C., December 4, 7 for 7.30 p.m., dinner meeting. *"Bad Habits in Children,"* discussion to be opened by Dr. Felix Brown and Dr. Wilfrid Sheldon.

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—December 4, 5 p.m., *"Infantile Hemiplegia,"* by Dr. W. G. Wyllie.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 4, 5.30 p.m., *"Spontaneous Hyphema,"* by Mr. J. H. Doggart.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—December 4, 5.30 p.m., lecture-demonstration for postgraduates by Dr. K. Cameron.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury Square, London, W.C.—December 4, 7.30 p.m., *"Veterinary Therapeutics,"* by J. Carmichael, D.Sc.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 4, 3.45 p.m., *"Human Pharmacology, with Special Reference to Antihistaminics,"* by Professor W A. Bain.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 4, 5.30 p.m., *"Anatomy of the Eye and Orbit,"* by Professor T. Nicol.

●SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.—December 4, 3.30 p.m., *"The Theoretical Aspects of Isotopes in Relation to Medicine,"* by Professor A W. Wormall; 5 p.m., *"Practical Aspects of Isotopes in Relation to Medicine,"* by Professor J. S. Mitchell.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—December 4, 4.45 p.m., *"Aspects of Protein Structure,"* by Dr. A. Elliott and Dr. W. E. Hanby.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., December 5, 5.30 p.m., *"High Blood Pressure and Renal Disease,"* by Professor Clifford Wilson.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 5, 5 p.m., *"Pigmentary Conditions of the Skin,"* by Dr. I. Muende.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At St. Paul's Hospital, Henrietta Street, London, W.C., December 5, 3 p.m., ward round by Mr. J. D. Fergusson; (2) At St. Peter's Hospital, Henrietta Street, London, W.C., December 5, 10.30 a.m., ward round by Mr. H. K. Vernon; (3) At St. Peter's Hospital, Henrietta Street, London, W.C., December 5, 5 p.m., *"New Growths of the Bladder,"* by Mr. J. G. Sandrey.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—December 5, 5 p.m., *"The History of Some Therapeutic Procedures: The Enema,"* FitzPatrick Lecture by Dr. William Brockbank.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 5, 5 p.m., *"Science and Art of Refraction,"* by Dr. T. H. Whittington.

●SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.—December 5, 3.30 p.m., *"Biochemical Considerations of the Suprarenal Gland and its Relationship to Medical Therapy, with Special Reference to Rheumatoid Arthritis,"* by Professor E. C. Dodds, F.R.S.; 5 p.m., *"The Use of Steroid Hormones in Rheumatoid Arthritis,"* by Dr. W. S. C Copeman.

Wednesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 6, 5 p.m., *"X-ray Technique,"* by Dr. C. W. McKenny.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Peter's Hospital, Henrietta Street, London, W.C., December 6, (1) 3.30 p.m., museum specimens by Dr. Cuthbert Dukes; (2) 5 p.m., *"New Growths of the Bladder,"* by Mr. J. G. Sandrey.

LONDON UNIVERSITY.—At University College (Anatomy Theatre), Gower Street, London, W.C., December 6, 5.30 p.m., *"The Cyto-architectonic Organization of the Spinal Cord,"* by Professor Bror Rexed (Stockholm).

●NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY.—At London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C., December 6, 6 p.m., *"The Institute's Inquiry into Joint Consultation,"* by Mrs. Winifred Raphael.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 6, 3.45 p.m., *"Principles of Immunity in Relation to Surgical Practice,"* by Lord Stamp.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 6, 4 p.m., *"Clinical Ophthalmology"* (Revision), by Mr. R. A. Burn and Mr. R. P. Crick; 5.30 p.m., *"Proptosis,"* by Mr. L. H. Savin.

●SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.—December 6, 3.30 p.m., *"The Theoretical Aspects of the Investigation of Renal Diseases,"* by Professor E. J. King; 5 p.m., *"Some Aspects of Treatment in Renal Disease,"* by Professor Max Rosenheim.

Thursday

BRITISH MEDICAL STUDENTS' ASSOCIATION.—At Bearsted Theatre, The London Hospital, Whitechapel, E., December 7, 5.30 p.m., *"Travels and Experience in Australia,"* by Dr. A. Peacock.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., December 7, 5.30 p.m., *"Dynamics of Heart Failure,"* by Professor J. McMichael.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, Great Ormond Street, London, W.C., December 7, 5 p.m., film: *"Varicose Ulceration: Its Treatment. Method of Bandaging Curative of Varicose Ulceration,"* to be presented by Dr Stuart McAusland. Discussion to be opened by Mr. Harold Dodd.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, December 7, 5 p.m., *"Osteoarthritis of the Hip,"* by Professor Walter Mercer.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 7, 5 p.m., *"Hirsutism,"* by Dr. A. D. Porter.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 7, 5.30 p.m., *"Non-inflammatory Lacrimal Obstruction,"* by Mr. G. G. Penman.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—December 7, 3 p.m., *"Neural Control of Pituitary Gland,"* by Dr. G. W. Harris.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., December 7, 5 p.m., *"Neoplasms of the Urethra, Penis, and Scrotum,"* by Mr. D. I. Williams.

LONDON COUNTY MEDICAL SOCIETY.—At New End Hospital, Hampstead, London, N.W., December 7, 3 p.m., clinical meeting.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.—December 7, 5 p.m., *"The History of Some Therapeutic Procedures: Cupping and Leeching,"* FitzPatrick Lecture by Dr. William Brockbank.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 7, 5 p.m., *"Artificial Eyes,"* by Mr. G. C. Pritchard.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—December 7, 4.30 p.m., lecture-demonstration on psychiatry by Sir Paul Mallinson.

●SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.—December 7, 3.30 p.m., *"The Medical Aspects of Peripheral Vascular Disease,"* by Sir Horace Evans; 5 p.m., *"The Surgery of Peripheral Arterial Disease,"* by Sir James Paterson Ross.

WINGFIELD-MORRIS ORTHOPAEDIC HOSPITAL: NUFFIELD ORTHOPAEDIC CENTRE, Oxford.—December 7, 8.30 p.m., *"The Treatment of 'Intractable' Spasticity,"* by Dr. L. Guttmann.

WREXHAM AND DISTRICT CLINICAL SOCIETY.—At Wynnstay Arms Hotel, Wrexham, December 7, 7.30 p.m., *"Epidemiological Aspects of Tuberculosis,"* by Dr. C. O. Stallybrass.

Friday

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 8, 5.30 p.m., *"Structure and Function of the Cornea,"* by Dr. H. Davson.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, London, S.E.—December 8, *"The Spine,"* Legg Memorial Lecture by Sir Thomas Fairbank.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—December 8, 5 p.m., clinical neurological demonstration by Dr. Anthony Feiling.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 8, 4.15 p.m., *"Pathology,"* by Miss M. Savory.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 8, 5.30 p.m., *"Physiology of the Eye."*

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—December 8, 8 p.m., Hat Night.

ROYAL SANITARY INSTITUTE.—At Newe Hall, Pilgrim Street, Newcastle-upon-Tyne, December 8, 10 a.m., papers: *"A Home of One's Own,"* by Dr. J. V. Walker; *"Drains and Sewers—The Legal Aspect,"* by Mr. L. Mair. Afternoon: visits.

●SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.—December 8, 3.30 p.m. and 5 p.m., *"Thyroid and Parathyroid Diseases,"* by Sir Henry Cohen.

Saturday

KENT PAEDIATRIC SOCIETY.—At Star Hotel, Maidstone, December 9, 2.30 p.m., *"The Value of Intelligence Testing,"* by Mr. M. B. Shapiro.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Elias.—On November 13, 1950, to Dr. Mary Elias (formerly Wiggins), wife of Major T J G. Elias, of 29, Firs Drive, Cranford, Middlesex, a son—David Robin Cliveden.

Finlay.—On November 24, 1950, at the Royal Hospital for Women, Sydney, Australia, to Francesca Maxwell (formerly Best), wife of Donald M. L. Finlay, M.B., a daughter.

Hargrove.—On November 16, 1950, at the Hill Nursing Home, Reading, to Elizabeth (formerly Corbett-Lowe), wife of Dr. Peter Hargrove, a daughter—Carole Susan

Mackay.—On November 16, 1950, to Viola (formerly Shafto), wife of Dr. Hugh Mackay, Gladwynne, Birtley, Co. Durham, a daughter.

MARRIAGES

Griffiths—Poulton.—On November 11, 1950, at Cheltenham, Eric Probert Griffiths M.R.C.S., L.R.C.P., D.C.H., D.R.C.O.G., to Elizabeth Ann Poulton

Shepherd—Graham.—On November 18, 1950, at Broughty Ferry, William Shepherd M.B., Ch.B., to Shirley Anne, eldest daughter of H. A. Graham, M.D., F.R.C.S.Ed.

DEATHS

Broadley.—On November 23, 1950, at 2, Beech Hill Road, Sheffield, John Broadley, M.B., F.R.C.S.Ed.

Brophy.—On November 16, 1950, at 94, Wimbledon Hill Road, London, S.W., Cyril Mary Brophy, M.C., F.R.C.S.

Clark.—On November 15, 1950, in Glasgow, John Sawers Clark, M.C., M.B., Ch.B., D.P.H., of Carnock, Willow Avenue, Lenzie, Dunbartonshire, late of Sittingbourne, West Wickham, and Newmilns, Ayrshire.

Douglas.—On November 20, 1950, at Royal Infirmary, Edinburgh, Andrew Douglas, M.B., Ch.B.

Murray.—On November 20, 1950, in a nursing-home, Brixton, James Alexander Murray, M.D., F.R.S., aged 76.

Any Questions?

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

Athletes and "Heart Strain"

Q.—*In athletic circles laymen often speak of sustaining a "strained heart" following some violent effort. Does this condition exist? If so, how does one recognize it, and what is the exact pathology?*

A.—It is not possible for a healthy young adult to strain his heart in the performance of heavy exercises. The effect of heavy exercise, such as rowing in the Boat Race, is often to cause the individual to become collapsed. In such cases, if there is any cardiac dilatation, which is questionable, this is quite transitory. The collapse is partly vasomotor and partly psychological in origin. There is also a transitory oxygen debt in the body.

If an individual is of the nervous type predisposed to effort syndrome, there is no doubt that physical overstrain may bring out the symptoms of this condition. This again causes no physical change in the heart but is an abnormality of the nervous system in which nervous stimuli to the heart cause undue tachycardia and nervous stimuli from the heart cause undue sensations arising from the heart beat.

Tropical Gastro-enteritis in Children

Q.—*We are losing a number of infants, about 6 months old, from gastro-enteritis in this area (Tel-el-Kebir). What treatment is recommended? At present we use intravenous saline and large doses of penicillin. Castor oil followed by sedation has not been tried recently. "Chloromycetin" was tried once, but it had no beneficial effect. Is "aureomycin" of any value in these cases, or is there any other effective antibiotic?*

A.—In hot climates where infection spreads through poor sanitation and defective food storage, gastro-enteritis continues to be a serious and fatal disease, and the younger the child the more serious it is. There is no specific cure for this disease. Castor oil followed by sedation does more harm than good. Chloromycetin and aureomycin may help in individual cases when the pathogenic organism is known, but their results are disappointing. The chief danger in the disease is in the chemical injury which comes from dehydration and electrolyte loss. The first step in treatment is to correct the dehydration by parenteral administrations of fluid, using saline, Hartmann's solution, or Darrow's solution, whichever may be indicated. If these are given intravenously great technical skill and constant supervision by both doctor and nurse are required; in the absence of adequate supervision it is better to give the fluid subcutaneously. When the pathogenic organism is not known sulphonamides can be given empirically (after the urine flow has been re-established)—or chloromycetin or aureomycin may be tried in the same way—but these are merely adjuvants. The correction of dehydration, and good nursing, are the first requirements.

Treatment of Dwarfism

Q.—*What is the treatment of dwarfism? After what age can any improvement cease to be expected?*

A.—The treatment of dwarfism is unsatisfactory. Retarded growth may be due (*a*) to deficiency of growth hormone, as in hypopituitarism, (*b*) to arrest of growth of bone and premature union of the epiphyses, as may be caused by chronic cachectic diseases in the past, and (*c*) to an inherent unresponsiveness of the growing ends of the bones to the normal growth stimulus, which may possibly be the cause of genetic or hereditary dwarfism. In the last two types there is no treatment which will be effective. In pituitary dwarfism the administration of growth hormone is the logical procedure, but the results obtained with the commercial preparations at present available are not impressive, probably on account of their low potency and inadequate dosage. Attempts may be made with doses of the order of 5 ml. of anterior pituitary growth hormone extract injected intramuscularly three to five times a week, but it is unlikely that any satisfactory therapeutic response will be obtained until pure growth hormone is available. When hypothyroidism is present this should be treated in the usual way. No improvement can ever be expected once the epiphyses have united.

Palatable Prescriptions of Iron

Q.—*What is the most palatable and yet effective prescription for iron for use in secondary anaemias? Are haemoglobin preparations any good?*

A.—It is difficult to state categorically which is the best and most palatable iron preparation. It is definitely established that soluble ferrous salts are the most active form of iron, but they are also the most astringent and most likely to cause nausea. Flavoured preparations of ferrous salts include syrup of ferrous iodide and syrup of ferrous phosphate, *B.P.C.*, 1949, and ferrous sulphate syrup, *U.S.P.*, XIV. Ferrous carbonate pills are slightly less liable to cause unpleasant side reactions than the sulphate, and absorption of iron from them is reasonably satisfactory.

Metallic iron, colloidal ferric preparations, and the scale preparations in which the iron is in a complex form and not readily ionized, all require to be given in large doses to produce effects. Solution of dialysed iron, *B.P.C.*, is a colloidal solution of ferric hydroxide and contains the equivalent of 3 to 4% of iron. This is non-irritant and non-astringent and is sometimes prescribed with two parts of glycerin.

For those patients who cannot tolerate any form of oral iron preparation or who do not appear to absorb iron from the digestive tract, the intravenous preparations "ferrivenin" and "iviron" are available.

Haemoglobin, after oral administration, is converted into haematin in the stomach and then passes through the bowel, very little, if any, being absorbed. An elixir of haemoglobin was included in the 1934 *B.P.C.*, but was so much inferior to the iron salts that it was deleted from the 1949 edition.

Vaginal Examination in Virgins

Q.—*What are the objections to examining a virgin without an anaesthetic?*

A.—The possibility of arousing erotic sensations under such circumstances is so remote that it can be dismissed. Indeed, such would be more likely to occur in a woman with sex experience. The reason for hesitating to make a pelvic examination in a virgin, even an inspection of the vulva, is that in most cases a young girl finds it acutely embarrassing, if not repulsive. Even if she is not hurt it is conceivable that she may suffer psychological trauma which may remain to cause aversion to coitus, vaginismus, and other marital difficulties in later life. Women in older age groups tend to tolerate pelvic examination better, and nowadays even in the younger age groups false modesty is less common. There can be no general rule, and the decision in each case must be based on clinical assessment of the likely reaction of a given patient. Whenever a tentative approach makes it clear that the patient is strongly averse to the examination, and that she is unlikely to co-operate, there should be no attempt at persuasion. If rectal examination does not then supply all the necessary information, vaginal examination under anaesthesia is indicated.

Ringworm of the Nails

Q.—*What is the best method of treating ringworm of the nails without surgical removal of the nails?*

A.—Nails infected with ringworm may be painted twice daily with tinct. iodi mitis, or they may be softened by soaking in a

solution of potassium permanganate (1 in 4,000) with subsequent scraping with the edge of a glass slide and the application of iodine, dithranol, or other fungicide. Fractional doses of *x* rays may be tried, either alone or with these measures, but no treatment is very successful, and treatment even after surgical removal fails in a considerable proportion of cases. Some fungi penetrate more deeply into the nail substance than others and are in consequence less easily cured.

Worn Incisors

Q.—*Can anything be done to improve the appearance when the upper incisors begin to wear down in middle age?*

A.—The remedy is the construction of porcelain or acrylic jacket crowns. The discoloured enamel is removed from the teeth and replaced by a shell of porcelain or acrylic resin. With this method of crowning the nerve of the tooth is left intact.

Allergic Rhinitis

Q.—*What investigations should be carried out to establish a diagnosis of allergic rhinitis? What is the treatment? Is there any known association between allergic rhinitis and glucose tolerance or gastric acidity?*

A.—The patient should be asked about the mode of onset and any seasonal incidence of the symptoms, and about his occupation and environment, with special reference to any food, dust, or other specific factor which might be a cause of the symptoms. Any substances suspected can be tested by appropriate cutaneous tests to ascertain if the patient is sensitive to it. If such sensitivity is established, treatment consists in avoiding the allergen where possible, a carefully graduated course of injections to desensitize the patient, or, if multiple sensitivity is present, a combination of these.

Many allergic patients have some degree of achlorhydria, and children who suffer from asthma have low blood sugars in over 60% of cases.

"Chloromycetin" and Hoarseness

Q.—*Can chloromycetin ever produce hoarseness or aphonia?*

A.—The most serious "toxic" effect of chloromycetin is the production of mucous membrane lesions. These commonly affect the tongue, mouth, and throat and give rise to infection, oedema, and pain. "Black tongue" has been described. The lesions are probably due to yeast infection, and it has been suggested that induced riboflavin deficiency may be a factor in causing these changes. Hoarseness and aphonia might well result, but the writer has not seen it reported. Less commonly, proctitis, vaginitis, and perineal irritation may occur and may persist for a considerable time after treatment is stopped. Nausea, anorexia, and diarrhoea are common symptoms during chloromycetin administration.

NOTES AND COMMENTS

Punch-drunkenness.—Dr. ERNST JOKL (Pretoria) writes: May I refer to your note in "Any Questions?" (September 30, p. 793). The point I wish to make is that punch-drunkenness is not a single syndrome. In our first communication on the subject in 1933 the late Eric Guttmann and I[1] made a distinction between two kinds of chronic impairment encountered in boxers—viz., behaviour anomalies indicative of psychopathic traits, and neurological or psychiatric conditions resulting from head injuries. As regards the former there are on record cases of "viciousness when drunk," "murder committed from jealousy," "boisterousness," "subnormal intelligence," "*malingering*," "vagrancy," "simple dementia," and "euphoria and delinquency." Instances are quoted in my book,[2] and Macdonald Critchley has recently contributed further evidence.[3] Sometimes there are neurological symptoms. Sometimes there are none. The question of the relation of the abnormal behaviour and boxing is often difficult to answer.[4] Conditions assumedly caused by head injuries in the ring include parkinsonism, cerebellar signs, dysarthria, epilepsy, paroxysmal headache, and hemiplegia.[5] Post-mortem studies in boxers have shown subdural haematoma (many cases), early delayed subarachnoid haemorrhage, multiple layers of coagulated blood (pachymeningitis haemorrhagica interna), haemorrhage into the pons, petechial haemorrhages into the cerebellum, petechial haemorrhages into the mid-brain, oedema of the entire brain, oedema of the medulla oblongata, bi-polar parenchymatous contrecoup lesions, laceration of the brain, and septic meningitis. *Ex definitione*, punch-drunkenness is a state of gradual deterioration. But, disregarding for the moment the psychopathic group, the cerebral lesions underlying the condition under discussion are assumed to be similar to those responsible for acute injuries. In fact, virtually every variety of symptom described in Rowbotham's textbook on head injuries[6] has been observed in boxers. The multiplicity of anomalies encountered renders unacceptable the assumption of a single syndrome of punch-drunkenness.

REFERENCES

1 *Münch. med. Wschr.*, 1933, **80**, 560.
2 *The Medical Aspects of Boxing*, 1941. Pretoria: Van Schaik.
3 *Punch-drunk Syndromes: the Chronic Traumatic Encephalopathy of Boxers*, ext. from *Hommage à Clovis Vincent*, 1949. Paris: Maloine.
4 Jokl, E., *Manpower*, 1947, **5-6**, 1.
5 *British Medical Journal*, 1949, **1**, 23.
6 *Acute Injuries of the Head*, 1949. Edinburgh: Livingstone.

Prickly Heat.—Dr. MARY E. EGERTON (Freetown, Sierra Leone) writes: I feel it is a pity that the readers of "Any Questions?" should not be reminded of the wartime discoveries with regard to the prevention of prickly heat (October 7, p. 847). By the issue of salt tablets the armies in tropical areas succeeded in reducing the incidence of all disabilities due to heat, including heat stroke and prickly heat. My own work on this subject hardly deserves mention, being infinitesimal by comparison, but I have again and again proved the efficacy of saline drinks to prevent prickly heat in the European newborn baby. All European babies born at the Princess Christian Hospital, Freetown, are at once put on to slightly hypertonic saline drinks instead of the usual boiled water, and by this means we have prevented the distressing prickly heat to which their sensitive skins are subject. Babies born elsewhere are frequently brought to us smothered in the rash, and I have found that saline by mouth is in every case an effective remedy, reducing the inflammation in the course of a day, and preventing further increase as long as it is continued. For adults extra salt (about three teaspoonfuls daily added to drinks) is also a remarkably effective remedy for heat lassitude.

Dr. C. J. WILSON (Kenya Colony) writes: In the *Journal* of October 7, "Any Questions?" (p. 847), occurs the statement: "There is no truly specific treatment for prickly heat." Can the author of this statement deny that the application of a mercurial lotion is invariably successful in curing prickly heat, and therefore can claim to be specific treatment (see *Journal*, 1948, **1**, 76, 228, 317, 525, 573, and 811)? When prickly heat is at last generally recognized for what it is—namely, a fungus infection at once curable by a mercurial application of requisite strength (my preference is for an aqueous solution of corrosive sublimate, 1 : 500)—perhaps we shall no longer be advised to smear the body with grease and avoid soap in an attempt to alleviate a condition so easily curable.

Dr. P. A. WITH (Trinidad) writes: I have just received the *Journal* for October 7, in which the statement is made that there is no specific treatment for prickly heat ("Any Questions?" p. 847). I notice that 1 : 1,500 solution of mercury perchloride is suggested. The specific treatment is: R Liquor hydrarg. perchlor. 1 : 1,000; strong HCl 1 min. to each ounce of the liquor. When very young and serving in the Mesopotamia campaign in World War I, this prescription was given to me by a planter doctor who had come out on service. I saw some very severe cases, the body being swollen and accompanied with high fever. This lotion, swabbed all over the body several times a day and allowed to dry, was almost magical in 24 hours. . . .

Correction.—Reporting a meeting of the General Medical Services Committee (*Supplement*, November 18, p. 206) we erroneously said that acute primary (including influenzal) pneumonia is not notifiable. It is in fact notifiable.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Alitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 9 1950

LESSONS FOR FUTURE TREATMENT FROM 472 FATALITIES IN DIABETIC CHILDREN*

BY

ELLIOTT P. JOSLIN, M.D., AND JAMES L. WILSON, M.D.

Boston

Our diabetic children are living a great deal longer than formerly, yet they still die prematurely and as a rule unnecessarily. We were much encouraged to learn that the average duration of diabetes in the 135 children who succumbed in 1944–9 exceeded the average duration in those dying in the previous six-year period, 1937–43, by approximately eight years, and that they were eight years older when they died. However, we were much discouraged to learn that tuberculosis and coma played a far more important part in mortality than among all our cases, young and old. In fact, these two preventable complications caused 21.5% of the deaths. Furthermore, an analysis of the cardiorenal-vascular group, which accounts for 56.3% (revised 59.3%) of the deaths, showed 37% (revised 51.9%) age, up to the end of 1949, 472 were dead, 2,381 living, and only 20 untraced at January 18, 1950. This table is compiled in conformity with all our previous records. It is based upon causes of death reported by the family physician or recorded on death certificates. Table II, discussed in detail later, gives what we consider a more accurate classification of causes of death, because this is derived from a detailed reinvestigation of the last illness and the utilization of ante-mortem records. These figures appear in the text as revised percentages. The changes in diagnosis relate almost exclusively to the cardiorenal-vascular group. Justification for such changes and a few others is mentioned below but cannot be explained in each instance because of lack of space.

TABLE I.—*Causes of Death of Child Diabetics. Number and percentage of Deaths from Selected Causes by Eras of Treatment. Experience of E. P. Joslin, 1898 to Date**

Causes of Death	Pre-insulin Era 1898–6/8/22		Insulin Era							
			Banting 7/8/22–31/12/36		Hagedorn 1/1/37–31/12/43		Chas. H. Best 1/1/44 to Date		Total 1898 to Date	
	No.	%	No.	%	No.	%	No.	%	No.	%
Diabetic coma, primary	135	86·0	56	56·6	22	27·2	13	9·6	226	47·9
Cardiorenal-vascular, total	1	0·6	5	5·1	14	17·3	76	56·3	96	20·3
Arteriosclerotic	—	—	2	2·0	14	17·3	76	56·3	92	19·5
Cardiac	—	—	—	—	3	3·7	21	15·6	24	5·1
Angina pectoris or coronary diseases	—	—	—	—	2	2·5	14	10·4	16	3·4
Nephritis	—	—	2	2·0	10	12·3	50	37·0	62	13·1
Apoplexy	—	—	—	—	1	1·2	3	2·2	4	0·8
Gangrene	—	—	—	—	—	—	2	1·5	2	0·4
Other circulatory and rheumatic heart diseases	1	0·6	3	3·0	—	—	—	—	4	0·8
Infections:	10	6·4	23	23·2	20	24·7	10	7·4	63	13·3
Respiratory	7	4·5	10	10·1	5	6·2	5	3·7	27	5·7
Kidney	—	—	—	—	1	1·2	3	2·2	4	0·8
Others	3	1·9	13	13·1	14	17·3	2	1·5	32	6·8
Tuberculosis	—	—	8	8·1	8	9·9	16	11·9	32	6·8
Cancer	—	—	—	—	—	—	1	0·7	1	0·2
Accidents	1	0·6	2	2·0	5	6·2	6	4·4	14	3·0
Suicides	—	—	—	—	1	1·2	2	1·5	3	0·6
Other diseases and conditions	9	5·7	5	5·1	9	11·1	7	5·2	30	6·4
Unknown	1	0·6	—	—	2	2·5	4	3·0	7	1·5
All causes	157	100·0	99	100·0	81	100·0	135	100·0	472	100·0

* Deaths reported up to January 18, 1950.

to be renal. The future holds even greater promise for diabetic children, because we believe not only that the number succumbing to tuberculosis and coma can be reduced but that progress can be made towards decreasing the large number of deaths now resulting from complications in the kidney. A similar optimistic view has come from Boulin's clinic.

In Table I the causes of death of 472 children are recorded in successive periods from 1898 to 1949. Of the 2,873 diabetic children seen, with onset before 15 years of

*Aided by a grant from the Life Insurance Medical Research Fund. Statistical analyses prepared by Statistical Department, Metropolitan Life Insurance Company.

It is true that the incidence of deaths due to diabetic coma has steadily dropped from 86% in the pre-insulin era to 9.6% since 1944, while the frequency of cardiorenal-vascular disease has steadily risen from 0.6% to 56.3%.

Inspection of the cardiorenal-vascular group discloses that only two cases of renal disease were recorded prior to 1937, but recently the figure has risen to 37%. Angina pectoris or coronary disease, likewise, did not appear until 1937, but since that time has risen from 2.5% to 10.4%. Apoplexy was observed only once among these children before 1944 and in only three cases since that time. As for gangrene, only two deaths were noted among the total number.

Fatal infections rose from an incidence of 6.4% before insulin to a peak of 24.7% in 1937–43, but since the introduction of specific chemotherapeutic agents and antibiotics they have fallen to 7.4%.

The children lived for so short a time prior to the discovery of insulin that none was recognized as dying from tuberculosis until the period 1922–36; and, indeed, until this present detailed follow-up of all our cases was made we really did not appreciate that since the use of insulin the deaths from this cause were as high as 8.1% from 1922 to 1936, 9.9% from 1937 to 1943, and 11.9% from 1944 to 1950.

Deaths before 1944 are really "water over the dam," but there is plenty to discuss about the most recent deaths.

Causes of Death of Juvenile Diabetics, 1944–9

A comprehensive review of the ante-mortem clinical records of the 135 patients whose deaths occurred in 1944–9 has just been completed (Table II). This detailed study was very revealing, and was particularly informative in those 76 cases (Table I) in which death was attributed primarily to cardiorenal-vascular causes, of which only 50 were recorded as renal. There were 13 such deaths assigned to cardiac disease because of statements on death certificates. However, we have definite evidence that severe renal diseases had existed for many years before the patients' sudden exitus. Most probably this was quite unknown to the physician signing the death certificate, for he may never have seen the patient before the terminal incident or not even until after death.

TABLE II.—*Revised Table of Causes of Death of Juvenile Diabetics, 1944–9, Based on Ante-mortem Clinical Records*

Causes of Death	No. of Cases	%
Diabetic coma, primary	12	8·8
Cardiorenal-vascular:		
Cardiac	8	5·9
Nephritis	70 } 80	51·9 } 59·3
Apoplexy	2	1·5
Infections	8	5·9
Tuberculosis	15	11·2
Cancer	1	0·7
Accidents:		
Suicide	1	0·7
Others	6 } 7	4·5 } 5·2
Miscellaneous	5	3·7
Unknown	7	5·2
Total	135	100

Two of the deaths reported on the certificate as due to previous gangrene were really due to advanced renal disease. Likewise, two of the cases classified under deaths due to infections were actually severe infections of the kidney superimposed upon a chronically diseased renal apparatus. Three other cases—reported as suicide (based upon suspicion), coma, and apoplexy—were in fact renal deaths. Other changes in our revised classification included one case which we deducted from the tuberculosis group because the osteopath who signed the death certificate told one of us he had included tuberculosis on the certificate on hearsay evidence only. Four others were similarly erroneously reported, but the errors were perpetuated statistically. Our final revisions appear in Table II.

The information disclosed by this critical analysis of the fundamental disease of the patient, as contrasted with the reported terminal event assigned on the death certificate, we believe to be of great significance. Among the diabetic children the true complication which we must combat is renal rather than cardiac. The early signs and symptoms for which we must be ever alert, and for which prophylaxis and newer therapeutic aids may be helpful, are those of complications in the kidney. These observations are in conformity with those published by Fanconi, but they lead us to hope that Boulin, with his group of cases of, as yet, shorter duration, may be justified in his more optimistic attitude.

Tuberculosis

Of the 135 fatal cases among children in 1944–9, there were 15 (11.2%) whose lives ended in tuberculosis. In all of our patients, young and old, tuberculosis never has caused more than 4.9% mortality in any period, and since 1944 it has been 2.5%. With children the previous highest rate was 9.9%, none of the deaths up to 1922 having been caused by it, presumably because before insulin the life-span of a diabetic child was so short. We are uncertain of how many of our living children have tuberculosis.

Six of these 15 deceased children were seen but once, either at a single visit to our office or upon their first and only stay in hospital. Two of them already had advanced tuberculosis. Most of these 15 cases should have been discovered earlier. One had tracheo-bronchial adenitis and another had calcified bronchial glands at their first visit, and two others had findings suggestive of old healed tuberculosis. Having known formerly that one in five of our patients who recovered from diabetic coma developed tuberculosis within five years, we should have supervised more closely the six cases with a history of coma. The diagnosis in six cases was first made by us. In nine cases *x*-ray examination was not carried out at the first visit or during the first stay in the hospital. In fact, six of the cases saw us within six months of the detection of the tuberculosis, and we have no comforting assurance of a negative radiograph in our files.

A special, and warning, lesson is to be learned from the three cases which were at an excellent charitable tuberculosis preventorium long before the tuberculosis was recognized. Certainly they were studied for tuberculosis while there, but after leaving the institution they were not sufficiently followed up. We cannot help wondering what will be the fate of the boys and girls who outgrow the sheltering care of any diabetic children's home. Only two of the fifteen children were ever treated in a diabetic summer camp. All the cases save one came from especially underprivileged families. Four of these patients married; three of them did so before the onset of tuberculosis. One patient married two years after the onset of her tuberculosis and later had one child. In one case pregnancy was interrupted at seven months because of tuberculosis, and another had a nephrectomy for a tuberculous kidney.

Yet there is a hopeful aspect to the picture of these 15 deaths due to tuberculosis in that the average duration of diabetes at death was 13.2 years, though the duration of diabetes since the appearance of tuberculosis was much less. If diabetic children can live 13 years *with* tuberculosis, how much longer should they live *without* it!

Diabetic Coma

Twelve (8.8%) of the 135 deaths in this group of juvenile diabetics were directly attributable to diabetic coma. Five males and seven females, three of whom were married, comprised the group. Six of these patients were known to have relatives who were also diabetic. The average age at onset of diabetes in these 12 patients was 7.9 years and the average duration of the disease before the fatal attack of coma was 10.0 years. Thus the fatal complication occurred in the group at an average age of 17.9 years.

No attacks of coma had occurred during the interval between diagnosis of diabetes and the fatal episode in seven of these cases. One patient had been grossly neglectful and was repeatedly treated for coma before his final attack. Information was inadequate in another case. One patient had suffered two attacks, and two other patients had each been in coma on one occasion between the onset of their disease and their fatal attack of coma.

It was impossible to determine definite precipitating factors in seven of these cases of fatal coma. One patient, having previously been in coma, omitted her insulin for three days because of an upper-respiratory infection; coma in one of the cases was reported to have been precipitated by complications of pregnancy. Dietary excesses alone or associated with the omission of insulin were responsible for the onset of coma in two other cases. Advanced bilateral pneumonia, unsuspected clinically, was first found at necropsy in one case treated at another hospital. This patient received much glucose intravenously during the course of treatment of her coma and was found to have a post-mortem blood sugar of 700 mg. Two of the children were severe behaviour problems, one of whom had associated epilepsy and died at a State mental hospital. Four of the children attended the diabetic camps during one or more summer sessions, but six of the group saw us only once. Not one of these 12 patients was treated at the New England Deaconess Hospital or seen by any one of our staff during their terminal illness. Only three patients were seen within twelve months of their final coma, and only two others had been seen within three years of their fatal illness. Nine of the deaths occurred during the second decade of life, two between the ages of 20 and 30, and one past the age of 30.

The usual variety of associated conditions was seen in these patients: thus one case each of epilepsy, necrobiosis lipoidica diabeticorum, retarded growth, nocturnal diarrhoea, retinitis with generalized arteriosclerosis, xanthomatosis, and insulin lipodystrophy were seen.

Arteriosclerosis

In general, arteriosclerosis when present in one part of the body will manifest itself in the vascular system throughout. As a result of this and its major incidence after 50 years of age the tendency in the past has been to group together all patients showing degenerative vascular disease under the general heading of deaths due to arteriosclerosis. However, a discriminating review of the clinical records of the 135 fatal cases in this series has revealed the presence of ante-mortem renal damage of considerable degree in at least 70 cases, or 51.9% of the entire number. There were 15 post-mortem examinations in the group of 70 fatal cases. The clinical data accumulated on the other 55 patients before their deaths clearly indicate that, despite various other death-certificate classifications, death was in reality due primarily and chiefly to renal disease. The majority of these 55 cases showed all three of the most frequently seen ante-mortem clinical manifestations of vascular nephritis—namely, proteinuria, oedema, and hypertension. Twenty-six of these 55 had shown frank uraemia. Records available indicated that retinitis was an associated manifestation in at least 60% of this group.

It was noted consistently in those cases having adequate follow-up examinations that the proteinuria invariably preceded the elevation of blood pressure, thus strongly supporting the thesis that the condition was primarily renal in origin rather than attributable to the onset of essential hypertension.

Most post-mortem examinations of children dying with diabetes mellitus reveal a mixture of several types of renal pathology, including pyelonephritis, intercapillary glomerulosclerosis, and arteriolosclerotic and arteriosclerotic disease. This was strikingly true in the 15 necropsies in this group. An exception to this general finding was, however, a case in which careful microscopical analysis failed to show evidence of any kidney lesions other than those of chronic glomerulonephritis, despite the fact that before her death the patient showed the classical symptoms of vascular nephritis and was in clinical uraemia terminally. In this case no arteriosclerotic renal changes were evident, although atheromatous changes were described in the aorta and coronary arteries.

Distribution of the cases according to sex seemed irrelevant, since 37 males and 33 females comprised the group. It was anticipated that there would be a considerable preponderance of females in this renal group because of the increased incidence of urinary-tract infections in these young girls. Infection, although playing some part in the pathogenesis of these renal complications, was far from being the entire explanation, though many of these cases revealed a history of previous severe urinary-tract or kidney infections, but without adequate follow-up studies.

Cardiac and Cerebral

Arteriosclerosis, as stated above, is seldom if ever confined to one organ, but in the 10 cases in which the changes were predominantly localized the heart was involved in eight and the brain in two. To say that the heart was not affected in the 70 cases of death due primarily to renal disease would be untrue, but the functional cardiac impairment was apparently of far less importance. Three of these cardiac patients showed also severe hypertension and proteinuria, and two of them had clinical nephritis before death. In one case at necropsy intercapillary glomerulosclerosis was present. These eight patients (five males and three females) died primarily of cardiac disease complicating their diabetes, which had been present for an average of 22 years. The two cerebral deaths were due to emboli, in one case after 26.3 years of diabetes and in the other case after 16.5 years of the disease.

Complications were numerous in the cardiac group. Pulmonary tuberculosis was suspected but never proved in two cases. Five cases had retinitis proliferans, and there was one instance of necrobiosis lipoidica diabeticorum. Severe diarrhoea, presumably on the basis of diabetic neuropathy, had occurred in two patients. None of these patients died in a Boston hospital, and a necropsy was performed in only one case, thus emphasizing our ignorance of the exact nature of the final illness. Very little information was available for review regarding the terminal events in these 10 patients whose death resulted from occlusive cardiovascular phenomena. One was known to have been markedly hypoglycaemic for a considerable period before his terminal coronary occlusion. The youngest patient to have a fatal coronary attack was 21.9 years old, and this same girl was also the only patient having been seen within two years of her death. In all the other cases the patients were last seen at the office or hospital from 3 to 25 years before the final outcome.

Miscellaneous Deaths

As shown in Table II, 27 (20%) of the cases were the result of accidents, infections, and miscellaneous or unknown causes. In seven cases it was impossible to trace the cause of death.

The seven accidental fatalities included a fractured skull in an industrial accident, flame burn in a circus fire, a car accident, a deer-hunting accident, suffocation in bed during

an epileptic seizure, one drowning, and one suicidal death from gunshot wounds. One death resulted from carcinoma of the bladder.

Infections were responsible for eight deaths: pneumonia accounted for four, and systemic infections for the remaining four.

Conclusions

Above all else, these 135 deaths of diabetic children within the last six years—11.2% from tuberculosis, 8.8% from diabetic coma, and 51.9% from renal disease—show that the diabetic with onset of disease in childhood should be followed more closely. Only in this way can needless deaths be avoided. Continuity of treatment is essential. Roentgenograms of the chest should be taken yearly. A constant awareness for evidences or incipient signs of renal disease must be maintained. Research should be concentrated on the kidney in the young diabetic. The importance of post-mortem examinations cannot be too strongly emphasized.

To preserve in comfort and prolong the lives of diabetic children the need is paramount for inexpensive and attractive opportunities, in children's and adolescents' camps, and especially in hospitals, of reviewing their physical condition and promoting morale and zeal for the continuing control of their diabetes.

ERYTHROCYTE SEDIMENTATION IN ANAEMIA

BY

RICHARD TERRY, M.D., M.R.C.P.

Senior Registrar, St. Bartholomew's Hospital

In 1921 Robin Fahraeus introduced his method of measuring the erythrocyte sedimentation rate (E.S.R.) and, after describing the various disorders in which it was increased, discussed the factors involved. Most of his findings are still widely accepted, especially the view that anaemia had an accelerating effect on blood sedimentation. Others studied this problem and also became convinced that anaemia, *per se*, increased the E.S.R. (De Courcy, 1925; Meeker, 1925; Rubin, 1926; Hubbard and Geiger, 1928; Cherry, 1934). It was soon suggested that the E.S.R. was so dependent on the red cell count that it was wholly unreliable in anaemia (Hunt, 1929) and that small increases in the E.S.R. should be discounted in the presence of anaemia (Bannick *et al.*, 1937). With few exceptions further studies have been in agreement on the effect of anaemia and on the need for correction of the increased rate, differing only over the best method of making this correction.

The object of this paper is to give certain theoretical, clinical, and experimental reasons for believing that the E.S.R. is not increased by anaemia, and therefore that the observed E.S.R. has the same significance in anaemia as in normal blood states.

Existing Correction Methods

Some recommend estimation of the E.S.R. in anaemia only after the packed cell volume (P.C.V.) has been adjusted to normal by manipulation of the blood sample (Hubbard and Geiger, 1928; Chung, 1935; Gibson, 1938), others after removal of enough plasma to raise the red cell count to 5 millions per c.mm. (Walton, 1933; Schuster, 1938). Charts have been devised to correct for various haemoglobin levels (Gram, 1929) or haematocrit readings (Ernsterne and Rourke, 1930). The latter method was adopted by Wintrobe and Landsberg (1935), who constructed a chart based on numerous readings on normal blood samples made "anaemic" by dilution with their own plasma. Certain impossible situations in this chart were pointed out by Hynes and Whitby (1938), whose modification is based on the same data. Other methods include simple subtraction based on the haemoglobin level (Gregg, 1939) and a proportional correction depending on the P.C.V. (Della Vida, 1947).

Contrary views have been expressed, but they have been weakened by inadequate evidence (Bouton, 1938; Vogt, 1941) or change of opinion (Gregg, 1937, 1939). Britton (1936) concluded that an increased E.S.R. in anaemia indicated a search for some accompanying disorder, but not only did he allow an upper limit of 15 mm. an hour (Westergren) for women, accounting for this high figure by their lower average red cell count, but he also lent support to a correction chart (Whitby and Britton, 1946). A number of cases of anaemia with normal E.S.R.s were reported by Sugarman (1939), but he gave few details and made no comment on correction. Without referring to clinical results, and believing that the red cells played an entirely passive part in sedimentation, Cutler *et al.* (1938) opposed correction.

This opposition has been too indecisive, and the field is now firmly held by the supporters of correction. The present position remains as described in the exhaustive review of blood sedimentation by Ham and Curtis (1938), who concluded: "It has been clearly established that decrease in erythrocyte concentration causes acceleration of the sedimentation rate."

Fallacies of Correction

Anaemia is not a simple entity. Alterations occur in the red cells affecting their number, mass, size, shape, uniformity, and haemoglobin content, and these alterations vary with the cause of the anaemia, as do changes in the plasma proteins. It follows that a single correction factor will not be suitable for all forms of anaemia, and that consideration of one aspect of the anaemia will lead to other aspects being ignored or distorted. Thus adjustment of the haemoglobin to 100% in an anaemic sample may well increase the red cell count to 10 millions per c.mm. and the P.C.V. to 60%, while manipulating the red cell count of the same specimen to 5 millions per c.mm. may leave the haemoglobin at 40% and the P.C.V. at 30%; similarly, adjusting the P.C.V. to normal will not produce normality in other respects.

These methods of "correcting" the blood sample before estimating the E.S.R. also ignore other changes in the red cells. Cutler *et al.* (1938) maintained that the red cells played an entirely passive part in sedimentation. It seems certain that this view is incorrect. Ham and Curtis (1938), by suspending washed red cells of varying size in the same plasma, showed that large cells sediment faster than small cells. The experiments of Bunting (1939) with cases of sickle-cell anaemia are convincing. He found that their E.S.R. was greatly increased after reducing the sickling by bubbling oxygen through the blood, whereas when about 50% sickling was produced by using carbon dioxide, rouleaux formation and sedimentation were almost abolished.

Plasma protein changes affecting the absolute and relative amounts of albumin/globulin fractions and fibrinogen vary with the cause of the anaemia, but they are not considered in any correction method.

That anaemia is not a simple entity therefore casts doubt on the whole system of correction.

Further doubt arises when one examines the construction of the most widely used correction chart, that of Wintrobe and Landsberg (1935). They diluted specimens of normal blood to produce various degrees of "anaemia." The E.S.R. of each "anaemic" sample was then estimated and the chart constructed from the results. Their argument was simply that if a blood sample of normal P.C.V. with an E.S.R. of 8 mm. an hour was diluted to a P.C.V. of 25% and the E.S.R. thereby increased to 42 mm. an hour, then an E.S.R. of 42 mm. an hour in an anaemic patient whose blood had a P.C.V. of 25% could be regarded as normal. It is apparent that the "anaemic" blood samples on which the chart was based consisted in fact of normal plasma and cells unaltered in any way except concentration. It is therefore difficult to see how this chart is applicable to anaemia.

Thus there seem to be reasonable grounds for doubting the validity of existing correction methods and also for believing that, even if correction were necessary, the complexity of the anaemias would make it impossible. The necessity for correction must now be examined.

Correction methods rest on the assumption that anaemia increases sedimentation. The grounds for this assumption appear to be flimsy. Fahraeus (1921) introduced the concept of anaemia increasing the E.S.R. at the same time that he published his method of measuring sedimentation, and it seems that the great value of the test and the excellence of his report have conferred immunity on his views on the effect of anaemia. He had been impressed by the frequent association of anaemia and increased sedimentation and, not perceiving that both had a common origin, concluded that the increase was due to the anaemia. The absence of sedimentation in polycythaemia seemed to confirm this view. When he found that he could increase the E.S.R. of normal blood by diluting the sample with its own plasma, he regarded the accelerating effect of anaemia as proved. Thus was pseudo-anaemia originated, and others, repeating the same error, have perpetuated the belief that anaemia increases sedimentation.

Evidence against any accelerating effect of anaemia will now be described. Unless otherwise stated, all E.S.R.s mentioned will have been estimated by the Westergren technique, using 0.4 ml. of 3.8% sodium citrate to 1.6 ml. of blood in a 200-mm. tube. The advantages of the Wintrobe technique are appreciated, but the Westergren method is still the most widely used. For similar reasons haemoglobin levels are given as % Haldane.

Range of Normal E.S.R.

There is considerable variation in the figures given for the normal E.S.R., but an upper limit of 10 mm. an hour agrees with most accepted figures. Fig. 1 shows the percentage distribution of E.S.R.s of 10 mm. per hour or less among 367 healthy women and 228 healthy men encountered during the present investigation, both groups having haemoglobin values above 86%.

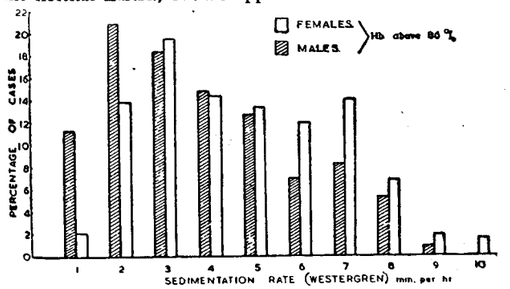


FIG. 1.—Percentage distribution of normal E.S.R.s in non-anaemic men and women.

The mean E.S.R. for the women is 4.72 mm. an hour (twice standard error = ± 0.22), with a modal E.S.R. of 3 mm. an hour; while for the men the mean E.S.R. is 3.82 mm. an hour (twice standard error = ±0.26) with a modal E.S.R. of 2 mm. an hour. Thus there is a highly significant difference.

Range of E.S.R. in Simple Hypochromic Anaemia

The percentage distribution of E.S.R.s between 1 and 10 mm. an hour found in 367 women with Hb values above 86% and in 160 women with Hb levels of 86% and less is shown in Fig 2

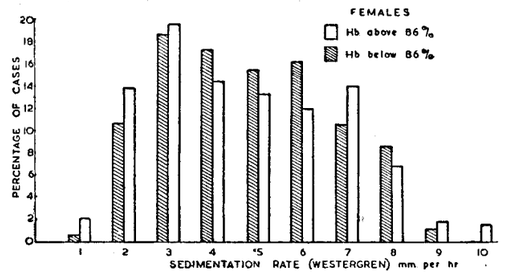


FIG. 2.—Percentage distribution of normal E.S.R.s in anaemic and non-anaemic women.

Of the 160 cases, the Hb levels were between 86% and 77% inclusive in 86, between 76% and 67% inclusive in 27, and 66% or less in 47. The anaemia was of a benign origin in every instance. The mean E.S.R. of the non-anaemic group is 4.72 mm. an hour (twice standard error = ±0.22) and of the anaemic group 4.79 mm. an hour (twice standard error = ±0.30). The modal E.S.R. is 3 mm. an hour in both groups.

The absence of any significant difference is considered to be evidence against anaemia having any accelerating effect on the E.S.R

A further conclusion suggested by these two distribution charts is that the higher E.S.R. of women is due to factors other than their lower average red cell count.

A similar comparison between anaemic and non-anaemic groups of males is not presented, simply because insufficient cases are available, anaemia of benign origin being so much less common in men.

Normal Sedimentation in Anaemia

Whatever theoretical grounds exist for thinking that anaemia has no accelerating effect on sedimentation, it is essential to determine whether normal E.S.R.s do in fact occur in significant anaemia. During this study 60 instances have been encountered and are detailed in Tables I and II. Table I shows the full blood counts of 30 patients with haemoglobin levels below 60% and E.S.R.s of 9 mm. an hour or less. Table II shows a similar group in which the indices were not estimated. All the cases were women except Nos. 58, 59, and 60. Without exception the anaemias were secondary to simple blood loss, usually menstrual and never neoplastic.

Clearly hypochromic anaemia does not inevitably increase sedimentation.

TABLE I.—*Full Blood Counts of Patients with Haemoglobin Levels Below 60% and E.S.R. of 9 mm./hr. or Less*

Case No.	E.S.R.	Hb%	R.B.C.	P.C.V.	M.C.H.C.	M.C.V.
1	8	21	3·2	18	16	56
2	2	24	2·6	17	20	65
3	5	36	3·2	22	16	69
4	6	36	3·6	25	20	69
5	3	38	5·3	28	19	53
6	5	38	3·0	25	21	83
7	6	38	4·2	26	20	62
8	8	40	4·8	29	19	61
9	2	44	4·3	30	21	68
10	2	44	4·1	31	20	76
11	3	44	4·3	31	20	74
12	5	44	4·1	26	24	64
13	7	44	4·3	28	22	64
14	9	44	4·9	27	22	55
15	1	46	3·9	28	22	71
16	2	46	4·7	33	19	72
17	3	46	5·0	30	21	60
18	5	46	3·7	32	20	86
19	5	46	5·1	34	19	68
20	3	48	3·7	27	24	72
21	6	48	5·0	32	20	64
22	3	50	3·8	34	20	90
23	4	50	3·5	29	23	82
24	7	50	3·3	32	21	98
25	2	54	4·3	31	24	72
26	4	54	3·7	29	26	78
27	2	56	3·1	27	29	87
28	4	56	5·0	41	19	80
29	8	56	4·7	35	22	74
30	3	58	4·3	35	23	80

TABLE II.—*Group of Patients Similar to Table I, But in Which the Indices Were Not Estimated*

Patient	E.S.R.	Hb%	R.B.C.	Patient	E.S.R.	Hb%	R.B.C.
31	3	42	5·1	46	6	58	—
32	6	44	2·3	47	8	58	5·2
33	8	44	—	48	9	58	—
34	2	46	3·4	49	4	60	5·1
35	5	46	3·4	50	5	60	4·3
36	6	48	2·5	51	5	60	4·9
37	7	48	4·2	52	5	60	4·5
38	6	50	4·9	53	6	60	4·9
39	8	50	4·7	54	7	60	4·8
40	6	52	—	55	2	64	—
41	3	54	4·8	56	3	64	—
42	7	54	3·8	57	3	64	—
43	6	56	—	58	5	38	—
44	7	56	4·5	59	6	39	—
45	5	58	—	60	1	50	—

Slightly Increased Sedimentation in Anaemia

If these arguments are correct, slight increases in the E.S.R. should be significant even when there is marked anaemia. Table III is presented in support of this view.

TABLE III.—*Slightly Abnormal E.S.R.s in Anaemia*

Case No.	E.S.R.	Hb%	R.B.C. (millis.)	P.C.V. (%)	M.C.H.C. (%)	M.C.V. (μ^3)	Diagnosis
61	15	23	3·5	20	16	56	Atrophic gastritis
62	12	26	3·2	20	18	62	Bronchitis. T. 99·8° F. (37·7° C.)
63	12	32	3·9	26	16	67	Dental sepsis. T. 99° F. (37·2° C.)
64	9	36	4·5	27	19	60	Ulcerative colitis
65	18	38	3·4	25	21	74	*Carcinoma of colon* (early)
66	15	40	3·9	24	23	62	Leucocytosis (? cause). 17,500
67	15	44	4·1	30	20	73	Bilateral phthisis
68	11	46	4·7	29	21	61	Chronic phthisis. T. 99·6° F. (37·55° C.)
69	11	48	3·5	26	24	74	Melaena. W.B.C. 13,000
70	19	48	3·5	—	—	—	Thrombophlebitis migrans
71	11	50	3·2	26	26	81	Cirrhosis hepatis
72	12	50	4·1	28	24	71	Pregnancy (5th month)
73	12	50	3·8	30	23	76	Post-gastrectomy syndrome
74	13	50	4·2	31	22	73	T. 99⁵ F.(? cause)
75	12	54	4·8	35	21	73	Recent infective hepatitis
76	14	56	5·0	34	22	62	Plummer–Vinson syndrome
77	15	60	3·8	31	27	80	Pregnancy (3rd month)
78	18	60	5·0	36	23	72	*Bact. coli* pyelitis
79	16	62	3·8	33	26	85	Subacute appendicitis
80	15	64	4·5	—	—	—	Advanced phthisis

In each case an abnormality usually associated with an increased E.S.R. was present, though the cause was sometimes obscure. It is emphasized that during this investigation no case of hypochromic anaemia with raised E.S.R. has been seen in which there was not good cause for that increase.

Grossly Increased Sedimentation in Anaemia

When there is gross acceleration of the E.S.R., anaemia with its reduced P.C.V. will delay the packing phase of sedimentation and so permit a greater fall over a period of time than if the P.C.V. were normal. The longer the packing phase is delayed the more accurate the reading with the Westergren and Wintrobe methods of estimating the fall in a specific time. But when the E.S.R. is assessed by the time required for a fall of specific length (Linzenmeier, 1920), or by the rate during the phase of constant sedimentation (Cutler, 1932), the effect of the packing phase is specifically eliminated. Thus there seems to be no indication for correction of high E.S.R.s in anaemia.

Antisedimenting Effect of Anaemia

Among the cases shown in Table III were many in which the E.S.R.s were less than might have been anticipated from the severity of the associated disorder, especially Cases 68 and 80, both of which had extensive bilateral phthisis, and Case 79, in which ulcerative colitis, though healing, was still causing four to six loose stools a day.

Further support for this antisedimenting effect is given by the behaviour of the E.S.R. in Cases 61, 63, 69, and 76 In these patients as the anaemia responded to treatment the E.S.R. increased, without clinical evidence of increased activity of the disorder responsible for the abnormal sedimentation (see Table IV).

TABLE IV.—*Behaviour of E.S.R. During Treatment of Anaemia*

Case No.	Before Treatment		During Treatment	
	E.S.R.	Hb%	E.S.R.	Hb%
61	15	23	19	44
63	12	32	25	78
69	11	48	35	70
76	14	56	18	68

Consideration of the effect of the sodium citrate content of the Westergren blood sample also suggests that the suspension stability of the red cells in anaemia is increased. Ham and Curtis (1938) demonstrated in experiments on haemophiliac blood that sodium citrate has a marked retarding effect on sedimentation. Now, the addition of one part of 3.8% sodium citrate to four parts of normal blood (P.C.V. = 45%, say) in the Westergren technique results in a concentration of 1.2% sodium citrate in the plasma. In the case of anaemic blood (P.C.V. = 25%, say) there is a final concentration of 0.95% in the plasma of the Westergren specimen. Thus when a normal E.S.R is present in anaemia (see Tables III and IV) it occurs in spite of a lower sodium citrate concentration than in normal specimens and therefore in spite of a smaller citrate retarding effect.

During this study observations have been made on the effect of diluting Westergren blood samples with their own citrated plasma. The retarding effect of sodium citrate was best seen in dilution experiments on polycythaemic blood (P.C.V. = 75%, say), in which the sodium citrate concentration in the Westergren specimen is 1.9% and the E.S.R. is normally zero. In one representative dilution experiment on polycythaemic blood, 75% dilution of the sample with the citrated plasma resulted in an increase of the E.S.R. to 3 mm. in one hour and 11 mm. in two hours: compared with 40 mm. in one hour and 95 mm. in two hours when the same dilution experiment was carried out with a Wintrobe sample. Wintrobe's dry oxalate mixture produces no alteration in sedimentation rate (Wintrobe and Landsberg, 1935; Ham and Curtis, 1938).

In every dilution experiment in this study on normal blood, dilution has resulted in marked acceleration of sedimentation, confirming the findings of Fahraeus (1921) and many others. However, in every experiment on anaemic blood similar dilution has resulted in less acceleration of the E.S.R. than in the normal specimens (comparing samples of identical E.S.R. before dilution). Now in these anaemic samples there is a smaller concentration of red cells and dilution is carried out with plasma containing a lower concentration of sodium citrate (see above). For these two reasons one would expect that dilution of anaemic samples would show a greater acceleration of sedimentation than dilution of non-anaemic samples. That there is in fact less acceleration is felt to be further evidence of the increased suspension stability of the red cells in anaemia.

Table V shows the increases in sedimentation with various dilutions of blood samples with haemoglobin levels of 136%, 100%, and 58%. These results are representative of repeated similar experiments.

TABLE V.—*Effect of Dilution on Westergren E.S.R.*

Hb%	E.S.R.	Dilution			
		Nil	25%	50%	75%
136	In one hour	0	0	2	3
100		4	9	15	20
58		4	7	10	15
136	In two hours	0	1	3	5
100		10	23	40	55
58		12	20	30	40

Discussion

With a wealth of authoritative opinion in support, correction of the E.S.R. is now generally believed to be necessary and is widely practised. When such corrections are made, minor abnormalities of the E.S.R. are converted to normal and any possible significance is lost. When the E.S.R. is raised in the presence of anaemia the elevation is usually disregarded because "the E.S.R. goes up in anaemia." When a patient is found to be anaemic the E.S.R. is often not estimated, since "it will be up anyway."

On the contrary, this study suggests that the E.S.R. in hypochromic anaemia of simple origin has the same limits of normal as in non-anaemic blood and that minor increases in the E.S.R. in anaemia are of at least the same significance as similar increases in normal blood. The E.S.R. has its limitations like any other clinical test, but anaemia is not one of them.

It is, however, a little unexpected to find normal sedimentation rates associated with marked anaemia, since dilution of normal blood undoubtedly increases the rate. It has been pointed out that the red cells are not entirely passive in the processes of sedimentation. It may be that the small abnormal cells of hypochromic anaemia resist rouleaux formation, or that the plasma of anaemia is deficient in rouleaux-forming properties.

Summary and Conclusion

Reasons are given for doubting the current view that the E.S.R. in anaemia requires correction.

The impossibility of correction and the fallacies of correction methods are discussed.

The distribution of E.S.R.s in 367 normal women was found to be identical with that in 160 women suffering from hypochromic anaemia of benign origin. The modal E.S.R. in both groups was 3 mm. an hour.

The modal E.S.R. in 273 normal men was found to be 2 mm. an hour. This finding is thought to indicate that the higher average E.S.R. of women is due to some factor other than their lower average red cell count.

In 60 patients with haemoglobin values between 21% and 60%, E.S.R.s ranged between 1 and 9 mm. an hour. It is therefore evident that anaemia does not increase the E.S.R.

In 20 patients with haemoglobin levels between 23% and 64%, the E.S.R.s were between 9 and 19 mm. an hour. Adequate reasons for the raised E.S.R.s were present in all, indicating the significance of small increases in sedimentation in anaemia and emphasizing the dangers of correction.

Evidence is outlined for believing that the suspension stability of red cells is increased in anaemia.

These findings refer to the Westergren E.S.R. Similar but insufficient observations suggest that they also apply to the Wintrobe E.S.R.

Hypochromic anaemia neither invalidates the Westergren E.S.R. nor necessitates correction.

It is with great pleasure that I record my gratitude to Dr. R. Bodley Scott for his advice and encouragement, to Dr. Geoffrey Bourne and others for access to their clinical material, to Dr. H. F. Brewer for facilities in the Department of Clinical Pathology, to Mr. M. P. Curwen, of the Statistics Department, and to Mr. Norman K. Harrison, of the Photographic Department, St. Bartholomew's Hospital.

REFERENCES

Bannick, E. G., Gregg, R. O., and Guernsey, C. M. (1937). *J. Amer. med. Ass.*, **109**, 1257.
Bouton, S. M. (1938). *J. Lab. clin. Med.*, **23**, 519.
Britton, C. J. C. (1936). *N.Z. med. J.*, **35**, 310.
Bunting, H. (1939). *Amer. J. med. Sci.*, **198**, 191.
Cherry, T. H. (1934). *J. Lab. clin. Med.*, **20**, 257.
Chung, H. (1935). Ibid., **20**, 633.
Cutler, J. W. (1932). *Amer. J. med. Sci.*, **183**, 643.
—— Park, F. R., and Herr, B. S. (1938). Ibid., **195**, 734.
De Courcy, J. L. (1925). *Amer. J. Surg.*, **39**, 129.
Della Vida, B. L. (1947). In Dyke's *Recent Advances in Clinical Pathology*. Churchill, London.
Ernsterne, A. C., and Rourke, M. D. (1930). *J. clin. Invest.*, **8**, 545.
Fahraeus, R. (1921). *Acta med. scand.*, **55**, 1.
Gibson, H. J. (1938). *Proc. R. Soc. Med.*, **31**, 309.
Gram, H. C. (1929). *Acta med. scand.*, **70**, 242.
Gregg, R. O. (1937). *J. Lab. clin. Med.*, **22**, 786.
—— (1939). *Proc. Mayo Clin.*, **14**, 600.
Ham, T. H., and Curtis, F. C. (1938) *Medicine*, **17**, 447.
Hubbard, R. S., and Geiger, H. B. (1928). *J. Lab. clin. Med.*, **13**, 322.
Hunt, H. F. (1929). Ibid., **14**, 1061.
Hynes, M., and Whitby, L. E. H. (1938). *Lancet*, **2**, 249.
Linzenmeier, G. (1920). *Arch. ges. Physiol.*, **181**, 169.
Meeker, D. O. (1925). *Clifton med. Bull.*, **11**, 72.
Rubin, E. H. (1926). *Arch. intern. Med.*, **37**, 848.
Schuster, N. H. (1938). *Tubercle*, **19**, 529.
Sugarman, H. (1939). *Canad. med. Ass. J.*, **40**, 65.
Vogt, C. J. (1941). *Amer. J. Obstet. Gynec.*, **41**, 206.
Walton, A. C. R. (1933). *Quart. J. Med.* n.s., **2**, 79.
Whitby, L. E. H., and Britton, C. J. C. (1946). *Disorders of the Blood*, 5th ed. Churchill, London.
Wintrobe, M. M., and Landsberg, J. W. (1935) *Amer. J. med Sci.*, **189**, 102.

Nearly 15,000 more hospital beds are now available for patients in England and Wales than before the National Health Service began in July, 1948. This brings the number of staffed beds to 470,000, out of a total of about 514,000. Hospital nursing and midwifery staff has increased by 24,000—16,000 more full-time and 8,000 more part-time. Increases have been recorded among all grades, including student nurses, midwives, and pupil midwives. There are now 7,000 more student nurses, the total having risen to 49,000. This is a new record. Total full-time hospital nursing and midwifery staff is now nearly 135,000, and part-time 25,000. The increase in staff has enabled many more hospitals not only to bring empty beds back into use but to introduce as well a 96-hour fortnight and to improve working conditions generally. These figures were issued by the Ministry of Health early in November, and cover the period July 5, 1948, to June 30, 1950—the first 24 months of the Service.

PSYCHOLOGICAL TREATMENT IN SKIN DISORDERS

WITH SPECIAL REFERENCE TO ABREACTIVE TECHNIQUES

BY

H. J. SHORVON, M.B., B.S., D.P.M., D.A.
A. J. ROOK, M.A., M.D., M.R.C.P.

AND

D. S. WILKINSON, M.D., M.R.C.P.

(From the Departments of Psychological Medicine and of Diseases of the Skin, St. Thomas's Hospital)

During the last 30 years there has been an increasing realization of the place of psychological factors in the production or precipitation of certain skin disorders. Pioneer contributions to the subject were made in England by O'Donovan, and in America by Stokes. MacKenna (1944) attempted to correlate personality types with certain skin reactions, and Klaber and Wittkower (1939) and Wittkower (1946) have studied series of patients with specific skin disorders in an endeavour to assess the importance of psychological factors in their pathogenesis. Gillespie (1938) and Sulzberger and Zaidens (1948) have dealt with the probable psychological mechanisms involved. Useful general reviews of the growing literature on this subject have been published by Stokes (1932), Klauder (1936), and Wittkower (1948).

We are impressed by the relative lack of emphasis on treatment and by the paucity of detail on methods employed and the results achieved.

The tendency has so far been for psychiatrists to treat cases referred from dermatologists by systematic long-term individual or group psychotherapy, but because of its time-consuming nature this method is necessarily limited to few patients. Treatment by "drug abreaction" offers an alternative method, having the advantage of taking up much less time and so allowing for the treatment of many more patients.

It is universally recognized that the free discussion of significant events, or "getting things off one's chest," may result in some relief of pent-up tension. The therapeutic value of a mere recital of unpleasant experiences is slight; but, as Freud and others observed, if the revived traumatic incidents are relived with emotional intensity and vividness (or, in other words, if the patient "abreacts") a striking release and relief of tension may occur. The term "abreaction" was originally applied to the recalling and reliving of repressed events, but has for some time been given a wider interpretation to include both conscious and unconscious material. Its essential feature is the excitement attained during the discharge of emotionally laden ideas and incidents, and our technique is to stimulate further and to facilitate the release of this excitement by the use of drugs. The more intense the emotion aroused and its release, the more successful the abreaction.

Irrespective of its cause, tension is present in many skin disorders. Since in many patients its relief results in the amelioration or disappearance of the skin condition, we considered the use of abreactive techniques in the treatment of 50 dermatological patients. The results so far obtained seem to us of sufficient interest to warrant this communication.

The results of treatment in the 50 cases may be classified as follows: in 21 the skin cleared (but 3 have relapsed within one year); in 22 the skin condition improved; and in 7 there was no change.

Of the seven who showed no change, one was psychotic, one a woman of 65, two discontinued treatment, and three others are still under treatment.

It will be realized that this does not represent a final or complete analysis. The patients whom we treated by abreaction were suffering from a variety of skin conditions. Moreover, this series was experimental in the sense that different intensities and lengths of treatment were used. It must be stressed also that the patients had been selected in the first instance by dermatologists as being suitable for this form of therapy and that the promising results must in part be attributed to this. For that reason we shall emphasize the criteria to which we have strictly adhered in our more recent cases.

Our present results give an approximate impression only. After a longer follow-up period we hope to publish a detailed analysis, in which due attention can be given to such obviously important factors as the type of skin condition, its chronicity, and the nature and duration of previous treatment.

Selection of Cases

Abreactive techniques have been applied by us to a wide range of skin disorders, and from our experience and findings we have attempted to determine some practical criteria for the selection of suitable patients by the dermatologist. In assessing this, one point requires emphasis. Not all patients whose skin eruptions are psychologically determined require this particular method of psychological treatment. Many will respond to superficial psychotherapy, or similar methods within the power of the general practitioner or dermatologist, whereas some may need other specialized forms of psychological therapy.

Our criteria for the selection of patients are: (1) The cutaneous reaction is one in which either a psychological cause is generally accepted or one in which it seems likely, from a combination of positive psychological and negative organic findings. (2) The disorder is of sudden onset or apparently related to a specific, emotionally traumatic incident. (3) The patient should preferably be under the age of 40. (4) The patient must be psychologically accessible, psychotics and defectives being obviously unsuitable.

In occasional patients the skin disorder, although not obviously determined by psychological factors, may, because of associated psychological disturbances, be expected to benefit from non-specific abreactive treatments.

Technique

We have used intravenous barbiturates, such as sodium amytal or thiopentone, ether, intravenous methylamphetamine hydrochloride ("methedrine"), and a carbon dioxide mixture, alone or in various combinations, to facilitate emotional release. An intravenous barbiturate alone has little part to play in the abreaction of skin disorders, though Sargant and Slater (1940), when treating battle casualties after Dunkirk, recognized its value in certain cases with tension due to recent trauma. They found that the induced emotional outbursts were often effective in breaking up the recently acquired neurotic patterns of behaviour. It is much more difficult to bring about an excitatory abreaction under intravenous barbiturates in chronic cases, and most

dermatological patients requiring psychological treatment fall into this group. In an ancillary capacity barbiturates can, however, occasionally be used to relax an apprehensive patient before an ether or carbon dioxide abreaction is attempted, or to reinforce the effect of methylamphetamine hydrochloride. They also have some value in special instances, such as the uncovering of an amnesia or the preliminary breaking-down of a reticent patient's inhibitions.

Summary of Cases

Case No.	Age	Sex	Diagnosis	Length of History	Outstanding Personality Traits or Psychiatric State	Result
1	34	M	Psoriasis	2 yrs.	Obsessional	+
2	23	M	Pruritus ani	4 ,,	Mildly obsessional	Cleared*
3	34	M	Urticaria	18 ,,	Anxious	+
4	24	F	Seborrhoeic eczema	2 ,,	Anxious. Paranoid trends	Cleared
5	22	M	Atopic dermatitis	4 ,, (present attack)	Anxious	
6	42	M	Neurodermatitis	3 yrs.	Obsessional	No change (discontinued treatment)
7	40	M	Pruritus ani	14 ,,	,,	+
8	30	M	,, ,,	9 ,,	,,	Cleared
9	33	M	Neurodermatitis	5 ,,	,,	,,
10	28	M	Pruritus ani	2 ,,	Mildly obsessional	+
11	28	M	,, ,,	12 ,,	Anxious	Cleared
12	51	M	Neurodermatitis	4 ,,	Mildly obsessional	Cleared (relapsed)
13	34	M	Prurigo	8 ,,	Mildly obsessional psychopath	Cleared (relapsed)
14	27	M	Hyperhidrosis	1 yr.	Hysteric	Cleared
15	27	M	Urticaria	4 yrs.	Psychopath	+
16	50	M	Psoriasis	30 ,,	—	+
17	33	M	,,	30 ,,	Anxious	+
18	38	F	Pruritus vulvae	1 yr.	,,	+
19	25	F	,, ,,	4 yrs.	Hysteric	Cleared
20	22	F	,, ,,	7 ,,	,,	No change
21	29	M	Atopic dermatitis	10 ,,	Mildly obsessional	+
22	37	M	Pruritus ani	11 ,,	Obsessional	+
23	49	M	Pruritus + Lichen planus	30 ,, / 3 ,,	,,	Cleared
24	29	F	Pruritus vulvae	13 ,,	Hysteric	,,
25	33	F	Neurodermatitis	8 ,,	Obsessional. Paranoid traits	,,
26	42	M	,,	12 ,,	(i) Anxious (ii) Defective	Cleared (relapsed)
27	35	F	Pruritus vulvae	10 ,,	Mildly obsessional	No change
28	45	F	Neurodermatitis	2 ,,	,,	Cleared
29	54	F	Urticaria + Psoriasis	5 ,, / 3 mths	Hysteric	Cleared +
30	50	M	Eczema	5 yrs.	Mildly obsessional	+
31	52	M	Seborrhoeic eczema	20 ,,	Anxious	+
32	32	F	Acne rosacea	1 yr.	—	+
33	30	F	Neurodermatitis	1 ,,	Hysteric	+
34	65	F	Pruritus vulvae	5 yrs.	Anxious	No change
35	32	M	Angioneurotic oedema	1½ ,,	Psychopath	Cleared
36	22	F	Hyperhidrosis	1 yr.	Anxious	+ (discontinued treatment)
37	28	F	Acne urticata	3 yrs.	Psychopath	+
38	45	M	Pruritus ani	1½ ,,	Obsessional	Cleared
39	44	M	Cheiropompholyx	4 ,,	Obsessive hysteric	
40	29	M	Psoriasis	15 ,,	Mildly obsessional	+
41	45	M	Erythematous dermatitis of face	3 ,,	,,	Cleared
42	32	F	Pruritus vulvae + Neurodermatitis	4 ,, / 4 ,,	Obsessive hysteric	+
43	27	M	Urticaria	12 ,,	Mildly obsessional	+
44	26	F	Dermographism	7 ,,	Psychopath	No change
45	20	F	Abnormal blushing	3 ,,	Anxious	+
46	35	F	Neurodermatitis	4 ,,	Mildly obsessional	No change (discontinued treatment)
47	40	M	,,	3 mths.	Paranoid psychosis	No change
48	34	F	Dyshidrosis	1½ yrs.	Hysteric	+
49	32	F	Prurigo	2 ,,	Anxious	+
50	35	M	Generalized prurigo	7 ,,	—	Cleared

* "Cleared" = When the skin condition completely disappears and has so far not recurred. + = When improvement occurs in the skin condition or in associated pruritus (which occurred in some cases of psoriasis).

An intense excitatory abreaction with the release of tension, anxiety, and aggression can often be induced with ether even in long-standing cases. Our technique has been fully described in previous papers by Sargant and Shorvon (1945) and Shorvon and Sargant (1947). Briefly, incidents of emotional significance are selected from the patient's past history and used to start off the abreaction. He is excited under light ether (far short of anaesthesia) with an open mask, and then encouraged to take himself back to the situations in which these events have occurred. Should he succeed in doing so, his voice becomes louder and he begins to abreact, behaving as though the events were happening at that moment. He is deliberately encouraged to shout, cry, and struggle, and the physician is on the alert to play on incidents of high emotional content which may become evident for the first time only during the abreaction. It is not always necessary to abreact specific incidents accurately, and in practice one may deliberately distort events if by so doing an even greater excitement or anger results. The patient experiences a marked easing of tension if the abreaction has been a success. Many patients, however, fail to abreact under ether, particularly those with marked obsessional trends in their make-up. They tend to answer in the past tense, in an impersonal manner, and are acutely aware of their surroundings.

For such patients, repeated intravenous injections of methylamphetamine hydrochloride, 25 to 30 mg., can be very useful (Simon and Taube, 1946; Sargant, 1948). A pleasantly relaxed feeling with mental calm, euphoria, and confidence soon sets in. "It increases the clarity of things" and "the brain races away as in insomnia." If encouraged, the patient exhibits a pressure of talk and acceleration of ideas with a lack of reserve. The loquaciousness may continue for many hours, particularly if the effect is reinforced by sodium amytal (3 to 6 gr.—0.2 to 0.4 g.).

As one patient said, "It gives me the desire to get rid of the junk in my mind," and much valuable and previously inaccessible material may pour out in a short time. This facilitation may be punctuated by emotional outbursts, especially if an ether mask is applied when traumatic events are discussed. The total effect is that of a prolonged moderate abreaction or, in other words, a prolonged state of excitation in full consciousness. We have encountered no untoward side-reactions, but the pulse rate is often accelerated, the blood pressure is raised, and there is some thirst and dryness of mouth.

Since 1947 experiments have been made by Sargant, and later by other members of the psychiatric department of St. Thomas's Hospital, in the application of Meduna's (1948) carbon dioxide inhalation technique to facilitate abreaction. This technique, with modifications, is to be reported in a paper by Marshall, Sargant, and Shorvon. The inhalation mixture consists of 30% carbon dioxide and 70% oxygen, and is a rapid and safe method that can easily be given in an out-patient department. The treatment is usually carried out two or three times a week, and, as a rule, at least 20 are required. We have found it useful in pruritus ani, lichenified neurodermatitis, and Besnier's prurigo, but the results have been inferior compared with cases treated by abreaction under ether or methylamphetamine hydrochloride. It can, however, be of distinct value if used to attain the end-point of an ether abreaction in which the patient failed to reach a climax of excitement. The patient is thereby relaxed and

may experience much relief. If successful there is a gradual lessening of tension with an easing of skin irritation.

We have employed abreactive techniques in the treatment of more than 50 dermatological patients (see Table) and the following cases illustrate some of the points we wish to bring out.

Case 9

A man aged 33 gave a five-years history of extensive exudative neurodermatitis of the arms, legs, and back. It began soon after his landing in Burma in 1944, first on the left elbow and then on the back of his legs. The itching was intense. Lotions, ointments, sulphonamides, and *x*-ray treatments were tried, with little effect. Since demobilization he felt "full of frustrations" and was unable to keep up with his work. He is an obsessional individual with phobias and "thousands of compulsions," and declares he is never relaxed. He joined the Regular Army in 1937 and was a corporal at the outbreak of war, but in a few years rose to the rank of major in a glider regiment. He knew of no immediate precipitating cause of his eruption, but stated that he went through a worrying time at O.C.T.U. in 1942 and had only four days with his wife after their marriage in 1943 before they were separated by their respective duties in the Services. He was treated by ether abreactions, at first twice weekly and then once a week.

In the first treatment he did not abreact, but gave further details of his history. In the second treatment there was some abreaction over a glider crash in which he was involved four months before going to Burma. However, he abreacted violently on the subject of a woman living in the flat below who irritated him beyond measure because of her objection to the slightest noise. He had to remove his shoes at night and see to it that his child was quiet. After this abreaction he said he felt happier than he had been for months, but he still had some skin irritation. In the third abreaction there was a marked release of aggression in regard to this woman, and also concerning his employer, whom he blamed for constantly increasing his work. In the ensuing week his wife said he was a different man to live with, and no longer "flew off the handle at the least thing." The irritation was negligible and the skin condition was much improved. The fourth abreaction was on similar lines and he felt "on top of the world," but suffered a slight setback after appearing before a medical board.

In the fifth abreaction he displayed little emotion when describing in detail the death of his friend in the glider crash, nor when he related the shock he experienced on a further occasion. He had watched the departure of three friends for Burma in a plane in which he was prevented from travelling at the last moment and soon after learned of their death when the plane hit a mountain. Again, however, there was a violent outburst over his neighbour. The same happened in the sixth abreaction, and he now "ceased to kick and snarl or lose his temper when things went wrong." The greatest abreaction took place at the seventh treatment. On the way to Burma the patient landed at Cairo and expected to meet his wife, who was serving in Egypt in the W.A.A.F. about a hundred miles away. The wing-commander refused him permission and he was sent on to Burma, yet other men who had been waiting for a plane for some weeks could easily have changed with him. The eighth abreaction was mainly concerned with the wing-commander and his neighbour, but he then began to talk of his wife's commanding officer in Egypt, who had apparently made several attempts to get into her tent at night. "I wish I could get at him. She wrote and told me about it before I left for Burma." The ninth and final abreaction was similar. He claimed that he "felt a new man," that little annoyances passed him by, and that he had infinitely more patience. After six weeks the skin lesions had regressed to such a degree that for the first time for a year he was able to walk with comfort. He put on 21 lb. (9.5 kg.) in weight in the next six months; his skin cleared and has remained so for over a year.

This case is of interest in that the patient, although obsessional, abreacted under ether. This is unusual with obsessionals. There was a gradual unfolding of incidents causing tension and aggression prior to the onset of the skin eruption, but the abreactions were non-specific in the sense that much use was made of situations occurring long after the skin trouble began. The treatment consisted of a general release of tension and aggression.

Case 24

A woman aged 29 complained of generalized pruritus together with pruritus vulvae et ani. This began in 1937 and was persistent till 1943. It began again in 1948. The irritation started at the age of 17 when a boy of whom she was very fond, and with whom she had been going out for 18 months, suddenly left her for another girl. "I did not get over it." She had received many forms of treatment without relief. She married in 1941, but the irritation continued throughout her pregnancy in the following year. The symptoms cleared when her husband went abroad in 1943, but returned when she began to work in her husband's office in 1948. She had had all the accepted methods of treatment, including *x*-ray therapy, and also sedation with barbiturates and antihistaminics.

From her own account she was a nervous, worrying, bad-tempered type and was somewhat hysterical and mildly obsessional. For the unhappiness of her marriage she blamed her inability to forget her first boy friend. She experienced no sexual satisfaction. She was hostile to her child and felt that her husband did not trust her, and that for this further reason he had placed her in his office, where he, moreover, paid marked attention to the other girls.

In the first ether abreaction she cried a good deal over her love for her former boy friend, Wally, who liked flirting but "did not insist on intercourse." He failed in his marriage and attempted, during her husband's absence overseas, to get her to live with him. They indulged in kissing and masturbation, and she was symptom-free during this period. Her pruritus was worse after the abreaction. A second ether abreaction in the same week was much the same, and produced no improvement. One week later she was given an intravenous injection of 30 mg. methylamphetamine hydrochloride. She now stated that since the recurrence of pruritus vulvae in 1948 she had not had intercourse with her husband. She admitted that during his absence abroad she made every effort to persuade Wally to leave his wife and come to her. Her husband, on embarkation leave, intercepted a letter from Wally and "had a colossal row with her and ceased to trust her." After this abreaction there was a marked easing of pruritus for some days.

After a further week she was given another intravenous injection, and she discussed the many neurotic symptoms of her early years and her maladjustments at home. She showed a marked hostility to her mother, who was exasperating and fault-finding. She said that her pruritus recurred in 1948, when she found her husband was happy in his office but not at home. After this abreaction she felt much calmer and decided to leave her husband and child "while she straightened things out in her mind."

The third methylamphetamine hydrochloride abreaction was largely concerned with her attitude to her husband and a general discussion of her life-situation. From this time her tension eased and she returned to her husband and is now leading a normal life with little or no pruritus.

This case illustrates the common history of frigidity met with in many patients with pruritus vulvae and the indication that the pruritus is a defence against sexual intercourse. We have often noticed that pruritus ani in women may precede or be associated with pruritus vulvae, as in this case. It is significant that her symptoms cleared as soon as her husband went overseas. It also illustrated the successful use of intravenous methylamphetamine hydrochloride where ether abreactions failed. Inadequate emotional release sometimes results in an increase of tension, as happened with this patient under ether, but a successful release was accomplished by the use of intravenous methylamphetamine hydrochloride.

Case 8

A man aged 30 complained of persistent pruritus ani for nine years, beginning almost immediately after the evacuation of Dunkirk. Various local applications had been tried with very little or no success. He stated that after much stress he got away from Dunkirk in an overcrowded boat which was bombed and machine-gunned, and then capsized. He managed to swim back to the beach and was eventually evacuated to England, where he experienced disturbing battle dreams and jumped at the least noise. The air raids and flying bombs greatly upset him, but he completed his Army service.

On examination his perianal skin was macerated and erythematous. He showed an obsessional personality and was tense, anxious, irritable, and sweating.

Treatment was by weekly abreactions under ether. The first was vivid and emotionally violent. He described his journey towards Dunkirk in an abandoned lorry. This was stopped by military police, who pointed out that he was sitting on boxes filled with high explosives. "I leapt off and felt I had sat on something hot." During the dive-bombing on the beaches his friend sustained multiple shrapnel wounds in the buttocks and he applied the dressings. The abreaction became most intense when he re-enacted his swim back to the beach after his boat capsized. This was reproduced so faithfully that he made repetitive swimming movements on the couch, puffed and grunted, became cyanosed, and developed a fine froth at the mouth. The irritation practically cleared after this treatment, but his hands remained moist and clammy.

The second abreaction was more detailed. Several men were killed in the water and he reached the shore after much difficulty. He also saw a large ship bombed and set on fire at night and watched several trapped men, silhouetted against the glare, leap off the burning vessel. After this abreaction he "felt fine. No bother. The best since 1940."

Dive-bombing and scenes at Dunkirk were the main topics of the third abreaction, and the patient attributed his pruritus to immersion and no change of clothing. He had some irritation after this abreaction, which cleared with the fifth and sixth abreactions. The latter were largely concerned with his difficulties in swimming in the oil-covered sea. The patient was still free of pruritus a year later.

It is always open to doubt how much a particular localization may be due to predetermined factors and how much to the particular psychological associations. We do not wish to stress, therefore, the localizing associations, such as dressing his friend's buttock wounds, which occur in this case. Removal of symptoms, however, followed abreaction of these incidents, and it is interesting that the ether abreactions were successful in spite of the fact that the traumata occurred several years ago.

Case 5

A man aged 22 stated that he developed an intensely irritating rash three years ago, when his arms were scalded by boiling oil from the back-flash of a boiler. This happened in Australia some months after he joined the Navy, and he was eventually invalided out. Recently he became very anxious during his wife's pregnancy, as he had strong views on the "agony of childbirth." A generalized spread occurred during her confinement, and a further exacerbation followed when he thought he had a duodenal ulcer. Clinically he presented an unusually extensive picture of Besnier's prurigo. At the age of 10 he had been treated by systematic psychotherapy for Besnier's prurigo of the arms, which was said to have followed the loss of the tip of his finger; the skin cleared after six months.

An ether abreaction was attempted, and he gave a complicated and detailed description of the "accident." Suddenly he became very emotional and declared the whole story to be a lie. He described his increasing dissatisfaction with the discipline and restrictions of the Service. A mate had failed "to work his ticket" and bet him that he would not succeed. He then began to scratch the flexures of his arms to bring out his former rash. His determination to do so was increased when he found he had been drafted for Hong Kong. Soon afterwards the back-flash occurred, but the oil did not touch him. He made full use of this incident and malingered. After his discharge from the Navy he felt very guilty and has made repeated attempts to rejoin and "serve his time."

He experienced a marked relief in relating the true story for the first time, and the skin condition rapidly cleared.

From a dermatological point of view, this patient was suffering from an extensive atopic eczema. His experiences with this complaint in earlier life enabled him to employ it as a mode of reaction for future difficulties. It is of interest that, having produced it artificially, the intense guilt over his own action and the superadded anxiety were sufficient to exacerbate the skin condition. During long periods in civilian and naval hospitals his response to treatment had been entirely unsatisfactory. Confession under ether and removal of guilt resulted in immediate improvement, which has so far been maintained for one year.

Case 25

A woman aged 33 gave a history of "eczema" of eight years' duration, beginning on her honeymoon. A sore patch behind an ear spread to the eyelids, back of the neck, and both ears. After the death of her mother in 1942 it spread all over her body, and there were further exacerbations when her only brother was presumed to have died in Burma and when a cousin died suddenly in 1949 from heart failure in her home. The itching was intense. There was only temporary or no relief from an abundance of treatments, such as superficial *x*-ray therapy, local applications, injections of calcium, dieting, and visits to faith-healers and homoeopaths.

She had a very unhappy upbringing. Her father was a gambler, and she had to wait outside his workplace in an attempt to save some money for the family before he lost it. She was very fond of her mother. At school she was very shy and kept to herself. Her personality is obsessional with paranoid trends. She expressed a hatred of any form of duplicity or dishonesty, and the least slight put her into an irritable, sulky state for days. She stated that bad attacks of irritation coincided with emotional upsets or occurred when she was overtired and worried. She also said she was in a persistent state of frustration and suppressed anger because her rich, vulgar, and domineering mother-in-law had strongly objected to her marriage and had shown her much ill-will before it and since. She felt guilty over her mother's death, having taken her home against the advice of a hospital. She also felt she had caused the death of her mother by giving her a hot drink instead of ice to suck when she had a haemorrhage.

Several attempts at abreaction under ether produced little or no emotional release, but there was a better response when the treatments were completed with carbon dioxide inhalations. Many of the details of her history were elaborated and she brought out further causes of friction. She gradually began to assert herself with her mother-in-law and showed an increasing resentment towards her husband. She stated that the treatment gave her some relief of irritation and "took a load off her mind." Her skin condition improved in so far as the lichenification of her arms and neck cleared.

As the condition then remained static, intravenous methylamphetamine hydrochloride therapy was tried. With the first injection she became very talkative for the first time and remained so for most of the day. She then disclosed that a fortnight before the marriage her fiancé presented a false medical certificate to avoid military service. As most of her family were in the Services, this was a tremendous shock to her. "I would not have married him had I known it earlier." The rash began immediately after the marriage, and the honeymoon was a very miserable one. She was too ashamed and furious to go out, and hid in their room in the hotel. As soon as the honeymoon ended she made her husband go to Scotland Yard and confess. He then joined the Army, but she continued to hold his intended evasion of service against him. With the second injection she poured out many further accusations against her husband and his mother, and afterwards had a "showdown"

with him. From this time their relationship greatly improved and her skin condition cleared altogether. She has remained well for a year.

This case is of interest in that repeated ether and carbon dioxide treatments resulted in some relief of tension with improvement of a severe lichenified neurodermatitis, but it required intravenous methylamphetamine hydrochloride injections to bring out the crucial precipitating factors, the abreaction of which resulted in complete relief of the skin condition.

Discussion

It will be seen from the foregoing cases that a variety of skin disorders may be associated with specific or non-specific psychological factors, and may be relieved by treatment of these factors. It is pertinent to stress here that because some such cases may be cured or alleviated by this treatment it does not necessarily follow that they are caused by such factors (though in the cases chosen these probably were of primary aetiological importance).

In certain other cases the treatment we have described may greatly influence the patient's attitude towards his disease, enabling him to reduce to reasonable proportions symptoms which had come to assume an overwhelming and unreasonable significance for him. A patient with psoriasis, for example, who considered that his skin lesions were ruining his life, was helped to adjust himself to the disease, although this was not significantly modified by such treatment. In other cases, such improvement gives the dermatologist a better chance of succeeding in the treatment of the disease along conventional lines. This is especially so in many cases of eczema, in which psychological factors may perpetuate an eruption of quite other causation. Perhaps the most important cases of this type are those in which the eruption was initially determined by occupational factors.

We believe that, even in the presence of skin reactions of a type in which the possible psychological origin is accepted, a careful exclusion of organic causes is essential if disaster is to be avoided. This exclusion should be made at an early stage and not after the failure of unsuitable treatment over a period of months or years. Pruritus may, for example, be a symptom of a pre-reticulosis, and pruritus vulvae may lead to the discovery of diabetes. It is perhaps less often realized that, conversely, failure to appreciate positive psychological factors at an equally early stage may condemn a patient to months of ineffective treatment.

Although the abreaction was the principal therapeutic procedure employed in the cases described, psychotherapy was of course used to a limited extent. It was superficial in the sense that, though possible precipitating events were discussed and the patient's life-situation and reactions were reviewed, no prolonged analysis was attempted. Attempts were made to persuade the patient to see the part played by mental symptoms and traumatic episodes in the genesis of skin disorder. Environmental, domestic, and occupational difficulties were tackled where necessary, but it is unfortunately true that such difficulties sometimes proved insuperable barriers to effective treatment.

Though the cases we treated required, in our view, the use of abreaction therapy, we believe that most patients with psychologically determined disorders can be adequately treated by simple psychotherapy administered by the practitioner or dermatologist who is aware of the indications. Sneddon (1949) has discussed this aspect and has shown that much can be achieved in suitable cases. Even a brief psychiatric history and personality assessment should enable the dermatologist or practitioner to discover these factors and to realize their significance.

The importance of the skin itself and the constitutional limitations of the atopic, ichthyotic, and seborrhoeic types must constantly be borne in mind. Both these and the morale of the patient, as well as the social problems we have mentioned, naturally affect the prognosis. Although we do not claim that this method is the only one that may be employed or that all cases are cured or benefited by it, we have found it of definite value in a considerable proportion of all cases considered to require treatment by a psychiatrist. The particular advantages, from a practical point of view, are that treatment can be carried out in the out-patient department and that a limited number of consultations are needed compared with systematic psychotherapy and analytical methods. We have been impressed, from the dermatologist's point of view, by the rapidity with which results are obtained and, within the limits of our follow-up, by the infrequency of recurrences. The period of time needed to produce marked improvement is generally a matter of weeks or months, depending on the frequency of treatment and type of skin disorder. On the whole, patients with neurodermatitis respond after a few treatments, while those with pruritus ani or pruritus vulvae need correspondingly more in view of the greater complexity of the factors involved.

Our experience of patients treated by convulsion therapy and prolonged sedation has been far less encouraging. Some of the patients we have referred to had already been treated with prolonged and deep sedation with little or no effect. We have already pointed out that obsessional patients often fail to abreact. Similarly, severely depressed patients may require convulsive shock therapy and very agitated patients deep narcosis as an urgent matter.

We are not aware that the abreactive technique has previously been employed in the treatment of skin disease, and the eminently practical nature of the treatment and the encouraging results obtained lead us to regard it as a useful addition to the dermatologist's therapeutic armoury. It is probable that the other methods of psychological treatment will be found to have specific indications in dermatology, and criteria for these should be established. It is obvious that no single method will be applicable to all cases

Summary

The literature on the psychological aspects of skin conditions contains few references to treatment.

The application of the abreactive technique in treatment of certain skin disorders is described, and an attempt has been made to define the criteria for its employment.

Five illustrative cases are reported.

The value and limitations of psychological methods of treatment are discussed, and it is suggested that the abreactive technique offers a practical and useful method of treatment.

We would like to thank Dr. William Sargant and Dr G B. Dowling for their interest and encouragement, and our colleagues who have referred many of the cases to us.

REFERENCES

Gillespie, R. D. (1938). *Brit. J. Derm. Syph.*, **50**, 1.
Klaber, R., and Wittkower, E. (1939) Ibid., **51**, 501.
Klauder, J. V. (1936). *J. nerv. ment Dis.* **84**, 249.
MacKenna, R. M. B. (1944). *Lancet*, **2**, 679
Meduna, L. J. (1948). *J. nerv. ment Dis.*, **108**, 373.
Sargant, W. (1948). *Dig. Neurol. Psychiat.*, **16**, 193.
—— and Shorvon, H. J. (1945). *Arch Neurol Psychiat., Chicago*, **54**, 231.
—— and Slater, E. (1940). *Lancet*, **2**, 1.
Shorvon, H. J., and Sargant, W (1947). *J. ment. Sci.*, **93**, 709
Simon, J. L., and Taube, H. (1946). *J nerv. ment. Dis.*, **104**, 593
Sneddon, I. B. (1949). *British Medical Journal*, **1**, 472.
Stokes, J. H. (1932). *Penn. med J.*, **35**, 229.
Sulzberger, M. B. and Zaidens, S. H. (1948). *Med. clin. N. Amer.*, **32**, 669.
Wittkower, E. (1946). *Lancet*, **1**, 566.
—— (1948). In *Modern Trends in Dermatology*, edited by R. M. B. MacKenna, p. 237. London.

HEREDITY AND LEG ULCERS

BY

S. T. ANNING, M.A., M.D., M.R.C.P.

Assistant Physician, Dermatological Department, Leeds General Infirmary

Accurate knowledge of the aetiology of any disease is necessary for its rational treatment. This applies equally to preventive treatment, and it was with this in mind that the present investigation was carried out to learn more about heredity in relation to gravitational ulcers of the leg.

Its place in the aetiology of these ulcers has never been soundly established, though many authors have expressed the opinion that it may be important. Weber, Rast, and Lutterotti (1930) described chronic ulceration of the legs following pneumonia in a man aged 25 with thrombo-angiitis obliterans whose father had suffered from similar ulcers, and Carleton (1948) reported a striking family history in two sisters with leg ulcers. Weber (1948) wrote that there certainly is a constitutional tendency to ulcus cruris in some families. Heredity undoubtedly plays a part in ulceration of the legs associated with purpura haemorrhagica, sickle-cell anaemia, congenital haemolytic icterus, splenic anaemia, Gaucher's disease, and Cooley's anaemia (Weber and Dorner, 1910; Weber, 1930; Taylor, 1939; Cummer and LaRocco, 1940; Witts, 1942; Woofter, Dick, and Bierring, 1945; Estes, Farber, and Stickney, 1948), but these conditions account for few of the leg ulcers seen here.

There is more evidence of the importance of heredity in the aetiology of varicose veins. Virchow (1855–61) recognized this, and Gay (1868) reported two affected families. Curtius (1928) published several pedigrees and Čičóvački and Stöger (1939) recorded one which showed that the condition is inherited as a dominant character. Ottley (1934) examined a series of 50 patients, and found that the inheritance was of a simple dominant type in 26 families; in another 10 either a recessive character was concerned or the usual dominant type was masked in predisposed individuals.

In patients with varicose veins a positive family history was found in 50–75% by Magnus (1921), 55% by Nicholson (1927), 65% by de Takats and Quint (1930), 56% by Jensen (1932), over 50% by Payne (1936), 43% by Larson and Smith (1943), only 6–10% by McPheeters and Anderson (1946), and 80% by Pratt (1950). A positive family history of varicosis might therefore be expected in many patients with leg ulcers resulting from varicose veins, and this has been noted by Bauer (1948).

Present Investigation

A series of 525 patients examined personally has been investigated to try to determine more precisely the place of heredity in gravitational ulceration.

Here the term "positive family history" indicates that ulcers or varicose veins are known to have been present in one or more parent, sibling, child, uncle, or aunt. Varicose veins rarely appear before the age of 20 (McPheeters and Anderson, 1946; Roberts, 1949), and in the present series ulceration before that age developed in only 17 patients (3.2%). Because of this and the difficulty in obtaining information about grandparents, pedigrees dealing with many generations are rarely obtained. Eighty pedigrees have been determined, but in many of them accurate information is limited to parents, siblings, and children.

It is not easy to discover the complete family history of patients with leg ulcers unless several members of the family can be examined, and this has seldom been possible here. Although the presence of ulcers and varicose veins in parents, siblings, and children may be known by the patient, accurate pedigrees which include other relations are difficult to obtain, as these conditions are not commonly disclosed.

Of the 525 patients (360 women and 165 men) examined, 29 were unable to give a family history, and of the remaining 496 a family history of ulcers or varicose veins was present in 256 (51.6%). As, however, the variety of causes of gravitational ulcer makes such figures of little value, an attempt has been made to break up the series into different aetiological groups. The accompanying Table shows the number of patients with a positive family history in each of these groups.

Details of Family History

Cause of Ulcer	No. of Patients	Family History Known	Negative Family History	Positive Family History				
				Without Details	History of V.V.	History of Ulcers Only	Total	%
Thrombotic:								
Post-partum thrombosis	111	103	48	15	30	10	55	53·4
Ante-partum thrombosis	28	28	11	9	5	3	17	60·7
Disease of leg:								
Injury without fracture	101	97	48	15	26	8	49	50·5
Injury with fracture	22	22	17	1	4	0	5	22·7
Infection of leg	20	19	15	2	2	0	4	22·2
Treatment of varicose veins	28	28	11	5	10	2	17	60·7
Operation on leg	9	8	3	2	3	0	5	62·5
Burns of leg	5	4	4	0	0	0	0	
Thrombosis — unknown cause	39	35	13	7	13	2	22	62·8
Recumbency:								
Medical illness	34	32	20	2	5	5	12	37·5
Operation—not on leg	19	18	9	2	7	0	9	50·0
Other causes	4	4	1	1	2	0	3	
Miscellaneous causes	5	5	1	0	3	1	4	
"Silent" thrombosis	9	9	6	1	1	1	3	33·3
Non-thrombotic:								
Varicose ulcers	32	29	3	2	22	2	26	89·9
Arteriosclerotic ulcers	6	6	2	0	0	4	4	
Arthritic ulcers	5	5	2	0	3	0	3	
Doubtful cause (with varicose veins)	44	40	24	4	8	4	16	40·0
Doubtful cause (without varicose veins)	4	4	2	1	1	0	2	
Total	525	496	240				256	51·6

In considering the incidence of positive family histories in the various groups in the table it must be remembered that varicose veins are common, and leg ulcers not uncommon, in the general population of this country. Roberts (1949) found, in the examination of 10,000 candidates applying for Post Office appointments, a mean incidence of 1.57% of men and 1.68% of women with varicose veins. All age groups were included, though most males were under 45 and most females under 25. In a social survey conducted in 1947 (General Register Office, 1950—personal communication) of 30,843 men and 38,503 women of all ages over 16 years, varicose veins were found in 1.03% of men and 3.13% of women. The highest incidence (4.18%) occurred in the 11,440 women aged 45–64 years. Less is known about the incidence of leg ulcers, but it has been stated (Annotation, 1950) that about 5 per 1,000 of the population are affected.

It has not been found possible, from these figures, to estimate the incidence of positive family histories to be

expected in the general population, and the determination of this incidence by questioning a random group has not been carried out.

The Thrombotic Group

However, ulceration from thrombosis after fracture, burning, infection, or operation affecting the leg would seem to result from causes less susceptible to hereditary influences than some, and more likely to result from chance. (The group with injury of the leg without fracture has not been included, as it is heterogenous, the degree and mode of injury being very variable.) Of the 56 patients concerned, 25% gave a positive family history. As hereditary factors may have played some part in causing the thrombosis which occurred in these patients (and this seems to have been so in the operation group), it cannot be argued that this incidence of positive family histories represents that to be expected in the general population, yet it provides a useful comparison with the incidence found in other groups of patients with ulcers.

In the thrombotic group, 53.4% of patients with ulcers caused by post-partum thrombosis gave a positive family history. This incidence is significantly higher than that expected (25%), and it is worthy of note that the mothers of 10 of these patients and the sisters of 2 of the 10 had also suffered from post-partum thrombosis. Special precautions to prevent thrombosis seem to be indicated in parturient women with a family history of varicose veins, leg ulcer, or thrombosis, especially if the confinement be difficult (Anning, 1949).

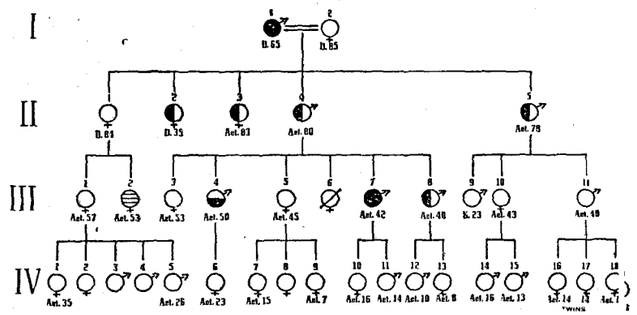
Among the other patients in the thrombotic group, those with ante-partum thrombosis, and thrombosis due to treatment (especially injection) of varicose veins, to operation on the leg, and to unknown causes, had a significantly higher incidence of positive family histories than that expected, and this is possibly also true of patients with thrombosis due to injury without fracture. In thrombosis from recumbency and in "silent" thrombosis, heredity seems to play a doubtful part.

The Non-thrombotic Group

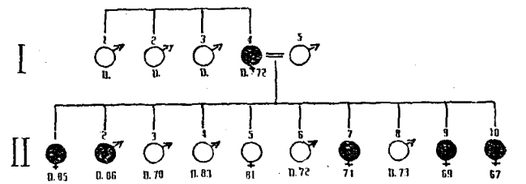
In the non-thrombotic group heredity is clearly of major importance in varicose ulcers—that is, ulcers due to varicose veins alone—a positive family history being present in 89.9%. A family affected in this way is shown in pedigree 1. Here gross varicose veins were present, but ulceration occurred only in two members, probably because most of the affected members wore elastic supporting bandages or stockings. Sitting back on her heels, kneeling, caused thrombosis in one member (III, 2).

In varicose ulcers it is possible that not only congenital weakness of the wall of the veins but congenital absence of valves may also play a part (Eger and Casper, 1943; Curtis and Helms, 1947). The importance of defective valves in the deep veins in this type of ulcer has been stressed by Warwick (1931), Luke (1941), and Bauer (1948).

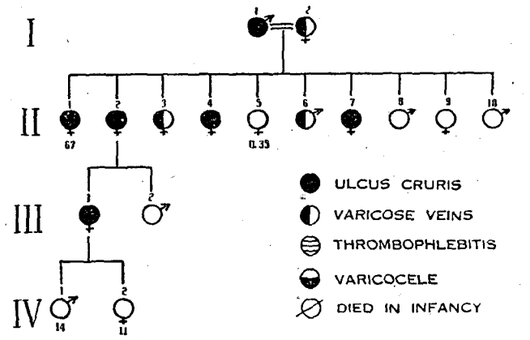
The number of patients with ulcers thought to be due primarily to arteriosclerosis is small, but of these a large proportion gave a family history of ulcers of the legs (without varicose veins), and such a family is shown in pedigree 2. Only the three youngest women in the second generation were examined. They each had cold extremities, cyanosis of the toes, tortuous radial arteries, impalpable dorsalis pedis arteries, and radiological evidence of calcification of arteries in the leg. There was hypertension.



PEDIGREE 1.—Ulcers due to varicose veins alone. (Key on Pedigree 3.)



PEDIGREE 2.—Ulcers of the legs (without varicose veins) due primarily to arteriosclerosis.



PEDIGREE 3.—Varicose veins, thrombosis from various causes, and ulcers.

It will be noted that, apart from the arteriosclerotic group, the proportion of patients with a family history of ulcers only is small compared with that of patients with a family history of varicose veins. A tendency to thrombosis occurs in some families, occasionally without primary varicose veins, but more commonly in association with them. (Here primary varicose veins must be distinguished from those appearing secondarily to the thrombosis.) Primary varicose veins seem to be the common factor in the family history, when positive, of most patients with leg ulcers of the post-thrombotic and the varicose types. A family with varicose veins, thrombosis from various causes, and ulcers is shown in pedigree 3. Here, in the first generation, the husband had a leg ulcer and his wife varicose veins; of their 10 children the eldest fractured her left tibia and fibula at the age of 46; thrombosis followed while the leg was in plaster-of-Paris and an ulcer appeared when she was 48; the second had a post-partum thrombosis followed by ulceration; the third had varicose veins; the fourth had thrombosis for no known cause and ulceration later; the sixth and seventh had varicose veins which were operated upon, an ulcer appearing after the operation in the seventh; of the third generation, one had an ulcer.

Conclusion

The presence of a familial tendency to ulceration, except in the arteriosclerotic group, is usually associated with the inheritance of varicose veins; this applies to post-thrombotic as well as to varicose ulceration. It must not be assumed, however, that varicose veins are present in an individual before thrombosis occurs, as this is not usually so. It means merely that thrombosis, unless caused by fracture or infection of the leg, seems more likely to occur in individuals with a family history of varicose veins.

Where thrombosis may occur, as in parturient women, patients recumbent for medical or surgical reasons, and those with fractures of or undergoing operations on the leg, special efforts should be made to prevent it if there is a family history of varicose veins, thrombosis, or ulcus cruris.

Summary

The influence of heredity in gravitational ulceration of the leg has been investigated in a series of 525 patients.

The significance of the family history has been considered in various groups of patients with ulcers from different causes.

The implications of the family history in regard to prevention of thrombosis are mentioned.

I am grateful to Dr. John T. Ingram and Dr. F. F. Hellier for allowing me to carry out this investigation on their patients, and to Dr. Percy Stocks and Miss Eileen M. Brooke for providing me with information from the General Register Office.

REFERENCES

Anning, S. T. (1949). *British Medical Journal*, **2**, 458.
Annotation (1950). Ibid., **2**, 338.
Bauer, G. (1948). *J. int. Chir.*, **8**, 937.
Carleton, Alice (1948). *Arch. Derm. Syph., Chicago*, **57**, 636.
Čičóvački, D., and Stöger, R. (1939). *Wien. klin. Wschr.*, **52**, 708.
Cummer, C. L., and LaRocco, C. G. (1940). *Arch. Derm. Syph., Chicago*, **42**, 1015.
Curtis, A. C., and Helms, R. W. (1947). Ibid., **55**, 639.
Curtius, F. (1928). *Dtsch. Arch. klin. Med.*, **162**, 194.
Eger, S. A., and Casper, S. L. (1943). *J. Amer. med. Ass.*, **123**, 148.
Estes, J. E., Farber, E. M., and Stickney, J. M. (1948). *Blood*, **3**, 302.
Gay, J. (1868). *On Varicose Diseases of the Lower Extremities*. Lettsomian Lectures of 1867. Churchill, London.
Jensen, D. R. (1932). *Ann. Surg.*, **95**, 738.
Larson, R. A., and Smith, F. L. (1943). *Proc. Mayo Clin.*, **18**, 400.
Luke, J. C. (1941). *Surg. Gynec. Obstet.*, **73**, 472.
McPheeters, H. O., and Anderson, J. K. (1946). *Injection Treatment of Varicose Veins and Hemorrhoids*, 3rd ed. Davis, Philadelphia.
Magnus, G. (1921). *Dtsch. Z. Chir.*, **162**, 71.
Nicholson, B. B. (1927). *Arch. Surg., Chicago*, **15**, 351.
Ottley, Constance (1934). *British Medical Journal*, **1**, 528.
Payne, R. T. (1936). Ibid., **1**, 877.
Pratt, G. H. (1950). *Med. Clin. N. Amer.*, **34**, 897.
Roberts, C. (1949). Cited by R. R. Foote, *Varicose Veins*, p. 38. Butterworth, London.
de Takats, G., and Quint, H. (1930). *Surg. Gynec. Obstet.*, **50**, 545.
Taylor, E. S. (1939). *J. Amer. med. Ass.*, **112**, 1574.
Virchow (1855–61). Cited by Warwick (1931).
Warwick, W. T. (1931). *The Rational Treatment of Varicose Veins and Varicocoele*. Faber and Faber, London.
Weber, F. Parkes (1930). *Practitioner*, **124**, 392.
—— (1948). In *Modern Trends in Dermatology*, edited by R. M. B. MacKenna. Butterworth, London.
—— and Dorner, G. (1910). *Lancet*, **1**, 227.
—— Rast, H., and Lutterotti, O. (1930). *British Medical Journal*, **2**, 279.
Witts, L. J. (1942). Ibid., **2**, 309.
Woofter, A. C., Dick, W. S., and Bierring, W. L. (1945). *Arch. intern. Med.*, **76**, 230.

The London Area Mobile Physiotherapy Service (L.A.M.P.S.) is a voluntary society founded in May, 1948, to provide physiotherapy at home to those who cannot afford to pay, since it became clear that the National Health Service would, for some years at least, be unable to provide such a service. About 30,000 members of the Home Nursing Scheme have automatically come into the society, and some 250 private physiotherapists are providing the treatments, which in the year 1949–50 amounted to nearly 4,000.

TREATMENT OF POST-PHLEBITIC LEG AND APPLICATION OF VENOUS-PRESSURE MEASUREMENT*

BY

A. J. WALKER, M.B., F.R.C.S.

Formerly Chief Assistant, Surgical Professorial Unit, St. Bartholomew's Hospital; Surgical Tutor, General Infirmary at Leeds

Homans (1941) was the first to champion ligation of the superficial femoral vein in the treatment of the post-phlebitic leg. He argued that the condition was due to valvular incompetence in the main leg veins as a result of the thrombus recanalizing, and that ligation of the superficial femoral vein, harmless when performed for other conditions, was likely to do good. His lead was followed by Buxton *et al.* (1944), who recorded 21 cases, later increased to 26 (Buxton and Collier, 1945). Linton and Hardy (1947) published 34 cases (58 legs), later raised to 49 (84 legs) (Linton and Hardy, 1948), in which they stripped the long saphenous vein as well. Glasser (1949) and Sandegård (1949) published 91 (40 cases followed up) and 32 cases respectively, the latter selecting his patients for operation by the retrograde phlebogram method of Bauer (1948).

Bauer in his paper advocated the ligation of the popliteal rather than of the femoral vein and published the result of 24 cases, later increased to 196 (Bauer, 1950). I have set out the results claimed by these authors in Table I. Ulcers are claimed to remain healed in 70–100% of cases, bursting pain is usually cured, but oedema persists in a disappointingly high proportion of those treated, except in Bauer's hands.

Impressed by Bauer's arguments and results, we have employed his methods at St. Bartholomew's Hospital on a series of 30 legs. This paper presents the results of this treatment, and the application of venous-pressure measurements in the selection of cases. The division and ligation of the vein is done through a 3-in. (7.6-cm.) vertical incision in the upper half of the popliteal fossa. Afterwards the knee is kept extended for five days to aid healing, but early walking with a crêpe bandage is allowed. Rapid healing is ensured if the joint crease is not transgressed.

Material

Twenty-six patients were treated, 4 of the 30 ligations having been done bilaterally. Four patients, accounting for six of the ligations, showed no evidence of previous thrombosis, and these must be included in Bauer's (1948) and Luke's (1941) group with primary valvular incompetence of the deep veins. The histories varied from 2 to 50 years in duration, and the ages from 24 to 72. Four patients were older than Buxton's upper limit of 55 years, and I agree with Glasser (1949) that this upper limit is meaningless.

The chief symptoms were ulceration or eczema—usually painful—bursting pain, and oedema. Less common were coldness and cyanosis, nocturnal cramps, and varicose veins. Ulceration occurred in 15 instances (50% of total). In 12 cases the ulcers were notably painful, a feature which helped to distinguish them from varicose ulcers. The medial malleolus was the common site, and a varying

*A slight amplification of a paper read to the Section of Surgery at the Annual Meeting of the British Medical Association, Liverpool, 1950.

TABLE I.—*Comparison of Results Claimed by Various Authors after Venous Ligation for Valvular Incompetence*

	Ligation of Superficial Femoral Vein						Ligation of Popliteal Vein		
	Buxton and Collier		Linton and Hardy		Glasser	Sandegård	Bauer		Present Series
	1	2	1	2			1	2	
No. of ligations followed up	21	26	58	84	40	32	24	196	27
Follow-up period (months)	3–6	3–15	3–14	1–16	6–48	9	3–14	6–36	3–15
Ulcer cases:									
No.	14	15	21	36	40	25	22	Not stated	15
% staying healed after operation	29	87	95	81	72·5	76	91	84	64
Bursting pain:									
No.	Not stated			54	Not stated		—	Not stated	20
% improved			All improved	37			—	—	15
% cured	—		—	63			100	100	80
	Majority								
Oedema:									
No.	7	Not stated	24	84	Not stated		24	Not stated	25
% improved	0	0	58	55			17		38
% cured	0	0	42	45			83	Usually cured	17

extent of pigmentation and subcutaneous sclerosis usually surrounded the ulcer. In two instances the skin changes were present without ulceration.

I cannot agree with Boyd (1950) that the presence of pigmentation and sclerosis necessarily means that secondary varicose veins are present, nor that these ulcers usually penetrate the deep fascia: the excision of these ulcers will readily show their superficial character. The extra pain associated with them cannot be attributed to greater infection as Boyd suggests: small clean ulcers can be excruciatingly painful. It is probably due to the greater pressure in the venules of the ulcer base.

Eczema occurred in only five legs. In four of these the eruption was painful. In two, the rash was confined to the feet, which is unusual, and in the others the leg was involved, as is more common.

Bursting pain is often described as one of the distinctive symptoms of deep venous incompetence. It was present in 20 legs (66% of total). Bursting as a descriptive term is perhaps not wholly appropriate. Although many patients do describe the pains as bursting in character, it has been referred to as an ache, a burning pain, a deep pain, and a tight feeling or a shooting pain. It is always located in the calf or lower leg, though in one case it was localized to an area of pigmentation and sclerosis above the medial malleolus. The commonest factor is that it comes on when the leg is dependent. It is always worst at the end of the day or after prolonged standing, but it may start directly the foot is put to the ground. In such cases it may wear off in a short while, only to restart as the day wears on. In others it is present all day. In some it is worse during exercise. It varies in severity from the annoying to the incapacitating. It is true to say that it is always relieved by elevation, but some patients state that they may feel it again when they get warm in bed. Of all the symptoms it is the one most easily treated. "Dependent pain" might be a more accurate term, but "bursting pain" graphically describes what is the probable cause—venous distension by blood at an abnormal pressure. In this it resembles the ache felt in varicose veins, but "bursting" pain is usually the more severe of the two.

Oedema occurred in 25 legs (83% of the total), but varied much in degree. It never extended above the knee, and was always worse after prolonged standing. Whereas in some a night's rest would cause disappearance of oedema, in the majority it was always present to some degree, but never to elephantoid proportions. The milder cases were controllable by elastic support, but in the worse legs elastic support of all types was badly tolerated and many patients with oedema would not wear their stockings and bandages towards the end of the day.

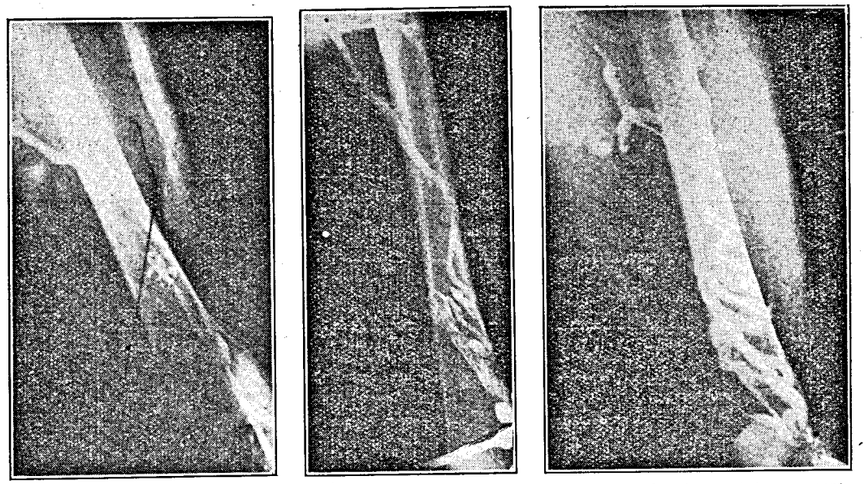
Authorities vary very much in their account of the frequency of superficial varicosities in the post-phlebitic leg. I agree with Luke (1941) that they are not usually a feature. They were present in nine cases (30% of the total), but in all except three cases the varices were scattered loops which did not fill from above. In two cases there were quite long varicose trunks in the leg, but in only one leg was the internal saphenous vein incompetent throughout its extent. In no case, however, did the veins empty when exercising with a light tourniquet below the knee, and in some they became tense.

Diagnosis

Apart from the history of a previous deep thrombosis, the diagnosis of deep venous disease was usually suggested by the finding of signs and symptoms such as those mentioned previously without there being any varicosities to account for them. It is not usually difficult to distinguish clinically between true varicose ulcers—associated with marked superficial varicosities and a "feeding" vein, no oedema, and but little pain—and the ulcers due to deep venous disease. The diagnosis of deep venous disease was confirmed in 25 cases by finding a venous pressure above 50 mm. Hg in the foot on exercise, with or without a light tourniquet below the knee to control the superficial veins as in Perthes's test, and a patent though often irregular main venous channel on ascending phlebography. The details of this technique are described below.

In 12 cases descending phlebography was used as well. Bauer's (1948) open technique was preferred to Luke's (1941) blind one, and reflux to the popliteal vein was demonstrated. If these indications were present the popliteal vein was tied. If, however, it was impossible to demonstrate patency of the femoral vein venous ligation was, of course, not possible. During the period that this work covers, four such patients were encountered. They are not included in this series. In three other cases, however, an additional phlebogram was taken by exposing the popliteal vein and injecting 20 ml. of diodone into it. In each of these three cases it was possible to demonstrate not only that the femoral vein was thrombosed but also that the blood was returning through a large collateral vein that ran up behind the femur and was probably derived from the profunda femoris veins. The foot venous exercise pressure was, of course, high; the valves in the collateral vessel must have been incompetent, and this new vessel was thus having the same effect on the venous return as would an incompetent femoral vein. These cases were treated as though it was the femoral vein which was incompetent, and they are included in the result of popliteal vein ligation. (The phlebograms from the popliteal vein are shown in Figs. 1–3.)

Boyd (1950) has argued that the information gained by pressure readings can be obtained more simply by exercising with a rubber band applied tightly enough below the knee to obliterate the superficial veins, as in Perthes's test. With this in position, if the deep veins are obliterated or incompetent the superficial veins should stand out after exercise and may ache. This is true so far as it goes, but most of these patients have no prominent superficial veins, and in them the test fails. Further, as is shown later, it is possible by means of the venous-pressure readings to exclude those patients whom experience in the method has shown will not benefit from operation. Of all methods of investigation of the venous function of the leg, this alone is quantitative.



FIGS. 1–3.—Phlebograms from the popliteal veins showing thrombosed femoral veins and incompetent collateral veins.

Results

Popliteal Vein Ligation.—Of the 30 legs treated 27 have been followed for from 3 to 15 months. This period is too short for any conclusions to be drawn from the ulcer cases. The effect on the other symptoms is definite enough, however, to encourage hope that the results in the healing of the ulcers will eventually prove similar. The results are summarized in the last column of Table I.

Ulceration.—Of 15 ulcerated-leg cases, only 13 have been followed. Two of these were unhealed on discharge from hospital, and both of these patients have refused to return for further treatment, and so have been excluded, leaving only 11 legs in which the treatment was concluded and the patients followed up. Four of these recurred. These four were among those with the worst pressure changes on exercise, and under such circumstances we have come to expect a bad result. They recurred at 3, 4, 8, and 12 months after operation. With one exception the recurrent ulcers were smaller than before and painless. In considering these patients with ulceration, too much significance must not be attached to the role of popliteal vein ligation in maintaining the ulcers in the healed state. Most of these patients continued to wear elastic support of one kind or another after the operation, and support by itself might produce similar results in the period under consideration.

Bursting Pain.—This was present in two-thirds of all legs. In the cases followed up, it was said to be unchanged in one case and considerably improved in three others. In all the rest (80%) it was abolished.

Oedema.—This is traditionally the most difficult symptom to treat. It was present in 23 legs followed up. It was improved to the extent that it was controllable by an elastic stocking in 11 legs, and was abolished completely, so that a stocking was unnecessary, in a further 3 legs.

Other Symptoms.—Nocturnal cramp is a feature of venous disease of the leg that has never been satisfactorily explained. It was present in only three legs and was abolished by popliteal vein ligation in each instance. Coldness and cyanosis were present in five legs. Three of these had previously had sympathectomy without permanent benefit; only one was improved by popliteal vein ligation. Eczema is a disappointing symptom despite local treatment. Of the five legs affected, three improved.

Subjective Improvement.—The 26 patients were asked whether they thought they had benefited from the operation. Eleven said they had, eight said they had not, and five were uncertain. Two cases were too recent for the result to be assessed. Of all the symptoms, pain, whether bursting pain, cramp, or pain in the ulcer itself, is the one most constantly relieved.

Treatment of the Post-phlebitic Ulcer

The chronicity of these ulcers is due to two factors—the disturbance of venous return and the local changes in the skin and subcutaneous tissues. A large number of deep thromboses must recanalize without any valvular incompetence developing. During the period of complete thrombosis, pigmentation, induration, and ulceration and scattered varices may develop, and persist when the venous function has returned to normal. I have studied five such cases. It would seem that the venous changes cause the pigmentation and sclerosis, which affects the powers of resistance and healing of the skin. These skin changes may be permanent.

To prevent recurrence of ulceration it is logical to treat both cause and effect not only by ligation of the superficial or deep veins, as indicated, but also, whenever this is possible, by exercise and grafting of the indurated area (Homans, 1917). I have performed this double treatment in only four of the present series, selecting those cases in which the ulcers were of long standing but the indurated area was not too extensive. The results so far are encouraging, but it is early yet to assess the result.

If not excised, it is important that the ulcer should be healed before the patient leaves hospital. Healing is achieved either by compression bandages or by elevation, and may be speeded at times by the use of local streptomycin to sterilize the area, and by grafting the ulcer. On discharge from hospital the patient should wear an elastic support to control

the veins in the neighbourhood of the ulcer site. In the presence of such persistent oedema, however, the support may not be well tolerated.

Venous-pressure Measurements in Selection of Cases

The method used to measure venous pressure has been described elsewhere (Walker and Longland, 1950). The apparatus used is shown in Fig. 4. A mercury manometer

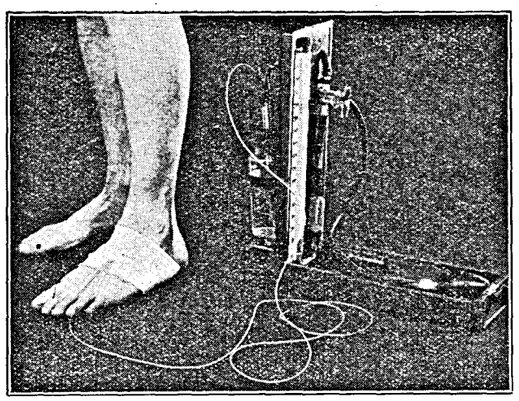


FIG. 4.—Apparatus for measuring venous pressure.

is connected by a three-way tap to a sphygmomanometer hand bulb and to a glass tube piercing the airtight cork of the reservoir bottle, which is sterile and is half filled with sterile heparinized saline. Also piercing the cork and extending below the fluid level is one end of a sterile polythene cannula several feet long. With the polythene cannula filled with saline from the bottle, its far end is tied into a vein which is exposed under local analgesia on the dorsum of the foot. Blood can then flow into the cannula, but by adjusting the pressure the flow can be checked. To measure the venous pressure, the pressure in the apparatus is raised above the expected venous pressure, and then, when the cannula is clear of blood, lowered very slowly. The pressure is read on the manometer at the instant blood appears in the cannula. Thanks to the flexibility of the tube, it is quite easy to take these readings with the patient exercising. The method of investigation is well within the capacity of the average house-surgeon.

Using this method, we have measured the venous-pressure changes on exercise in normal legs and legs with varicose veins on the post-phlebitic syndrome. Our results (Walker and Longland, 1950) agree with those published elsewhere (Smirk, 1936; Beecher, 1937; Seiro, 1938; Pollack *et al.*, 1949; Warren *et al.*, 1949; White and Warren, 1949; Hojensgard and Stürup, 1949). At rest, the venous pressure in the limbs is the pressure exerted by a column of blood extending vertically from heart level to the level of the point of measurement. In the standing position it varies in the foot between 70 and 100 mm. Hg, irrespective of the state of the leg veins, depending solely on the height of the patient. But directly the patient exercises, the pressure falls in a normal individual to less than 30 mm. Hg.

Pollack and Wood (1949) have shown that the degree of exercise has little influence on this result. If there are superficial varices present, then the pressure on exercise is reduced less, depending on the severity of the varicosities, to figures varying from 80 to 30 mm. Hg. If the reflux down the varices is prevented by placing a tourniquet below the knee the pressure on exercise is reduced further till it reaches the normal range. In contrast, if there is valvular incompetence or thrombosis of the deep veins, then the fall of pressure on exercise is even less than in varicose vein cases, and is unaffected by the below-knee tourniquet. In some cases the pressure may even rise. The pressures to be expected in the various groups are summarized in Table II.

TABLE II.—*Foot Venous Pressures in Erect Position*

Standing still—all cases	70–100 mm. Hg
Exercising—normals	0–30 " "
" —varicose veins	30–80 " "
" with light tourniquet below knee	0–30 " "
" —deep venous disease	50–110 " "
" with light tourniquet below knee	50–110 " "

It is reasonable to assume that the fall on exercise is proportional to the efficiency of the venous return of the whole limb, and that in legs with the least fall of pressure on exercise ligation of the main vein will merely divert the blood to other incompetent channels with no resulting benefit. In those with the greatest fall of pressure in exercise the collateral veins are presumably competent, and benefit is likely to be considerable. To test this assumption those cases in which the venous pressures were measured are so arranged (Table III) that those with the greatest fall of venous pressure on exercise are at the bottom and those with the least at the top. Opposite each case are recorded the results of the operation. These changes are recorded numerically as 3, 2, and 1, meaning that symptoms were unchanged, improved, or cured respectively. In the case of ulcer, 1 means that it has remained healed, 2 that it has recurred to a small degree, 3 that it has recurred to a size as large as before. As regards oedema, 2 indicates that the oedema is controllable by elastic support. Table III shows a steady improvement in

TABLE III.—*Changes in Symptoms After Popliteal Vein Ligation Compared With the Changes in Venous Pressure on Exercise, Before Ligation*

Case	Rise (+) or Fall (−) in Venous Pressure on Exercise	Bursting Pain	Pains of Ulcer or Eczema	Cramp	Ulcer*	Eczema	Cyanosis and Coldness	Oedema†	Overall Improvement	Remarks
G. B.	+10	1		1				2	+	
R. M.	+6	1	3		3			3	+	
A. H. (Rt.) ..	+6		3			3	3	3	−	Leg amputated
A. H. (Lt.) ..	+2		2			2	3	3	?	
A. A.	+6		3			3	3	3	−	Worse
A. B.	+4	3	2		1			3	−	Oedema worse
Mrs. D. L. ..	0	2						3	−	
Mrs. E. B. ..	−6	1	2		2			2	+	
Mrs. N. R. ..	−12	1					3	2	+	
Mrs. W. D. T. ..	−12	1	1	1	2			3	?	
Mrs. M. H. ..	−15						2	1	+	
Mrs. E. P. ..	−16		1		1			2	+	
Mrs. S. J. ..	−17	1			1			1	+	
W. A.	−18	2	1		1			2	?	
Mrs. E. O. ..	−18		2		3			2	−	Ulcer never healed
Mrs. F. H. ..	−18	2						2	?	
Mrs. E. R. ..	−20	1	1		1					
Mrs. M. A. ..	−31	1	2		3			3	−	Ulcer never healed
Mrs. E. B. ..	−32	1				2			+	
Mrs. R. K. ..	−36	1	2			2		2	+	
Mrs. R. D. ..	−36	1	1	1	1			1	+	

3 = Not improved; 2 = improved; 1 = symptom cured.
* In cases of ulcers: 1 = remained healed; 2 = recurred to small degree; 3 = recurred as large as before.
† = 2 = Oedema controllable by elastic support.

results as the drop in pressure on exercise recorded preoperatively increases. If there is no pressure fall on exercise before operation the operation will probably be valueless, especially when ulceration, eczema, and oedema are the principal symptoms. As the drop in pressure on exercise becomes greater the outlook improves.

Discussion

Among patients who exhibit the post-phlebitic syndrome in varying degrees, not all are suitable for popliteal vein ligation, and this should not be practised indiscriminately if the best results are to be obtained.

Unsuitable cases are: (*a*) Those in which the main vein has not recanalized. These will be excluded by the ascending phlebogram. In doubtful cases a phlebogram from the popliteal vein may help. (*b*) Those in which venous function has returned to normal. These will show normal venous pressures. Their sole symptom is ulceration. (*c*) Those with maximal valvular incompetence. In these, exercise will produce little or no drop of venous pressure from the resting level and may even show it to rise.

When these cases have been excluded, note should be taken of the presenting symptoms in the remainder before operation is advised. The most consistently good results are obtained where pain is a prominent symptom, be it bursting pain, cramp, or painful ulcer or eczema. The results in treating oedema are less satisfactory, and experience suggests that where oedema is a predominant cause of complaint ligation may not abolish it. It is too early to say to what extent ligation will help to prevent recurrent ulceration, especially as most patients continue to wear elastic support and so complicate the problem. In suitable cases excision and grafting of the ulcers of patients whose veins have been tied may well prove helpful in producing a lasting cure. Venous-pressure measuring is a simple investigation and not purely a research weapon. Its routine use is a most valuable help in the selection of patients in whom popliteal vein ligation is contemplated.

Summary

A series of 30 legs, the seat of valvular incompetence of the deep veins, is presented; on these popliteal vein ligation was performed.

A simple method of measuring venous pressures at rest and during exercise is described. It is shown how these readings coupled with ascending phlebography can establish the diagnosis of valvular incompetency of the deep vein.

Treatment has been by ligation and division of the popliteal vein. Figures for the 3–15 months follow-up are presented, and are contrasted with the results of other authors.

It is shown how those results could be improved by the selection of cases by means of their venous-pressure changes.

The operation is most useful in those patients in whom pain is a prominent feature.

I am greatly indebted to Professor Sir James Paterson Ross, director of the Surgical Professorial Unit at St. Bartholomew's Hospital, for facilities to undertake the work, and for much helpful criticism in the preparation of this paper. Also to Mr. R. S. Corbett, Mr. J. P. Hosford, and Mr. E. G. Tuckwell for access to such of their patients as are included in this paper; and to Mr. R. S. Murley and my colleagues on the surgical professorial unit for advice and assistance; to the theatre staff for their patience; and to the photographic department for the radiographs.

REFERENCES

Bauer, G. (1948). *J. int. Chir.*, **8**, 937.
—— (1950). *British Medical Journal*, **2**, 318.
Beecher, H. K. (1937). *J. clin. Invest.*, **16**, 733.
Boyd, A. M. (1950). *British Medical Journal*, **2**, 269.
Buxton, R. W., and Collier, F. A. (1945). *Surgery*, **18**, 663.
—— Farris, J. M., Moyer, C. A., and Collier, F. A. (1944). Ibid., **15**, 749.
Glasser, S. T. (1949). *Surg. Gynec. Obstet.*, **89**, 541.
Hojensgard, I. C., and Stürup, H. (1949). *Acta chir. scand.*, **99**, 133.
Homans, J. (1917). *Surg. Gynec. Obstet.*, **24**, 300.
—— (1941). *New Engl. J. Med.*, **224**, 179.
Linton, R. R., and Hardy, I. B. (1947). *Surg. Clin. N. Amer.*, **27**, 1171.
—— —— (1948). *Surgery*, **24**, 452.
Luke, J. C. (1941). *Surg. Gynec. Obstet.*, **73**, 472.
Pollack, A. A., Bowen, E. T., Myers, T. T., and Wood, E. H. (1949). *J. clin. Invest.*, **28**, 559.
—— and Wood, E. H. (1949). *J. appl. Physiol.*, **1**, 649.
Sandegård, E. (1949). *Nord. Med.*, **41**, 560.
Seiro, V. (1938). *Acta chir. scand.*, **80**, 44.
Smirk, F. H. (1936). *Clin. Sci.*, **2**, 317.
Walker, A. J., and Longland, C. J. (1950). Ibid., **9**, 101.
Warren, R., White, E. A., and Belcher, C. D. (1949). *Surgery*, **26**, 435.
White, E. A., and Warren, R. (1949). Ibid., **26**, 987.

USE OF DECAMETHONIUM IODIDE IN ANAESTHESIA FOR PERORAL ENDOSCOPY

BY

C. F. SCURR, M.B., D.A.
Anaesthetist, Westminster Hospital

In the early papers on the use of D-tubocurarine in anaesthesia, note was made that a combination of curarization with thiopentone–nitrous-oxide anaesthesia provided satisfactory conditions for peroral endoscopy. It is usually preferable to perform these examinations under local analgesia, but, as Dinsdale (1949) has pointed out, there may be indications for using general anaesthesia—for example, in children, in very nervous patients, or where there is difficulty in obtaining relaxation of the jaw.

Bourne (1947) contributed a paper on the use of D-tubocurarine for intubation. However, one authority has described its use for this purpose as a steam-hammer blow; thus a pointer is given to the main disadvantage of using D-tubocurarine in these cases—if an adequate curarizing dose is given, then depression of the patient persists for about three-quarters of an hour. Attempts to avoid this by reducing the dose of D-tubocurarine lead only to unsatisfactory results However, as Bourne points out. the toxic effects are less than when deeper anaesthesia with ether is employed.

Suitable anaesthesia for peroral endoscopy and intubation is, however, provided by the use of decamethonium iodide in conjunction with thiopentone—a combination which seems to avoid almost entirely the disadvantages of the D-tubocurarine–thiopentone technique.

The important desiderata for peroral endoscopy are relaxation of the jaw, an open glottis, and lack of reflex response. Relaxation of the jaw is usually stated to accompany anaesthesia with thiopentone; but this cannot be guaranteed, and very often the stimulus of introducing a laryngoscope will cause the jaw muscles to tighten. In the edentulous this factor is less important, but where there is a full set of long teeth, especially in association with some degree of inferior retrusion, profound relaxation is essential.

As Gray and Halton (1946a, 1946b) noted, D-tubocurarine is a potent preventive of laryngeal spasm. In an adequately curarized patient the cords are almost invariably seen to be well abducted, and this is essential for atraumatic intubation or bronchoscopy. This lack of spasm makes it possible to perform oesophagoscopy without intubation (Organe, 1947), as there is no anxiety about loss of control of the airway. It is preferable, however, to intubate such cases. A special advantage of curarization applied to oesophagoscopy is that the relaxation of the post-cricoid sphincter makes passage of the oesophagoscope a very easy procedure.

Decamethonium iodide prevents reflex motor response by producing a block at the myoneural junction of skeletal muscle. The use of topical anaesthesia to depress reflexes

on the afferent side is an important adjunct. For this reason we prefer to spray the throat in all cases with a 2% solution of amethocaine hydrochloride at the beginning of anaesthesia: in bronchoscopies 1 ml. of the solution is introduced into the trachea by means of a laryngeal cannula or by injection through the cricothyroid membrane. It is not known whether decamethonium iodide has any protective effect against possible cardio-inhibitory and other reflexes of the vago-vagal type; although it is uncertain how common or dangerous such phenomena may be, topical anaesthesia provides an additional safeguard in this respect. Notable advantages of the method are lack of explosion danger, greater safety than chloroform anaesthesia, low toxicity, and speed.

Technique

Suitable premedication, including atropine or scopolamine, is given one hour pre-operatively. The estimated dose of decamethonium iodide (ranging from 3 to 5 mg. in adults) is injected intravenously and is immediately followed by little more than a sleep dose of thiopentone (0.3–0.5 g.) given slowly through the same needle. An oral airway is inserted and the 2% amethocaine hydrochloride spray directed down it. Oxygen is then administered by inhalation or inflation for three to four minutes until the relaxant effect is maximal. This is an important point, as apnoea, should it occur, is well tolerated in the presence of full oxygenation of the lungs. A small additional dose of thiopentone is now given and the endoscopy is begun or the endotracheal tube introduced.

Maintenance is usually ensured by further doses of thiopentone given intermittently during the operation. Where an endotracheal tube is used nitrous oxide and oxygen are administered; trichlorethylene has occasionally been employed as a supplement. In rare instances where the operation has lasted more than 15 minutes, further doses of decamethonium iodide have been given as indicated.

Should respiratory depression or apnoea occur, it is the duty of the anaesthetist to maintain adequate oxygenation of the patient; this involves (1) the maintenance of a clear airway and (2) artificial ventilation. The former is secured by the instrument in bronchoscopy or by the tube in other cases. Adequate respiratory exchange should be ensured by gentle compression of the flanks and lower ribs (as in Schäfer's method) or, in the intubated cases, by rhythmic pressure on the rebreathing bag of the anaesthetic apparatus.

Discussion

The method described has been used in 50 operations for peroral endoscopy and in 250 cases for endotracheal intubation. The ages of the patients ranged from 3 to 82 years. Satisfactory operating conditions were obtained in all.

The dosage of decamethonium iodide has approximated to 0.5 mg. per stone (6.35 kg.) body weight. This high rate is important, as adequate curarization is an essential part of the technique. In no instance has delayed return of respiration been encountered. Recovery can always be confidently predicted within a 20-minute period from administration; however short the operation, the residual period elapsing before recovery can only be brief, and during this interval oxygenation can easily be maintained by ventilation with oxygen, simple anaesthetic apparatus being used. For this reason the antagonist—pentamethonium iodide—has never been employed. The unfortunate side-effect of ganglionic block by this drug renders its use inadvisable on most occasions; its employment in surgery is likely to be limited to the deliberate production of hypotension to reduce haemorrhage during certain operations —for example, fenestration. This technique is unsuitable where the administrator is not skilled in the care of the apnoeic patient or where adequate facilities and equipment are lacking. Dyspnoea is a contraindication to the use of the method.

Jaw clonus has been encountered occasionally during the induction period; this may be associated with the anti-esterase effect of decamethonium iodide. However, in all instances it has been transitory and has provided no obstacle to intubation.

No qualitative difference has been evident in comparison with other relaxants: an apparently greater ease of laryngoscopy noted early in the series is probably due to the fact that a relatively high dosage of the short-acting decamethonium iodide was employed. In contrast to the observations of Doughty (1950), irritability of the respiratory tract has not been greater than with other relaxants; our experience in this respect is confirmed by Harris and Dripps (1950).

It is believed that this method possesses definite advantages, especially over D-tubocurarine, in that the short-lived action of decamethonium iodide approximates closely to the average duration of these relatively short procedures.

I am indebted to my colleagues for access to their records in the preparation of this paper.

REFERENCES

Bourne, J. G. (1947). *British Medical Journal*, **2**, 654.
Dinsdale, T. (1949). *Brit. J. Anaesth.*, **21**, 193.
Doughty, A. G. (1950). *Lancet*, **1**, 899.
Gray, T. C., and Halton, J. (1946a). *Proc. R. Soc. Med.*, **39**, 400.
—— —— (1946b). *British Medical Journal*, **2**, 293.
Harris, L. C., and Dripps, R. D. (1950). *Anesthesiology*, **11**, 215.
Organe, G. (1947). *Proc. R. Soc. Med.*, **40**, 596.

Medical Memoranda

A Toxic Effect of Thiouracil Hitherto Undescribed

The object of this communication is to set on record a hitherto undescribed side-effect of thiouracil.

CASE REPORT

The patient, a woman aged 48, during a period of intense business anxiety in November, 1947, became "nervy," developed palpitation, and lost 42 lb. (19 kg.) in weight during the next six months. In July, 1948, her doctor asked me to see her because she had a persistent tachycardia and had failed to regain her normal weight in spite of considerable improvement in her general condition with rest and sedatives.

She was a small-boned but not very thin woman, and weighed 7 st. 6 lb. (47.2 kg.) in her indoor clothes. In spite of some nervous agitation under examination she did not give the impression of being a neurotic subject. Her pulse was regular at 120, the thyroid gland was slightly enlarged, and she had a fine tremor of the outstretched hands. There was no exophthalmos or other abnormal eye sign, and her skin was not unduly moist. Her heart was normal and her blood pressure 160/74.

At that time I did not regard the clinical evidence of thyrotoxicosis as strong enough to justify a change in treatment. Six months later, however, though there had been no alteration in weight, her thyroid gland had enlarged and she had developed exophthalmos of the right eye; moreover, she complained of always feeling hot, and her skin was moist.

Treatment with methyl thiouracil, 100 mg. twice daily, was begun and considerable clinical improvement followed. After two weeks she complained of "difficulty in focusing her eyes," and her doctor noted that she had horizontal nystagmus to right and left. The dose of thiouracil was reduced to 100 mg. once a day during the next week, but she stated that she felt "light-headed" and that everything she looked at "seemed to be jumping about." After another four days she developed such intense vertigo that she could not stand or even sit up in bed unless she kept her eyes closed, and any attempt to get up and move about caused nausea and sickness. Gross nystagmus was present in all planes. Thiouracil was stopped and the more severe symptoms subsided during the next three days, but she remained unsteady and immediately became sick when she tried to walk. At no time was there any headache or skin rash, and apart from the symptoms described above she felt quite well.

Her general condition was good and the signs and symptoms of thyrotoxicosis were definitely improved—pulse 100, exophthalmos much less noticeable, skin normal, and no complaint of feeling hot. She was in fact very pleased with the effect of treatment and most anxious to continue to take the thiouracil in case symptoms should return. The only abnormal finding in a full examination of the central nervous system was a very coarse nystagmus in all planes. Romberg's sign was negative and the ocular fundi and tympanic membranes were normal. The condition of the heart and the blood pressure were unchanged, except that a few extrasystoles were noted.

During the next three weeks she gradually improved and was able to go out if accompanied. She still found reading difficult. Her thyrotoxic symptoms, however, increased again, and partly on this account and partly because of the unusual effects of the thiouracil treatment she was sent to Professor Himsworth. He agreed that the development of nystagmus could, in reason, be attributed only to the thiouracil, but could neither recall having encountered a similar case himself nor, in spite of wide inquiry, both in this country and abroad, find anyone else who had done so. He advised surgical treatment for the thyrotoxicosis without delay.

The patient was admitted to hospital on May 24, 1949; and on June 3 subtotal thyroidectomy was performed by Mr. John Griffith. During the first week after operation nystagmus increased, but by the fourteenth day, when the general condition was excellent and the pulse rate had become stabilized between 70 and 80, it became less marked and she made no complaint of visual disturbance. She was then discharged from hospital.

Sections of the excised gland were examined by the pathologist (Dr. R. W. Johnson), who reported that the appearances were typical of thyrotoxicosis.

When last seen, on July 15, 1949, six weeks after operation, she looked and felt well and had gained a stone (6.4 kg.) in weight. Nystagmus, however, was still present, being most marked when she looked to right and left, but also when the eyes were raised upwards. She said that she could read without difficulty but that "things jumped about" when she looked to either side. Apart from the nystagmus, examination of the central nervous system was negative as before, and there was no evidence of cardiovascular sclerosis or ear disease.

COMMENT

When thiouracil produces toxic effects they are generally manifest on or about the fourteenth day after the beginning of treatment. In the present case visual symptoms and nystagmus appeared at this time. These receded again with omission of the drug. There is therefore strong presumptive evidence that this was an effect of thiouracil. The absence of history or physical signs of disease of the central nervous system or of vascular sclerosis makes any alternative explanation improbable.

It might be suggested that the particular sample of thiouracil used contained an impurity which could be held to blame; some of the tablets were therefore sent to the manufacturers for analysis, but they were found to be in every way normal pure samples of methyl thiouracil.

In the circumstances it is of course impossible to give a prognosis, but as four months have elapsed since thiouracil was discontinued and signs and symptoms are still present it seems unlikely that complete recovery will now take place.

Acknowledgment is due to Dr. Fitzgerald Frazer for permission to publish these notes of his patient and for his own careful records of the case while she was under his care. I have also to thank Professor Himsworth for his interest and advice.

C. BARRINGTON PROWSE, M.B., M.R.C.P.,
Physician, Royal Sussex County Hospital, Brighton.

Fulminating Staphylococcal Pneumonia Treated with Massive Doses of Chloramphenicol and Penicillin

Fulminating staphylococcal pneumonia has in recent years shown itself to be a rapidly fatal condition despite penicillin therapy. We have recently encountered a case following influenza B infection in which the organism was resistant to penicillin. Early treatment with chloramphenicol was instituted, but the patient's condition deteriorated rapidly; however, with increased dosage he recovered after a critical illness.

CASE REPORT

The patient was a male nurse aged 39. His first symptoms were those of a severe febrile cold. After four days he developed a slight pain in the left side of his chest. During the next six hours this increased to such an extent that breathing became difficult; it was at this stage that he attended the casualty department of University College Hospital.

Physical examination showed a severely ill man with marked respiratory distress, temperature 100.6° F. (38.1° C.), pulse 100,

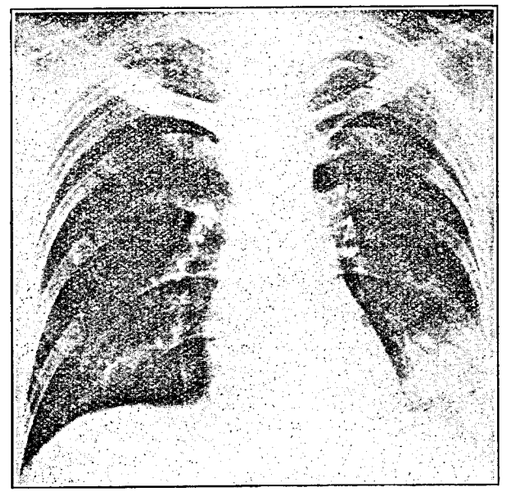


FIG. 1.—Radiograph taken on March 22.

respirations 26. Movement on the left side of his chest was considerably reduced and rhonchi were widespread. Radiographs of his chest taken at that time (March 22, 1950) showed consolidation in the anterior and middle basal segments of the left lower lobe (Fig. 1). A diagnosis of aspiration pneumonia was made, and after blood and sputum had been collected for laboratory examination he was given 2.5 g. of chloramphenicol

followed by 0.25 g. four-hourly. This drug was made available as part of an investigation into the treatment of aspiration pneumonia. Later, when it became obvious that this was in fact a case of penicillin-resistant staphylococcal pneumonia, the supply was maintained by the Ministry of Health.

During the first 24 hours of treatment there was a great deterioration in the patient's condition. He showed an ashen-grey cyanosis, his temperature reached a maximum of 102° F. (38.9° C.), and the physical signs in his chest indicated rapid spread of the pneumonic process. The left side did not move at all on respiration, the percussion note over it was stony dull, and breath sounds were inaudible. Radiographs at this stage showed (March 24) the left hemithorax to be completely opaque, but with no evidence of mediastinal displacement (Fig. 2). A report of the sputum culture described a predominant growth of *Staphylococcus aureus*, resistant to penicillin and moderately sensitive to chloramphenicol.

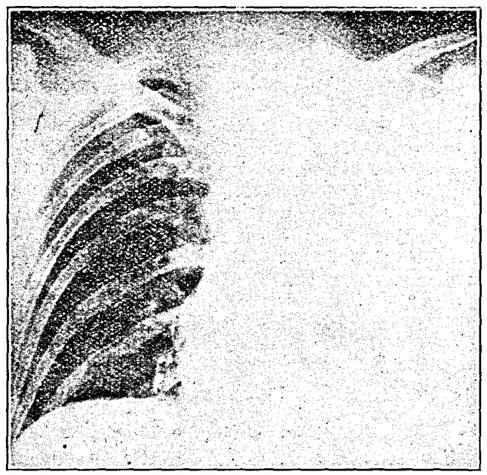


FIG. 2.—Radiograph taken on March 24.

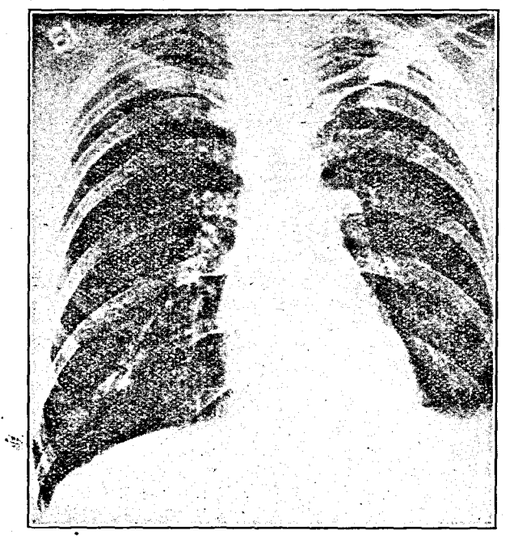


FIG. 3.—Radiograph taken on August 8.

In view of this report and of the patient's poor response to chemotherapy, the dosage of chloramphenicol was doubled and crystalline penicillin, 1,000,000 units three-hourly, was started; the patient was placed in an oxygen tent.

For 24 hours his condition remained critical, but thereafter he made steady, if slow, improvement. His temperature fell by lysis to normal in 14 days. Within 10 days of his admission radiographic evidence of resolution appeared and three weeks later was almost complete. He received in all 43 g. of chloramphenicol. Complement-fixation tests for influenza showed a titre of 1/4 for influenza B on admission and a titre of more than 1/128 six days later. Fig. 3 shows the radiographic appearance on August 8.

DISCUSSION

In the great influenza pandemics of 1889 and 1918–19 the staphylococcus was only occasionally found in fatal cases, although in localized outbreaks a high incidence was reported (Netter, 1892; Chickering and Park, 1919). In the smaller epidemics of recent years it has been found in a considerable proportion of the more serious cases (Stuart-Harris *et al.*, 1938). Wollenman and Finland (1943) and Stuart-Harris *et al.* (1950) have commented on the failure of fulminating cases to respond to chemotherapy.

The present case appeared on admission to be one of a moderately severe aspiration pneumonia. It was only after 24 hours on conservative doses of chloramphenicol that the condition gave rise to anxiety. At this stage he presented the prostration, respiratory distress, and ashen-grey cyanosis typical of a fulminating case of staphylococcal pneumonia. There seems to be little doubt that, without the very large doses of chloramphenicol and penicillin used, he would have succumbed to his infection within 48 hours of his admission to hospital.

SUMMARY

A case is described of fulminating staphylococcal pneumonia, secondary to influenza B, successfully treated with chloramphenicol and massive doses of penicillin.

Reference to the literature suggests that the association of influenza and staphylococcal pneumonia is an extremely fatal one.

I wish to thank the Virus Reference Laboratory, Colindale, for carrying out the complement-fixation tests for influenza, Professor M. L. Rosenheim for permission to publish this case, and Dr. J. D. Nabarro for advice in preparing the manuscript.

J. M. WALSHE, M.A., M.B.,
Medical Unit, University College Hospital.

REFERENCES

Chickering, H. T., and Park, J. H., jun. (1919). *J. Amer. med. Ass.*, **72**, 617.
Netter (1892). *Arch. Méd. exp.*, **4**, 28.
Stuart-Harris, C. H., Andrewes, C. H., and Smith, Wilson (1938). M.R.C. Report No. 228. H.M.S.O., London.
—— Franks, Z., and Tyrrell, D. (1950). *British Medical Journal*, **1**, 263.
Wollenman, O. J., jun., and Finland, M. (1943). *Amer. J. Path.*, **19**, 23.

The Ministry of Health states that more blood was given to hospitals in England and Wales during the June quarter this year than in any three months since the war. Gifts totalled 128,392, making over 250,000 in the first half of this year. Over 35,000 new donors joined the National Blood Transfusion Service in the quarter. Blood consumption is 50 times what it was in 1938 and is still mounting. To meet these increasing demands without calling too often on existing donors, at least 200,000 more enrolments are needed. There are now 388,000 registered donors—a gain of 10,700 in the quarter and the highest total since 1945.

Reviews

SAINT AND PIONEER

Florence Nightingale, 1820–1910. By Cecil Woodham-Smith. (Pp. 615; illustrated. 15s.) London: Constable and Co. 1950.

I must confess to an early prejudice against Florence Nightingale. I thought she had created a tradition of nursing discipline which was rigid and inhuman, and my only knowledge of her life was derived from Lytton Strachey's astringent essay. My prejudice was first shaken when I saw her bust in the National Portrait Gallery and realized that she was not a misfavoured feminist but an extremely beautiful woman. It was further weakened by the feeling I have had that our attitude to sickness in the welfare State is becoming utilitarian, and that neither the medical nor the nursing professions will flourish without a renewed sense of their vocation. It has been finally destroyed by reading Mrs. Woodham-Smith's enthralling biography and realizing the condition of our hospitals less than a hundred years ago, the filth and lack of sanitation in the wards, the drunkenness, immorality, and inefficiency of the nurses, and the complacency of the medical staffs. It is against this background that Florence Nightingale's achievement is to be measured.

She was, indeed, a remarkable woman. She was beautiful, wealthy, and gifted, brought up in an age and society where women were expected to display an excessive sensibility. Although she had a passionate nature and attracted many suitors, she never married. From the age of 19 onwards her life was a prolonged battle with her mother, who was bitterly disappointed at her refusal to follow the conventional path to social success. Florence had had the feeling from early childhood that she was not like other people but was set apart. God had spoken to her at 17, as He was to do again three times afterwards; but what a heartbreaking business it was, finding the task for which she was called. After the first voice at 17, seven years passed before she decided that her call was for nursing, and it took another nine to persuade her family. Fortunately, she had a gift for making friends who were able to supply the understanding which she could not get from her parents, and gradually she began the study of hospitals and nursing which was to make her one of the foremost health experts in the world. Throughout this period her health suffered from the struggle, and she was subject to uncontrollable daydreaming. At the age of 29, after refusing Richard Monckton Milnes, she wrote:

"I have an intellectual nature which requires satisfaction and that would find it in him. I have a passionate nature which requires satisfaction and that would find it in him. I have a moral, an active, nature which requires satisfaction and that would not find it in his life. Sometimes I think I will satisfy my passionate nature at all events, because that will at least secure me from the evil of dreaming. But would it? I could be satisfied to spend a life with him in combining our different powers in some great object. I could not satisfy this nature by spending a life with him in making society and arranging domestic things."

Eventually she obtained her freedom and the superintendentship of the Institution for the Care of Sick Gentlewomen in Distressed Circumstances. A year later came the Crimean War and the invitation to take out a nursing contingent. This war witnessed the destruction of an army and the breakdown of its medical services as a result almost entirely of administrative incompetence. Once again human suffering reached its extreme limits, as it had done, alas, in so many previous campaigns. The collapse of the medical services would have been complete but for the personality, skill, and indomitable energy of Florence Nightingale. The Sanitary Commission described the defects of the Barrack Hospital at Scutari as murderous.

"Beneath the magnificent structure were sewers of the worst possible construction, mere cesspools, choked, inefficient, and grossly overloaded. The whole vast building stood in a sea of decaying filth. The very walls, constructed of porous plaster, were soaked in it. Every breeze, every puff of air, blew poisonous gas through the pipes of numerous open privies into the corridors and wards where the sick were lying."

But even worse was man's inhumanity to man, the quagmire of administrative difficulties, the obstructive group loyalties, the defence of the old regime, the intrigues, the mere inertia. No army medical department likes to be found incompetent, and it likes it even less when the main source of criticism appears to be an amateur. Nevertheless, she succeeded, and the mortality, which in six months had been 73% in eight regiments from disease alone, was brought to a lower level than in England. In achieving this she had created not only the modern nurse but the modern soldier.

She had a horror of publicity. All her life she hated having a likeness taken, which explains the shortage of photographs and portraits, and before she died she desired that the only memorial on her grave should be a small cross, on which are the words "F.N. Born 1820. Died 1910." At the end of the Crimean War, when a nation was waiting to welcome her, she slipped home unnoticed.

"Mrs. Watson, the housekeeper, was sitting in her room in the front of the house. She looked up, saw a lady in black walking alone up the drive, looked again, shrieked, burst into tears, ran out to meet her."

That scene, I think, is how a film on Florence Nightingale might end, and in a way the film would be right, for never before or after were her powers so fused and concentrated as during the Crimean War. She was now 36. During the next 50 years she was to do an immense amount of work in the reform of nursing at home and abroad and in the improvement of conditions of life in the Army and in India. She became an expert on hospitals, nursing, and sanitation, and a pioneer medical statistician, but she was never really happy, and it was as if her work was an obstacle to happiness rather than the means to it. Her health collapsed when she was 37, and though mentally energetic she lived the life of a physical invalid thereafter. She became, in fact, a highly productive neurasthenic who worked most of her collaborators to death. A further deterioration in her health occurred when she was 48, and thereafter she never had quite the same immense powers of sustained concentration.

Looking back on these fevered years of commissions and Blue Books, one is tempted to compare Florence Nightingale with Beatrice Webb. Both had something inhuman about them. "I never gave or took an excuse," said Florence. Mrs. Gaskell thought that she lacked a love for individuals, and most people who worked with Florence Nightingale were hurt in the end by something hard within her. In her just resentment against her mother she had once spoken of the devourer and the devoured, but her own treatment of Sidney Herbert is hard to forgive. Admittedly her mother was obtuse and cruel, but even as a child Florence never showed any affection for her. Beatrice was fortunate in finding an ideal partner in Sidney Webb, and in their tranquil union they accomplished an immense work, which

has left its mark on almost every aspect of British society. Florence momentarily reached a greater height, a height which in women is probably only possible for the saint or the celibate, but she had not the serenity of sainthood, and the later years, the neurasthenia, the cats, the girlish letters, and the decline into senility are painful to study.

Mrs. Woodham-Smith's biography is magnificent. It is crowded with figures like a Frith canvas and all are alive. Her writing is so transparent and her observation so dispassionate that her art reaches the highest level of achievement; the medium is forgotten and the past lives again. It is a big book of 600 pages, and busy doctors may feel that they need a holiday or an illness to read it; but however they make the time they will be well rewarded.

L. J. WITTS.

⁂ A hitherto unpublished letter from Florence Nightingale appears on page 1328.—ED., *B.M.J.*

CHROMATOGRAPHY

Progress in Chromatography 1938-1947. By Professor L. Zechmeister. (Pp. 368. £2 5s.) London: Chapman and Hall. 1950.

Many notable advances, for instance the introduction of partition chromatography, have been made in the decade that has elapsed since the publication of *Principles and Practice of Chromatography*, by Zechmeister and Cholnoky. The senior author—mistakenly, in the reviewer's opinion—has decided to issue a supplement instead of revising the original treatise. As an almost complete list of references to the application of chromatography to the separation of carotenoids, steroids, amino-acids, carbohydrates, etc., this book could hardly be bettered.

On the theoretical side, however, a list of references is of little use to anyone wishing to understand the broad principles of chromatography. Indeed, even practically it is difficult to learn from the many examples given those manipulative tricks on which the success of a chromatographic separation so often depends. The subject is developing rapidly, and the beginner (and indeed the expert) will gain greater understanding by listening to or reading transcripts of discussion between experts than by studying uncritical reviews. Luckily such a discussion on chromatographic analysis (*Discussions of the Faraday Society*, No. 7, 1949) is now available.

The book is well printed, with the exceptions of the plates, which are blurred, and the chemical formulae, which are too small. The price is too high for a list of references unleavened by critical commentary.

H. M. E. CARDWELL.

KÜNTSCHER NAILING

Marknagelung nach Küntscher bei Schaftbrüchen der langen Röhrenknochen. By Professor Carl Häbler. Second edition. (Pp. 302; 350 figures. M. 26.) Munich and Berlin: Urban and Schwarzenberg. 1950.

The first edition of this work appeared in 1943 under the title of "The Stable Osteosynthesis." In the second and much improved volume, now named "Küntscher's Medullary Nailing," the author illustrates in detail the use of the nail in all bones in which it has been found of value and elaborates the technical details of insertion. The method is not without danger, and if the local complications differ little from those arising during the other forms of internal fixation the general complications, notably fat embolism, are increased. Five personal cases (an incidence of 2.5%) are reported, all in fractures of the femur. Two occurred in operations on fresh fractures and three in late cases. Other authors have also reported deaths in cases of late medullary nailing, and, even if experimentally the dangers in fresh fractures can be shown to be small, in late fractures, where the pathology differs, there is certainly an added risk. As it is particularly in fractures of the femoral shaft that Küntscher nailing offers advantages over other methods, it is unfortunate that nailing this particular bone is most likely to produce fat embolism.

Efficient nailing is dependent on an accurate appreciation of the mechanics of the nail and the physical shape of the fracture. There is an abundance of diagrammatic detail which should be studied by anyone who approaches the procedure with a conviction that it is simple and a limited armamentarium.

Among the tables of results provided, a high figure is found for infection after open nailing of old healed fractures, and even if the use of the method in inexperienced hands is to be blamed, as the book suggests, more than one lesson may be learned from these figures. One is that the skin tension on restoring the full length to a limb may result in local skin necrosis and infection.

As in many Continental works, one has to work hard to discover the broad principles, for they are overlaid by a mass of case histories and individual operative details which is not always distinguished from the main text by typographical alterations. This book is the most complete one available on the subject, though its value as a reference book would be considerably increased by the provision of a detailed index.

J. G. BONNIN.

DESIRES AND NEEDS

Human Desires and Their Fulfilment. By K. W. Monsarrat. (Pp. 270. 12s. 6d.) Liverpool: University Press. 1950.

It is a commonplace for the psychiatrist that while human beings have needs and desires and strive for their fulfilment they are very often mistaken about their needs, desire inappropriate satisfactions, and go the wrong way to obtain them. It is part of Mr. Monsarrat's task to expose these errors and to offer the means of correcting them; but as he starts from first principles a very large amount of ground is covered before he reaches his conclusions.

The history of human modes of thought from a primitive vitalism through a belief in supernatural agencies to sophisticated and scientific thinking is surveyed. The author emphasizes the capacity of scientific, or analytical, thinking to provide meaningful answers, but points out its limitations. It is, in final analysis, invariably circular and never eliminates the subjective element. We can never know things in themselves but only their relations one to another and to ourselves. An examination of our basic knowledge of physics, biology, physiology, and psychology over several chapters shows that in every case we are concerned with relations and that the analytical view cannot take us further. But there are many other questions which seem to demand an answer. Some of them are inherently unanswerable and, on examination, based on a misconception of what is knowable. But the whole world of values is also involved, and Mr. Monsarrat does not accept the view, which at present prevails among scientific men, that analytical, or scientific, thought is unable to help us here. Haphazard attempts to solve these problems are playing havoc with human relations at the present day. "Science has in its files clear and indisputable evidence that mutual assistance to balance has been throughout terrestrial history the one and only relation which has given equilibrium to collections of associated units on any plane." The doctrine of the necessity of conflict, with values in terms of power, as exhibited in the works of a number of philosophers, especially Hegel and Marx, is emphatically rejected; and what one might call the doctrine of love is held up, not only as appealing to a loftier view of the world, but, more importantly, as being scientifically well founded.

This book is not easy reading. But the author is no doubt right, first that no thoughtful man can safely burke these issues, and secondly that science has somehow or other got to learn to handle in a logical and dispassionate way data in which values are involved. Some preliminary assumptions are inevitably involved. Mr. Monsarrat's definition of what constitutes a "higher" state is very similar to one recently proposed by Julian Huxley, and of a kind to appeal to biologists and medical men.

ELIOT SLATER.

PHYSIOTHERAPY

Manual of Massage and Movements. By E. M. Prosser, T.M.M.G. (Pp. 388; 287 figures. 15s.) London: Faber and Faber. 1950.

Ever since its first appearance 13 years ago this volume has provided a mine of information for physiotherapy students. Massage is discussed in five chapters, none of them very satisfactory. For example, stroking movements over the back are stated to be useful in debility and depression because of their effect on the peripheral nervous system; over the abdomen in gastric atony and intestinal stasis; along the limbs in anaemia, and over the scalp in alopecia. A similar mixture of fact and fancy colours the views on kneading, which is said to be called for in: upper motor neurone disease, oedema, anaemia, debility, rheumatoid arthritis, insomnia, convalescence after poliomyelitis or a fracture, securing a greater flow of urine and bile, nerve-palsies, incipient flat-foot, and haematomata. It is only fair to point out that most other textbooks on massage make yet more extravagant claims; by contrast, therefore, this book represents a comparatively factual approach.

The author considers exercises in the next 17 chapters. The action of gravity and the nature of levers is admirably set out. The fundamental starting positions are well described, and the muscles involved in them, and in the exercises derived from them, are listed. Excellent line drawings enhance clarity and are of obvious value to students, but the fact that the scapula is rotated on full elevation of the arm is ignored throughout. Sometimes too many variations of one exercise are elaborated; for example, 25 drawings illustrate different methods of performing flexion and extension at the hip. Nothing could be clearer or more factual than this—the main—part of the book (apart from an extraordinary statement about tuberculosis on page 302).

But practical questions cannot be ignored. Does rehabilitation, as carried out to-day, employ these measures often enough to make detailed knowledge of these variants essential to students? Can exercises be taught in the abstract without reference to their indications—for example, after meniscectomy at the knee, for relief of the thoracic-outlet syndrome? Many contemporary methods of active rehabilitation of this sort are omitted. It is true that the student who has grasped the fundamental facts of posture and muscle work possesses the basic knowledge enabling her to vary her methods according to the needs of to-day. But she would obviously be greatly aided by a more modern approach to exercise therapy. As matters now stand, however, this popular and authoritative work is indispensable to every candidate for the examinations of the Chartered Society of Physiotherapy.

J. H. CYRIAX.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Virus and Rickettsial Diseases. By S. P. Bedson, M.D., F.R.C.P., F.R.S., and others. (Pp. 383. 24s.) London: Edward Arnold. 1950.

Child of Destiny. By I. Ross. (Pp. 309. 16s.) London: Victor Gollancz. 1950.

Radiology of the Teeth and Jaws. By F. L. Ingram, D.M.R.D., L.D.S., M.R.C.S., L.R.C.P. (Pp. 160. 16s.) London: Edward Arnold. 1950.

Selected Studies on Arteriosclerosis. By Professor R. Altschul. (Pp. 182. 40s.) Oxford: Blackwell Scientific Publications. 1950.

Plasma Clot Suture of Peripheral Nerves and Nerve Roots. By I. M. Tarlov, M.D. (Pp. 116. 40s.) Oxford: Blackwell Scientific Publications. 1950.

The Practice of Nursing. By H. M. Gration, S.R.N., S.C.M., D.N., and D. L. Holland, S.R.N., S.C.M., D.N. (Pp. 456. 18s.) London: Faber and Faber. 1950.

Radiation Therapy in the Management of Cancer of the Uterine Cervix. By S. T. Cantril, M.D. (Pp. 196. 36s.) Oxford: Blackwell Scientific Publications. 1950.

Physics in Medical Radiology. By S. Russ, C.B.E., D.Sc., F.Inst.P., and others. 2nd revised ed. (Pp. 296. 25s.) London: Chapman and Hall. 1950.

The Life of Dr. John Radcliffe, 1652-1714. By C. R. Hone, M.A., D.D. (Pp. 149. 15s.) London: Faber and Faber. 1950.

Aids to Botany. By H. J. Bonham, B.Sc. 3rd ed. (Pp. 223. 6s. 6d.) London: Baillière, Tindall and Cox. 1950.

Aids to Orthopaedic Surgery and Fractures. By I. E. Zieve, M.A., F.R.C.S. 3rd ed. (Pp. 283. 6s. 6d.) London: Baillière, Tindall and Cox. 1950.

Common Skin Diseases. By A. C. Roxburgh, M.A., M.D., B.Ch., F.R.C.P. 9th ed. (Pp. 505. 25s.) London: H. K. Lewis. 1950.

The Neural Crest. By Professor S. Hörstadius. (Pp. 111. 15s.) London: Geoffrey Cumberlege. 1950.

The Clinical Use of Radioactive Isotopes. By B. V. A. Low-Beer, M.D. (Pp. 414. 70s.) Oxford: Blackwell Scientific Publications. 1950.

The Physiological Basis for Oxygen Therapy. By Professor J. H. Comroe, jun., and Professor R. D. Dripps (Pp. 85. 15s.) Oxford: Blackwell Scientific Publications. 1950.

The Diagnosis and Treatment of Endocrine Disorders in Childhood and Adolescence. By L. Wilkins, M.D. (Pp. 384. 95s.) Oxford: Blackwell Scientific Publications. 1950.

Massage. By Dr. A. L. Pécunia (Pp. 363. 600 francs.) Paris: Librairie Maloine. 1950.

La Voix et la Parole. By J. Tarneaud and Professor M. Seeman. (Pp. 180. 700 francs.) Paris: Librairie Maloine. 1950.

Thérapeutique Clinique Journalière des Maladies du Foie et des Voies Biliaires. By Professor M. Chiray and A. R. Salmon-Malebranche. (Pp. 206. No price.) Paris: Librairie Maloine. 1950.

Two Commandments. By C. Jörgensen. (Pp. 254. No price.) Copenhagen: Einar Munksgaard. 1950.

Méthodes Biologiques en Clinique Psychiatrique. By Professor J. Delay. (Pp. 536. 2,000 francs.) Paris: Masson. 1950

Augenheilkunde für Praktische Ärtze und Internisten. By Dr. F. Fischer. (Pp 218. M. 24.) Vienna: Wilhelm Maudrich. 1950.

Die Nebenwirkungen der Arzneimittel auf die Haut. By J. Mayr, M.D. (Pp. 162. M. 13.50.) Jena: Gustav Fischer. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY DECEMBER 9 1950

EUTHANASIA

The Voluntary Euthanasia Legislation Society was founded in 1935, and its first public meeting was held in B.M.A. House in that year. Dr. C. Killick Millard was its honorary secretary and Lord Moynihan its first president. The society had the backing of a number of distinguished men in the Church and in the medical profession. Soon after it had come into being it promoted a Bill which was introduced in the House of Lords in 1936. Last year considerable interest was once more raised in this matter when a medical man in the U.S.A. was on trial for murder because of a "mercy killing" of a patient said to have incurable cancer. Last week a further debate in the House of Lords on the motion of Lord Chorley showed that the interest in this question is by no means abated, and also, too, that the House of Lords is still unwilling to take any steps towards putting a Euthanasia Bill on the Statute Book.

The procedure laid down in the Bill of 1936 was briefly as follows: The patient desiring euthanasia must be over 21 years of age and suffering from an incurable and fatal disease accompanied by severe pain. Application for euthanasia must be made by the patient in writing, on a special form, in the presence of witnesses. The application, accompanied by a medical certificate, must then be sent to a euthanasia referee appointed by the Minister of Health. Before granting permission for euthanasia the referee "must satisfy himself, by a personal interview with the patient and otherwise, that the requisite conditions have been fulfilled and that the patient fully understands the nature and purpose of the application."[1] After the euthanasia referee sends the permit to the patient there is to be a lapse of seven days before the permit is put into execution. Meanwhile the nearest relative has been informed that permission has been granted, and may then appeal to a Court of Summary Jurisdiction on the grounds that one or more of the conditions have not been fulfilled. Euthanasia is to be administered by the medical practitioner named in the permit and in the presence of witnesses. The Bill provided that the Act should be in the hands of the Minister, who should have power to make regulations "(*a*) for the issue to medical practitioners of licences to administer euthanasia; (*b*) prescribing the duties of euthanasia referees and the fees payable to them; (*c*) prescribing the procedure to be followed in administering euthanasia; (*d*) prescribing the various forms to be used."

This bare description of the official procedure to be followed by someone whose anguish of mind would make any objective judgment of his own fate almost impossible is likely to raise less enthusiasm for euthanasia than the eloquent and learned speeches made by distinguished members of the House of Lords in 1936 and again last week. Lord Ponsonby in 1936 based part of his case on instances of suicide "which were not only innocent and laudable but very noble."[2] The introduction of the verdict of "Suicide while of unsound mind" was, he argued, a practice which showed that the law was being stretched. He thought, too, that it was putting far too great an onus on a doctor to leave in his hands the decision to administer a merciful dose of narcotic. Lord Ponsonby pleaded that "we are not opening any door, we are merely unlocking it. We are drawing the bolts by which prejudice and tradition have kept it closed. We want to be as merciful with one another as we are to our own animals."[3]

The view of the medical profession was put in two admirable speeches in 1936 by Lord Dawson and Lord Horder. As cancer was uppermost in people's minds and the one condition from which the relief of euthanasia would be sought above all others, Lord Dawson pointed out that it would be incorrect to say that most cases of cancer were characterized by agonizing pain. He thought that during the past 50 years there had been a gradual change in medical opinion. Looking back 50 years, he said he thought it was true to say that then the medical profession "concentrated all its endeavours on the maintenance of life, despite the nature of the illness and even despite sometimes the imminence of death."[4] But now the opinion was growing "that one should make the act of dying more gentle and more peaceful even if it does involve curtailment of the length of life." He emphasized that their first thought in the face of incurable disease should be to assuage pain, even if this did involve shortening of life. The Archbishop of Canterbury (the late Lord Lang) thought it was "a situation which must be dealt with from inside, by the confidential relations of the doctor and the patient; not from outside by the procedure which is contemplated in this Bill."[5] Lord Horder, who in essence said last week what he said so well in 1936, observed "that the good doctor is aware of the distinction between prolonging life and prolonging the act of dying." He viewed with misgiving the "suggested intervention of the bureau as replacing that complete confidence and understanding which is one of the most satisfactory of all human relationships." In last week's debate Lord Horder emphasized again that this matter of euthanasia was not really one for the doctor to settle, but that as a doctor he hoped he could give some guidance to those discussing such a settlement; and he made a statement which has special relevance at a time when so many advances are being made in therapeutics. "As to incurability of a disease in general, incurability is the measure at the moment of the doctor's experience of incurability, and those who have the most experience use the term incurability least often, because in Medicine we talk more and more of controlling disease rather than of curing it."[6] Lord Uvedale stressed the possibility of error in diagnosis and saw the practice of euthanasia as something that would disrupt the bond of sympathy and affection existing between the doctor and the patient in a late stage of a disease. Three other medical Peers —Lord Webb-Johnson, Lord Haden-Guest, and Lord Amulree—put the weight of their experience in the same scales against legislation on the practice under discussion.

The subject of euthanasia is one that is bound to stir up emotion and prejudice. It is not something that can be decided by controlled experiment, nor would the legalization of voluntary euthanasia be likely to show an effect on the suicide rate. When the World Medical Association met in New York in October of this year doctors from different parts of the world declared themselves to be in a majority against the introduction of such a practice into Medicine. While it is true that it will be the community at large that has the decision in its hands, the doctors who would have to execute the community's wishes in this matter must have a say out of proportion to their numbers. No one can fail to be impressed by the fact that men of great responsibility in the medical and other learned professions firmly believe that such a measure as voluntary euthanasia should be introduced as a benefit not to be withheld from the man or woman dying from a painful and incurable disease. Yet in the two debates in the House of Lords medical men of the highest eminence and unrivalled experience have given cogent expression to what surely must be the medical man's instinctive attitude. When faced with disease and injury the doctor's job is to relieve pain and to set in motion all methods of treatment that may help him and the patient to bring disease under control. And so little is yet firmly known of the natural history of disease, especially perhaps of cancer, that the pressure on the doctor by patient and relative to seek a way out by euthanasia would introduce a new and disturbing element in the doctor's assessment of a case. Those many medical men who are opposed to legislation on this subject will see much point in the observation made by the Earl of Iddesleigh when he said: "There is something very terrible about this reversal in the morale of the sick-room." A part of the morale of the sick-room in which a person lies dying resides surely in the general belief that the good doctor will distinguish between prolongation of life and the unnecessary prolongation of the act of dying.

[1] *British Medical Journal*, 1935, **2**, 856.
[2] *Hansard, House of Lords*, 1937, Col. 469.
[3] Ibid., 472.
[4] Ibid., 481.
[5] Ibid., 489.
[6] *Hansard*, Vol. 169, No. 12, Col. 567.

CHLORAMPHENICOL NOW AVAILABLE

We print on page 1326 a Ministry of Health statement that from December 11 chloramphenicol will be generally available on prescription. This drug is one of three new antibiotics which have been developed in the United States, and all of them are available without restriction in that country. Owing to shortage of dollars they cannot be made so in Great Britain until manufactured here. The production of chloramphenicol, which is the synthetic form of "chloromycetin," has been undertaken in England with commendable energy, and supplies are now adequate for its release. Plans for the home production of "aureomycin" and "terramycin" are unlikely to mature for some time. Fortunately the indications for all three antibiotics are broadly the same, though there are a few absolute exceptions to this rule and a number of differences in relative efficacy for particular infections. In the Ministry of Health statement of indications for chloramphenicol the expression, "More effective than any of the therapeutic agents at present generally available," presumably refers only to the present position in this country. It is doubtful whether the action of the drug even equals that of aureomycin in primary atypical pneumonia. If experimental infection with this virus in cotton rats is any guide to its behaviour in man, then, according to the findings of Eaton,[1] aureomycin is much the more effective of the two.

An outstanding merit of chloramphenicol is its action in typhoid fever, which naturally comes first on the list of unqualified indications. On the other hand, treatment with the drug does not prevent the persistence of a

[1] *Proc. Soc. exp. Biol., N.Y.*, 1950, **73**, 24.
[2] *Amer. J. trop. Med.*, 1950, **30**, 357.
[3] Quoted by Kirby, W. M. M., *J. Amer. med. Ass.*, 1950, **144**, 233.
[4] Ross, S., *et al.*, *New Engl. J. Med.*, 1950, **242**, 173.
[5] *J. clin. Invest.*, 1949, **28**, 953.
[6] *New Engl. J. Med.*, 1950, **242**, 119.
[7] *Sth. med. J. Bgham, Ala*, 1950, **43**, 85.
[8] See annotation in *British Medical Journal*, 1950, **1**, 829.

carrier state, nor is it of the slightest value in trying to abolish this. Smadel,[2] in a review of the pioneer work on the treatment of typhoid and typhus in which he himself played so large a part, proposes an explanation for this anomaly. The action of chloramphenicol—and indeed of all three newer antibiotics—unlike that of penicillin and streptomycin, is simply to inhibit bacterial growth: organisms are not actually killed even when exposed to high concentrations. It is thus easy to picture the survival of bacilli despite treatment which is fully effective in terminating the disease. According to Rammelkamp[3] the same thing happens when aureomycin is given for haemolytic streptococcal throat infections, for, though the clinical results equal those obtainable with penicillin, the organism is not eliminated. Chloramphenicol is also indicated for salmonella enteritis. But here again a carrier state is apt to persist: it did so in seven out of nine such cases carefully studied at the Children's Hospital, Washington.[4] Among other intestinal infections, only ulcerative colitis is mentioned in the Ministry's statement—as a disease not to be treated with chloramphenicol. There is no mention of infantile gastro-enteritis or of dysentery.

Other unquestionable indications for chloramphenicol—undulant fever, rickettsial infections, psittacosis, and lymphogranuloma inguinale—are all rare conditions. It has been obtainable for these purposes for some time past, and the new uses to which it will now be put, such as the treatment of urinary and respiratory-tract infections generally, are of a less specific nature and call for some discrimination. To direct such treatment intelligently will also require help from the laboratory. It is as well that this is pointed out in the Ministry's statement where urinary-tract infections are listed, particularly since two of the causal organisms mentioned are often resistant to the drug. Although it is excreted in high concentration in the urine much of it is in a combined and consequently inactive form, and sensitivity of the organism to 25 μg. per ml. is a minimum requirement if treatment is to have any prospect of success. Of 19 strains of *Ps. pyocyanea* tested by McLean and his colleagues[5] only six were inhibited by this concentration or less, the remainder being more resistant. Hewitt and Williams[6] and Garvey and his colleagues[7] report respectively 93 and 21 cases of urinary-tract infections treated with chloramphenicol, and in both papers unsatisfactory results are recorded in infections due to *Ps. pyocyanea* and, to a less extent, *Proteus*. *Bact. coli* and *Bact. aerogenes*, on the other hand, were found sensitive both *in vitro* and *in vivo*.

It is to be hoped that the drug will not be used indiscriminately for urinary-tract infections. Laboratory evidence of its potential efficacy should be obtained first, and the same is true of multiple infections elsewhere, particularly in the air passages. As a general rule chloramphenicol is more effective than aureomycin for Gram-negative infections, whereas the reverse holds for Gram-positive infections. Thus, as the statement says, the drug indicated for penicillin-resistant staphylococcal infection is aureomycin. In so far as this applies also to pneumococci and streptococci generally—and the indications are that it does—chloramphenicol cannot be expected to give results as good as those obtainable with aureomycin in miscellaneous infections in which such organisms are concerned. There will doubtless be a strong temptation to try chloramphenicol when penicillin has failed in fever of unascertained cause, but this sort of blind therapy is to be deplored until every possible diagnostic aid has been exhausted. Even should fever abate during treatment the diagnosis is still unmade, and there is no knowing how long the drug should be continued. It will be most unfortunate if chloramphenicol comes to be regarded by the public as the latest wonder drug, and to be demanded by patients themselves because they have read sensational accounts of its powers. There is no appeal for economy in the Ministry of Health's statement, but it should perhaps be known that the drug is expensive: adequate treatment costs at least a pound a day.

Chloramphenicol is taken by mouth. Since excretion is comparatively slow, four doses a day are enough. The total daily dose used has been 4 g. or even more in severe infections and sometimes less in less serious conditions. No serious toxic effects have been reported except the occasional occurrence of granulocytopenia. Vascular collapse occurring during the treatment of typhoid fever with chloramphenicol has been attributed to the rapid liberation of potent endotoxins.[8] Minor unpleasant effects are anorexia and dryness of the mouth. Administration to children who cannot swallow capsules presents difficulty, since the drug is exceedingly bitter.

PROFESSOR E. D. ADRIAN, P.R.S.

Since the Royal Society was founded in 1662, eight of the 48 presidents have been medical men, the last being Sir Henry Dale, who was elected president 10 years ago. The medical profession is proud that once again one of its distinguished members has been elected to this, the highest, office in British science, and will extend its warmest congratulations to Professor E. D. Adrian, who was elected P.R.S. on November 30.

Adrian has been professor of physiology at Cambridge since 1937, when he succeeded Joseph Barcroft. World-wide recognition was given to his work when in 1932 he shared with Sir Charles Sherrington the Nobel Prize in

[1] Article signed A. V. H. in *St Bart's Hosp. J.*, April, 1937.

physiology and medicine, and in 1942 he became one of those select few to join the Order of Merit. Among his many other distinctions was the award of the Gold Medal of the Royal Society in 1934 and of its Copley Medal in 1946. Adrian, who was a King's scholar at Westminster School, showed that this was not necessarily a bad introduction to science when he achieved what is believed to be a record of obtaining first-class honours in five separate subjects in the Natural Science Tripos at Cambridge.[1] After an interlude at St. Bartholomew's Hospital and the Hospital for Nervous Diseases at Queen's Square, Adrian returned to Trinity College as a Fellow in 1913. There he began with Keith Lucas his investigations into the fundamental nature of the activity of the nerve cell, which made his laboratory a centre of research in electro-physiology. During the war of 1914–18 Adrian and Keith Lucas were looking into the possibility of using the thermionic valve for the detailed investigation of the electrical activity which is associated with nervous action. After Lucas's death in 1917, while flying, Adrian carried on those researches which have so vividly illuminated the nature of nervous activity. It was not until he had reinvestigated the discoveries of Berger that all the implications of changes in brain potentials were fully and widely appreciated, which led, among other things, to the clinical use of the electro-encephalogram.

Adrian inherited and enriched the Cambridge tradition of manual dexterity and subtlety in experiment. His lectures to Cambridge students on the physiology of the nervous system were enlivened by constant reference to clinical neurology, reflecting his experience in this specialty during the 1914–18 war. Professor A. V. Hill,[1] writing in 1937, summed up Adrian's work thus: "To have given a new quantitative basis to nervous behaviour, to have shown that afferent or efferent effect in any given neurone depends on the pattern in time of the impulses which travel in it, is the great achievement of Adrian's recent work. In it he and his pupils have explored the activity of the single neurone, the single sensory end-organ, the single muscle group, their excitation, their adaptation, their fatigue." By his work on the basis of sensation and on the nature of nervous activity, Adrian has broken down still one more barrier which lies between man and the knowledge of his own nature.

TUBERCULOSIS AS A PRESCRIBED DISEASE

Dr. Edith Summerskill, Minister of National Insurance, stated in Parliament last week that she has accepted the recommendation of the Industrial Injuries Advisory Council that tuberculosis should be a "prescribed" disease. Section 55 of the National Insurance (Industrial Injuries) Act, 1946, lays it down that "a disease or injury may be prescribed . . . in relation to any insured persons if the Minister is satisfied that (*a*) it ought to be treated, having regard to its causes and incidence and any other relevant considerations, as a risk of their occupations and not as a risk common to all persons; and (*b*) it is such that in the absence of special circumstances the attribution of particular cases to the nature of the employment can be established or presumed with reasonable certainty." When the Industrial Diseases Subcommittee of the Industrial Injuries Advisory Council was asked to consider and advise on the question whether tuberculosis (and other communicable diseases) should be prescribed as an industrial disease of nurses and other health workers it was set a very difficult task. However, in spite of the difficulties the council has succeeded in bringing out a concise and informative report[1] with a number of cut-and-dried recommendations on which the Minister has already acted. It is doubtful if any will disagree with the general recommendations that diseases due to tuberculous infection might properly be prescribed under the Act in so far as they affect persons "having close and frequent contact with the infection by reason of their employment." The conditions under which the disease may be presumed to be due to the nature of the employment are clearly laid down. But the council was quite definite in stating that the attribution of particular cases of the disease to the nature of the employment could not be established, as distinct from presumed, with reasonable certainty except on rare occasions. In reaching decisions of such importance the council was helped by the evidence put before it by many expert witnesses. Earlier this year the Council of the B.M.A. approved a memorandum[2] on this subject prepared by a committee under the chairmanship of Dr. R. R. Trail, and this memorandum was formally submitted to the Industrial Diseases Subcommittee of the Industrial Injuries Advisory Council. The recommendations of the latter body are in close agreement with those of the B.M.A. committee.

It is of course to be expected that some of the points of detail in this report will give rise to controversy. In fact there will be many who will agree with the interesting and practical note by Mr. T. A. E. Layborn, dissenting from a recommendation of the council that the disease may be presumed to have been contracted at work for as long as two years after employment ceased. He also considers that there should be a definite minimum qualifying period of six months' employment (the council's recommendation is six weeks) before the presumption is permitted that the infection was a result of previous employment. No doubt some will question the council's view that it is impracticable at present to insist that claimants under the Act should have had a pre-employment tuberculin test. Other problems which the council had to face were the definition of tuberculosis and what is meant by "close and frequent contact." Those who consider that the primary infection is all-important and that subsequent disease is due to endogenous exacerbation will support Mr. Layborn's comment that "circumstances quite unconnected with nursing and

[1] *Tuberculosis and Other Communicable Diseases in Relation to Nurses and Other Health Workers*, Ministry of National Insurance, 1950.
[2] *British Medical Journal*, 1950, 1, 484.

other health work are responsible for the great majority of cases of the disease," and they may feel that the council has not given sufficient weight to this view. Nevertheless the wisdom of the report outweighs these debatable details, and it will bring much satisfaction to all tuberculosis workers. Though industrial injury benefits are higher than those for ordinary sickness under the National Insurance Act, there is some uncertainty about the effect of "prescribing" tuberculosis on nursing recruitment. Some potential entrants to the profession may now have a greater sense of security, while others may be put off by the possible danger. The council has shown good judgment in refusing to recommend "block" prescription of other communicable diseases. It appreciates that the recommendations about tuberculosis will have wide repercussions, and it prefers to await developments before extending the concessions.

EMOTIONS AND THE SKIN

Clinical reports on the association between urticarial rashes and emotional changes have been quite frequent since 1935. A recent report by Graham and Wolf[1] is interesting, because clinical examination was combined with experimental investigation. The subjects were 17 women and 13 men who had had repeated attacks of urticaria, showing either as superficial weals or deeper and more diffuse swellings. Some had an itching blotchy erythema with pronounced dermographism. A fairly complete life history was obtained from each patient, with particular attention to exposure to possible antigens and the emotional aspect of situations in which attacks of urticaria were known to have occurred. The patients were then asked to discuss these situations, while observations were made on skin temperature and the reactive hyperaemia threshold. To carry out the latter test a weight is applied to the skin long enough to cause a zone of erythema (due to dilatation of the minute vessels) to appear after removal of the weight, the time being measured. This is a test of the tonus of the vessels and not of their calibre. Skin temperature, on the other hand, is dependent on the dilatation or constriction of the arterioles. Room temperature was kept constant throughout the experiments. In a number of cases the authors also tested the sensitivity of the skin to pilocarpine and histamine introduced electrically by iontophoresis. In 29 out of the 30 cases there was an invariable relation between past attacks of urticaria and the emotional state at the time. Curiously, there was no important association with foods or other antigens. The nature of the emotional state was also specific. Emotions of anxiety, hostility, grief, or dejection were not directly associated with attacks of urticaria, but the prominent emotional state was one which might be called resentful frustration. At the time when the attack happened the patients had felt themselves "on the spot" in some way and unable to do anything about it. The authors' experiments confirmed this impression. They recorded the emotional state on graphs—through self-consciousness, anxiety, tears, and dejection to resentment—as the patient discussed his preoccupations in the course of the interview; and, whereas other emotions caused little change, when resentment was felt the skin temperature rose, the tonus of minute vessels fell, and the patient might even start to scratch. Other emotions were not entirely without effect; anxiety tended to cause an increase in minute vessel tone and delay of flushing after pressure, and dejection was associated with a fall in minute vessel tone and also a fall in skin temperature, probably due to arteriolar constriction.

The authors make an interesting point when they say that, while they were able to establish a relation between urticaria and a particular mental state, they were often unable to understand just why the patient had taken that emotional attitude. Often enough when the patient explained that "there was nothing I could do," it seemed to the observer that, in fact, a good many things could have been done. The patients, as a whole, not only failed to express hostility but tended not even to feel it. In the past they had adopted rather a passive attitude to punishment from parents or superiors. Some of the women found hostility unacceptable in terms of their standards of proper behaviour. An attack of urticaria sometimes occurred while a patient was pondering on his problems, but at such times there was an absence of aggressive fantasies. On the other hand there was no general lack of initiative and energy of character; the passivity was shown only in meeting external hostility. Physiologically urticaria is due to an increased tendency to vascular dilatation both in the arterioles and in the minute vessels. Graham and Wolf do not find it necessary to postulate the local liberation of histamine. The permeability of the vessels increases as they dilate, until the point is reached where exudation occurs. Local stimulation—for instance, the rubbing of a collar—may decide the actual place of appearance.

To a certain extent these experiments run counter to prevailing clinical opinion, which would ascribe an important role to the emotion of hostility in provoking urticaria. It is in any case a little difficult to distinguish between hostility and resentment. Nevertheless it is investigations of this kind that aid in the exploration of psychosomatic relationships. Elsewhere in this issue we publish a report by Drs. H. J. Shorvon, A. J. Rook, and D. S. Wilkinson on the treatment of skin disorders by inducing emotional release through "drug abreaction." Much has yet to be learned about the indications for this treatment, but the fact that such encouraging results have already been obtained not only confirms the importance of psychological factors in precipitating certain skin disorders but shows that psychiatric treatment is far from impracticable. An interesting finding was that after abreaction some patients were able to reduce to reasonable proportions symptoms which had come to assume an overwhelming significance for them. Increasing knowledge of the pathogenesis of such obscure conditions as the neurodermatoses should help in another direction. One of the greatest weaknesses of psychiatric observations is that they have to be expressed so largely in ill-defined qualitative words and phrases. If we could redefine such psychological expressions as "anxiety" and "depression" in physiological terms and begin to measure differences between patients and in the same patients at different times it would go far to clear away present obscurities.

[1] *J. Amer. med. Ass.*, 1950, **143**, 1396.

REFRESHER COURSE FOR GENERAL PRACTITIONERS
THE TREATMENT OF VARICOSE VEINS

BY

REGINALD T. PAYNE, M.D., M.S., F.R.C.S.

I heard two beggars that under an hedge sate,
Who did with long talk their matters debate.
They had both sore legs most loathsome to see,
All raw from the foot well most to the knee.
"My leg," quoth the one, "I thank God is fair."
"So is mine," quoth the other, "in a cold air,
For then it looketh raw and as red as any blood,
I would not have it healed for any world's good.
No man would pity me but for my sore leg,
Wherefore if I were whole I might in vain beg.
I should be constrained to labour and sweat,
And perhaps sometime with scourges be beat."

ROBERT CROWLEY, *Epigrams, c.* 1550.

Idiopathic varicose veins are common in all sections of the community, and every general practitioner is faced with the problems of diagnosis and treatment. Sometimes he must take full responsibility, while in other cases treatment can be carried out successfully only in conjunction with a specialist. The results will be gratifying if diagnosis is accurate and the scope of treatment recognized.

The consultant tends to see the most advanced cases and other people's failures. In some there has been a non-recognition of threatening complications or the true origin of a dermatitis. In others treatment has failed because of ignorance of the anatomical territories of the internal and the short saphenous veins. Some failures are due to the giving of injections in quite unsuitable cases, others to giving inadequate injection treatment in suitable cases. The treatment of ulceration, phlebitis, etc., may prove unsuccessful through the omission of necessary surgical measures.

The treatment and management of limbs in which there is varicosity or enlargement of the superficial veins secondary to obstruction or thrombosis of the deeper veins are not considered here. Such cases should be eliminated by a careful history and a full clinical examination.

Diagnosis

Treatment should not be undertaken without an adequate medical history and a careful examination.

History.—It is important to know the patient's age, the age at which the veins developed, their speed of progress, the effect of any pregnancies, the nature of any complications, the details of past treatment, and the nature of the present disability. The character of the patient's work and other physical activities should be ascertained.

Past History.—Information must be sought about the patient's previous health. Has there ever been typhoid fever or any other possible cause of deep thrombosis? Is there a history of skin disease, of peripheral arterial disease, or of other disability of the lower limbs?

Family History.—A family history of varicose diseases occurs in approximately two-thirds of the cases, and a bad history has an important bearing upon the question of treatment. The practitioner who embarks upon the treatment of a familial case in which the veins have started at an early age and have progressed rapidly with successive pregnancies will gain little credit from injection treatment.

Physical Signs.—A general examination is advisable if systemic disease is suspected. Both lower limbs must be examined and the general condition of the skin and subcutaneous tissue determined. More detailed information about the size, thickness, and tortuosity of the veins can be obtained by palpation. Varicosity of the short saphenous vein (Fig. 1) is apt to be overlooked, and examination for this should always include the region behind the external malleolus.

The various tests for venous incompetence should be carried out. These include the determination of a well-defined impulse on coughing or percussion of the vein, and Trendelenburg's test. Special attention should be directed to the skin. There may be thinning in relation to actual varicosities or congestion of the lower and inner part of the leg when the internal saphenous vein is incompetent.

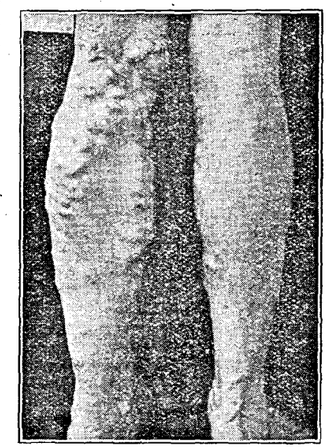


FIG. 1.—Posterior aspect of legs showing varicosity of left internal and short saphenous veins.

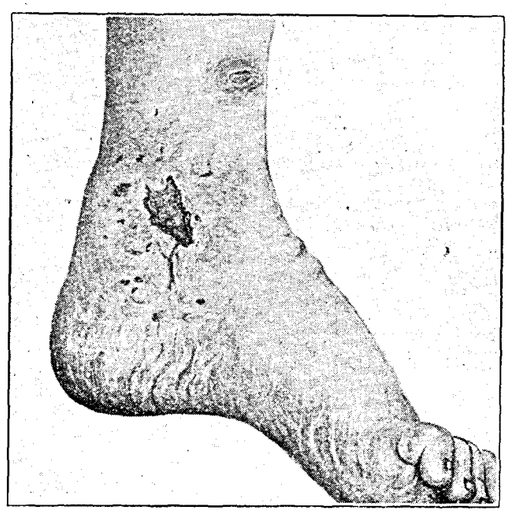


FIG. 2.—Chronic varicose ulceration in region of right external malleolus, associated with incompetence and varicosity of short saphenous vein.

Details of any phlebitis, eczema, ulceration, or oedema must be noted, and the relationship of these complications to the underlying veins determined (Fig. 2). The horizontal position is best when examining an area of suspected phlebitis.

It is advisable also to know whether the arteries are clinically normal in the feet, and the latter should be examined for deformities such as hallux valgus, corns, etc. The type and suitability of shoes should be noted.

Principles of Treatment

The practitioner must know what may be reasonably expected from the various methods of treatment. Relief may be obtained in uncomplicated cases by supports, by injections, by operation, or by a combination of operation and injection. Varicosities below the knee, especially when thin-walled, respond well to injections. If, however, the internal saphenous vein is incompetent in the thigh, or if the veins are relatively straight and thick-walled, then thrombosis will be uncertain and recanalization likely. Operation, or operation and injection, will be needed in these cases.

In complicated cases it is essential to know the extent and nature of the underlying varicose veins. If these are of a type likely to respond to injections, then injection will have to be incorporated in the scheme of treatment. If, on the other hand, the veins require operative treatment, then the complications will have to be dealt with and the appropriate surgical treatment carried out. The ideal to be aimed at is the cure of complications, the obliteration of incompetent veins, and the restoration of a limb which requires no permanent support.

External supports are indicated only in uncomplicated cases when other treatment is not possible or advisable, or as a temporary measure during injection treatment. The various types of crêpe bandages can be extremely helpful, but all too frequently these are applied in such a way as to give little support to the limb. Elastic stockings must fit accurately, and should be fitted by the suppliers. Measurements for them should be taken first thing in the morning.

Injection Treatment

Many drugs have been used as sclerosing agents, but quinine–urethane is one of the most certain. It must be used only by those familiar with intravenous technique, as leakage into the tissues may produce necrosis. The veins should be distended by a light rubber tourniquet, and then the patient should lie horizontally on a couch in a comfortable position. Treatment should start in the distal veins and one injection should be given at each sitting. The initial dose should be 0.5 ml., and subsequent dosage should not exceed 2 ml., depending upon the size of the vein. Local reactions are usually moderate, except when the veins are very thin-walled or very large. Mild general quinine reactions occasionally occur in women. Large veins should be treated at intervals of five to seven days, while smaller veins may be treated at intervals of two or three days. A crêpe bandage may give support during the treatment of large veins.

Cases for operation will not normally come under the care of the general practitioner, but post-operative injections may be required. Occasionally excellent results are obtained in those borderline cases in which surgery would appear to be preferable but in which for one reason or another it is decided to test the efficacy of injections.

Phlebitis

Phlebitis in the lower limbs is invariably due to varicose veins and is secondary to venous stagnation and nutritional impairment of the vein wall. The diagnosis will be established by the history and by the presence of varicosities and a tender subcutaneous swelling, with fixation and discoloration of the overlying skin. Oedema may be marked in massive thrombophlebitis.

The objects of treatment are: (1) to prevent spread of the thrombosis in the superficial varicose veins; (2) to prevent spread of the thrombosis to the deep veins with the risks of pulmonary embolus; (3) to control oedema; (4) to improve the circulation; (5) to control infection if present; and (6) to prevent recurrence.

Anticoagulants will not be discussed here, as these will not normally be used in cases under the general practitioner's care. The following are the main types of phlebitis.

Local.—In mild or moderately severe cases the leg should be enclosed in "elastoplast" and a pad incorporated immediately above the upper limit of the thrombosis. Moderate activity should be permitted, although fatigue must be avoided. The elastoplast should be changed at weekly intervals and should be continued until the local inflammatory changes have disappeared.

Spreading.—Ligation of the internal saphenous vein at the saphenous opening may be indicated in cases with ascending thrombosis in the thigh.

Recurrent and Chronic.—Most of these cases show saphenous incompetence in the thigh, and operative treatment is necessary after the acute attack has subsided.

"Sock" Phlebitis.—In this condition there is much periphlebitis with extensive woody induration of the tissues of the lower part of the leg. Resolution occurs with prolonged elastoplast treatment, but operative treatment of the veins is usually required to prevent recurrence.

Infective Thrombophlebitis.—These cases are usually streptococcal and associated with high fever, rigors, and acute inflammatory signs. Penicillin and saphenous ligation are indicated.

Diagnosis may be difficult when the veins are embedded in a large amount of fat. Conditions such as thrombophlebitis migrans, thrombo-angiitis obliterans, etc., should be considered when thrombosis occurs in apparently normal veins.

The use of external supports may be needed temporarily after the acute phase has subsided. When operation is indicated this should be carried out during a quiescent interval. If injections are indicated these should not be started until at least six months after the attack of phlebitis.

Eczema or Dermatitis

Typically varicose eczema starts in the lower third of the leg, in relation to old-standing areas of congestion, but it may develop over varicosities anywhere or be secondary to ulceration (Fig. 3). Long-continued eczema leads to sensitization of the skin and involvement of other parts of the body. Recurrence is inevitable if the varicose origin of the eczema is not recognized.

Curative treatment involves treatment both of the eczema and of the veins. It is essential to decide whether the veins can be cured by injections or by operation. Elastoplast should not be used on patients with eczema.

Mild Cases.—Local treatment will usually cure small areas of dry eczema. An ointment of equal parts of zinc oxide ointment and soft paraffin should be applied daily and the affected region covered with as little dressing as possible. The old ointment should be cleaned off with liquid paraffin at each daily redressing. Some cases respond well to "siccolam," but very little must be applied and the new ointment should be put on the top of the old. No other dressing is necessary. A mild "sphagnol" ointment often proves helpful, and *x*-ray treatment is invaluable in old-standing cases. If injections are indicated these may be carried out during the treatment of the eczema.

Severe Cases.—When the eczema is extensive or severe, treatment should be on the above lines, but combined with a period of absolute rest in bed, with the lower end of the bed elevated. In many cases there are indications for operation. This can be carried out under penicillin cover after rest and local treatment have controlled the eczema.

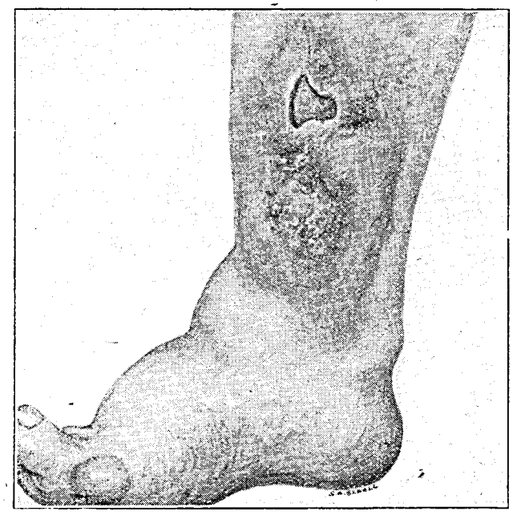


FIG. 3.—Chronic varicose ulceration with scarring, pigmentation, and eczema.

Varicose Ulceration

There are many methods of treatment of varicose ulceration. I have gradually come to the conclusion that long-standing cases are best treated by operation if sound healing of the ulceration and a useful limb requiring no external support are to be secured. The special indications for operation are either incompetent veins in the thigh, incompetent communicating veins in the calf, or incompetent thick-walled veins.

Cases Suitable for Injection.—If the veins are of a type suitable for injection, then treatment must be built around this, and small and early ulcers may be cured by this measure alone. Most cases, however, require a combination of injections and external support. Injections should start distally and as near the ulcerated area as is safe, and the limb should be enclosed in elastoplast below the knee. This should be changed weekly and a further injection given. Elastoplast treatment should be continued for about three weeks after the ulceration has healed and it should be followed by the use of a crêpe bandage for a further three to four weeks.

Cases Suitable for Operation.—The ulceration is healed by postural treatment before carrying out surgery. This involves a period of absolute rest in bed, with the lower end of the bed raised on 8-in. (20-cm.) blocks. The ulcerated area should be dressed with an ointment of equal parts of zinc oxide ointment and soft paraffin, and covered with light gauze dressing. Fresh ointment is applied daily after cleaning off the old ointment with liquid paraffin. The oedema and pain rapidly clear up, and a foul infected ulcer is converted to a clean granulating wound which heals steadily. Penicillin cover has made operation possible immediately healing has occurred. This method of treatment may also be used as a preliminary to injections or permanent supports.

The various types of adhesive dressings cannot be considered, nor can the treatment of very complicated cases be discussed in which there is ulceration, eczema, chronic phlebitis, and bone change. There are two points which may be of some value to the general practitioner. The first is that, although penicillin applications may sterilize an ulcer, they will not necessarily lead to healing, and may, exceptionally, cause a generalized skin eruption. Secondly, rashes may follow the prolonged use of ointments containing sulphonamides.

Haemorrhage

External haemorrhage may arise either spontaneously from thin-walled and congested malleolar varicosities, or it may result from injury. In either case the blood loss may be rapid and considerable. Immediate elevation of the limb must be followed by a firm local dressing. Ulceration may develop at the site of the haemorrhage. Subsequent treatment of the veins is indicated.

Internal haemorrhage may occur. Spontaneous cases result from the rupture of minute subcutaneous vessels, and active treatment is rarely needed. Traumatic haemorrhage may occur when a large vein is torn but the skin remains intact. A small haematoma may resolve satisfactorily with elastoplast treatment, but a large one may require evacuation. Traumatic thrombosis may lead to an extending phlebitis.

Pregnancy

Varicosities usually start about the second or third month of pregnancy. Rapid progress often occurs when there is a bad family history of varicose diseases, and especially when varicosities have started at puberty. Uncomplicated varicosities do not cause oedema, but may be associated with other causes of swelling of the lower limbs. The degree of discomfort produced is partly an individual factor and partly related to the speed of development of the varicosities. Generalized skin congestion and discoloration may be marked. Vulval varicosities and piles may also develop.

Active treatment is not often advisable, because success is unlikely owing to the speed of development of the condition. If local symptoms are marked or if the veins are large, then crêpe bandages or elastic stockings should be worn and an afternoon rest taken if possible. Injection treatment should be regarded as quite exceptional, and quinine should not be used. The veins usually show considerable improvement after delivery, but they never return to the condition they were in before the pregnancy. After the baby has been weaned active treatment should be carried out in keeping with the general principles already indicated. Every subsequent pregnancy tends to aggravate existing varicose veins, and thus increases the risks of subsequent complications. If active treatment has been carried out and a further pregnancy is desired, then such treatment should be completed well before the pregnancy starts, and should be safeguarded by wearing a below-knee stocking throughout the pregnancy.

In a leading article in the *Journal of the American Medical Association* (September 9, 1950, p. 182) it is estimated that the minimum cost to medical students of attending medical school for one academic year, including the cost of tuition, other fees, books, equipment, all essential living, and travel, ranges from $567 (£202 at the present rate of exchange) to $2,252 (£804), with a median of $1,473 (£526).



Walter Stoneman, London.]

PROFESSOR E. D. ADRIAN, O.M., M.D., F.R.C.P., P.R.S.

Professor E. D. Adrian, who in 1937 succeeded the late Sir Joseph Barcroft in the chair of physiology at Cambridge, was elected President of the Royal Society on November 30, being the ninth medical man to occupy this position (see also leading article at p. 1320).

DISTRIBUTION OF CHLORAMPHENICOL (CHLOROMYCETIN)

From December 11 all doctors will be able to prescribe chloramphenicol ("chloromycetin") for their private or N.H.S. patients. The Ministry of Health has issued the following statement (see leading article on p. 1319):

Owing to improvement in supplies, chloramphenicol (chloromycetin) will be generally available on prescription from December 11. The following provisional lists are intended as a guide to practitioners in prescribing this antibiotic.

There are certain infections (list 1 below) in the treatment of which chloramphenicol is more effective than any of the therapeutic agents at present generally available. Apart from these there is a variety of infective conditions (list 2 below) in which the value of treatment is less certain; preliminary trials both in this country and abroad have given variable results, and further experience is needed before chloramphenicol can be recommended as routine treatment in these diseases. In certain diseases (list 3 below) there is no satisfactory evidence that chloramphenicol has any therapeutic value.

1. *Infections in which the Therapeutic Value of Chloramphenicol is Superior to that of Sulphonamides or Penicillin.*—Typhoid and paratyphoid fevers (excepting carriers), brucellosis (undulant fever); rickettsial diseases—i.e., typhus, scrub typhus, Q fever; psittacosis; lymphogranuloma inguinale; atypical (virus) pneumonias; urinary tract infections resistant to sulphonamides and penicillin (these include infections due to resistant strains of *B. coli, B. proteus, Ps. pyocyanea,* and *Str. faecalis.* Sensitivity of the organism to chloramphenicol should be determined).

2. *Infections in which Therapeutic Benefit from Chloramphenicol has been Reported but not Fully Substantiated.*—Whooping-cough, salmonella food-poisoning, *H. influenzae* meningitis.

3. *Infections in which there is no Satisfactory Evidence of the Therapeutic Value of Chloramphenicol.*—Influenza, the common cold, poliomyelitis and encephalitis, tuberculosis, syphilis, ulcerative colitis.

Chloramphenicol is probably effective in a number of pyogenic infections, such as bacterial pneumonias, gonorrhoea, and peritonitis, but it is doubtful whether it is as effective as penicillin or sulphonamides. In bacterial endocarditis due to organisms which are penicillin-resistant, chloramphenicol is probably inferior to a combination of streptomycin and penicillin. An exception to this is bacterial endocarditis due to penicillin-resistant *Staph. pyogenes*; for this, as for any severe penicillin-resistant staphylococcal infection, "aureomycin" is the antibiotic of choice.

It should be noted that chloramphenicol in the powdered form has an extremely bitter taste. It is not, therefore, easily administered to young children who will not swallow capsules.

THE BLAIR-BELL MEDAL

PRESENTATION TO PROFESSOR MUNRO KERR

The first Blair-Bell medal of the Royal Society of Medicine, awarded quinquennially for the advancement of science in gynaecology or obstetrics or both in the preceding five years, was presented to Professor J. M. Munro Kerr in the presence of a distinguished company on November 30. The medal was designed by Mr. Carter Preston.

Lord Webb-Johnson, President of the Royal Society of Medicine, said that he had not known Blair-Bell as well as he would have liked, but he well knew his brother, who wore himself to death in the service of the wounded in the first world war. It was a delight to see many members of Blair-Bell's family present on this occasion. The medal was a beautiful example of the engraver's art. On one side it bore an excellent portrait of Blair-Bell, and on the other a design to represent Juno Lucina, the chief goddess of childbirth. He spoke of his great admiration and affection for the first recipient of the award.

Mr. V. B. Green-Armytage, President of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine, and Professor Hilda Lloyd, President of the Royal College of Obstetricians and Gynaecologists, then presented Professor Munro Kerr to Lord Webb-Johnson. In doing so, Mr. Green-Armytage said that for over 50 years Professor Munro Kerr had adorned and embellished their profession; during that time he had stimulated countless students—undergraduate and postgraduate—and had earned the regard and affection of countless colleagues. When it was learned that Professor William Blair-Bell had left £500 to the Royal Society of Medicine to establish a medal to be given every five years to the man or woman who had done most to advance science in gynaecology and obstetrics it was the unanimous vote of their Section of the Society that the first recipient should be their guest of that evening.

Professor Munro Kerr, after receiving the medal at the hands of Lord Webb-Johnson, said how deeply he was touched and how greatly he prized the honour. When he heard that this honour had been given him he wondered what some of his old colleagues now in the Elysian fields would say about it. Probably they would say that it was only what was to be expected in the case of a Scot, long-lived and persistent.

He appreciated the medal the more because it had been handed to him by a great surgeon. The relationship between surgeons and gynaecologists had not always been so friendly and amicable as it was to-day. When he looked back to the 'eighties, at the time when he was a student, he recalled that gynaecologists were recruited from old obstetricians who had very little experience of abdominal surgery. They had one such in Glasgow, a very erudite man, and a good obstetrician, who had been a medallist in anatomy, though when he came to know him he was an accepted authority on seaweed.

He thanked Mr. Green-Armytage, a friend of many years' standing, and Lord Webb-Johnson for the kindly words with which they had introduced him to the company, and he associated with the thanks Mr. Geoffrey Edwards, the secretary of the Society, who had arranged this occasion and who himself was celebrating his 25 years' association with the Society.

Reports of Societies

SYMMETRICAL CORTICAL NECROSIS OF KIDNEYS

At a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine on November 17, with Dr. V. B. GREEN-ARMYTAGE in the chair, a paper was read on symmetrical cortical necrosis of the kidneys.

Professor H. L. SHEEHAN, of the Department of Pathology, University of Liverpool, said that the great majority of these cases arose from concealed accidental haemorrhage in pregnancy. In studies of a large series of kidneys in women who had died after concealed accidental haemorrhage, some of them a few hours after the haemorrhage and others a few days later, all the stages of different renal lesions could be seen, from very slight and minor degrees of damage up to complete cortical necrosis. The cause of the kidney damage was ischaemia, due to temporary arrest of the circulation to the renal cortex at the time of the accidental haemorrhage or soon afterwards, followed, on the restoration of blood flow, by the development of necrotic changes and the formation of thrombi.

He divided the renal lesions into nine grades. The first grade, illustrating the slightest lesion, was a condition of proteinuria, brought about by a spasm of the afferent arterioles which lasted, perhaps, a quarter of an hour. All that resulted from the spasm was a certain amount of damage to the filtration mechanism of the glomeruli. To the naked eye the kidney in this grade showed no marked abnormality, and there was usually a return to normal within one or two days. The second grade was signified by colloid degeneration in the epithelium of the proximal convoluted tubules and colloid casts in the intermediate zone. Here again the patient had a spasm affecting the afferent arterioles, lasting for possibly an hour. The epithelium of the tubules was partially damaged and developed a series of degenerative changes. Usually with a Grade 2 lesion there was a return to normal within two or three days.

In the third grade there was necrosis of the proximal convoluted tubules. Here the spasm lasted a good deal longer, probably for two or three hours; there was necrosis of the proximal convoluted tubules, though the other structures of the kidney, being less sensitive, survived. In most of the tubules the epithelium began to regenerate after about three days. At this grade there was obviously a severe impairment of renal function. The fourth grade was marked by benign thrombosis of the glomerular capillaries. The spasm of the afferent arterioles here continued longer, and the tubular necrosis was more widespread. The thrombi, however, did not occlude the capillary lumen. The fifth grade showed focal cortical necrosis, with the glomeruli themselves damaged, and thrombosis in the arterioles. The initial spasm in the greater part of the cortex lasted from two to four hours, and in the few small foci from eight to ten hours. The subsequent course was healing of the small focal lesions if the degree of proximal tubular necrosis was not too great to allow the patient to survive.

The sixth grade he had entitled "minor cortical necrosis." It was here that arterial lesions as distinct from lesions of the arterioles began to play a part. Spasm lasted in the distal part of the arteries for eight or twelve hours, killing the glomeruli and parts of the cortex in the area. When the arteries relaxed, and the blood opened up with sufficient pressure, there quickly developed necrosis and dilatation in these dead arteries. The seventh grade consisted of patchy cortical necrosis. The spasm developed about the mid-point of the intralobular artery. After relaxation of the spasm thrombi appeared in the necrosed artery at about 18 or 24 hours. So much kidney tissue was lost as a result of the widespread and prolonged ischaemia that chances of recovery were very poor.

The eighth grade was marked by gross cortical necrosis, with spasm occurring low down in the intralobular artery, cutting off the whole blood supply to the cortex, all structures in the ischaemic area being necrosed. When arterial spasm relaxed, the whole arterial tree dilated, and necrotic changes and thrombus of the usual sort developed. The final grade showed gross cortical necrosis of a most severe kind. In a schema which Professor Sheehan showed, out of 1,000 cases of concealed accidental haemorrhage it was estimated that 105 had changes corresponding to Grades 4 to 9. Among these 1,000 cases there were 64 deaths on the first day, 44 deaths later in the puerperium, and 892 recoveries.

In the ensuing discussion Dr. A. M. JOEKES described 10 cases of cortical necrosis of the kidneys, five of them fatal, and three with prolonged and two with short-term oliguria. In the five non-fatal cases the course of recovery of renal function was identical. Ability to concentrate urine was recovered in anything up to a fortnight after onset. There was no fundamental difference in the ischaemia resulting from cortical necrosis, nephron necrosis, or tubular damage; the difference was only one of degree. He stressed the impossibility of diagnosing with certainty a complete cortical necrosis; therefore all cases must be treated on the assumption that there was a recoverable renal lesion.

Professor KENNETH FRANKLIN said that he had wondered whether other renal troubles of pregnancy had not some aetiological basis common to them and to cortical necrosis. Changes apparently comparable had been induced in animals by various experimental procedures. In rabbits experimental renal cortical necrosis was definitely induced by ischaemia. The renal effects occurring in cases of concealed accidental haemorrhage ranged from quite minor changes to full necrosis. There was a certain measure of renal cortical blood-flow diversion a little before term. The contraction of the abdominal muscles with the onset of labour must also be borne in mind. It could be visualized how, under the various influences which were brought to bear, cortical necrosis or some other renal lesion might develop.

Professor J. F. HEGGIE said that he had seen similar changes to those described by Professor Sheehan. He noted that Professor Sheehan had not suggested a cause for the spasm, and it was very difficult to prove or disprove that spasm occurred, though many writers on the subject had described spasm on the strength of the aetiological evidence.

Mr. G. J. SOPHIAN gave a review of recent literature on the subject. He thought that the work of Trueta and his colleagues had made possible a more rational explanation of what occurred, and it was this which had suggested to him the hypothesis which he had been advancing since 1947 concerning the causation of the major renal disturbance which underlay pregnancy toxaemia. In the laboratory animal faradic stimulation of the renal nerve could result in some degree of cortical necrosis, with visible changes in the cortex. He showed sections illustrating changes noted in the kidney of the rabbit following renal ischaemia.

Dr. R. H. PARAMORE commented on the three main theories put forward—toxins, reflex nervous stimuli, and increased activity of abdominal muscles in parturition—and directed attention to the last of these as having an importance hitherto neglected.

The Ministry of Health has prepared a booklet entitled *Allocation of Pension* explaining the superannuation scheme to medical practitioners and others about to retire from the National Health Service. Copies have been sent to hospital boards and executive councils so that it may be seen by doctors who are about to retire, and it may also be obtained from H.M. Stationery Office for 6d.

Nova et Vetera

FLORENCE NIGHTINGALE'S VIEWS ON THE AGE AT WHICH A YOUNG LADY SHOULD BECOME A NURSE

The letter from Florence Nightingale printed below was written to Sir William Richmond, R.A., about the daughter of a friend of his. It is interesting to record that the subject of this letter, in later life, worked with great devotion among the Kentish hop pickers.

The original lettef, which we publish by kind permission of the present owner, Dr. Arthur M. Ware, is written in pencil.

Oct. 17/87
10, South Street,
Park Lane, W.

My dear Sir,

Your wishes are law to me. And your account of the young lady of 18 who wishes to devote herself as a Nurse is so very interesting.

But have you thought whether 18 is not too young, both physically and morally ?

There are sacred secrets belonging to the sick which 18 could not and ought not to be able to understand—and there are secrets the very reverse of sacred, the secrets of vice, about Patients which their Nurse *must* know if she is not to be made a fool of; and which one shrinks from any young woman, gentle or simple, knowing. (Alas ! the "simple" know them far too soon.)

A gentlewoman, or gentle girl, would either be shocked and run away. Or she would be hardened, which is the worse evil of the two. Then about the physical side—we do not take any one into our Training School at St. Thomas' Hospital under 23—tho' I think we strive to make it a home where the mother of any girl need not object to seeing her daughter.

Whatever you take out of a woman in Nursing life before 23 or 24 you more than take out of her at the other end; indeed you may reckon two years for every one at this end that she loses at the other. Even in Children's Hospitals I believe they take no Probationers under 20. (It is true that the present Matron of St. Thomas' (just appointed) who was Matron of the Great Edinburgh Infirmary for 13 years, came to us before she was 20, and has been in the Service ever since. But the exception proves the rule (This lady is a pearl of the finest water), and I think even she would have better health, had she entered later.)

We even prefer not admitting *gentlewomen* earlier than 26 or 27, for two reasons: one that gentlewomen are younger in *knowingness* than those who have had to rough it: the other that posts of superintendents will be theirs if they persevere in the life* and 24 is too young to superintend.

Having laid these things, as an old Nurse and Trainer, before you and Mrs. Richmond, I will gladly see the young lady whenever we can make an appointment.

Pray do not think that I cry down Hospital life. To me it is the most sacred, the holiest of all. What is the highest character worth but to use it for those who have none ? What is holiness for but to spend it for those who are unholy ? And the lovely things one sees among Patients, the return of good feeling among those who for years have never heard a "good word" would alone make the life a delightful one.

Pardon me for not having answered your note before. I have been so driven both by work and illness since I came back that I have scarcely had time to breathe, and shall be. But in November I hope to have a little more time and to make an appointment to see your maiden fair.

May she run her noble career in life is the earnest wish of yours ever faithfully,

FLORENCE NIGHTINGALE.

How can I thank you enough for your picture of me; for my sister is more than delighted with it ! ! That is what genius can do.

F. N.

W. B. Richmond, Esq.

*i.e., after their year's probation.

Bejel is a childhood-acquired, non-venereal, syphilis-like disease due to treponema and widespread among the semi-nomadic populations of the eastern Mediterranean area. It responds to penicillin, and a Unicef-W.H.O. project in conjunction with the Iraq Government to control it opened in Bagdad in October under the direction of Dr. E. H. Hudson, of Ohio University, Athens, Ohio, an authority on treponematosis.

Correspondence

Economy in the Health Service

SIR,—You deserve the gratitude of all responsible citizens for your excellent leader (December 2, p. 1262). The N.H.S. is facing financial disaster, and in the very near future. This year it is estimated to cost £483m.: if this runs true to form, the actual cost should be well over £500m. Drastic economies *may* save this much-desired service, but it is idle to believe that careful administration and the mere elimination of discovered waste can produce the kind of economies that will bring expenditure permanently within the nation's capacity.

It has been suggested in authoritative circles that some small charge will have to be made throughout the Service; but the nature of the charge and how it is to be imposed are not clear. The issue cannot much longer be shirked. We must be realists and crystallize these rumblings about economy into clear and definite action to produce a better health service at a lesser cost. So I shall venture further and mention at least five sections of the Service in which substantial economies could, and should, be made. These are the administrative, dental, ophthalmic, pharmaceutical, and hospital sections.

The costliness of the dental and ophthalmic services is a matter for grave concern. It may be politically expedient, but it is scientifically wrong and economically unsound to provide dentures and spectacles for octogenarians while allowing the teeth and eyes of the rising generation to be neglected. It is our duty to see that priorities are restored. Dental and ophthalmic benefits were in existence before 1948 under the N.H.I., and were free from abuse. Under this system the patient paid half of the cost for teeth and spectacles; and it may be that we should reconsider this well-tried method for patients who are in full employment.

The pharmaceutical service is worthy of the closest scrutiny. Unfortunately, many people have regarded the N.H.S. as a source of free supplies and not, as they should have done, as a guarantee that no man, woman, or child shall be debarred from receiving free of charge costly, life-saving, and disease-preventing drugs, and drugs necessary for certain chronic illnesses. The Australian Government has profited by our costly mistakes and has prepared a list of these important drugs, some 140 items, which shall be free on a doctor's prescription: but the inessentials of medicine are not included and the public cannot "run riot in the chemist's shop." We should do well to free the N.H.S. in this way from abuses which cannot meet with the approval of responsible citizens.

The cost of the hospital services (£238m.) has shown an alarming increase and is mounting daily. Yet there are no more beds in the hospitals: in fact, there are 50,000 empty beds as compared with 1939. The great cost has been attributed to the increase in administrative, clerical, and medical staffs, and to the present inefficient system of financing the hospitals. The result has been a tremendous increase in the maintenance rate per bed, which in many hospitals has more than trebled since 1948. There should be ample scope here for substantial economies. Furthermore, though the N.H.S. has been widely advertised as a free Health Service it has never been advertised as a free hotel service. So for those who can afford it, and there must be few who cannot in this country of full employment, a reasonable charge of £1 per week should be made for board while in hospital: with over 500,000 hospital beds in the country this should effect a saving of at least £20m. a year.

The need for retrenchment is urgent. Economies on the above lines would, I feel confident, produce a more efficient health service, free from abuse and exploitation on the part of both patient and practitioner. The Minister has invited our representatives to put forward suggestions for economies (*Supplement*, July 8, p. 19), but neither the Council nor the G.M.S. Committee has yet taken any steps in the matter. It may soon be too late to save the Service.—I am, etc.,

Guildford. J. O. M. REES.

Displaced Registrars

SIR,—It seems that the conscience of the profession is causing discomfort. The hardness of the bargain which the negotiating committee drove with the Minister is being gradually realized, and matters are being brought to a head by the difficulty of defending the secret merit award scheme and by the suggestion that the awards should be devoted to medical charities. Your leading article (November 18, p. 1158) points out that the proposal of the Ministry of Health to discard 1,100 registrars is due to financial reasons and not because there are already sufficient consultants in the Service. The suggestion has also been made that the period of service for senior registrars should be extended, but it would probably be more satisfactory to establish a grade of assistant consultants. Some of the money might be provided from the merit awards. This money was granted for the improvement of the Service, and, if it is not desired by the consultants and is not having the effect expected, it should be devoted to some other part of the Service. I can think of no more worthy way in which it could be spent than in providing salaries for assistant consultants.—I am, etc.,

Liverpool. H. H. MACWILLIAM.

SIR,—In your leading article (November 18, p. 1158) you make the point that this hard decision to discard over a thousand registrars is due to the financial impossibility of creating the new consultant posts which are considered necessary to the proper running of the Service. I am glad you did so, because it is a vital point. Many of the major difficulties confronting the Service at the moment are essentially financial. The extension of hospitals and building of new ones, the provision of more nurses and better care for the tuberculous and the aged sick, the building of health centres, the increase in the capitation fee and better pay for doctors in the Forces, all call for a great deal more money.

The necessity for rearmament has of course imposed economy on the country. But prior to this it seemed at least doubtful whether the public were prepared to spend any more money on the Service. It would seem very desirable that the profession should emphasize whenever possible that if the country wants a good Service it must be prepared eventually to pay more for it. Any failure on our part to do this may prove a disservice to the future of medicine in this country.—I am, etc.,

London, N.18. DAVID FERRIMAN.

SIR,—Your leading article (November 18, p. 1158) quotes 1,100 as the number likely to have their appointments terminated by M.O.H. Memorandum R.H.B. (50) 106. This is a considerable understatement. Apart from the 1,100, whose posts are ruled as above establishment, the great majority of the remainder have been registrars since July 5, 1948, and their appointments will also be automatically terminated. The total number of registrars to be discharged from the National Health Service is likely to be over 2,000. Many of these men are in their late thirties and have young families.

A return to service in the armed Forces is unlikely to appeal to the majority of registrars, who have already served through the war. Moreover, it is no solution to the problem to suggest that many will find openings in general practice. It is as hard to enter general practice as a principal to-day as it is to become a consultant.

Does the Minister of Health think that the National Health Service will benefit from the sudden loss of these men ? Surely they are the very people, young, keen, and well qualified, who should be making the Health Service a success. Unless some suitable employment within the National Health Service is offered before this memorandum is implemented, large numbers of registrars are certain to become unemployed next year.—I am, etc.,

Bath. K. G. PASCALL.

SIR,—So great was my pleasure in following your reasoned arguments (November 18, p. 1158) on the fate of registrars that I should be glad if you will allow me to stress one aspect of their training touched upon by you. No consultant who has been through the ranks of general practice has any doubt that the added training he thus received is of incalculable value to him in determining the advice he shall give. Can it possibly come to be regarded, not as a disadvantage, but as a normal part of his training that the potential consultant shall have a background of general practice ? If so, it might then be regarded as normal that the general-practitioner registrar should have a right to promotion.

Can the difficulty envisaged by you, of arranging for the future of 1,100 registrars, be overcome by judicious placing of them in general practices where they will have not only an opportunity but a right to appointments as clinical assistants at recognized hospitals ? If they can be given a reasonable prospect of promotion over a period of five years, at the rate of 200 promotions a year, to consultant status, would not the consultant body be all the richer for their experience ?—I am, etc.,

Bangor. LEONARD LANCASTER.

SIR,—The Ministry of Health circular "Registrar Grades: Review of Appointments" was discussed at recent meeting of the Welsh Regional Registrars Group. A unanimous resolution was passed that the following criticisms be placed on record:

1. That the proposals are entirely unacceptable in that no satisfactory solution of the registrar problem is offered.
2. That the instruction to hospital boards in paragraph 9 (ii) (that registrar and senior registrar appointments be reviewed annually and where necessary terminated in the implementation of the reduced establishments) will involve flagrant breach of contract in many cases where appointment has already been made for two or three years in accordance with the terms and conditions of service.
3. That the proposals in paragraph 11 (*b*) are particularly unacceptable to registrars.
4. That paragraph 12 merely adds insult to injury.

—I am, etc.,

G. R. VENNING,
Acting Secretary, Welsh Regional Registrars Group.

Registrar House

SIR,—The efficiency of hospital services will suffer so much from the displacement of registrars that the registrars can surely turn the situation to their personal advantage, and let us give them every help and encouragement. I suggest that they form themselves into groups, acquire a house near their hospital for consulting-rooms, minor out-patient surgery, etc., and call it Registrar House. They should enlist the support (financial, if necessary) of their present chiefs, and coach them in the best way of referring cases for that extra attention and prompt treatment for which many of the public will gladly pay (not to be overdone !). The consultants and not-yet-displaced registrars should co-operate to maintain the liaison necessary to provide those facilities which can be found only in the hospitals. I feel sure that the authorities would turn a blind eye to a little outside practice by registrars during the last weeks before they are discarded, while a little unobtrusive advertising would be overlooked—say a joint notification of the address to the local practitioners.

For certain conditions the service provided at Registrar House would be so much more efficient and prompt than the hospital provides that it should be an immediate success. Indeed, perhaps the securely (?) established consultant might make it a condition of early financial help that he should have a future claim on a room in Registrar House if things become intolerable elsewhere.—I am, etc.,

Oxford. W. RITCHIE RUSSELL.

Exercises in the Bath

SIR,—Sir Leonard Hill's enthusiastic approbation (November 18, p. 1153) of Mr. Togna's under-water exercises is surely misleading. He judges their value by the oxygen consumption per pulse-beat, upon which basis Mr. Togna's oxygen intake with a pulse frequency of 66 per minute is equal to that of a famous marathon runner with a cardiac rate during exercise of 118.

But this gives an erroneous impression of the real criteria, the total oxygen consumption per minute. Sir Leonard says that

"Togna's theory was established in effect by the experiments of Professor G. P. Crowden." Crowden showed, as would have been expected, that simple exercises performed in water involved little exertion, as indicated by the oxygen intake and, of course, the small increase in cardiac rate and blood pressure. With a simple arm- or leg-bending exercise the increased oxygen requirement per minute is about twice as great in the air as in the water, while in another type of exercise in which the trunk is raised and lowered the increase in oxygen requirement in water is only one-third of that for the same exercise performed in the air. To quote Togna's own figures, the cost of action done in air for one minute at the rate of 70 movements to the minute raised the pulse rate from 60 to 180 and the oxygen requirement to 3,470 ml. per minute. The cost of the same action vigorously done in the bath for five minutes at the rate of 60 movements per minute raised the pulse rate from 60 to 88 and the oxygen requirement to 1,401 ml. per minute.

It was only to be expected that the lay press, with the advocacy of a popular medical journalist, has not been tardy to represent that all the advantages of strenuous exercise, especially—*on y revient toujours*—weight reduction, may thus be served with none of the disadvantages, in particular circulatory stress. It is proper to concede that no harm results from such a misconception. The corpulent middle-aged and elderly who are disinclined or unable to take strenuous exercise will have the physical pleasure of effortless splashing about in warm water and the psychical advantage of believing that they are even surpassing their more vigorous self-exhausting brethren.—I am, etc.,

London, W.1. ADOLPHE ABRAHAMS.

SIR,—Sir Leonard Hill's interesting article (November 18, p. 1153) was no doubt intended as a serious contribution to therapeutics and perhaps geriatrics. One would therefore wish for rather more detail. Sir Leonard implies that the chief benefit lies in the removal of the effect of gravity; if this is so, why is swimming classed with "exercises in air" as inferior? Unless the temperature of the water is the deciding factor the difference between exercises and swimming must be in the precise nature of the exercises, and one would like to know more about them. From experiment in a normal bath I can assert that it is difficult to carry out any exercises except the simultaneous employment of opposing muscles—e.g., flexors and extensors of the limbs—and this I should have thought could have been done lying "in air" with no particular complication by gravity.—I am, etc.,

London, W.1. NORMAN J. AINSWORTH.

A Clinical Test for Free Blood

SIR,—The amount of free blood that can be present in the peritoneal cavity without advertising itself often comes as a surprise to the surgeon. For the last 15 years I have made it a practice in case of doubt to tilt the patient by raising the foot of the bed 18 in. (45 cm.). Unilateral or bilateral shoulder pain is usually felt within half an hour, and is a remarkably constant sign when free blood is present. No doubt the idea has occurred to others, but it is apparently not in general teaching and usage. This is my only justification for placing on record such a simple procedure.—I am, etc.,

Luanshya, Northern Rhodesia. A. C. FISHER.

Family Planning for the Rhesus-negative Mother

SIR,—Doctors practising obstetrics must be frequently asked nowadays to advise Rhesus-negative mothers on the number of their family. The glamour of exchange transfusion, and other measures aimed at combating the effects of erythroblastosis foetalis, have been much publicized. Unfortunately the impression left in the minds of many Rhesus-negative women is that their baby, whether it be their first or their fourth, is almost certain to be stillborn or at best will live only to become the inmate of a mental hospital.

I am anxious to publish the following two cases to show how wrong is this impression.

Case 1.—Mother, Group B, Rhesus-negative, gave birth to:—1932, girl: normal, Group B, Rhesus-positive; 1934, girl: normal, Group B, Rhesus-negative; 1935 (February), 1935 (August), 1935 (December), eight-week miscarriages; 1937, girl: died after discharge from hospital, no icterus, no evidence of erythroblastosis foetalis; 1940, girl: normal, Group B, Rhesus-positive; 1948, boy: normal, Group B, Rhesus-negative; 1950, girl: Rhesus-positive, Coombs-positive, jaundice; apparently completely normal after exchange transfusion.

The husband's blood in this case is Rhesus-positive, and, in the light of the Rhesus grouping of the children, must be heterozygous.

Case 2.—Mother, Group A, Rhesus-negative, gave birth to:—1929, girl: normal, Group O, Rhesus-positive; 1930, girl: normal, Group A, Rhesus-positive; 1932, boy: normal, Group A, Rhesus-positive; 1934, boy: normal, Group O, Rhesus-positive; 1936, boy: normal, Group O, Rhesus-positive; 1938, boy: normal, Group O, Rhesus-positive; 1940, boy: normal, Group A, Rhesus-positive; 1942, boy: normal, Group O, Rhesus-positive; 1947, boy: normal, Group A, Rhesus-positive; 1950, girl: normal, Group A, Rhesus-positive.

Genotyping was carried out by Professor Mourant on the husband's blood, and was reported as Group O, probable Rh genotype, Rh_1Rh_1 (CDe/CDe). In his report Professor Mourant added that the Rh grouping might be R_1R^1 (CDe/Cde), but the children's Rh groups are against this. This case shows that an apparently homozygous Rhesus-positive man mated to a Rhesus-negative woman can produce ten healthy normal children, without the formation of antibody in the wife's serum and without any of the effects of erythroblastosis in the offspring.

Case 1 serves to illustrate the fact that to forecast the future without knowledge of the Rhesus grouping of the husband is useless. Even with this grouping, unless his genotype is known (or the Rhesus grouping of the existing children, from which his genotype can be assumed), no prognosis for future pregnancies can be given.

Case 2 shows that, where the outlook appeared to be as unfavourable as possible (Rhesus-negative wife, homozygous Rhesus-positive husband), the couple managed to have ten normal healthy children.

To sum up, it would appear that no Rhesus-negative woman should be advised against embarking on further pregnancies unless the Rhesus grouping (and possibly genotyping) of her husband's blood has been done. Even when these facts are obtained and appear to point to a bad prognosis, occasionally couples can rear large families of healthy normal children. The only completely certain case where avoidance of further pregnancies can be confidently recommended (and where some authorities would be prepared to terminate and sterilize a woman) is when the Rhesus-negative wife has antibodies in her serum, a history of one or more previous erythroblastotic infants, and a homozygous Rhesus-positive husband.—I am, etc.,

Taplow, Berks. JOHN HENDERSON.

Hygiene of Urinal Bottles

SIR,—The stench peculiar to a ward of elderly men is an aesthetic challenge hitherto neglected by the medical profession. Analysis of this smell in a geriatric hospital showed that although strongly noticeable on the male side it was not apparent in wards for women, whether ambulant, bedridden, clean, or incontinent. Yet the female wards were of precisely similar construction and had the same standard of nursing, cleanliness, and ventilation. It was not the smell of stale tobacco-smoke lingering on bed-linen, etc., nor was it due to sex differences in composition of sweat, or incidence of bromidrosis and ringworm of the feet, for the malodour was not present in all male wards. The source of offence was traced to the male urinal bottle.

The urinal bottles available at present are made of glass, porcelain, enamelled iron, or stainless steel. Incrustations accumulate in all, but the opaque utensils have the added disadvantage that vigorous action is rarely taken to remove what is not seen. Enamelled iron bottles, being cheap, are very widely used, but as they soon chip to expose rusty metal they rapidly become unsightly and unhygienic; in the long run they are uneconomical and on all grounds should be abolished. A stout transparent plastic urinal bottle would be ideal, but, until such

becomes available, glass or stainless steel are the materials of choice.

After some weeks of use, even though rinsed carefully, the bottle becomes fouled with a hard brown incrustation overlaid by a furry deposit. This accretion is the source of the foul smell. The hard brown crust is composed of mineral salts, chiefly calcium phosphate, stained with urinary pigments. From the furry slime overlying it a rich variety of organisms can be isolated, including β haemolytic streptococci (Lancefield group C), *B. proteus communis*, achromobacters, aerobic spore-bearers, and micrococci. Once it has formed, this accretion is extremely tenacious and can be removed only by strong caustics. Washing alone, however meticulous, does not prevent its recurrence. The problem was solved by applying a modification of the method used for sweetening vats in the brewing industry.

The routine recommended is as follows:

(1) Initially all bottles which have been in use are cleaned by soaking in concentrated commercial hydrochloric acid (approximately 33%) for 30 minutes. After washing in several changes of water, and finally rinsing in a bottle-washer or under a tap, they are ready for use. New, unused utensils do not, of course, require this initial cleansing.

(2) Used bottles are collected from the patient's side four-hourly (clean ones being issued in their place) and their contents emptied down the sluice.

(3) About 2 ml. of an acid detergent mixture, consisting of "izal" liquid cleanser 1% with commercial hydrochloric acid ("spirits of salt") 1% in water, is inserted into the urinal bottle and about ¼ pint (250 ml.) of water added.

(4) The mouth of the bottle is then covered with a rubber pad and the vessel shaken vigorously for 30 seconds.

(5) The contents are poured down the sluice, and

(6) the bottle is rinsed in the standard bottle-washer or under the tap.

It must be emphasized that the acid-detergent mixture does not remove long-standing accretions, but does prevent incrustations from forming in utensils initially clean. The method has proved effective in practice over the past twelve months and ensures a sterile, inodorous urinal bottle.

I am grateful to Mr. W. Trillwood, chief pharmacist to the United Oxford Hospitals, for his assistance, and to Dr. R. L. Vollum, director of the Public Health Laboratory Service, Oxford, for the bacteriology.

—I am, etc.,

Oxford. P. D. BEDFORD.

Atelectasis and Bronchiectasis in Pertussis

SIR,—Dr. A. W. Lees's paper (November 18, p. 1138) is a useful contribution to our knowledge of the incidence, distribution, and duration of segmental and lobular atelectasis in pertussis. The rarity with which permanent bronchiectasis occurred in his series is surprising when one considers the frequency with which one encounters bronchiectatics who date their respiratory illness to an attack of whooping-cough in infancy or childhood. Of course, such a difference may well be due to the selected material one observes in a chest department or, as your annotator justly remarks (p. 1162), to the mildness of the pertussis epidemic investigated by Dr. Lees.

My sole criticism of an otherwise valuable paper rests on Dr. Lees's tacit assumption that Lander and Davidson are necessarily correct in their hypothesis about the genesis of bronchial dilatation—viz., a more negative intrapleural pressure results not merely in the compensatory phenomena of lung emphysema and diaphragmatic and mediastinal movements but also in *widening of the calibre of the bronchi* in the affected atelectatic areas. Now the latter part of this thesis may be partially correct, but I very much doubt if it represents the entire story. It fails to offer an adequate explanation why one encounters "reversible" bronchial dilatation in children whose intrapleural pressure readings remain substantially within normal limits throughout their pertussis illness. Similarly, Lander and Davidson's views do not offer a satisfactory explanation for the *absence* of bronchial dilatation (as a compensatory mechanism) *outside the areas of lobar atelectasis*, even when the intrapleural pressure is substantially lowered.

Perhaps it is because of this very doubt existing in Dr. Lees's mind that he remains so guarded in his appraisal of the merits of artificial pneumothorax as a therapeutic weapon "to counter the mechanical stresses dilating the bronchi." Clearly, if Lander and Davidson's hypothesis on the aetiology of bronchiectasis is only a partial explanation, then the entire principle underlying collapse therapy in potential bronchiectatics is invalidated. In any event, it appears contradictory to advocate postural drainage, percussion, and bronchoscopic suction as therapeutic measures to facilitate expulsion of secretions, while simultaneously advocating a technique which must entail compression and constriction of the bronchial lumen and result in the retention of bronchial secretions which were initially responsible for the atelectasis.—I am, etc.,

Halifax. BERTRAM MANN.

SIR,—Bronchiectasis has still its full share of what Sir Thomas Browne called "vulgar and common errors." Dr. A. W. Lees (November 18, p. 1138) is to be congratulated on investigating one, for which Laennec is somewhat to blame, that pertussis is a common cause. My own experience, like that of Dr. Lees, does not support this view. Some years ago the then superintendent of the North-eastern Fever Hospital gave me the opportunity of seeing all those patients who had survived very severe or complicated whooping-cough during the preceding two or three years. Clinical and radiological examination suggested that all had recovered completely, so that there was no single case in whom bronchography could be justified.

The histories of proved cases of bronchiectasis referred for admission to the Invalid Children's Aid Association's special hospital school (the Meath Home) sometimes contain the statement that the symptoms date from pertussis, or from pertussis and measles consecutively. In nearly every such case a more careful questioning of the parents reveals that in fact there had been respiratory symptoms before the pertussis. The accurate history is that pertussis had aggravated respiratory symptoms already present.

Dr. Lees appears to accept what may be another error, that the prognosis in a severe case is poor without surgical intervention. The mother of one of my most severe childhood cases recently wrote me that the boy, having passed A1 into the Army and after intensive training, was just off to Malaya. I was able to save him from what might have been a medically disastrous adventure. The exact role of surgery in the treatment of childhood bronchiectasis has still to be defined. It is misleading to attack this difficult problem with the assumption that the prognosis is known to be bad, when recent follow-up studies have cast doubt upon this.—I am, etc.,

London, W.1. ALFRED WHITE FRANKLIN.

Intraperitoneal Intestinal Anastomosis

SIR,—I do not wish to discuss the merits of this operation, but would like to point out a few practical principles concerning colostomy closure which, judging from the difficulties which one so frequently sees recounted, are not as fully appreciated as they might be. Failure to close a colostomy is usually due to obstruction at the site of closure, assuming that obstruction at a distal level, and particularly that due to faecal masses in the rectum, has been ruled out before closure is undertaken. Obstruction at the closure practically always means inadequate crushing of the colostomy spur.

Before closing the peritoneum in a Mikulicz resection the two limbs of colon which are to form a double-barrelled colostomy should be sutured together for a full 3 in. (7.6 cm.), and this should be done in such a way that the mesentery is well clear of the spur, and so that there is no possibility of a loop of small bowel finding its way between the walls of the colon subsequently to being crushed. If this is done, then with reasonable care there is no difficulty in crushing a spur of adequate depth; such extensive "gun-barrelling" will necessitate a considerably more extensive colonic mobilization than is required when intraperitoneal anastomosis is carried out, if the operation is to be as radical as it must be.

The type of enterotome used is important. There are many unsatisfactory types of enterotome in use. All enterotomes which are hinged on the scissor principle are fundamentally unsound; their maximum crushing power is close to the hinge, and thus at the upper end of the colostomy spur, and they may slip off when this is crushed, leaving the deeper part intact. Many enterotomes are too short. A satisfactory enterotome should be capable of crushing a spur to a depth of 3 in. The blades should be brought together by being screwed along a bar, and should be arranged so that they converge slightly towards their distal ends. This arrangement ensures a controlled but powerful crushing force which is maximal at the lower end of the spur. The question of teeth is probably not important. Short teeth are harmless and make slipping of the enterotome less likely, but are not absolutely necessary. Such an enterotome, applied carefully, will seldom need more than two applications to crush the spur adequately. A second application is sometimes needed, as it is not always possible to obtain a safe application to the full depth of the spur until the latter has been partly crushed. In this connexion it is important when applying the enterotome to make sure that the tip is freely movable, thus ensuring that it cannot include any structure on the posterior abdominal wall.

Mr. W. Garden Hendry (November 18, p. 1148) states, "An extraperitoneal closure in the presence of a partially crushed spur is always difficult and unsatisfactory. . . ." I would add that it should not, and need not, be attempted. Before closing the colostomy it should be possible to pass an index finger to its full length before the remains of the crushed spur are felt. If closure is attempted under these circumstances there need be little fear of breakdown.

Certainly, keeping to these principles and using an enterotome of the type indicated, I have as yet had no case of even temporary leakage, or of the subsequent development of obstructive symptoms.—I am, etc.,

Northampton. J. H. C. PHILLIPS.

SIR,—Mr. W. Garden Hendry (November 18, p. 1148) has performed a useful service in drawing attention to the undoubted advantages of immediate anastomosis after resection of the colon. However, four of his 15 cases were operated upon for growths of the caecum. Primary anastomosis has long been the established method of completing a right hemicolectomy. The comparative safety of the procedure lies in the fact that in the presence of a caecal growth the vitality of the colon is not impaired by the effects of obstruction, whether acute or chronic. These affect only the small intestine, and experience gained from resections for strangulation teaches that the healing powers of small intestine, in contrast to those of the colon, are not appreciably reduced by obstruction.

In six of his remaining cases Mr. Hendry availed himself of proximal decompression by a caecostomy or colostomy. This again, it is fair to say, has been a common practice for many years and it has given good results. Still, one of the cases in this group developed a faecal fistula and remains with a colostomy and three others have undergone a second operation for closure of the caecostomy.

Mr. Hendry is to be congratulated on the five cases in which he successfully performed an immediate colonic anastomosis without a caecostomy or colostomy. He is on sure ground when he refers to the saving in time and inconvenience to the patient of this method when compared with the Paul–Mikulicz procedure. But I cannot endorse his strictures on the latter method when he writes of the difficulties of crushing the spur, of the painfulness of the process, and of the multiple attempts at spur crushing and colostomy closure. This is quite contrary to my experience.

In a series of 34 resections carried out on the Paul–Mikulicz principle I have had three deaths before the colostomy was closed. One was from bronchopneumonia in a patient aged 79 and one occurred in a young man suffering from severe cachexia. The third death resulted from a technical error and was the only one related to the method in question. In the absence of an enterotome I used a pair of Kocher's forceps to crush the spur. Penetration by the sharp teeth of this instrument caused a local peritonitis with formation of adhesions. The patient died from perforation of a gangrenous strangulated loop of small intestine. In the remaining 31 cases the spur was crushed and the colostomy closed at the first attempt. A good many of the wounds have suppurated for a short time. In one or two cases there has been a small faecal fistula which closed spontaneously in a few days. I have not observed subsequent stricture formation nor evidence of defective colonic function which Mr. Hendry supposes must result from fixation of the colon to the abdominal wall. I doubt if after intraperitoneal anastomosis the colon often retains substantially more mobility than after an extraperitoneal completion of the anastomosis.

Finally, I must join issue with Mr. Hendry over his statement that "it [intraperitoneal anastomosis] can, of course, be a good deal more radical than an extraperitoneal excision." Disregarding his confusion of terms, by which he implies that it is the anastomosis instead of the excision the extent of which is in question, it needs to be stated emphatically that the method of anastomosis to be used should in no way influence the extent of the excision. This, except in purely palliative operations, must be decided solely by the extent of the pathological process. In cases of carcinoma this means the extent of glandular involvement. Only when such excision is completed need the surgeon concern himself with the question of which type of anastomosis will give the best result. I can assure Mr. Hendry that, because of the great mobility of the colon to which he himself refers, provided there are 6 in. (15 cm.) of free bowel distal to the resection an extraperitoneal anastomosis can be performed in any circumstances in which an intraperitoneal anastomosis would be feasible.—I am, etc.,

Edgware. FRANK FORTY.

SIR,—It was with great interest that I read Mr. W. Garden Hendry's article (November 18, p. 1148) on fifteen cases of intraperitoneal anastomosis in colectomy. I have practised this method for the last twenty years and can inform him that I have never carried out one single case of the Paul–Mikulicz technique in my surgical history. When I was working at the New York medical centre in 1932, Dr. Eugene Poole was the chief advocate of the extraperitoneal method. He was an excellent surgeon, and admittedly got good results; but, so he informed me, the average time a patient was in hospital was just over ten weeks—a serious consideration for a working man, as Mr. Hendry points out. Having closely followed Poole's work for three months, I came to the conclusion that with careful technique in carrying out the end-to-end or end-to-side anastomosis there was no real need to swing over to the extraperitoneal method. In those days the sulphonamide compounds were unknown, so a prescribed pre-operative course of other antiseptics was used. Salol by mouth and lower bowel washouts with 1/8,000 permanganate of potash or albargin seemed to be satisfactory.

My technique is much the same as that described by Mr. Hendry, but I would like to make the following comments:

(1) In right-sided hemicolectomy—e.g., for Crohn's disease—I have found that the easiest method of anastomosis is end (ileum) to side (transverse colon).

(2) In resections of the left side of the colon, sigmoid, rectosigmoid, or descending colon I have found that a very effective method of protecting the anastomosis is to pass a large old-fashioned type stomach tube up through the anus into the bowel and beyond the anastomosis. The tube is then stitched to the anal margin. This device prevents the accumulation of gas in the distal bowel and so saves any strain on the junction. It is left in for five to six days and can be kept free by running saline through a funnel. Side holes cut in the tube are an additional measure which may be of assistance in preventing blockage.

(3) I have not used suphonamide powder on the actual suture line, as so far I have not found it necessary. As an added precaution I am in favour of it.

(4) Drainage should be instituted in all cases, as with the somewhat doubtful suture materials at one's disposal to-day a possible faecal leak cannot be ruled out.

(5) I prefer to lock every third loop of the through-and-through suture.

(6) The post-operative use of streptomycin is to be strongly advocated. I have had five cases of slight faecal leak which have caused no serious set-back and which cleared up within seven to ten days.

Following on Mr. Hendry's article I trust that more surgeons will attempt this method of anastomosis. I feel sure that they and their patients will be highly gratified with the results.—I am, etc.,

Burnley. STANFORD HOWARD.

Tuberculin Jelly Test

SIR,—The modification of the tuberculin jelly test which I described in a recent article in the *Journal* (July 15, p. 141) was developed to enable the useful range of the test to be extended into the teens and possibly beyond. As several cases have been brought to my notice of severe reactions in very young children in whom this modified technique has been employed, may I say that I would not advise its use, and do not think it necessary, in children under 5 years of age? Their skins are so sensitive that the original jelly test without flour-paper should be quite adequate. If flour-paper is used then some severe reactions may result.—I am, etc.,

London, N.W.3. W. POINTON DICK.

Transmission of Kala-azar

SIR,—As pointed out by your correspondent, Dr. B. J. Bouché (November 4, p. 1060), the sandfly theory has been severely mauled in the past few years. As there have been no serious attempts at resuscitation since September, 1945, I think we may assume that it is dead and has been decently, if unobtrusively, buried by its friends. May we hope that the obituary notice will duly appear in the next generation of textbooks?—I am, etc.,

Sheffield. R. H. MALONE.

Four Brothers with Duodenal Ulcer

SIR,—Although a familial history of peptic ulcer is quite usual, I have recently encountered a remarkable tendency to chronic duodenal ulceration in the male members of one family. Of nine children seven are male, all of whom are miners by occupation. I have myself in the course of the last fifteen months carried out a partial gastrectomy in three of the brothers for chronic duodenal ulceration. In each case the ulcer was on the first part of the duodenum, was extremely chronic, and in two of the three was associated with severe pyloric stenosis: in fact, the first brother to come under my care was admitted as an early case of alkalosis. Besides these three who have been treated by partial gastrectomy, one has been operated upon for a perforated duodenal ulcer some twelve years ago, and yet another is at present undergoing investigation elsewhere for severe indigestion, and has been told he is suffering from "stomach trouble." Of the two remaining brothers, one is symptom-free, and the other has mild indigestion, but has not thought it worth his while to seek medical advice. Therefore, of the seven male members of this family, three have had gastric resections for severe duodenal ulcer, one has had a perforated duodenal ulcer, one is at present under treatment for gastric trouble, one has slight symptoms, and only one is completely free. Both sisters are fit and well, as are the parents and near relatives. The ages of the seven brothers range from 31 to 53.

It would appear as though the tendency to duodenal ulceration in this instance is not hereditary. The fact that they are all miners (even allowing for the increased instance of peptic ulceration among miners) would not seem to account for such a high percentage of duodenal ulceration; nor have the three cases upon which I have operated exhibited any signs of undue apprehension—indeed, they have all three been excellent patients, and were certainly not of the anxious worrying type so commonly associated with a duodenal ulcer.—I am, etc.,

Barnsley, Yorks. ANDREW G. BUTTERS.

Amphetamine in Barbiturate Poisoning

SIR,—The widespread use of the barbiturate drugs, with consequent increase in the incidence of acute poisoning resulting from them, whether accidental or intentional, adds importance to a recent article on the problem from the pen of Dr. J. D. N. Nabarro (October 21, p. 924). A desire to have the results of his clinical experience in this matter elucidated prompts my letter. The author cites several cases from which the reader can only conclude that amphetamine sulphate has commendable therapeutic value in acute barbiturate poisoning. He follows with the suggestion that the drug is directly indicated (to the exclusion of the at present more widely advised picrotoxin) if rapid rousing of the patient is desired, as in the case of the asthmatic (Case 2); and he goes on to say, "Many of the properties of amphetamine referred to make it questionable whether the use of this drug in barbiturate poisoning is ever justified."

Dr. Nabarro renders a clinical service by drawing attention to the untoward properties of a drug which has such widespread applications, and he clearly regards as important the cardiovascular side-effects in question. But how important are they, and how frequently do they occur? The enormous quantities of "dexedrine" and "benzedrine" which are now taken prove conclusively that these drugs are not ordinarily associated with significant side-effects at all. But, even agreeing with Dr. Nabarro that cardiovascular toxicity occurs, surely it is better to risk a possible though rare cardiac arrhythmia while leaving a coma quickly, than to avoid the arrhythmia and invite the delayed bronchopneumonia.

It is unreasonable to discard a drug of proved value in the treatment of barbiturate poisoning because it has side-effects, especially when, as Dr. Nabarro says, "no undesirable results seem to have followed the large amounts of amphetamine administered," and more especially when he goes on to admit that picrotoxin quickly induces dangerous "preconvulsive muscular twitchings." Surely the association of an untoward drug effect with the cerebral rather than with the cardiac component of the human being does not necessarily lessen its significance. In short, far from being a "useful ancillary drug," as Dr. Nabarro says, in the treatment of such cases, amphetamine sulphate is the drug of choice for acute barbiturate poisoning; it is picrotoxin which is ancillary.

Finally, none of my comments contradict or are contradicted by Chakravarti, who wrote: "In relation to its toxicity benzedrine is the most potent substance for arousing narcotized mice, being more potent than cardiazol or picrotoxin; on the other hand, as an antidote to lethal doses of the same narcotic, benzedrine is quite useless."—I am, etc.,

London, N.W.3. H. CREDITOR.

Dangers of Penicillin Snuff

SIR,—It was with some concern that I read recently in the press of the extensive and frequent usage of penicillin snuff in the treatment and the prevention of the common cold at a Midlands factory. In the course of a personal research during the past six years on the aetiology and treatment of the common cold I have used this method of treatment, and from personal clinical observations I am of the opinion that the following are some of the risks involved:

1. In some patients frequent inhalation of penicillin snuff produces a degree of penicillin sensitization which on subsequent use causes an allergic rhinorrhoea. This in effect defeats its own object.

2. I have observed patients who have been thus sensitized develop anaphylactic shock and/or severe acute urticaria when penicillin therapy has been used for other infections at a future date. In these cases patients have been denied the benefit of penicillin therapy in much more dangerous infections for what is a relatively trivial complaint.

3. By repeated inhalation of penicillin snuff the organisms responsible for the secondary stage (muco-purulent catarrh) of the common cold eventually become resistant, and not only has the treatment no effect but if any other part of the body becomes infected with these organisms penicillin treatment is ineffective.

From clinical experience, my own opinion is that penicillin snuff is only of value in converting the secondary stage of the common cold to the primary stage of simple rhinorrhoea, which in itself can be controlled by instillation of a mixture of a vasoconstrictor and antihistaminic.

The works medical officer will find that he will reduce the incidence of the common cold in susceptible persons if they are given regular dosages of glucose and vitamin C, thereby avoiding the risks I have pointed out.—I am, etc.,

Whitburn, Co. Durham. FRANK CORT.

Vasomotor Collapse after Chloramphenicol

SIR,—Several of our colleagues have reported that in treating cases of typhoid fever with chloramphenicol they have encountered in some cases a critical fall of temperature, with feeble or imperceptible pulse, profuse sweating, cold extremities, etc. Recently we have come across two such cases, which are described below.

(1) A male 30-year-old Indian Hindu was admitted with a history of eight days' continuous temperature with headache and prostration. The patient was restless and toxic, with temperature 103° F. (39.4° C.), pulse 106, respirations 26 per min., tongue coated and moist, but no rash and no enlarged glands. The lungs showed occasional rhonchi on both sides, and the liver and spleen were both just palpable. Blood count: total W.B.C., 8,700 per c.mm.; differential count: neutrophils 72%; lymphocytes 28%; monocytes 0; eosinophils 0. Malaria parasites 0. Blood on culture did not show any growth.

The patient's temperature continued between 102° and 104° F. (38.9° and 40° C.), and on the tenth day of fever the Widal reaction showed agglutination with *B. typhosus* (H) positive in 1-in-125 dilution, the Weil-Felix reaction was negative, and chloramphenicol was started, 1.5 g. at first, followed by 500 mg. every two hours. (The patient was not weighed, but he was a muscular man of average build and would have weighed about 10 stone.)

After about 24 hours and after 7 g. of chloramphenicol his temperature fell sharply to 96° F. (35.6° C.), associated with symptoms of collapse. He had profuse and continuous sweating, and his pulse was very feeble at the wrist. Heart sounds were very weak, and the rate varied between 120 and 140 per minute. Blood pressure was 60/45 mm. Hg. There was also retention of urine. There was no evidence of intestinal haemorrhage or perforation. The stools continued to be of normal colour subsequently. He was in that condition for nearly 36 hours and gradually recovered with stimulants and supportive treatment. The subsequent course was uneventful and he did not have a relapse. He had a total of 9 g. chloramphenicol.

(2) A female Hindu, aged 12 years, was first seen on the fifth day of a clinical relapse of paratyphoid A fever. She had continuous temperature for 12 days, when the blood showed agglutination positive with *B. paratyphosus* A in a dilution of 1 in 250. She was then treated with chloramphenicol, 1 g. followed by 250 mg. three-hourly, when her temperature came down in three or four days' time. Chloramphenicol was continued for four days after defervescence, 250 mg. four-hourly. She remained well for 12 days and then started with fever again. At this time her temperature ranged between 101° and 103.6° F. (38.3° and 39.8° C.), with pulse 100 per minute, blood pressure 100/60 mm. Hg. The abdomen was slightly distended, but no other abnormal signs were seen. Blood count: total W.B.C. 5,400 per c.mm. (neutrophils 68%, lymphocytes 26%, monocytes 4%, eosinophils 2%). No malaria parasites.

Chloramphenicol was started again on the sixth day of relapse; 250 mg. was given every two hours. After 36 hours, when 4.5 g. had been given, there was a sharp fall of temperature to 95° F. (35° C.) with symptoms of collapse. She had profuse perspiration and pulse imperceptible at the wrist. Her condition improved with stimulants, but the temperature continued subnormal for about 72 hours, when it rose again to 101° F. (38.3° C.). The fever continued for another six days and gradually came down to normal. There was no rigidity of the abdomen and no free fluid. The stools continued to be of normal colour.

A limited search of the published reports on the trial of chloramphenicol in typhoid and paratyphoid fevers shows only one report[1] of sudden fall of temperature to subnormal level with circulatory collapse. That case ended fatally. As mentioned above, several physicians in Calcutta have also noticed similar complications, sometimes with fatal result (personal communication). In a series of 17 cases of typhoid fever (excluding the second case above, which was seen outside) treated by us in hospital during the last three months with chloramphenicol, the temperature came down by lysis in two to four days' time without any evidence of collapse in 13 cases. Case 1 (above) had a sudden fall of temperature with circulatory collapse. Three other cases had a rapid fall of temperature, which reached subnormal level with severe sweating, but did not have circulatory collapse.

Stephens thinks that the sudden fall of temperature with circulatory collapse may be due to a reaction of the nature of a Jarisch–Herxheimer reaction. The sudden liberation of the endotoxins of bacilli destroyed by chloramphenicol may cause a depression of the vasomotor centre. This explanation, however, seems unconvincing. It is desirable that the pharmacological action of chloramphenicol should be more carefully studied, with particular reference to any possible antipyretic action and depressant action on the vasomotor centre.—We are, etc.,

P. K. CHATTERJEE.
Calcutta. B. BASU ROY.

REFERENCE

[1] Stephens, P. R., *Lancet*, 1950, **1**, 731.

*** See also *Bull. Soc. méd. Hôp., Paris*, 1950, **66**, 85, and annotation in *British Medical Journal*, 1950, **1**, 829.—ED., *B.M.J.*

Pethidine in Anaesthesia

SIR,—Having read an article by Dr. H. F. Griffiths (*Journal*, September 30, p. 763), I tried his technique out on a case, with the following results. The subject was a mental patient aged 60 years, of fairly muscular build, and was referred by the neuropsychiatrist for a left inguino-scrotal hernia.

The patient was sitting up on the stretcher and boisterous when wheeled into the anaesthetic room one hour and fifteen minutes after having been given two-thirds of a bulb of "omnopon" ¾ gr. (44 mg.) and scopolamine 1/150 gr. (1 mg.). He was held down and thiopentone sodium given, dose 0.5 g. Anaesthesia was continued with nitrous oxide, 5½ l. per minute, and oxygen 1½ l. per minute. When placed on the operating table 25 mg. of pethidine hydrochloride was given intravenously. The surgeon complained of a tensed abdomen, and 5 mg. of "tubarine" was given intravenously. About fifteen minutes after the commencement of the operation the surgeon again complained of rigidity, when a trickle of ether was added to the anaesthesia. About ten minutes after this the patient ceased breathing and artificial respiration was given by squeezing the rubber bag for rebreathing. A good colour was maintained and his pulse was regular, with good tension and volume, at 80 per minute.

After a further ten minutes an endotracheal tube was passed under direct vision and oxygen given by artificial respiration. As there was no evidence of automatic breathing being resumed 2 ml. nikethamide and 1 ml. lobeline were given intravenously, when immediate automatic respiration was resumed. The operation was meanwhile being continued, and the patient left the theatre with normal respiration and pulse.

Is it possible that the respiratory arrest was due to the trickle of ether, which was not used in the technique described by Griffiths, or to the premedication?—I am, etc.,

Colombo, Ceylon. T. W. VANNIASINGHAM.

Producing Anaesthesia of Trigeminal Nerve Distribution

SIR,—Dr. Wilfred Harris (November 4, p. 1015) is not alone in his difficulties over producing third-division trigeminal anaesthesia after alcohol injection of the Gasserian ganglion, or surgical section of the sensory root in the middle fossa, for we, and many other neurosurgeons, have had a similar experience. In recent years we have been dividing the trigeminal sensory root in the middle fossa through an intradural approach, and have thereby obtained a clearer view of the ganglion and its root *in situ*, for in the usual extradural operation stripping of the dura is apt to rotate the ganglion and to distort its normal structure and relations. As a result of our experience with this operation we have come to recognize the fact that in not a few instances the third division is separated from the first and second by a fibrous tissue septum in the ganglion, which may extend far into the sensory root; in fact, these two portions of the root may have a separate arachnoidal sheath. Wide variations in the point of trifurcation of the ganglion have been noted by others.[1] It would not be surprising, therefore, that when injecting the ganglion, or dividing its sensory root, one might enter one of these compartments and destroy the fibres running in it, while leaving the other unaffected. It has been our experience after such procedures to obtain only first- and second-division anaesthesia on a few occasions, and more rarely the reverse has been true.

Failure to obtain third-division anaesthesia after sensory root section near the pons is more difficult to explain. It has been the experience of one of us (B. H.) that careful preservation of a bundle of fibres, thought to be the motor root, in the middle fossa operation has resulted in first- and second-division anaesthesia only, while section of this bundle at a second operation has resulted in third-division anaesthesia (and motor paralysis). Is it not possible that in some cases the third-division sensory fibres are closely applied to, or incorporated in, the motor root, and that this state of affairs may persist right up to the side of the pons? Perhaps the anatomists can supply the answer, and if this contention is true it may be that deliberate sacrifice of the motor root will have to be accepted in such cases.—We are, etc.,

Birmingham. BRODIE HUGHES.
J. M. SMALL.

REFERENCE

[1] Gass, H., and Van Wagenen, W. P. (1950). *J. Neurosurg.*, **7**, 325.

Teething

SIR,—Like Dr. H. M. Tietze (December 2, p. 1281), I was brought up to regard the diagnosis of "teething" as the refuge of the destitute, and when used irresponsibly I believe it still is. However, I have modified my views since observing my own child. He invariably had loose stools for a few days before eruption of a tooth—so much so that the diagnosis of "another tooth" was absolute on onset of this symptom. I feel that our teachers appreciated this, but rightly felt that missing a case of gastro-enteritis was a more serious matter than not diagnosing teething in the appropriate case.

It may be that teething is a physiological process, but so is menstruation, and one cannot deny that the latter process is often accompanied by symptoms which are very disturbing. I therefore think it is wise to avoid the diagnosis of teething if possible, but one should recognize its possibilities.—I am, etc.,

London, E.17. P. R. SAVILLE.

Lower-segment Caesarean Section Modified

SIR,—I have learned recently of an unusual modification of the standard technique employed by some operators when difficulty is encountered in extracting the foetal head through the transverse incision in the lower uterine segment. An incision is made vertically into the upper segment from the mid-point of the transverse incision, resulting in the formation of a T-shaped opening through which the child is extracted. Furthermore, I am told that this procedure was advocated in the circumstances mentioned by an examiner at a recent examination at the Royal College of Obstetricians and Gynaecologists.

It appears to me that, following retraction of the uterus, satisfactory apposition of the cut edges must be extremely difficult, particularly at the points of junction of the two incisions, and a weak scar would be likely to result. At present I have attending my hospital antenatal clinic a patient whose last labour was terminated in this way on account of foetal distress. I am therefore interested to know if any of your readers have experience of the conduct of labour following such an operation.—I am, etc.,

London, W.9. JOHN P. ERSKINE.

Should First M.B. be Passed at School?

SIR,—It was with interest and appreciation that I read of the protest made by Dr. Robert Birley (*Journal*, November 4, p. 1052) on the restrictions imposed on boys' education by the unwarranted insistence of the universities on First M.B. passes at school.

In its present form the First M.B. is about the most archaic type of examination in an already overburdened and outmoded curriculum. For the universities to transfer to the schools the obvious pressure put on them to retain the absurdly weighted "training programme" of modern medical schools is a sorry reflection on the weakening independent status of universities. At the very time when an opportunity presents itself, at the conclusion of the specialized efforts of school certificate and matriculation examinations, to "educate" in the widest sense a potential member of a supposedly learned profession, the wretched boy is to be driven even further into the confined niche of a super-technical apprenticeship.

It surely cannot be a matter of indifference to the profession that a vital stage in education is being by-passed, in the opinion of many, for the sake of superfluous cramming.—I am, etc.,

Princes Risborough, Bucks. F. H. M. DUMMER.

Obituary

SIR WILLIAM THOMSON, M.D., F.R.C.P.

Sir William Thomson, professor of medicine at Queen's University, Belfast, died at home on November 26, aged 65 years. He had occupied the chair of medicine for 27 years, and his death has robbed the Belfast medical school of a well-loved and outstanding personality.

William Willis Dalziel Thomson was the son of the late Dr. W. Thomson, J.P., of Anahilt House, Hillsborough, Co. Down. He was educated at Campbell College, and became a student at the old Queen's College, Belfast. He had a remarkable undergraduate career, obtaining the B.A. of the Royal University of Ireland with first-class honours and an exhibition in 1907 and graduating M.B., B.Ch. at the Queen's University, Belfast, in 1910 with first place, first-class honours, and a scholarship—a record which it would be difficult to surpass. This promise of a great career to come was not confined solely to intellectual achievement, for he took an active part in student life and was elected president of the Students' Representative Council in 1908, thereby becoming a member of the Senate of the University. He won many prizes, including the Hutchinson-Stewart Scholarship and the Dunville Studentship. After graduation he spent a year in residence at the Fever Hospital, Purdysburn, and later became demonstrator first in physiology and later in pathology at the university. His studies then led him further afield, to Dublin, London, Paris, and Budapest. One of his first papers, on the subject of blood urea and published in 1914, was an outcome of his work with Widal in Paris. In 1912 he took the D.P.H. and in 1913 the B.Sc.(Belfast) with first-class honours. He proceeded M.D., winning a gold medal, in 1916. In the summer of 1915, as a temporary captain in the R.A.M.C., he worked with the late Sir Almroth Wright on war nephritis in the research laboratory attached to No. 13 General Hospital at Boulogne. The results of this research were later published in the *Quarterly Journal of Medicine*. While in France he came to know many eminent medical men. In 1916 he gained experience of chest wounds through his association with Sir Bertrand (later Lord) Dawson, which may have contributed to his later interest in diseases of the lungs. In the same way it seems probable that it was the example and teaching of Gordon Holmes, with whom he formed a friendship at this time, that determined his abiding and profound interest in clinical neurology.



[Walter Stoneman, London.

Such was the background against which W. D. Thomson emerged at the end of the first world war. For a time he was a member of the staff of the Mater Hospital, and he was elected assistant physician at the Royal Victoria Hospital in 1918, the year in which he became a Member of the Royal College of Physicians of London. His appointment to the chair of medicine followed the retirement of the late Professor James Lindsay in 1923. A year later he was full physician and assumed charge of wards 1 and 2—the medical unit in the hospital with which his name and reputation have since been inseparably linked. He was

elected a Fellow of the Royal College of Physicians in 1928. Unfortunately at this stage in his career serious illness overtook him, the malady proving intractable and at times threatening life and calling forth all his powers of endurance. For long periods he had to give up practice. After great suffering he made a splendid recovery, and all his friends were delighted to see that subsequently there were no signs of recurrence of the old enemy. Honours and increasing responsibilities followed: he was elected president of the Northern Ireland Branch of the British Medical Association in 1932 and of the Irish Medical Schools' and Graduates' Association in 1936. He delivered the Lumleian Lecture before the Royal College of Physicians on "Primary Carcinoma of the Lung" in 1939, and the year 1937, when the British Medical Association met in Belfast, saw him President of the Section of Medicine. After the end of the second world war Thomson took an active part in committee work and in the negotiations entailed in the organization of the hospitals under the new Health Act. He was a member of the Hospitals Authority and other important committees from their inception. On the retirement of Professor C. G. Lowry he became a member of the General Medical Council. He continued to serve on several important committees of the B.M.A., including the Central Medical War Committee, until 1946. Two further distinctions awaited him: the presidency of the Association of Physicians of Great Britain and Ireland in 1949 and his elevation to a knighthood in the last New Year Honours. He received the accolade from the King on March 29, 1950.

Dr. R. S. Allison writes: Sir William Thomson was an unassuming personality and incapable of airing his accomplishments. This gifted scholar, who in spite of his snowy hair seemed to grow no older, never failed in his consideration for others. "W. D.," as he was always affectionately known, had no guile and was incapable of dishonesty either in his professional work or in his dealings with his fellow men. Tall and commanding in his person and with characteristic bushy eyebrows, he was renowned for his toleration and for his gift for seeing the important issue behind the façade of trivial or petty detail. But, while he was generous and quick to support a worthy cause, he had profound contempt for anything that savoured of charlatanism or deceit, and if he considered a decision unjust or improper he had no hesitation in saying so and in exerting his influence to put it right. He was a natural leader of men. He never gave orders; instead he would suggest that such and such a thing should be done. Where another man might rage at some mistake or omission he would simply take his subordinate gently by the arm and smilingly make an appropriate suggestion, or, if the occasion warranted it and he knew his man, poke a little fun. He was a good companion and liked a story, especially one which had local colour. He and Lady Thomson kept open house, and to be a guest at their table was an unforgettable experience. These were some of the qualities that drew so many to him and made him at one with his students, house-physicians, registrars, and colleagues—all of whom he treated alike. He was one of the greatest clinical teachers this school has ever known, for he had the gift, while not trying to over-simplify a subject, of presenting it in such a way that its chief characteristics became apparent. As has been said of Boerhaave of Leyden, "he led his pupils by the hand to clinical medicine." Any task he set himself he undertook with characteristic single-minded devotion. During the last 12 years, when he had good health, he became greatly attracted to gardening, and visiting examiners and others will recall with pleasure being entertained at his country house, "Seven Tides," Donaghadee. Here, out of bare pasture land and on an exposed site facing the sea, he succeeded in raising a remarkable collection of trees, rare shrubs, and plants which, together with his flowers, it was his delight to demonstrate.

In 1914 he married Josephine, daughter of the late Mr. Humphrey Barron, J.P., and their life together was ideally happy. Throughout his earlier illness his wife unstintingly devoted herself to his care, and there is no doubt that this contributed materially to his recovery. Their only child, Humphrey Barron Thomson, who had graduated in medicine in 1939, at once volunteered for service with the R.A.M.C., and in 1942 was killed by the Japanese. His parents bore this sorrow unflinchingly. How great was the effort to remain composed only their closest friends knew.

It is difficult, now that Thomson's presence has been so swiftly withdrawn, to realize the incalculable loss we have suffered; a loss that will be shared by his patients, his students, and colleagues alike. He will go down in the annals of our school as a man of genius, and yet of great simplicity, for though he rose to one of the highest places in the community he himself never seemed to be conscious of it and remained throughout his life steadfast in his humanity, gentleness, and honesty. Our deepest sympathy is extended to his widow.

H. L. T. writes: "W. D." was known by his initials to the medical profession throughout the British Isles, and everywhere he was truly loved. He rose to the top of his profession as a physician, and as he mounted the ladder of success those whom he passed by felt neither rancour nor jealousy. Nor would he have felt any himself if others had been preferred to him. For he possessed to a remarkable degree a quality of charm, almost feminine in its gentleness, which spread its influence to those around him. Yet his character was by no means weak. He would always listen to others, but he formed his own opinions and held firmly to what he believed to be right. The correctness of his judgment was so recognized that he was able to direct the policy of the medical school which was his life's interest and which he raised in reputation as he rose himself. He was welcome everywhere. If where he went he met only acquaintances, he left them as his personal friends. He died with his harness on his back. Much as he loved the country and his garden, perhaps this is what he would have chosen. A happy warrior indeed, his memory will be long and widely revered.

E'en as he trod that day to God so walked he from his birth,
In simpleness and gentleness and honour and clean mirth.

Professor F. J. Nattrass writes: I should like to record a brief tribute to Sir William Thomson—"W.D." to all his friends. I had the privilege of knowing him intimately, both as a fellow pilgrim to medical schools at home and abroad and through several years examining in Belfast. He occupied a position which seemed to me unique: more than anyone I have met, he was the centre of all medical affairs, educational and administrative, in the area he served. This is not surprising, as he was the object of universal respect and affection—a very fine physician, a man of great charm and modesty, an outstanding orator, a beloved teacher. His courage and cheerfulness, and that of his wife, were maintained in spite of prolonged illness in his earlier years, and the loss of their only child, a young doctor killed in cold blood after capture by the Japanese. He will be deeply missed by a great company of friends in England and Scotland as in his native province.

H. B. RUSSELL, M.D., M.R.C.P.

Dr. H. B. Russell, for many years in charge of the electrocardiographic department at St. Thomas's Hospital, died at his home at Greatstone-on-Sea, Kent, on November 27 from a cardiac condition which he had most courageously suffered for a long time.

Henry Bret Russell was the son of Dr. Alexander Russell, F.R.S. He was educated at St. Paul's School, and from there went straight to St. Thomas's. He took the Conjoint qualification in 1917 and graduated M.B., B.S. in 1919. Among the posts he held at his hospital was the important one of resident assistant physician. Later he became resident medical superintendent at the Hospital for Sick Children, Great Ormond Street. In 1920 he proceeded M.D. and became a member of the Royal College of Physicians. At a very early stage he developed an interest in electrocardiography, working under the late Sir Maurice Cassidy. With his illustrious father's help he made many practical suggestions to the manufacturers of electrocardiographic equipment. Until his death he also worked as physician in charge of the electrocardiographic department of the Royal Masonic Hospital.

Russell, who was consulting physician to the Queen's Hospital for Children, Hackney, was particularly interested in heart disease in childhood, and he published a book on this subject with Dr. C. K. J. Hamilton as co-author. In another sphere he assisted Sir Maurice Cassidy and, later, Dr. Isaac Jones in the medical department of the Metropolitan Police, being appointed deputy physician in 1926. Here his sterling qualities and wide knowledge of human nature made his services greatly valued. Russell had a kindly heart and a gay disposition in spite of a disabling congenital joint condition. Although a first-class physician he himself felt that he would have been happier using his very mathematical mind away from medicine. When driving a car he would often work out all types of arithmetical problems with the numbers he saw on the registration plates of passing cars. He had a great love for the Highlands and for travel in general, and was never happier than when starting out with a map and compass on a long motor tour. He was a keen Mason, being a past master of the Cheselden Lodge, in which he had held the posts of secretary and treasurer. He was also a member of the Cheselden Chapter and held London Grand Rank. His passing will be deeply felt by the many real friends he had made.

JAMES N. MEENAN, M.D.

Dr. J. N. Meenan, professor of medicine at University College, Dublin, died suddenly at his home on November 20 in his 72nd year.

James Nahor Meenan was born in Co. Tyrone and came to Dublin from Clongowes Wood College in 1897 with an already established reputation as a brilliant classical student. Entering the old Cecilia Street School of Medicine, he steadily maintained that reputation throughout his course of professional study, and when he graduated M.B. in 1903 he won the Chancellor's Gold Medal. In his final year at St. Vincent's Hospital he also won the Bellingham Gold Medal in clinical medicine, which award then carried with it the coveted succession to the post of resident house physician for the ensuing year. From Vincent's he passed on to the resident physician's post at Cork Street Hospital. When in 1905 the post of assistant physician became vacant at St. Vincent's Hospital Meenan's appointment was a choice approved by all. From the outset his capacity as a teacher was outstanding. A man of great modesty and of retiring habit, Meenan had come, almost involuntarily, to be a prominent figure in Dublin medical life. He had passed through every grade at his hospital till he had become the active doyen of its staff, enjoying there the trust and affection of students and staff alike. At University College his course had run on parallel lines. His first appointment there had been as lecturer in hygiene—he took the D.P.H. in 1903. From the chair of medical jurisprudence he succeeded to that of systemic medicine in 1926; later he became the representative of the medical faculty on the governing body of the college. In 1934 the honorary degree of M.D. was conferred on him by the National University of Ireland. A signal tribute was paid to him when in 1947 the then president of the college—the late Dr. Arthur Conway—retired through illness and the senate of the university requested Meenan to undertake the duties of acting president until the successor to Dr. Conway was selected. As a consultant, Meenan's opinion was widely sought throughout the country. He was consulting physician to St. Patrick's College, Maynooth, to the National Maternity Hospital in Dublin, and to Cork Street Fever Hospital. An original member of the General Nursing Council (Ireland), he was one of the two nominated members appointed to the Medical Registration Council by the Executive Council of the Irish Government in 1927. Few matters of public medical policy did not bear traces of his influence in Ireland. His readiness to assist and encourage his juniors was proverbial, and to the unexpected end his generous interest in former pupils was unfailing. At the funeral service, held in St. Vincent's Hospital, the enormous attendance of mourners, representative of every element in the community from the presidency downwards, must have brought solace to his widow and family in their bereavement.—W. D.

Dr. DAVID BLAIR, who at one time was mental superintendent of the Lancashire County Mental Hospital, at Prestwich, died in Edinburgh on November 10. He studied medicine at Glasgow University, graduating M.B., C.M. in 1894 and proceeding M.D. in 1899. Before his appointment as medical superintendent at Prestwich he was deputy medical superintendent at the County Mental Hospital, Lancaster. Blair was a Scotsman of many parts. He was of striking appearance, and his tall erect figure, friendly voice, and courteous manner were familiar to staff and patients alike. He was lecturer in mental diseases at Manchester University, but besides having an extensive knowledge of psychiatry as a science he showed above all the human touch when dealing with patients. This was particularly striking when he was showing patients to his classes of undergraduate or postgraduate students, who were always impressed by his sympathy with and understanding of a man or woman suffering from a distressing illness and requiring help and guidance. Possessing the imagination to see the advances possible in psychiatry, he was able to carry out many improvements in his hospital and had planned many others. He welcomed the passing of the Mental Treatment Act of 1930, and it was he who inaugurated one of the first psychiatric clinics under the auspices of the Lancashire Mental Hospitals Board. He did a considerable amount of original work, being specially interested in the problems of mental deficiency and endocrine disturbances, and he made several contributions to medical journals. At the Annual Meeting of the British Medical Association in Liverpool in 1912 he was vice-president of the Section of Neurology and Psychological Medicine, and he was a representative of his Division on several occasions. In 1934, the year of his retirement, the Royal Medico-Psychological Association held a most successful meeting at his hospital at Prestwich. He retained his interest in the work of these Associations for many years longer.

While Blair retained what might now be thought to be an old-world idea of the dignity of the profession of medicine, he was too kindly in disposition to be a very strict disciplinarian, and if he erred at all it was in always believing the best of people and in attributing to them the worthiest of motives. He was somewhat of a philosopher and a keen classical scholar. He was renowned for his hospitality, and many former colleagues and friends will remember his Christmas parties and tennis afternoons. Although it is sixteen years since he retired, his memory is still respected by all those who knew him. He was an approachable and generous colleague and a humanitarian with a wide interest in social and individual problems.—A. McG. and G. T.

DR. HENRY DEAN HAWORTH, for many years in general practice in Nelson, died suddenly in that town on November 4, aged 69. He was educated at Manchester Grammar School and Manchester University. As a student he won the Dauntesey medical scholarship in 1899 and the Platt physiological exhibition a year later. He graduated M.B., Ch.B. in 1903, proceeding M.D. in 1907. Before going to Nelson he held several appointments in Manchester and Salford, including those of house-physician at Manchester Royal Infirmary and senior house-surgeon at Salford Royal Hospital. In 1906 he was a research fellow in public health at the Victoria University, Manchester, and he took the D.P.H. in 1907. During the first world war he served with the R.A.M.C. Shortly after he commenced practising in Nelson he was appointed honorary physician to the Victoria Hospital, Burnley, a post which he retained until his death, though he had retired from general practice. As a consultant Haworth's opinion was always worth having in any case he was called to see. Immaculate in dress and appearance, he was always bright and cheery and a comfort to all his patients. He worked hard and was always very punctual. He took an active part in local affairs, being chairman of the Burnley Division of the B.M.A. in 1934–5. His interests, however, were not confined to his medical work. He was a keen social welfare worker, and particularly had the aged sick at heart, being a prime mover in arranging Christmas cheer, outings for the disabled, and camps for poor children. Educational matters interested him greatly, and he was a governor of Nelson Grammar School. At one time he was a member of the Nelson Town Council, and by his forthrightness he got much useful work done in the town during his membership. Beyond all these activities, he was a lover of music. An accomplished musician himself, he was for many years associated with Nelson Clef Club and was president of the Nelson Arion Glee Union, a male voice choir which obtained many honours under his presidency. He died suddenly while waiting to open a choral concert. The sympathy of his many friends and colleagues will be extended to his widow.—A. J. McC.

DR. ISAAC GEORGE BRIGGS died in Green Lane Hospital, Auckland, New Zealand, on November 2, aged 58. He was born in Birmingham, and educated at Bromsgrove School, Birmingham University, and the London Hospital. He qualified in 1927, afterwards practising in Greenford, Middlesex. Later he decided to become a barrister, and was called to the Bar at the Inner Temple. In the period between 1936 and 1939 he made several voyages to India as a ship surgeon, and on the outbreak of war he joined the R.A.M.C., in which he served as a major. After retiring from the Service he was appointed registrar at the Hospital for Head Injuries at Oxford. In 1942 he joined the Nuffield organization and was responsible for the laying out and equipping of one of its medical centres. In addition to his legal and medical activities, Briggs was the author of several books, the best-known being *How to Start in General Practice*, *The Surgeon Goes to Sea*, and *They Gave Me a Crown*. In 1947 he went to New Zealand and practised in Auckland, where he remained until his death. It is a tribute to his personality that during his comparatively short residence in that country he made many friends. He will be sincerely mourned by all his patients and medical associates, whose sympathy is extended to his widow.—F. J. G.

Medical Notes in Parliament

Legalizing Euthanasia

Lord CHORLEY on November 28 called attention to "the need for legalizing voluntary euthanasia." He recalled that in 1936 the late Lord Ponsonby had introduced a Voluntary Euthanasia Legalization Bill, but that a second reading had been refused: he wanted to bring the matter again into discussion and hoped the Government would try to solve the administrative difficulties so that the necessary legislation could be introduced.

The Bill of 1936 had laid down that the sufferer must be not less than 21 years of age, must be of sound mind, must be suffering from illness involving severe pain and of an incurable and fatal character, and must make application in writing on a set form. He had to sign the application himself in the presence of two witnesses, and it had to be supported by two medical certificates, one from his own doctor and the other from a medical practitioner with special qualifications for dealing with cases of this kind. The application had to be made to a referee appointed by the Minister of Health, who was bound to go personally to see the sufferer. Having satisfied himself, the referee would make the necessary order and the euthanasia would be administered in the presence of an official witness by a medical practitioner from a special panel maintained for the purpose.

From time to time sympathetic judges had said that the law ought to be altered to enable voluntary euthanasia to be applied. When the 1936 Bill was before the House of Lords the late Lord Dawson of Penn had made an eloquent plea for voluntary euthanasia although he voted against the Bill. He had said that it was something which belonged to the wisdom and conscience of the medical profession and not to the realm of law.

It seemed to Lord Chorley that Lord Dawson proposed to leave the decision over euthanasia to the discretion of the doctors. Many people held that doctors, moved by compassion, did take the law into their own hands; but many doctors had religious scruples against doing anything of the sort. Surely it was wrong that the wretched patient's chance of escape from his sufferings should have to depend on the accident of who was his doctor, or that society should place the burden of the decision upon the shoulders of an individual doctor.

Lord DENMAN said there was a growing force of public opinion in favour of euthanasia. Members of the Government and of the Front Opposition Bench were in the list of supporters of the Voluntary Euthanasia Legislation Society. In 1936, after the debate, he had discussed the subject with Lord Dawson, who said: "This Bill that you advocate is really unnecessary, because we already do what you seek to do under the proposals in the Bill." Lord Denman said that while it might be possible for an eminent physician like the late Lord Dawson to do as he liked in a matter of this kind, it was different for the ordinary general practitioner, who had to take the risk of prosecution and possibly of professional ruin.

The ARCHBISHOP OF YORK said the duty of prolonging life was not the same as prolonging dying. But if once Parliament began to adopt legislation of this kind it would put its foot on a very slippery slope. If the right was granted in connexion with excessive pain, why should it not also be granted to those who were born feeble-minded or physically so crippled that they could be of no service, and why should it not also be applied to those in mental asylums? In Germany euthanasia was applied at first to very few, but eventually to a large number who were regarded as useless mouths in a time of emergency. The value attached to human life would be reduced if by law it was possible year by year to kill a large number of people. From experience gained through visiting old people, often incurably ill, he doubted whether the regulations to which Lord Chorley had referred would be a sufficient safeguard. It was impossible to know what pressure might be brought to bear on people behind the scenes. When the mind had been weakened by morphine and pain it was difficult to know whether the patient fully understood what he was asking for.

Whose Agony?

Lord HORDER said that in 1936 he had pointed out that it was not a doctor's job to settle this matter. The doctor tried to cure the patient's disease, and, if this was impossible, to prolong his life, relieving pain, whether physical or mental. A good doctor distinguished between prolonging life and prolonging the act of dying. On the other hand, in his experience, the attitude of most patients was that of the soldier who wished to face the enemy: during a morning depression the patient might favour an application for euthanasia, but later in the day he thought differently, or had forgotten what happened in the morning. Their lordships must distinguish between the trials of the patient and the trials of the relatives and friends. He recollected being addressed by a tense-faced relative. "But, Doctor," said the son, "this agony must not go on." Lord Horder said he had done right in looking him straight in the eye and asking, "Whose agony?" Upstairs an old man lay slowly and peacefully dying, but downstairs people could not stand and wait.

Lord IDDESLEIGH said euthanasia had been rejected by orthodox Jews from time immemorial, by Christians since the ninth century, and by Mohammedans since the flight of the Prophet. He could conceive nothing more dangerous than to create by Act of Parliament another class licensed to bring death, and nothing more psychologically disruptive than to give that function to doctors, known to all as bringers of life and health.

Extension of Liberty

Lord ESHER said euthanasia was an evolutionary extension of liberty giving to the individual new rights to which up till now he had no access. It was argued that the doctors were against it. They all knew that when Miss Florence Nightingale was trying to reduce the sum of human misery the doctors were against her, and that when Mr. Bevan brought forward his great measures of public health he had not noticed any affection for them among the doctors.

Lord AMULREE said that it would be bad if the patient felt that one day the doctor would come in as executioner. In the last 20 years much had been done towards the relief of pain, not merely by the use of narcotics but by minor surgical operations and other treatments.

Lord UVEDALE OF NORTH END said it was notorious that doctors were occasionally wrong in diagnosis. In one case he had consulted with two of the most eminent members of the profession and they had agreed that the patient had only six months to live. That patient died years afterwards from an entirely different complaint. He thought that before euthanasia could be properly carried out the matter would have to go before a medical jury, and even that jury might come to a wrong conclusion.

Relief from New Treatments

Lord HADEN-GUEST said that no progress whatever had been made since 1936 by the advocates of euthanasia in assembling arguments which might bring conviction to an unprejudiced audience. Since 1936 there had been almost a revolution in the introduction of new methods of treatment, and a greater and more powerful armoury of drugs was in the hands of the medical profession to deal with pain and to relieve suffering. He said that he had practised in this country and in South Africa, but could not recall examples of terrible pain which called for euthanasia. At the recent meeting of the World Medical Association a resolution had been passed against euthanasia. One might say that a great majority of the whole medical profession in the world was against euthanasia. He asked the House to remember that once a law was passed there was nowadays an arrangement through which it could be extended by regulation and order. If euthanasia was to be applied it might be extended to mentally defective children, hopeless lunatics, or any of the mentally and medically unfit.

Lord WEBB-JOHNSON said members of the medical profession were unanimous in rejecting the proposal. If the idea of euthanasia had been accepted in the past patients now being relieved by modern treatment might have been quietly put away. He instanced cancer of the prostate, one of the most distressing and painful diseases, in many cases of which suffering was removed and life prolonged not by drastic treatment but by pills swallowed twice a day. Further, although a patient might apply for a form and sign it one day, he might wish to revoke it. He asked what the procedure would then be.

The EARL OF HUNTINGDON said he respected the reluctance of the medical profession, but thought that Parliament had to consider the patient. He had been told that the number of incurable cancer cases in England was about 60,000; he knew of at least three poor people who for months suffered agonizing pain through not having enough of the drugs, and cried out for release but were not given it.

The Legal View

The LORD CHANCELLOR said from the legal point of view the consequences of passing any Bill like the one which had been discussed would be most serious. He suggested that the right solution had been put by Lord Dawson of Penn when he had said:

"I read that it is lawful to use drugs to alleviate pain, even though it be foreseen that these may shorten life, provided that the alleviation of pain and not the shortening of life is the primary purpose of the drug."

If the House accepted this as the medical ethic it must leave to the conscience of the medical profession its carrying out in accordance with its traditions. If they placed such a Bill on the Statute Book he foresaw a defence in future, "I made a mistake about this. I did not get the right form so I knocked the old lady on the head." This doctrine of putting people out of what was called their misery might have very serious repercussions on the criminal law. There could be no adequate safeguards where one human being was allowed to start killing another.

Lord CHORLEY said that it was perhaps to be expected that medical peers would be more conservative than other doctors, and it was the fact that over 200 eminent members of the medical profession were strong supporters of these proposals. He pointed out that the resolution of the World Medical Association had been against the sort of thing which had been practised in Germany and not against voluntary euthanasia with safeguards.

Lord HADEN-GUEST interposed to say that the resolution had been equally directed against the course which Lord Chorley advocated.

Lord CHORLEY replied that there was nothing in the resolution about death being voluntary and nothing at all about safeguards. What the doctors who put it forward were trying to prevent was that euthanasia should be left completely to the discretion of the doctor. It was because the advocates of the proposal felt that human life was sacred and human personality was sacred that they said there ought to be this means of relief. He did not propose to divide the House, and asked permission to withdraw his motion.

The motion was then withdrawn.

The Durham Affair

This matter (see *Journal*, November 25, p. 1229) was raised again by Mr. WINSTON CHURCHILL on November 29 and by Mr. J. GRIMOND and Miss IRENE WARD on December 4.

Mr. HERBERT MORRISON in reply said that Parliament had left the choice of officers and their conditions of service to the county council except for very limited classes where Ministerial approval was needed. The Durham County Council had already been informed that the Government strongly deprecated the council's proposal to make membership of an association or union a condition of service. The Government or individual Ministers had no authority to take further action, but where their approval was sought to the termination of some appointment, or there was a breakdown, or threat of breakdown, in services for which the council had statutory responsibility, Ministers could intervene to secure the proper maintenance of the service, and would if necessary do so.

Mr. GRIMOND asked whether it was intended to introduce legislation to prevent public bodies from enforcing a closed shop.

Mr. MORRISON said he thought there were peaceful ways of resolving this difficulty and that they would be unwise to make declarations about legislation at this moment.

Mr. ANTHONY EDEN asked whether some form of discussion between the Government and Durham County Council was proceeding, and whether the House could expect a further statement before the Christmas recess.

Mr. MORRISON repeated his contention that it would be far better to try to settle the matter by persuasion, but said that, if necessary, another statement would be made.

Tuberculosis Insurance for Nurses

Dr. EDITH SUMMERSKILL stated on November 28 that she had decided to accept the recommendation of the Industrial Injuries Advisory Council that nurses and certain others who come into close and frequent contact with tuberculous infection should be insured under the National Insurance (Industrial Injuries) Act. She added that the precautions which nurses and other health workers were able to take to-day were such that the chances of contracting tuberculosis were very small. Fewer nurses had contracted tuberculosis in sanatoria than in practically any other work.

Displaced Registrars

On November 30 Mr. K. PICKTHORN and other members addressed questions to Mr. Bevan suggesting that he should suspend and reconsider his recent circular about appointments of senior registrars and registrars.

Mr. BEVAN replied that this circular, which had been grossly misrepresented, was issued after full consultation with the profession's representatives. Its object was in the interests of the profession itself—to secure a proper relationship between the numbers of training posts for future specialists and the number of specialist posts likely to be available. In estimating the latter it allowed for a reasonable annual expansion over mere replacements in present posts. The numbers of training posts would be reviewed as and when further expansion occurred in later years. The urgency of the circular was that the number of trainees had already risen to nearly twice the number needed to produce the specialists likely to be required and about four times the pre-war number, a situation thoroughly unfair to all concerned. He added that the circular was not prompted by economy. Indeed, it provided for alternative appointments if necessary for the work of the hospital.

Mr. J. K. VAUGHAN-MORGAN then asked what prospects of suitable employment were open to those 1,100 hospital registrars who would become redundant.

Mr. BEVAN replied that each existing senior registrar and registrar would complete his present year of appointment. Afterwards a senior registrar whose appointment was not renewed but whose services were still needed might be offered a similar temporary hospital appointment for one year. Others could, as had always been the case, apply to set up in general practice, possibly supplemented by a part-time clinical assistantship at a hospital.

Universities and Colleges

UNIVERSITY OF DURHAM

Professor J. Z. Young, F.R.S., will deliver the eighth Rutherford Morison Lecture at the Royal Victoria Infirmary, Newcastle-upon-Tyne, on Monday, January 15, at 5.15 p.m. His subject is "Experiments in Learning."

UNIVERSITY OF LONDON

Professor Alan Moncrieff has been appointed a representative of the university at the Conference of Home Universities to be held in London on December 15 and 16, and Professor J. H. Dible a delegate of the university at the fifth centenary celebrations of the University of Glasgow from June 17 to 24, 1951.

The following have been appointed, or nominated for appointment or reappointment, as representatives of the university on the governing bodies indicated in parentheses: Dr. C. F. Harris (British Postgraduate Medical Federation); Dr. E. C. Warner (Charing Cross Hospital); Dr. Penry Rowland (Colchester Royal Grammar School: Estates Governor); Dr. A. J. W. Beard (King's College School, Wimbledon); Mr. P. H. Mitchiner (Reigate Grammar School).

The Special Advisory Board in Postgraduate Medical Studies has been reappointed for a further period of three years from October 1.

The John Marshall Fellowship in Surgical Pathology for 1950, which is of the value of £700 a year for two years in the first instance and which is tenable at University College Hospital Medical School, has been awarded to Dr. D. E. H. Phillips (University College Hospital Medical School) as from October 1.

The Sanderson-Wells (Senior) Prize for 1950, of the value of £20, has been awarded to Dr. Alexander Swan (King's College Hospital Medical School) for his essay on "The Influence of Diet on the Occurrence of Dental and Parodontal Disease in Man." The Sanderson-Wells (Junior) Prize for 1950, of the value of £10, has been awarded to A. F. C. Coppin (St. Thomas's Hospital Medical School) for his essay on "Methods of Assessing the Adequacy of Human Diets."

The title of Reader in Anatomy in the University has been conferred on Richard John Harrison, D.Sc., M.B., B.Chir., in respect of the post held by him at Charing Cross Hospital Medical School.

UNIVERSITY OF WALES

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

MEDICINE.—A. G. Alexander, L. M. Charles, S. I. Davies, A. R. Harris, S. J. S. Polwin, D. St. J. D. Rees, Dilys Rees, D. B. Scourfield, T. B. Stephens, A. P. Thomas, D. S. Wood.

PHARMACOLOGY.—A. Cunningham, W. Harrop-Griffiths, Norma A. Lloyd, E. H. Massey, J. Parry-Jones, D. C. Powell, Jeanne G. Roper.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Professor H. L. Sheehan will deliver the Weild Lecture in the Hall of the Faculty (242, St. Vincent Street, Glasgow) on Wednesday, December 13, at 5 p.m. His subject is "Renal Cortical Necrosis." Medical practitioners are invited to attend the lecture.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following were admitted to the Membership of the College on November 3: N. P. Bector, W. G. D. Caldwell, W. W. Ghali, D. E. Mellon, G. H. A. Chamberlain.

ROYAL COLLEGE OF SURGEONS IN IRELAND

On December 1 the Fellowship of the College was conferred on C. R. F. McDowell.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending November 25 were paralytic, 111 (110); non-paralytic, 19 (39); total, 130 (149). The figures for the previous week, compared with which there was a total decrease of 19, are in parentheses. Uncorrected notifications for the corresponding weeks in 1947 and 1949 totalled 145 and 193 respectively. Total uncorrected notifications for 1950 to and including the week under review are 8,251. The corresponding figures for 1947, 1948, and 1949 are 8,821, 2,212, and 6,327.

Kent, Devon, Gloucester, Lancs, Surrey, and the West Riding produced the largest numbers of notifications and contributed together some 38% of the total notifications.

The seasonal downward trend in weekly notifications is maintained.

Smallpox Not Confirmed

A coloured student in a hostel in Chelsea M.B. was removed to hospital on November 28 as a suspected case of smallpox. Laboratory investigations and clinical developments have now removed all suspicion of smallpox.

Industrial Accidents and Diseases

According to the *Ministry of Labour Gazette* (November, 1950) the number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in October was 117, compared with 220 in the previous month, and 114 in October, 1949. The largest number of deaths in any single category was 31 for workers underground in coal mines. In the 13 weeks ended July 1, 88 persons were killed underground in coal mines, and in the 13 weeks ended September 30, 182. The last figure includes 109 deaths in the disasters at Knockshinnoch and Cresswell collieries.

The following cases of industrial diseases in the United Kingdom were reported during October: lead poisoning, 5; mercurial poisoning, 1; anthrax, 3; epitheliomatous ulceration, 20 (pitch 7, tar 12, oil 1); and chrome ulceration, 14; total, 43.

Discussion of Table

In England and Wales increases occurred in the number of notifications of measles 1,275, whooping-cough 405, scarlet fever 180, acute pneumonia 93, dysentery 63, and diphtheria 21, while the only decrease in incidence of any size was acute poliomyelitis 76.

The largest rises in the number of notifications of measles were Yorkshire East Riding 264, London 222, Surrey 203, Yorkshire West Riding 303, and Kent 78, and the largest decline was Gloucestershire 66. A rise in the incidence of whooping-cough was reported from every region except the South Midland; the largest increases were Yorkshire West Riding 69, London 55, and Lancashire 36. A small rise in the number of notifications of scarlet fever was reported in every region except London, where the number of cases was the same as in the preceding week. The notifications of diphtheria were more numerous than for any week since March. The largest of the local rises were Lancashire 10, Glamorganshire 6, London 5, Durham 4; the largest fall was 7 in Warwickshire. A small rise in the incidence of acute pneumonia was fairly general throughout the country, the largest increases being Yorkshire West Riding 28 and London 20.

The notifications of dysentery were the largest for over six years. The chief centres of infection during the week were London 74 (Lambeth 53); Surrey 66 (Surbiton M.B. 59); Lancashire 66 (Liverpool C.B. 15, Southport C.B. 10, Prestwich M.B. 10); Leicestershire 40 (Leicester C.B. 30); Northumberland 34 (Rothbury R.D. 19, Newcastle-upon-Tyne C.B. 10); Yorkshire West Riding 28 (Morley M.B. 12); Essex 25 (Romford M.B. 14, Leyton M.B. 9); Durham 21 (Darlington C.B. 14); Glamorganshire 16 (Cardiff C.B. 16); Shropshire 13; Cheshire 13. The largest outbreak of food-poisoning was 62 notifications in Lancashire, Formby U.D.

A fall in the notifications of acute poliomyelitis occurred throughout the country. The largest returns were Gloucestershire 13 (Bristol C.B. 6); Yorkshire West Riding 12 (Sheffield C.B. 4); London 10; Cheshire 9; Devonshire 8; and Surrey 8.

In *Scotland* decreases were recorded in the number of notifications of measles 83, whooping-cough 42, acute poliomyelitis 13. There was a rise of 55 in the notifications of acute primary pneumonia. Although the notifications of dysentery were only 7 more than in the preceding week a considerable change in the regional distribution occurred. The notifications of dysentery in Glasgow rose from 57 to 103; the only other centres of importance were Lanark county 18 and Edinburgh 9.

In *Eire* decreases in the number of notifications of diarrhoea and enteritis 22 and whooping-cough 23 were the only large fluctuations in the trends of infectious diseases.

In *Northern Ireland* a fall of 63 in the number of notifications of measles was the chief feature of the returns. The fall in the incidence of measles was general throughout the country. The only case of acute poliomyelitis was notified in Down county.

Week Ending November 24

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,483, whooping-cough 4,334, diphtheria 61, measles 11,343, acute pneumonia 490, acute poliomyelitis 130, dysentery 626, paratyphoid fever 7, and typhoid fever 3.

No. 46

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	33	4	12	1	1	22	4	13	2	1
Deaths	—	—	—				1	—		
Diphtheria	76	6	9	6	5	96	12	32	3	6
Deaths	—	—	—	—	—	—	—	—	—	—
Dysentery	474	74	153		3	116	10	79	2	—
Deaths		—			—				—	—
Encephalitis, acute	5	—	—		—	—	—	—		—
Deaths		—		—			—			
Erysipelas			27	5	6		*	34	6	6
Deaths							—			
Infective enteritis or diarrhoea under 2 years				20	22				47	
Deaths	14		5	4	1	21	1	4	6	1
Measles*	10,132	766	112	104	57	1,301	23	33	51	76
Deaths†		—	—	—	—			—	2	—
Ophthalmia neonatorum	38	11	12		1	37	2	6		2
Deaths										
Paratyphoid fever	1	—	—	1 (B)	2	6	—	1 (A)	2 (B)	2
Deaths	—		—		—		—	—		—
Pneumonia, influenzal	558	40	4		11	667	52	13	2	3
Deaths (from influenza)‡	16	3	4	—	—	19	2	3	—	—
Pneumonia, primary	188	24	201	¶ 9	10	268	59	216	32	11
Deaths									19	
Poliomyelitis, acute	149	10	9	5	1	226	29	5	4	—
Deaths§	8	—		—		13	1			
Puerperal fever			2			*		12		—
Deaths										
Puerperal pyrexia‖	67	9	4	2	—	112	12	6		1
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,386	99	206	109	48	2,563	186	269	161	276
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—		—
Deaths					—					—
Typhoid fever	5	1	—	1	1	21	—	—	1	—
Deaths	—	—	—		—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,130	340	496	41	31	991	35	43	29	61
Deaths	3	—	1	—	—	2	—	—	—	—
Deaths (0–1 year)	250	28	32	17	12	239	33	44	24	7
Deaths (excluding stillbirths)	5,107	793	649	199	108	5,399	937	621	211	113
Annual death rate (per 1,000 persons living)			13·0					12·5	13·1	
Live births	6,549	1062	789	374	206	6,804	1050	831	305	220
Annual rate per 1,000 persons living			15·9					16·7	18·9	
Stillbirths	174	20	27			158	25	18		
Rate per 1,000 total births (including stillborn)			33					21		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

Medical News

U.S. Government Grants for Visiting America

Under the terms of the Smith-Mundt Act there are now available grants in dollars to assist faculty members at the university level, advanced scholars, and research workers to visit the United States for the purposes of research or teaching in the year 1951–2. Applications will be accepted in the following fields of study: American studies (History, Economics, Government), Education, Science and Technology, American Literature and Journalism, Administration and Management. The grants will vary in amount, and each will be calculated to assist the candidate to maintain an adequate standard of living. Grants will be awarded for a term of study of not less than six months but preferably of twelve months. Expenses of travel may be met by a Fulbright travel grant (see below). To be eligible for an award the candidate must be a British subject resident in the United Kingdom. The selecting committees will award the grants on the basis of evidence of character and scholarly achievement, as shown in the applications, the academic record, and the plan of study proposed by the applicant. Each applicant will be required to state a plan for study or a specific project which can be materially assisted by a period of from six months to a year in the United States as a research scholar or teacher. It is expected that the applicant will establish his own affiliation with an American university or research institution. Application forms may be obtained from the United States Cultural Office, Room 22, 5, Grosvenor Square, London, W.1, and the closing date is January 15, 1951.

Fulbright Travel Grants, 1951–2

Once again applications for these financial aids to assist visits to America may be made to the United States Educational Commission in the United Kingdom, 55, Upper Brook Street, London, W.1. A full statement of the conditions of grant appeared in the *British Medical Journal*, 1949, 2, 1424 (issue of December 17).

Liverpool Medical Institution

The first pathological meeting of the session was held on November 9, with the president, Dr. David Johnston, in the chair, when Dr. C. V. Harrison read a paper on "The Pathology of Pulmonary Hypertension." The paper was restricted to a consideration of primary pulmonary hypertension, in which no cause could be found in the left heart, the lungs, or the thoracic cage. Seven such cases were encountered amongst 5,000 necropsies at the postgraduate school. One of the seven was caused by multiple tumour emboli occluding most of the smaller pulmonary arteries, and another four showed visible multiple thrombotic emboli. In a group of rabbits experimentally subjected to repeated showers of small pulmonary emboli, lesions like those seen in the human cases appeared over a period of months, and gave rise to a statistically significant right ventricular hypertrophy which disappeared if the embolization was stopped. Hence repeated small pulmonary emboli should be looked for in cases of apparently primary pulmonary hypertension. The inaugural Florence Blair Bell memorial lecture was delivered by Sir Stanford Cade on November 16 on "Chemotherapy of Cancer." The address paid tribute to the personality of Blair Bell, his memorable service to the Royal College of Obstetricians and Gynaecologists, of which he was the first president, and to his work as professor of gynaecology and obstetrics in the University of Liverpool.

North of England Obstetrical and Gynaecological Society

At a meeting held in conjunction with the Birmingham and Midland Obstetrical and Gynaecological Society in Nottingham on October 13 Professor Hilda Lloyd was in the chair, and Mr. Percy Malpas read a paper on the problem of postmaturity. Mrs. A. E. Marrow described three interesting cases of volvulus associated with pregnancy. Mr. P. C. Barkla, of Nottingham, described a case in which the foetus had assumed several bizarre positions throughout pregnancy and it had always been extremely easy to convert it from a transverse or oblique position to a vertex. The child was ultimately found to have extraordinarily atonic muscles. Mr. H. Agar reported a case of stab wound of the abdomen, produced by an irate husband hurling a bread knife at his pregnant spouse.

The wife was an eighth gravida, and the wound seemed to be quite trivial at first. Her pulse rate rose, the general condition deteriorated, and laparotomy was decided upon. At operation it was found that the wound had involved the uterine musculature and impinged upon an anteriorly situated placenta. The amniotic cavity contained a large amount of blood, and one of the vessels near the origin of the cord had been incised and had led to exsanguination and intrauterine death of the foetus.

An interesting case of leaking ovarian tumour was described by Mr. L. M. Park.

A New Science Centre

Mr. Herbert Morrison announced in the House of Commons on November 21 that the Government is to build a British science centre in London to house the Royal Society and other scientific societies at present using the cramped quarters of Burlington House, Piccadilly. It will be some years before the actual buildings can be put up, but the central site to be acquired will be named early in 1951. It is planned to provide sets of rooms not only for the present occupiers of Burlington House but also for others such as the Physiological and Biochemical Societies, and the Royal Anthropological Institute, who are either without any dwelling or scattered throughout London. Hospitality will also be offered to many of the smaller clubs and societies. In addition the Patent Office and its library, and the Government scientific offices, such as the Department of Scientific and Industrial Research and possibly the Medical Research Council, will be moved to the same group of new buildings so as to provide an integrated and easily accessible capital city of science.

Scottish General Nursing Council

New members include Professor G. M. Wishart (dean of the Faculty of Medicine, Glasgow University), Dr. A. D. Briggs (medical superintendent, Stobhill General Hospital, Glasgow), Dr. W. G. Clark (medical officer of health, Edinburgh), and Dr. Mary Esslemont (general practitioner, Aberdeen). Thirteen of the 26 members of the council are registered nurses working in Scotland, elected by a nursing vote.

Royal Dental Hospital "At Home"

The Royal Dental Hospital of London School of Dental Surgery in Leicester Square was "at home" on November 25. The building was full of interesting exhibitions and demonstrations, including a demonstration of malocclusion, its aetiology and principles of treatment, by members of the junior teaching staff, and a film in colour of bilateral mandibular osteotomy. The most popular event was a Brains Trust, for which the lecture theatre was crowded out. The question master was Dr. A. B. MacGregor, and there were four members of the trust who were never caught out by any question, although they sometimes answered questions in opposite ways.

Swiss Beds for British Patients?

As announced recently in the House of Commons, the Department of Health for Scotland is sending a clinical team to Switzerland now, to study the medical facilities available there for the treatment of patients suffering from pulmonary tuberculosis. The party consists of Dr. M. A. Foulis, physician-superintendent, Robroyston Hospital, Glasgow; Dr. R. Y. Keers, medical director, British Red Cross Sanatoria in Scotland; Miss G. M. M. Carter, matron, East Fortune Sanatorium, East Lothian; and Dr. I. M. Macgregor, medical officer, Department of Health for Scotland.

In Brief

Dr. A. Q. Wells, of Shipton Manor, Kidlington, Oxford, has been nominated a Sheriff for Oxfordshire, and Dr. R. Davies Jones, of Llys Hafren, Llanidloes, a Sheriff for Montgomeryshire, North Wales.

Dr. G. Campbell has been elected president, Dr. J. G. H. McNabb captain, and Dr. R. J. Sandys treasurer, of the London Irish Medical Golfing Society.

Dr. Grantly Dick Read has been appointed honorary lecturer in the Department of Philosophy (Philosophy of Science Section) of the University of Witwatersrand. It will be recalled (see *Journal*, 1949, 2, 187) that he now practises in South Africa.

Dr. Honorio Delgado, director of the department of psychiatry and neuropathology at the Faculty of Medicine at Lima, and Peruvian delegate to the International Congress of Psychiatry in Paris and the Hispano-American Congress of Intellectual Co-operation in Madrid, visited Britain under the auspices of the British Council between November 28 and December 8. He is at present engaged in setting up Peru's first institute of neuropsychiatry and mental hygiene.

Wills

Dr. Margaret E. Bryson, of Bushey, Herts, and St. Briavels, Glos, left £10,023; Dr. J. S. S. Steele-Perkins, J.P., of Exeter, former consulting surgeon at the Royal Devon and Exeter Hospital and Exeter Dispensary, left £18,995; Colonel J. P. Cameron, C.S.I., C.I.E., I.M.S., of Camberley, Surrey, Inspector-General, Civil Hospitals and Prisons, Assam, 1931–5, and commandant, Middleton Park Convalescent Hospital for Head Injuries, 1940–5, £11,054; Mr. D. W. Daniels, F.R.C.S., of Mansfield, Notts, £14,633; Dr. O. A. P. Clark, of Worthing, and formerly of Kingston-on-Thames, £8,779; Dr. R. C. Mott, of Parkstone, Dorset, £11,066; Lieutenant-Colonel W. D. Hayward, I.M.S., of Kingsdown, Deal, £12,109; Dr. David Moodie, of Goodmayes, Essex, formerly practising at Aldridge, Staffs, and in Durham, £17,571.

COMING EVENTS

Association of Psychiatrists

A general meeting will be held at 8 p.m. on Monday, December 11, at B.M.A. House, Tavistock Square, London, W.C.1, to consider, among other matters, the recent Ministry of Health document on registrar establishments. All psychiatrists in the region, whether members of the Association or not, are invited to attend.

Scientific Film Association

A meeting of the Medical Committee of the Scientific Film Association will be held at the Royal Society of Medicine, 1, Wimpole Street, London, W., on Monday, December 11, at 5 p.m., when some films on pathology will be shown, with Professor R. Cruickshank in the chair.

Association of Sea and Air Port Health Authorities

The meeting on Wednesday, December 13, will be held at the Royal Sanitary Institute, 90, Buckingham Palace Road, Victoria, S.W.1, and not at the London School of Hygiene as previously announced.

Ophthalmology Lecture

Professor L. J. Witts, Nuffield Professor of Clinical Medicine in the University of Oxford, will deliver a lecture on "Ocular Aspects of Blood Dyscrasias" at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C., on Thursday, December 14, at 3 p.m. The lecture is open to those attending courses in the College and to all other medical practitioners, dental surgeons, and advanced students.

Remedial Work Among School-children

A conference on school remedial work will be held in London from January 2–4, 1951, by the Ling Physical Education Association in co-operation with the Society of Medical Officers of Health (Schools Health Service Group). Particulars may be obtained from the General Secretary, Ling Physical Education Association, Hamilton House, Bidborough Street, London, W.C.1.

Course on the Use of B.C.G.

On March 16 and 17, 1951, at the British Medical Association (Scottish Branch), 7, Drumsheugh Gardens, Edinburgh, 3, the National Association for the Prevention of Tuberculosis is holding lecture seminars and demonstrations. The fee is three guineas, and particulars may be obtained from N.A.P.T., 65, Castle Street, Edinburgh, 2.

SOCIETIES AND LECTURES

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

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—December 11, 5 p.m., "*Congenital Diplegia*," by Dr. P. R. Evans.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—December 11, 8.30 p.m., pathological meeting.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 11, 3.45 p.m., "*Principles of Immunity in Relation to Surgical Practice*," by Lord Stamp.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 11, 4 p.m., "*Optics*" (Revision), by Mr. H. N. Reed.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 11, 5.30 p.m., "*Anatomy of the Eye and Orbit*," by Professor T. Nicol.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—December 11, 4.30 p.m., "*Studies on Child Health: Historical Background, the Unborn Child*," Harben Lecture by Sir Leonard Parsons, F.R.S.

UNIVERSITY COLLEGE, Gower Street, London, W.C.—December 11, 4.45 p.m., "*Aspects of Protein Structure*," by Dr. A. Elliott and Dr. W. E. Hanby.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., December 12, 5.30 p.m., "*The Definition and Assessment of Respiratory Function*," by Dr. K. W. Donald.

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 47, Queen's Gate Terrace, London, S.W., December 12, 7 for 7.30 p.m., "*Health and Education East of the Iron Curtain*," discussion to be opened by the Very Rev. Dr. Hewlett Johnson.

●CIBA FOUNDATION, 41, Portland Place, London, W.—December 12, 5 p.m., "*The Role of Suprarenal Cortical Function in Disorders of Childhood*," by Sir Stanton Hicks (Adelaide).

EDINBURGH POSTGRADUATE BOARD FOR MEDICINE.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, December 12, 5 p.m., "*Renal Cortical Necrosis*," by Professor H. L. Sheehan.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 12, 5 p.m., "*Pathology*," by Dr. J. O. Oliver.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., December 12, 5 p.m., "*Epididymitis. Cystic Swelling of the Scrotum*," by Mr. J. D. Fergusson.

PADDINGTON MEDICAL SOCIETY.—At St. Mary's Hospital, Praed Street, London, W., December 12, 8.30 p.m., "*Restraint in Surgery*," by Professor C. A. Pannett.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 12, 3.45 p.m., "*Hormones of Adrenal Cortex*," by Professor N. F. Maclagan.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 12, 5 p.m., "*Science and Art of Refraction*," by Dr. T. H. Whittington.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—December 12, 4.30 p.m., "*Studies on Child Health: The Newborn Child and the Infant*," Harben Lecture by Sir Leonard Parsons, F.R.S.

Wednesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 13, 5 p.m., "*X-ray Technique*," by Dr. C. W. McKenny.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Henrietta Street, London, W.C., December 13, (1) 3.30 p.m., demonstration of x-rays by Mr. Harland Rees; (2) 5 p.m., "*Tumours of the Testicle*," by Mr. H. G. Hanley.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 13, 4 p.m., "*Dublin's Surgeon-Anatomists*," Thomas Vicary Lecture by Mr. William Doolin.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 13, 4 p.m., "*Clinical Ophthalmology*" (Revision), by Mr. R. A. Burn and Mr. R. P. Crick.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow.—December 13, 5 p.m., "*Renal Cortical Necrosis*," Weild Lecture by Professor H. L. Sheehan.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—December 13, 4.30 p.m., "*Studies on Child Health: The Older Child, a Glance into the Future*," Harben Lecture by Sir Leonard Parsons, F.R.S.

ROYAL MICROSCOPICAL SOCIETY.—At B.M.A. House, Tavistock Square, London, W.C., December 13, 5.30 p.m., "*Mouldlike Growth in Certain Bacteria*," by Mr. M. H. Mannering and Miss P. Davis.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace Road, London, S.W.—December 13, 2.30 p.m., discussion: "*Blowflies in Slaughterhouses*," to be opened by Mr. A. A. Green.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At Burlington House, Piccadilly, London, W., December 13, 6.15 p.m., meeting of Nutrition Panel. "*Factors in Distribution Affecting the Quality and Nutritive Value of Foodstuffs*," speakers, Dr. J. Sword, F.R.I.C., and Miss A. M. Copping, B.Sc.

SOCIETY OF CHEMICAL INDUSTRY: BIRMINGHAM AND MIDLAND SECTION.—At University Mason Theatre, Edmund Street, Birmingham, December 13, 6.30 p.m., joint meeting with Fine Chemicals Group, "*Dextran Blood Plasma Substitute*," by A. R. Lockwood, B.Sc., A.R.I.C. A discussion will follow.

Thursday

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, London, W., December 14, 8 p.m., "*Initiation*," by Dr. Edward F. Griffith. Discussion to be opened by Dr. E. N. Snowden.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—December 14, 8.15 p.m., "*Presentation of the Radiograph—Photographic, Photomechanical, and Display*," by Dr. R. G. W. Ollerenshaw.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., December 14, 5.30 p.m., "*The Definition and Assessment of Respiratory Function*," by Dr. K. W. Donald.

EDINBURGH CLINICAL CLUB.—At B.M.A. Rooms, 7, Drumsheugh Gardens, Edinburgh, December 14, 8 p.m., "*Pitfalls in Practice*," by Dr. Douglas Robertson.

HONYMAN GILLESPIE LECTURE.—At University New Buildings (Anatomy Theatre), Teviot Place, Edinburgh, December 14, 5 p.m., "*Reflections from a Provincial Deanery*," by Dr. J. G. McCrie.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—December 14, 5 p.m., "*Bites and Stings*," by Dr. E. J. Moynahan.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—(1) At St. Peter's Hospital, Henrietta Street, London, W.C., December 14, 3 p.m., ward round by Mr. A. W. Badenoch; (2) At St. Paul's Hospital, Henrietta Street, London, W.C., December 14, 5 p.m., "*Congenital Defects of the Testis and Epididymis*," by Mr. D. I. Williams.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool—December 14, 8 p.m., "*The Pathology of Captive Wild Animals*," by Dr. R. E. Rewell.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At London Jewish Hospital, Stepney Green, London, E., December 14, 3 p.m., clinical meeting.

LONDON UNIVERSITY, Senate House, Bloomsbury, W.C.—December 14, 5.30 p.m., "*Food and Folly*," Sanderson-Wells Lecture by Sir Stanton Hicks (University of Adelaide).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 14, 3 p.m., "*Ocular Aspects of Blood Dyscrasias*," by Professor L. J. Witts.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 14, 5 p.m., "*Methods of Examination*," by Mr. C. M. Shafto.

ROYAL SOCIETY, Burlington House, Piccadilly, London, W.—December 14, 4.30 p.m., "*The History of Microdissection*," Wilkins Lecture by Professor F. J. Cole, F.R.S.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, London, W., December 14, 7.30 p.m., "*A Review of Investigations on Scrub Typhus in Burma and Malaya*," by Dr. J. R. Audy.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—December 14, 4.30 p.m., lecture-demonstration on neurology by Dr. A. Feiling.

TORQUAY AND DISTRICT MEDICAL SOCIETY.—At Torbay Hospital, December 14, 8.30 p.m., "*Surgical Aspects of Hypertension*," by Mr. Norman Lake.

Friday

BIOCHEMICAL SOCIETY.—At Department of Biochemistry and Chemistry, the Medical College of St. Bartholomew's Hospital, Charterhouse Square, London, E.C., December 15, 2 p.m., 292nd meeting. Scientific papers will be read.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—December 15, (1) 5 p.m., meeting of medical members; (2) 6.30 p.m., "*Radiation Chemistry with Emphasis on Dosimetry*," to be introduced by F. T. Farmer, Ph.D. Paper by M. J. Day, M.A.

EDINBURGH UNIVERSITY, University New Buildings (Surgery Lecture Theatre), Edinburgh.—December 15, 2.30 p.m., "*The Surgical Exposure of the Pancreas*," Macarthur Postgraduate Lecture by Professor Ian Aird.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 15, 5.30 p.m., "*Clinical Perimetry*," by Mr. G. I. Scott.

●MAIDA VALE HOSPITAL MEDICAL SCHOOL, London, W.—December 15, 5 p.m., clinical neurological demonstration by Mr. Valentine Logue.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 15, 3.45 p.m., "*Some Practical Applications of Bacteriology to Surgery*," by Lord Stamp.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 15, 5.30 p.m., "*Physiology of the Eye*."

Saturday

ASSOCIATION OF BRITISH NEUROLOGISTS.—At National Hospital, Queen Square, London, W.C., December 16, 10 a.m., "*Basic Problems in the Pathology of Disseminated Sclerosis and Demyelinating Disease*," Florence Tong Lecture by Dr. E. C. Lumsden.

APPOINTMENTS

HOWELL, T. E., M.B., B.S., Principal Medical Inspector of Mines, Ministry of Fuel and Power, 7, Millbank, London, S.W.

Dr. Howell, who was born in 1900, worked for some years in the coal-mining industry before beginning the study of medicine, and obtained a first-class mine manager's certificate. His medical training was at Guy's Hospital, London, and he qualified in 1934. After a period in general practice he returned to Guy's as registrar and chief clinical assistant to out-patients. In 1938 he joined the Factory Department of the Home Office as Medical Inspector of Factories in charge of the South-western Region, and after five years, during which time he was also Lecturer in Industrial Medicine at Bristol University, he joined the Ministry of Fuel and Power as Deputy Chief Mines Medical Officer. For several months during 1946 he was loaned to the Ministry of Labour to deal with difficulties in connexion with recruitment of miners for work in the Ruhr coalfields, and he recently represented the Ministry of Fuel and Power at a Congress of Industrial Medical Officers in Vienna.

Dr. W. T. Joseph has been appointed an Official Member of the Legislative Council of the Virgin Islands.

GILLORAN, JAMES LEITCH, M.B., Ch.B., D.P.H., Assistant County Medical Officer, Cumberland County Council.

HAYWARD, J. B. W., M.B., Ch.B., Medical Director in Charge of Mass Radiography Unit at Gloucester, South-western Regional Hospital Board.

KERSHAW, G. R., M.R.C.S., L.R.C.P., D.P.H., Area Medical Officer, Warwickshire County Council, Medical Officer of Health, Borough of Nuneaton and Bedworth Urban District Council.

LYCETT, C. D., L., M.D., D.P.H., Deputy County Medical Officer of Health, Staffordshire County Council.

MCDOWALL, GEORGE D., M.B., Ch.B., F.R.C.S.Ed., Assistant Surgeon, Ear, Nose, and Throat Department, Royal Infirmary, Edinburgh.

MARTIN, KENNETH W., M.B., B.S., F.R.C.S., Senior Registrar, St. Peter's and St. Paul's Hospital, to work at St. Paul's Hospital, Endell Street, London, W.C.

NICOL, WILLIAM, M.B., Ch.B., D.P.H., Assistant Medical Officer of Health, Birmingham.

O'BEIRNE, MICHAEL S., M.B., B.Ch., B.A.O., D.P.H., M.R.C.P.I., Medical Officer, Arklow, Co. Wicklow, Eire, and Medical Officer Maternity and Child Welfare Clinic, Arklow.

PARSONAGE, M. J., B.Sc., M.B., M.R.C.P., D.C.H., Assistant Physician, Department of Neurology, General Infirmary at Leeds, and Consulting Neurologist to hospitals under the control of the Leeds Regional Hospital Board.

PRINCESS TSAHAI MEMORIAL HOSPITAL, Addis Ababa, Ethiopia.—*Medical Superintendent and First Surgeon*, S. W. Allinson, M.B., F.R.C.S., D.L.O. *First Physician*, Edward Davison, M.D., D.P.H. *Second Surgeon*, H. C. Fletcher-Jones, M.B., F.R.C.S.

ROWLEY-HARVEY (formerly Davies), SADIE MARGARET, B.Sc., M.B., B.Ch., C.P.H., Area Medical Officer of Health, No. 10 Area, comprising Abergavenny Borough, Abergavenny Rural, Pontypool Rural, and Usk Urban Councils, Monmouthshire.

TINKER, CECILY M., M.D., M.R.C.P., Senior Registrar, Lancaster House Chest Clinic, Southend-on-Sea.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Heining.—On November 14, 1950, at Beckenham, to Joan Marie (formerly Brotherton), wife of Dr. E. W. Heining, a son—Timothy Edward Dalrymple.

McCullough.—On November 28, 1950, to Dr. and Mrs. J. K. H. McCullough, 12, Middleton Hall Road, Kings Norton, Birmingham, a son—Philip Hugh.

DEATHS

Elliot.—On November 18, 1950, at Woodlands, Fleet, Hants, Andrew Elliot, M.D., M.R.C.P., D.P.H.

Finsterbush.—On November 15, 1950, at 237, Oxford Road, Reading, Edmund Finsterbush, M.D.

Foott.—On November 17, 1950, at Southsea, Hants, Frank Williamson Foott, L.R.C.P.&S.I.&L.M., aged 82.

Harris.—On November 20, 1950, Charles Edward Smith Harris, M.B., Ch.B.

Jones.—On November 21, 1950, at "Little Seeleys," Beaconsfield, George Arthur Jones, L.S.A.

Lindenstein.—On November 14, 1950, at Selly Oak Hospital, Birmingham, Louis Lindenstein, M.D., aged 71.

Macevoy.—On November 17, 1950, at Pensylvia, Sticklepath, Devon, Henry John Macevoy, M.D., late of Brondesbury, London.

McQueen.—On November 23, 1950, at Cumloden, Ridgacre Road, Quinton, Birmingham, Alexander Dairymple McQueen, M.B., Ch.B., aged 74.

Malcolmson.—On November 24, 1950, at a nursing-home, Edinburgh, Alexander Mowat Malcolmson, M.D., 305, St. John's Road, Corstorphine, Edinburgh.

Rolleston.—On November 19, 1950, at Ketton, Stamford, Lincs, Christopher Rolleston, D.M., M.R.C.P., D.P.H., aged 73.

Smith.—On November 16, 1950, at 34, High Street, Markyate, Herts, James Ernest Sutcliffe Smith, M.B., B.S., aged 73.

Sutton.—On November 15, 1950, at 57, Glenmore Road, Minehead, Somerset, Frederick Reginald Sutton, M.D., aged 79.

Swaffield.—On November 19, 1950, at 2, Deancry Street, London, W., Walter Henry Swaffield, M.D., F.R.C.S.Ed.

Any Questions?

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

Value of Pasteurization

Q.—*What is the effect of pasteurization on the food value and digestibility of milk? Is there any evidence that pasteurization reduces the incidence of tuberculosis, and has it ever been shown to cause an increase of other diseases (e.g., in institutional observations)?*

A.—Pasteurization of cows' milk by the official Holder method laid down by the Ministry of Health leads to the destruction of about 10% of vitamin B and 20% of vitamin C. Carefully controlled observations on rats, mice, calves, and children have failed to reveal any change in the biological value and digestibility of the protein, in the availability of the calcium and phosphorus, in the amount of vitamin A or D, or in the total energy or nutritive value of the milk for the growing animal. The slight destructive effect on vitamins B and C is of little practical significance, because vitamin B is about 10 times as abundant in cows' milk as in human milk, and because vitamin C is present in such small quantity in cows' milk and is so readily inactivated by exposure to light that in infant feeding it must be supplemented by orange juice or some other abundant source of vitamin C. Pasteurization by the high-temperature short-time method, which is also officially recognized by the Ministry of Health, has not been studied so fully, but there is reason to believe that the minor changes it produces in milk are even less than those caused by the Holder method.

The best factual evidence that the use of pasteurized milk reduces the incidence of tuberculosis is afforded by the observations of R. M. Price (*Canad. J. publ. Hlth*, 1934, **25**, 13) at Toronto. Working at the Hospital for Sick Children, she determined the type of infecting bacillus in a series of 300 cases of non-pulmonary tuberculosis in children under 14 years of age. Of these, 15% were found to be infected with the bovine tubercle bacillus. Inquiry revealed that every one of these children came from parts of Ontario where the milk was drunk raw. In Toronto itself, where compulsory pasteurization had been in force since 1915, not a single case of infection with the bovine type was discovered in spite of the fact that 4% of the churn milk and 26% of the bulked milk entering the city contained tubercle bacilli.

There is no evidence that the use of pasteurized milk causes an increase in the incidence of other diseases. On the other hand there is a good deal of evidence to show that its use is followed by a reduction in the incidence of tuberculosis of bovine origin, of undulant fever, and of epidemic milk-borne disease such as scarlet fever, septic sore throat, diphtheria, enteric fever, dysentery, and gastro-enteritis. A classic illustration of the effect of pasteurization in reducing disease is afforded by the experience of a children's institute on Randall's Island, New York, where a mortality rate of 44.36 per thousand per annum was promptly reduced to one of 19.8 after all the milk was pasteurized, no other hygienic measures having been put into operation.

Sunlight and Pulmonary Tuberculosis

Q.—*Does direct sunlight harm patients convalescent from pulmonary tuberculosis or with healed fibrotic lesions?*

A.—There is some evidence that exposure of the chest or back to direct sunlight may cause a flare-up in patients whose tuberculosis is only quiescent. There is no evidence that exposure of other parts of the body to the sun, short of burning or "cooking," has any deleterious effect. If the lesions are really healed, exposure to sunlight is not detrimental, but it is extremely difficult to say which lesions are completely healed, and, to be on the safe side, it is best to tell patients to refrain from exposing their back and chest to direct sunlight. This of course does not apply to the very short periods of exposure involved in sea-bathing, but to lying or standing about in the sun with the back or chest uncovered.

Heredity and Peptic Ulcer

Q.—*To what extent do familial and hereditary factors play a part in the aetiology of peptic ulcers?*

A.—It has for long been noticed that relatives of peptic ulcer patients often have ulcers or complain of dyspeptic symptoms, and some families with a remarkable number of dyspeptics in them have been recorded. It has not, however, been possible to conclude from this that peptic ulcers are hereditary. The difficulty is that ulcers are so common that it is by no means unlikely for several members of a family to be affected. For example, if 10% of men develop a peptic ulcer at some period of their life, it can be shown that three out of four male relatives would be expected to develop ulcers in four of every 1,000 families. The difficulty cannot be overcome by comparing the family histories of ulcer patients with the histories given by other hospital patients, for it has been shown[1] that patients with a given disease are more likely to know about its occurrence among their relatives than are other patients who do not themselves suffer from the disease. This is only to be expected, but it is surprising how often it has been overlooked in the past.

The only satisfactory proof of the existence of hereditary factors in a common disease is obtained by comparing the incidence of the disease in relatives of sufferers with its incidence in the general population, and this can be done only when accurate information about the prevalence of the disease is known. It has recently been possible to do this for peptic ulcer, and the results[2] confirm that there is a distinct hereditary factor. It seems probable that peptic ulcers occur about twice as often in "ulcer families" as would be expected[3] and, what is particularly interesting, it appears that the site of the ulcer—whether in stomach or duodenum—is usually the same in all members of the affected family. This does not, of course, mean that environmental factors are not also significant. On the contrary, we know that they are important in the production of both gastric and duodenal ulcers. What is inherited is the liability to have an ulcer, but whether one actually develops must be largely dependent on the conditions to which the subject is exposed.

REFERENCES

1 Busk, T., *Ann. Eugen., Camb.*, 1948, **14**, 213.
2 Doll, R., Avery Jones, F., and Buckatzsch, M. M., Medical Research Council, Special Report No. 276 (in the press).
3 Doll, R., and Buch, J., *Ann. Eugen., Camb.*, 1950, **15**, 135.

Trauma and Tuberculous Meningitis

Q.—*Has any relationship been established between trauma and the onset of tuberculous meningitis?*

A.—The general opinion on the pathogenesis of tuberculous meningitis is that the meninges are not infected directly from the blood stream but from the cerebrospinal fluid, which is itself infected from a cerebral or meningeal tuberculoma probably by rupture of a tubercle into the subarachnoid space. This view is supported by J. Schwarz in a comprehensive survey of the subject (*Amer. Rev. Tuberc.*, 1948, **57**, 63). The lesion is usually a sequel to a primary infection, but it can develop in patients in whom the primary focus has apparently healed but in whom there is an active focus of a post primary character.

In the literature on tuberculous meningitis, the influence of trauma as a predisposing factor is rarely mentioned. A. R. Rich (*The Pathogenesis of Tuberculosis*, 1944, pp. 630–3, Chas. C. Thomas, Baltimore) considers that there is evidence that the disease may follow directly upon a head injury. He makes the point that the lesion follows within a short period of the injury. Schwarz, however, does not think that the number of cases of tuberculous meningitis preceded by injury is of statistical significance, but qualifies that opinion by the statement "that repeated cerebral traumata are probably more

frequent in childhood than in other age groups," implying that head injuries may cause the infection to spread to the meninges.

Vagotomy

Q.—*What are the effects of vagotomy? How is a "medical" vagotomy performed?*

A.—The secretion of acid in the stomach is controlled partly by a hormone and partly by the parasympathetic nervous system through the vagus nerves. It has been shown that complete section of the vagi considerably reduces both acid secretion and the motility of the stomach. Beneficial results can therefore be expected in cases of duodenal ulcer, particularly where severe pain is a leading feature.

The vagi can be cut either above or below the diaphragm. Owing to anatomical abnormalities complete section is not always possible below the diaphragm and a transpleural approach is more certain, but this has the disadvantage that the lesion in the duodenum cannot be inspected. In practice an abdominal route is usually used, and by pulling on the oesophagus the nerves are severed as high as possible.

The reduction in gastric motility leads to gastric retention, and the operation is contraindicated if there is any narrowing of the duodenum. Movement of the small intestine is increased, and chronic diarrhoea may follow the operation. Pyloric narrowing may require a gastro-enterostomy to be combined with the vagotomy, and conversely vagotomy may be tried on patients who have recurrent ulceration following a short-circuit. In this way the formidable operation of gastrectomy following gastro-enterostomy may be avoided.

Belladonna paralyses the nerve endings of the vagus, and if given in sufficient quantity will reduce the secretion of hydrochloric acid. Starting with 5 minims (0.3 ml.) thrice daily, the dose should be increased by a minim at a time until the largest dose that the patient can tolerate without side-effects is given. Dryness of the mouth and blurring of vision are the principal side-effects which often militate against the successful use of belladonna. A less toxic preparation is atropine methyl nitrate in doses of 5 mg.

Faecal Incontinence in Childhood

Q.—*What are the likely causes of faecal incontinence of recent origin in a boy of 8 years? How should the condition be treated?*

A.—Probably the commonest cause is gross constipation, but in this case the incontinence is always associated with diarrhoea, due to local irritation caused by the hard scybala. The diagnosis can often be made on the history of the child's not having had a motion for several days at a time, and then having watery motions with incontinence. It is confirmed readily by rectal examination during the phase of diarrhoea, when the rectum is found to be enormously distended and loaded with hard faeces. On abdominal palpation hard faecal masses can also often be felt. Constipation of this degree is usually a behaviour problem, of which the commonest cause is undue concentration by the parents on the child's bowels. All the child's motions are inspected to see if they are "adequate," and he is compelled to stay in the lavatory if the product does not come up to the parents' desires. Occasionally the constipation may be due to a painful local lesion, such as anal fissure. If there is no associated diarrhoea, the faecal incontinence is again almost certainly a behaviour problem. It may be due to the treatment described above, but it is more likely to be due to an emotional disturbance of recent onset, such as jealousy of a new baby, domestic unhappiness, or worries at school, either because of difficulties in a particular subject or with a particular teacher, or because of bullying. The problem is perpetuated by punishment of the child in the form of smacking or of efforts to shame him.

The treatment must be directed towards the cause, and can only be very briefly outlined here. The first essential is to deal with the parental attitudes and anxieties. On no account must the child be punished or shamed for the incontinence. His greatest need is love, security, and encouragement. If the incontinence is due to hard scybala, these must be removed by saline purgatives and daily enemas, but it is essential to stop these as soon as that has been achieved. The child must then be left to look after his own bowel actions without any anxiety being shown about their sufficiency. If there is no constipation, the precipitating cause must be discovered by a really careful history in order to determine exactly what happened just before the onset of the incontinence, and in particular what is going on in the home or school to upset the child. There is no place for drugs, other than the saline purgatives mentioned above, in the treatment of the condition.

Sensitivity to Antibiotics

Q.—*(1) What concentration of an antibiotic should be used to determine the sensitivity of an organism? (2) What relation has the in vitro sensitivity of the organism to the serum concentration of antibiotic necessary for successful therapy?*

A.—(1) To obtain accurate information about the sensitivity of an organism to an antibiotic, it is necessary to use not one but a series of different concentrations of the antibiotic in separate tubes of culture medium. The result of such a test may be to show that the organism is inhibited by, for example, 0.02 unit of penicillin per ml., but not by 0.01. The various agar diffusion methods yield similar information, although this can be expressed only approximately in the same terms.

(2) The outcome of treatment certainly depends on whether the concentration found inhibitory *in vitro* is attained and indeed somewhat exceeded in the blood in consequence of the dosage given. Although this has been more or less self-evident since the earliest therapeutic use of penicillin, the fact that *in vitro* results are directly applicable to conditions *in vivo* has recently been experimentally proved by Eagle, Fleischman, and Musselman (*J. Bact.*, 1950, **59**, 625). They inoculated mice and rabbits with pneumococci, one hour previously having administered different doses of a slowly absorbed procaine–penicillin preparation giving sustained blood levels which were accurately determined. The doses required to save half the animals were those giving serum concentrations two to five times greater than the minimum effective concentration *in vitro*. This two- to five-fold difference is accounted for by plasma binding and by the concentration gradient between the blood and tissue fluids: in other words, the concentrations active *in vitro* and *in vivo* are evidently about the same.

The same considerations apply to sensitivity tests with other antibiotics, although the techniques differ owing to such factors as the instability of "aureomycin" or the marked dependence of the action of streptomycin on the size of the inoculum and the composition of the medium.

NOTES AND COMMENTS

Rectal Prolapse.—Mr. J. R. M. WHIGHAM (London) writes: With regard to rectal prolapse ("Any Questions?" November 18, p. 1184), I think the operation recommended by R. R. Graham (*Ann. Surg.*, 1942, **115**, 1007) is worth a mention. The principle of the method is based on the assumption that a complete rectal prolapse is essentially a sliding hernia of the anterior wall of the rectum. The rectum is approached from above, the peritoneal sac is removed, and the anatomical defect in the pelvic fascia repaired. I have found the results satisfactory and the operation well borne even in a patient as old as the one mentioned.

Correction.—In our report of Mr. Brock Chisholm's statement to the press (*Journal*, November 4, p. 1049) it was said that two Ethiopian medical students were studying medicine in the Sudan. We understand that this is not the case. Two Ethiopian undergraduate medical students are studying in the Lebanon and two in Egypt. Five nurses from Ethiopia are studying under W.H.O. Fellowships in Uganda.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone.
Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 16 1950

APPENDICITIS

BY

Sir CECIL WAKELEY, K.B.E., C.B., D.Sc., P.R.C.S., F.R.S.Ed.

Senior Surgeon and Director of Surgical Studies, King's College Hospital; Surgeon to the Royal Masonic Hospital and Belgrave Hospital for Children; Consultant Surgeon to the Royal Navy

AND

PETER CHILDS, M.A., D.M., M.Ch., F.R.C.S.

Surgeon, South Devon and East Cornwall Hospital, Plymouth; late Surgical First Assistant, King's College Hospital

[WITH SPECIAL PLATE]

Appendicectomy is one of the commonest surgical operations performed, especially as an emergency. The Registrar-General's figures show that "in the period 1935–8 the number of deaths from appendicitis remained very constant, successive annual totals being 3,178, 3,053, 3,039, and 3,027. In the next three years a rapid fall occurred, to 2,733 in 1939, 2,465 in 1940, and 1,970 in 1941, but this was followed by a stationary period with 2,038, 1,976, and 1,965 deaths. In 1945 a further fall began, bringing the number to 1,774 in that year." The report continues, "These two changes were contemporaneous with the introduction on a considerable scale of sulphonamides and penicillin respectively. Non-civilian deaths included in the above totals in years 1939–45 were 11, 87, 97, 111, 90, 84, 71" (Registrar-General for England and Wales, 1949).

Development

The stages in development of the appendix are shown in Fig. A.

At the fifth week of foetal life the caecum appears as a small outgrowth of the wall of the primitive midgut, which is not yet differentiated into small and large intestines. This outgrowth is the same diameter throughout, equal to that of the intestine But about the eleventh week it increases in length. Even at this early stage the process differentiates into a basal fifth and a distal four-fifths, which grow differently. The basal portion grows equally with the large bowel, whereas the distal portion grows greatly in length but little in diameter. Thus at the end of foetal life the caecum is conical in shape, with its wide base joining the ascending colon and the narrow end tapering gradually into the vermiform appendix. Such a caecum is termed infantile, and persists for some time after birth. In 3% of cases such a type of caecum is found throughout life.

At the sixth or seventh month of foetal life the terminal part of the ileum adheres to the medial wall of the caecum for some distance. In addition, two folds of peritoneum—one anteriorly, one posteriorly—pass between the two parts. In such a way is future

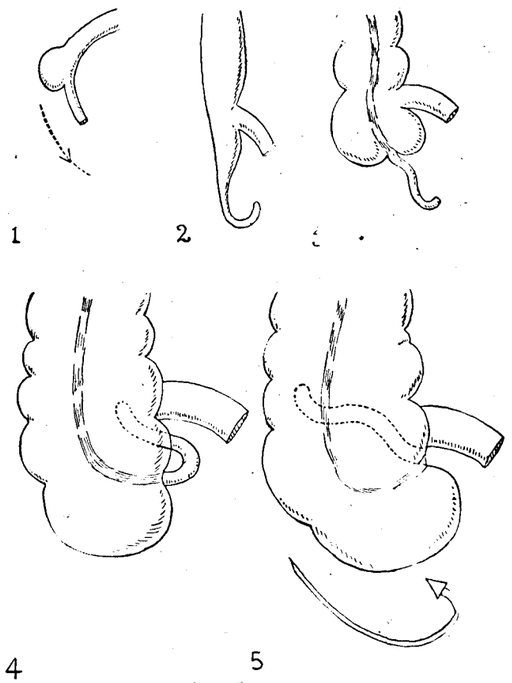


FIG. A.—Early development of the appendix, showing its tendency to become retrocaecal.

growth of the caecum regulated. As the caecum begins to expand the medial part of the wall cannot enlarge as much as the rest. The lateral part grows much more rapidly, and eventually forms the apex and most of the body of the caecum, while the original apex with the vermiform appendix is pushed into one or other of the sites mentioned below.

The level of the caecum varies at different periods of foetal life. At the eleventh or twelfth week it lies immediately beneath the liver and to the left of the median plane. Gradually it travels to the right across the descending part of the duodenum, and lies on the right side, and downward, to reach its adult position at birth or some time later. Descent may be imperfect, giving a high caecum, or excessive, in which case the caecum lies in the pelvis (Cunningham, 1931).

Anatomy

The general anatomy is well known and requires no discussion (Fig. B). But the site in which the appendix

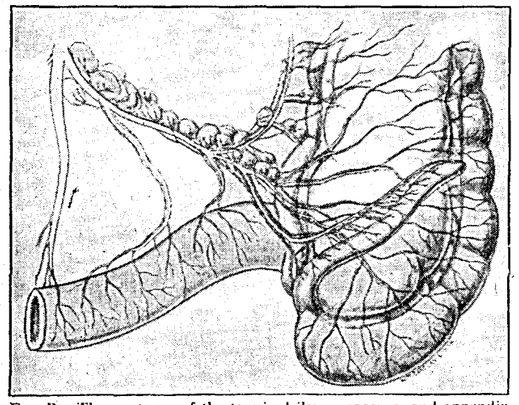


FIG. B.—The anatomy of the terminal ileum, caecum, and appendix as seen from behind.

finally settles is of importance, as the symptoms, signs, and complications of appendicitis are in some degree related to the site of the appendix.

Wakeley and Gladstone (1928) analysed 5,000 cases taken from the operating theatre, post-mortem room, and dissecting-room. Their findings are shown in Table I

TABLE I.—*Position of Appendix in 5,000 Cases (Wakeley and Gladstone)*

	No. of Cases
Anterior or pre-ileal	47 (0·94%)
Splenic or post-ileal	25 (0·5%)
Pelvic, on psoas muscle, near or hanging over brim of pelvis	1,606 (32·11%)
Subcaecal, beneath the caput caeci	101 (2·02%)
Post-caecal and retrocolic	3,219 (64·38%)
Ectopic	2 (0·04%)

In a consecutive series of 430 operations for appendicectomy performed at King's College Hospital during 1947 and 1948 the position of the appendix was noted in 171; the results are given in Table II.

TABLE II.—*Position of Appendix in 171 Cases at King's College Hospital*

	No. of Cases
Anterior or pre-ileal	7 (4·1%)
Splenic or post-ileal	13 (7·6%)
Pelvic, on psoas muscle, near or hanging over brim of pelvis	42 (24·5%)
Paracolic	7 (4·1%)
Post-caecal and retrocolic	101 (59·1%)
Ectopic—in umbilical hernia	1 (0·6%)

It is not only the site which is important surgically. In the case of the post-caecal and retrocolic appendices the relation of the appendix to the peritoneal reflection is important, for on this depends, to some extent, the likelihood of dissemination of infection into the general peritoneal cavity. Figs. C, D, and E show some of the possible relations.

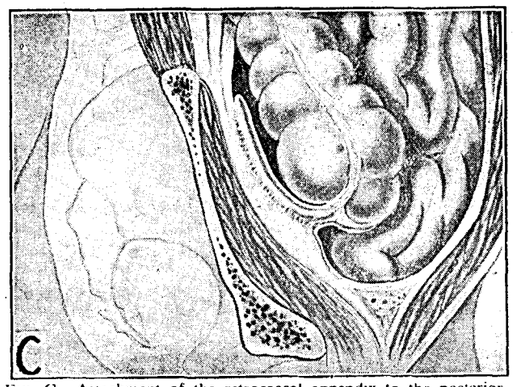


FIG. C.—Attachment of the retrocaecal appendix to the posterior abdominal wall in the right iliac fossa.

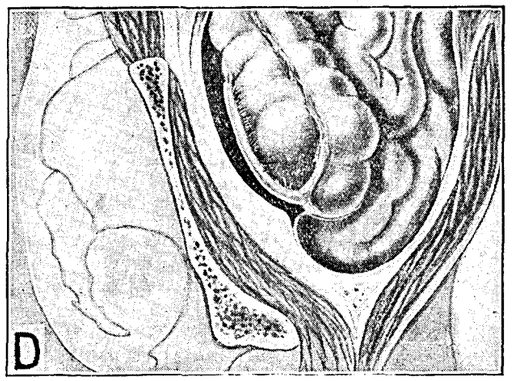


FIG. D.—The retrocaecal appendix attached to the posterior wall of the caecum

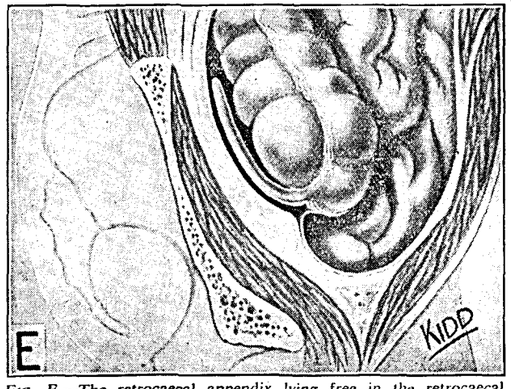


FIG. E.—The retrocaecal appendix lying free in the retrocaecal fossa.

Material.—During the 31 months, February, 1947, to August 31, 1949, 217 appendicectomies were performed by one of us. There were no deaths. It has been thought worth while to review the pathology of the appendix as illustrated in this series and to discuss the treatment of appendicitis.

SIR CECIL WAKELEY AND P. CHILDS: APPENDICITIS



FIG. 1.—Case 40. Mucosa intact; no abnormality in the outer coats apart from vascular dilatation in the subserosa. (× 25.)



FIG. 2.—Case 206. Intense congestion of vessels of the subserosa. Muscle coat oedematous and mucosa intact. (× 25.)



FIG. 3.—Case 17. Showing the earliest changes of an acute inflammatory reaction in subserosa and muscle coats. (× 25.)



FIG. 4.—Complete destruction of the mucosa; all outer coats are heavily infiltrated with polymorphonuclear cells. (× 25.)



FIG. 5.—Section of the distal part of the appendix shows complete replacement of lumen and mucosa by fibro-adipose tissue. (× 25.)

A. J. N. WARRACK: TUBEROUS SCLEROSIS

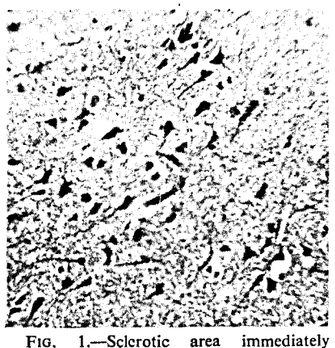


FIG. 1.—Sclerotic area immediately below surface of cortex. Phosphotungstic acid; haematoxylin. (× 300.)

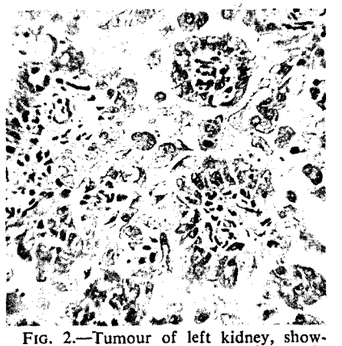


FIG. 2.—Tumour of left kidney, showing adenocarcinomatous type of growth. H. and E. (× 300.)

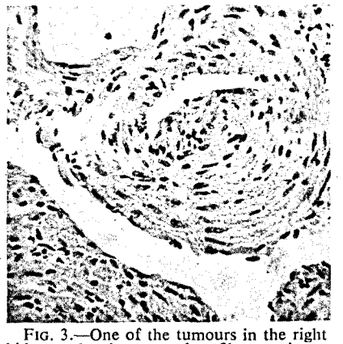


FIG. 3.—One of the tumours in the right kidney, showing vascular fibrous tissue. H. and E. (× 300.)

F. E. CRAWLEY: ERYTHEMA NODOSUM AND BOECK'S SARCOIDOSIS

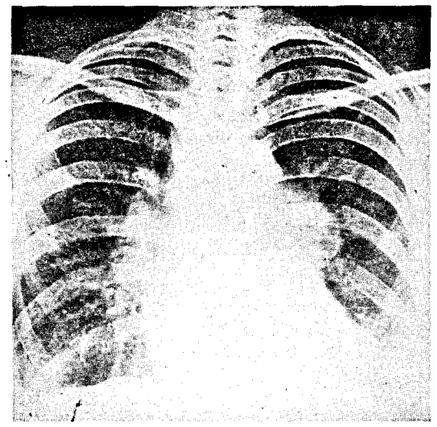


FIG. 1.—Case 1.

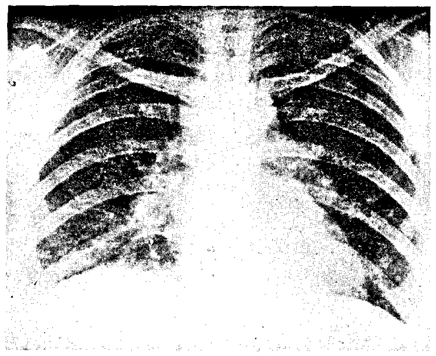


FIG. 2.—Case 2.

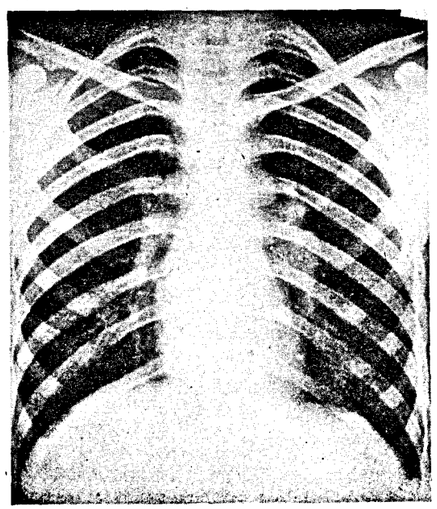


FIG. 3.—Case 3.

A. BOGDAN and J. CLARK: MANUBRIO-STERNAL JOINT IN RHEUMATOID ARTHRITIS



FIG. 1.—Lateral radiograph of sternum, showing irregular destruction of the articular margins of the manubrio-sternal joint (Case 1).



FIG. 2.—Radiograph showing expansion of articulating bone ends with gross irregular narrowing of the joint space (Case 2).



FIG. 3.—Radiograph showing irregular bony expansion at the joint with erosion of joint margins and irregularity of the joint space (Case 4).



FIG. 4.—Radiograph in a normal woman aged 65 showing naturally occurring synostosis of the joint. Note the smooth continuity of the bony surfaces.

Pathology in "Acute" Appendicitis

Table III sets out the pathology found in 168 appendicectomies performed as emergencies.

TABLE III

	No. of Cases
Acute suppurative appendicitis:	
Uncomplicated	61
Non-perforated, with early general peritonitis	4
Non-perforated, with abscess	2
Perforated, with general peritonitis	6
Perforated, with abscess	2
Associated with faecaliths	4
Associated with "kinking" of appendix and localized peritonitis	1
Associated with faecalith, perforation, abscess, and local peritonitis	3
Acute gangrenous appendicitis	3
With early general peritonitis	2
With faecalith and established general peritonitis	3
With abscess	1
Late general peritonitis due to acute suppurative appendicitis	2
Appendix abscess drained	4
Acute suppurative appendicitis with evidence of past inflammation	9
Vascular dilatation in the outer layers of the appendix	1
Chronic appendicitis	10
Normal appendices	15
Containing faecaliths	16
Adherent	4
Removed from children under the age of 13	10
Containing worms	1
Misdiagnoses (pyelitis, lymphoid hyperplasia of terminal ileum, pneumonia)	3
Unknown pathology	1

The earliest case operated on was that of a medical student aged 28 (Case 40). He gave a history of only 2½–3 hours, but the signs and symptoms were typical of appendicitis and he had vomited much. The pathologist's report on his appendix is interesting (Plate, Fig. 1): "An appendix 9 cm. in length. Its mesentery is very fatty. The serosal surface is congested, but the lumen is patent throughout, and the mucosa is normal. Section shows an intact mucosa and no abnormality in the outer coats apart from vascular dilatation in the subserosa. There is no inflammatory infiltration."

The exact significance of this vascular dilatation is difficult to determine. It may, in view of the shortness of the history, represent the earliest stage of inflammation. It is impossible to be dogmatic about this, but it is worth noting that in the "acute" series five cases, and in the "elective" series two cases, in which the pathologist reported macroscopically and microscopically no evidence of inflammatory change, it was noted at operation that there was abnormally marked injection of the serosal vessels of the appendix.

Whatever may be the significance of vascular dilatation, 7 of the 61 cases of acute suppurative appendicitis indicated clearly that the infection of the appendix did not begin in the lumen. In none of these appendices was the lumen in any way obstructed, nor was there evidence of involvement of the mucosa. Typical reports from pathologists are as follows:

Case 206.—A boy aged 12½ (Fig. 2). "Section shows intense congestion of the vessels of the subserosa, which is heavily infiltrated by polymorphs and covered in a few areas by fibrinopurulent exudate. The muscle coat is oedematous, and is infiltrated by moderate numbers of polymorphs. The mucosa, which is intact, is least involved by this acute suppurative process, which appears to have started in the outer layers."

Case 17.—A boy aged 15 (Fig. 3). "Section showed the earliest changes of an acute inflammatory reaction in the subserosa and muscle coats."

The shortest history in these seven cases was 12 hours, the longest four days. All patients were between 8 and 22 years of age. None complained of nausea, and there was slight vomiting in only two cases.

Two pathological reports among the remaining 54 cases of uncomplicated acute suppurative appendicitis were as follows:

Case 89.—A man aged 29, 18 hours' history. "*The proximal* third of a 9-cm. appendix is covered with fibrinous exudate. The lumen is patent throughout and there appears to be some diffuse superficial ulceration of the mucosa. Section shows *acute suppurative appendicitis* with extensive mucosal ulceration and oedema, and polymorphonuclear infiltration of all the coats of the organ."

Case 71.—A man aged 41, 12 hours' history. "The lumen of an 11-cm. appendix is patent throughout. The proximal 2 cm. shows congestion and ulceration of the mucosa. Elsewhere the mucosa is intact, but the organ is dilated. Section through the proximal part shows early ulceration of the mucosa and diffuse and focal polymorph infiltration of the outer coats."

In none of these cases was there evidence of a causative obstructive lesion. But Case 71 does illustrate how inflammatory swelling of mucosa in the proximal part may cause obstruction secondarily.

The length of history in these 54 cases lay between 8 and 48 hours. The age incidence was as follows:

0–10 years	8 cases	41–50 years	4 cases
11–20 "	21 "	51–60 "	1 case
21–30 "	15 "	61–70 "	1 "
31–40 "	4 "		

Where the disease had progressed beyond the stage illustrated by these 54 cases we found complications.

Acute suppurative appendicitis was found with early general peritonitis in four cases, in which a seropurulent fluid was disseminated throughout the general peritoneal cavity; the bowel was injected along its whole length. A typical pathological report was as follows (Fig. 4): "The distal half is covered with inflammatory exudate, and shows mucosal ulceration. Section shows complete destruction of the mucosa, and all the outer coats are heavily infiltrated with polymorphonuclear cells."

The history in all four cases ranged from 24 hours to 3 days. All the appendices were lying free in the peritoneal cavity, one being anterior and pre-ileal and three being subcaecal.

The acute suppurative appendix can, without perforation, give rise to an abscess. This was found in Case 23, that of a girl aged 4¾ with a 48-hour history, in whom a small abscess was walled off by omentum round an unperforated appendix. And in Case 47, a woman aged 39, with an eight-day history, an abscess was found round an appendix which the pathologist described as follows: "The distal third of an appendix 7 cm. long is surrounded by a ragged mass of haemorrhagic tissue. The lumen is patent and there is no obvious ulceration of the mucosa. Section through the distal part shows it surrounded by a mass of haemorrhagic granulation tissue which is heavily infiltrated by polymorphs. The inflammation extends through the muscle coats into the submucosa, but the mucosa is intact."

In six cases perforation of acute suppurative appendices occurred, and general peritonitis ensued, with free pus in the peritoneal cavity. In Case 85, a man aged 37 with a five-day history of pain in the right iliac fossa, the pathologist's report was: "The specimen consists of an appendix 5 cm. long. The mucosa is extensively ulcerated, and perforation has occurred in the middle third of the organ, where its wall is completely necrotic."

The length of history in these cases ranged from 36 hours to 5 days. A feature worthy of note was looseness of and frequency of motions in four of the six cases. This symptom was associated with both pelvic and retrocaecal appendices. The ages of the patients were 7, 11, 15, 36, 37, and 50 years.

In two cases of acute suppurative appendicitis, one retro-ileal with a 36-hour history, the other subcaecal with a 56-hour history, perforation of the appendix occurred with localization and formation of an abscess. Adjacent loops of small bowel formed the abscess wall.

Abscess formation is a complication of acute suppurative appendicitis, but abscess formation may itself be complicated by general peritonitis. In Case 1, that of a woman aged 62, a diagnosis of general peritonitis was made preoperatively. At operation this was found to be due to spread from an abscess cavity lying behind the caecum; while in Case 5, that of a girl aged 17½ with an eight-day history of abdominal pain, general peritonitis was found to be due to spread from an abscess which had formed round a pelvic appendix.

Four acute suppurative appendices were complicated by the presence of faecaliths. The histories ranged from 24 to 48 hours. Vomiting was a marked feature in two cases, where the faecalith was clearly obstructing the lumen. Colic was pronounced in the third case. In the fourth case neither colic, nausea, nor vomiting was complained of.

In Case 132, that of a man aged 32 with a four-day history, the patient complained of copious vomiting and much colic, and an acute suppurative appendicitis, with a kink obstructing the lumen, and local peritonitis of the adjacent bowel were found. The appendix was lying retrocaecally.

Acute gangrenous appendicitis was found in three cases —two girls aged 17 and 14 years, and a boy aged 6. The histories ranged from 24 to 48 hours, and the appendix was in one case retro-ileal, in one pelvic, and in one retrocaecal. There was a localized peritonitis round the appendix in all three cases; in two of the cases faecaliths were obstructing the lumen. In Case 131, that of a boy aged 6 with a 24-hour history, the pathologist reported: "The lumen of a 7.5-cm. appendix is obstructed 2.5 cm. from the tip by a hard pellet of laminated faecal material. Beyond this point the wall is gangrenous, the serosa is covered by fibrinous exudate, and the lumen is filled with pus." In all these cases persistent vomiting was a marked feature.

In two cases acute gangrenous appendicitis led to early general peritonitis, with foul-smelling seropurulent fluid free in the peritoneal cavity, in 36–60 hours. In Case 60 the pathologist reported: "The appendix, 6 cm. in length, shows the typical naked-eye appearances of late acute suppurative appendicitis. Section shows almost complete destruction of all the coats of the organ." In one of these cases the appendix was retrocaecal, in the other pelvic. In one vomiting was a marked feature.

Two cases of acute gangrenous appendicitis in association with a faecalith perforated and gave rise to well-established general peritonitis, after 48 hours in one case and five days in another. In both cases vomiting was a marked feature. One appendix was pelvic, the other retrocaecal. In Case 111, that of a man aged 32 who gave a history of three days' abdominal pain but who had not vomited at all, the pathologist reported: "The mucosa of the proximal half of the appendix is dark and ulcerated. The wall is thickened and the serosa covered by exudate. Beyond this the lumen is obstructed by a faecalith, and beyond this faecalith the wall is thin, completely necrotic, but not yet perforated.

In Case 40, that of a man aged 72 with a five-day history, a gangrenous retrocaecal retroperitoneal appendix was found surrounded by an abscess.

In four cases of appendix abscess which were drained only, the appendix was removed at a later date. In Case 204, that of a woman aged 49, the pathologist's report on the appendix removed one year later was: "The wall of the appendix is thickened, and the lumen of the terminal ¾ in. (1.9 cm.) is obliterated. No section was made."

In Case 55, that of a man aged 46, the pathologist reported six months after the abscess was drained (Fig. 5): "The middle part of an appendix 4 cm. long is replaced by a thin fibrous cord, and the distal part of the lumen is obliterated. Section of the distal part shows complete replacement of the lumen and mucosa by fibro-adipose tissue."

Perhaps the most intriguing finding is in Case 29, that of a boy aged 3 years who had an appendix abscess drained, and four months later had his retrocaecal appendix removed. The pathologist reported: "The specimen consists of an appendix 4 cm. in length. There is some patchy congestion of the serosa. The lumen is patent throughout. The mucosa and muscle coats show no naked-eye abnormality. Section shows an intact mucosa with no evidence of past or recent inflammatory change in the submucosa or subserosa."

There were nine cases in which acute suppurative appendicitis was found in appendices showing evidence of previous pathological change. In Case 195, that of a woman aged 63 who had a long history of dyspepsia and a recent history of 48 hours' pain in the right iliac fossa, there was localized peritonitis, and free pus was found round an anterolateral paracolic appendix, the lumen of which was obliterated, while the tip was patent, the site of acute suppurative appendicitis, and perforated. She had not vomited. In contrast, in Case 129, that of a woman aged 43 with a 24-hour history, acute suppurative appendicitis was found in the proximal part of the appendix, the tip of which was not inflamed. She had vomited much, and had looseness and frequency of bowel motion. In two other cases the distal part of the appendix was obliterated by fibro-adipose tissue, while the proximal segment was the site of an acute suppurative process. In two others there was proximal obliteration of the lumen, with a distal acute suppurative process. In three cases there was thickening of the wall with subserosal and submucosal fibrosis. In at least one of these cases there was no previous history of abdominal pain.

In the 10 cases reported as chronic appendicitis by the pathologist, the lesions found were: submucosal fibrosis in six cases; subserosal fibrosis in five cases; and obliteration of the lumen, in part, in seven cases.

In Case 92, that of a woman aged 34 with a history of previous attacks and a recent history of 24 hours, the report was: "The middle quarter of an appendix 5 in. (12.7 cm.) long is almost obliterated, and reduced to a thin cord. There is slight dilatation beyond this, and it contains mucoid material. Section shows well-developed submucosal and subserosal fibrosis." Such an appendix might well have developed into a mucocele of the appendix.

Pathology in "Chronic" Appendicitis

Table IV shows the pathology of the appendix in those cases in which it was removed as an elective procedure (39 cases).

TABLE IV

Acute suppurative appendicitis	4
Chronic appendicitis	9
Vascular dilatation of outer layers of the appendix	2
Normal appendix	12
Normal appendix containing faecaliths or inspissated faeces	7
Normal appendix associated with kink	1
Normal appendix associated with adhesions	4

There were four cases in which the appendix showed acute suppurative appendicitis.

Case 80.—A woman aged 41 had had attacks of pain in the right iliac fossa on and off for four years. Her first attack began with pain in the right iliac fossa, and later she felt sick and vomited several times. The second attack was two years later. It lasted for two days with pain which was not so severe as in the first attack. She felt some nausea but did not vomit. Her tongue felt "rough," her appetite was poor, and she felt constipated. Since then she has had frequent mild attacks of similar character at intervals of three to six months, and in the last attack she had some diarrhoea.

Examination on admission showed only one abnormal finding —namely, tenderness in the right iliac fossa. Operation showed the appendix to be adherent in the pelvis. The pathologist reported: "The lumen of the 6-cm.-long appendix is patent throughout. The mucosa and outer coats show no macroscopic abnormality. Section shows a very early stage of acute suppurative appendicitis with focal polymorphonuclear infiltration in places. The lumen contains purulent exudate, and there is oedema of the outer coats."

In the other three cases intermittent pain in the right side was the only prominent symptom, and tenderness in the right iliac fossa the only sign. In one case the barium meal and follow-through examination was negative, and in one the radiologist reported chronic appendicitis. In all three the pathologist reported acute suppurative appendicitis with ulceration of mucosa.

In the nine cases reported by the pathologist to be chronic appendicitis the lesions found were: obliteration of the lumen by fibro-adipose tissue, five times; submucosal fibrosis, five times; and subserosal fibrosis, three times.

In both the "acute" and the "chronic" series there were appendices which were normal macroscopically and on histological examination. The significance of such "lily white" appendices has been discussed elsewhere (Childs, 1949).

Mode of Infection

In this series of cases evidence is heavily in favour of infection by the blood stream. Those appendices showing early changes have changes in the outer layers. Inflammation and ulceration of the mucosa occur relatively later in the disease.

Mechanical obstruction of the lumen of the appendix does not seem to play any part in the initiation of acute appendicitis. When acute suppurative infection occurs in an appendix which shows evidence of previous inflammation it is as likely to be found proximal to an obliterated part of the lumen as it is to be found distal (See Cases 195 and 129 above). When the infection is distal to an obliteration of the lumen the mechanical obstruction produces a secondary effect. It causes a rise in tension in the distal part, and perforation may result therefrom. It is our impression that faecaliths play no part in the initiation of disease; but when the appendicular tissues around a faecalith become swollen and infiltrated the faecalith acts as an immovable object and causes pressure necrosis and perforation. It is significant, too, that faecaliths are so often found in association with acute gangrenous appendicitis.

Those cases of acute suppurative appendicitis in which there is no perforation but a localized or generalized peritonitis or an abscess also point to blood-stream infection; for in these cases it is sometimes found that the mucosa of the appendix is not involved in the inflammation.

In none of our cases has there been any evidence to suggest spread of infection from within the lumen of the appendix.

Diagnosis

It is not our intention here to recapitulate the signs and symptoms of appendicitis. They are well known. But we do wish to emphasize one or two points. In a case of uncomplicated appendicitis there is no place for "expectant" treatment. The case is one of acute appendicitis requiring urgent operation, or it is a case of chronic appendicitis in which operation may be performed as an elective procedure. There are several features of the presentation of the case which may help in the making of a decision:

(*a*) Where symptoms which were intermittent have become constant or more frequent, or where there has been sudden and definite aggravation of the symptoms, operation should be regarded as urgent.

(*b*) Where fetor of the breath is appreciated, pungently but not constantly, just as one appreciates the scent of roses on a summer evening, operation must be considered urgent.

(*c*) Absence of pyrexia has no significance, but when slight pyrexia is associated with the signs and symptoms of appendicitis operation must be looked upon as urgent.

(*d*) Where vomiting and looseness of the bowel are prominent features of the history operation should be regarded as urgent.

(*e*) When pain is experienced in the left iliac fossa and maybe spreads upwards to the left costal margin, but is associated with tenderness in the right iliac fossa, the appendix will be found lying in the pelvis and extending across the midline. Operation should be considered urgent in such cases.

(*f*) In children, if it is thought that they may have appendicitis, operation is always urgent.

(*g*) The path of development of the appendix must be remembered. Where the caecum is undescended an appendicitis may give rise to pain and tenderness high up under the costal margin; or the caecum may have descended into the pelvis, and tenderness may be found only per rectum.

Treatment

1. *Chronic Appendicitis.*—Elective appendicectomy was performed through a muscle-split incision in the right iliac fossa. This incision was used in females as well as males whenever the diagnosis was assured. The wound was closed without drainage and the patient was allowed—nay, rather encouraged—to walk the next day, and if home circumstances were satisfactory the patient was sent home on the third or fourth post-operative day. A paramedian incision was used only rarely, when it was thought desirable to explore the abdomen.

2. *Acute Appendicitis.*—Urgent appendicectomy was performed through a muscle-split incision in the right iliac fossa. The muscle split incision can readily be converted, for greater ease of access in difficult cases, into a muscle cut as used by the Newcastle school and originally described by Rutherford Morison. The peritoneum was closed without drainage. The skin was also closed without drainage unless it was thought that it might have been contaminated. In the event of complications being found at operation, treatment was modified as follows:

(*a*) If there was an appreciable quantity of seropurulent fluid in the abdomen, with an early general peritonitis, the peritoneal cavity was cleared of this, so far as was possible, by sucker and gauze mops, particular attention being directed to the pelvis and the right paracolic gutter. The peritoneum was closed without drainage, but the wound was drained. The patient was treated post-operatively with continuous gastric suction, nothing by mouth, and intravenous saline and glucose-saline, until the gut moved again spontaneously.

(*b*) Where appreciable involvement of adjacent viscera by local peritonitis was found the appendix was removed, 10 g. of sulphathiazole and penicillin powder dusted over the affected area, the peritoneum closed without drainage, and the patient

treated post-operatively with continuous gastric suction, nothing by mouth, and intravenous saline and glucose-saline. Only in the more severe cases were systemic penicillin and sulphadiazine given.

(c) Where an abscess was found surrounding the appendix the appendix was removed whenever possible, the cavity cleared of sloughs (and faecaliths, if present), 10 g. of sulphathiazole and penicillin powder was dusted into the cavity, and the peritoneum was closed without drainage, but the wound was drained. The patient was given penicillin and sulphadiazine systemically, post-operatively. And if the abscess was not completely retrocaecal, post-operative suction and intravenous drip therapy was used.

3. Where the patient presented as a case of well-established late general peritonitis it was not possible to be certain pre-operatively that the appendix was the cause. Paramedian incision was used in these cases; a drainage-tube was placed in the pelvis and a stab drain into the right iliac fossa, and the wounds were closed. The patient was given systemic penicillin and sulphadiazine and treated with gastric suction and intravenous drip therapy. The appendix was removed through a muscle-cut incision in the right iliac fossa later.

4. Where the patient presented with an appendix abscess, a muscle-split incision in the right iliac fossa was used. The appendix was not removed unless it was readily accessible. If the appendix was not removed a drain was placed into the abscess cavity after it had been cleared of pus and sloughs (and faecaliths, if present). If the appendix was removed the cavity was dusted with penicillin and sulphathiazole powder, and the peritoneum closed without drainage, though the wound was drained.

Complications

In our series there were no deaths. Table V gives a list of the complications which developed post-operatively.

TABLE V.—*Post-operative Complications*

Respiratory	Slight	3
	Moderate	7
	Severe	1
Wound infection	Slight	6
	Severe	6
Persistent sinus		1*
Pelvic abscess		3†
Thrombophlebitis in calf		1
Penicillin urticaria		2
Irritation of skin due to penicillin		1
Prolapse of omentum along drainage-tube track		1

* Actually shown by lipiodol injection to be a fistula leading through the appendix into the caecum following drainage in an eight-day case of general peritonitis. There was no faecal discharge.

† All cases of general peritonitis—1 developed on fifth day and discharged P.R. on tenth day; 1 developed on seventh day and discharged P.R. on eleventh day; 1 developed on 24th day and resolved by 36th day.

Mortality before the Advent of Sulphonamide and Penicillin Therapy

Bailey (1932) reported a mortality of less than 1% in those cases of acute appendicitis operated on within 12 hours of onset. If operation was delayed until 36 hours after onset the mortality rose to 11–18%. Peritonitis was the cause of death in more than 80% of fatal cases. Christopher and Jennings (1932) reported a mortality of approximately 5% in cases of acute appendicitis.

Holcomb (1932) reported 5 deaths in 153 (3.3%) cases of acute appendicitis. One death occurred in a case of acute suppurative appendicitis, three in cases with perforation and general peritonitis, and one in a case with gangrenous appendicitis and general peritonitis. Rayner (1933) had 17 deaths in 347 cases (4.9%); the proportion of "early" cases in the series (that is, within 24 hours of onset) was 25%. Garlock (1934) reported a mortality of 4.6% in 433 cases. Nuttall (1934) quotes McNeill Love: operation on first day, 1.1% mortality; on second day, 2.8% mortality; on third day, 10.3% mortality.

Comment

In 1932 Shipley and Bailey were advising strongly against the use of drainage-tubes inside the peritoneal cavity. They increase the formation of adhesions and the liability to the production of post-operative obstruction. They need only be used, in our experience, in those cases in which the appendix is not removed.

Peritonitis was the commonest cause of death in days gone by. Provided the appendix is removed or the site of the appendix is drained, few patients need now die of peritonitis if systemic sulphonamide and penicillin therapy is used, the bowel is put completely at rest by the use of continuous gastric suction, and intravenous fluids are given to maintain the electrolyte balance until the bowel moves once again of its own accord.

Since McNeill Love (1933) advocated expectant treatment for cases of appendicitis with localized peritonitis, the following have been added to the surgeon's armamentarium: sulphonamides, penicillin, intravenous drip therapy, and gastric suction.

This new armamentarium has increased the safety of immediate operation in the presence of localized peritonitis. In the above series of cases, expectant treatment was practised only three times; in all three cases—two of abscess and one of appendix mass—the local signs indicated spread during the time the patient was watched, and operation was therefore performed.

Conclusions

Early diagnosis and early operation remain the most important factors in reducing mortality due to appendicitis.

If the diagnosis is appendicitis, and if it is clearly not chronic, operation is urgent. There is no place for expectant treatment.

Sulphonamide and penicillin should be used locally in the peritoneal cavity if there is an abscess or much local peritonitis, but the peritoneal cavity should never be drained if the appendix has been removed. Sulphonamide and penicillin should be given systemically whenever inflammation is widespread.

If there has been soiling of the general peritoneal cavity, or involvement of loops of small bowel in local peritonitis or in the wall of an abscess cavity, treat the patient with continuous gastric suction and intravenous drip therapy post-operatively until the bowel moves again of its own accord.

Always drain the wound if there is danger of contamination.

We wish to express our thanks to Mr. E. G. Muir, under whom some of these patients were admitted; Professor H. A. Magnus and his pathological department; Mr. W. Smith, of the photographic department, for the photomicrographs; and Miss Fern and her Record Office staff.

REFERENCES

Bailey, F. W. (1932). *Ann. Surg.*, **96**, 530.
Childs, P. (1949). *Med. Pr.*, **222**, 95.
Christopher, E., and Jennings, W. K. (1932). *Amer. J. Surg.*, **18**, 16.
Cunningham, D. J. (1931). *Textbook of Anatomy*, 6th ed., Oxford University Press, London.
Garlock, J. H. (1934). *Amer. J. Surg.*, **23**, 248.
Holcomb, O. W. (1932). *Minn. Med.*, **15**, 458.
Love, R. J. McN. (1933). *Lancet*, **1**, 1229.
Nuttall, H. C. W. (1934). *Brit. J. Surg.*, **21**, 411.
Rayner, H. H. (1933). *Proc. R. Soc. Med.*, **26**, 185.
Registrar-General (1940–5). *Statistical Review of England and Wales*. Text, vol. 1, Medical. London.
Shipley, A. M., and Bailey, H. A. (1932). *Ann. Surg.*, **96**, 537.
Wakeley, C. P. G., and Gladstone, R. J. (1928). *Lancet*, **1**, 178.

CARE OF THE TUBERCULOUS IN THE HOME*

BY

F. R. G. HEAF, M.D., F.R.C.P.

Professor of Tuberculosis, University of Wales

At the end of 1948 there were approximately 210,000 cases of tuberculosis on the dispensary registers; 180,000 of these were respiratory tuberculosis, and about 100,000 of them were expectorating tubercle bacilli. Every one of these cases was a potential source of spread of the disease. At the same time approximately 30,000 beds were occupied by patients suffering from respiratory tuberculosis; about one-third of these patients would not be infectious, so that 20,000 of the positive cases were in-patients, leaving 80,000 patients, most of whom were expectorating tubercle bacilli, among the general population. This is a minimum figure, as mass radiography surveys show that there are at least three unknown cases with active disease among every 1,000 adults between the ages of 15 and 45. If these are taken into account another 57,000 persons must be added, making a grand total of 137,000 cases of respiratory tuberculosis with active disease under domiciliary conditions. It is the care of this great army of infectious and potentially infectious persons that is the problem we have before us.

It will not be denied that every case with a positive sputum constitutes a public health problem, and in most instances a medical one, too, so that the subject is of major importance in any tuberculosis scheme. Curiously enough, the attention given to it bears little relation to its magnitude and significance. The problem has come into prominence in recent years because of the shortage of institutional beds. We have been forced to treat patients in their homes, and we are finding out that much can be done to benefit them: in some instances actual recovery can be effected without resorting to institutional care. The number of patients treated in their homes who return to normal life and work without danger of spreading tuberculosis to their fellows is increasing every year. This is a most significant change in tuberculosis administration, and will have a profound effect upon the future development of public health programmes.

Approach to the Problem.—The problem may be approached from two points; first, from consideration of the requirement of the individual to recover or maintain a good state of health; and, secondly, from the need of the community as a whole to be protected from the risk of contracting the disease. In other words, we have the curative aspect and the preventive aspect, neither of which must be allowed to eclipse the other.

The Curative Aspect

Although the results of domiciliary treatment are becoming known, most persons suffering from tuberculosis are still recommended for a period of sanatorium treatment. It is possible that this slavish adherence to the prescribing of this form of treatment has become a habit, and a more enlightened approach to the management of all cases might be established by asking ourselves in every case if sanatorium treatment is really necessary. In present circumstances, whatever the answer may be, most patients will be treated at home for a long period. It is only recently that the problem of pre-sanatorium domiciliary care has become a matter of importance, and we must realize that it has come to stay for a number of years. It is therefore worthy of close attention and detailed study.

*Read in opening a discussion at a combined meeting of the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the British Medical Association, Liverpool, 1950

Pre-sanatorium Period

When tuberculosis has been diagnosed the management of the case will depend greatly on the social circumstances; but, whatever these may be, it is essential that the family appreciates the implications of the diagnosis and that certain obligations fall on all its members to play their part in assisting the patient towards recovery. In this matter it is highly probable that the general practitioner can be of considerable help, as he usually has a better acquaintance with the individual peculiarities of each member of the family, and knows best how to deal with them. It is important, however, that the chest physician and the general practitioner agree on the line of treatment to be pursued. A most unfortunate situation would arise if the former advocated rest in bed and quiet, whilst the other recommended basking in the sun on the hill-tops. It is hoped that neither of these physicians will cause unrest and discontent by arguing with the patient and members of the family about the National Health Service Act, and enlarge upon the fact that there are not enough sanatorium beds to allow for the immediate admission of patients to institutional treatment. However much we may fume within ourselves, such agitation does nothing but harm if passed on to the patient.

It will be agreed that during this pre-sanatorium period, which may be as long as nine months, the one important lesson the patient has to learn is the need for rest of both mind and body. Every instruction and piece of advice to the family must be designed to promote an atmosphere of calm patience in the home, thus providing the foundation on which treatment depends—treatment that quite often reduces the duration of the subsequent period at a sanatorium and sometimes eliminates the necessity for it altogether. I would say that three essentials in successful home treatment are (1) the full co-operation of the patient and the family; (2) freedom from financial anxiety; and (3) the possibility for the patient to obtain the necessary rest in bed. There are other essentials; but these are of primary importance, and without them success cannot be obtained. Adequate physical rest is complementary to peace of mind, and the spectre of want can easily destroy both.

In some homes it is impossible to create an atmosphere that is conducive to recovery. The experienced chest physician will soon become aware of this and not attempt the impossible. Patients in these households must be sent to sanatorium or hospital to escape the nerve-racking of such conditions, the most frequent cause of which is overcrowding. Where this exists, domiciliary care is extremely difficult, and priority of admission to an institution should be given to all such cases. If this is not done, money and labour will be wasted, for domiciliary treatment costs money and involves a great deal of work for the staff of the chest clinic.

It is a big mistake to think that treatment of patients at home can be organized without considerable expenditure, and both regional hospital boards and local health authorities must be prepared to vote money so that the necessary facilities may be provided. It is cheaper than sanatorium treatment, but that does not mean that it costs nothing. Money must be found to provide an adequate

ambulance service, sufficient home helps, good equipment for the chest clinic, and enough health visitors and handicraft instructors to give every patient the full attention he needs. Home helps are the key to the problem of relieving the patient of domestic worries. We all know how difficult housekeeping has become these days. If the patient happens to be the mother of the family, she can obtain no rest without a generous provision of labour in the form of home helps. To start a scheme of domiciliary treatment without home helps is like running an engine without oil.

Domiciliary care becomes increasingly difficult with the lowering of the standard of living and the morals of the home. In fact, in certain areas the factors that we know to be the predisposing causes of tuberculosis are present to such a degree that it is useless to try to establish domiciliary care until they are removed. In this problem, as in others connected with tuberculosis, we must be realists and deal with fundamentals, otherwise we shall waste much money in attempting to achieve the impossible.

Special Treatments

There are, however, homes in which domiciliary treatment can be carried out with success; and where this is so the enthusiastic physician will often be of the opinion that, although adequate rest has been secured for the patient, more can be done by the application of special treatments in the form of collapse therapy, postural rest, and antibiotics and chemotherapeutics. It must be realized that the inability to exercise close supervision over the patient introduces an element of risk into the administration of special treatment in the home. If there is sufficient staff at the chest clinic to provide frequent visits to the patient, and a good ambulance service to ensure the attendance of the patient at the clinic for adequate radiographic control, then much can be done to reduce these risks to a minimum.

Active domiciliary treatment throws a great strain on the chest clinic and a considerable amount of extra work on the staff. We all know that with collapse therapy certain complications often arise. Adhesions need cutting, fluid has to be aspirated, phrenic operations may be necessary, and, occasionally, emergency admission to hospital must be provided owing to the development of an empyema or a bronchial fistula. These complications can be avoided by inducing a pneumoperitoneum instead of a pneumothorax, but even here it is usually necessary to have the services of a surgeon.

Existing Schemes

Three different schemes have been developed to provide special treatment in the home during the pre-sanatorium period. In Glasgow in 1943, under the direction of A. Maclean and J. S. Gemmill, four beds were reserved in Baird Street Auxiliary Hospital, to which selected patients awaiting admission to sanatorium, and suitable for collapse therapy, were admitted. Artificial pneumothorax was induced on the day of admission, and the first and second refills were given on the following days. Some hours after the second refill the patient was sent home by ambulance, and rest in bed continued at home; refills were given at the hospital on the fifth or sixth day after induction and subsequently at weekly intervals. A report on 150 consecutive cases treated in this way shows that 20 to 33 months after induction the result was satisfactory in 82 cases, and in 65 (43%) recovery was obtained without any institutional treatment (Maclean and Gemmill, 1948). Sputum conversion occurred in at least 36%.

A modification of the Glasgow scheme has been adopted by Wynn-Williams, Shaw, and Mashiter (1950) in Bedfordshire, where selected patients suitable for collapse therapy, and others in need of emergency treatment, are given priority of admission to sanatorium, but when they are ambulant for two hours they receive their discharge to enable treatment to be carried on at home, with medical supervision at the chest clinic or sanatorium. In this scheme chronic cases with good home conditions are not admitted to institutional beds, but are given necessary treatment at home. In selected cases phrenic crush, pneumoperitoneum inductions, and bronchoscopies are performed on out-patients.

Heller (1949), at Hounslow, induces artificial pneumothorax or pneumoperitoneum, and is not averse to giving streptomycin while the patient is under domiciliary treatment. Phrenic crush is performed on selected cases in the out-patient department. Of the 50 cases in which artificial pneumothorax treatment was attempted, a successful induction was obtained in 33, and the disease was arrested in 11 and made quiescent in 19. Five of the artificial pneumothorax cases developed fluid. Pneumoperitoneum was induced in 150 cases and had to be abandoned in only 11. Eight of the artificial pneumothorax cases were treated entirely at home, and 25 were admitted to sanatorium for short periods for adhesion section.

James Cuthbert (1950) by careful selection of cases has had good results when admitting patients to hospital for successive periods of from three to five nights for the induction of a pneumoperitoneum with a phrenic crush, later for artificial pneumothorax induction, and, finally, if necessary, for adhesion section. In this way collapse therapy is established without undue risk while the patient is at home, and the danger of the development of progressive disease during the waiting period before sanatorium treatment is considerably diminished.

Toussaint has carried out domiciliary collapse therapy for a number of years, and at Tottenham he has been giving artificial pneumothorax and pneumoperitoneum treatment whilst the patient remained at home. He has had very encouraging results, achieving quiescence in 60% of cases. The organization of the scheme is worthy of close study, as it is a model of its kind. While in no way detracting from the value of the work, it must be noted that the Willesden Chest Clinic is very well staffed, the Central Middlesex Hospital is most co-operative in every way, the services of a thoracic surgeon are readily available, the area served by the clinic is mainly of the artisan and lower-middle-class type, and, most important of all, a large number of home helps are available. These conditions and facilities are not always easy to obtain, but that does not mean that we should be deterred from extending the trail that has been blazed by the enthusiastic work of an energetic chest physician. To-day domiciliary treatment is a necessity, and Toussaint has shown us what is needed to produce good results.

Administration of Special Treatments

It will be agreed that, although the administration of special treatments under domiciliary conditions may not be a method of choice and has been adopted only because the bed situation causes such a long waiting period for admission to sanatorium, it can nevertheless be carried out successfully and be of benefit to the patient. Those who have practised it are unanimous on four points: (1) it throws a very heavy strain on the staff of the chest clinic: (2) the chest clinic must be well equipped; (3) it is necessary to have a good and efficient ambulance service at the disposal of the chest physician; and (4) the latter must have complete control of the patient during domiciliary treatment and during periods of admission to sanatorium or hospital for special procedures. There must therefore be close co-operation between the chest physician and the medical superintendent of the hospital.

To these points I would add that the services of a thoracic surgeon must be available when required, and the local health authority should show a sympathetic interest in the work and provide the means to enable the patient to procure adequate rest at home. I would emphasize that in all domiciliary treatment there must be complete agreement and mutual co-operation between the local health authority and the regional hospital board, as each of these bodies has a special responsibility in the matter, and if quibbling about payments and providing services is allowed to arise, administration of the scheme will be difficult and probably impossible.

Very little has been written on the administration of streptomycin and P.A.S. under domiciliary conditions, but there is no doubt that these drugs are being tried on an extending scale now that both are cheaper and are available to all. There is no objection to the use of P.A.S. in domiciliary treatment, except that the drug's efficiency when used alone is still debatable; but streptomycin is in a quite different category, and if indiscriminately prescribed can do more harm than good. The use of streptomycin should be controlled by drug-sensitivity tests, and a careful watch should be made for the development of complications. These precautions are difficult to maintain under domiciliary conditions, but the neglect of them may mean on the one hand the infection of other individuals with drug-resistant bacilli, and, on the other, distressing sequelae to treatment. It is therefore permissible to use streptomycin in home treatment only in the circumstances in which these conditions can be met.

Lesions of the respiratory tract are an exception to this rule. Cases of tuberculous laryngitis, particularly those with dysphagia, and cases of tuberculous tracheobronchitis or bronchitis, respond so remarkably to streptomycin that its use under domiciliary conditions is justified. I think, however, that it would be a wise policy for all general practitioners wishing to use the drug in respiratory tuberculosis to consult the chest physician before starting treatment.

Prevention

As we are still considering the management of the patient prior to admission to an institution, it is necessary to refer to prevention of the spread of the disease. The diagnosis of active tuberculosis in one member of the family places the others in the category of contacts, requiring full medical examination, including tuberculin-testing. This should be carried out on adults as well as children, and the negative reactors should receive B.C.G. vaccination. This is not the time to discuss the need or practicability of segregation, but one is inclined to the view that, although segregation is desirable, vaccination without segregation is better than no vaccination at all.

In addition to the well-known precautionary measures that should be taken to prevent the spread of infection, I should like to put in a plea for a more systematic development of facilities for educating the family, and in particular the housewife, in domestic economy and the special points in household management that are associated with the presence of a tuberculous person. There must be much that the average housewife could learn which would improve the nutrition of the family and add to the comfort and well-being of the patient and others in the house.

I would also ask for biological and biochemical research into the reason why some members of a household develop the disease while others escape active infection and in some instances even fail to exhibit tuberculin sensitivity though they have been living in contact with an open case for a long period. The detailed study of family units would reveal facts which would be helpful in solving some of the problems of the pathogenesis of the disease.

Post-sanatorium Treatment

The problems of the post-sanatorium period of domiciliary treatment differ considerably from those associated with the person awaiting admission, for the patient will either have recovered sufficiently to need rehabilitation or be a chronic invalid, ambulant for only short periods or completely bedridden. The patient may be infectious or non-infectious, but it is well to remember that the ambulant infectious case spreads the disease to a much wider circle than the bedridden one; therefore our preventive measures must not neglect control of the habits of the ambulant person. It is probable that the bedridden patient can do little harm if he has a room to himself and is not allowed contact with children and Mantoux-negative persons.

The problem of the prevention of the spread of infection should be simpler in the case of the patient who has received sanatorium treatment, as we should be able to assume that he has had a thorough instruction during the course of treatment. In view of the frequency with which the child of an ex-sanatorium patient develops tuberculous meningitis even in a reasonably good home environment, some doubt may be expressed on the efficiency of this tuition. The fault may be in ourselves in that we do not instruct the patient carefully and thoroughly enough for him to retain the essentials of the precautionary measures we wish him to put into practice in his home.

Evidence that control of infection in tuberculous households is possible is found in the fact that no case of meningitis or miliary tuberculosis has developed among the children of the tuberculous households in our village settlements; showing that there need be no danger from living with open cases of tuberculosis if there is willing co-operation and understanding of the problem by the patient and members of the family. We must therefore ensure that they are all properly instructed.

In addition to prevention of spread of infection, the ambulant or semi-ambulant case presents many problems. The presence of an idle person with a well-developed invalid complex is a great trial to the other members in any household, particularly if there is any degree of overcrowding. Sheltered employment for such patients relieves the situation to a considerable degree. It is unfortunate that the development of organized schemes to provide rehabilitation that leads to employment has been so slow. This is mainly due to the reluctance of local health authorities to shoulder the responsibilities which the Act permits them to assume with regard to aftercare, which, of course, includes rehabilitation.

The value of diversional therapy to bed patients is well known, yet there is little enthusiasm for the development of home handicrafts. I admit that this is an expensive venture and must not be expected to bring in any financial return. It is difficult to organize, and to be successful it should be controlled from the chest clinic, if possible in connexion with a municipal workshop. All this involves

considerable expenditure; but does not the comfort and welfare of these patients, whom we are forced to treat at home through lack of beds, mean nothing to those responsible for their domiciliary care? Cannot some of the money which would have been expended on them had they been admitted to a sanatorium at anything from £6 to £10 a week be expended on developing efficient domiciliary treatment?

In answering these questions we come up against the difficulty that the money not being expended on institutional treatment is the concern of the regional hospital boards, and the cost of domiciliary care is largely borne by local health authorities, so that the adjustment is complicated. It is another instance in which the dual control operates against the benefit of the patient.

During the post-sanatorium period rehabilitation is of the highest importance. The National Health Service Act places this responsibility on the local health authority. The National Assistance Act provides for financial relief in cases of need and has made the National Assistance Boards responsible for the provision of the benefits that were scheduled in Memorandum 266T of the Ministry of Health. Under the Disabled Persons Emp'oyment Act, 1944, the development of sheltered industries can take place on a commercial basis, and the Ministry of Labour and National Service can give adequate financial assistance, both to the disabled individual under training and to the rehabilitation centre, for the provision of facilities to overcome the loss of working power which the disability has caused. The stage is therefore set for the development for the tuberculous in this country of the finest rehabilitation service in the world if we will only take full advantage of the powers that are provided in the Acts mentioned.

Drawbacks of Dual Control

It is not always realized how great is the change in environment for a patient who is discharged from a sanatorium and returns to an urban home. The frequency of relapse during the first year after discharge from the sanatorium shows how serious the strain can be, and how unfitted some patients are to withstand the stresses and anxieties of normal life. It is one of the disadvantages of sanatorium treatment that recovery takes place in conditions that are totally different from those under which the patient normally lives. For such a patient the first few months of domiciliary care should always be regarded as a transitional stage during which the closest clinical observation is maintained and wherever necessary sheltered employment provided until stabilization under home conditions is assured. In this way many relapses could be prevented, but it can be done only through the recognition by regional hospital boards and the local health authorities that rehabilitation is an essential part of treatment. Rehabilitation does not begin when sanatorium treatment ends, but both run concurrently from diagnosis until the disease is arrested.

It has been stated on many occasions that the most urgent need in tuberculosis at the present time is an adequate supply of nurses. This, indeed, is a necessity in order to provide more beds for institutional treatment, and also more efficient domiciliary care; but on the administrative side there is just as urgent a problem—the reuniting of the tuberculosis services so as to restore the relationship between prevention, diagnosis, treatment, and rehabilitation that existed before the National Health Service Act.

To try to organize treatment of tuberculosis apart from prevention and rehabilitation is to admit a complete lack of appreciation of the fundamental characteristics of the disease. Tuberculosis is most deceptive and insidious in its manifestations; it has a serious influence on the industrial life of the population, and causes repercussions throughout social relationships, and yet at the same time it is one of the most individualistic of disabilities. For these reasons the treatment of a case of tuberculosis should not be, as it is at present, the responsibility of one authority, leaving another authority to deal with the important aspect of prevention and aftercare.

Reorganization of the Services

The need for a reorganization of the existing administration of our tuberculosis services is urgent, and the care of the tuberculous in the home emphasizes very clearly the necessity for an amalgamation between the local health authorities and the regional hospital boards with respect to this disease. Let it be clearly understood that domiciliary treatment has come to stay. Experience has shown that in certain circumstances domiciliary treatment can shorten, and sometimes eliminate, institutional treatment, and it is reasonable to suppose that the clinical improvement obtained in the normal environment of the home will be more permanent in character than that derived under the abnormal surroundings and routine of the sanatorium. By domiciliary treatment the great difference between sanatorium life and home life is avoided, and the patient escapes the hazard of having to acclimatize himself to home conditions.

We therefore must plan for the development of domiciliary treatment, and create the machinery whereby the regional hospital board and the local health authority can jointly deal with the tuberculosis problem in their areas. The employment of the chest physician by either body should be on the same terms, and there should be an easy exchange of information and a mutual interest in each other's activities. This can best be established by the formation of a joint tuberculosis panel, consisting of members of the board of governors of teaching hospitals, regional hospital boards, and the local health authorities. It may be that there is no authority under the Act to give such a body preceptive powers, but it could be an authority to which all debatable tuberculosis problems in the region could be referred for advice. This would go some way towards adjusting the present disjointed administration.

A more satisfactory solution is to admit that the National Health Service Act as at present administered is inadequate for dealing with tuberculosis, because it does not take into consideration the peculiarities of the disease, and to press for an Amending Act to create a tuberculosis administration that would enable a service to be developed that could reduce the mortality and morbidity of the disease to an insignificant figure. Until this is done we shall proceed in a wasteful, discontented, and disorderly manner without hope of any real progress. The necessity for this action is of increasing importance in view of the international situation. In the event of war it is essential that our defences against tuberculosis shall be strong enough to withstand the strain that such conditions place upon them.

Conclusion

I would stress that domiciliary treatment can be beneficial, but to carry it out successfully requires money, good equipment, staff, and all those facilities that enable the patient to take the necessary rest at home. The higher the standard of living and the better the morals of the family, the more successful will be the result. Pre-sanatorium treatment differs from post-sanatorium care, but both should be of interest to the regional hospital board and the local health authority. Without the mutual co-operation of these two bodies there is little hope of the development of efficient domiciliary care and treatment. In fact, there is urgent need for a complete revision of our tuberculosis administration and the creation of a special service which the peculiar characteristics of the disease demands.

REFERENCES

Cuthbert, J. (1950). *Tubercle*, **31**, 131.
Heller, R. (1949). Ibid., **30**, 204.
Maclean, A., and Gemmill, J. S. (1948). *Lancet*, **1**, 173.
Wynn-Williams, N., Shaw, J. Brian, and Mashiter, W. E. (1950). Ibid., **1**, 221.

THE CONTENT OF HAEMOPOIETIC FACTORS IN LIVER EXTRACTS

RELATIONSHIP TO CLINICAL RESPONSE

BY

RONALD H. GIRDWOOD, M.B., Ch.B., F.R.C.P.Ed.
Lecturer in Medicine, University of Edinburgh

AND

KATHLEEN M. CARMICHAEL, M.B., Ch.B.
Assistant, Department of Medicine, University of Edinburgh

With Statistics by B. WOOLF, M.A., Ph.D., F.R.S.E.
Lecturer in Medical Statistics, Department of Public Health and Social Medicine, University of Edinburgh

In recent years there has been considerable discussion about the potency or otherwise of liver extracts available in this country for the treatment of the megaloblastic anaemias. This has been referred to by Mollin (1950), who has given clinical evidence of a decline in the potency of commercial liver extracts during the period from 1943 to 1948.

Since vitamin B_{12} was isolated from liver almost simultaneously in Great Britain (Lester Smith, 1948; Lester Smith and Parker, 1948) and in the United States (Rickes *et al.*, 1948), it has become clear that this substance is the main therapeutically active material present in refined liver extracts used for the treatment of pernicious anaemia, and vitamin B_{12} is therefore generally considered to be what was formerly known as the "specific anti-anaemic factor." Ungley (1949) has reported on the therapeutic activity of vitamin B_{12} in a series of 53 patients with pernicious anaemia, and Cuthbertson *et al.* (1949) and Shaw (1949a) have assayed certain liver extracts for vitamin B_{12} content and discussed the relationship of this to their clinical activity. A detailed review of the clinical and experimental uses of vitamin B_{12} and related factors has been made by Girdwood (1950).

The object of the present investigation was to estimate the vitamin B_{12} and pteroylglutamic acid (folic acid) content of various liver extracts that had been prepared commercially between the years 1945 and 1950, and to compare the vitamin B_{12} activity as assayed by microbiological methods with the clinical response on the basis of the results of Ungley (1949), who used vitamin B_{12} itself as the therapeutic agent in cases of pernicious anaemia and put forward a formula to indicate the rise in red cells that might be expected to occur with various doses. In addition, by the kind co-operation of certain manufacturers of liver extracts it was found possible to compare a few of our vitamin B_{12} estimations with the results obtained by these commercial houses. Estimation of vitamin B_{12} was carried out in all instances by measuring the turbidity produced by the growth of organisms in a vitamin-B_{12}-deficient medium to which had been added various dilutions of the liver extracts to be tested. These were compared with a standard obtained by measuring the growth sustained by adding known amounts of vitamin B_{12} to the same culture medium.

Methods

The patients were typical cases of Addisonian pernicious anaemia with histamine-fast achlorhydria and a megaloblastic bone marrow. There was no evidence of steatorrhoea or of any abnormality of dietetic habits. A control period without treatment preceded the injections of liver extract, and during this period there was no evidence of spontaneous remission. All the haematological investigations were carried out by one of two experienced research technicians whose results were in close agreement.

The liver extracts were kept in a refrigerator from the time of issue for clinical testing except where otherwise noted.

The microbiological assays for vitamin B_{12} were carried out by an unpublished modification of the method of Hoffmann *et al.* (1949), using *Lactobacillus leichmannii* as the test organism. Hoffmann and his co-workers in one of their methods added thioglycollic acid to the culture medium to prevent loss of vitamin B_{12} activity as a result of autoclaving, but we preferred to omit the thioglycollic acid and to add the samples aseptically after the medium had been autoclaved. It has been shown (Cuthbertson and Lester Smith, 1949; Shaw, 1949b; Winsten and Eigen, 1949) that liver extracts contain substances other than vitamin B_{12} capable of sustaining the growth of *L. leichmannii*. These can be separated by methods which include partition chromatography and by destroying the vitamin B_{12} by alkaline hydrolysis and then re-estimating the ability of the extract to support growth of the test organism. We tested our liver extracts by the latter method, and showed that substances other than vitamin B_{12} were responsible for only a negligible fraction of the growth-supporting activity of the samples tested, except in the case of the extract produced by Manufacturer C, 1948 (Table III), where 25% of this activity was due to substances other than vitamin B_{12}.

In each instance our vitamin B_{12} assay figure is the mean of three readings, and, as will be seen from Table I, the readings were in close agreement. The discrepancies within a group of triplicates are approximately proportional to the absolute value of the mean. The logarithms of the readings were therefore taken for statistical treatment.

TABLE I.—*Results of Vitamin B_{12} Assays on 16 Liver Extracts, Using a Tube Method with L. leichmanii as Test Organism*

Extract No.	Results of Three Assays (μg./ml.)			Mean
1	7·5	7·7	7·6	7·6
2	5·4	5·5	5·4	5·4
3	4·1	5·5	4·7	4·8
4	4·4	3·4	4·9	4·2
5	4·3	4·0	3·7	4·0
6	3·95	3·3	3·75	3·7
7	2·85	2·3	2·9	2·7
8	1·9	2·0	2·3	2·1
9	2·05	2·2	2·0	2·1
10	2·0	2·2	1·8	2·0
11	1·3	1·6	1·3	1·4
12	1·3	1·2	1·25	1·25
13	0·92	0·99	0·82	0·91
14	0·47	0·45	0·45	0·46
15	0·36	0·34	0·35	0·35
16	0·24	0·27	0·24	0·25

The logarithmic standard error of the mean is 0.02302, and the 5% fiducial limits are ±0.04698. This implies that the standard limit of the mean is about ±5.3% of the assay result, and it can safely be taken to be within the range 90 to 111% of the true mean in 19 cases out of 20.

In addition to our own results, we were fortunate in having assays performed for us on a few extracts by three commercial firms, and the results of these tests are shown in Table II.

TABLE II.—*Comparison of Vitamin B_{12} Assay Results With Those of Three Manufacturing Firms (μg/ml.)*

Extract	Manufacturing Firm	*L. leichmannii*, Tube Method			*L. lactis* Dorner, Plate Method
		Own Assay	Firm X	Firm Y	Firm Z
1 ..	Z	3·7	3·1	3·8	5·56
2 ..	X	0·46	0·27	—	—
3 ..	X	7·6	14·4	7·2	10·2
4 ..	X	4·0	1·4	—	2·1

The pteroylglutamic acid estimations were carried out by the method of Teply and Elvehjem (1945), using *Streptococcus faecalis* as the test organism, and measuring the growth of the organisms by turbidity estimations in a Spekker photoelectric absorptiometer.

In the paper by Ungley (1949), Campbell gives a formula to express the expected red cell rise when a dosage of 5, 10, 20, 40, or 80 μg. of vitamin B_{12} is given. Campbell's formula was calculated from the actual rise of red cells over a period of 15 days in 63 cases receiving vitamin B_{12}. In our calculations we have the slight inaccuracy that in most instances the red cell count had been done on the 14th rather than the 15th day (the day of injection being calculated as Day 0). The difference in red cell level between 14th and 15th days was extremely small in the few instances where a count was done on both days.

Statistical examination reveals that Campbell's formula is not wholly satisfactory. In the first place, for reasons given in the original paper, he considered it advisable to omit all data derived from the administration of very low doses of vitamin B_{12}, and to reject a discrepant observation within the range of doses he included (a patient who showed an exceptionally large red cell rise with 5 μg. of vitamin B_{12}). In the second place, none of the three regression coefficients in the formula he actually uses is statistically significant. In fact, he gives two formulae—one linear with respect to initial erythrocyte count and log. dose, and the other containing also a product term. The simpler formula, which he rejects, actually has the higher statistical credentials. To be on the safe side we have calculated our own results in terms of both formulae. As given by Campbell, these formulae are not convenient for the calculation of the expected responses at doses other than those he used. We have therefore used algebraically equivalent forms, in which the dose is expressed in ordinary logarithms to base 10. The two formulae are:

(a) $I_{15} = 0.684 - 0.131\ E + 0.814\ P - 0.056\ PE$
(b) $I_{15} = 0.913 - 0.199\ E + 0.641\ P$

where

I_{15} = Expected increase in red blood cell count (millions per c.mm.) on the 15th day
E = Initial red blood cell count (millions per c.mm.) on day of injection
P = Logarithm of number of μg. of vitamin B_{12} injected.

Ungley has pointed out that the formula used in his paper is unsatisfactory for doses of 2.5 μg. or less of vitamin B_{12}. For this reason we have divided our findings into two groups according to whether the dosage of vitamin B_{12} given was greater or less than 4 μg.

Results

The results of our assays for vitamin B_{12} and pteroylglutamic acid on 15 extracts that were tested clinically on 20 patients are given in Table III. All but one of these had been marketed as a high potency extract. In Table IV

TABLE III.—*Vitamin B_{12} and Pteroylglutamic Acid Content of Liver Extracts*

Manufacturer	Date of Manufacture	Vitamin B_{12} Content (μg./ml.)	P.G.A. Content (μg./ml.)
A	1945	5·45	0·150
B	1945	2·7	0·594
A	1946	1·25	0·062
B	1946	1·4	0·538
B	1947	2·1	0·253
B	1947	2·1	0·525
B	1947	0·9	0·272
A	1948	4·0	0·041
C	1948	0·25	0·335
A	1948*	0·46	0·378
B	1948	2·0	0·173
A	1949	7·6	0·067
D	1949	0·35	0·906
B	1950	4·8	0·494
B	1950	3·7	0·149

* Extract was not marketed as a high-potency extract.

TABLE IV.—*Vitamin B_{12} Content of Liver Extracts and B_{12} Preparations Purchased Commercially in 1950*

Preparation	Country of Origin	Manufacturer's Statement of Vitamin B_{12} Content or Potency	Content According to Our Assay
Vitamin B_{12} ..	U.K.	20 μg./ml.	16·5 μg./ml.
,, ,, ..	U.K.	10 μg./ml.	10·0 μg./ml.
Liver extract ..	U.K.	20 μg./ml.	3·75 μg./ml
,, ,, ..	U.S.A.	15 U.S.P. units	1·5 μg./ml.

are given the results for four preparations of stated potency purchased in 1950. The American extract was provided by a patient who visited the United States.

In Tables V and VI are given the actual red cell rises when these extracts were used clinically, the expected cell rises according to each of the above formulae, and the differences between the observed and the calculated rises Table V refers to the 12 cases receiving 4 μg. or more of vitamin B_{12}, and Table VI to the eight patients who had less than this amount. It will be seen that the expected values on the two formulae are closely similar. Table VII summarizes the results of the comparison of observed and expected values. In the 12 cases in the first group the mean red blood cell rise was 1,068,000. The mean discrepancy on each of the two formulae was very small. The spread of values about the mean, conveniently measured by the standard deviation, was 0.508. Use of either formula reduces the standard deviation to about 0.45. This means that the formula is of some value for prediction but the reduction of standard deviation in these few cases is not statistically significant. On the other hand, in the second (low-dose) group, to which Campbell's formula is not supposed to apply, the predictive value of the formula is considerable and statistically significant.

We therefore combined the two groups, and the predictive value of the formulae on all the cases is shown at the bottom of Table VII. The standard deviation is reduced by about 22%, although, at 0.47, it is still considerably higher than the value of 0.33 claimed by Ungley and Campbell. Formula (b) seems slightly better than formula (a).

TABLE V.—*Red Cell Response to Injections of Liver Extract of Known Vitamin B_{12} Content (Dose More Than 4 μg.)*

Case No.	Sex	Age	Initial Red Cell Level (mills./c.mm.)	Vitamin B_{12} Given in Liver Extract (μg.)	Retic. Peak and Day	Actual Red Cell Rise (mills./c.mm.) and Day	Formula (a)		Formula (b)		Volume of Dose (ml.)
							Expected Red Cell Rise (mills./c.mm.) at 15 Days	Difference (Actual – Expected)	Expected Red Cell Rise (mills./c.mm.)	Difference (Actual – Expected)	
1	F	46	1·48	15·2	19·4 (5)	0·92 (14)	1·35	−0·43	1·38	−0·46	2
2	F	50	2·08	10·9	22·4 (5)	1·86 (15)	1·13	+0·73	1·16	+0·70	2
3	M	68	1·44	10·9	23·4 (4)	1·41 (14)	1·26	+0·15	1·29	+0·12	2
4	F	67	2·32	10·9	20·6 (5)	0·90 (15)	1·09	−0·19	1·12	−0·22	2
5	F	49	1·61	8·0	22·4 (5)	1·10 (14)	1·13	−0·03	1·17	−0·07	2
6	F	66	1·65	8·0	3·4 (6)	1·50 (14)	1·12	+0·38	1·16	+0·34	2
7	M	67	1·89	7·4	5·2 (6)	0·37 (15)	1·05	−0·68	1·09	−0·72	2
8	M	73	1·35	5·4	9·8 (6)	0·73 (14)	1·05	−0·32	1·11	−0·38	2
9	F	40	0·95	4·2	22·0 (6)	1·71 (15)	1·03	+0·68	1·12	+0·59	2
10	F	52	1·51	4·2	6·2 (6)	0·30 (15)	0·94	−0·64	1·01	−0·71	2
11	F	75	1·30	4·2	18·0 (5)	1·07 (14)	0·98	+0·09	1·05	+0·02	2
12	M	73	2·20	4·0	8·4 (6)	0·94 (15)	0·81	+0·13	0·86	+0·08	2

TABLE VI.—*Red Cell Response to Injections of Liver Extract of Known Vitamin B_{12} Content (Dose Less Than 4 μg.)*

Case No.	Sex	Age	Initial Red Cell Level (mills./c.mm.)	Vitamin B_{12} Given in Liver Extract (μg.)	Retic. Peak and Day	Actual Red Cell Rise (mills./c.mm.) and Day	Formula (a)		Formula (b)		Volume of Dose (ml.)
							Expected Red Cell Rise (mills./c.mm.) at 15 Days	Difference (Actual – Expected)	Expected Red Cell Rise (mills./c.mm.)	Difference (Actual – Expected)	
13	F	34	1·21	2·8	17·4 (5)	1·51 (14)	0·86	+0·65	0·96	+0·55	2
14	F	63	1·33	2·5	22·4 (4)	1·81 (15)	0·80	+1·01	0·90	+0·91	2
15	F	59	1·97	1·8	10·4 (5)	0·91 (14)	0·61	+0·30	0·68	+0·23	4
16	F	55	2·48	1·8	4·0 (7)	0·14 (15)	0·53	−0·39	0·58	−0·44	4
17	F	42	1·61	1·8	9·0 (5)	0·40 (15)	0·66	−0·26	0·76	−0·36	2
18	F	67	1·73	1·4	12·0 (6)	1·10 (14)	0·56	+0·54	0·66	+0·44	4
19	F	59	2·35	0·5	1·2 (5)	−0·06 (14)	0·17	−0·23	0·25	−0·31	2
20	F	62	1·74	0·5	1·9 (4)	−0·16 (14)	0·24	−0·40	0·37	−0·53	2

TABLE VII.—*Comparison of Observed and Expected Values for Red Cell Rise*

	Observed Red Cell Rise	Observed Minus Expected Red Cell Rise	
		Using Formula (a)	Using Formula (b)
Dosage of vitamin B_{12} 4 μg. or more (12 cases):			
Mean (mills./c.mm.)	1·068	−0·011	−0·059
Standard deviation ..	0·508	0·466	0·448
Dosage of vitamin B_{12} less than 4 μg. (8 cases):			
Mean (mills./c.mm.)	0·706	+0·153	+0·061
Standard deviation ..	0·738	0·531	0·510
Both groups (20 cases):			
Mean (mills./c.mm.)	0·923	+0·055	−0·011
Standard deviation ..	0·609	0·482	0·473

It seemed worth while to obtain from our data the best-fitting formula, for comparison with that put forward by Ungley. The analogue of his formula (b) worked out as :

$$I_{15} = 1.474 - 0.542\ E + 0.665\ P.$$

It is remarkably similar to that of Ungley, differing mainly in the increased importance given to the influence of the patients' initial counts on the final result. We believe that, by omitting his cases receiving a low dosage of vitamin B_{12}, Ungley artificially minimized the importance of this factor.

It is important to stress that, as is suggested by Table II, different results might have been obtained and different conclusions reached had the vitamin B_{12} assays been carried out by other workers using various modifications of the assay methods.

As has been found by previous workers (Stokstad and Jukes, 1946), the pteroylglutamic acid content of the extracts was in all instances therapeutically negligible.

In order to see how small a dose of vitamin B_{12} might be effective, we gave one patient, suffering from classical Addisonian pernicious anaemia, a single injection of 0.4 μg. of vitamin B_{12} itself after a control period. It will be seen from the Graph that we seem to have selected by chance a patient who was able to show some response even to this small dosage, for the red cell count rose by 670,000 per c.mm. in 13 days, and there was a partial

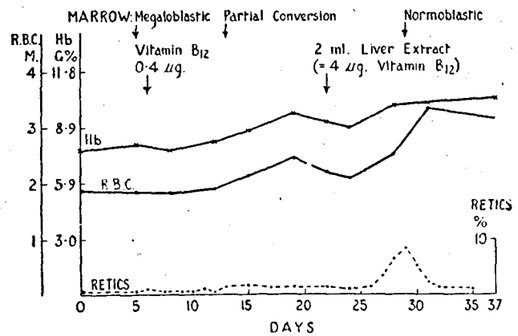


Chart showing response to vitamin B_{12} in a case of pernicious anaemia (man aged 73).

conversion of the bone marrow towards the normoblastic state, as evidenced by condensation of the nuclei of the megaloblasts.

Discussion

The results of this investigation indicate that the vitamin B_{12} content of all 15 batches of liver extracts manufactured between the years 1945 and 1950 and tested both microbiologically and clinically was low or very low. For comparison we have the figure of 25 μg./ml. for an American liver extract given by Mollin (1950). On the other hand, we have not included in the series a British liver extract, marketed in 1948 but not tested clinically by us, which we found to have a vitamin B_{12} content of 14 μg./ml. It is of interest that we obtained similar results

on assaying two samples of the same batch of one extract manufactured two years previously, one ampoule of which had been kept in a refrigerator and the other sent back to us from the Fiji Islands.

It has been suggested by Rickes *et al.* (1948) and by many workers since then that 1 U.S.P. unit of activity is approximately equal to 1 μg. of vitamin B_{12}, and the aim of manufacturers has been to market high-potency extracts containing 15 U.S.P. units of activity. How far the extracts considered in the present paper fall short of this target is evident. It should be realized that it was not the fault of British manufacturers that the vitamin B_{12} content of their products was low at a time when clinical testing was the only method of assay available to them, and individual variation to the same dose was so great that it would no doubt be possible to show the presence of "15 U.S.P. units of activity" in many of the above extracts if those testing them persevered long enough to find a sufficiently sensitive patient. Nor should it be thought that all American extracts are superior to British ones. Personal experience by one of us of the clinical results obtained in the United States by various liver extracts has convinced us that low-potency extracts were not uncommon across the Atlantic, too, when microbiological assay methods were not available, and from Table IV we see that a "high-potency" extract marketed in 1950 by a reputable American firm contained only 1.5 μg./ml.

The relationship between the actual red cell rise and the expected rise when liver extracts are used clinically, and calculating from Ungley's results with vitamin B_{12} itself, is obviously of importance. One should not, however, attach too much importance to formulae, especially those based on the relatively meagre data here considered, even if Ungley's findings and those of the present series are considered together. The random errors are so high, and the other relevant factors not taken into account are probably so important, that the formulae can do little more than indicate a qualitative relationship. All one can say with confidence at the moment is that the data indicate that the red blood cell rise is greater the lower the initial state of the patient and increases with increase of dose, and give some idea of the order of magnitude of the influence of these factors. We must add, however, that a statistical analysis of all available data may give one a fair idea of the quantitative importance of these influences. A study of this nature is planned.

In view of this, our conclusions must be guarded, but it is true to say that we have produced no evidence to support the view that the results in these cases cannot be explained on the assumption that the haemopoietic responses are due to the vitamin B_{12} content of the extracts. In order to suggest that the activity of a liver extract was not due solely to its vitamin B_{12} content it would be necessary to show a consistent and definite difference in response to the injection of that particular extract given to a relatively large number of patients. When the actual response is much greater than the expected response the chief possibilities are: (*a*) that this is a case that, by reason of some individual variation as yet not understood, responds unusually well to the dosage given; (*b*) that a spontaneous remission has coincided with the test; (*c*) that there is some substance present in the liver extract that has a haemopoietic effect and is not a growth factor for *L. leichmannii* or any other test organism used; (*d*) that the liver extract contains, in addition to vitamin B_{12}, inhibitors for the growth of *L. leichmannii*; or (*e*) that some of the vitamin B_{12} is present in a conjugate form that does not support the growth of *L. leichmannii*.

The significance of these factors is not yet understood. An artificially produced hydrogenation product of vitamin B_{12} has been named vitamin B_{12a} (Kaczka *et al.*, 1949), and it is possibly the same as vitamin B_{12b} isolated in crystalline form by Pierce *et al.* (1949) (Brockman *et al.*, 1950). More recently, vitamin B_{12c} has been isolated (Buchanan *et al.*, 1950), but so far there is no published evidence of the presence in liver of forms active clinically and not microbiologically, although reference to the possible existence of such forms has been made by Lester Smith (1950).

The problem of whether liver extract is active haemopoietically only by virtue of its vitamin B_{12} content may also be approached by comparison of the results of maintenance therapy. Recently Meacham *et al.* (1950) have reported that a vitamin B_{12} concentrate in a dosage equivalent to 1 μg. daily, but given every three or four weeks, did not maintain optimal blood levels in pernicious anaemia patients. They attribute this to inadequate dosage of vitamin B_{12}, but further work of this nature is indicated and other possible explanations require investigation, including the possibility that vitamin B_{12} is absorbed and excreted less rapidly if injected in the form of a liver extract.

It is of some interest to know how many patients would be required to assay a liver extract or vitamin B_{12} preparation clinically to any desired degree of precision. An answer to this question may emerge from our further statistical study. On the basis of the formulae used in this paper, for what they are worth, one can make the following rough estimates. If the true potency of a preparation be put at 100, then, using 4 patients, one would expect, in 19 times out of 20, to get a result only within the range 30 to 330; 16 patients would give an accuracy, in 95% of cases, between about 60 and 160; 64 patients between 80 and 125; while to get within 10% of the true result 250 or more subjects would be required. The same order of magnitude of error emerges from the results of the present series using liver extracts and from those of Ungley (1949) using vitamin B_{12}.

When microbiological assay is carried out, however, it is important that the method should be standardized, since, as we have seen in Tables II and IV, quite marked discrepancies may occur. At present the best practicable method of testing liver extracts for haemopoietic activity would appear to be by the combination of clinical tests on a few patients and microbiological assay by an agreed standard technique

Summary

The vitamin B_{12} content of 15 batches of British liver extracts prepared for commercial use between 1945 and 1950 and tested microbiologically by a tube method using *L. leichmannii* as the test organism was low, varying from 0.25 μg./ml. to 7.6 μg./ml. The pteroylglutamic acid content was negligible.

The actual rise of red cells in 20 pernicious anaemia patients treated with these liver extracts was compared with the calculated response according to the vitamin B_{12} content. Too much importance should not be attached to formulae, especially in view of the relatively meagre data available, but the results give no evidence to suggest that the haemopoietic responses cannot be attributed to the vitamin B_{12} content of the liver extracts.

Clinical testing alone of liver extracts or vitamin B_{12} concentrates may give very inaccurate information, but, although it is possible to obtain consistent results with a single microbiological method of vitamin B_{12} assay, there may be considerable variation between the results obtained by workers using different microbiological methods. Hence it is important that a standard method be agreed upon.

We are very grateful to Professor L. S. P. Davidson, Dr. W. A. Alexander, and Dr. T. R. R. Todd for access to clinical material in their wards, and to Professor L. S. P. Davidson and Professor F. A. E. Crew for their interest in this work. We wish to thank Dr. Augustus Gibson, of Messrs. Merck, Inc., Rahway, New Jersey, for supplying us with crystalline vitamin B_{12} for use as a standard. One of us (R. H. G.) was in receipt of a grant from the John Risk Bequest, and grateful acknowledgment is made for the assistance given in defraying the expenses of the investigation.

REFERENCES

Brockman, J. A., Pierce, J. V., Stokstad, E. L. R., Broquist, H. P., and Jukes, T. H. (1950). *J. Amer. chem. Soc.*, **72**, 1042.
Buchanan, J. G., Johnson, A. W., Mills, J. A., and Todd, A. R. (1950). *Chem. & Ind.*, p. 426.
Cuthbertson, W. F. J., Lloyd, J. F., Emery, W. B., and Lees, K. A. (1949). *J. Pharm. Pharmacol.*, **1**, 705.
—— and Smith, E. Lester (1949). *Biochem. J.*, **44**, v.
Girdwood, R. H. (1950). *Edinb. med. J.*, **57**, 72.
Hoffmann, C. E., Stokstad, E. L. R., Hutchings, B. L., Dornbush, A. C., and Jukes, T. H. (1949). *J. biol. Chem.*, **181**, 635.
Kaczka, E., Wolf, D. E., and Folkers, K. (1949). *J. Amer. chem. Soc.*, **71**, 1514.
Meacham, G. C., Vignos, P. J., Heinle, R. W., Weisberger, A. S., and Epstein, M. (1950). *J. Lab. clin. Med.*, **35**, 713.
Mollin, D. L. (1950). *Lancet*, **1**, 1064.
Pierce, J. V., Page, A. C., jun., Stokstad, E. L. R., and Jukes, T. H. (1949). *J. Amer. chem. Soc.*, **71**, 2952.
Rickes, E. L., Brink, N. G., Koniuszy, F. R., Wood, T. R., and Folkers, K. (1948). *Science*, **107**, 396.
Shaw, G. E. (1949a). *J. Pharm. Pharmacol.*, **1**, 701.
—— (1949b). Ibid., **1**, 695.
Smith, E. Lester (1948). *Nature, Lond.*, **161**, 638.
—— (1950). *Proc. R. Soc. Med.*, **43**, 535.
—— and Parker, L. F. J. (1948). *Biochem. J.*, **43**, viii.
Stokstad, E. L. R., and Jukes, T. H. (1946). *Proc. Soc. exp. Biol., N.Y.*, **62**, 112.
Teply, L. J., and Elvehjem, C. A. (1945). *J. biol. Chem.*, **157**, 303.
Ungley, C. C. (1949). *British Medical Journal*, **2**, 1370.
Winsten, W. A., and Eigen, E. (1949). *J. biol. Chem.*, **177**, 989.

THE MANUBRIO-STERNAL JOINT IN RHEUMATOID ARTHRITIS

BY

ANDREW BOGDAN, M.D.

AND

JUSTIN CLARK, M.D., M.R.C.P.

(From the Rheumatism Unit, Westminster Hospital)

[WITH SPECIAL PLATE]

Examination of the manubrio-sternal joint in a series of patients has shown that rheumatoid involvement of this joint is not uncommon. Five examples are outlined here to indicate the clinical and radiological features.

Case Reports

Case 1.—A married woman aged 55 gave a five-year history of rheumatoid arthritis, still active, and showing typical clinical and radiological involvement of feet, wrists, fingers, and right elbow. The manubrio-sternal joint became painful two years after the onset of the disease, and the patient noticed that there was swelling and tenderness over the joint. The pain came in bouts lasting two to three days; between the bouts there was a residual ache. During the bouts the pain was aggravated by coughing and sneezing, and inhibited deep respiratory movement. Examination of the joint confirmed the presence of soft-tissue swelling and tenderness (Fig. A). Radiographs showed irregular destruction of the articular margins of the joint (Plate, Fig. 1). The sedimentation rate was 31 mm. (Wintrobe corrected) at the end of one hour.

Case 2.—A married woman aged 52, who gave a twenty-two year history of rheumatoid arthritis, starting with pain, swelling, and tenderness over the manubrio-sternal joint, showed clinical and radiological evidence of active disease in almost all the peripheral joints. The manubrio-sternal pain had lasted for one month only, and had not recurred. Examination showed no clinical abnormality of the joint, but a radiograph revealed gross narrowing and irregularity of the joint space, with marked irregular expansion of the articulating ends of the bones (Fig. 2). The sedimentation rate was 30 mm. (Wintrobe corrected) at the end of one hour.



FIG. A.—Swelling over the manubrio-sternal joint (Case 1).

Case 3.—A girl aged 16 gave a one-year history of swelling, aching, and stiffness of the proximal interphalangeal joints of the right index and middle fingers and of the left index finger. Examination of these joints showed soft-tissue swelling and tenderness, with tenderness of some of the other proximal interphalangeal, metacarpo-phalangeal, and wrist joints. Radiographs of these showed only soft-tissue changes. For three weeks prior to attending the clinic she had experienced a constant tight sensation over the front of the chest, in the region of the manubrio-sternal joint, aggravated by deep inspiration and yawning. She had no cough or other chest symptoms. There was definite tenderness over the manubrio-sternal joint, which persisted for one month. A radiograph of the manubrio-sternal joint showed no abnormality.

Case 4.—A married woman aged 52 gave a nine-year history of rheumatoid arthritis affecting all the peripheral joints and the cervical spine. She was severely crippled. For the past two years she had had intermittent pain in the region of the manubrio-sternal joint aggravated by deep breathing, coughing, and yawning. Examination showed swelling and tenderness of the manubrio-sternal joint. Radiographs showed irregularity of the joint space, erosion of the joint margins, and irregular expansion of the articulating ends of the bones (Fig. 3).

Case 5.—A married woman aged 53 gave a twelve-year history of rheumatoid arthritis with involvement of the knees, shoulders, elbows, wrists, fingers, and ankles, with typical radiological changes. Pain in the region of the manubrio-sternal joint was first noticed six months before attending the clinic, and became her chief symptom. The pain occurred in attacks lasting up to twenty-four hours, and was aggravated by yawning and coughing. A striking feature of the pain was its tendency to occur on exertion, especially on walking uphill, after which it often lasted several hours. When severe, she found difficulty in taking a deep breath. This pain, which had the same quality as her arthritic pains elsewhere, was relieved by aspirin. There was marked tenderness over the manubrio-sternal joint. A radiograph of the joint showed no abnormality. Examination of the cardiovascular system, cardioscopy, and the electrocardiogram were normal. Blood Wassermann and Kahn reactions were negative. The sedimentation rate was 31 mm. (Wintrobe corrected) at the end of one hour.

Anatomy

The manubrio-sternal joint is of the cartilaginous type, the articular surfaces being covered by a layer of hyaline cartilage and connected by a disk of fibro-cartilage. A limited amount of movement is permitted, and occurs with each thoracic respiratory movement. It is stated that in rather more than 30% of people conversion into a synovial

joint takes place by absorption of the central part of the disk (Johnston and Whillis, 1949). The incidence of ossification of the disk was found to average 10% and was commoner in women than in men. There was no correlation between incidence of ossification and age (Trotter, 1934).

Discussion

The above cases are examples of the effect of rheumatoid arthritis on the manubrio-sternal joint. In the early stages there is pain, swelling, and tenderness at the joint site, and in more advanced cases radiological changes. It may be the first manifestation of rheumatoid arthritis (Case 2). The pain may be constant or may show periodicity. In all the above cases it was aggravated by respiratory movements, and in particular by coughing, sneezing, yawning, and deep inspiration, and hence may occur on exertion. It may be severe enough to inhibit full inspiration. The pain has to be distinguished from other causes of chest pain. In Case 5 its precipitation by exertion simulated angina of effort.

Soft-tissue swelling was prominent in two cases. Tenderness oyer the joint was present in all the cases; as an isolated finding, however, it was not considered sufficient to justify the diagnosis, because this area may be sensitive in normal people, particularly those with a prominent sternal angle.

Radiological changes present in three cases included soft-tissue swelling, irregularity and narrowing of the joint space, erosion of the articular surfaces, and irregular expansion of the articulating ends of the manubrium and sternum. Progression to bony ankylosis was not observed in any of the cases. When bony ankylosis occurs in normal people the radiographs show that the continuity of the bony surfaces is quite smooth (Fig. 4). The joint was best visualized in coned lateral views; routine lateral chest films were usually not satisfactory. The joint picture may be obscured by superimposition of calcification in the second costal cartilage or in the presence of a depressed sternum.

Rheumatoid arthritis commonly affects synovial joints, especially those at the periphery, where considerable mobility is a feature. In contrast, the manubrio-sternal joint is usually cartilaginous and the site of very limited movement.

Involvement of the manubrio-sternal joint is well recognized in ankylosing spondylitis, and was noted in 7 out of 65 cases (Hart, Bogdanovitch, and Nichol, 1950). Osteoarthritis of this joint has been described (Rolleston, 1892–3). There is reference to two cases of osteochondritis (Brailsford, 1934).

Summary

Rheumatoid arthritis of the manubrio-sternal joint is described, with particular reference to five illustrative cases.

The pain may be the first symptom of rheumatoid arthritis. It is mainly related to respiratory movements, and has to be differentiated from other causes of chest pain.

The radiological changes, when present, are best seen in coned lateral views of the joint. The chief features are irregular narrowing of the joint space, with irregular expansion of the articulating bone ends.

We should like to express our thanks to Dr. F. Dudley Hart for encouragement and permission to publish these cases from the Rheumatism Unit of Westminster Hospital. We are also indebted to Dr. W. D. Nichol for his help with the radiology; also the Department of Medical Photography. We are indebted to Miss F. E. Stevens for her invaluable secretarial assistance.

References

Brailsford, J. F. (1934). *Radiology of Bones and Joints*, p. 356. London.
Hart, F. D., Bogdanovitch, A., and Nichol, W. D. (1950). *Ann. rheum. Dis.*, **9**, 116.
Johnston, T. B., and Whillis, J. (1949). *Gray's Anatomy*, 30th ed., p. 461. London.
Rolleston, H. D. (1892–3). *Trans. path. Soc., Lond.*, **44**, 131.
Trotter, M. (1934). *Amer. J. phys. Anthrop.*, **18**, 439.

ERYTHEMA NODOSUM AS INITIAL MANIFESTATION OF BOECK'S SARCOIDOSIS

BY

F. E. CRAWLEY, M.D., M.R.C.P., D.P.H.

Consultant Chest Physician, South and Central Liverpool

[WITH SPECIAL PLATE]

In chest clinics there is increasing awareness of growing appreciation among the profession of the fact that erythema nodosum is often a manifestation of tuberculous infection, and the formerly widely held opinion that this disorder is of rheumatic origin is fast disappearing. It is less widely recognized that the determination of the cause often provides an intriguing exercise in diagnosis for the chest physician who is aware of the multiplicity of disorders with which erythema nodosum has associations, and which tend to be discussed in the more specialized journals to the loss of those whose reading is confined to the more widely circulating publications.

Consideration is primarily given to investigations of tuberculosis as the cause, for it is now commonly considered that the eruption occurs during primary infection at the time when the patient first develops hypersensitivity to tuberculin. In Scandinavia, Wallgren (1938) has shown that 95% of his series of 800 cases gave positive tuberculin skin reactions, though that high percentage is not generally found in this country, where 54% of the cases of Bruce Perry (1944) were tuberculin-positive. In Scandinavia, where primary infection occurs at a later average age than here, 30% of primary infections were associated with the eruption; but in Ireland, where the age of onset of primary infection is earlier, Dunlevy (1949) has shown an incidence of only 2.8%.

Causes other than tuberculosis appear, therefore, to be more frequent in this country than in many others. Collis (1932) revealed that some tuberculin-negative patients showed pronounced skin sensitivity to streptococcal nucleoprotein, and Rotnes (1936) recorded a case in which the eruption appeared on 14 occasions, mostly after attacks of tonsillitis.

Sulphonamide sensitivity is not infrequently a cause, and it may be difficult to decide whether a patient with streptococcal tonsillitis under treatment with sulphonamides has developed erythema nodosum as a result of the streptococcal infection or of the treatment. Similarly, in patients with pyrexia of unknown cause under treatment with sulphonamides, the eruption cannot be attributed to the drug without the exclusion of tuberculosis and other conditions. During the recent war it was commonly recognized that meningococcal septicaemia was a far from infrequent cause.

In California, infection with *Coccidioides immitis* has resulted in a considerable number of cases, but none seem to have been recognized in this country, and

other infrequent causes here and elsewhere are syphilis, gonococcal septicaemia, lymphogranuloma inguinale, leprosy, lymphadenoma, and iodides, bromides, and other drugs. It is difficult as yet to determine the importance of Boeck's sarcoidosis as a factor in the aetiology of the disorder, but, in this country, Kerley (1942, 1943) and, in Scandinavia, Löfgren (1946) and Bjerkelund (1947) have described cases in which sarcoidosis was considered to be responsible.

Below is given the history of three cases in which there are thought to be grounds for arriving at the diagnosis of sarcoidosis.

Case 1

A married woman aged 30 had an attack of erythema nodosum in June, 1949. There had been no preceding illness of any kind. Her chest was *x*-rayed at a general hospital when the erythema had subsided and again in mid-August, both films showing gross bilateral hilar glandular enlargement and a small shadow in the left subclavicular area. She had no cough and was breast-feeding her few-months-old baby, and, apart from some lassitude, had no symptoms.

In view of the radiological appearances she was referred to the chest clinic late in August. Her weight was 10 st. 7 lb. (66.7 kg.); there was no evidence of glandular or splenic enlargement, no history of uveitis or parotid swelling, and no skin eruption; the E.S.R. (Cutler) was 12 mm. in one hour, and the differential white cell count showed 48% neutrophils, 5% eosinophils, 1% monocytes, and 46% lymphocytes. Examination of the chest revealed a slightly impaired percussion note in the hilar region on both sides posteriorly and a marked signe d'Espine. The *x*-ray film (Plate, Fig. 1) showed gross bilateral lobulated hilar glandular enlargement, an irregular faint shadow in the first left interspace, and hard streaky shadowing in the right upper zone. A Mantoux test performed with 1 in 1,000 O.T. was negative.

On October 11 she weighed 10 st. 4 lb. (65.3 kg.) and felt well; her E.S.R. (Cutler) was 7 mm. in one hour, and Mantoux 1 in 1,000 was again negative. There was now a small cluster of papules on the left side of the forehead and one small gland palpable above the head of the right clavicle. A laryngeal swab contained no tubercle bacilli on culture. An *x*-ray film showed some diminution in the size of the glandular enlargement, but the striations were increased in the right lung and were now also evident on the left. A film of both hands revealed no abnormality in the bones.

On November 25 she felt as well as she had done for years, and weighed 10 st. 5 lb. (65.8 kg.); the papules and gland were unchanged; Mantoux 1 in 100 was negative; W.R., Kahn, and G.C.F.T. tests were negative; and serum proteins totalled 7.55 g. %. Rather copious fine rales were audible at the right base, but she denied having any cough. An *x*-ray film showed further diminution in size of the hilar glandular enlargement, but the left subclavicular shadow and the striations in both lungs were unchanged and a few pinhead faint shadows were evident in the right upper zone.

Case 2

A married woman aged 28 had an attack of erythema nodosum in July, 1949, and two weeks previously had had a slight sore throat but had not received any treatment. After four weeks in bed she was referred to the chest clinic on August 30. She then felt perfectly well and weighed 14 st. 1 lb. (89.4 kg.).

General examination and questioning showed no evidence of splenic or glandular enlargement, skin eruption, or history of eye trouble or parotid swelling. No abnormal signs were found on examination of the chest, but *x*-ray films (Fig. 2) of the lungs showed considerable bilateral lobulated glandular enlargement and faint irregular striations in both lower zones. A Mantoux test with 1 in 1,000 O.T. was negative.

The patient was asked to attend for further investigation a few days later, but went for a holiday to another county and was not seen until November 1. She was then feeling perfectly well and weighed 14 st. 3 lb. (90.3 kg.), but whilst on holiday in early September she had a recurrence of erythema nodosum. Her E.S.R. (Cutler) was 10 mm. in one hour; the differential count was 66% neutrophils, 3% eosinophils, 4% monocytes, and 27% lymphocytes; the W.R., Kahn, and G.C.F.T. tests were negative; a laryngeal swab showed no tubercle bacilli on culture; radiographs of the hands revealed no abnormality; and chest films showed no alteration in the picture. Mantoux 1 in 1,000 was again negative, but on November 8 a Mantoux test with 1 in 100 O.T. produced a positive reaction of 1½ in. (3.75 cm.) diameter.

On November 29 she weighed 14 st. 1 lb., and felt perfectly well; the serum proteins amounted to 7.9%, and the E.S.R. (Wintrobe) was 12 mm. in one hour. Radiologically the bilateral hilar enlargement was much less, but a few fine faint floccular shadows were scattered in both lungs, especially in the right mid-zone.

Case 3

A youth aged 18 was seen on June 3, 1949, two weeks after the onset of erythema nodosum. There had been no preceding illness other than a slight cold in the head a week before the eruption appeared. He still had a slight cough and some nasal catarrh. His weight was 10 st. 4 lb. (65.3 kg.). No abnormal signs were found in his lungs, but an *x*-ray film (Fig. 3) showed marked enlargement of the left and slight enlargement of the right hilar shadow. A Mantoux test with 1 in 1,000 O.T. was negative.

He was persuaded to attend for further investigation on October 21. He had felt perfectly well and had been at work from the week after his previous visit. His weight was still 10 st. 4 lb. There was no enlargement of spleen or of glands other than a few in both axillae, but these were apparently secondary to many cuts and abrasions on the hands, sustained at work. There had been no previous trouble with his eyes and no history of parotid swelling. His E.S.R. (Cutler) was 3 mm. in one hour; the Mantoux test, 1 in 1,000, was again negative; the white cell count was 8,800 per c.mm., and the differential count 67% neutrophils, 2% eosinophils, 1% basophils, 2% metamyelocytes, 2% monocytes, and 26% lymphocytes. Serum proteins were 7.55 g. %; the W.R., Kahn, and G.C.F.T. tests were negative; a laryngeal swab showed no tubercle bacilli on culture and there were no abnormal signs in the lungs. *X*-ray films of the hands showed no abnormality, and lung radiographs revealed considerable diminution in size of the left hilar shadow.

When seen again on December 2 he remained well, and weighed 10 st. 7 lb. (66.7 kg.), Mantoux 1 in 100 was negative, and a film of the lungs showed an almost normal hilar shadow on the right but a moderately increased shadow on the left. At no time was there any evidence of infiltration in the lungs.

Discussion

The tuberculin sensitivity was not recorded in the cases described by Kerley (1942, 1943), who based his diagnosis on the radiological appearances of massive glandular enlargement in the lungs, with or without lung infection. In his earlier series of 12 cases, all adults, eight showed benign infiltration of the lungs, and the hilar glandular enlargement in 10 was bilateral and in two on the left only. He states that in lymphadenoma it is exceptional to see the bronchial glands involved in the early stages, that bilateral lymphatic obstruction has not been described in this disease, and that the large lobulated bronchial glands have not been described in lymphosarcoma or the leukaemias.

In the studies of 185 patients over 15 years of age with erythema nodosum, Löfgren (1946) considers that in adults a non-tuberculous cause is more common than in children. Two of his sarcoidosis cases were diagnosed with the supporting evidence of biopsy, and in one of

these there was a positive tuberculin reaction to 1 in 100 O.T. He found that on testing with increasing strengths of tuberculin the skin sensitivity of erythema nodosum patients increases rapidly after the initial threshold had been passed. This may account for the marked reaction to 1 in 100 O.T. in Case 2. This effect does not appear to be due to sensitization produced by the serial testing, as others using stronger test dilutions in much greater number have not produced Mantoux conversion by this means. Löfgren classed all his six cases with bilateral hilar glandular swellings with miliary infiltrations as sarcoidosis, and a further nine with bilateral glandular enlargement and negative reactions or reaction to 1 in 1,000 or 1 in 100 O.T. as probable sarcoids. Most estimates of the incidence of negative reactors to tuberculin in sarcoidosis give figures of 60–70%, the remaining positives tending to be weak reactors. In the case described by Bjerkelund there were a negative reaction to 1 in 100 tuberculin, bilateral hilar glandular enlargement, and only two small pea-sized infiltrations near the hilum.

In sarcoidosis one-quarter to one-half of the cases show an eosinophilia, rarely over 10–15%, and the findings in Case 1 may be significant. In the active phase an increase in serum proteins is often noted and may exceed 9 g. %, the result in Case 3 being possibly a little further supporting evidence.

Whilst it may be regretted that histological proof of the diagnosis could not be obtained, it was not considered justifiable to ask the patients to submit to the inconvenience of the necessary investigations, but on the above criteria the three cases could be regarded as sarcoidosis.

Summary

The many different causes to be considered in the differential diagnosis of erythema nodosum are discussed and three cases are described in which the cause appears to be sarcoidosis.

REFERENCES

Bjerkelund, C. J. (1947). *Acta med. scand.*, **128**, 538.
Collis, W. R. F. (1932). *Quart. J. Med.*, **25**, 141.
Dunlevy, M. (1949). *British Medical Journal*, **2**, 1114.
Kerley, P. (1942). *Brit. J. Radiol.*, **15**, 155.
—— (1943). Ibid., **16**, 199.
Löfgren, S. (1946). *Acta med. Scand.*, Suppl. 174.
Perry, C. Bruce (1944). *British Medical Journal*, **2**, 843.
Rotnes, P. L. (1936). *Acta derm.-venereol., Stockh.*, **17**, Suppl. 3.
Wallgren, A. (1938). *Lancet*, **1**, 359.

A new approach to Shakespeare's plays is being made in the United States. In an experimental course sponsored by the Institute of Arts and Sciences at Columbia University in New York modern psychiatric techniques are applied in studying the characters in nine Shakespearian plays: *Othello, Hamlet, Macbeth, Romeo and Juliet, A Midsummer Night's Dream, Antony and Cleopatra, Julius Caesar, King Lear,* and *The Tempest.* The aim of the course, according to Dr. Russell Potter, director of the institute, is to utilize applied science to gain a "more sympathetic comprehension" of some of Shakespeare's great character studies. Five psychiatrists, all of them Shakespearean scholars, will co-operate with Dr. Maurice Valency, professor of English at Columbia, in conducting the course. Dr. Daniel E. Schneider, one of the psychiatrists, emphasizes that the course does not seek to psycho-analyse any particular character in the play. "Rather," he says, "we will try to judge the relationship of one character to another to achieve an understanding of the entire outline of the play." It is his opinion that much of modern psycho-analysis derives some of its roots from the great poets and dramatists of the past. "Shakespeare was the greatest analyst of them all," he believes.

CARDIOLOGICAL CASE FINDING BY MEANS OF MASS MINIATURE RADIOGRAPHY

BY

PETER O. LEGGAT, M.B., M.R.C.P.

Medical Director, Mass Radiography Unit, Liverpool Regional Hospital Board

The main object of mass miniature radiography surveys is to identify patients with minimal asymptomatic pulmonary tuberculosis. In carrying out such a survey many non-tuberculous lesions are met with, and these include a fair number of cardiac examples. The following is a description of the methods used in such a survey, and a discussion of the results obtained.

Method

Survey 1 was carried out in an industrial town in the North of England, and Survey 2 in a hospital for mental defectives closely adjoining this town. In the former the material consisted of 11,929 subjects, of whom 3,931 were females and 7,998 were males, with ages varying between 14 and 75 years. The great bulk of the group consisted of 10,306 industrial workers in factories. In the same group there were 1,255 school-children, all 14–15 years old; they were particularly chosen for *x*-ray examination as they were at the age when their school careers terminated. The remaining small group of 368 subjects consisted of those other than factory workers who volunteered for mass miniature radiography. In the mental hospital group of 244 subjects all were women, their ages ranging from 18 to 66 years.

The apparatus used was the standard type as supplied by the Ministry of Health for mass radiography surveys. This has a camera attachment so that the *x*-ray picture is photographed on to a 35-mm. film; after development the miniatures are projected through a Pullin projector on to a specially prepared white screen, the distance of the projector from the screen being so arranged that an enlargement of the miniature to 6½ in. (16.7 cm.) square can be satisfactorily carried out. If the enlargement is increased to greater than these dimensions there is a larger area for the eyes to cover and the strain of reading numerous miniature films is thereby increased.

Any patients who showed evidence of cardiac abnormalities were recalled for a routine history and physical examination, followed by screening and a barium swallow if thought necessary. At the same time large films were taken in the standard postero-anterior and oblique positions.

In making the diagnosis of cardiac abnormality by means of a miniature film, the following criteria were adopted: enlargement of the cardiac shadow; undue prominence of the pulmonary artery; changes in the contour of the aortic arch and cardiac shadow; changes in the lung fields. There are certain difficulties in using miniature films which are not found in large films, quite apart from the reduced size of the negatives. In the taking of miniatures the *x*-ray tube is situated 36 in. (91.4 cm.) from the fluorescent screen, so that there is bound to be some distortion of the cardiac shadow, which will appear larger than normal. Adiposity also causes broadening of the cardiac shadow, by consequent elevation of the diaphragm. I have found that all subjects with a maximum postero-anterior diameter of the chest of over 10½ in. (26.7 cm.) have a diaphragm that is higher than one would normally expect, so that the heart

outline is broadened. A considerable number of such persons were recalled for clinical examination, but were found to be perfectly normal.

An abnormally prominent pulmonary artery was of considerable value as a signpost to cardiac pathology. It was of less importance in young adults, in many of whom a prominent pulmonary artery was a normal feature of their cardiac outline (Parkinson, 1949). Many young adults showing this feature were recalled for clinical examination without any evidence of abnormality being found clinically, and on screening the heart was normal except for a slight to moderate prominence of the pulmonary artery. A very similar picture was produced if the patient was slightly rotated, or if a moderate degree of thoracic scoliosis was present; both of these abnormalities are usually evident on inspection of the miniature, and do not give rise to undue difficulty in diagnosis. Unfolding of the aorta secondary to arteriosclerosis with or without hypertension was particularly difficult to estimate. Considerable variation in the shape of the aortic arch can be brought about by moderate elevation of the diaphragm; thus the same factors are important here as in apparent broadening of the cardiac shadow.

With these many difficulties it is not surprising that a considerable number of those recalled for clinical examination and screening show no evidence of cardiac abnormality. Vascular shadows are much more obvious on the miniature films than they are on large films: evidence of pulmonary congestion if present is usually clearly seen. An additional feature in miniature radiography which tends to obscure the picture is the effect of secondary radiation; it is especially troublesome in obese people, and tends to cast a blur over the cardiac shadow and the pulmonary vascular shadows.

Results

In the two surveys 33 cases of rheumatic heart disease were discovered (see Table). There were 22 cases in Survey 1 (Chart 1) and 11 cases in Survey 2. Although

Cases of Rheumatic Heart Disease in Surveys 1 and 2

Type of Lesion	Sex	Average Age (Years)	No. of Cases
Mitral stenosis	Male	30·75	8
	Female	37·28	7
Mitral stenosis with aortic incompetence	Male	34·0	3
	Female	34·5	2
Mitral stenosis with aortic stenosis	Male	30·0	1
	Female	—	0
Aortic incompetence ..	Male	50·0	2
	Female	27·3	3
Mitral incompetence with aortic incompetence	Male	—	0
	Female	14·0	1
Aortic stenosis	Male	50·0	1
	Female	—	0
Mitral incompetence ..	Male	—	0
	Female	38·0	4
Mitral incompetence with aortic stenosis	Male	—	0
	Female	47·0	1
Total ..	—	—	33

in Survey 1 all the 22 cases were identified through the use of mass miniature radiography, 17 of them had already been diagnosed by other means prior to the survey. In Survey 2 only two cases were diagnosed radiologically, though all 11 cases had been previously diagnosed on clinical grounds. There were 14 instances of hypertensive heart disease discovered in Survey 1, none of which had been diagnosed before the mass miniature radiography survey (see Chart 1). The group consisted of nine males with ages ranging from 33 to 61 years, and five females, the youngest of whom was aged 45 and the oldest 51. Those subjects who had a systolic blood pressure at the high level of normal had a diastolic pressure above normal. There were also subjects who had a diastolic pressure situated at a high level of normal but whose systolic pressure was well above normal (Chart 2). The latter group showed a considerable degree of arteriosclerosis, so that an abnormally rigid aorta may well have been the causal factor in a marked raising of the systolic blood pressure.

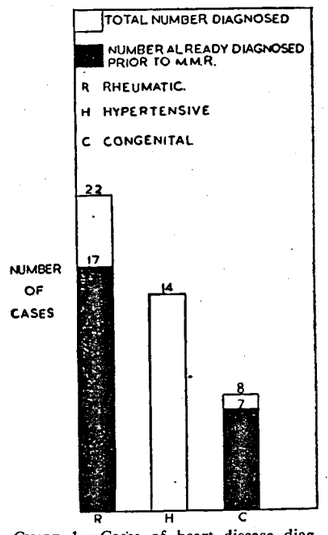


CHART 1.—Cases of heart disease diagnosed in Survey 1.

In regard to Survey 2, four cases of hypertensive heart disease were discovered, of which only one was diagnosed by means of mass miniature radiography—a female aged 62 with a blood pressure of 180/100. The remainder of the group were aged 45, 49, and 66. The lowest systolic blood pressure was 150 mm. Hg and the highest 180 mm.: the diastolic pressure was 100 mm. in all three subjects.

In Survey 1 there were eight cases of congenital heart disease which were diagnosed by means of mass miniature

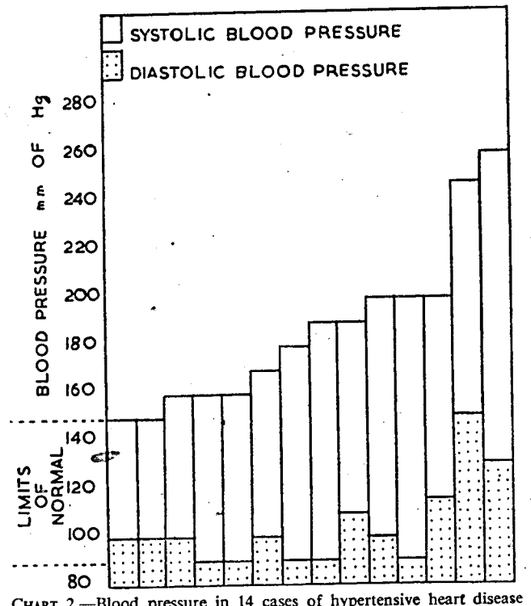


CHART 2.—Blood pressure in 14 cases of hypertensive heart disease occurring in Survey 1.

radiography. Seven of these had been previously diagnosed (Chart 1), usually on a routine school examination, though two had been diagnosed in their pre-school days. All these cases were asymptomatic, and none of them showed any sign of cyanosis or clubbing. The group consisted of two cases of patent interventricular septum (both males, aged 16 and 32) and four cases of patent interauricular septum (all males—two aged 22, one aged 31, and one aged 33). There were also two cases of dextrocardia with situs inversus, both males, aged 42 and 52. Considering the ages of the patients in relation to Campbell's observations that only one in two "blue babies" will survive to the seventh year and less than one in ten will reach the age of 10 years (Campbell, 1948), it is not surprising that cases of congenital heart disease with cyanosis were not present in this particular group.

Discussion

It has been suggested by the earlier pioneers in mass miniature radiography that it might be used for identifying cardiac abnormalities (M.R.C., 1945). No one so far has attempted to assess the potentialities of this method for disclosing the presence of cardiac abnormalities.

In the first survey we were dealing with a population containing an unknown number of cardiac cases, so that it is not possible to estimate how many were missed by the radiological screening. Of those rheumatic cases discovered, over half had already come under the supervision of their doctor on account of symptoms of varying degrees of severity. Subdividing the group into those cases diagnosed prior to mass miniature radiography and those diagnosed primarily by that means, we find that 12 of the former had symptoms, while this was true of only three of the latter.

All the cases in the hypertensive group of Survey 1 were identified from the cardiac enlargement on the miniature film; five had symptoms, and none had been diagnosed previously.

In these two groups the survey was of some value in that it identified 19 cardiac cases not previously diagnosed which would benefit from medical supervision.

None of the cases of congenital heart disease had any symptoms, nor had they any signs of cyanosis or clubbing. With the exception of the two cases of dextrocardia, all would benefit from medical supervision on account of the potential danger of subacute bacterial endocarditis. However, seven of these cases were already known to their medical advisers, so that benefit was brought to only one case by means of mass miniature radiography. There were no cases of congenital heart disease amenable to surgery.

Considering all three groups together, there were 44 cardiac cases in Survey 1, equivalent to 3.68 per 1,000. In the M.R.C. series a total of 21,178 subjects, consisting of office and factory workers in equal proportions, were *x*-rayed. In that survey 32 cardiac cases were discovered, equivalent to 1.51 per 1,000. The considerable difference in the two series is due to the fact that in the latter survey only those young cardiac patients in whom "some benefit was thought to be possible" were recalled for medical interview.

In Survey 2 all the subjects were females. The average age of this group was considerably higher than that of Survey 1; also there were a known number of cardiac cases, as all the patients had been examined on admission to hospital. In the primary radiological survey only three cases were identified by means of mass miniature radiography. Following this, all these known cardiac cases were examined personally and the clinical diagnoses checked. The relevant miniature films were looked at again to see whether any cases had been missed radiologically on the first inspection of the films. Even with the additional knowledge of the clinical condition of these patients, no further cases could be diagnosed radiologically. It appears, therefore, that mass miniature radiography is of some, though limited, value in the diagnosis of cardiac abnormalities, and that by its means some cases of cardiac disease with few or no symptoms may be revealed. It is obvious that in every survey a large number of cardiac cases must be missed, because they have not reached the stage where there are radiological abnormalities, or because the thickness of the chest wall, with or without excessive adiposity, produces such a poor miniature that it is useless for diagnostic purposes.

Summary

In two mass miniature radiography surveys 12,173 subjects were *x*-rayed; 47 cases of cardiac disease were diagnosed radiologically and checked by clinical examination.

Seventeen cases of rheumatic heart disease and seven cases of congenital heart disease had been previously diagnosed in Survey 1 (11,929 cases).

Three cases of cardiac disease were diagnosed out of a known number of 15 occurring among the 244 cases in Survey 2.

The difficulties met with in the reading of miniature films are described.

It is considered that mass miniature radiography is of value in identifying some cases of cardiac disease, though in any survey a large number are bound to be missed for technical reasons and through lack of radiological change.

It gives me pleasure to record my appreciation of the criticism and encouragement given to me by Dr. Robert Coope in the preparation of this paper. In Survey No. 2 I am indebted to Dr. MacKenzie and the staff of Newchurch Hospital for their very willing co-operation.

REFERENCES

Campbell, M. (1948). *Guy's Hosp. Rep.*, 97, 1.
Medical Research Council (1945). *Spec. Rep. Ser.*, No. 251, p. 95
Parkinson, J. (1949). *Lancet*, 1, 895.

The Women's Advisory Council on Solid Fuel (18, South Molton Street, London, W.1) took occasion at a conference on November 9 to draw attention to the need for effective safety appliances for kitchen ranges and open coal-fires. The seriousness of the need was pointed out by Mrs. Vera Colebrook, who said that over 100,000 cases of burns and scalds required hospital treatment in England and Wales every year. This represented a financial drain on the National Health Service of over £2m., and 300,000 bed-days could be saved if burns were prevented. Of the cases of burns 70% were caused in the home and 30% in industrial establishments, but while there were safety precautions in industry nothing was done about the domestic fire. Mrs. Colebrook criticized the rule whereby a fireguard when sold separately was not subject to purchase tax, but the tax was chargeable if the guard was incorporated in the heating appliance. Gas and electric fires with fixed guards were being exported to countries like Sweden and Iceland, where the incorporation of the guard with the fire was compulsory, but in this country a tax was imposed on the incorporated device. Two new types of guards were exhibited at the conference. One was for fixing in front of the fire when it was opened in a special type of solid fuel range. The other was an adaptation of the "cage" type of guard for the open fire, having a special door in front so that the guard need not be put aside when more fuel was added, and there was a device for fixing it firmly so that it could not be easily knocked over.

UNUSUAL CASE OF TUBEROUS SCLEROSIS

BY

A. J. N. WARRACK, M.B.E., M.D., D.T.M.&H.
Assistant Director of Pathology, Southern Command; Lieutenant-Colonel, R.A.M.C.

[WITH SPECIAL PLATE]

Tuberous sclerosis is a condition found in the brain as a feature of the syndrome epiloia. Critchley and Earl (1932) described 29 cases of epiloia, and in a review of the literature pointed out the essential features of the disease. Classical cases are characterized by mental deficiency, recognizable in early life, adenoma sebaceum at puberty, and epileptic fits. A psychopathic taint is often a feature of the mental state, and motor restlessness is common. A familial incidence may also be discovered. Other signs recognizable during life may include thickening (shagreen patches) of the skin, flattened dermal fibromata on the back, pedunculated dermal tags, and such stigmata as simian hands, with incurving of the little finger, and misshapen ears.

At post-mortem examination the cerebral convolutions are found to contain numerous sclerotic areas which on microscopy appear to consist of an increase in neuroglial tissue with the addition of giant cells foreign to the central nervous system. Tumours of other organs are common, including cardiac myomata and bizarre renal neoplasms varying from sarcoma to hypernephroma.

Tredgold (1947) described the condition and discussed the features of the mental state. Clinical variants occur, and Stewart (1935) recorded the sudden death in epilepsy of an apparently normal young woman. Typical sclerotic areas were found in the brain, though there was no previous history of mental deficiency or fits, and no evidence of adenoma sebaceum or renal neoplasms.

The purpose of this paper is to describe another of the *formes frustes* of epiloia which occurred in a young soldier.

Case Report

The patient was called up for national service in August, 1949. He was found fit and drafted to a selection unit. His medical documents stated: "Pigmented rash on face. Marked refractive error in both eyes—corrected to 6/6. A history of migrainous headaches." There was no history of fits of any kind. He underwent the usual selection procedure at his unit and was given the intelligence rating "S.G. 3P." This placed him in the top 50% of the Army population and showed him to be above average intelligence. The personnel selection officer made the following comments at a routine interview: "He is a man of above average intelligence and ability and has been on survey work. He is of negative personality."

It should be noted, however, that the man's instructors described him as "slow to learn," while his father later stated that although he was an affectionate boy he was not as quick as his brother. There was no family history of mental disease or of fits.

Soon after his arrival at the selection unit he reported sick with headaches. The presence of adenoma sebaceum on the face was at this time remarked upon and he was kept under observation. Four weeks later his comrades reported, at about 8.30 p.m., that he had complained of drowsiness at about 4.30 p.m., had gone to bed, and could not be roused.

On admission to hospital he was semi-comatose and restless, with alternating pulse and Cheyne–Stokes respiration. The limbs were in the position of decerebrate rigidity; the arms being flexed and legs extended. The tonic state of the limbs was described as striking. The pupils were at first equal and reacted to light, but as his condition deteriorated into deep coma they became fixed and dilated. The tendon reflexes were brisk but the abdominal reflexes were absent.

He died at 10.45 p.m., apparently from a brain-stem lesion, about seven hours after he had first complained of drowsiness.

Post-mortem Examination

External Appearance.—The body was that of a well-nourished young adult male. The pupils were dilated and equal. There was a small pedunculated papilloma close to the left nasal cleft surrounded by several sessile red and brown plaques varying from a pin's head to 2 mm. in size. Similar plaques and a tiny papilloma were visible in the right nasal cleft. A few tiny red spots were visible on the cheeks. The distribution of these plaques was of a butterfly nature and the condition appeared to be one of adenoma sebaceum. There was a small papilloma about 0.5 cm. in diameter in each groin. In the small of the back in the region of the third and fourth lumbar vertebrae there were about a dozen brown sessile plaques varying from 1 mm. to 1 cm. in diameter. A similar collection was present over the sacrum.

Central Nervous System.—The cerebral cortex was studded with firm sclerotic masses about 1 cm. in diameter. These could readily be discerned with the finger-tips, but were extremely difficult to see with the naked eye. There was no evidence of hydrocephalus or haemorrhage. The cerebellum was normal. Examination of the pons and medulla showed surprisingly little change considering the decerebrate and acute nature of the man's death.

Urinary System.—The left kidney was congested. Several white pin-point spots were visible on the surface. On cut section a round circumscribed fibrous mass was found at the upper pole 0.5 cm. below the surface. The right kidney showed a similar mass 1.5 cm. in diameter at the lower pole and another small deposit near the pelvis. No abnormalities were noticed in any other organs.

On histological examination of the central nervous system the sclerotic areas showed an increase in glial tissue, with a bizarre cellular structure. Displacement and disorientation of large nerve cells were characteristic (Plate, Fig. 1). The tumour in the left kidney was epithelial in nature and had an adenocarcinomatous appearance (Fig. 2). The other renal tumours were quite different, and consisted of vascular fibrous tissue (Fig. 3).

This patient thus showed many of the classical lesions of epiloia, including adenoma sebaceum, dermal tags and plaques, tuberous sclerosis, and bizarre renal neoplasms. His normal intelligence and the absence of any history of fits were unusual features.

Summary

Sudden death in a young adult is described in which the typical lesions of epiloia were found with recent evidence of normal intelligence and no evidence of fits.

A similar case described by Stewart (1935) did not exhibit adenoma sebaceum or renal neoplasms.

I am indebted to Lieutenant-Colonel W. D. Hughes, R.A.M.C., officer in charge, Medical Division, Cambridge Hospital, for the clinical details and valuable advice and encouragement, and to Captain T. D. S. Oswald, R.A.M.C., for the previous history and for his interest in the preparation of this report. I also thank the late Dr. K. Paddle, medical superintendent, Botleys Park Mental Colony, Chertsey, and his colleagues for their kindness in demonstrating their cases of typical epiloia; Dr. J. G. Greenfield, of the National Hospital for Nervous Diseases, for his kindness in examining the sections; and Captain J. L. Garson, R.A.M.C., for the photomicrographs.

REFERENCES

Critchley, M., and Earl, C. J. C. (1932). *Brain*, 55, 311.
Stewart, R. M. (1935). *British Medical Journal*, 2, 60.
Tredgold, A. F. (1947). *Textbook for Mental Deficiency*, p. 216. London.

Medical Memoranda

Pernicious Anaemia and Tumours of the Stomach

The following two cases are considered worthy of record as illustrating the association between pernicious anaemia and gastric tumours.

CASE 1

A 55-year-old man attended the Manchester Royal Infirmary in October, 1946, and was found to be suffering from pernicious anaemia. Fractional gastric analysis showed complete achlorhydria. There was a rapid response to parenteral liver therapy and he was maintained in good health with normal blood count by continued treatment.

In January, 1949, he had a small haematemesis with uneventful recovery, and in June was admitted to hospital under the care of Dr. A. H. Holmes for investigation. He stated that he felt quite well and denied having dyspepsia either before or since the haematemesis. There were no abnormal physical signs, and the results of investigations were as follows: blood count was normal; examination of the faeces for occult blood was positive, and barium-meal examination revealed a smooth mobile filling defect close to the greater curvature of the stomach suggestive of a polyp. This was confirmed gastroscopically by Dr. C. S. D. Don, and a Schoemaker gastrectomy was performed by Professor John Morley. There was no evidence of the presence of other polyps.

Pathological Report.—The portion of the stomach removed contained a tumour situated on the anterior wall close to the greater curvature towards the pylorus. The tumour consisted of two parts, the larger pedunculated and the smaller sessile. Histologically it was an adenomatous gastric polyp with no evidence of malignancy.

CASE 2

A 54-year-old woman had a subtotal thyroidectomy for hyperthyroidism in May, 1946; at that time the blood count was: red cells, 4,900,000 per c.mm.; haemoglobin, 92%; colour index, 0.94; white cells, 7,200 per c.mm. Her health improved after the operation, but in February, 1948, she was readmitted to hospital under the care of Dr. A. H. Holmes complaining of epigastric discomfort, dysphagia at the xiphisternum, and loss of weight, over the last year. The tongue had recently been sore and atrophic glossitis was present. She was wasted and pale. A hard mass was felt in the epigastrium to the left of the midline, and the liver edge was 2 in. (5 cm.) below the right costal margin; it was also thought that the spleen was just palpable.

A blood count showed: red cells, 3,460,000 per c.mm.; haemoglobin, 78%; colour index, 1.13; white cells, 6,700 per c.mm., with normal differential count; the sternal marrow was megaloblastic. Fractional gastric analysis showed absence of free HCl with very low total acid. *X*-ray examination revealed a large filling defect in the fundus and body of the stomach. It was apparent that she had both pernicious anaemia and gastric carcinoma. Intramuscular liver injections resulted in a reticulocyte response reaching 31% on the sixth day, but the haemoglobin did not rise. Laparotomy was carried out by Professor A. M. Boyd, and an inoperable gastric carcinoma with metastases in the liver and peritoneum was discovered. She was discharged from hospital and died soon afterwards.

COMMENT

In the past few years increasing attention has been drawn by American workers to the coexistence of pernicious anaemia and gastric epithelial tumours. Kaplan and Rigler (1945) made a study of 43,021 consecutive necropsies and were able to find 293 cases of pernicious anaemia, 36 of which also had carcinoma of the stomach, an incidence of 12.3%; this was over three times the incidence in the remaining necropsy population of the same age. Concerning benign tumours of the stomach, it is interesting to note that Brown (1934) found 12 gastric polyps (8%) among 151 cases of pernicious anaemia in 18,200 necropsies.

Kaplan and Rigler (1947) also carried out repeated radiological and gastroscopic examinations of patients with pernicious anaemia, and out of 259 such patients 18 (6.9%) were found to have carcinoma of the stomach, and 17 (6.6%) had benign polyps. Bourne (1948) similarly investigated 15 patients with pernicious anaemia over a period of two years and found three symptomless gastric carcinomas, one polyp, and one leiomyoma. Other authors have also reported a high incidence of gastric polyps in pernicious anaemia (Doehring and Eusterman, 1942; Washburn and Rozendaal, 1938). Velde (1938) found six such cases (14%) in a series of 42 patients with pernicious anaemia, as contrasted with an incidence of only 0.7% in a control series of patients with other diseases.

The tendency to the development of gastric polyps displayed by such patients is clearly of great importance when one considers the frequent development of malignant changes in such tumours (Stewart, 1929; Miller *et al.*, 1930; McRoberts, 1933; Lawrence, 1936; Rigler and Erickson, 1936). It is of interest that gastric carcinomas developing in patients with pernicious anaemia are usually of polypoid type and situated in that area of the stomach which Magnus and Ungley (1938) have shown to be atrophic in this disease—namely, the body and fundus.

Wilkinson (1949) stated: "My series produced 28 gastric cancers in 1,532 patients who lived—i.e., 1.83%, or on the basis of total fatal cases (28 gastric cancers in 301 dead pernicious anaemia patients) a frequency of 9.3%—and therefore suggests the necessity for regular and frequent examination of all patients with pernicious anaemia." The most rational explanation of the occurrence together of the two diseases is that both are the result of the same inherent abnormality of the gastric mucosa.

It should be noted that our second case is rather unusual in that the carcinoma and pernicious anaemia apparently arose within a short period of each other, as a blood count performed less than two years before both diagnoses were made was quite normal. As we have pointed out above, in all probability the pernicious anaemia and the carcinoma shared a common "ancestor," whatever that may be; it is conceivable, however, that in our patient the carcinoma actually produced the pernicious anaemia by virtue of its localization in the fundus and body of the stomach.

ADDENDUM: Since our submission of this paper, Mosbech and Videbaek (*British Medical Journal*, 1950, **2**, 390) have recorded 15 cases of gastric carcinoma occurring among 301 patients with pernicious anaemia. These authors considered that the gastric carcinomas of patients with pernicious anaemia had the same anatomical distribution as in normal people.

We wish to thank Dr. A. H. Holmes for his encouragement and advice, and the other physicians and surgeons of the Manchester Royal Infirmary mentioned in the text.

M. H. OELBAUM, M.B., B.Sc., M.R.C.P
N. J. ROUSSAK, M.B., B.Sc., M.R.C.P.
Manchester Royal Infirmary.

REFERENCES

Bourne, W. A. (1948). *British Medical Journal*, **1**, 92.
Brown, M. R. (1934). *New Engl. J. Med.*, **210**, 473.
Doehring, P. C., and Eusterman, G. B. (1942). *Arch. Surg., Chicago*, **45**, 554.
Kaplan, H. S., and Rigler, L. G. (1945). *Amer. J. med. Sci.*, **209**, 339.
—— —— (1947). *J. Lab. clin. Med.*, **32**, 644.
Lawrence, J. C. (1936). *Amer. J. Surg.*, **31**, 499.
McRoberts, J. W. (1933). *Proc. Mayo Clin.*, **8**, 685.
Magnus, H. A., and Ungley, C. C. (1938). *Lancet*, **1**, 420.
Miller, T. G., Eliason, E. L., and Wright, V. W. M. (1930). *Arch. intern. Med.*, **46**, 841.
Rigler, L. G., and Erickson, L. G. (1936). *Radiology*, **26**, 6.
Stewart, M. J. (1929). *British Medical Journal*, **2**, 567.
Velde, G. (1938). *Z. klin. Med.*, **134**, 653.
Washburn, R. N., and Rozendaal, H. M. (1938). *Ann. intern. Med.*, **11**, 2172.
Wilkinson, J. F. (1949). *Lancet*, **1**, 336.

Atresia of the Small Intestine

Congenital atresia of the intestine is not a common condition and it is rarely diagnosed at a stage when surgical treatment holds out a hope of success; yet early diagnosis is relatively simple.

Vomiting always occurs on the first day of life and is persistent and increasing (Ladd and Gross, 1941). It almost invariably contains bile. These two findings distinguish the condition from hypertrophic pyloric stenosis. The stools are usually small, dry, and lighter in colour than normal meconium (Ladd and Gross, 1941; Potts, 1947). Absolute constipation is not the rule. Abdominal distension is variable, depending on the duration of the symptoms and the level of the lesion. When the atresia is in the ileum distension is usually marked and visible peristalsis is often present (Ladd and Gross, 1941; Potts, 1947). Dehydration is pronounced only if the condition has persisted for some days.

A plain radiograph of the abdomen, particularly if taken with the infant held erect, will not only establish the diagnosis of obstruction but will give a clue to its approximate level. The administration of barium in these cases is not only unnecessary but may be dangerous, as an inhalation of vomited barium may give rise to a fatal pneumonia.

Farber's test depends on the fact that normal meconium contains cornified epidermal cells from swallowed liquor amnii. If microscopical examination of a specimen of meconium (taken from the centre of a stool) shows absence of such cells complete obstruction of the intestine may be assumed. As stenosis is not excluded this test would seem to be of more academic than practical value. It should be stressed that repeated vomiting during the first 24 hours of life indicates the urgent need for radiographic investigation.

CASE REPORT

A baby girl, born at 4.30 p.m. on July 31, 1949 (weight, 6 lb. 12 oz.—3.06 kg.), was admitted to hospital at about 1 p.m. the next day with a diagnosis of imperforate anus and a history of repeated vomiting since birth and failure to pass meconium.

On examination the abdomen was distended. Ladder patterns and visible peristalsis were seen over the central and upper abdomen. Her clothes showed evidence of bile-stained vomit. Per rectum there was no difficulty in inserting a finger, and examination was followed at once by the passage of a normal looking tarry meconium. A radiograph of the abdomen (erect position) showed coils of distended small bowel with fluid levels. The radiologist (Dr. J. O. Y. Cole) reported "small-gut obstruction, probably mid-ileum."

A 10E rubber urethral catheter was passed into the stomach, and repeated aspirations were carried out. About 1 oz. (28 ml.) of bile-stained fluid was aspirated. Ringer-lactate solution, 100 ml., was injected subcutaneously.

Operation.—Anaesthesia was induced by ethyl chloride followed by nitrous oxide, oxygen, and ether (Dr. Reid). A right paramedian incision centred opposite the umbilicus and 3 in. (7.5 cm.) in length was made. Grossly distended loops of small intestine presented and were allowed to prolapse freely. The distended bowel ended blindly about midileum, and at this point the gut was almost 2 in. (5 cm.) in diameter and very thin-walled, but not gangrenous. For the next 2 in. there was complete absence of intestine, the mesentery ending in a free edge just distal to the vascular arcades. The distal bowel was extremely small, the diameter being less than ¼ in. (0.6 cm.).

With a fine hypodermic needle some 30 ml. of air was injected into the distal loop, which promptly dilated to about ½ in. (1.25 cm.) diameter and the pelvic colon could be felt distended with air. The proximal loop was aspirated and much gas and a little brown fluid were withdrawn, causing the loop to collapse considerably. The needle puncture was turned in with a purse-string suture of 3/0 chromic catgut.

Using light clamps, a 1½-in. (3.75-cm.) side-to-side anastomosis was made between the two loops by standard technique. As no suitable non-absorbable suture was available 3/0 chromic catgut on an atraumatic needle was used for both layers. No tube was used and anastomosis was not difficult. The gap in the mesentery was closed and the bowel was returned to the abdomen. The abdomen was closed in layers, using 2/0 chromic catgut for the deep layers and fine nylon for the skin.

The gastric catheter was left in place and aspirated hourly. Ringer-lactate solution, 100 ml., was injected subcutaneously at four-hourly intervals for 24 hours. Rectal salines, 4 oz. (114 ml.), were injected four-hourly, partly with a view to increasing fluid intake, but chiefly to distend the distal bowel. Penicillin, 50,000 units three-hourly, was given. The infant was nursed in an incubator with extra oxygen.

On August 2 only a few ounces of bile-stained fluid were aspirated. The bowels opened 12 hours after operation—meconium and a little blood. Next day, with the gastric tube in position, 1 oz. of 5% glucose was fed to the infant from a spoon at hourly intervals and aspirations were continued hourly (midway between feeds). After a few hours it was obvious that the fluid aspirated was much less than the intake. The bowels moved once again. Subcutaneous and rectal fluids were discontinued, the gastric tube was withdrawn, and glucose water was continued and gradually increased.

Three-hourly feeding with a reconstituted food was begun on August 4. From this point the feeding and care of the infant were left entirely to the nursing staff of the maternity unit and the baby was treated as "premature." The successful outcome of the case is due in no small measure to their devotion and skill. The child was discharged on September 17 and, apart from some fat intolerance, was normal. When seen on November 7 she was progressing normally and her weight was 11 lb. 4 oz. (5.1 kg.).

HARRY M. BENNETT, F.R.C.S.Ed.

REFERENCES

Ladd, W. E., and Gross, R. E. (1941). *Abdominal Surgery of Infancy and Childhood*. Philadelphia.
Potts, W. J. (1947). *Surg. Gynec. Obstet.*, **85**, 14.

In the not-too-distant future the number of pharmaceutical research scholarships may be substantially increased, Mr. C. W. Maplethorpe, chairman of the Pharmaceutical Society's education committee, stated in the course of an address on the society's education policy. There are already three such scholarships of the annual value of £300 each. A lease of a building, he added, had been taken for the establishment of a well-equipped laboratory for work in connexion with the scientific publications of the society. Because of the new opportunities in pharmacy, more young people were entering the profession. Since January they amounted to 784, and if the number of entries during the remainder of the year was at the same rate as last year they would exceed the entry figures for any year since 1933.

Reviews

SUPERVOLTAGE RADIOTHERAPY

Supervoltage Roentgentherapy. By Franz Buschke, M.D., Simeon T. Cantril, M.D., and Herbert M. Parker, M.Sc. From the Tumour Institute of the Swedish Hospital, Seattle, Washington. (Pp. 297; illustrated. £3 17s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

During the last two decades there has been much technical progress in radiotherapy, and one of the principal changes was the application, for therapeutic use, of *x* rays generated at over half a million volts (in the so-called supervoltage range). In this book the authors record their clinical experience with an 800-kV apparatus installed in 1932—in the pioneer stages of supervoltage development—which has continued to provide a satisfactory radiation beam. Physical considerations discussed in the opening chapter include the lay-out of the Villard circuit, protection, and measurements of radiation quality and quantity. The effective wavelength of the beam, 0.0245 Å, is satisfactorily low for a pulsating type of circuit at 800 kVp, but the heavy filtration necessary reduces the dosage rate to about 20 r per minute at one metre focus-skin distance. The *x*-ray beam is projected vertically downwards from an aperture in the ceiling of the treatment room, and spatial angulation has to be made by adjusting the patient's position relative to the fixed beam; this, the authors admit, is an outstanding weakness of the arrangement. The physical advantages claimed for supervoltage therapy are, in addition to the improved depth dose in treating deep-seated lesions, the reduction in skin reaction and the restriction of radiation to the geometric beam, thereby diminishing the constitutional upset of the patient.

Throughout the chapters on the irradiation of malignant disease at various sites the emphasis is on clinical aspects, and many detailed and well-illustrated case histories are included. Statistical analyses are limited, because the authors feel that "at this stage there is more to be gained by a discussion of the particular patient, his disease, and reactions to treatment than can be gained from statistical evaluation." The importance of deep mucosal reactions, and not skin reaction, as the factor limiting permissible dosage in many sites is well brought out in these chapters. Supervoltage therapy, they find, has been used with advantage in advanced carcinomata of the oral cavity and pharynx, especially of the base of the tongue. In carcinoma of the maxillary antrum and larynx they believe the response to depend more on the histological type of the growth than on the dose or energy of the radiation. In oesophageal and bladder growths the results obtained are distinctly encouraging, but breast carcinoma the authors regard pessimistically from a radiotherapeutic viewpoint. In a detailed discussion of the problems presented by carcinoma of the cervix uteri they emphasize the dangers of over-irradiation in the pelvis, where again the limiting factor is the reaction of the intestinal mucosa.

The authors conclude that "supervoltage roentgentherapy has a limited but definite place in an institution which tries to give the cancer patient the benefit of whatever increment has been made in radiation therapy." Their experience has, however, been limited by the lack of flexibility of their apparatus, so that the full benefit of modern supervoltage therapy by multiple beam-directed small fields could not be readily attained. Many radiotherapists now about to use supervoltage therapy for the first time will find in this book a well-produced, fully documented, and clearly illustrated account of the clinical effects of supervoltage radiation on normal and malignant tissues.

ARTHUR JONES.

VENOUS PRESSURE

A Primer of Venous Pressure. By G. E. Burch, M.D. (Pp. 174; illustrated. 28s.) London: Henry Kimpton. 1950.

As stated in the preface, this short monograph is intended for the beginner. It is designed to arouse his interest in the venous pressure and its bearing on clinical problems, so that he may better understand and manage his patient. After reading the 164 pages and studying the 170 diagrams, the novice is unlikely to be a better doctor: he will certainly be unable to estimate the venous pressure at the bedside, unless already taught how to do so elsewhere, and he will be unaware of the chief fallacies in such estimations. This is a pity, especially since the clinical value of measuring and understanding the venous pressure is repeatedly emphasized. The author presents much anatomical and physiological information about the veins in various parts of the body, but it is questionable whether these are the facts the clinician wants to know. His interest might have been captured more securely if his difficulties had been better appreciated and met. For example, at the bedside it is almost impossible to consider the central venous pressure without reference to the venous pulse: but Professor Burch dismisses the jugular pulse in 10 lines He may have had good grounds for doing so, perhaps because he believed it had little to do with his subject: but it is hard to see why. His attitude would excite more sympathy had the title of the book been "A Primer of Peripheral Venous Pressure."

At the bedside the clinician tries to distinguish one cause of raised venous pressure from another, and in doing so he naturally attempts to analyse the venous pulse. In this way he can recognize tricuspid incompetence, tricuspid stenosis, and a group of conditions that give rise to strong right auricular contractions, and so distinguish them from congestive failure. Differences of opinion on the interpretation of the hepato-jugular reflux are not considered, yet there has been and still is much controversy about this elemental phenomenon. The venous pressure is considered in relation to sex, race, age, altitude, and nutrition, but not in relation to bradycardia, pregnancy, menstruation, fever, or anaemia.

Despite such drawbacks much valuable information has been collected and is presented in a manner characteristic of Professor Burch's other works. The book is recommended to those who wish to study the peripheral venous pressure more seriously, and to research workers who are interested in problems relating to the venous pressure But students and clinicians may find it disappointing: much is offered that they may not want to know; much that they may seek is omitted.

PAUL WOOD.

TUBERCULOSIS OF THE HIP

Coxitis tuberkulosa. By Dr. Herbert Gardemin. (Pp. 166; 245 figures. M. 18.) Berlin and Munich: Urban and Schwarzenberg. 1950.

The secondary title of Dr. Herbert Gardemin's book on tuberculosis of the hip is "A Contribution to the Radiological Pathology of Skeletal Tuberculosis." The volume is primarily intended for radiologists, but, as the radiological appearances are related to pathological findings, a wide field is covered, and the book will be of interest to all concerned with the long-term treatment and diagnosis of this disease. The author pays particular attention to the early features of the disease and the detection of the minimal lesion. There is a well-illustrated series of cases showing the main primary sites of infection and their progress. A knowledge of this is of value in forming a prognosis and some assistance in deciding when operative treatment should be carried out.

The author carefully analyses the relationship of the radiological appearances to the healing process. This point is obviously important if minimal immobilization is the goal of treatment. The undesirable influence of pus and caseation in healing is well shown, though its presence does not appear to excite any direct effect on reparative ossification, which starts in the majority of cases from the acetabular area.

In general, the findings emphasize the value of conservative treatment. It is a pity that the space devoted to the discussion of differential diagnosis is disproportionate to the rest of the volume. A diet of rich detail of one aspect raises an appetite for a similar exposition of the imitative lesions.

J. G. BONNIN.

SOMATOGENIC ILLNESSES

Klinische Psychopathologie. By Kurt Schneider. Third edition. (Pp. 179. M. 11.40.) Stuttgart: Georg Thieme. 1950.

The various schools of psychopathology differ in their basic assumptions and the type of clinical data on which they build their systems. This book starts out with a sharp division of psychological disorders into two categories: mental illness, which is due to somatic disease or malformation; and mental abnormality, which is merely an excessive deviation from a normal average. The author claims that this distinction is supported by clinical experience, which revealed to him that transitional conditions between the two categories are exceedingly rare, so that diagnostic difficulties in distinguishing between them hardly ever occur. For example, he has rarely been in doubt whether a patient should be classified as schizophrenic or manic-depressive, or whether he should be regarded merely as an abnormal personality Therefore he concludes that schizophrenia and manic-depressive psychosis are due to an as yet unknown somatic disease—a rather daring conclusion in view of the slender, subjective, and speculative basis on which it rests.

The psychopathology of these two categories of mental disorder are treated in a different manner. Discussing the somatogenic illnesses, the interest of the author is focused on the kind of symptom which can be caused by the underlying somatic disease. In this section of the book he therefore concentrates on a careful and detailed description of the possible symptomatology. He also classifies the symptoms into two groups according to the diagnostic value they have.

When he turns to his second category of mental disorders the author does not limit himself to descriptive analysis and classification The deviations with which he deals in particular are abnormal intellectual endowment, abnormal personality, and abnormal reactions to experience. A delineation of psychopathic and neurotic personality types is attempted, but only limited clinical usefulness is claimed for it. These descriptive formulations are supplemented by dynamic considerations of the interaction between constitutional trends and individual experiences. The views in these chapters approach certain concepts which have been developed by the psycho-analytical school. But the author is critical of these concepts and underlines the difference from them of his point of view. The name of Freud is never mentioned, not even in disagreement. Nor does the term "unconscious" appear in the book; it has to be replaced by such cumbersome circumlocutions as "the basis which is not and cannot be experienced," and "the background of previous experiences which need not be immediately recalled."

F. K. TAYLOR.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

A Handbook on Diseases of Children. By B. Williamson, M.D., F.R.C.P. 6th ed. (Pp. 440. 17s. 6d.) Edinburgh: E. and S. Livingstone. 1951.

Life Among the Doctors. By P. de Kruif. (Pp. 479. 16s.) London: Jonathan Cape. 1950.

Just .. Medley of Amusing Tales and Interesting Medical and Legal Experiences. By "An Old Retired Scotch Doctor." (Pp. 80. 5s.) Reigate, Surrey: George J. Hieatt. 1950.

Injuries of the Knee Joint. By I. S. Smillie, O.B.E., Ch.M., F.R.C.S.Ed., F.R.F.P.S. 2nd ed. (Pp. 391. 50s.) Edinburgh: E. and S Livingstone. 1951.

Le Salmonellosi nell'Uomo. By G. Scotti and G. T. Sicca. (Pp. 143. $3.50.) Pisa: Omnia Medica. 1950.

Medical Dictionary. By Dr. E. Veillon. (Pp. 1,407. 126s.) London: H. K. Lewis. 1950.

The Care of Young Babies. By J. Gibbens, M.B., M.R.C.P. 3rd ed. (Pp. 204. 5s.) London: J. and A. Churchill. 1950.

You are Younger than You Think. By M. Gumpert, M.D. (Pp. 261. 10s. 6d.) London: Hammond and Hammond. 1950.

The Mystery of Dreams. By W. O. Stevens. (Pp. 280. 16s.) London: George Allen and Unwin. 1950.

Dental Surgery and Pathology. By T. W. Widdowson, F.D.S., R.C.S.Eng., and E. V. B. Widdowson, L.D.S., R.C.S.Eng. 4th ed. (Pp. 745. 63s.) London: Staples Press. 1950.

Health and Disease in the Tropics. By C. Wilcocks, M.D., F.R.C.P., D.T.M.&H. (Pp. 200. 15s.) London: Geoffrey Cumberlege. 1950.

Santa Claus, M.D. By W. W. Bauer, M.D. (Pp. 266. $2.75.) New York: The Bobbs-Merrill Company. 1950.

La Constipation. By M. Chiray and R. Stieffel. (Pp. 189. No price.) Paris: L'Expansion Scientifique Française. 1950.

Les Hémorroïdes et leur Traitement. By R. Bensaude and P. Oury. 3rd ed. (Pp. 209. 650 francs.) Paris: L'Expansion Scientifique Française. 1950

Recent Advances in Ophthalmology. By Sir Stewart Duke-Elder, K.C.V.O., M.A., D.Sc., LL.D., Ph.D., M.D., F.R.C.S., F.A.C.S., and A. J. B. Goldsmith, M.B., B.S., F.R.C.S. 4th ed. (Pp. 372. 28s.) London: J. and A. Churchill. 1951.

The Pathogenesis and Pathology of Viral Diseases. Edited by J. G. Kidd. (Pp. 235. 32s 6d.) London: Geoffrey Cumberlege. 1950.

Contribution à la Thérapeutique Biologique de L'Alcoolisme Chronique: Le Traitement par L'Apomorphine. By H. Feldmann, M.D. (Pp. 239. 800 francs.) Paris: L'Expansion Scientifique Française. 1950.

Das Problem der Bisexualität. By Professor B. Breitner. (Pp. 77. M. 5.) Vienna: Wilhelm Maudrich. 1951.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY DECEMBER 16 1950

DISPLACED REGISTRARS

Since July, 1948, no action of the Minister of Health has caused such disquiet and anxiety as the recent decision summarily to dismiss over 1,000 registrars from the hospital service of this country. The first and most ominous ground for disquiet is this unpleasant reminder of the absolute powers of the Minister. As short a time ago as 11 months the Ministry of Health published a memorandum on the development of consultant services,[1] in which it made this reference to the increase and distribution of consultant staff: "Thus for the first time there is generally available the means of providing additional staff where it is most needed. . . . The deficiency in numbers can be made good only gradually, because the training of consultants is necessarily long." This memorandum, which had been circulated to hospital boards a year previously to guide them in planning consultant services, was generally welcomed as making a constructive approach to the evolution of a consultant service adequate to the needs of the community. In fact, in the first paragraph of the memorandum it was admitted that there are too few consultants to meet the needs of the whole population. This is a matter on which the medical profession and the Ministry of Health are in agreement, and yet what does the Minister do within a year of publishing the memorandum? He cuts the present registrar strength by half and at the same time introduces as a *long-term policy* a proposal which does not yet seem to have aroused enough interest in the profession—namely, that general practitioners should serve as clinical assistants in hospitals in order to meet "staffing difficulties in the senior registrar field." Here is a radical change in policy which has been introduced without agreement by the medical profession. When questioned in the House of Commons Mr. Aneurin Bevan gave a completely false impression when he stated that the proposals relating to registrars had been introduced after consultation with the profession. The falsity lay in the implication that consultation implied agreement. As was made clear in a statement in the *Supplement* to last week's *Journal*, the Joint Committee, representing the Royal Colleges and Corporations and the B.M.A., did not accept the Ministry of Health's proposals. A further statement in this week's *Supplement* makes the position of the Joint Committee unambiguous, and it is urging the Ministry to postpone action on the proposals made and at the same time to reopen discussions on the whole question of registrars in relation to the consultant service of the country. An organization from which Mr. Bevan might have expected some support has, on the contrary, peremptorily demanded "the immediate withdrawal of circular RHB (50) 106." The Socialist Medical Association, which has made this demand, agrees with the Joint Committee when it states that "the circular shows a total failure to understand the importance of the contribution made by registrars to the hospital service. By concentrating on the training they receive it fails to appreciate how much of the essential work on the wards and in the out-patient departments is done by registrars, many of whom are in fact doing consultants' work."

The second disturbing feature of the Minister's recent action is the failure on his part—or perhaps we should say on the part of those who advise him—to appreciate the position of registrars in hospitals and his failure to go ahead with the policy of expanding the consultant services of this country in relation to the needs of the community. Part of the trouble has arisen because of the Minister of Health's apparent habit of regarding registrars merely as trainees. They are of course trainees in the sense that every doctor who practises medicine is undergoing a constant training for his job, if only for the reason that he is always having to learn how to use new methods and new tools. It is absolutely essential that the Minister and his Department should realize that the work of registrars is indispensable to the hospitals of this country and should be related primarily to the needs of the hospital—that is to say, to the needs of the patients in the hospital—and only secondarily to prospective vacancies in the consultant world. It may well be that in some hospitals there are too many registrars, just as in other hospitals there are too few; but the possibility of making arrangements for transfer was envisaged in the Ministry's memorandum on consultant services. No one would pretend that everyone who gets a job as a registrar should be a consultant. This again is one of the unfortunate results of talking about the registrars as being trainees. Before July, 1948, a man was appointed to be a registrar because there was a job of work to be done. At the same time the appointment gave him a chance, and his seniors a chance, to see whether or not he would be likely to make a career as a consultant. But whatever his future, the registrar was under no illusion about his present—and that was that he was an indispensable and hard-working member of the hospital team. Among those factors that decided his future when he came to the end of his time as registrar was the possibility of finding an opening in consulting practice, and this almost invariably depended on obtaining an appointment to a hospital staff. Whether or not there were vacancies available, not all registrars, obviously, had those qualifications which fitted them for a consultant's career, and no one would pretend that all the existing 2,800 senior registrars and registrars should automatically become consultants. It is unfortunate that the idea of their being trainees should have led them to expect this. Nevertheless, we cannot but believe that a good many of the 1,100 who are to be dismissed have the capacity and ability to take up consultant work.

We understand that regional hospital boards and boards of governors would like to create something in the region of 1,000 new consultant posts in the hospital service of the country. Why, therefore, has the Ministry of Health been in such a hurry to get rid of so many potential consultants at a time when they must have been fully aware of the expected demands to be made on them for carrying out the declared Government policy of expanding the consultant service to meet the needs of the community? Mr. Bevan said about the circular on registrar establishments: "It was not prompted by economy—indeed, it provides for alternative appointments if necessary for the work of the hospital." If the pending action is not economic in origin, what is the explanation? It is known that hospitals generally need registrars; the registrars want to do the work; hospitals all over the country are, in fulfilment of the Minister's policy, anxious to make new appointments, in addition of course to filling vacancies created by retirement or death. It may be politically embarrassing for the Minister to admit that the economy of the Health Service as a whole is so overstrained as to call for a standstill in the development of the hospital services. In 1949 Sir Stafford Cripps said in his budget speech that there were to be no supplementary estimates except in special cases. This year he said emphatically that present expenditure on the Health Service must not be exceeded. It is quite plain that the finances of the Health Service have got completely out of hand and that the present decision about registrars is dictated primarily by the need for economy.

The Minister of Health must by now realize that the medical profession as a whole, in the working of its three main services, is in a state of acute dissatisfaction and frustration. It is, we are convinced, anxious to co-operate with the Minister and his Department provided it is able to work with a full sense of co-partnership in an enterprise that should call forth the best out of everyone. It can do this only if, to use a well-worn phrase, the cards are laid face upwards on the table, only if there is frank disclosure of all the facts in a total situation instead of a partial, piecemeal disclosure in an order that seems to be completely illogical. In so far as the present problem is concerned, and its relation to the wider problem of the consultant services of the country, it may well be worth looking into the feasibility of establishing permanent joint consultative machinery for making possible a continuous review of consultant and hospital services by both the Ministry of Health as representing the management, and medical men as representing those who work in the service. This would be something quite other than those standing advisory committees appointed by the Minister. Medical representatives in some such joint consultative mechanism should be appointed by the profession itself. With machinery of this nature, such problems as are worrying the profession now would not arise, and a smoother evolution of the consultant services on constructive lines might well be made possible. If things go on as they are the Health Service will sooner or later become a warning rather than an example to the rest of the world.

[1] London, H.M.S.O., 1950, 9d. net.

TUBERCULOSIS AND THE N.H.S.

Such captions as "Whither Tuberculosis?" "Tuberculosis at the Crossroads," and "Crisis in Tuberculosis," all of which have appeared recently in this *Journal*, themselves express the prevailing dissatisfaction with the development of the tuberculosis services in Britain since July, 1948. Recruitment of doctors to clinic and sanatorium work is already falling short of needs. Behind all the discontent and argument stand the facts that the mortality from tuberculosis is decreasing rapidly, that the number of new cases is increasing, that the average age at the time of first infection with tubercle bacilli is rising, and that the expectancy of life of tuberculous persons is lengthening.

Special reports on what is the most important infectious disease in this country have been published by such bodies as the Joint Tuberculosis Council,[1] the Tuberculosis Group of the Society of Medical Officers of Health,[2] a special joint subcommittee in Scotland,[3] and lastly the Tuberculosis and Diseases of the Chest Group Committee of the British Medical Association. A summary of this last committee's report appears in this issue at page 1382. It describes the present situation as a "national scandal," and later asserts that the Ministry of Health clearly intends "that existing tuberculosis organizations are to be expanded into a branch of medicine dealing with all diseases of the chest." In outlining the organization of the tuberculosis service the Group Committee emphasizes once again the need for well-equipped and well-staffed clinics for diseases of the lung. Those responsible for the administration of the National Health Service must realize that these demands are based

[1] *Joint Tuberculosis Council Reports*, September 16, 1944.
[2] *Publ. Hlth.* 1948, 61. 195.
[3] *British Medical Journal*, 1950, 2. 61.
[4] *Brit. J. soc. Med.*, 1950, 4. 143.
[5] *British Medical Journal*, 1948, 2, 870

on the carefully considered conclusions of experienced chest physicians who are making a conscientious plea for a service vital to the nation. In discussions on hospital accommodation there is often a tendency to forget that not all tuberculous patients require costly modern treatment, and some readers of this report will be surprised at the statement that "a sanatorium of less than 200 beds is not an economic unit." There is no harm in aiming high, but there is a present shortage of money, materials, and persons. The peak of the incidence of respiratory tuberculosis is moving to the higher age groups, and elderly patients do not necessarily require the same treatment as young adults. In the admirable section on prevention, care, and aftercare—and indeed throughout the whole report—the Group Committee insists that prevention, social welfare, and aftercare of tuberculous families are inseparable from the clinical work of the physician. Reference is also made to the rehabilitation of tuberculous students, and it will probably not be long before practical steps are taken to meet the great need for accommodation where "convalescent" students can continue their studies. In general the Group Committee's report, unlike that of the Scottish subcommittee, does not contain precise suggestions for getting over temporary difficulties until the full proposals can be carried into effect, but it does give a clear picture of the unsatisfactory condition of the existing tuberculosis services.

It would not be fair to attribute to the Ministry of Health all the blame for the deterioration of these services. Before July, 1948, the main criticisms were that they were very uneven in quality, and that the tuberculosis officer was the minion of the medical officer of health, had little or no opportunity for treating patients, and was not recognized as a clinical specialist. Complaints were made that the salaries of tuberculosis officers were too low, that progress was being prevented by the parsimonious attitude of many local authorities, and that the prognosis in individual cases sometimes depended largely on the geographical situation of his home. Many of these justifiable grievances have been met by the National Health Service Act. To-day the slogan is, "Give us beds, and the tuberculosis problem will be solved." But it is to be hoped that this appeal will not be answered by providing only expensively equipped specialized units for thoracic surgery without the smaller, less expensive, convalescent or segregation homes that were of such value in the past. Some of these useful institutions have been recently closed as not being suitable for the treatment of tuberculosis—an action that shows how little some administrators understand the tuberculosis problem. Over 4,000 tuberculosis beds are still empty because of the shortage of nurses, and until they can be filled again very careful thought must be given to the best use of accommodation and also to the possibility of home treatment. The homes of tuberculous patients are often unsatisfactory, and additional proof, if any were needed, of the association between bad housing and tuberculosis has recently been provided by Stein,[4] of Edinburgh. Nevertheless, as Professor F. R. G. Heaf points out in a paper of particular interest to all tuberculosis workers (see page 1353), some patients can be successfully treated by modern methods in their own homes, though not at a small cost. Suitable precautions can reduce to a minimum the risks of home treatment. Heaf suggests that the three essentials for successful home treatment are: full co-operation of the patient and his family; freedom from financial anxiety; and the possibility for the patient to obtain the necessary rest in bed. To this must be added the important proviso that the home as a house is suitable—not an easy condition to secure with the present shortage of houses.

The successful campaign against tuberculosis, as Lloyd[5] emphasized in 1948, cannot be modelled on the "all too common procedure of hospital and out-patient departments." It is no ordinary disease that can be tackled in the general provision for diseases of the chest but a systemic infection that has wide repercussions on the life and work of the nation. Well-equipped clinics, where the whole family can be supervised, are needed to strengthen the measures taken to prevent the spread of infection in homes, factories, or schools. The necessity for a close link with the public health service must never be forgotten. In an article published at page 1380 Dr. G. F. B. Page very rightly reminds us of Sir Robert Philip's conception of a co-ordinated tuberculosis scheme, with the dispensary (Dr. Page prefers that term to "clinic") as the directional centre. The weak spot in the present administrative arrangements is lack of co-ordination. This shows itself in many ways, even in uncertainty about the contracts and salaries of physicians for chest diseases. Page is inclined to think that since the local authorities have had their chance and have not been very successful the whole control of the tuberculosis service should be turned over to the regional hospital boards. Heaf, on the other hand, believes that the problem of tuberculosis cannot be satisfactorily tackled under the National Health Service as it exists at present, and he suggests the creation of a separate tuberculosis administration. In the North of Ireland a tuberculosis authority has been established, but it remains to be seen how effective its work will be. Since the National Health Service Act was passed much has been said and written about the defects in the arrangements for the control of tuberculosis. It is nearly six months since we wrote in these columns, "What is needed now—desperately needed—is not reports but action." The longer the present drift continues the more difficult will become the control of this disease.

CORTISONE AND A.C.T.H. IN BRITAIN

We understand from a newspaper report[1] that the Ministry of Health is to distribute small quantities of "cortisone" and A.C.T.H. to hospitals in various parts of the country. This will be welcomed both by doctors, who are anxious to learn more about these substances, and by the patients with rheumatoid arthritis and other diseases relieved by treatment with them. The necessity for co-ordination in this clinical research is obvious, since the supply of the drugs will be small, though presumably constant, and there may well be an inclination on the part of the selected hospitals to give short courses in order to observe the responses in a wide variety of conditions. The rheumatic diseases are likely to take first place in the use of cortisone and A.C.T.H. Recently the original team[2] from the Mayo Clinic have reported on a second series of cases of rheumatoid arthritis, studied for a much longer period than the first. This report and publications from other American centres and from Copeman and his colleagues[3] in this country all confirm the success of the earlier findings. Many medical men and women in the British Isles have recently had the welcome opportunity of listening to Dr. Philip Hench lecture on these remarkable drugs.[4] Workers at the Mayo Clinic have also contributed to a symposium[5] on cortisone and A.C.T.H. therapy. There is hope that in acute rheumatic fever patients will be protected by these drugs during the course of the disease so that damage to the heart is avoided, but it will be years before this can be proved. Disseminated lupus responds symptomatically,[6] and, though there is evidence that the disease is not arrested, long remissions have been reported after cessation of treatment. Periarteritis nodosa has responded well by reversal of pathological changes in some cases. Bronchial asthma and hay-fever have been relieved more successfully than by desensitizing injections or by the use of antihistamine drugs. In Addison's disease a relatively small dose of cortisone combined with D.C.A. has caused return of strength and the ability to withstand stress. There is some slight evidence that these hormones may prevent the serious protein loss which is such a problem in the treatment of severe burns, and we have recently published two interesting papers on this subject by Canadian workers.[7] Promising results have been obtained in certain diseases of the eye. According to the Mayo Clinic report the intra-ocular operation for the relief of glaucoma of each eye during the course of uveitis was successfully performed under a cortisone "umbrella." Previously the ophthalmic surgeons had not dared to operate on such cases, except in an acute emergency. Surgeons at the Ford Hospital at Detroit[8] have also reported good results in inflammatory eye diseases.

One of the main difficulties with cortisone and A.C.T.H. is maintenance therapy, and effective ways of economizing in these expensive and powerful drugs must be found. Evidently in some cases the gap between the smallest effective dose and overdose is a narrow one, and may indeed vary during the course of treatment. Much more research of the kind recently described in this *Journal* by Goslings and his colleagues[9] will be needed before the most suitable and economic method of administration is settled. It is not yet known whether it is better to prescribe a long period of treatment on the smallest dose which will keep the patient free from pain, or whether shorter courses with intervals between them are preferable. In order to form an opinion on these problems it is obviously necessary to keep suitable cases under treatment and observation for a long period. Though it will be difficult for hospitals to resist the temptation of trying to help a large number of their patients with these drugs, in the long run more will be learned by treating patients whose improvement can be permanently maintained, and this will also be the most humane method of using the drugs. The physician will gain little from observing a short remission which cannot be repeated for lack of supplies, and the effect on the patient is bound to be distressing. Already excellent studies on cortisone or A.C.T.H. have been reported from London,[3] Edinburgh,[10] and Manchester,[11] where with small supplies and grants from the Medical Research Council methods of assessment have been worked out. It is hoped that the experience of the clinicians who have done this work will be enlisted in the wider allocation now contemplated by the Ministry. The selected centres will have a chance to contribute essential information about the best use of these drugs. Failure to obtain this information will result not only in waste of dollars but in waste of opportunity.

1 *Yorkshire Post*, November 23, 1950.
2 Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F., *Arch. intern. Med.*, 1950, **85**, 545.
3 *British Medical Journal*, 1950, **2**, 849.
4 Ibid., 1950, **2**, 942.
5 *Proc. Mayo Clin.*, 1950, **25**, 17.
6 Ferriman, D. G., and Wilsdon, R. B. N., *British Medical Journal*, 1950, **1**, 884.
7 Crasswellet, P. O., Farmer, A. W., and Franks, W. R., ibid., 1950, **2**, 242, 977.
8 *Amer. J. Ophthal.*, 1950, **33**, 1033.
9 *British Medical Journal*, 1950, **2**, 1019.
10 Robson, H. N., and Duthie, J. J. R., ibid., 1950, **2**, 971.
11 Janus, O., ibid., 1950, **2**, 1244.

MORTALITY FROM APPENDICITIS

When the Medical Research Council published a report on appendicitis by Young and Russell[1] in 1939 it was disturbing to find that the mortality had been increasing at ages under 5 and over 45, but since the case fatality rate recorded by many hospitals in different countries had shown a consistent decline during the same period it was considered reasonable to attribute the increase to a greater incidence of appendicitis. Moloney, Russell, and Wilson[2] have now brought our knowledge of the prevalence of appendicitis up to date with a review of the social factors suspected of playing a part in its aetiology, and of the

recent surgical experience at the Radcliffe Infirmary. According to their estimate 1 in 700 of the population may be expected to get acute appendicitis each year. They are unable to determine whether this represents a continued increase in prevalence or not, but it will at least serve as a basis for comparison in the future. Mortality, it is satisfactory to note, has been decreasing at all ages since 1930, but even in 1945–6 the death rate in patients under 5 and over 65 had not fallen below the level of 1920. Mortality fell during the second world war as in the first, but, unlike the earlier occasion, continued to fall afterwards. In the U.S.A. the deaths from appendicitis in 1948 were a quarter of the 1930 total.[3] The fall during the first world war and the subsequent rise which occurred in the mortality from diabetes, diseases of the gall-bladder, and appendicitis was attributed in this country to the changes in dietary habits induced by wartime conditions. If true, this provided important support for Rendle Short's view that the replacement of cellulose- and fibre-containing foods by meat and processed imported foods was a cause of appendicitis—a view which was also supported by the disproportionately high incidence of appendicitis in the wealthier classes. During the second world war mortality from all three diseases declined, but the decline continued afterwards and was still marked in 1948. The mortality from appendicitis in particular was in that year little more than a third of what it had been 10 years earlier. It must be supposed that even if dietary factors have contributed to a reduction in the disease improvements in therapy have been more important.

In analysing surgical experience Moloney, Russell, and Wilson have taken care to include in their series of cases admitted to the Radcliffe Infirmary in 1945–8 only those in which the diagnosis of acute appendicitis could be firmly substantiated. They were forced, therefore, to discard 499 of the 1,573 cases which had been labelled appendicitis in the hospital records. Many of these must have had a true appendicitis in the past and have come to operation in a quiescent period, but it must be considered whether the safety of appendicectomy has not to some extent hindered clinical judgment, with a consequent wastage of beds, money, and surgical time, quite apart from the inconvenience to the patient. It is to be hoped that these doubtful cases will be followed up and analysed in a further paper. The 1,074 cases which were accepted as being true examples of acute appendicitis have been classified according to Grey Turner's[4] method and the results compared with those reported by Grey Turner for the period up to 1934. In neither series were there any deaths in the group of patients with acute appendicitis without peritonitis, but in the group with diffuse peritonitis the mortality was reduced from 29% to 6%. This is reasonably attributed to the use of sulphonamides and penicillin, though the authors comment that both drugs were probably employed too seldom and in too small a dosage. With the free use of streptomycin or the newer antibiotics it may be supposed that the mortality will be reduced even further. The importance of early admission to hospital is well borne out by this series. Most of the patients (86%) were in hospital within 72 hours of the onset of symptoms. In 12 of the 15 fatal cases the delay in admission was more than 72 hours. General peritonitis was, however, already present in 5% of those cases which were admitted within 24 hours, so that a delay of even a few hours must still be considered dangerous. Sir Cecil Wakeley and Mr. P. Childs, whose report on a series of 217 cases of appendicitis appears in the opening pages of this issue, conclude that early diagnosis and early operation remain the most important factors in reducing mortality. They believe that few people need now die of peritonitis, and they do not see much, if any, need for the expectant treatment of localized peritonitis. Like the Oxford workers, Wakeley and Childs very seldom find it necessary to leave a drainage tube inside the peritoneal cavity, though there are surgeons who still believe in drainage.[3] A point of technical interest is that Moloney and his colleagues found that the use of nylon sutures reduced the incidence of wound sepsis.

[1] *Spec. Rep. Ser. med Res. Coun. Lond.*, No. 233. London: H.M.S.O.
[2] *Brit. J. Surg.*, 1950, 38, 52.
[3] Schullinger, R. N., *Surg. Clin. N. Amer.*, 1950, 30, 495.
[4] *British Medical Journal*, 1938, 2, 691.

STREPTOMYCIN IN GENITO-URINARY TUBERCULOSIS

Patients will have to be observed for many years before a final assessment can be made of the value of new drugs in the treatment of tuberculosis. The Veterans Administration in the U.S.A. is carrying out a long-term investigation into the effects of streptomycin in genito-urinary tuberculosis, and Lattimer, Amberson, and Braham[1] have recently reported the results of treatment of 253 cases followed up for two years. Repeated urine cultures for tubercle bacilli were done in every case, as well as cystoscopies, intravenous and retrograde pyelographies, and renal function tests. Three dose schedules were used. Of 64 patients who received 2 g. of streptomycin daily (in four-hourly doses of 0.3 g.) for 120 days, 83% ceased to pass tubercle bacilli in the urine immediately, while 68% remained free for six months. The corresponding figures for 42 patients who received 1 g. daily (in two doses of 0.5 g.) for 120 days were 60–75% and 46%. The third schedule—1 g. daily for 42 days—was found to be ineffective. As would be expected, the results varied according to the initial severity of the infection. The best results were obtained when there was no pyelographic abnormality, though the urine was T.B.-positive: eight out of ten cases remained negative for two years after beginning treatment, and the remaining two were "probably negative." When demonstrable lesions were present in the kidney the urine became T.B.-negative in only 25% of cases, though in others the progress of the disease was slowed. For large unilateral kidney lesions, and when there is complicating infection of the prostate and epididymis, the authors advocate surgery combined with a short course of streptomycin. Superficial ulceration of the bladder and ureter responded well to streptomycin, but no improvement was obtained in deep-seated lesions. Rinker[2] has reported that old tuberculous lesions of the ureter are apt to contract during treatment, with the formation of a stricture. Negative bacteriological reports may be misleading if this occlusion is not recognized. These results indicate the importance of early diagnosis. If the diagnosis is not made until caseating or ulcerating lesions develop, results with streptomycin will be disappointing, and the bacilli are likely to become resistant to the antibiotic. Better results will probably be obtained by combining *para*-aminosalicylic acid with streptomycin.

[1] *Amer. Rev. Tuberc.*, 1950, 61, 518.
[2] *J. Urol.*, 1950, 64, 242.

PERSONALITY CHANGES AFTER HEAD INJURY

Personality changes associated with head injury were widely studied in this country during the war, with some valuable results. Thus the incidence of personality change in relation to the length of post-traumatic amnesia (and hence to presumptive severity of injury) was defined statistically by Symonds and Ritchie Russell.[1] Kremer[2] drew attention to the important part played by milder grades of personality change in the aetiology of post-traumatic neurosis. Paterson,[3 4] whose studies in this field remain models of their kind, laid stress on the fact that exaggerations of previous temperamental traits are common after head injury, and in severe cases may give rise to a virtual caricature of the original personality. Much work, too, was done on the study and assessment of post-traumatic intellectual defects. Although psychometric methods found their place in such work, all responsible investigators were agreed that the results of mental tests are to be assessed with caution. Further, the relation of intellectual defects to changes in the sphere of personality remains not a little obscure.

In two recent papers Pflugfelder[5] reports detailed studies of 12 cases of severe contusional head injury, and his findings are fully consistent with British wartime experience. He has analysed in some detail the lasting post-traumatic personality changes found in 10 of the patients. The change in four of them was in the direction of expansiveness and lowered self-control, whereas in five it was in the opposite direction of apathy. These changes could be regarded, with some justice, as exaggerations of previous personality traits, thus supporting Paterson's generalization. Intellectual disturbances were present in all cases and were investigated with special care. Although making much use of psychological test methods, Pflugfelder was careful to employ them in a flexible manner and to adapt them where necessary to the specific pattern of disability shown by the individual patient. This approach should be well noted by the clinical psychologist, who has shown himself hitherto only too prone to substitute statistical sophistication for clinical acumen. The precise pattern of post-traumatic intellectual defect exhibited by Pflugfelder's cases varied from patient to patient. In some cases at least these individual differences could be correlated with differences in size and extent of the principal cortical lesions. Although fairly marked defects were shown by all on mental tests, it is interesting that only in six was practical judgment said to be affected. It is also worthy of note that Pflugfelder's follow-up studies strongly suggest that the severity of permanent post-traumatic intellectual loss can be assessed with some accuracy on neuropsychiatric examination six to twelve months after injury. From a practical no less than a scientific standpoint Pflugfelder's careful study deserves close scrutiny.

[1] *Lancet*, 1943, 1, 7.
[2] *Proc. R. Soc. Med.*, 1944, 37, 564.
[3] *Lancet*, 1942, 2, 717.
[4] *Proc. R. Soc. Med.*, 1944, 37, 557.
[5] *Mschr. Psychiat. Neurol.*, 1949, 118, 288, 379.

LUNG ABSCESS AS A COMPLICATION OF E.C.T.

Psychiatrists who are familiar with the use of electro-convulsive therapy would probably rank the incidence of lung abscess fairly low among the complications of this treatment, certainly much less than 1%. The occurrence, therefore, of 25 cases of lung abscess in eight years at one hospital in the U.S.A. among 2,562 patients given E.C.T. deserves attention, particularly since the authors of the report[1] state that the five deaths due to lung abscess constituted well over half the total deaths associated with E.C.T. during this period. In the hospital population as a whole lung abscesses occurred less commonly than among the patients treated by E.C.T. The complication was diagnosed in each case during or shortly after treatment. Lung abscess may, of course, not be recognized as a complication at all if its onset is insidious and the signs become apparent months after the completion of electro-convulsive therapy. Such factors as the position of the patient, the type of mouth gag, or tube feeding could not be related to the occurrence of lung abscess. Nevertheless the authors point out that seven of the patients who developed this complication were being tube-fed as well as having E.C.T., and in the same eight-year period seven tube-fed patients among those not receiving E.C.T. also developed lung abscess. The age of the patient and the severity of the mental disturbance did appear to be related to the incidence of this complication. In 60% of the cases the patients were over 40 years of age, and at least 23 of the 25 patients were severely disturbed. It is a fact that acutely disturbed patients, who are difficult to examine and treat, often have filthy mouths and infected nasal cavities. According to Brock,[2] 40 to 80% of the patients developing lung abscesses in general hospitals have dental abscesses or infections, and he cites evidence that iodized oil injected into the nose while a person is asleep will be aspirated into the lungs, particularly into the right upper lobe. Thirteen of the 25 abscesses among the patients receiving E.C.T. were in the right upper or middle lobe; five in the left lower lobe; four in the left upper lobe; while the site of three could not be determined from the records.

To prevent this complication sedation or light anaesthesia may be necessary before examining the oral and nasal passages in patients with severe psychoses who are to be treated by E.C.T. It is possible that curare may reduce the risk of lung abscess by modifying the vigour of the first inhalations taken by some patients after the apnoea of the fit. The prophylactic use of penicillin in debilitated patients should be considered or in any patient in whom resistance to infection might be lowered. The authors of the American report, besides emphasizing the importance of dental hygiene, suggest the use of atropine to reduce salivation and of suction if secretion is excessive. They advise daily temperature recording while the patient is under treatment, and *x*-ray examination at the first sign of respiratory symptoms after E.C.T. has stopped. Some will see in the possibility of this complication an additional reason for reserving out-patient electro-convulsive therapy for younger, physically fit patients.

[1] Kwalwasser, S., Monroe, R. R., and Neander, J. F., *Amer. J. Psychiat.*, 1950, 106, 750.
[2] *The Anatomy of the Bronchial Tree.* New York: Oxford University Press. 1946.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE MANAGEMENT OF THYROTOXICOSIS

BY

RAYMOND GREENE, M.A., D.M., M.R.C.P.

Physician, Royal Northern, Metropolitan, and Harrow Hospitals; Consulting Physician, New End Hospital and the New End Thyroid Clinic

The diagnosis of thyrotoxicosis and the division of the disorder into its component syndromes lie outside the scope of this paper. Nevertheless, a few introductory words on these subjects are necessary if misunderstanding of what follows is to be avoided.

Pathological Types

It has been customary in the past to lay some stress on the consistence of the thyroid gland, and especially on the presence or absence of nodules. There is little doubt that nodularity is of great pathological significance and academic interest, but until it has been subjected to far more study it is wise to avoid exaggeration of its clinical significance. It should be remembered that almost all diffusely enlarged glands become nodular with the passage of the years. Moreover, it is a common experience that glands considered to be diffusely enlarged before and even during operation are found under the microscope to be in fact nodular. It is therefore justifiable to attach significance to the presence of nodules, but not to their absence.

It is also unwise to be influenced too greatly by the size of the gland, unless severe pressure symptoms occur. Severe thyrotoxicosis may exist in patients whose thyroid glands are impalpable either because of their position or the shape of the neck or because they are in fact not enlarged.

Symptomatology

The sufferer from classical Graves's disease is easy to recognize. He complains of sweating, anxiety, irritability, palpitations of the heart, breathlessness on exertion, excessive activity followed by undue fatigue, loss of weight, and intolerance of warmth, and shows the signs of thyroid enlargement, exophthalmos, upper-lid retraction, vasodilatation, tremor, and tachycardia. Many patients present few of these symptoms and signs, and all too often are stigmatized as malingerers or hysterics, experiencing years of avoidable invalidism. Most often unrecognized are those in whom the brunt of the disease falls upon the heart, in whom no evidence of thyrotoxicosis may be found except tachycardia, fibrillation, and even congestive heart failure, and in whose thyroid glands may be found a nodule too small or too deeply placed to have been obvious even to the patient. There is no more satisfying experience in medicine than the discovery, treatment, and actual cure of patients such as these.

It is important to remember that even when the disorder is fully developed all the symptoms and signs may not be due to thyrotoxicosis. In foretelling the results of treatment, knowledge of the patient's physique and personality before the onset of the disease is of great importance. In many instances thyrotoxicosis attacks the constitutionally inadequate. Indeed, many of us believe that it is sometimes the result of the impact of shocks and strains upon patients ill formed by nature to bear them. In such circumstances we cannot expect to make a silk purse out of a sow's ear. In a few patients the anxiety state or other original inadequacy may remain, expressing itself perhaps by an autonomic or psychological imbalance which both patient and doctor had assumed to be part of the thyrotoxic state. Nevertheless, even these patients are better able after treatment to cope with the difficulties of their lives.

Factors Bearing on Management

Before any definite conclusions can be reached about the ideal management of a case of thyrotoxicosis the disease must be considered historically. The heredity of the patient (for thyrotoxicosis is often familial), his environment before the disease developed (for this may be alterable), the immediate predisposing causes (which may never be repeated), and the nature of the disease itself must be examined.

From the practical point of view a family history of thyroid disease is important because it suggests that the thyroid once having "gone wrong" is likely to go wrong again, should similar circumstances arise. It is one point in favour of the partial removal of the offending organ. The previous environment is important, because careful inquiry may elicit the reasons for the thyroid gland's persistent overactivity—the earlier straws which weakened the camel's back. Such straws may be avoidable, or they may be unavoidable and therefore a continuing risk. The immediate predisposing causes—the last straws which broke the camel's back—are often obvious. Among these are puberty, childbirth, the menopause, severe infection, psychological shock, and the unwise administration of thyroid in the treatment of obesity. Often these are causes against which the patient can be protected, but unfortunately they are frequently interchangeable, and in avoiding one the patient may encounter another. Any last straw will do. Indeed, however successful may be our treatment for the time being, the thyrotoxic patient remains at risk while he retains his thyroid gland, for ever watching the wind to see which way the last straws are blowing. There is much to be said for the dictum of Mr. Charles Donald. At a meeting at the Royal Society of Medicine he criticized the medical treatment of thyrotoxicosis with its claim for remissions lasting several years, and stated his belief that all patients so treated would eventually relapse. Certainly at the New End Thyroid Clinic we have seen scores of middle-aged patients with a typical exacerbation or—a still more serious event—with auricular fibrillation, and sometimes with cardiac failure, who had had thyrotoxicosis in their youth.

Medical Treatment

Despite this proviso, we are still justified in considering the desirability of medical treatment in the individual case, and our justification is likely to remain until we have had an opportunity of examining the after-history of "successfully treated" patients for half a century. Even before the introduction six years ago of the thiouracil derivatives, there were patients who recovered without operation, and some of these have not so far relapsed. My own experience in those days was slight, but it was large enough to leave an impression on my mind clear enough for comparison

with those of older physicians, many of whom formed, with better reason, a similar opinion. In the days when surgery was very risky, physicians often attempted to treat their less severely ill patients by means which are still an essential part of the medical treatment of thyrotoxicosis; means, I would add, which are often unjustifiably neglected by those who are content with the straight choice between thiouracil and thyroidectomy. They attempted to secure for their patients the maximum of physical and mental rest by confinement to bed, sedation, advice on the replanning of their lives, and simple psychotherapy.

My earlier memories suggest that those who responded by a prolonged remission were usually young women with mild thyrotoxicosis and small, diffusely enlarged, or impalpable thyroid glands, with no family history of thyroid disorder, and with an apparently obvious "last straw" from the weight of which they could be easily relieved. My experience in the last six years suggests that this type of patient may have a prolonged remission after treatment with thiouracil derivatives, but whether this remission will prove permanent only time will show. Even when patients are carefully selected and treatment is continued, as it should be, for at least a year, relapse within a year, and usually within six months, is common. Those who relapse can be treated again by the same means, with equally satisfactory results, but, again, relapse is common. In a disorder characterized by undue anxiety it seems unjustifiable thus to play cat-and-mouse with the patient, and it is better to recommend thyroidectomy when the first relapse occurs.

When treatment with thiouracil is chosen, all those general measures which were a part of the older medical treatment should be instituted, though rest in bed is no longer necessary, except in the severest cases. In this country the methyl derivative of thiouracil is generally used, in the United States of America the propyl derivative. The latter is said to be less toxic, but, as serious toxic symptoms are rare with either, more prolonged controlled observations will be needed before a final conclusion can be reached. Methyl thiouracil, 200 mg., is given morning and evening until all signs of thyrotoxicosis have been controlled. During this initial period of a few weeks no reduction can be expected in either the size of the thyroid or the degree of exophthalmos, both of which may indeed be slightly increased. The dose is then gradually reduced to 50 mg. daily, at which level it is kept for at least a year.

Complications of Thiouracil Treatment

It was formerly the custom to perform frequent white cell counts during treatment with thiouracil, as once it was during the administration of the sulphonamide group of drugs. This is now considered neither necessary nor helpful. The dreaded complication of agranulocytosis is very rare, occurring with the modern derivatives of thiouracil and with the small doses now employed in less than 2% of cases. Moreover, agranulocytosis does not usually develop gradually, but strikes suddenly. In one example it occurred only two days after a white cell count of 10,000 had been recorded. Instead of frequent examinations of the blood, a warning is issued to the patient that in the event of his throat becoming sore he should take no more of the drug and report immediately to hospital. Should the white cells then be found to be greatly reduced he is immediately admitted, and massive doses of penicillin and blood transfusions are given.

Other complications of treatment are less serious and rarely enforce discontinuance of the treatment. They include a variety of rashes, such as purpura and urticaria, swelling of the joints, nausea, drug fever, and enlargement of the lymphatic glands. The rashes usually respond to the antihistamine drugs such as promethazine hydrochloride ("phenergan"). The frequency of these complications in two series of 200 patients are as follows:

	Edinburgh*	New End
Agranulocytosis	4	2
Leucopenia	2	2
Purpura	1	0
Urticaria	Not stated	7
Fever and vomiting	5	0
Conjunctivitis	5	2

*Reported by Professor Derek Dunlop.

A different class of complication occurs which should be regarded as evidence of overdosage. It includes obvious increase in the size of the gland or in the degree of exophthalmos, and the appearance of oedema and myxoedema. If these occur treatment should be stopped until the undesirable effects have passed off, when it should be continued in smaller doses.

Contraindications to treatment with methyl thiouracil are the presence of large goitres, causing pressure symptoms, and of retrosternal goitres. In the opinion of the team working at the New End Thyroid Clinic, obvious nodularity is also a contraindication. In our experience, though the signs and symptoms of hyperthyroidism are in such cases easily controlled, relapse invariably occurs. The intelligence of the patient and his willingness to co-operate must be considered seriously, and the slightest deviation from the rules laid down for his safety is an indication for thyroidectomy. But perhaps the most serious contraindication to medical treatment is the fact that it imposes on a patient, already as a rule unduly anxious, a period of prolonged reliance on his doctor, which cannot fail to exaggerate any hypochondriacal traits which may be already present.

Surgical Treatment

The indications for surgical treatment are implicit in what has already been written. After a preliminary enthusiasm for medical treatment on my part, the members of the team at the New End Thyroid Clinic, which has the advantage of treating over 300 patients suffering from thyrotoxicosis per annum, are of the opinion that in most cases thyroidectomy after proper preparation is the ideal method of treatment. In skilled hands (a point referred to below) the risks by either method are too small for comparison. The results of surgery are more certainly and more rapidly achieved. The economic position of the patient is better protected by a method which in most cases rids him within two months of the necessity for further treatment. The cosmetic results, except for the inevitable risk of keloid scars (a risk we shall shortly be able to eliminate), are unexceptionable. Within a month or two the scar in most cases is invisible, or almost invisible, at a normal conversational distance.

The statement that the risks by either method are equal and negligible requires qualification. It implies in the first place a close and friendly collaboration between physician and surgeon, and in the second place a surgical technique of the first order. Even to-day the risk of surgery to the life of the patient and to the integrity of his recurrent laryngeal nerves and of his parathyroid glands is by no means negligible in the hands of one who has been called by Linnell "the occasional thyroid surgeon," however competent he may be to perform the other operations of surgery. In certain areas the general practitioner, dealing with a patient suffering from gastric ulceration, for whom he feels that a partial gastrectomy is the operation of

choice, may decide for similar reasons that his patient had best be dealt with by a gastro-jejunostomy or even by purely medical treatment. I have been forced to make such a choice in circumstances in which the gastric operation would perforce be performed by myself. It is impossible to discuss a question like this except on the assumption that both medical and surgical treatment will be of the highest order.

When, with this assumption granted, it has been decided that the treatment of choice is thyroidectomy, the preparation for operation, important though it may be, is straightforward. Admission to hospital is no longer necessary until a day or two before operation. Patients suffering from mild symptoms and signs of thyrotoxicosis can safely be prepared by means of iodine alone. Lugol's solution in the unnecessarily large dose of 5 minims (0.3 ml.) three times a day is usually given for a period of two to three weeks. The patient is then admitted to hospital and the operation performed almost immediately.

When, however, the degree of toxicity is moderate or severe, it should first be controlled by means of methyl thiouracil. The thiouracil derivatives have the disadvantage of rendering the operation of thyroidectomy more difficult in the occasional case. This disadvantage—a small one in comparison with the enhancement of safety which accompanies it—can usually be overcome by the administration of iodine for two to three weeks before operation. Some physicians prefer to combine the iodine in the pre-operative period with methyl thiouracil; some (as at New End) forgo the thiouracil for the final period and use iodine alone; others overlap the two drugs for various periods, giving at first methyl thiouracil alone, then a combination of methyl thiouracil with iodine, and, finally, iodine alone. Others administer thyroid as well. So far it seems that no advantage is attached to any one of these methods. All are excellent in their results, and it will be many years before any valid comparison can be made between them. Whichever method is adopted, the patient is usually out of bed in four or five days and out of hospital in from nine to twelve days.

There seem to be few contraindications to operation. Certainly auricular fibrillation is not one of them. In from 60 to 80% of cases the fibrillation ceases, almost always in paroxysmal fibrillation, as a result of thyroidectomy alone or of thyroidectomy followed by a short course of quinidine. Even congestive heart failure is no contraindication, though it may call for a longer pre-operative period, perhaps in hospital. The operative death rate in skilled hands is under 1%, the incidence of other complications is negligible, recurrence is of the greatest rarity, and a return to normal life and work almost invariable.

The use of radioactive iodine may well be the method of the future, but no useful purpose would be served in discussing it here. Even in centres in which it is available it is still in the experimental stage. It is not generally available in Great Britain. When it is, it will be beyond the scope of the general practitioner because of the special knowledge and equipment which it requires.

In no other disorder is the judgment of the general practitioner, with his knowledge of the background, character, and economic situation of his patient, of greater value than in thyrotoxicosis. It should be largely his responsibility to decide upon the best method of treatment. On the assumption that an expert thyroid surgeon is at his disposal, he will probably decide on thyroidectomy, after adequate medical preparation, as the best treatment for most of his patients.

A DIFFERENT VIEW OF THE TUBERCULOSIS PROBLEM

BY

G. F. B. PAGE, M.D., D.P.H.
Late Medical Officer of Health for Exeter

Nearly all those who have written in the lay or medical papers about the tuberculosis problem, as it exists to-day, have emphasized the need for more institutional beds and for more nurses to staff them. While everyone will agree that there is a shortage of beds and staff, and that there are long lists of sick and often infectious persons waiting for admission, it must not be forgotten that the provision of hospital and sanatorium accommodation is but one aspect of the matter in considering any truly comprehensive scheme for the prevention and treatment of tuberculosis.

A few contributors have mentioned what may be called the other end, or perhaps the beginning, of the problem. They have written of the housing situation and particularly of overcrowding. While agreeing with them, most of us on reflection would like to extend the idea to improving the whole environment of the people, whether in the home, school, office, shop, or factory. Many of the early triumphs of preventive medicine were won on the environment front, and there is still plenty to be done there.

Let it be agreed, then, that at one end of the situation we want more functioning beds and at the other end better environmental conditions, especially housing, not overlooking such matters as milk-borne infection.

Sir Robert Philip's Scheme

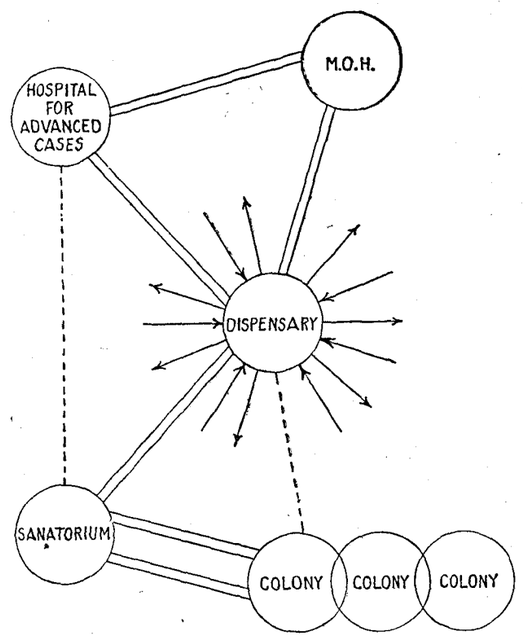
What is lacking is uniform and purposive control. That kind of control can be produced and maintained only by restoring the tuberculosis dispensary to its proper position in each clinical area as the directional centre of what the late Sir Robert Philip called many years ago a co-ordinated tuberculosis scheme.

It is to be doubted if many of the younger men and women practising medicine to-day, even those working in the tuberculosis field, have any clear conception of what the tuberculosis dispensary should be and should do. It is certain that many members of local health authorities, hospital management committees, and regional hospital boards have only the vaguest ideas about the whole matter, and yet they are the bodies that are supposed to be directing policy. Up to the appointed day there were areas with excellent schemes, and there are still some; but they were never numerous, and many more local authority units were content with poor or indifferent arrangements. In these latter it will be found that the dispensary has become an isolated and degraded out-patient department, falling very far short of the kind of dispensary conceived in Philip's mind as long ago as 1887.

Below is shown how Philip defined the tuberculosis dispensary, and I am able to reproduce from my tuberculosis scrapbook the diagram which accompanied the description. Both pamphlet and diagram were given out to his classes in the University of Edinburgh after the foundation of the chair of tuberculosis.

Under the heading "Co-ordinated Tuberculosis Scheme —Edinburgh Pattern" the tuberculosis dispensary is described as "an institution for the detection of tuberculosis, and for the treatment and guidance of persons and households suffering therefrom. It is a 'reception house' and 'clearing house,' and a centre of information regarding

the prevention and care of tuberculosis." The functions of the sanatorium, the hospital, the colony, the open-air school, the tuberculosis care committee, etc., are then defined. If the diagram is examined it will be seen that the dispensary is the centre of the scheme—in fact, the sun of the tuberculosis solar system. Particular attention should be paid to the arrows pointing into and out of the dispensary. The former represent information, patients, suspects, and contacts coming into the dispensary, and the latter active search by the dispensary staff, including the physicians, for tuberculosis in the population generally by all possible means, together with domiciliary supervision, aftercare arrangements, and preventive measures.



Scheme of anti-tuberculosis measures: Edinburgh plan.

To-day I think we should be content to mark the circle entitled "Hospital for advanced cases" just "Hospital," and probably we should agree to replace the three interlocking circles marked "Colony" by some expression representing organized arrangements under the Ministry of Labour and the Assistance Board, together with voluntary bodies dealing with reablement, in addition to the actual colonies. With these trifling amendments the diagram presents the main idea to-day as well as it did when first drawn.

The Official Outlook

One of the important functions of a dispensary (now called chest clinic, in spite of the fact that tuberculosis affects other systems besides the respiratory) is the selection of cases for treatment. If this is done properly there should be some fairly substantial saving in institutional patient-days.

A recent Ministry of Health circular (RHB (50) 64) addressed to regional hospital boards makes the following statement.

"*Chest Clinics.*—Attention should be given to ways in which chest clinics can help to relieve pressure on institutional beds. A high standard of clinical judgment is necessary to avoid recommendation of treatment for cases in which it is not essential and for which domiciliary care would suffice."

The circular goes on to emphasize the importance of avoiding the use of special treatment "when consequential complications may only protract the stay in the institution." It would be interesting to know how far institutional beds are occupied by and blocked by unfortunate patients who are the victims of ill-considered special therapy. It must be common knowledge that the readily acquired techniques of collapse therapy in its various forms have not always been accompanied by the judgment and wisdom which physicians (and surgeons) are expected to show.

The paragraph ends with a laudable exhortation to chest physicians not to neglect their duties in the spheres of prevention and aftercare. It runs, "Chest physicians will recognize that it is important to concern themselves *no less* with prevention and aftercare than with their clinical work; and that it is necessary to give *sedulous attention* to case-finding and the supervision of the tuberculous family, *including visitation in the home.*" The italics are mine. A chest physician who runs a dispensary as a second-rate and isolated out-patient department is clearly not doing these things, even if some semblance of the work is carried out by clinic nurses.

Speaking at a meeting of the Tuberculosis Society on January 21, 1918, Sir Robert Philip is reported (*British Medical Journal*, 1918, **1**, 150) as saying: "Many cases of tuberculosis do not require residential treatment. Skilled surveillance at home or at the tuberculosis dispensary was sufficient." He goes on to define the cases likely to benefit from hospital and sanatorium treatment, including the rather special type of case suitable for colony treatment rather than prolonged "unnecessary and uneconomic" residence in a sanatorium.

Although 28 years separate these two quotations from authoritative sources, there runs through them the same emphasis on careful and skilful selection at the dispensary, chest clinic, or whatever we choose to call it. Once again it is from this central point, and this point only, that a properly co-ordinated scheme for the prevention and treatment of tuberculosis can be directed. To the layman and to many members of the medical profession a diagnosis of tuberculosis means automatic admission to the waiting-list for residential treatment. In fact, if this is not done, patients, their relatives, and the family doctor are apt sometimes to become resentful and distrustful. It is not surprising that local authority and hospital management committees think only in terms of institutional beds whenever tuberculosis is mentioned. It is someone's job to teach these bodies to revise their ideas and review the matter as a whole.

Unified Control

Two things follow. The tuberculosis dispensary must be restored to its proper position as the centre controlling a properly planned scheme in each area, and the direction must be under a medical officer of consultant status with real administrative ability. As has been stated already, there are still good and well-run schemes in Britain, but a large number of the men and women in charge of dispensaries lack administrative sense and good clinical judgment founded on mature experience. They need guidance, and, while capable of making a useful contribution, should not be left to drift along as many are doing at present. If this is not done, the exhortation quoted from the Ministry's circular can never bear fruit.

Finally, we arrive at the difficulty of dual control—in fact, King Charles's head again. The tuberculosis physician, as

I prefer to call him, is usually an officer of the regional hospital board. So long as he is working at diagnosis and treatment he is doing the board's work. When he is working at prevention, care, and aftercare he is doing duty for the local health authority under section 28 of the National Health Service Act, 1946. This matter was debated with much eloquence and enthusiasm at the Commonwealth and Empire Congress of the National Association for the Prevention of Tuberculosis in July, 1949. No definite decision was reached, but at the end of the meeting the impression remained that those with real knowledge of and deep sympathy with tuberculosis work strongly deprecated this dichotomy, and, moreover, foresaw that it would lead to disaster.

It will in the end have to be admitted even by the most obstinate administrative Civil Servant that the present arrangement, if such a term is admissible, or, to be frank, the present muddle, cannot be permitted to continue. There may be a difference of opinion concerning what body shall control the dispensary, but there surely must be agreement that we cannot continue to have two people at the ship's wheel, each wanting to go his own way, or possibly not caring which way he goes. No amount of talk about co-operation, co-ordination, and liaison—those sugary placebos of the Civil Service—can solve this problem. Above all, do not let us have any more joint committees. The works of the entire Health Service are cluttered up with committees.

Control must be in the hands of the regional hospital boards *or* the local health authorities, unless someone is rash enough to invent a new body altogether, which heaven forbid !

Many will feel that the local health authorities, as county councils and county borough councils, have had their chance, and on the whole have not done the job very well. Moreover, a dispensary (cannot we drop the misleading expression "chest clinic"?) must be attached to a hospital administratively if not physically. This being the case, let the regional hospital boards take control and come to terms with the local health authorities as best they may. This might need new legislation. It would certainly mean revision by the Ministry of paragraph 37 of Circular 118/47, which laid certain duties upon local health authorities.

Conclusion

Section 1(1) of the National Health Service Act, 1946, defines the duty of the Minister. "It shall be the duty of the Minister of Health to promote the establishment in England and Wales of a comprehensive health service . . . and for that purpose to secure the effective provision of services." The tuberculosis service is neither comprehensive nor effective, nor can it be so long as the present imperfect machinery is employed.

To sum up: (1) The tuberculosis dispensary must be restored to its proper position and function in each clinical area. (2) It must be adequately staffed and under the general direction of an officer of consultant status. (3) There must be unified control, preferably by the appropriate regional hospital board.

In his annual report for 1949 to the Kent County Council, Dr. A. Elliott, county medical officer, states that according to his estimate some 180 health centres would eventually be required in the county, but that the realization of such a programme at a possible capital cost of £18m. lies so far in the future as to make no real contribution to the work of the executive council.

TUBERCULOSIS AND THE NATIONAL HEALTH SERVICE

REPORT OF B.M.A. GROUP COMMITTEE

"The inadequacy of the present provision for the diagnosis, treatment, and aftercare of tuberculosis in this country is a national scandal which can no longer be viewed with complacency." So starts the comprehensive report prepared by the Tuberculosis and Diseases of the Chest Group Committee, which was recently approved unanimously by the Council of the British Medical Association. The Group Committee of 12 members, under the chairmanship of Dr. Peter Edwards, includes several medical superintendents of sanatoria and chest physicians in large centres, a thoracic surgeon, and a county medical officer of health.

The report, in discussing the problem of tuberculosis in relation to the National Health Service, draws attention to the 11,000 tuberculous patients awaiting admission to the 23,000 beds provided for the treatment of this disease. The development of a comprehensive plan is the more difficult because of the absence of any official figures on the optimum number of beds, nurses, and doctors, but the report outlines a policy and makes recommendations on the organization of the service, on the staffing of chest clinics and sanatoria, and on measures for the prevention of tuberculosis and the welfare of tuberculous patients.

The Problem Stated

Little detailed consideration is given to the tuberculosis service in the National Health Service Act, but certain general advice on the subject has been given to regional hospital boards by the Ministry of Health, and it is clearly intended that existing tuberculosis organizations are to be expanded into a branch of medicine dealing with all diseases of the chest. It is considered by the Group Committee, however, that tuberculosis will continue to be the main problem in the field of chest diseases for many years to come. In the past, as a problem of public health, it has been too much segregated from general hospital services. Many tuberculosis dispensaries have no *x*-ray equipment and no access to the basic services of a general hospital, and are inadequately used. The chest clinic, which will displace the tuberculosis dispensary, will be the centre from which the attack on tuberculosis is organized, but it must be linked to the general hospital, and it must also have the opportunity of applying to all forms of chest disease the principles of social medicine.

The prevention of tuberculosis and the social welfare and aftercare of the tuberculous patient and his family are the responsibility of local authorities under Section 28 of the Act, but they are inseparable from the clinical work of the chest physician, who must maintain the closest liaison with the medical officer of health, to whom he should act as consultant.

Organization of Clinics for Diseases of the Chest

Four principles are laid down for the development of future clinics for diseases of the chest:

(1) The provision of a complete service comprising all aspects of chest and tuberculosis work.

(2) Association wherever possible with general hospitals; occasionally such clinics may be sited within sanatoria, particularly in rural areas.

(3) Provision of an efficient follow-up service and maintenance of close liaison with local general practitioners.

(4) Provision for the education of medical students, practitioners, nurses, and social workers at suitable centres.

A large full-time clinic for chest diseases established in a general hospital will require its own permanent and specially trained auxiliary staff. In the smaller hospitals a part-time clinic, if adequately housed and equipped, may serve to upgrade the hospital and allow it to provide other specialist services previously available only at a larger hospital at a distance.

It is considered that each hospital region should be subdivided into smaller areas served by appropriately placed clinics. The optimum population served by a clinic would probably be about 200,000 in an urban area and less than this in a rural area. In compact urban areas with good public transport it would be better to have a single well-equipped clinic than a large number of minor centres. It is acknowledged that in rural areas the development of comprehensive clinics for chest diseases may be difficult, especially if there are no general or cottage hospitals. A system of mobile clinics as suggested in the *British Journal of Tuberculosis* (1949, **43**, 36) may be advisable in some areas.

The X-ray Equipment of a Clinic for Chest Diseases

It is estimated that at a clinic serving a population of 200,000 it may be necessary to take 5,000 radiographs a year. This would call for an *x*-ray department within the clinic to deal with chest work only. A rotating anode tube, with a generator capable of producing 200–400 milliamperes at 90–95 kVp, and with provision for tomography, is regarded as essential if the necessary quality and comparability of chest radiographs are to be maintained.

In each consulting- and treatment-room in the clinic there should be equipment for chest fluoroscopy distinct from the main *x*-ray plant and available for the personal use of the chest physician. Small clinics holding only two or three sessions a week may use the general *x*-ray department of the hospital, but it is emphasized that the same high standard of technique and equipment must obtain. In a general hospital these *x*-ray facilities will be the ultimate responsibility of the hospital's radiologist.

A working arrangement between the hospital radiologist and the chest physician to cover such matters as control of quality, reporting on serial radiographs, filing and record-keeping, and appointments for *x*-ray examination will be necessary. In general it is felt that the volume of chest radiography is such that the radiologist should be willing to leave routine reporting to the chest physician, but frequent and mutual consultation upon abnormal findings and other matters of interest is essential.

The provision of a comprehensive dental service in the hospital for all patients attending the clinic for diseases of the chest is also recommended.

Health Visitors and Almoners

In the struggle against a disease in which home conditions count for so much, for both the patient and the other members of his household, the health visitor is a key person. The Committee recommends the appointment of full-time specially trained tuberculosis visitors in urban areas, and wherever possible in rural areas, and that the medical officer of health should delegate the supervision of the work of these visitors to the physician for chest diseases. In the large whole-time clinics something is to be said for the employment of a proportion of clinic nurses who will be engaged solely in out-patient work. In part-time clinics the tuberculosis visitor should always attend the clinic at the same time as the physician and should act as clinic nurse. A system whereby the tuberculosis visitor would divide her time between domiciliary and clinic work is favoured.

It is realized that the work of the health visitor may overlap to some extent that of the almoner; nevertheless, a fully qualified almoner—or, if this is not possible, a trained social worker—is considered an essential part of every large clinic. The general hospital almoner may find it possible to cover this duty in the case of a part-time clinic. So far as possible the same almoner should work in both the chest clinic and the sanatorium, because the social problems of the patient are the same in both. Domiciliary visiting should normally be done by the tuberculosis visitor, not by the almoner. Domiciliary treatment is increasing, and the help of general practitioners may be required if chemotherapeutic and antibiotic drugs have to be administered. The home nursing service may also be called on to provide assistance.

Clerical staff is another necessity in a clinic for chest diseases, to save both the physician and the nurse from much routine labour. A system of reporting to general practitioners is regarded as essential.

Hospital Accommodation

The minimum number of beds needed for the treatment of pulmonary tuberculosis is estimated at one bed for each thousand of the population. At present only about half this number of beds are available. A sanatorium of less than 200 beds is not an economic unit if, as is desirable, every sanatorium is to have *x*-ray equipment of the same standard as that for clinics for chest diseases, adequate laboratories, and the services of consultants and specialists. Diversional and occupational therapy should be designed at the hospitals to effect a process of rehabilitation continuous with and preceding that provided through the clinic.

While the present acute shortage of beds continues it is agreed that some central control of admissions may be necessary, but reference should always be made to the clinic physicians in the area. It is thought that cases of non-respiratory tuberculosis should be treated in appropriate special hospitals, all of which should be regularly visited by a consultant chest physician. A special problem is presented by patients who require treatment for combined respiratory and non-respiratory tuberculosis. In each region at least one central sanatorium block should be provided for such cases. Cases of active respiratory tuberculosis requiring short-stay investigation or treatment for non-respiratory conditions, such as urogenital tuberculosis, should, however, be admitted to general hospitals under the care of the appropriate specialist.

Staff Structure

The Committee next turns to the question of staff. It points out that at present many chest-disease physicians work exclusively either in clinics or in sanatoria. In some cases the clinic physician also acts as medical superintendent of a small sanatorium; in others the medical superintendent of a large sanatorium acts as consultant for the surrounding district. A satisfactory relation between the clinic physician and the sanatorium physician is not always easy to achieve. Probably there is no single solution, and local conditions will often determine the pattern irrespective of any ideal arrangement.

The following recommendations are made:

(1) In the larger sanatoria the sanatorium physician should accept final responsibility for the course of treatment given to any patient in the sanatorium. The programme of treatment for each patient should clearly be decided by mutual consultation between the sanatorium physician and the clinic physician, who should visit the sanatorium regularly.

(2) Regular consultative sessions between sanatorium physicians, physicians concerned with clinic work, and other interested persons (especially thoracic surgeons) should become routine practice both in clinics and in sanatoria.

(3) Small institutions situated within or close to the areas they serve would usually be staffed jointly or work in collaboration with clinics in their areas.

A few remarks are added about co-ordination with other specialties. The development of clinics for chest diseases within general hospitals should assist collaboration between the chest-disease physician and his other specialist colleagues, so that the facilities of other departments would be available to the clinic. Thoracic surgical units which are concerned with both tuberculous and non-tuberculous cases should be established according to geographical needs. The relationship between the physician and the thoracic surgeon should be particularly close. It is suggested also that in addition to any wards allocated for the treatment of tuberculosis each physician should control a number of beds in the general hospital, where diagnosis and assessment could be undertaken, these beds to be associated, wherever possible, with the thoracic surgery unit.

A chest clinic serving, as recommended, a population of 200,000 would need an establishment of one consultant, two assistant physicians, and an appropriate staff of registrar grade. The lay staff would comprise one almoner, five health visitors and clinic nurses, and five clerks. With regard to the intermediate grade of assistant physician for chest diseases—a grade between senior registrar and consultant—it is considered that there is a place in the service for such officers, provided they are recruited solely from the ranks of registrars. This grade

should comprise only practitioners in senior posts acting as assistants to consultants, but not normally trusted with full responsibility.

In sanatoria it is recommended that there should be, on an average, one medical officer to fifty patients. Establishments with fewer than 100 beds should be run by clinic physicians; those between 100 and 150 should have one consultant, one assistant physician, and one medical officer; those between 150 and 200, two consultants, one assistant physician, and two medical officers, and those between 200 and 300, two consultants, two assistant physicians, one senior registrar, and two medical officers. It is added that the staff, especially in sanatoria, may have to be increased during the summer to allow for holidays, and that when locumtenents have to be employed the possibilities for rehabilitation of doctors who themselves have had tuberculosis should be borne in mind.

Mass Radiography

The Group Committee holds the view that mass radiography can be extended far beyond its present scope. The mass radiography unit should be under the direction of the physician for chest diseases, who would work in collaboration with appropriate officers such as medical officers of health. The work of the unit should be limited to the detection of abnormalities. When an abnormality is discovered, its further investigation, with the consent of the patient's general practitioner, should be carried out at the clinic for chest diseases.

It is considered that no medical officer should remain in mass radiography for less than one year or more than two. Where a junior physician accepts such a post in the service he should have the assurance of returning to general chest-disease work without loss of status. The idea of part-time service for the medical officer of a mass radiography unit, the rest of his time being spent in the clinic, is thought to be impracticable, at least in a unit covering a large area with perhaps some 30,000 or 40,000 examinations a year. The medical officer's time-table would be likely to be so irregular as to prevent him from fitting into a clinic time-table. If he had a background of sanatorium and clinic work it is thought that he would lose nothing from full-time work with the unit, and experience in such a unit should be regarded as a desirable part of the training of a physician for chest diseases.

Training of Physicians for Chest Diseases

It is acknowledged that in the past tuberculosis work, as a subordinate part of the public health service, has failed to attract physicians of the highest calibre. The best standards of work in the new chest service will be attained only if the opportunities for promotion are as good as those in any other specialty. The terms of service for chest physicians must therefore be the same as for other consultants. Specialization should begin at the registrar level after the practitioner has held house appointments in general medicine and general surgery and preferably a special post giving experience in general chest diseases. A minimum period of three years should be spent in sanatoria and chest clinics, during which time the practitioner should gain experience of environmental medicine, including attendance at the health department of a local authority. (No reference is made in the report to postgraduate diplomas.)

The Nursing Problem

The nursing problem is specially acute in tuberculosis. Fear of infection is real but is not the only reason for failure in recruitment. This report mentions general dissatisfaction over salary scales. Living conditions for nurses are not always of the highest order, and the charges for board and lodging present many anomalies. Again, the responsibility for the complete rehabilitation of the nurse who develops tuberculosis has not in the past been accepted by all hospital authorities.

It is considered that for the adequate staffing of sanatoria and hospitals it is highly undesirable to work to an arbitrary ratio of nurses to in-patient beds. In convalescent and ambulatory wards the ratio might be 1 to 6, but in tuberculosis hospitals and sanatoria engaged in active treatment, including the practice of major and minor thoracic surgery, with or without out-patient clinics, a ratio of 1 to 2.5 might be necessary, and in theatre units with recovery wards attached it might be 1 to 1. The nursing of tuberculous patients demands a high ratio of trained staff, and the demand cannot be met by the employment of untrained staff in the category of ward orderlies. Part-time nurses are more useful in clinics than in sanatoria, although at present their services to in-patients must be accepted. It is pointed out, however, that two half-time nurses, non-resident, do not add up to one full-time resident nurse.

A real contribution to the solution of some of the difficulties would be met by the inclusion of tuberculosis in the general nursing curriculum and the regular secondment for three months of all student nurses from general hospitals to hospitals specializing in chest diseases. Voluntary secondment of trained staff for six or twelve months would also be most useful. Specialized training in tuberculosis nursing should particularly attract groups of men and women who seek postgraduate qualifications or desire a satisfying vocation other than general nursing. As for the fear which lurks in the tuberculosis hospital, the obligation of routine methods of hygiene in the wards, the use of tests for susceptibility, and the vaccination of susceptibles reduce the risk of illness to below that of the general public.

The following recommendations are made:

(1) Vigorous and well-planned propaganda to stress the urgency of tuberculosis as a national problem.

(2) Education of the nursing profession in the achievements of thoracic surgery and modern chemotherapy.

(3) Inclusion of tuberculosis nursing in approved hospitals or sanatoria in the training of student nurses.

(4) Nurses in general training who present minimal lesions to be advised to accept temporary secondment to sanatorium nursing.

(5) Extension of rehabilitation of trained and untrained nurses suffering from tuberculosis.

(6) Service allowance payable to nurses in tuberculosis service to be paid in two instalments, after six and twelve months' service.

(7) Living conditions and amenities for resident staff to be of the highest order.

(8) Some form of effective representation of sanatorium nurses on the General Nursing Council.

Prevention

In the second part of the report, which deals with prevention, the existing provisions are set out and some of them underlined. Under Section 28 of the National Health Service Act local authorities are given power to carry out functions in relation to prevention, care, and aftercare, and the Minister in his Circular 118 in 1947 directed that such arrangements should be made in relation to tuberculosis. One of the major tasks is to encourage the discovery of pulmonary tuberculosis in the preclinical stage, so that the number of uncontrolled sources of infection may be gradually reduced. "True prevention, apart from the control of infection, must deal primarily with the creation of positive health by the improvement of standards of life, morale, food, housing, and hygiene of the whole population, with particular emphasis on children and adolescents."

A list of the principal preventive measures available to the local health authority is given:

(1) *Supervision of Notifications.*—Close co-ordination is necessary between all engaged in tuberculosis work to ensure that as much as possible is done to follow up the notifications with the object of tracing the sources of infection.

(2) *Health Education of the Population.*—It should be made clear that it is the unsuspected open case that is the public danger.

(3) *Assisted Housing Schemes.*—Housing authorities should give high priority to the rehousing of tuberculous families. Some form of assistance towards higher rate charges should be given in cases of needy families, either through the Assistance Board or by the provision of preferential rents.

(4) *Liaison with Regional Tuberculosis Service.*—The medical officer of a health authority must be given full and up-to-date information regarding new patients and their movements and changes of classification. "Accurate records form the basis of efficient action."

(5) *Mass Radiography.*—This is the responsibility of regional boards, but medical officers of health should participate actively in the planning of the service.

(6) *Control of Milk Supplies.*—Application of laboratory tests should be on a liberal scale, and publicity concerning milk supplies infected with tubercle bacilli is desirable. The Milk (Special Designations) Act, 1949, will go far towards solving the difficulties of bovine infection.

(7) *B.C.G. Vaccination.*—Its adoption in this country for certain susceptible groups is welcomed.

(8) *Examination of Contacts.*—Contact examination is extremely important and is comparable to mass radiography in that it discovers tuberculosis in persons who do not admit to being ill. The local health authority should assist through health visitors in encouraging contacts to be examined.

Care and Aftercare

The object of care work is to prevent deterioration in the living standards of the patient and his family. Sources from which assistance can be obtained are (1) the National Assistance Board, which has wide powers for assisting tuberculous families; (2) the welfare committee of the local health authority, which may provide a wide range of help in kind; (3) the voluntary care committee, giving help from charitable funds; and (4) private charitable trusts existing in a few areas for the benefit of local residents.

The provision of home helps is in many cases essential, and every effort should be made to further this service.

It is stressed that in all schemes the health visitor and the almoner are the vital link between the home and the source of assistance.

Rehabilitation

The restoration of the patient to employment is, as the report points out, again a matter for co-operation. It depends upon the employers, the chest physician, the officers of the Ministry of Labour, the medical officer of health, and not least the patient himself. The object of rehabilitation is to make the patient as useful a member of the community as his disability permits. Rehabilitation is both mental and physical. The majority of non-infectious patients are able to find work on their own account; the problem is almost confined to tuberculous patients who remain infectious. Special measures on their behalf take the form of village settlements, employment under the Disabled Persons (Employment) Act, and local authority employment schemes assisted by the Ministry of Labour.

Village settlements, numbering about half a dozen, have done valuable pioneer work, which should be continued, but it is thought that there is no case for each local authority setting up its own settlement. Accommodation in night sanatoria and hostels for people in ordinary industry should be provided. Under the Disabled Persons (Employment) Act, employers are required to have a quota of 5% of registered disabled in their employment; persons substantially disabled by tuberculosis should be encouraged to register. A final recommendation is for the extension of "Remploy" factories by the establishment of local workshops. "Remploy" factories are built by the Disabled Persons' Employment Corporation specially for tuberculous persons. There is also the special problem of rehabilitation of students suffering from tuberculosis. The development of some scheme to enable the student to continue with his studies while still under medical supervision would be of great value. Sanatoria for this purpose have been established in France and Switzerland.

This comprehensive and forward-looking report should receive the attention it deserves from the appropriate Ministries, the regional hospital boards, and the local authorities. In its proposals for the organization of the chest service and the staffing of chest clinics and sanatoria it lays down lines along which regional and local schemes may effectively proceed.

Half a century has passed since the first distribution of the Nobel Prizes. During this time a total of 242 scientists, authors, and peace champions from twenty-three different nations have been awarded prizes totalling Kr. 28,000,000 (£1,900,000). In order to commemorate the jubilee the Nobel Foundation in Stockholm has issued two almost identical volumes, one in Swedish and one in English, in which a number of representative writers review Alfred Nobel and his life's work as well as the Nobel laureates and their achievements. (*Nobel—The Man and his Prizes*, pp. 620, edited by the Nobel Foundation and published by Sohlmans Förlag, Stockholm, Kr. 30.)

EXPERIMENTS ON THE NERVOUS SYSTEM

PROFESSOR ADRIAN'S LECTURE

The nineteenth Stephen Paget Memorial Lecture, given under the auspices of the Research Defence Society, was delivered by Professor E. D. Adrian, O.M., on November 22. Sir Henry Dale, O.M., was in the chair.

Professor Adrian took as his subject "Experiments on the Nervous System." In discussing the role of animal experiment in this connexion he said that it was true that the bodies of different living creatures were not all alike, and experiments on animals could never completely show what happened in bodies like our own. The work on sulphonamides and on the antibiotics had been based on long-drawn-out animal experiment, but the final experiment was on man. Between man and animals there were some differences in their reactions to drugs and considerable differences in the nature of the infections from which they suffered. But the testing of new remedies on animals before they were used on man had saved an immense amount of sickness and death. If it had been necessary to make all preliminary experiments on man, it would have taken many years to reach anything like the present control over bacterial disease.

Advances in chemotherapy had depended on a knowledge of the general defensive mechanisms of the body, and these were much the same in man and in animals. With most of the special organs the differences were not so important as to prevent a great deal from being learned about the human organ from a study of the corresponding organ in animals. Operations now made on the human heart could be planned by experiments on dogs before they were carried out on babies with congenital heart disease. The nervous system, however, was in a special category, at least as regards its highest level, the brain.

The hearts of different mammals varied in size and shape, but the variations were not much greater than those between one make of motor-cycle and another. One heart was built for speed and another for reliability, but both were blood pumps and worked with the same cycle of operations and the same kind of valve. The differences between the brain of a man and of a rabbit, however, were of quite another order. They were best realized by considering the kind of life that man lived as compared with the rabbit. The human brain, like the elephant's trunk or the giraffe's neck, was an organ developed to a special degree in one species and responsible for behaviour peculiar to that species. Man's dominant position in the animal world had depended on the evolution of the human brain, which had made human behaviour far more intelligent than that of any other animal. Man could control his environment in a manner which no other kind of animal attempted. That was why so much reliance had to be placed on observations and experiments on man if mental disorders were to be understood and treated. Animal experiments were necessary also, but the knowledge to be gained from them came at a much earlier stage. They showed the general plan of the central nervous system, but they could not be expected to cover all the ground.

Investigation of Mental Disorders

Another difficulty arose from the fact that in most mental diseases it was impossible to find what material change had taken place, what had gone wrong with the organization of nerve cells and fibres on which mental processes depended. The abnormal working of the brain could be apprehended from the patient's abnormal behaviour, but often enough no brain lesion could be detected with any certainty. There were a few conditions in which the pathology was known, such as general paralysis of the insane and the alcoholic psychoses, but with the rest they were faced only with symptoms. Many people had been seriously concerned when they read of treatments in mental hospitals in which the human brain was subjected to violent disturbance or permanent mutilation. These critics could now be wise after the event, but the history of these new methods of treating mental disorders was instructive, for it showed how much medical men were handicapped when they

moved outside the field within which animal experiment could give a direct answer.

Professor Adrian then discussed the place of insulin and electric convulsion therapy and leucotomy in the treatment of mental disorders.

Fortunately there was now another source of information about the human brain, deriving from the great advances which had been made in neurosurgery. The exposure of the brain was a much less formidable undertaking than it was when Victor Horsley began to remove cerebral tumours. It was possible to explore the brain surface by electrical methods, and maps could be constructed, comparing with more complete maps made from the brains of the larger apes. The human brain could be stimulated electrically with the patient fully conscious. The procedure was not painful, and the patient could say what he felt or what came into his mind. Thus the work of Penfield and his colleagues in Montreal had afforded new information about the brain which could not be derived from studies on animals, although it could not have been looked for had not studies on animals prepared the way for it.

The Place of Animal Experiment

So far he had dealt only with disorders at the highest level of the central nervous system. High-level activities were developed in man, and accurate information about them could not be expected from animal brains. Advances must come mostly from what could be found out from patients. Experiments on patients were justifiable up to a point when the subject was willing and there was little risk of permanent injury. When the subject was insane and the risk appreciable, the only kind of experiment which could be made was one which, if successful, would give direct benefit to the patient himself. Animal experiments, therefore, had played little part in deciding the present trend in psychiatric treatment. Most of the data had had to be obtained by observation or experiment on man; therefore progress was bound to be slow. On the other hand, many disorders affected the lower part of the nervous system, and here there was quite enough likeness between the human nervous system and that of animals to throw light on the general plan and way of working of the nervous machinery. An essential step in the understanding of these disorders was the accurate mapping of the nervous system and a knowledge of the function of the different pathways. Here the lecturer described the work of Sherrington and other investigators, and touched on some of the achievements of modern neurology in war and peace.

In conclusion he said that he might seem to have assumed that if experiments were made on animals there must be some proportion between the pain inflicted and the benefit gained. That rule was just, but it was a rule which, fortunately, needed to be applied very rarely indeed. The days were long past when operations on animals, as on man, had to be made without anaesthetics, and in the great majority of experiments on the nervous system the animal was anaesthetized and never regained consciousness. If the animal survived there might be paralysis or loss of sensation, but severe pain—the kind of pain which was experienced when the skin was cut—was quite inadmissible, even on the most utilitarian ground, because it would almost inevitably make the experiment valueless.

Pain was an experience of the mind rather than of the body. In unconsciousness one did not feel pain, and yet the sensitive nerve endings and nervous pathways might be sending up urgent signals which would evoke severe pain if the brain were able to receive them. On their way to the brain these signals might give rise to many of the bodily reactions which accompanied pain, such as rise of blood pressure, deeper breathing, widening of pupil, and tension of muscles. These could be studied in completely unconscious animals, because they occur in the decerebrate preparation in which the whole of the forebrain has been destroyed under anaesthesia.

Traditional beliefs died hard, and there was still a tradition that experiments on animals must be painful, and it was natural and right that people should be concerned with this, and those who carried out experiments had the responsibility of making sure that their concern was needless. In the days before anaesthetics experiments on animals were undoubtedly painful, but whether one approved of them or not it must be remembered that very many people had profited by them. Anaesthetics were introduced a hundred years ago, and the experiments of Magendie in 1822, from which he showed the complete separation of motor and sensory functions, and which shocked our forefathers and quickened the anti-vivisection movement, could now be made quite painlessly.

Reports of Societies

TREATMENT OF BELL'S PALSY

A meeting of the Section of Otology of the Royal Society of Medicine was held on December 1, at which Mr. TERENCE CAWTHORNE read a paper on the pathology and surgical treatment of Bell's palsy. Mr. D. F. A. NEILSON was in the chair.

The researches of Sir Charles Bell into the function and diseases of the facial nerve, or "respiratory nerve of the face," to use his own nomenclature, had led in the first half of the nineteenth century to his name being attached to all forms of facial paralysis, no matter what the underlying cause might be. In 1893 Gowers was able to distinguish such obvious causes as injury, infection, and new growth from the true Bell's palsies, those due "to a neuritis within the Fallopian canal."

Mr. CAWTHORNE stated that in a series of 270 cases of facial paralysis under his care he had found that Bell's palsy was responsible for 157 (58%). The disease affected chiefly those between the ages of 20 and 60 years, and men were slightly more prone to the condition than women.

Because the disease did not cause death, histological material was rarely available, and the pathology had not been established; but from his operative findings he was able to state that the lesion lay in the trunk of the facial nerve at or near the stylo-mastoid foramen. Swelling of the nerve was probably the result of ischaemia, and this might be the result of exposure to cold. The consequent compression of the nerve trunk in the bony Fallopian canal would impair the transmission of neural impulses. Mr. Cawthorne described the appearance of the nerve as seen through the binocular operating microscope, and said that the nerve appeared to be unduly constricted at the point where it left the stylo-mastoid foramen and fine haemorrhagic streaks were to be seen running up the length of the nerve for a few millimetres. Above the constriction the nerve was swollen. In three cases of long-standing paralysis the trunk was found to be a shrunken fibrous strand.

Of 151 cases of severe Bell's palsy, within two months 75 (50%) had completely recovered, 19 (12%) had made a partial recovery, and 57 (38%) showed no signs of improvement. The worst prognosis for spontaneous recovery was found in those in whom the facial paralysis was complete and the faradic responses were absent.

Ballance and Duel in 1932 had treated severe cases by exposure and "decompression" of the nerve at the stylo-mastoid foramen and in the lower part of the Fallopian canal.

The speaker said that where the paralysis had remained complete for a month the likelihood of spontaneous and complete recovery was remote, and if in addition the responses to faradic stimulation had been lost he advocated decompression of the nerve. In this direction lay the best chance of good recovery. He stressed that, valuable as were electrical stimulation and splintage of the paralysed side of the face, they contributed nothing to the treatment or relief of the lesion responsible for the palsy. The operation was best done in the second month of the disease. The nerve was exposed through a post-aural incision, and, after the trunk had been identified, as much of the mastoid cortex was removed as would allow of free access to the lower part of the nerve. Slitting up of the sheath and manipulation of the nerve demanded the utmost gentleness and was best done under the binocular operating microscope by an experienced surgeon.

Probably 75% of all cases of Bell's palsy which had lasted a month would show some spontaneous improvement, but frequently there was residual paralysis or spasm of the facial muscles. Of 37 cases recently treated by decompression, 31 had shown considerable improvement, while 6 had not benefited appreciably. Of these last, in 3 the nerve had been found reduced to a thin fibrous cord, and these cases might have done better if this had been excised and a nerve graft inserted.

Air Commodore E. D. D. DICKSON read a short paper on the results of conservative treatment of 37 cases of facial paralysis by means of physiotherapy and splinting the facial muscles by a plastic hook attached to the upper teeth. Treatment lasted from between one and six months. Thirty-three cases recovered completely, three are still improving, and one had failed to improve at all. He was in favour of non-operative measures in dealing with Bell's palsy, at least in the first few months.

Miss D. J. COLLIER was of the same opinion, and she challenged Mr. Cawthorne's views on the pathology of the condition, and his rationale of treatment. If Bell's palsy was due to exposure to cold, why was it not more common in cold climates or in the winter months? Why did it occur in small epidemics? These suggested a virus infection.

She asked whether Mr. Cawthorne recommended decompression to prevent degeneration of the nerve or to promote regeneration. Electromyography had shown that physiological block could persist as long as six weeks. The cases of rapid recovery claimed for decompression might belong to this group. When degeneration of the nerve had occurred recovery could only be by regeneration. The rate of regeneration might vary, but clinical evidence of re-innervation could not be expected earlier than three months and might not be apparent until much later. A single negative faradic response did not preclude the possibility of spontaneous recovery. Serial observations of the electrical reactions and by electromyography were needed for prognosis. The latter might give evidence of impending recovery two to three months before facial movements could be seen.

Operations in traumatic cases of facial paralysis showed that the nerve completely filled the canal during life, and nerve bundles always bulged out when the nerve sheath was opened. If the primary lesion in Bell's palsy was held to be a constriction at the stylo-mastoid foramen it was curious that the nerve should be pathologically constricted just where the Fallopian canal was widest.

Miss R. BOWDEN demonstrated by a series of graphs the importance of serial electrical examinations of both nerve trunk and muscular response in arriving at a reliable estimate of the prognosis. The technique should be a standardized one, using for choice a stimulator in which the current could be measured accurately.

Mr. I. A. TUMARKIN stated that permanent paralysis was caused by herpes of the geniculate ganglion. He doubted the efficacy of an operation which decompressed the lower end of the facial nerve and left its upper reaches unexplored.

Mr. CAWTHORNE, in reply, agreed that the aetiology of Bell's palsy was still in doubt, but felt that the demonstration of constriction and swelling of the nerve at the lower end of the Fallopian canal was so well proved at operation as to pinpoint the site of the lesion accurately. Should the swelling spread up the canal so as to implicate the chorda tympani and give rise to homolateral loss of taste, the prognosis was not necessarily worsened. He agreed with Miss Collier and Miss Bowden on the value of serial electromyography in watching the course of the disease.

MANCHESTER MEDICAL SOCIETY

The Dangers of Giving Fluids

In a paper on "Some Hazards of Fluid Therapy," read on November 1 before the Section of Medicine, Dr. D. A. K. BLACK warned members of some of the dangers of indiscriminate treatment with intravenous fluids. Although the value of suitable treatment with saline or glucose solutions was well established, their use might also give rise to harmful effects which were the more dangerous as they might develop insidiously.

The normal composition and distribution of body fluids were reviewed, and the essential differences between a predominantly salt depletion and a predominantly water depletion were discussed. In spite of Marriott's work on the subject, saline fluid was still given when a non-saline fluid would be more appropriate, and vice versa. Clinically, a complaint of thirst should suggest predominantly water depletion, and signs of peripheral circulatory failure predominantly salt depletion. The estimation of serum sodium was the most direct biochemical method of distinguishing between salt and water depletion. The test for urinary chloride might be misleading in the presence of acidosis or alkalosis, or of renal or suprarenal disease.

In addition to giving the wrong type of fluid, it was possible to give excessive amounts of the correct type of fluid. This was well appreciated with salines, but the dangers of an excessive intake of non-saline fluid were less well known. In anuria, it was essential to restrict the intake of water as well as of salt; and there was also a risk of water intoxication in the period following surgical operations, in which Coller and his associates had shown that the elimination of water was seriously impaired.

There was a danger of producing a significant acidosis when large amounts of normal saline were given to correct salt depletion; it was better in severe salt depletion to give a fifth of the required sodium as lactate. The use of ammonium chloride in the treatment of alkalosis was discussed. When alkalosis was caused by excessive alkali administration, ammonium chloride could safely be given; but, when alkalosis was due to vomiting, it was associated with salt depletion, and normal saline was more suitable than ammonium chloride. It was important to remember that a low alkali reserve might be due to a respiratory alkalosis, and not to a metabolic acidosis; for example, in salicylate poisoning the low alkali reserve was a sign of respiratory alkalosis, and sodium bicarbonate might not be the best treatment. Caution was very necessary in the intravenous use of potassium. Potassium infusions should be given very slowly, to avoid cardiac arrest, and the oral route was much to be preferred, whenever and as soon as practicable.

In conclusion, Dr. Black disclaimed any wish to set up a new specialty of applied electrolytology, but suggested that those undertaking fluid therapy should ask themselves three questions, which could often be answered clinically:

(1) Do we need to give fluid at all?
(2) Should we give saline or non-saline fluid?
(3) Have we given enough, or too much, fluid?

Healthy kidneys were a great help in correcting mistakes in fluid administration, and, after all, most of the patients survived.

A lively discussion followed.

Mice and Lymphocytic Chorio-meningitis

On November 8 Dr. J. O'H. TOBIN read a paper on "The Laboratory Diagnosis of Lymphocytic Chorio-meningitis" before the Section of Pathology. Dr. Tobin said that one of the many types of lymphocytic meningitis was caused by the virus isolated originally by Armstrong. This virus caused true lymphocytic chorio-meningitis, and was pathogenic to man, mice, guinea-pigs, and other animals. In man the virus could give rise to three different clinical pictures, besides an unapparent infection—namely, a simple upper respiratory infection, an influenza-like syndrome followed in one or two weeks by meningitis, or an encephalo-meningitis. In the laboratory the diagnosis was made by the isolation of the causal agent and confirmed by serological methods, or solely by serological methods. Virus could be isolated from C.S.F., throat washings, or blood by inoculating mice or guinea-pigs with fresh material. There was a specific complement-fixation test in which infected guinea-pig spleen was used as the antigen; neutralizing antibodies could also be demonstrated in convalescents.

The disease was associated with house mice, which carried the virus, and eradication of mice in the vicinity of the patient's home should be attempted. In Manchester two such foci were present, and all the cases except one seen in the city had come from these two localized areas. From the routine point of view serological diagnosis was the method of choice, as attempts at virus isolation from human material were a waste of time unless a virus laboratory was in the immediate vicinity.

Correspondence

Displaced Registrars

SIR,—The parlous position of so many registrars is not a matter that should be allowed to be fought out by them alone: we do, although it is sometimes not very obvious, form a profession, in which we owe duties to one another. The seniors must help their junior colleagues to get a fair deal.

It is, of course, obvious that far too many registrar posts have been created, and that when the present holders of these redundant posts have been settled elsewhere they should be allowed to lapse. In this way a recurrence of the present muddle due to incompetent planning would be impossible. Even so, we are faced with the question, "What shall the present registrars do to make a living and to make use of their skill and knowledge?" May I make a few proposals which if put into effect would increase the number of consultant appointments, with only a small increase of expense?

There are many part-time consultants who do nine paid sessions a week, but who remain on the staff of a hospital at which as honoraries they do other unpaid sessions, sometimes because they have a sentimental attachment to an institution at which they have worked for many years, sometimes because there are pay-beds, and for a variety of other reasons. If such unpaid sessions were abolished, there would be vacancies, which could be filled by up-grading senior registrars. Perhaps the number of sessions would be small, but it would give these people a chance to get their feet on to the consultant ladder.

Secondly, in order to reduce the competition for consultant posts I should suggest that nobody who is now a consultant and who is over the age of 50 (or perhaps even 45) should be eligible for appointment to any new post, except of course university ones. (It may prevent rude letters if I say frankly that I am over 50.)

Thirdly, again in order to decrease competition for posts it might well be agreed that no part-time specialist of consultant status who is doing seven or more sessions should be eligible for further sessions.

If these three suggestions were carried into effect the problem would not be completely solved, but at least some of the (about-to-be) displaced registrars would have a chance of climbing upwards.

There is one difficulty which at the moment seems to be insuperable: that is, the unsuitability of men who have been registrars for some years to become competent general practitioners. Could they not be given financial assistance during a period of training? And should we not take steps to see that this absurd position never recurs by doing away with the mobs of registrars who mill round the out-patient and casualty departments, replacing them by old-fashioned casualty or receiving-room officers—a group of residents who made the finest and most promising general practitioners?—I am, etc.,

London, W.1. A. PINEY.

SIR,—We suggest immediate collective action by all registrars for the amendment of the Ministry of Health edict RHB (50) 106, if only to avert our financial ruin, irrespective of the wider questions of increasing the number of consultant posts available and maintaining adequate hospital staffs. We suggest two basic demands to achieve this: security of tenure of non-teaching hospital appointments above the rank of senior houseman, such as existed in the municipal hospital services; constructive proposals for those leaving the hospital service, to replace the impracticable suggestions about the armed Services and the Colonies contained in paragraph 12. This security of tenure will mean that such hospitals will not be robbed of a vital segment of their medical staffs, for a cut is bound to be at their expense, as it appears unlikely that registrar appointments in teaching hospitals will be cut by half; and that individuals not advancing to consultant status will drop out (as, indeed, they always did) at their own convenience, and consultants will be produced by competition, experience, and qualifications instead of by any rigid and uniform time-table system. Artificially recurring crises of superfluous registrars would not then arise. At present the situation can be compared to a factory where the foremen not reaching the board of directors in two years are automatically thrown out of the industry.

The constructive proposals for those leaving the hospital service might include facilitated entry into general practice and training courses without loss of pay—essential for those who have spent years in a specialty—preference for practices where part-time work in the specialty would be available, and no sudden termination of contracts now.

We urge the most vigorous action of all registrars by personal interviews with M.P.s, through their own group of the B.M.A., and, if possible, by deputation to the Minister of Health.—We are, etc.,

J. MURRAY DALE. P. W. GRANT.
H. BOURNE. N. B. JETMALANI.
J. A. IRWIN. J. F. HUDSON.
J. B. JEFFRIES. J. I. HALLINAN.
Coulsdon, Surrey. N. C. CONNELL.

SIR,—The Minister of Health in the House of Commons on November 3 said that "this circular [referring to RHB (50) 106] was issued after full consultation with the profession's representatives." There is no evidence that these representatives would be any other than the Joint Committee. Yet in the *British Medical Journal*, December 2, *Supplement*, p. 205, there is a denial of any agreement with the Minister. The Minister seems cautious enough not to mention agreement, but only consultation. The statements, however, are sufficiently at variance to require further information urgently. The committee can vindicate themselves only by issuing a full and complete statement of what transpired at these consultations, and how far they were committed in this infamy.—We are, etc.,

Central Middlesex Hospital, London, N.W.10. THE REGISTRAR GROUP.

*** See the Joint Committee's statement in this week's *Supplement*, p. 245.—ED., *B.M.J.*

Cost of Academic Clinical Office

SIR,—Who can now blame Oxford for living in a world apart? Academicus (December 2, p. 1275) paints a picture so remote from the grim but exciting world of 1950 as to suggest a fantasy. £250 for professional entertaining? £670 *annually* for a car, £160 for travel, £90 for a telephone? This is surely Wall Street, not the quiet path of academic life. What would an Oxford don, with his gross income of perhaps £1,200 (and that twice the income of many a schoolmaster), think of these figures?

However much individual experience induces a personal smart, the truth is that the twentieth century is one of social revolution. Privileges no longer go by divine right but are subject to scrutiny. The economics of medicine, especially in its specialist branches, still appear to the less fortunate as highly favourable (witness the huge entry to the medical schools). It is not "appeasement" but common sense to recognize this fact. To put it on its lowest plane, we may as well make a virtue of necessity in acknowledging the essential justice of the social change. Nor is there the slightest prospect of a general rise in the standard of living, but rather of increased "austerity" as the demands of depressed millions all over the world are met, either by agreement or conflict.

This is not to deny the essentially sound argument in Academicus's letter—i.e., the distinction made by the Ministry of Health in allowances and by the Inland Revenue in expenses between whole-time specialists and those in private practice. It is this distinction, rather than the distinction of teaching and research, which is anomalous. The choice of an academic career has always been recognized, *ceteris paribus*, as implying a financial sacrifice. And there is one anomaly which affects all intellectual workers—the refusal of the Inland Revenue to allow expenditure on books and journals as a professional expense; this constitutes a tax on thought and efficiency.—I am, etc.,

Bickley, Kent. DUNCAN LEYS.

SIR,—It is unfortunate that the plea of Academicus (December 2, p. 1275) for more adequate remuneration should be based on a collection of extravagant figures and illogical comparisons, since these are more likely to lose than gain the sympathy of his colleagues. From the size of his petrol bill and telephone account, one is tempted to deduce that a considerable number of his claimed 70 hours of work in the week is taken up by motoring and using the telephone. The former, at least, is much higher than one would associate with the essential motor travel imposed by a full-time university appointment.

If the above comments seem uncharitable, may I atone by offering Academicus some advice? Since his £1,400 car is costing him some £250 per annum in tax, insurance, garage, and repairs, might he not be advised either to drive more carefully or to try a different garage or, perhaps, get rid of his present car? I cover 14,000 miles annually in my 30-h.p. car for about £200 (which figure includes petrol, full maintenance, overheads, and garaging at city rates). As regards his figure for his net income, it all depends on what you mean by "net."

Finally, I feel that Academicus rather oversteps the mark when he imagines that most academic clinicians are endowed with substantial wealth from other sources. This appears to me a very rash assumption.

The trend of my remarks may allow me to assume the pseudonym of

REALIST.

SIR,—Academicus (December 2, p. 1275) must have a peculiar interpretation of the necessary expenses of his occupation. I would suggest that he cannot unduly complain when he can run a £1,400 car and spend £250 + £198 + £160 = £608 on what is, after all, personal enjoyment.—I am, etc.,

Barnsley. H. A. CROWTHER.

SIR,—An academic scientist, with a gross income small compared with that of Academicus (December 2, p. 1275), may perhaps sympathize in general with the position of the academic clinician. Yet, in all honesty, he must wonder at a man who, while claiming an effective income of £3 7s. 6d. per week, can apparently write off a £1,400 car completely after only four years. Is the Minister of Health alone responsible for medical extravagance?—I am, etc.,

Hull. J. J. KIPLING.

Protection of Laboratory Animals

SIR,—The time has come to thank you cordially for permitting a correspondence about my draft (see *Journal*, September 23, p. 724, and October 14, p. 888) and to thank likewise those who have contributed comments, whether favourable or unfavourable.

I do not acknowledge the sentiments and aims which Dr. Lane-Petter and Dr. Dyer (November 11, p. 1114) have imputed to me. It would be tedious to rebut all these imputations, but if any reader believes I have sinister intentions I would crave an opportunity of sending him gratis a pamphlet, *How to Befriend Laboratory Animals*, which has been well received by the scientific press and has been distributed in America by the National Society for Medical Research, Chicago. The vivisection controversy has induced strong feelings which are unfavourable to mutual understanding and dispassionate judgment, but I still believe that a good deal of common ground can be found if we patiently analyse it out. The need remains for an agreed scheme which can be offered to foreign humanitarians who seek advice. My draft was got out precipitately with the August conference at the Hague in view, but now that it has missed that boat the revise can be tried on a few selected dogs before being submitted to general discussion. The form of an Act of Parliament was adopted in the hope that concrete proposals would keep discussion to the point, but it aroused so much prejudice that the redraft will have to be in narrative form.

No suggestion of altering the British statute has arisen, of course, though the latter is unsuitable for export because it would lose its virtue if divorced from the administrative tradition that has been built up on it. But surprisingly many people believe that in this country experimental biology consists in cutting animals up alive without anaesthetics; the reports of the Home Office are not widely read, and the Research Defence Society deals mainly with the utility of research. What would reassure the public more than anything else would be to know that research scientists as a class were disposed, in a generous and large-minded spirit, to help a genuine if imperfect attempt to better the lot of laboratory animals abroad. U.F.A.W. has incurred bitter hostility and deliberately sacrificed much support by having licence-holders among its officers and recognizing that experimenters are as humane as anybody else. Is it not rather ungenerous, therefore, on the part of some medical men to adopt a purely negative, hostile, *nitouche* attitude, especially when criticisms have been asked for and welcomed? Happily *non sic omnes*; one director of research is kindly collecting comments for me from all his staff.—I am, etc.,

Universities Federation for Animal Welfare, London, N.3. C. W. HUME.

Reconsideration of B.M.A. Policy

SIR,—It appears that many people outside the profession are asking whether it is sufficient to plan a neat and orderly Health Service (though experience has demonstrated beyond doubt that it is neither) unless the planners ensure that those who are asked to work it are satisfied that the terms and conditions of service are satisfactory to them and to the patients alike; and whether we, as doctors, are taking a broad enough view. Unfortunately, and with some justification, it appears to them that we are boggling over money details when, as you so rightly say (*Journal*, December 2, p. 1262), we should be concerning ourselves with the principles and the "failure [of the Ministry] to define what should be the terms of fulfilment of the Spens recommendations."

If we are able to persuade the Ministry to give such a definition, so much the better; but surely, Sir, we as a profession have many other and more important principles on which we require decision. If our grounds of complaint are adequately marshalled, they will present a damning indictment of the Service and will present us with adequate reasons for withdrawal unless they are rectified. This matter is not one which concerns the G.P. only; it is of vital importance to the consultants as well as to the M.O.H. group; it concerns every branch of the profession, and it concerns the public.

As Dr. Ireland and Dr. Pridham have already said in Council, what is urgently required is a reconsideration of B.M.A. policy to fit the new set of circumstances with which we are faced.

After two and a half years' working of the National Health Service, is such a review not imperative? If this suggestion is acceptable, we should then ask the Government to meet us and invite them to reconsider, in an entirely different atmosphere from that which has prevailed in the past between us, the whole Act and its regulations.

There have been mistakes on both sides. How could it have been otherwise in so vast and complicated an experiment? Is this not the time for recriminations to cease and for broader and wider counsels to prevail?

It behoves us to set our own house in order first, by setting out quite clearly in one document, covering all branches of the profession, the main considerations which lead us to condemn the Service in part, and put forward constructive proposals. If we can persuade the public, as we undoubtedly can in such a document, that our interests and theirs are irretrievably integrated, we shall have their support and good will, and no Government, whatever its complexion, can afford to ignore this.—I am, etc.,

Tunbridge Wells, Kent. R. PROSPER LISTON.

Dead Bodies in Water

SIR,—An admittedly limited experience lends small support to Dr. Hugh Willoughby's suggestion (December 2, p. 1277) that drowned men taken from the Thames invariably float face downwards. I have seen at least one body which did not, and an ageing Thames waterman and certain members of the Metropolitan and River Police will bear me out. Fifteen years ago, perhaps more, I was crossing Waterloo Bridge when I noticed

a waterman standing knee-deep in the sludge off the Surrey shore attempting to lasso a floating body. It was that of an elderly man. He was lying on his back as if resting in a hammock, his knees and hips partly flexed, the head and shoulders bent slightly forward, while his arms and hands, at full extension, grasped the edges of a faded Prince Albert coat as if to draw its skirts protectively about his thighs. While the waterman secured the body a young constable signalled a police launch, which towed the remains towards Westminster Pier. Did he fall or was he pushed? This question naturally arises, for the manner of death may influence in some degree the way a body floats. Its discussion must be left to those with more knowledge of these matters than myself.—I am, etc.,

Bognor Regis. H. D. LIVINGSTONE-SPENCE.

SIR,—I agree with Dr. Hugh Willoughby (December 2, p. 1227) that female adult corpses float face upwards and male corpses float face downwards in fresh water. I have seen them in rivers as far apart as the Yangtze (China) and the rivers and ponds of India and England. It is sometimes difficult for students and busy doctors to keep these facts in mind clearly, but it is helpful if one remembers that in death from drowning the two sexes float in a position complementary to each other.

I am sorry that I have no experience of salt water in these cases.—I am, etc.,

Appleby Magna, Staffs. J. R. SALMOND.

Peanut from Bronchus by Percussion

SIR,—The following case report might be of interest.

The patient, a Chinese boy aged 10 years, was admitted to the Chuanchow General Hospital, Tsinkiang, Fukien, on August 10. His mother stated that, four days before, while eating peanuts he had had an alarming paroxysm of coughing during which he became blue in the face and unable to speak. He was still reluctant to talk. Since the accident he had had some evening fever, and frequent attacks of cough during which he became breathless and cyanosed, but he had not been able to cough up anything. He was somewhat breathless between attacks. At home he had been inverted and his back beaten soundly, but without result.

The child was obviously quiet and anxious, but walked into the consulting-room himself, though he avoided any exertion or sudden movement. He was small for his age, but in good condition. On examination of his chest the right side appeared somewhat collapsed, and respiratory movements and breath sounds were reduced on this side. Temperature on admission was 100° F. (37.8° C.). No other abnormal signs were elicited. A radiograph showed that the mediastinum was shifted towards the right side, but the right lung was still well aerated. A diagnosis of a peanut partially obstructing the right main bronchus was made.

As our hospital is not provided with a bronchoscope the problem of how to remove it was a difficult one, though probably not unique. Our child's size oesophagoscope was obviously too big to pass the cords. Chevalier Jackson states that only 2% of foreign bodies are spontaneously evacuated from the bronchi, and then not usually until the patient is seriously ill.

We remembered that, in some cases of post-operative collapse of the lung, plugs of mucus can be shaken out of the bronchi by the use of postural percussion—i.e., laying the patient with the affected side uppermost, and the head low, then percussing with the closed fist over the other hand placed over the lateral aspect of the ribs. We decided to try to dislodge the peanut in this fashion.

Peanuts and other vegetable foreign bodies cause intense inflammatory reaction in the respiratory passages around the nut, holding it more firmly; also after four days there would be secondary infection increasing the inflammatory swelling. So first we gave penicillin (15,000 units three-hourly for 24 hours) and steam inhalations of tinct. benzoin. co., hoping thereby to reduce this swelling a little. At the end of this time 0.5 ml. of liq. adrenalin. was injected, to reduce the congestion and swelling of the mucosa further and relax any spasm of the bronchus. About five to ten minutes later the patient was taken by the legs and inverted to about 60°. Owing to his struggles it was necessary to have further assistance to hold his chest with the affected side uppermost. The right side of his chest was vigorously pounded as described above. After the third attempt the patient cried out that he could feel the nut in his throat; no doubt his struggles assisted in dislodging it. Sure enough a tap could be felt on the anterior surface of the trachea, occurring with each cough or respiration. This was no doubt due to the nut moving in the current of air, and impinging on the tracheal wall or the cords. It is a well-known sign of a foreign body in the trachea and was, I think, well described by our intern as being like a ball valve in action.

The mother refused permission for further interference in the meantime in the hope that he could cough it out. This seemed to us unlikely, but the child was left lying with his head low and making voluntary efforts to cough it out. The next day the nut was still there, and the mother gave consent for operation.

The patient had not been well behaved or co-operative, and so was given 1/12 gr. (5 mg.) morphine pre-operatively, and this enabled us to perform tracheotomy under local analgesia. The isthmus of the thyroid was divided, and a wider opening than usual made into the trachea. The nut was seen at the first expiration lodged in the lower end of the wound in the trachea. It was removed with a spoon and forceps. It was found to measure 1.75 by 1.00 by 0.75 cm. It is surprising to think that such a large body should be able to pass the cords at all. Some swelling would no doubt have taken place during the time that it was in such a damp situation, but the nut had been cooked in oil, and still showed a practically undamaged glossy surface, and so it is unlikely that it had absorbed very much fluid.

A tracheotomy tube was left in for 24 hours and penicillin continued for four days, when the patient was afebrile and active. He was discharged well with the wound practically healed at the end of seven days from the operation.

We feel that this cannot be a unique situation. We found it worrying, and though we, no doubt, were fortunate we feel that this experience might be of use to others.

It is a pleasure to acknowledge the help of my colleague, Mr. D. W. Short, in the treatment of this case and in reporting it.

—I am, etc.,

Tsinkiang, S. Fukien. N. TUNNELL.

The Meaning of Heart Failure

SIR,—Dr. L. Carp (*Journal*, November 25, p. 1201) reviews a series of 100 post-operative deaths in old people coming to necropsy. He states that 27 of these cases died from heart failure, next to bronchopneumonia the largest single cause of death in his surgical patients. Heart failure as a cause of death looms large in most post-operative mortality figures.

The purpose of this letter is to inquire what exactly we mean by "heart failure" following operation. Do we imply by this term that the patient's death is due to decompensation of one or both ventricles with the attendant clinical picture of systemic or pulmonary congestion, or do we, as I believe, imply that the cause of death is due to collapse of the peripheral circulation? One would like to know on what clinical or pathological grounds Dr. Carp assumes that the heart was at fault in these cases. Does he base his conclusions on the finding of "varying degrees and types of cardiac pathology" though the rest of his series showed similar lesions? These cases may have shown pulmonary oedema at necropsy, but to my mind this finding does not warrant the diagnosis of heart failure, as one would expect the same condition in vascular collapse with loss of tone in the pulmonary vessels.

Despite some experience in dealing with the problems arising during the post-operative period I cannot definitely state that I have seen one single case die primarily from heart failure. I have, however, seen many patients die from peripheral vascular collapse, particularly those cases which have been subjected to extensive surgical procedures involving considerable trauma and exposure of tissues. I feel that many, if not the majority, of deaths following operation and certified as having been due to heart failure are in reality due to peripheral vascular collapse. The fault is not in the heart but rather in the vital centres, and in particular the vasomotor centre, which is unable to cope with the stress of the operation. If the heart does fail to maintain the circulation it is only because it receives an inadequate return of blood from the systemic vessels.

Apart from the academic question of nomenclature, it is surely of great importance from the point of view of treatment that we should be clearly aware of the problems these cases present. The treatment of heart failure requires digitalis, mercurial diuretics, oxygen, and even venesection. The treatment of peripheral vascular failure requires the minimum amount of trauma and exposure at operation, the avoidance of heat loss, the maintenance of fluid and electrolyte balance, and the use of stimulants. One is the treatment of the failing heart, the other the treatment of surgical shock.

As long as the term "heart failure" is used to describe what is in actual fact peripheral vascular failure, so long shall we continue to watch the heart and ignore the essential problem, in these cases, the peripheral circulation.—I am, etc.,

Dublin. RISTEARD MULCAHY.

Indwelling Tube for Haematemesis

SIR,—I would like to endorse the remarks of Mr. V. J. Kinsella (November 18, p. 1174) concerning the use of a Ryle's tube in the treatment of haematemesis. It would seem, in my experience, that, while its value is fully appreciated by a great many surgeons, it is not so appreciated by the physicians under whose care these cases are first admitted to hospital.

There is no doubt that half-hourly aspirations will show instantly whether bleeding is controlled or not, and this is of inestimable value where surgery may be necessary for recurrent haematemesis. For, whereas a patient will always vomit after the first bout of bleeding, no further vomiting may take place at all, or at least until a considerable quantity of blood is present in the stomach and small bowel, as the shock and the reflex dilatation of the stomach present in these cases depress the vomiting reflex; further, the body having compensated for the shock caused by the initial haemorrhage, it is keyed up to compensate quickly for any further bleeding, and consequently it may be some time before blood pressure and pulse indicate a recurrence of the bleeding.

The value from the operative point of view of having a Ryle's tube passed early in the treatment was well illustrated to me in two cases of haematemesis on which I operated on successive days. The first was admitted to a surgical ward and had a tube passed immediately. Aspiration showed a recurrence of the bleeding 14 hours after admission and transfusion, and I was able to operate in good time, on a somewhat hypotonic stomach, it is true, but not one full of blood, despite the fact that the artery spattered my forehead when the stomach had been opened and the ulcer localized. The second case had had no tube passed since attempts to pass one pre-operatively failed because of the distress of the patient. Here the stomach was found full of clot and considerably more distended and flabby than in the previous case. Incidentally, this patient never vomited during his second haemorrhage, which occurred three days after his first, and from the amount of blood in the stomach it must have been proceeding for some time before it was appreciated clinically.

I feel certain, therefore, that a Ryle's tube is an essential in the treatment of haematemesis and that its advantages far outweigh the theoretical disadvantage of the tube itself causing the ulcer to bleed, a likelihood which I believe is negligible.

Finally, in regard to the operative treatment of haematemesis, may I make a plea for simple suture of the bleeding point? In the expert hands of gastric surgeons like Tanner, Ogilvie, and others, gastrectomy may be quick and safe, but in the hands of the average surgeon I feel strongly that obliteration of the bleeding point (with subsequent gastrectomy), a long procedure though it may sometimes be, is a wiser procedure and one with much less risk to the patient.—I am, etc.,

Tunbridge Wells. I. LANGDALE GREGORY.

Teething

SIR,—Perhaps I may illustrate the value of routine examinations and the keeping of height and weight charts during the first five years of life by replying to Dr. H. M. Tietze's letter on teething (December 2, p. 1281). Like Dr. Tietze, I was taught that teething was a physiological process and so should not be looked upon as the cause of infantile ailments. In my early days in child-welfare work I tried to impress this fact on the mothers, often to be told by the owner of a copious family that it was time I had some children myself.

After more than 25 years of child-welfare work with the additional experience of bearing and rearing two children of my own, I would say that the answer in "Any Questions?" of October 28 (p. 1013) is well-reasoned and substantially correct.

Poor colour, lack of appetite, loss of muscle tone, frequency of respiratory infections, and recurrence of the fat intolerance of early infancy (often the cause of vomiting and diarrhoea: careful questioning brings to light the occurrence of loose, offensive, putty-coloured stools following an attack of vomiting and preceded by loss of appetite) occur again and again during the eruption of the first molar and canine teeth. There is a return to normal health for a period until the second molars begin to erupt, when the infections and the offensive stools reappear.

It is a simple matter to mark the period of tooth eruption on the weight chart and to note that all too often the child's weight is at a standstill during this period and that he rapidly puts on weight during a lull in tooth eruption. Few indeed are the children who do not show some signs of distress at this time, and I have long been convinced that it is the loss of muscle tone then which is the cause of so many of the knock-knees so prevalent to-day.

I have heard school teachers say that absenteeism, inattention, and other erratic behaviour occurs more frequently among the age group with the toothless gaps and the imminent eruption of permanent teeth. Children of this age show a recurrence of the bronchial attacks they used to have when cutting teeth as a baby.

From all this I would say that the pain of teething is the cause of lowered resistance to infection, or to a temporary diminution of gastric or intestinal secretions. I would strongly deprecate the dismissal of such ailments as paltry and "only due to teething." Much catarrhal deafness and many deformed chests are the results of respiratory infections untreated because of this belief.

More and more we find the advice of the child-welfare medical officer is sought by mothers who are ex-teachers, university lecturers, or ex-nurses, and even by the wives of medical practitioners. Surely we child-welfare officers have still something to contribute to the future of child health, although I freely admit that we have lost much by not being given the opportunity of keeping in closer touch with the clinical work in hospitals and the curative work in general practice.—I am, etc.,

Manchester. MABEL LINDSEY.

Inoculation and Injection Paralysis

SIR,—The paper by Professor A. Bradford Hill and Dr. J. Knowelden (July 1, p. 1) and your annotation (p. 28) throw light on what is known here among the African natives as "injection paralysis." This condition is seen from time to time in the out-patient department of this hospital, and the story is very similar in each case. The baby had a fever; he was taken to a dispensary, where an injection of quinine was given into a buttock, "since when the baby's leg has been paralysed." It always seems to be the leg which was injected. However, careful questioning of the mother usually makes it clear that the paralysis did not appear until two or three weeks after the injection, and there has never been any evidence of suppuration of the injection site. Clinically, the condition is poliomyelitis; the condition is seen among older children who have not had an injection. It is flaccid and there are no sensory disturbances. Most native dressers are taught carefully how to avoid injections into the region of the sciatic nerve.

It appears, then, that "injection paralysis" has scientific grounds for its existence, and that indeed the localization in the affected limb is a direct effect of the injection, as Congo mothers have so long asserted to sceptical doctors.—I am, etc.,

Sona Bata, Belgian Congo. E. W. PRICE.

Slide Test for P.A.S. Sensitivity

SIR,—I have read with interest the report (November 11, p. 1073) by the M.R.C. on the treatment of pulmonary tuberculosis with streptomycin and *para*-amino salicylic acid (P.A.S.). With regard to testing P.A.S. resistance the view is expressed that the methods used did not prove very reliable. Swedish workers have used Pryce's slide culture method in the P.A.S. test *after* isolation of tubercle bacilli on standard culture media. For the past three months I have been testing P.A.S. sensitivity with the modified slide culture method which I described in the *Lancet*, 1943, **1**, 615, adapting it for the purpose by adding P.A.S. to make concentration from 1 mg.% to 0.006 mg.% and also penicillin (10 units/ml. of culture medium) to counteract secondary contamination. This makes it possible to assess sensitivity on the original material, thereby shortening the time-factor as well as enabling us to study the morphological changes of the bacillus. The assessment is easy and, as judged by limited experience, fairly accurate, as one can use direct microscopical examination of the growth either by low- or high-power magnification.

In 20 cases, so far supplied by Dr. Thompson-Evans, the chest physician, the method has been used and found reliable. It is hoped to report on our results at a later date.—I am, etc.,

Shoreham-by-Sea, Sussex. K. S. RODAN.

Volvulus of the Small Intestine

SIR,—The following cases of volvulus of the small intestine are reported as being unusual: the first was a high intestinal obstruction due to volvulus of the afferent loop of jejunum following partial gastrectomy, and the second obstruction from a volvulus at the terminal part of the ileum.

Case 1.—The patient, aged 69, was admitted to hospital on July 27, at midnight, as a suspected case of perforated peptic ulcer. He stated that ten hours previously he was suddenly seized with severe upper abdominal pain, had vomited small quantities of gastric contents twice, had had his bowels opened before the onset of pain, but had not passed flatus afterwards. The pain had increased in severity and was now situated just above the umbilicus; he also complained of severe backache. He passed urine normally after admission.

He had previously had two operations (the second two years ago) for gastric ulcer, but did not know what exact procedure had taken place. He had enjoyed good health since.

He was obviously in great pain and could not lie still in bed. He did not appear unduly shocked (pulse 86, blood pressure 110/70 mm. Hg). Right abdominal paramedian and mid-line laparotomy incisions were both soundly healed. A palpable, fixed tumour was noted about the level of the umbilicus, tender to touch and fixed posteriorly. The abdominal muscles were rigid except in the lower sectors. Bilateral reducible inguinal herniae were present. Peristaltic sounds were audible. Rectal examination was negative, and no abnormal signs were detected in the chest. A pre-operative diagnosis was made of herniation of a loop of small intestine into the lesser sac, or an acute pancreatitis, with the former the more likely.

After passing a Ryle's tube and establishing an intravenous drip transfusion, laparotomy was undertaken under general anaesthetic. On opening the abdomen, the mass previously palpated was seen to be a very distended duodenum with surrounding retro-peritoneal exudation. Under the left costal margin a loop of jejunum was observed lying below the left part of the transverse colon. It was then ascertained that the patient had previously had a partial gastrectomy with retrocolic isoperistaltic gastro-jejunal anastomosis. The opening in the mesocolon had been fixed on the gastric side of the anastomosis. The distended loop of jejunum was easily displayed and proved to be a volvulus of the afferent loop which was unduly long, approximately 8 in. (20 cm.). Rotation had occurred through 360° in a clockwise direction, the fixed points being the duodeno-jejunal junction and the gastro-jejunal junction. Two obstructions, therefore, were present, one in the duodenum, from the closed duodenal stump to the duodenal-jejunal flexure, and the other in the twisted afferent jejunal loop. The obstruction was relieved by rotating the latter through 360° in an anti-clockwise direction; the intestine was quite viable, but showed intense congestion. Consideration was then given to the best method of preventing a recurrence. To undo and reconstitute the gastro-jejunal anastomosis using a shorter afferent jejunal loop was impracticable owing to the congested state of the jejunum, and consequently the mesentery of the afferent jejunum was fixed to the mesocolon by three or four interrupted catgut sutures, and the abdomen was closed in layers.

The patient's condition at the end of operation and for some hours afterwards was apparently satisfactory. 1,000 ml. of normal saline and 560 ml. "casydrol" had been administered. Seven hours after operation signs of acute cardiac failure developed, with fatal termination. A post-mortem examination showed extremely friable myocardial muscle with coronary narrowing. The duodenum was removed *en bloc*, and the surface of the pancreas was seen to be covered by a sanguineous exudate, as was also the area around the coeliac axis.

Case 2.—This woman, aged 46, was admitted on January 31. She stated that six days prior to admission she developed colicky abdominal pain situated below the umbilicus, mostly in the mid-line. Vomiting occurred on the following day, and constipation had been absolute throughout. She had had an enema on each day prior to admission, without result. The pain had been absent for the past 24 hours; the vomiting had become progressively worse and was now offensive, dark, and copious. There was nothing relevant in her past history.

She presented the typical appearance of advanced intestinal obstruction, with sunken eyes, dry tongue, cold extremities, rapid thready pulse, and anxious expression. The abdomen was grossly distended; no mass could be palpated; there was general slight tenderness. Rectal examination was negative and the hernial orifices clear. No peristaltic sounds were audible. Pulse 126, blood pressure 110/70 mm. Hg. A duodenal tube was passed on admission and continuous aspiration started. Intravenous 5% dextrose in saline was also given, and operation deferred for some hours.

Later, under general anaesthetic, the abdomen was opened through a right lower paramedian incision. The caecum was found to be collapsed, and on locating and tracing a loop of lower ileum it was seen that the obstruction was due to a volvulus of the terminal 10 in. (25 cm.) of ileum. At this site there was complete absence of mesentery for 10 in., and the small intestine was free to twist between the fixed ileocaecal junction and the point where the mesentery ended. The volvulus was undone by rotating the bowel through three complete circles, and the mesenteric defect quickly repaired. The abdomen was closed in layers. An intravenous transfusion of normal saline was maintained and 200,000 units penicillin with "sulphamezathine" 1 g. given four-hourly. Gastric suction continued to produce copious amounts of offensive intestinal contents, and the distension was completely relieved ten hours after operation. The pulse rate, however, continued to rise, and the temperature rose to 105° F. (40.6° C.). Twelve hours after operation the patient was *in extremis*, the peripheral circulation was failing, and she died in hyperthermia.

A routine post-mortem examination failed to reveal any abnormality in chest, brain, or renal systems. The entire small intestine was normal in appearance, except for congestion of the mucosa with small haemorrhagic areas: there was no distension. Death was presumed to be due to toxic absorption from the small intestine.

I wish to express my thanks to Mr. J. Philp, F.R.C.S., consultant surgeon to the hospital, under whose care these patients were admitted, for permission to publish the foregoing.

—I am, etc.,

Warrington. BRENDAN MCCARTHY.

Refusal to Appear in Court

SIR,—Mr. A. A. Walford's letter (November 18, p. 1176) ventilates a state of affairs which is proving a source of difficulty to other members of the legal profession. His impression is quite correct about the value of blood tests in some cases of disputed paternity, and Lord Merthyr's Bill, which was unfortunately shelved in 1939 owing to the outbreak of war, was drafted with a view to clarifying the position. At the same time it is only proper that the legal profession should appreciate that these tests do present difficulties to the pathologist. The examination has to be carried out by a person of experience and necessitates access to the proper sera. After completing the test the pathologist has still to be prepared to face cross-examination after, in many cases, waiting at a court for what may be a considerable period. Finally, he may find that the magistrates have reached conclusions completely in conflict with his findings. Under such circumstances it is not difficult to understand the lack of volunteers, and, although a solution can be found to the problem and is, in fact, being devised, nevertheless it would be greatly simplified if Lord Merthyr's Bill were again to be introduced.—I am, etc.,

London, W.1. FRANCIS CAMPS.

Penicillin in Typhoid

SIR,—The sweeping assertion in the leading article "Antibiotic Synergism and Antagonism" (November 18, p. 1160) that penicillin alone is useless in typhoid is not proved. Effective dosage has never been tried. Penicillin resistance is relative. *In vitro* concentrations of 15–20 units of penicillin per ml., and less, inhibit *Bact. typhosum*. This requires an *in vivo* dosage of not less than 20–40 mega units daily, in divided three- to four-hourly amounts, which has never been tried, except for interrupted daily treatment in the carrier state. "Chloromycetin" has also failed in carriers.

The euphoria produced by this dosage, unrelated to any alleviation of toxaemia, together with the subcutaneous injection technique (Garrod, L. P., August 19, p. 453), lessens the needle phobia, apart from which there are no systemic ill-effects. A subcutaneous injection of 2–3 mega units may leave a pea-sized nodule, which takes at least eight months and more to disappear, a fact previously unrecorded. Large doses diminish the rate of renal excretion and raise the blood level correspondingly (*Subacute Bacterial Endocarditis*, by E. Libman and C. K. Friedberg. Oxford University Press, 1948, 2nd ed., p. 364).—I am, etc.,

Dublin. A. D. MCDWYER.

Diagnosis of Placenta Praevia

SIR,—I have read Dr. J. M. Thomson's interesting letter (November 25, p. 1226) on the report of the discussion on placenta praevia (November 4, p. 1055), and I would like to add a few words in support of vaginal examination through the fornices as a diagnostic method. It is usually mentioned only superficially and rather slightingly in obstetrics textbooks. There is some analogy with *x*-ray examination by cystography. Both methods can give positive results only when the head is presenting, and both reveal the space between the vaginal or bladder structure and the contour of the skull. But palpation is more efficient, because we are able to determine the presence of the placenta praevia by its characteristic consistence and to exclude tumours or other causes of high position of the foetal head. It is even possible to distinguish the accumulation of clots from placental tissue if one has sufficient experience in such examinations. The examination gives positive results in marginal placenta and complete placenta (2nd, 3rd, and 4th degree) but is rather negative when only a small part of the placenta dips in the lower uterine segment. Doubtful results are obtained in cases of placenta praevia membranacea, but this is true of *x*-ray examination.

I believe that, in cases with antepartum haemorrhage characteristic of placenta praevia, a positive result in a vaginal examination through the fornices is from a clinical and practical point of view quite sufficient for diagnosis. There is no doubt that feeling the placenta directly after passing the finger through the cervical canal is more positive, but the examination through the fornices has several advantages which cannot be disregarded—namely, it is usually not necessary to pass the whole hand into the vagina unless the head is very high, and so a general anaesthetic can be avoided; there is less danger of inducing bleeding; it can be used in cases where the cervix is completely closed; and it is possible to determine on which side the placenta is situated and where its margin may be found. This is of the utmost importance not only for the prognosis but also for the treatment. For instance, if there is some contraindication to caesarean section in a case of complete placenta praevia with the margin near the internal os, and thus the vaginal route with Willet's forceps, or podalic version, must be adopted, we have the advantage of knowing in what direction we should seek the placental margin after passing the finger through the cervical canal to rupture the membranes. Thus we avoid going in a false direction and making an unnecessary separation of the placenta which induces haemorrhage and impairs the prognosis for the mother and the foetus. If the result from vaginal examination is negative we can expect that it is a case of accidental haemorrhage or lateral placenta praevia (1st degree) and therefore we can adopt an expectant treatment with very little risk.

From the above it can be seen there are sufficient reasons to use this examination more often, and in any case it should always precede the examination through the cervix. In all this there is, of course, nothing to lessen the value of *x*-ray examination, especially by the method of soft-tissue radiography, developed by Dr. Reid, which is of great assistance in clinical examination.—I am, etc.,

London, W.3. C. UHMA.

Two Public Health Problems

SIR,—I am struck by the contrast between, say, two people who want to live in an old bus but are refused permission on the ground that it is insanitary, and the fact that 30 or more people are crowded into a similar space (perhaps without any heating) for hours on end, with all windows tightly closed—e.g., football excursions. Railway coaches are a little better. After the experience gained during the war in air-raid shelters surely it should be possible to fit automatic hypochlorite sprays in at least new buses, and compel their maintenance and use, at least during the winter months. This problem appears to me greater than that of any notifiable fever.

Examination of at least one well-known brand of flat (folded) toilet paper advertised as being safe because it is impregnated with an antiseptic shows that there are four small perforations near the fold (presumably from the folding machine). The risk of hand infection must be appreciably increased by this.—I am, etc.,

Stockport, Lancs. JOHN HEGINBOTHAM.

POINTS FROM LETTERS

Spontaneous Amputation

Dr. J. BROWNRIGG-GLEESON (Dublin) writes: Spontaneous amputation in arteriosclerotic gangrene seems nowadays to be an unusual rarity. . . . Some months ago while in the country I was called to see a patient, whose relatives described her rather euphemistically as suffering from a "sore foot." I found an emaciated, apathetic, cachectic old woman aged 90, who was obviously in an advanced state of senile degeneration, and who had been confined to bed for some time . . . . Coldness of the toes combined with pain, tingling, and numbness, alternating with pain in the calf muscles, had started five months previously. Her pains were accentuated when in a recumbent position but alleviated by dangling her leg over the side of the bed or chair. Her right big toe first showed signs of gangrene, gradually proceeding to a lifeless white colour and eventually presenting a dark shrivelled appearance. . . . The right foot was now in an advanced stage of gangrene, extending from the great toe to about ½ in. (1.3 cm.) proximal to the ankle-joint. There was no line of demarcation present, and the process seemed to be spreading rapidly. Pulsation was felt in the femoral and to a lesser extent in the popliteal arteries, but not lower down. . . . Conservative measures were adopted in view of the patient's advanced age. The gangrene subsequently ascended to midway between the ankle and knee-joints, where a well-defined line of demarcation appeared, above which the tissues seemed healthy. The fore part of the foot was by now exuding a fetid discharge and was anatomically unrecognizable. In the course of a short time separation ensued and was complete within ten days, the parts merely being held together by a few skin tags; there was no bleeding. The tags were severed, and the stump presented a clean healthy appearance. The patient, who was in a moribund state up to this, seemed to show some signs of a slight improvement and became almost rational. But presently the ominous signs of gangrene became apparent in her other foot, and she died from hypostatic pneumonia about three weeks after the amputation. The whole process, from the onset of gangrene to spontaneous amputation, took approximately five months.

Mass Inoculation Technique

Dr. A. BARLOVATZ (Stanleyville, Belgian Congo) writes: Some of your readers might be interested in a method ensuring sterility during mass inoculations of typhoid and other vaccines. For injecting 1–2 ml. doses to each person I use a series of 20-ml. syringes and two dozen hypodermic needles. After boiling and cooling the syringes, the needles are kept boiling in a rather flat container placed on a table within easy reach of the physician's right hand all the time the inoculation is going on. They are fished out of the boiling water one by one, as needed, with a crossed surgical forceps, fastened on to the syringe's nozzle, and after the patient's inoculation replaced into the boiling water, and the next needle in the row lifted out of the water, and so on. The first needle used remains in the boiling water until one has reached the 24th, and is then employed again, having had ample time to lose all living microbes likely to be transmitted from one patient to another. In order to save time, the forceps remain in the physician's hand, held by two fingers, without ever being dropped, and the needles are never handled with the fingers. Thus it is unnecessary to allow any time for the needle to cool: the base does not touch either the physician's or the patient's skin, and the shaft, if it is of small bore (not more than 0.5 mm. external diameter), cools automatically almost instantaneously. With a little practice it is quite easy to inject while holding syringe and forceps in the same hand. If properly aided, a physician may thus inoculate about 200 persons per hour, provided they are guided right up to him so that he loses no time walking to and fro, and under practically satisfactory conditions of syringe and needle sterility, and with a limited amount of material—viz., a few large syringes, about two dozen hypodermic needles, one crossed forceps, one flat metallic container, and one electric or petrol burner.

Indwelling Tube for Gastric Haemorrhage

Dr. IVOR LEWIS (Liverpool) writes: I am in total agreement with the views expressed by Mr. V. J. Kinsella (November 18, p. 1174) regarding the importance of the use of an indwelling Ryle's tube with frequent aspirations in cases of severe haematemesis and melaena. I have recently seen two cases of peripheral circulatory failure terminating in death on the third day following gastrectomy for severe haematemesis and melaena. . . . Death was due to peripheral circulatory failure caused, in my opinion, by secondary shock following the absorption of altered blood in the intestines. . . . Unlike Mr. Kinsella, I fail to see how the blood vessels can contract in a stomach that is dilated and paralysed.

Obituary

Sir JOHN STRATHEARN, C.B.E., M.D.

Dr. W. E. Thompson writes from Winnipeg: It is only in the last few days that I have heard of the death of my old colleague and friend, Sir John Strathearn (whose obituary notice appeared in the *Journal* of September 2). My association with him became close when in 1924 I worked under him as registrar at the Ophthalmic Hospital of the Order of St. John of Jerusalem. This was a time of rather exceptional activity, since the Ophthalmic Hospital was being improved, new departments added, and the scope of work increased in special ways. Strathearn's tireless devotion to each and every patient was evident in many ways, and everyone wondered when the annual reports were issued how it was possible to do so much on the expenditure. His motto was, "The greatest good for the greatest number." Each patient, however humble, was a guest of the hospital, whether as an in-patient, out-patient, or visitor, and the same courtesy was extended to them whether they were penniless or could pay liberally. All treatment was free and given without any distinction of class, creed, or colour, and anything contributed was voluntary. A hard morning's work, when upward of 200 new cases and over 400 old cases were seen, was bound to fatigue the staff, but Strathearn conserved his energy amazingly well, though it never could have been possible without the watchful care of his wife. Many instances could be related of his prowess and unique methods of professional work, but he could not be persuaded to publish his methods and results. His aim was simplicity in everything—preparation, operation, and after-treatment. There was always a willingness to carry out new procedures after due consideration of their merit, and ophthalmic surgeons from many parts of the world felt humble in his presence. He was known as one of the ten best eye surgeons in the world. There was nothing spectacular about him or "playing to the gallery." He could not be flustered. Finesse was the rule in all his operations. He had an uncanny intuition whether an eye was good for intra-ocular interference or not. Those doctors and nurses who were fortunate enough to train under him will always remember his gentleness, personal interest, enthusiasm, and desire to help the unfortunate ones. His love of music, quiet humour, and "pawky" remarks made him delightful in company, though he was of a retiring nature and hated fuss. Even when he was persuaded to accept his knighthood there was a reticence and desire that friends should forget about it. It was an honour fully merited and gave the greatest pleasure to his many admirers, who knew that it was his sheer merit which won him that recognition. I am certain that those who were intimate with him bless the day they met him, knowing that his character lives on in the lives of so many, professional and lay, who were fortunate to have him as a friend.

Sir ERNEST GRAHAM-LITTLE, M.D., F.R.C.P.

Dame Louise McIlroy and Mr. G. F. Goodchild write: We would like to thank you for the fine and sympathetic obituary notice (October 21, p. 952) you gave of Sir Ernest Graham-Little, one of our most distinguished physicians and an upholder of the highest ethical standards of medical practice. May we, however, be allowed to amend the statement that he won his last parliamentary election by "a very few votes"? A graduate of the University of London had to pay a fee to become a registered member of Convocation, and thus only would he qualify for the vote. Therefore the actual electorate was small in number compared to the graduates represented, and in his last published election address Sir Ernest wrote of having won all "successive elections" since 1924 by "progressively increasing majorities. My majority in my last election was 13 times as large as in my first." In the parliamentary election to which you refer occurred one of the biggest landslides for the Conservative Party and independents known to history, when a wave of Labour supporters and fellow travellers had swept over our universities. Indeed, Sir Ernest's opponent, Mrs. Stocks, was reported in the public press to have boasted that "she hopes to unite the Left . . . from the Liberals to the Communists." The poll in 1945 was particularly small—a mere 15,000-odd—owing to the large numbers of graduates abroad and in the fighting Forces and to other results of the war. However, despite all this, Sir Ernest had a majority which can hardly be described as "a very few votes" when we consider that the present Labour Party came into power by an overall majority one-twenty-fifth of the number by which Sir Ernest Graham-Little won and retained his seat until the university franchise was abolished in the early part of this year.

MAX LOWENBERG, M.D.

Dr. R. T. Brain writes: Dr. Max Lowenberg, who died on November 22, was an eminent refugee dermatologist from Düsseldorf. He had been assistant in the clinic for internal diseases in Frankfurt-am-Main under Professor von Noorden and in the clinic for surgical diseases under Professor Bockenheimer. After specializing, he became chief assistant to Professor Hern in the clinic for skin and venereal diseases of the medical academy in Düsseldorf. Early in the war he came to this country as a refugee, and because of his excellent credentials he was welcomed by Professor R. A. Webb and his colleagues in the pathological department at the Royal Free Hospital. Unfortunately, until he was registered a few years ago, the only work he could be offered was that of a technician, and he settled down very contentedly to the simple tasks of cutting sections. It was a revelation to see so eminent a physician working happily and enthusiastically in this humble role. Dr. Lowenberg was quite deaf, and although he could lip-read spoken German and, astonishingly, learnt to speak good English, our communications with him had to be written. His wide knowledge of dermatology and histopathology was soon appreciated. It is probable that there was no greater authority on the histopathology of the skin in this country, and as soon as his registration could be effected after the war he was appointed senior clinical assistant to the skin department of the Royal Free Hospital, where his help with difficult cases was invaluable. The few of us at the Royal Free Hospital who knew him well regarded our association with him as an outstanding philosophical experience. He had the charm of the old-time gentleman, and his natural modesty and humility merely enhanced his intellectual brilliance. He had a severe attack of angina about a year ago, but he returned to his laboratory with all his old vigour, and none could persuade him to devote less time to the hospital. For some months before his death he seemed to know that it was imminent, but he always hoped that he would die in the laboratory that had afforded him so much interest and hospitality and in which he had made admiring friends of all. His wish was granted.

ADOLF LICHTENSTEIN, M.D.

Professor Adolf Lichtenstein, who was born in Stockholm on November 1, 1884, was on his way to the International Congress in Paediatrics at Zurich last summer when he was taken ill. Two days after his return to Stockholm on July 21 he died of a cerebral thrombosis. He was undoubtedly the outstanding figure in the Scandinavian world of paediatrics at the time of his death. This was so largely because of his tireless energy and enterprise in countless directions within his specialty: during the last three years of his professional life he published some 50 studies either alone or in association with his colleagues. His first important work appeared in 1917 and was concerned with haematological studies of prematurely born infants during the first years of life. In a series of 10 different publications he discussed the subject of scarlatina, its aetiology, prophylaxis, and treatment, and he was among the first to show that the so-called relapses from this disease may be due to reinfections with haemolytic streptococci from recent cases of scarlatina admitted to the same hospital. Applying this hypothesis in practice, he succeeded in reducing the incidence of such cases by individual isolation. Another field in which he was a pioneer was in the treatment of diabetic children, whose strict dieting used to cause much distress. The comparatively free diet he introduced was, in spite of insulin, accompanied by the risk of coma and hypoglycaemia, and it needed all his powers of persuasion and his large series of successfully treated patients to convince his colleagues of the soundness of his, at that time, unorthodox views. In conjunction with Professor Frölich, of Oslo, and Professor Monrad, of Copenhagen, Lichtenstein was the author of the standard textbook on paediatrics for students in the Scandinavian countries. He was also editor of *Acta Pediatrica* since 1946. On his retirement from the chair of paediatrics in Stockholm, this publication appeared as a 687-page Festskrift to which colleagues from the U.S.A., Holland, Switzerland, and Italy, as well as the Scandinavian countries, had contributed.

J. H. VINCENT, M.D.

Professor J. H. Vincent, the eminent French bacteriologist, died in Paris on November 23 at the age of 87.

Jean Hyacinthe Vincent was born at Bordeaux on December 22, 1862, and was educated there and at Paris. He joined the staff of the Val de Grâce Military Hospital in 1896, becoming professor of epidemiology there in 1912. In 1925 he was appointed a professor of the Collège de France, where he worked as director of the laboratory of epidemiology and infectious diseases. He was elected a member of the Académie de Médecine in 1907, and in 1940 was president of the Académie des Sciences, of which he became a member in 1922. Vincent introduced a new method of preparing typhoid-paratyphoid vaccine, which proved its value during the first world war, and his work on antibacterial sera was also fruitful. In 1894 he isolated *Nocardia madurae* (*Actinomyces madurae*), one of the organisms causing Madura foot, and two years later he first described *Borrelia vincentii* and *Fusobacterium plauti-vincenti*, which he found associated with "hospital gangrene." Later he demonstrated these two organisms in ulcero-membranous stomatitis ("Vincent's angina"). He also made important contributions to the knowledge of the aetiology and pathogenesis of tetanus. In clinical medicine Vincent published papers on occipital neuralgia, the relation between thyroid disorders and rheumatism, Graves's disease, scleroderma, and meningitis. He was a foreign honorary fellow of the Royal Society of Medicine.

Dr. H. D. A. UTIDJIAN, who was in practice in Wembley for 21 years, died suddenly at the age of 59 at his home in Kenton, Middlesex, on November 12. He had been forced for the past year by failing health to modify his unsparing services to his patients. Born in Nicosia, Cyprus, of distinguished Armenian parentage, he was educated at the University of Beirut, where he graduated in the equivalent degrees of B.A. and B.Com. He worked with the American Red Cross in 1917–18, and held the posts of medical officer at the Brumana Hospital, Lebanon, and first assistant at the Lebanon Hospital for Mental and Nervous Diseases. He proceeded to the French State Diploma of Doctor of Medicine in 1920 and in the same year came to England, where he studied at University College Hospital, taking the Conjoint qualification in 1922. He practised, always arduously, in the East End and in Kilburn before coming to Wembley. He was an honorary member of the staff of Wembley Hospital throughout his practising years and was made a life member of the British Red Cross Society for his war services as medical officer to a Middlesex detachment. He was a greatly respected member of the Armenian community in England and was prominently identified with the affairs of the Armenian Church. He was chosen to go as the English delegate to the world conference in Soviet Armenia in 1945 for the election of the Catholicos of all Armenians. He was justly proud that his mission, primarily ecclesiastical, yet semi-political, was sponsored at high level by the Foreign Office while England was still at war. He was fluent in many languages and had an expert knowledge of Levantine history, of which he had a comprehensive library. He is survived by a widow, two sons who are medical students, and a daughter who may also follow his calling. The Armenian community in England, and indeed abroad, have suffered a great loss. His Wembley patients will mourn the death of a kindly, sympathetic, and truly devoted family doctor and friend.—R. E. D.

Dr. JOHN RANKIN died at Southport on November 16 at the age of 77. Born near Londonderry, he graduated M.B. at Glasgow University in 1895, and after a short period of practice in Newtownstewart he moved to Drogheda, where in 1908 he found time to take his F.R.C.S.I. He went to Southport in 1909, and worked for 37 years in the Churchtown district of that town, retiring in 1946. He suffered for many years from severe rheumatoid arthritis, and there was a touch of true greatness in the way he rose above this handicap and carried on. He was the ideal general practitioner, accurate in diagnosis, skilled in treatment, and always a personal friend of his patient. He usually had a joke or new story to tell, and his visits alone were a tonic. It was a great privilege as well as a great benefit to work with him.—H. G. M.

Dr. ALEXANDER JOHNSTONE, medical officer of health for Greenock, died suddenly at his home on November 17 at the age of 58. He was born in Aberdeen, and was educated at Aberdeen Grammar School and Aberdeen University, graduating M.A. in 1913, and M.B., Ch.B. in 1915. He proceeded M.D. in 1928. After a short period as house-surgeon in Aberdeen Royal Infirmary, he served from 1916 to 1919 with the R.A.M.C. in Mesopotamia and India, and was awarded the Military Cross. On his return to civilian life he took the D.P.H. in 1920, and was then appointed assistant medical officer of health for the county of Angus—a post which he held for two years. From 1922 to 1927 he was assistant medical officer for the county of Dunbarton. In November, 1927, he was appointed medical officer of health for the burgh of Greenock—a post which he filled with distinction until his death. He held many local appointments, being a member of the local medical committee and the Greenock hospital board and secretary of the Greenock and District Faculty of Medicine. He was also an examiner for the Royal Sanitary Association of Scotland.

H. F. K. writes: It is no easy task to write of Alexander Johnstone. As a friend during the past 23 years of his stay in Greenock I came to appreciate his qualities year by year. He was a typical Aberdonian—friendly, cautious, and energetic. He started his appointment a young man in his prime, and

he soon revealed qualities which made him respected by all who came in contact with him. His many duties included medical officer of the V.D. Clinic and police surgeon of the burgh of Greenock. His one desire was to seek co-operation with the medical practitioners of the town. During the war years he had the task of organizing the first-aid services of the burgh. In this capacity he became known intimately to thousands of the population. Many of the former civil defence workers will remember his nightly visits to their posts from 1939 to 1945, for he always had a cheery and encouraging word for everyone. There is no doubt that these years left their mark on him physically, and Greenock owes him a great debt of gratitude. He was also a prime mover in getting the new Rankin Maternity Hospital built, and this will be a lasting reminder of his efficiency. His many other achievements towards improving the health of the community included the extension of the maternity services, the organization of local arrangements for diphtheria immunization, and the provision of day nurseries. He was always anxious to consult the general practitioners before introducing anything new, and this co-operation with us was a feature of his tenure of office. His staff were devoted to him, and they appreciated his loyalty towards them. We feel his loss greatly as a medical officer of health, a friend, and secretary of the Faculty. We respected his integrity, admired his industry, and loved him as a man. He is survived by his wife, who shared with him the appreciation of all who came in contact with them.

Dr. HENRY JOHN MACEVOY, who practised for many years in North London, died in Sticklepath, Devon, on November 17, aged 87. The earliest years of his long life were spent in France —his spiritual home. He went to school there as a young boy, but he was eventually sent to England to attend an English school. Much of his wide knowledge and logical mentality sprang from his French sympathies, and he was deeply versed in French history and literature. Before taking up the study of medicine at St. Thomas's Hospital he obtained the B.Sc.(London) with honours in 1883. He qualified in 1886 and graduated M.B. with honours in medicine in 1888. A year later he proceeded M.D. At St. Thomas's Macevoy was house-physician to Dr. Ord just at the time when Ord was working out the aetiology of myxoedema and establishing it as an entity, the honour for which he shared with Sir William Gull. Macevoy also distinguished himself at athletics, winning the inter-hospital 100 yards on at least two occasions. He continued his post-graduate studies in Paris, where he attended the lectures of Dr. G. Dieulafoy and Professor Charcot, whose theatrical displays with hysterical patients and hypnotic demonstrations he witnessed. Later he settled down in practice in Brondesbury. For many years he took an active part in the affairs of the B.M.A., having been an ex-chairman of the Willesden and Hampstead Divisions and an ex-vice-president of the Metropolitan Counties Branch.

J. L. M. writes: Macevoy was an original member of a most flourishing and friendly little medical club, the Priory Medical Society, to which I was admitted in 1895. About 15 of us met every fortnight at one another's houses, and the cases we were able to show were drawn from every class, rich and poor. Macevoy was a remarkably wise, able, and experienced doctor, not without strong opinions and prejudices. His consultations with the physicians and surgeons of his time were sometimes more controversial than usual, since when he did not agree he said so, and I think some famous specialists were careful "to pull up their socks" when going to meet Macevoy again after a first encounter. His opinion on mental cases was particularly valuable. He was always interested in myxoedema, and if he saw an obvious case of this disease in the street or in a shop he could not refrain from engaging the woman in conversation, and if her condition had been until then unrecognized and untreated he would find out the name of her doctor and give him a kindly hint about the nature of her trouble. As an obstetrician he had the complete confidence of his medical neighbours, who often sought his help with difficult confinements. Besides his professional work he had many other interests. His botanical knowledge was great, and he loved wild flowers. This was one of the great interests of his old age after he went to live in Devonshire: he was a familiar figure as he stood gazing into the hedgerows. His mental activity and power seemed quite unimpaired to the end of his life, and except when he was listening to music his mind seemed always to be actively at work. With his wide background of experience and knowledge he was an ornament to his profession.

C. H. H. writes: It cannot be the good fortune of many practitioners to be able to boast of a friendship lasting between two of them for 50 years. My friendship with H. J. Macevoy began in a meeting of medical men in one of the suburbs of London. He was typically a Frenchman, and, be it said, a non-believer in the Englishman's traditional superiority. "He is too lazy," was one of his favourite sayings. Macevoy was always keen to show his deep knowledge of French clinical medicine to a few of his friends. "Creative evolution" was his answer to many of the problems of thought; the absolute that many would lightly suggest found little favour with him. An independent thinker upon most things, he was a most careful seeker after the truth. His friendship was something to be treasured.

Dr. G. A. JONES, who was for many years anaesthetist to the Samaritan Free Hospital for Women and to the Grosvenor Hospital for Women and Children, died at Beaconsfield on November 21. He was the son of an Essex clergyman, and his younger brother was the late Lawrence Jones, F.R.C.S., who died in July, 1949. George Arthur Jones was educated at St. Paul's School, Oxford University, and St. George's Hospital. He took an arts degree at Oxford before studying medicine. He qualified L.S.A. in 1902, and after holding house appointments at St. George's Hospital he took up anaesthetics as a specialty. Like his brother, with whom he lived for many years, he was of an essentially modest and unassuming disposition; this endeared him to very many friends.—H. R.

By the death of Dr. JOHN BROADLEY on November 24 at the age of 76 Sheffield has lost a well-known member of the medical profession. He was born at Keighley and educated at the local grammar school. He entered the medical school at Leeds in 1891 and obtained the M.B. degree of the University of London in 1897 as an external student. After holding a resident appointment as house-surgeon in the Leeds General Infirmary, he decided to widen his experience by acting as a locumtenent in the district, and for a time he was an assistant to a general practitioner in Wakefield. In 1900, having developed a liking for surgery, he became a house-surgeon in the ear, nose, and throat department of the Leeds General Infirmary, and in 1901 came to the Royal Infirmary, Sheffield, as a house-surgeon. Later he held the post of resident surgical officer for a year. In 1902 he obtained the diploma of F.R.C.S. (Edinburgh) and in 1903 the degree of B.S. of the University of London. He began general practice in Sheffield in 1903, and when the University of Leeds in 1905 obtained its charter to grant its own medical degrees he immediately graduated M.B., Ch.B. at that university. While in practice as a general practitioner he did most of the operations required by his patients, and in 1909 he was appointed an honorary surgeon to the Children's Hospital in Sheffield. He retained this post until 1935, when he retired, having reached the age limit. He was also for many years honorary medical officer of the x-ray and electrical department. At the outbreak of the first world war he joined the R.A.M.C. and served on the staff of the 3rd Northern General Hospital. In 1917 he went to France, being attached to the 59th General Hospital at St. Omer. He was awarded the King Albert Medal for his work there.

E. F. writes: John Broadley was an outstanding example of a type of practitioner who is rapidly disappearing—the competent, efficient, and well-read general-practitioner surgeon. Under the National Health Service this type will soon be a thing of the past, but it should be understood that these men played a very important part in the evolution of modern surgery. They probably practised more pure medicine than operative surgery, and it was this which gave them such a wide outlook. They knew full well their limitations and were never too proud to ask for help from others with more experience in particular surgical procedures. Broadley was appointed to the surgical staff of the Sheffield Children's Hospital at a crucial time in its development, and the position it holds to-day in the paediatric world is due in no small degree to his self-sacrificing work there. During the first world war he did much for the wounded and sick, both before and after the period of his service abroad. The men had, like his own patients, the greatest confidence in his skill as a surgeon, and this was supplemented by his kindliness and humane attitude in treating their disabilities. In all his dealings with colleagues and patients he had the same, perhaps sometimes blunt, but always straightforward method of approach which he had inherited from his Yorkshire forebears. This was very noticeable in his treatment of injured miners and colliery workers whom he examined for the Yorkshire Coal Owners' Federation. Many owe much to his sympathetic but firm handling of their case. He will be missed by them as he will be by his former patients, friends, and colleagues, who sympathize with his widow and two daughters in their loss.

Dr. JAMES LESLIE BARFORD died suddenly on November 29, after a brief illness, in Redhill County Hospital, at the age of 67. The fourth son of Dr. James Gale Barford, who was the first medical officer to Wellington College, he was educated at Epsom College and King's College Hospital, where he was house-surgeon to the late Mr. Barrow. He qualified M.R.C.S., L.R.C.P. in 1905, and almost immediately entered the Royal Navy, in which he served till 1919, becoming the youngest surgeon-commander in the Service at the end of the first world war. He then transferred to the Merchant Navy, serving for many years, mainly with the P. and O. line, and travelling to most parts of the world. Later he became interested in mental health, and worked as a locumtenent at mental hospitals in Lincoln and Ipswich. In 1938 he became assistant medical officer at the Royal Earlswood Institution, and, a year later, at the comparatively late age of 56, he took the D.P.M. During the second world war he was medical officer to the Surrey County Council civil defence organization, to which he devoted characteristic enthusiasm and ingenuity in planning and in the teaching of first aid. In 1946 he spent nine months in the Antarctic with the first post-war whaling expedition to leave this country, as medical officer to s.s. *Southern Venturer*, and he carried out much research into the collection and large-scale manufacture of various glandular products. On his return his desire for adventure soon reasserted itself and he joined the Post Office telegraph department as medical officer on H.M. Telegraph Ship *Alert* and later on H.M.T.S. *Monarch*. Barlow remained a bachelor, and during his varied career he made great numbers of friends in all countries and walks of life. He had a special delight in the company of youth, on whom he was an unfailing influence for good. Often whimsical, with a constant sense of humour and possessed of a certain literary gift, he made several original and refreshing contributions to the pages of this *Journal*.—F. J. C.

Professor EMIL ABDERHALDEN, known throughout the world for his physiological research, died in Zurich on August 5 aged 74 after a cerebral haemorrhage. He was born on March 9, 1877, the son of a Swiss schoolmaster. He studied medicine in Basle, and, after receiving his doctorate in 1902, he went to Berlin to work with Professor Emil Fischer on protein chemistry. His earliest important publication appeared in 1904 and was a complete scientific bibliography on alcohol and alcoholism. He himself was an ardent worker for temperance. His book on physiological chemistry proved extremely popular, running through 26 editions in 42 years. He worked on protein chemistry, digestion, and enzymes from 1902 to 1908. He became a professor in 1908 and followed Munk at the Veterinary University in Berlin. In 1909 he started editing the immense *Handbuch der biologischen Arbeitsmethoden*. He was appointed to the chair of physiology in Halle in 1911, and won the Helmholtz Prize in 1913. From this time dates his interest in mental hygiene and social problems. He founded a children's hospital in 1915, and interested himself in the smallholding movement. He was also active in sending undernourished German children to Switzerland after the 1914–18 war. In 1921 the Swedish Medical Association gave him the Berzelius Medal. He founded two journals, one on enzyme research and one on ethics. In the autumn of 1945 he and his family were obliged to leave Halle and return to Switzerland, where he became emeritus professor in Zurich. He was a modest and deeply religious person, a clear thinker, and a born teacher. He is said to have dictated his entire *Textbook of Physiological Chemistry*, together with the references, from memory.

Medical Notes in Parliament

Kingston Dispute

On December 7 Mr. J. BOYD-CARPENTER asked Mr. Bevan whether he had considered the proposal of the British Medical Association that a public inquiry be held in connexion with the dispute over the future use of the Kingston Victoria Hospital; and what action he proposed to take.

Mr. A. BEVAN said the future of this hospital had been fully and carefully reviewed, both by the regional board and by his own Department, and had been the subject of a debate in the House. He certainly did not think that the proposed inquiry would either be appropriate or add to their knowledge, and he saw no reason to intervene.

Mr. BOYD-CARPENTER pointed out that no opportunity had been given for local opinion to express itself directly to those responsible.

Mr. BEVAN said he did not believe that any better court of inquiry existed in Great Britain than the House of Commons on a matter of this kind.

Mr. SOMERVILLE HASTINGS asked whether Mr. Bevan agreed that in hospital management the opinion of experts was more important than local opinion.

Mr. BEVAN said that was the view which had been taken by the management committee and the regional hospital board with all the facts before them. If this matter had not been sufficiently ventilated he would be happy to recount these facts again.

Colonel M. STODDART-SCOTT asked whether it was true that Mr. Bevan, during the passage of the National Health Service Bill, had again and again advocated the establishment of general-practitioner hospitals, but that ever since the passage of the Act he had closed one general-practitioner hospital after another.

Mr. BEVAN said this statement was as prejudiced and inaccurate as most of Colonel Stoddart-Scott's statements.

Mr. BOYD-CARPENTER gave notice that he would raise the matter again.

River Pollution

Mr. ANEURIN BEVAN, on November 27, moved the second reading of the Rivers (Prevention of Pollution) Bill founded on the agreed report of the expert Central Water Advisory Committee. Their main object was to make a survey of the rivers and to lay down standards, and the river boards would be advised by technical bodies on the degree of purification which they could reasonably demand for particular effluents. The technical knowledge of how to control industrial effluents was in its infancy, and protection of rivers and streams would have to be done gradually over the years.

Mr. WALTER ELLIOT said the Bill really attempted to define under what conditions rivers could be polluted.

After some debate on individual rivers Mr. JOHN MORRISON said that, with some of the modern spraying chemicals, pollution from farm drainage might in future be important.

Sir HUGH LUCAS-TOOTH asked what the Government intended to do about pollution by cottagers in rural neighbourhoods who simply upset their sewage into the river.

Mr. A. BLENKINSOP said that the Ministry expected that a series of standards would be laid down for the different reaches of the rivers, and in each case there would be a gradual improvement. Under the Bill it would be possible to apply the

definition of a stream to the tidal reaches of a river without having to establish a connexion between public health and the amount of polluting matter in the water.

The Bill was read a second time without a division.

Domiciliary Physiotherapy

Mr. KENNETH THOMPSON on December 4 raised the need for domiciliary physiotherapy services. Some people for whom the treatment was prescribed, such as sufferers from cardiac complications, heart disease, old age, and advancing infirmity, could not attend hospitals and clinics where the regional hospital boards provided physiotherapy. Several regions had contractual arrangements with district nursing associations and private practitioners to take the service to such patients. All these regions now appeared to have received instructions to terminate the contracts, and had been told that

The shortage of adequate trained personnel, which will continue for an indefinite period, makes it imperative to concentrate them in hospital departments.

He had found no clear statement of whether this was to secure the fullest use of skill in short supply, or to ensure that the patient received adequate treatment, or on the grounds of economy. Physiotherapists would in all probability continue in the service of the nursing associations and would be used less rather than more after the instruction was put into operation. The Ministry of Health had declared that the system of contracting with other agencies had proved to be expensive, but Mr. Thompson said that in Liverpool it cost the board not more than 9s. a treatment. In another part of the country the cost to the board was 11s., and in a third 14s. He asked if the Minister wanted the House to believe that any system he could establish would provide treatment at a lower cost than that. The cost of transport of a patient to hospital in an ambulance was about 20s. a trip. The regions should be entitled to decide a matter like this themselves, and, where they could arrange an efficient and inexpensive service, should not be subject to this kind of blanket instruction.

Mr. A. BLENKINSOP, replying for the Ministry, said their chief concern was with the welfare of the patient. Those who on medical grounds required physiotherapy in their homes would continue to receive it, but he had to insist that physiotherapy provided in the home was a poor second-best to that provided in the medical surroundings of a hospital or clinic properly fitted out for the purpose. With old people the important question was to give active treatment, and not to let it be regarded as a natural part of the life of the patient. That was the great danger with treatment at home, which few old people needed. It was obvious that the amount of equipment which could be provided with a domiciliary team was limited compared with provision in hospital. It was not economical that trained staff should wander about the country giving individual treatment instead of providing treatment for several patients together in a clinic. The experience of the Ministry had been that when contracts of the sort under discussion had been made, whether with an organization or with individual physiotherapists, there was a danger of a gradual growth of demand which could not properly be regarded as medical. The Ministry was concerned not merely with sifting out those who could be regarded in the initial stages as medical cases, but also with ensuring that it had a reasonable control over how long the treatment continued. The difficulty with domiciliary treatment was that it tended to become permanent, instead of being a method of ensuring that patients could later go to a hospital for treatment, which would be much better for them. Discussions were going on with the regional boards to work out ways in which the problem could be overcome, either by use of existing hospital staff or by appointments of part-time or full-time physiotherapists. If that should prove impossible, the Ministry would look into the matter again, to ensure that the service was provided for those who really needed it.

Pneumoconiosis

At the close of a debate on Welsh affairs in the House of Commons on December 5, Mr. NESS EDWARDS said that 6,000 sufferers had gone back to the pits, and they complained that if they became worse they could not get increased compensation. He was authorized to say that Dr. Edith Summerskill had consulted the Industrial Injuries Advisory Council and was willing to make regulations to enable these men to get Industrial Injuries benefit.

Mr. EMRYS ROBERTS asked whether this would apply to slate quarries.

Mr. NESS EDWARDS said that if the concession came under the general Industrial Injuries Regulations he imagined it would, but a question should be put on the subject to Dr. Summerskill. He believed that under the auspices of the Ministry of Fuel and Power a new method of extracting the dust had been devised, and they hoped the quarries would introduce these new methods and conquer the fear of pneumoconiosis among slate-quarry workers.

Among 32,000 unemployed in South Wales 10,000 were disabled workers, and one-third of these were pneumoconiosis cases. In the last five years 15,000 men had left the mines with pneumoconiosis, and, in spite of all the efforts to get these men into employment, more were getting on to the unemployment register.

Central Buying for Hospitals

Mr. A. BEVAN, in reply to a question on December 7, stated that central contracts were placed for *x*-ray equipment and films, laboratory and blood transfusion apparatus, spectacles, rubber goods, and certain scarce and costly drugs. Hearing-aids were purchased under contract by the Post Office, surgical and orthopaedic appliances by the Ministry of Pensions, and occupational therapy equipment and invalid tricycles by the Ministry of Works. He added that he intended, as soon as practicable, to extend these arrangements to cleaning materials and hardware, bedding, cotton and woollen textiles, drugs and dressings, and other common-user goods. Net savings could not be precisely calculated, but were not less than £2½m. to £3m.

Registrars

Mr. A. BEVAN on December 7 said that he had suggested to hospital boards a transfer system whereby registrars of non-teaching hospitals would spend a portion of their training period at teaching hospitals and vice versa.

Mr. NIGEL DAVIES pointed out on December 7 that, whereas Mr. Bevan had proposed that the number of hospital registrars and senior registrars in England and Wales should be cut from 2,800 to 1,700, it was proposed that the cut in the North-east Metropolitan Region should be from approximately 300 to 134.

Mr. BEVAN replied that the reduced number represented the share of the total which he thought appropriate to that region, taking into account its population, the number of consultants, the available training facilities, and the number of beds there compared with the country as a whole. In the South-west Metropolitan Region there were about 320 senior registrars and 320 hospital registrars (including teaching hospitals), and the new establishments were to be 83 and 151 respectively.

The Capitation Fee

In reply to a question on December 7 Mr. A. BEVAN replied that he had always preferred the idea of a graduated system, with a higher capitation rate for the first 1,000 or so patients on the doctor's list. This would discourage the accumulation of over-large lists and encourage the better-balanced practices. It was not always easy to translate idea into fact; he wanted to go into it very thoroughly with the profession.

Smallpox.—Figures in the Registrar-General's Weekly Returns relate to original notifications, though the disease may afterwards be shown not to be smallpox. Figures in the Registrar-General's other publications relate to corrected notifications.

Diphtheria.—The numbers of original notifications of diphtheria in 1947, 1948, and 1949 were 10,465, 8,035, and 4,982 respectively; after correction they were 5,592, 3,560, and 1,881.

Gifts to Hospitals.—Where the benefit of a gratuitous covenant in favour of a named hospital has been transferred under the National Health Service Act, 1946, to the Hospital Endowments Fund the distribution of money is regulated by statute and the Minister of Health has no power to vary it by a direction. Hospital management committees should have regard to the original intention of the gift in the use made of their shares.

Clean Food.—The Minister of Food announced that up to November 17 he had confirmed model by-laws governing cleanliness in the handling, wrapping, and delivery of food for 973 authorities, and was shortly to do likewise for a further 260; but 211 authorities were still outstanding.

Exemption from National Service.—Men exempt on medical grounds (excluding men not examined, because blind, etc.) in 1946 numbered 39,964; in 1947, 24,648; in 1948, 24,711; in 1949, 33,818; in 1950 (to September 28), 34,506.

Housing.—In Liverpool 27,328 houses are classified by the Liverpool medical officer of health as unfit for human habitation.

Medico-Legal

DEATH DUE TO A SWAB

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In spite of the strict precautions taken in all operating theatres, now and again a swab still eludes the vigilance of the team. In a recent case the victim was a girl aged 2 who was brought into the Warwick Hospital for an emergency operation to relieve torsion of a dermoid cyst in the region of the left ovary. She made a good recovery and was sent back in due course to the sanatorium from which she had been admitted, where she was under treatment for advanced tuberculosis of the lungs. About 11 weeks afterwards she was readmitted for abdominal pain and vomiting. A tumour was palpable in the mid-abdominal region, but radiography gave no assistance in diagnosis. There was no evidence of obstruction. She settled down very rapidly, and, in view of the tuberculosis and the finding at the operation of enlarged mesenteric glands, the surgeon thought that her symptoms might be due to a plastic tuberculous peritonitis with further enlargement of the glands. He therefore decided to observe her and treat her conservatively. She continued to improve up to the fourth day after admission, when she suddenly collapsed and died. At necropsy the palpable mass in the abdomen was found to be a swab which had become encysted and adherent to a loop of small bowel.

The case was therefore reported to the coroner, who held an inquest on August 29. The surgical registrar who performed the operation said that great care was always taken over the counting of swabs both before use and after the closing of the abdominal cavity. He might, on account of the child's small size, have used a "large six" swab as a pack instead of an ordinary pack, but even so it should have been counted with the other swabs. He maintained that, when the child was brought in for the second time, there had been no evidence of obstruction, and the diagnosis of the condition as a result of her tuberculosis was clinically right. The theatre sister explained in evidence that large swabs ("big sixes") were counted before and after an operation; small swabs were not counted but were always used on a holder. The night, however, had been hot, and the surgeon might have had to have his brow wiped. If this were done with an unsterilized swab it might have been picked up and included in the count. The theatre technician, whose task had been to check the swabs, described how an operation was usually begun with 24 "big sixes" and two abdominal packs, which were all checked. During the operation it was his custom to collect all the used swabs and lay them in a special rack until six were used; those were then taken out of the rack, placed in a bucket, and marked off on the graph which he used for keeping the count. If extra swabs were taken into use they also were marked on the graph. He was certain that the routine had been observed on that occasion. It was his duty to wipe the surgeon's brow, which he did with an unsterile swab which he would put into his pocket.

The jury found that the little girl had died from intestinal obstruction by a surgical swab inadvertently left in the abdomen during the operation. They added two riders: (1) that thought should be given by the hospital authorities to devising a scheme by which swabs used for packing could be recorded and recovered, and (2) that a record should be kept by the hospital of all the persons engaged in an operation.

In a letter to the senior officer of the Birmingham Regional Board the acting deputy coroner, Mr. L. D. Overell, suggested that in their first rider the jury might have been referring to the possible use of a "big six" as a pack, and have considered it desirable for any material used for packing to be quite distinct from ordinary dressings. The second rider referred to an uncertainty in regard to the identity of the assistant to the theatre sister, which had caused an adjournment. The surgeon, he added, had immediately given instructions that in future some quite different material, which could not be mistaken for a dressing, should always be used for wiping the surgeon's brow. The coroner went on to say that all the usual routine drill to prevent a mishap of this kind appeared to be in operation at the Warwick Hospital; but he expressed the personal opinion that, as quite well educated persons were frequently faulty in arithmetic, such an accident could easily be due to a failure by a harassed theatre sister to add correctly the numbers of the used and the unused swabs. Whether this or the use of a swab for the surgeon's brow is the true explanation, this case has pointed to another possible source of what is fortunately an extremely rare mishap.

Universities and Colleges

UNIVERSITY OF OXFORD

The Weldon Memorial Prize for 1950 has been awarded to Lionel Sharples Penrose, M.D., Galton Professor of Eugenics, University College, London.

UNIVERSITY OF CAMBRIDGE

In Congregation on December 2 the following degrees were conferred:

M.A.—Oswald Lloyd, M.D., F.R.C.S., M.R.C.O.G., Associate Lecturer in the Faculty of Medicine.

M.D.—P. Sainsbury, G. M. Fleming, W. L. Calnan, H. Butler.

M.B., B.CHIR.—*Ion-Dan Edeleanu.

A Grace recommending the conferment of the degree of M.A. upon Janet E. Bottomley, M.D., F.R.C.S., M.R.C.O.G., Associate Lecturer in the Faculty of Medicine, passed the Senate on December 2.

*By proxy.

UNIVERSITY OF GLASGOW

On December 1 the degree of Ph.D. was confirmed *in absentia* by diploma upon C. Mukherjee, M.B., Ch.B.

UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—[1 3]D. Burman, [1 6]M. W. Cemlyn-Jones, [1 2]P. J. Chapman, [1 2 5]S. S. Epstein, [1 5]D. I. Fryer, [1 7]L. G. Goodwin, [1 5]P. E. B. Holmes, [1 4]C. B. Ingor-Willey, [1 5]R. P. V. Jayewardene, [1 5]R. S. Jelliffe, [1 2 4 6 7]D. J. Jenden (*University Medal*), [1 4]N. MacDonald, [1 5]F. W. O'Grady, [1 2]T. H. Roffe, [1 6]M. K. Sawday, [1 6]G. Walker, R. G. Adams, D. G. E. Alldridge, J. D. B. Andrews, B. Bass, D. A. Begg, Marion Berry, C. N. Best, Margaret E. Beynon, N. P. Bhandari, Irene F. A. Blakeney, A. G. Blyth, Elizabeth M. Bough, J. Ll. Bowen, Betty B. Boxall, T. L. Bradbeer, C. J. Bradfield, Yvonne J. Bradfield, R. O. Brettell, J. E. Bridger, W. V. Brooks, D. E. Brown, O. F. Brown, K. M. Bryant, N. L. Bucky, M. G. Budden, S. H. Burges, Patricia M. Bushell, R. P. Butt, G. Canti, R. J. A. Carey, S. J. Carne, W. I. Carter, P. J. Chesterman, J. W. Cieszynski, P. H. Cima, D. A. Clements, N. F. Cockett, R. A. Cocks, R. F. Coggins, Sheila D. Cooper, C. H. Corby, A. H. Cox, Elizabeth P. Cracroft, A. J. I. Dacre, Mary G. C. A. Dale, R. A. Davidson, Aldwyth H. Davies, J. W. Davies, W. H. G. Davies, J. G. Dawe, Geva B P. de Winton, P. L. C. Diggory, S. Dische, F. B. Dobbs, Winifred B. Drew, B. H Du Heaume, W. R. Edwards, Alison M. M. Fleming, N. S. Galbraith, O. P. Galpin, M. F Gardiner, F. P. A. Garton, Angela M Geere, M. J. Gilkes, D. Goldman, A. M. Goldstein, Edwina R. Goodall, Helen

Gordon, R. Goulding, J. Gower, B. P. Green, C. R. Greenacre, E. J. Griffiths, P. W. W. Griffiths, S. Hacking, Antoinette I. Hallett, C. P. Handforth, H. R. Hewitt, P. G. Higgins, June R. Hill, R. R. W. Hill, R. F. H. Horn, H. Horwitz, B. J. Hovenden, J. G. Howard, St. C. M. L'A. Hubbard, E. R. Huehns, F. T. Hunt, Sylvia R. Ingold, Diana H. Ireland-Jones, M. C. H. Jackson, Elsie S. Jaikaran, Brenda James, G. C. Jenkins, F. G. Johnson, M. H. F. Johnson, D. R. Jones, R. J. B. H. Jones, Ann Kiln, A. E. Kingston, G. W. Korn, E. B. Kraus, A. C. K. Lawrence, D. A. Lawrence, J. J. Lesser, S. Liu, J. W. McCloy, D. H. McFerren, K. A. McNeill, I. J. MacQueen, G. W. Marsh, Nancy A. H. Marston, J. A. M. Martin, M. Mason, Jennie C. Maurice-Jones, A. R. May, A. Melinek, A. L. Miller, J. Minnis, C. Molloy, D. Montague Jackson, Margaret C. R. Moore, Doreen P. Morgan, P. D. Moyes, A. R. Moynahan, D. J. F. Munro, R. W. Nash, B. E. C. Nordin, S. F. Oakenfull, K. J. O'Connor, A. L. C. Packham, H. J. G. Palmer, Kathleen M. Parker, Mary Parsons, J. K. Paterson, Dina Patuk, D. L. Pedersen, R. D. Peduzzi, J. R. P. Pegg, H. F. Pile, J. D. Pollitt, W. E. B. Preston, C. F. G. Prideaux, K. G. Prior, Rebe S. Rainsbury, J. H. Reading, Doreen M. Reside, Mary Rhoderick, G. A. Roberts, Margaret E. Robson, I. Rocker, E. H. Roffey, J. K. Ross, P. W. Ruggles, R. H. B. Sacks, Barbara J. Salisbury, J. F. Santer, J. N. McM. Schofield, J. Scorey, W. C. Scott, D. I. Segall, S. A. Seligman, S. J. G. Semple, Pauline M. Seymour-Cole, I. M. Sharpe, E. M. Shipsey, Isabel G. Smith, D. P. Smyly, R. S. Somers, T. Spiro, V. Stanhill, C. Steer, F. P. Stephens, P. B. Stewart, K. H. Stone, L. R. Sweetman, P. K. Sylvester, Gwendolyn R. Tapp, P. K. Thomas, D. J. G. Tilley, W. L. Timmins, J. A. Tottle, A. F. Tuohy, C. L. Tutty, Lilian S. Underhill, J. Vaccaro, R. Vickers, M. H. Vickery, F. H. Walker, I. H. Wallington, A. V. Watts, T. P. S. Watts, D. M. Webster, R. H. C. Wells, Mary F. West, E. J. Williams, J. Ll. Williams, F. P. Willis, M. L. N. Willoughby, M. A. Wilson, H. Windschauer, M. Wise, M. E. Y. York-Moore, J. P. W. Young, T. M. Young.

[1]With honours. [2]Distinguished in pathology. [3]Distinguished in hygiene and forensic medicine. [4]Distinguished in medicine. [5]Distinguished in applied pharmacology and therapeutics. [6]Distinguished in surgery. [7]Distinguished in obstetrics and gynaecology.

UNIVERSITY OF BIRMINGHAM

In the *Journal* of December 2 (p. 1286) we announced the appointment of Mr. Alexander Innes as University Lecturer in Minor Operative Surgery. The announcement should have read that Mr. Innes has *resigned* from the post.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the annual meeting of the College held on November 30, with the President, Sir David K. Henderson, in the chair, the following were elected to the Council: Dr. W. A. Alexander, Dr. D. J. A. Kerr, Dr. D. N. Nicholson, Dr. R. M. Murray-Lyon, Dr. J. G. M. Hamilton, Dr. T. Anderson.

Sir David Henderson was re-elected President for the ensuing year and Dr. Alexander was re-elected Vice-president.

At a meeting of Council held on December 5, the following were elected office-bearers for the ensuing year: *Trustees*, The Treasurer, Dr. A. Fergus Hewat, Dr. W. D. D. Small, Professor Thomas Ferguson, Mr. I. Simson Hall; *Treasurer*, Dr. J. Alastair Bruce; *Secretary and Registrar*, Dr. J. Halliday Croom; *Honorary Librarian*, Professor D. M. Lyon.

CONJOINT BOARD OF IRELAND

The following candidates were duly admitted licentiates in medicine and midwifery on December 1, having passed the final examination in medicine, surgery, and midwifery of the Conjoint Board of Ireland: Eleanor A. Bolger, Alice Boushel, J. P. Cahill, James Connolly, Dorothy J. Davis, M. J. Foley, Carmel P. Gibson, V. J. Haslan, Mabel Jackson, Sheila Moriarty, Mary J. McCann, Helena M. McManus, M. P. McPartlin, Maureen B. O'Gorman, A. P. O'Kelly, M. P. O'Reilly, Sheelah K. O'Shea, R. A. Power, S. J. Raverty, A. Rudnick, W. E. Rutherford, Dympna E. Sharkey, W. S. Snow, C. M. Watson, Avril M. Webb, J. R. White, J. E. Whyte, C. E. Wilson.

The Services

The *London Gazette* has announced the appointment as M.B.E. (Military Division) to Temporary Surgeon Lieutenant-Commander D. S. Macphail, R.N.V.R., for courage, skill, and determination when he was dropped by parachute into Yugoslavia in May, 1944, and, in spite of the very primitive conditions and the scarcity of medical supplies, established a hospital for the Partisans.

Medical News

Plan for New Medical Centre

London University has just acquired property in Bloomsbury at the corner of Guilford Street and Millman Street almost opposite London House, the hostel for postgraduate students from the Dominions, and hopes to build there, as soon as circumstances permit, a headquarters for the British Postgraduate Medical Federation. This new centre will be within easy reach of the Institutes of Neurology in Queen Square, of Child Health in Great Ormond Street, of Ophthalmology in Judd Street, and of Laryngology and Otology in Gray's Inn Road, and will probably contain a refectory and common-rooms and be a social as well as an administrative centre.

A Medical Christmas Present

The last 50 years have seen astounding developments in medicine and surgery, in public health, and in medical administration. In a well-designed book of 330 pages, in an attractive dust-jacket and beautifully bound in red cloth boards with gold lettering on the spine, the articles on "Fifty Years of Medicine" which appeared originally in the special issue of the *British Medical Journal* for January 7, 1950, have now been reprinted. There are over 300 text pages, a 16-page index, and 32 pages of illustrations on art paper, and the price is 15s. through booksellers, or post free from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Chelsea Clinical Society

The second meeting of the session was held on November 14, at the South Kensington Hotel, with the president, Mr. Geoffrey Parker, in the chair, when Mr. Dickson Wright, M.S., F.R.C.S., showed a series of films from the B.M.A. library: "Radioactive Isotopes in Cancer of the Thyroid," "Thrombosis and Embolism," "Infections of the Hands," and "Total Retro-Pleural Sympathectomy for Relief of Hypertension."

Medical Films for Pathologists

In 1946 the Scientific Film Association issued a *Catalogue of Medical Films*, which has now long been sold out. While a new edition is in preparation, the association is issuing up-to-date interim lists of films on special subjects. A list of films for nurses is on the way, and a list of *Films of Interest to Pathologists* (publication 60) is now available, price 2s. 6d., from 4, Great Russell Street, London, W.C.1, or 16–17, Woodside Terrace, Glasgow, C.3.

Cortisone Summary

Some 90 papers on cortisone and A.C.T.H., mostly published this year in British or American journals, have been summarized conveniently in a 48-page booklet just issued by the Empire Rheumatism Council from Tavistock House, Tavistock Square, London, W.C.1, price 5s.

Centenary of Bernhard Baron

December 5 was the hundredth anniversary of the birth of Bernhard Baron, and also marked the end of the distribution of the funds of the two charitable trusts he founded, in accordance with his order that all money must be given away within 20 years of foundation. In addition to orphanages, homes for cripples and old people, and institutions for the blind, many hospitals have benefited from large gifts, including the Middlesex (£61,000), which has a wing named after him, Queen Charlotte's (£75,000), and the Hospital for Sick Children (£14,000). The Royal College of Obstetricians and Gynaecologists received £10,000 for a travelling scholarship and the Royal College of Surgeons £70,000 to establish research laboratories and a professorship. In all £1,625,922 has been distributed to many hundreds of institutions not supported by the State or local rates. A maximum of one-quarter of one fund, and one-fifth of the other, have been devoted to Jewish charities, as the donor laid down. At his death in 1929 Baron's estate was worth nearly £5m., while during his life he had given away about £2m. in charity. This wealth came primarily from the manufacture and sale of cigarettes, in particular from his firm, Carreras Ltd.

Baron was born in Russia of Jewish parents, and moved as a boy to the United States where he got work in a New York tobacco factory just at the time when cigarettes were first devised. After various early misfortunes, including the loss of his savings in a bank failure in 1874, he began to prosper with a cigar factory in Baltimore, and from 1890 to 1895 was managing director of the National Cigarette Tobacco Company of New York. During this time he invented a cigarette-making machine, and when he came to England in 1895 he formed his own company to exploit its use. To sell his cigarettes in competition with the Imperial Tobacco Company, he bought the small London tobacco business of J. J. Carreras in 1903, and built it up to its present large and wealthy form.

Jordan Medical Journal

This first medical periodical to be published in the Hashimite Kingdom of the Jordan will include papers in English and Arabic, and will appear six times a year. The editor is Dr. Wasif Kana'an, P.O. Box 256, Amman, Jordan.

In Brief

Professor R. E. Lane, M.D., F.R.C.P. (Nuffield professor of occupational health in the University of Manchester), Professor J. M. Mackintosh, M.D., F.R.C.P. (professor of public health, University of London), and Sir Hugh E. Griffiths, C.B.E., F.R.C.S. (a consulting surgeon), are the medical members of the Industrial Injuries Advisory Council.

Professor Ange Catacuzinos, director of the neuro-psychiatry unit at the Evangelismos and Pammakaristos Hospitals in Athens, is in Britain, December 3–19, and is lecturing at the National Hospital, Queen Square, London, W.C.1.

The Secretary of State for Scotland has appointed Mr. James South, senior partner of an Inverness firm of solicitors, to be chairman of the Northern Regional Hospital Board.

Dr. H. Gardiner Hill has been elected president and Dr. J. G. H. McNabb captain for the 1951 season of the Medical Golfing Society.

Wills

Dr. George Taylor, of Coldingham, Berwickshire, late of Edinburgh, left £21,132; Dr. James Lyons, late police surgeon in Lincoln, left £23,835; Mr. Howard Stevenson, of Belfast, a former member of the Northern Ireland Parliament, left estate in Great Britain and personal estate in Northern Ireland valued at £9,266; Mr. M. T. Williams, of Aberystwyth, £34,372; Dr. H. G. Stacey, of Harrogate, formerly in practice in Leeds, £19,184; Dr. E. C. Carter, of Enfield, £69,801.

COMING EVENTS

Franco-Anglo-American Medical Society

A business meeting will be held on Tuesday, December 19, at 2.30 p.m., at 11, Chandos Street, Cavendish Square, London, W.1.

Association of Clinical Pathologists

The winter meeting of the Association of Clinical Pathologists will be held at Westminster Hospital, London, S.W., on January 25, 26, and 27, 1951.

International Congress of Clinical Pathology

This will be held in London, July 16–20, 1951, under the presidency of Sir Lionel Whitby. The scientific meetings, which will be held in English and French, are to be grouped under the headings of microbiology, haematology, morbid anatomy, and chemical pathology. Travel and hotel arrangements are in the hands of Messrs. Thos. Cook and Son, Ltd., and for all other matters the secretary is Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9.

American Academy of Forensic Sciences

The second annual meeting of the American Academy of Forensic Sciences will take place in Chicago on March 1–3, 1951. Further particulars of this meeting can be obtained from Dr. R. B. H. Gradwohl, 3514, Lucas Avenue, St. Louis 3, Mo., U.S.A.

German Society for Internal Medicine

The 57th meeting of the Deutschen Gesellschaft für Innere Medizin will be held at Wiesbaden, April 2–5, 1951, under the chairmanship of Professor M. Bürger, of Leipzig. The chief topics are the relation between hypophysis and adrenal; changes in the clinical picture of thyroid disease, lung cancer and its treatment, physical and biological basis of ultrasonic treatment, endocrine aspects of the relation between diabetes and tuberculosis. Those proposing to read papers must submit a summary before January 15. Further information can be obtained from Professor Fr. Kauffmann, (16) Wiesbaden, Städt. Krankenanstalten.

Italian Tuberculosis Congress

The 10th Italian Congress of Pulmonary Tuberculosis will take place at Naples on April 3–8, 1951. Further particulars of the Congress may be obtained from the Secretary of the Congress at the Istituto "Principi di Piemonte," Naples.

International Gynaecological Congress, 1951

The Congrès International Jubilaire de la Société Française de Gynécologie will be held in Paris on June 23–29, 1951. Further particulars may be obtained from Dr. Maurice Fabre, 1, rue Jules-Lefebvre, Paris 9e, and information regarding the exhibition at the congress from M. André Pecker, 74, boulevard Haussmann, Paris 8e.

SOCIETIES AND LECTURES

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

Monday

●INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—December 18, 5 p.m., *"Aphasia in Children,"* by Dr. Macdonald Critchley.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 18, 5.30 p.m., *"Visual Pigments,"* by Dr. H. J. Dartnall.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—December 18, 3.45 p.m., *"Analgesic Drugs,"* by Dr. C. A. Keele.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 18, 4 p.m., *"Optics"* (Revision), by Mr. H. N. Reed.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 18, 5.30 p.m., *"Anatomy of the Eye and Orbit,"* by Professor T. Nicol.

Tuesday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C., December 19, 5.30 p.m., *"Respiratory Chemistry of the Blood,"* by Professor F. J. W. Roughton, Ph.D., F.R.S.

EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, London, W., December 19, 5.30 p.m., *"The Ideal of an Elite,"* by Mr. Paul Bloomfield.

INSTITUTE OF OPHTHALMOLOGY, Judd Street, London, W.C.—December 19, 5.30 p.m., *"Ocular Tuberculosis,"* by Mr. P. McG. Moffatt.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Endell Street, London, W.C., December 19, 5 p.m., *"Stress Incontinence in the Female,"* by Mr. Harland Rees.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 19, 5 p.m., *"Science and Art of Refraction,"* by Dr. T. H. Whittington.

Wednesday

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Endell Street, London, W.C., December 20, (1) 3.30 p.m., demonstration of museum specimens by Mr. H. G. Hanley; (2) 5 p.m., *"Incontinence in the Male, Atony of the Bladder, and Enuresis,"* by Mr. D. I. Williams.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 20, 4 p.m., *"Clinical Ophthalmology"* (Revision), by Mr. R. A. Burn and Mr. R. P. Crick.

Thursday

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.; December 21, 5.30 p.m., "*Respiratory Chemistry of the Blood*," by Professor F. J. W. Roughton, Ph.D., F.R.S.

INSTITUTE OF UROLOGY (UNIVERSITY OF LONDON).—At St. Paul's Hospital, Endell Street, London, W.C., December 21, 5 p.m., "*Infertility in the Male*," by Mr. A. R. C. Higham.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—December 21, 5 p.m., "*Methods of Examination*," by Mr. C. M. Shafto.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—December 21, 4.30 p.m., lecture-demonstration on psychiatry by Dr. M. A. Partridge.

APPOINTMENTS

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE.—The following appointments at the hospitals indicated in parentheses are announced: *Consultant Venereologist*, Joan Halstead, M.B., Ch.B. (General Hospital); *Resident Anaesthetist*, T. R. Bomonji, M.R.C.S., L.R.C.P. (General Hospital); *Casualty Officer*, W. E. O'Hara, M.D. (General Hospital); *Junior Obstetrical Registrar*, D. J. Cassidy, M.B., B.S. (Mayday Hospital); *Obstetrical House Officer*, A. K. Doust, M.R.C.S., L.R.C.P. (Mayday Hospital); *Assistant Medical Officer (Surgical)*, D. O'Keeffe, M.B., B.Ch. (Mayday Hospital); *Anaesthetist Registrar*, Mary Connolly, M.B., B.Ch. (Mayday Hospital); *Casualty Officer*, D. W. Heustis, M.D. (Mayday Hospital); *Consultant Radiologist*, D. W. Seth-Smith, M.R.C.S., L.R.C.P., D.M.R. (Croydon Group).

DUIGNAN, JAMES, M.B., B.Ch., D.P.H., Assistant County Medical Officer of Health, County Mayo, Eire.

MILLER, R. G., M.B., M.R.C.P., Resident Medical Officer, Manchester Royal Infirmary.

SMYTH, MICHAEL J., M.Ch., F.R.C.S., Consulting Surgeon to the Jockey Club; Consulting Surgeon to the National Hunt.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Beaton.—On November 13, 1950, to Betty (formerly Dr. Elizabeth S. Bayne), wife of Donald Beaton, M.B., Ch.B., D.A., 92, Bonnymuir Place, Aberdeen, a daughter.

Davidson.—*On November 3, 1950*, at Nicosia General Hospital, to Helen Audrey Davidson, M.B., B.Ch., B.A.O. (formerly Lynas), wife of Mr. Malcolm Norman Davidson, Colonial Administrative Service, Cyprus, a daughter.

Hingston.—On November 9, 1950, at Leeds, to Dr. Etheline (formerly Brady), wife of Dr. James Hingston, 19, Bainbrigge Road, Headingley, Leeds, a daughter.

Sloan.—*On December 7, 1950*, to Mairi, wife of Dr. J. Burnley Sloan, High Corner, Ardnave Crescent, Bassett, Southampton, a son—Gordon Burnley.

MARRIAGES

Pearce—Thompson.—On December 2, 1950, at Llanishen, Cardiff, Douglas John Pearce, M.B., B.S., to Margaret Patricia Thompson, S.R.N.

Sidebotham—Jefferies.—On December 2, 1950, at Wilmslow Parish Church, Robert Noël Sidebotham, M.B., B.S., to Patricia Mary Jefferies, M.C.S.P.

DEATHS

Barford.—On November 29, 1950, in hospital, James Leslie Barford, M.R.C.S., L.R.C.P., D.P.M., of 2, Earlswood Road, Redhill, Surrey.

Benton.—On December 5, 1950, at Broughton Corner, Thornton Road, Thornton Heath, Surrey, *William Benton*, M.R.C.S., L.R.C.P., D.P.H., J.P., also of 35, Robson Road, Worthing, Sussex, aged 82.

Caldwell.—On December 3, 1950, at St. Albans, *Alfred George Caldwell*, M.D., D.P.H.

Evans.—On November 26, 1950, at Crowell, Oxford, Jessie Downie Granger Evans, M.D.

Howat.—On November 26, 1950, at Westminster Hospital, William Howat, M.B., Ch.B., of Leyton, London, E.

Hutchinson.—On December 2, 1950, at Highbury, Walmersley, Bury, Gladys Hilda Hutchinson, M.B., Ch.B.

Purdon.—On December 1, 1950, at his home, Kensington, London, William Brooke Purdon, D.S.O., O.B.E., M.C., M.B., B.Ch., D.P.H., Major-General, A.M.S., retired, aged 68.

Rankin.—On November 16, 1950, at Southport, Lancs, John Rankin, M.B., F.R.C.S.I., aged 77.

Russell.—On November 27, 1950, Henry Bret Russell, M.D., M.R.C.P., aged 55.

Walcot.—On November 24, 1950, at a North Finchley nursing-home, Thomas Walcot, M.D., aged 87.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ending December 2 were: paralytic, 90 (111); non-paralytic, 38 (19); total, 128 (130). The figures for the previous week, compared with which there was a total decrease of 2, are in parentheses.

Uncorrected notifications for the corresponding week in 1947 and 1949 totalled 106 and 157 respectively. Total uncorrected notifications for 1950 up to and including the week under review are 8,379. The corresponding figures for 1947, 1948, and 1949 are 8,927, 2,272, and 6,483 respectively.

County areas with the most numerous notifications were Devon 6, Gloucester 10, Lancs 12, Southampton 6, Surrey 10, and West Riding 10. The decrease in the week ending December 2 is insignificant and disappointing in view of the large fall in the previous week.

Discussion of Table

In *England and Wales* a further increase was reported in the very high incidence of measles 1,211, whooping-cough 204, and dysentery 152. A rise of 97 occurred in the number of notifications of scarlet fever, but, in relation to the incidence in former years, this disease is at a low level. A fall in incidence was recorded for acute pneumonia 68, acute poliomyelitis 19, and diphtheria 15.

The largest rises in the number of notifications of measles were Lancashire 512, Middlesex 215, Essex 101, while the chief exception to the rising trend was a decrease of 107 in Surrey. A small rise in the incidence of whooping-cough was general throughout the country; the outstanding exception to the increasing trend was a fall of 106 in Yorkshire West Riding. The increase in the incidence of scarlet fever was due to a small rise in most sections of the country. The chief variations in the returns for diphtheria were falls in Yorkshire West Riding 9, Lancashire 8, Glamorganshire 5, and a rise of 4 in London.

The largest rises in the number of notifications of dysentery were Lancashire 63, Leicestershire 36, and Wales 26. The largest returns for dysentery during the week were Lancashire 129 (Manchester C.B. 22, Southport C.B. 16, Prestwich M.B. 15, Great Harwood U.D. 14, Middleton M.B. 10, Urmston U.D. 8); Leicestershire 76 (Leicester C.B. 63); Yorkshire West Riding 52 (Dewsbury C.B. 14, Saddleworth U.D. 14); Durham 39 (Darlington C.B. 13, South Shields C.B. 13); Monmouthshire 29 (Abercorn U.D. 17, Newport C.B. 9); London 28; Cheshire 28; Surrey 23 (Surbiton M.B. 18); Essex 23 (Romford M.B. 17); Shropshire 21 (Whitchurch U.D. 11); Northumberland 20 (Newcastle-upon-Tyne C.B. 11); Nottinghamshire 16 (Mansfield M.B. 12); Northamptonshire 15 (Kettering M.B. 14); Middlesex 12; Gloucestershire 12 (Thornbury R.D. 7); Cumberland 12; Caernarvonshire 12 (Bangor M.B. 8); Carmarthenshire 10 (Llandovery M.B. 8).

The largest returns of acute poliomyelitis were Surrey 9, Lancashire 9, Devonshire 8, Gloucestershire 8 (Bristol C.B. 8), Yorkshire West Riding 8.

In *Scotland* infectious diseases were more prevalent during the week, and increases occurred in the number of notifications of whooping-cough 110, measles 79, diphtheria 16, and dysentery 11. The largest increases in diphtheria were Glasgow 7 and Lanark county 5. The number of notifications of dysentery in Glasgow fell from 103 to 64, and rises were recorded in Edinburgh from 9 to 36, and in Dundee from 4 to 14. The other important centre of dysentery was Lanark county 17.

In *Eire* rises occurred in the number of notifications of measles 60, whooping-cough 14, diarrhoea and enteritis 12, and a fall of 34 was recorded for scarlet fever. A decline in the incidence of scarlet fever occurred in the country generally with the exception of Dublin C.B.

In *Northern Ireland* a rise of 85 in the notifications of measles and of 15 for scarlet fever were the chief features of the returns. The largest rise for measles was 32 in Armagh county.

Week Ending December 2

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,434, whooping-cough 4,458, diphtheria 45, measles 12,323, acute pneumonia 497, acute poliomyelitis 128, dysentery 856, paratyphoid fever 8, and typhoid fever 1.

Quarterly Returns for Northern Ireland

The birth rate during the March quarter of this year was equivalent to an annual rate of 21.3 per 1,000, and was 1.2 below the average of the five preceding first quarters. The infant mortality was 44 per 1,000 registered births, and was 21 below the average of the corresponding quarter for the five preceding years. The general death rate was 13.3 per 1,000, and was 2.0 below the five-year average. Deaths from pulmonary tuberculosis numbered 152, and 36 from other forms of tuberculosis. These were 45 and 2 below the number registered in the first quarter of 1949. Of the 113 deaths attributed to the principal epidemic diseases, 75 were due to influenza, 21 to diarrhoea and enteritis, and 11 to whooping-cough.

No. 47

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	37	5	16	3	2	32	4	11	2	2
Deaths		2	1				1	—		
Diphtheria	61	10	25	9	1	121	18	28	3	9
Deaths	1	1	—	—	—	1	—	—	—	—
Dysentery	626	28	164	2	6	144	25	88	—	—
Deaths		—			—				—	—
Encephalitis, acute	5	—	—		—	1	—	—	—	—
Deaths		—		—			—			
Erysipelas			31	7	2			27	5	3
Deaths							—			
Infective enteritis or diarrhoea under 2 years				32	30				33	
Deaths	9		6	—	2	21	1	8	2	4
Measles*	11,343	827	191	164	142	1,467	28	39	200	87
Deaths†		—	—	—				—	1	—
Ophthalmia neonatorum	45	5	9		—	31	3	9	1	—
Deaths										
Paratyphoid fever	7	2	—		—	11	1	1 (B)	—	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	490	33	8		15	710	51	2	2	7
Deaths (from influenza)‡	24	3	6	—	2	35	9	3	—	—
Pneumonia, primary			198	¶				266	27	
Deaths	207	26		8	9	303	67		11	5
Poliomyelitis, acute	130	4	10	5	—	193	24	6	8	1
Deaths§	6	—	—			21	8			
Puerperal fever			2				—	9		
Deaths										
Puerperal pyrexia‖	48	4	13		—	87	7	6	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,483	101	198	75	63	2,827	224	365	154	341
Deaths†		—	—	1	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	—	1	1	1	11	—	1	14	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,334	376	606	55	27	1,035	43	63	66	67
Deaths	5	—	—	—	—	1	—	—	—	—
Deaths (0–1 year)	210	31	47	15	9	288	32	45	23	11
Deaths (excluding still-births)	5,321	819	736	183	159	5,730	995	683	193	148
Annual death rate (per 1,000 persons living)			14·8					13·7	12·0	
Live births	6,543	1062	800	293	185	6,938	1109	867	333	233
Annual rate per 1,000 persons living			16·1					17·4	20·6	
Stillbirths	188	28	24			142	16	31		
Rate per 1,000 total births (including stillborn)			29					35		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

Any Questions?

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

Hypersensitivity after B.C.G.

Q.—*I am a final-year student and persistently Mantoux negative. I have been offered B.C.G. vaccination and would be glad to avail myself of the opportunity. However, I am due to do a tuberculosis course at a sanatorium in four months' time. If I have my inoculation in the next few weeks, will I be hypersensitive to tuberculous infection when I do my course?*

A.—An individual who is given B.C.G. vaccine while incubating a virulent tuberculous infection, or who is exposed to such an infection during the pre-allergic phase following vaccination, appears to run no greater risk of serious disease than if he had not been vaccinated. Nor is there evidence of any hypersusceptible phase following Mantoux-conversion due to B.C.G. vaccination. The purpose of separating a vaccinated person from a known infective case is to preserve the reputation of B.C.G. vaccination rather than the subject. When carried out, segregation is usually from six weeks before vaccination until six to twelve weeks after, so that the physician can know both that the individual was tuberculin-negative sufficiently long after the contact had been broken to have escaped natural infection therefrom, and that he has become tuberculin-positive (from B.C.G.) before he resumed contact. By these tokens the questioner, if vaccinated successfully in the next few weeks, will have had his tuberculin-conversion demonstrated before starting his sanatorium course, and will thereafter have some degree of protection.

Small Temperature Swings in Spinal Tuberculosis

Q.—*What is the significance of a small but persistent daily temperature swing (97.2 to 98.8° F.—36.2 to 37.1° C.) in a patient suffering from spinal tuberculosis? A lumbar abscess complicated by a sinus has subsided, and the sinus has ceased to discharge. The blood sedimentation rate is within normal limits, and the radiological appearance of the diseased vertebrae is satisfactory. I may add that the patient has had this temperature swing for the last two years, while undergoing immobilization on a plaster bed to which he is still confined.*

A.—The disease in this patient is in all probability quiescent. But it is wise in such a case to continue immobilization on the plaster bed for three months after first obtaining a satisfactory sedimentation rate and radiograph. If the sedimentation rate and radiological appearances remain satisfactory and the sinus keeps dry, the small temperature swing mentioned may be disregarded.

Causes of Kerato-conjunctivitis

Q.—*What is the aetiology of non-specific kerato-conjunctivitis? Is there any association with tuberculosis?*

A.—The causes of kerato-conjunctivitis are many; some are known, and about others we are at present ignorant. Often there are several aetiological factors. Kerato-conjunctivitis is sometimes associated with systemic disorders of endogenous origin and with a number of skin diseases such as acne rosacea, seborrhoeic dermatitis, pemphigus, and others. Superficial punctate keratitis occurs in epidemic form in India and Malaya, and indeed it did so in London in 1930–1; it is then associated with an acute but transitory infection of the upper air passages, and is thought to be due to a filter-passing virus. Some cases of kerato-conjunctivitis are bacterial in origin and some are due to neurotrophic causes, as when the Gasserian ganglion is diseased. The disease may also appear during the acute exanthemata and influenza. It may result from exposure of the cornea due to absence of blinking in severe illness and unconsciousness or to failure of the upper lid to cover the cornea.

The condition may also arise from such industrial hazards as electric short-circuit flashes; exposure of the unprotected eyes in acetylene welding and to ultra-violet-light lamps; the irritation of chemical fumes and dust; and in the manufacture of artificial silk. Kerato-conjunctivitis is evident in so-called "snow-blindness," when the injurious agent is thought to be ultra-violet rays reflected by snow fields at high altitudes. Some people are very sensitive to aniline dyes, and in such paraphenylene diamine, which is used in certain eyelash cosmetics, may cause a very severe kerato-conjunctivitis. A number of articles such as jequirity seeds,* used for self-inflicted eye injuries, induce kerato-conjunctivitis, and in war mustard gas causes characteristic lesions of the bulbar conjunctiva and cornea.

Kerato-conjunctivitis may also occur in arsenical poisoning associated with exfoliative dermatitis, and when chrysarobin is administered for skin diseases.

Phlyctenular kerato-conjunctivitis is a tuberculo-allergic manifestation which may be associated with a healed tuberculous lesion, and occurs in children and young adults with a family history of tuberculosis. Those affected by this disease are often living in poor hygienic conditions; they are often in a low state of health, indulge in a diet with carbohydrate excess, and have lymphoid hyperplasia of their tonsils and adenoids and some upper respiratory infection.

Blindness and Heredity

Q.—*What are the hereditary causes of blindness, and at what ages does hereditary blindness usually occur? What are the chances of transmitting these diseases?*

A.—There are a large number of hereditary diseases that lead to blindness. Some produce gross visual defect or total blindness from congenital anomalies, others are abiotrophic in character—i.e., the eye is normal at birth and for some years subsequently, when degenerative changes set in and progress, leading to blindness in early life or very much later, the time depending on the affection. Microphthalmos is typical of the first group and retinitis pigmentosa of the second. Whether a particular form of hereditary disease is transmitted or not depends on the mode of inheritance. In recessive affections transmission of the disease occurs only under exceptional conditions; with a regular dominant mode of inheritance 50% of the offspring are likely to be affected; in recessive sex-linked affections the children of an affected man will not be affected, but 50% of his daughters' sons will be affected. Further information on this subject will be found in *Genetics in Ophthalmology* (Butterworth, London), by Professor Arnold Sorsby.

Ultra-violet Light and Children

Q.—*Will regular ultra-violet-light baths help normal healthy children, from 1 to 4 years old, to resist the common cold and other infections? Are there any contraindications? Can you suggest dosage for these ages?*

A.—The only extensive controlled survey of the value of ultra-violet light in the prevention of colds was that carried out by Dora Colebrook under the auspices of the Medical Research Council (*Industrial Health Research Board Report*, No. 89, H.M.S.O.). The work applied to adults only and showed that as a prophylactic ultra-violet light had no demonstrable value. There seems to have been no corresponding survey in children, but there is no reason to believe that a "normal healthy child" will react differently from an adult. On the other hand many clinicians believe that under-developed children with poor appetites and a tendency to respiratory infections are less liable to develop colds if given regular courses of ultra-violet light. This is a clinical impression only. Ultra-violet light sometimes aggravates an already existing cold and should temporarily be discontinued if a cold develops during the course of treatment, otherwise there are no obvious contraindications to its use in *healthy* children. The dosage for a child between the ages of 1 to 4 is half the normal adult dose recommended by the makers of the lamp.

*Jequirity, or the poisonous seeds of *Abrus precatorius*, contains an active principle called abrin, which is a toxalbumin similar to ricin and to snake venom. This has no action by mouth if the mucous membrane is intact, but when injected into the skin or applied to the surface of a wound urgent symptoms of collapse occur. These are accompanied by local inflammation and oedema, and capillary thrombosis and haemorrhage, and are often followed by death.

Leucoderma

Q.—*Has there been any recent advance in the treatment of leucoderma? Does pregnancy affect the condition?*

A.—There is as yet no effective treatment for leucoderma. Pregnancy may affect the condition for better or worse. It is an expression of disturbance of pigmentary function which appears in the majority of cases to be due to emotional, nervous, or endocrine influences, not of a gross nature nor, unfortunately, amenable to treatment. Recovery may occur spontaneously.

Meat and Chicken Soups

Q.—*What nutritive value have meat and chicken soups?*

A.—The composition of a meat or chicken soup will naturally depend on the relative amounts of water and of meat or chicken which have been used in its preparation. Even the most concentrated soups, however, contain little in the way of nutrients. One plateful (one-third of a pint or about 200 ml.) might contain, as a maximum, about 5 g. protein, 1 g. fat, and 3 g. carbohydrate, which together would yield about 40 calories. It may also contain a little vitamin B_1, riboflavin, and nicotinic acid, but not more than one-tenth of the daily requirements of these. The chief components that give the flavour are the soluble salts and extractives. The former are too small in quantity to contribute appreciably to the needs of the body. The extractives include very little urea, but appreciable amounts of creatine and creatinine, each of which may amount to 1 g. in a portion.

If we are interpreting nutritive value rather more widely, we should mention two further points. First, soups, taken as they are in the early part of the meal, stimulate appetite, and may thus indirectly improve the dietary. Secondly, when a meat or chicken soup is used as a base for a thick soup made with, say, pulses or potatoes, and to which has perhaps been added small pieces of meat or chicken, it is clearly possible to obtain a dish of quite high nutritive value.

Inheritance of Epilepsy

Q.—*A married woman, whose aunt suffers from epilepsy, wishes to have children. What risk is there that a child would be affected?*

A.—The risk is not appreciably greater than that for a woman with no family history of epilepsy.

NOTES AND COMMENTS

Carbon Dioxide and Asthma.—Dr. S. F. GILBERT (Manchester) writes: May I add my comments to your answer to this question ("Any Questions?" November 25, p. 1236)? While being in full agreement that such inhalations can be most harmful in some cases, and of no benefit in others, when given by uncontrolled methods, I have yet to see in my own practice any but beneficial effects. . . . At a later date I intend to submit full details of my method and results for publication.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 23 1950

HARVEY AND THE SCIENTIFIC METHOD*

BY

Sir HENRY COHEN, M.D., LL.D., F.R.C.P.

Corresponding Member of the Harveian Society of London

No compliment could be more acceptable to a physician than an invitation to deliver a lecture adorned by the name of Harvey. Yet the task and responsibility which the honour conveys are less enviable, and increase in difficulty as the years advance. Two hundred and thirty Harveian orators at the Royal College of Physicians and nearly a hundred Harveian lecturers of this distinguished society have probed deeply and well-nigh exhausted all that might be said of Harvey, his life and times, his contemporaries and forebears, his philosophy, and his contributions to medicine and science. So little would seem to remain that some orators and lecturers, having faced their difficulties, have solved them by avoiding them and have unashamedly deleted Harvey from the theme of their discourses, whilst not a few have sought refuge in the reflection of the French writer that "everything has been said before, but since nobody seems to listen we can say it all over again." As my tale unfolds you may well believe that I am not wholly guiltless of this exprobation.

Yet new facts concerning Harvey are still being revealed, and in the past year Harveian literature has been splendidly enriched by Mr. Geoffrey Keynes in his Linacre and Thomas Vicary Lectures dealing with the personality and portraiture of Harvey. The physician must feel deeply the passing of the initiative in this field of medical scholarship to the surgeon; if he is wise he will not be addulced by Mr. Keynes's assertion that "as a surgeon I belong to the less learned half of the medical profession"; rather will he sense that this is a meretricious concession not to the superior learning of the physician but to his overweening conceit.

But there is an aspect of history more significant than the study of persons and portraits, a study which is too apt to reflect the personality, not of the subject, but of the biographer and the artist. As Sir Arthur Helps has written:

> "To us, my friend, the times that are gone by
> Are a mysterious book, sealed with seven seals:
> That which you call the spirit of ages past
> Is but, in truth, the spirit of some few authors
> In which those ages are beheld reflected,
> With what distortion strange heaven only knows.
> History!
> Facts dramatized say rather—action—plot—
> Sentiment, everything the writer's own,
> As it best fits the web-work of his story,
> With here and there a solitary fact
> Of consequence."

*The Harveian Lecture delivered before the Harveian Society of London on March 22.

We can, however, study the mind of the man and its working in his writings. It is this which conveys to us a due sense of his greatness; it is this which helps us to assess his contribution to that irrepressible insurgence of the human spirit which reveals itself in the advancing frontiers of knowledge. It explains why we place Harvey amongst the greatest physicians of all times, not because he *discovered* that the blood circulates but because he *demonstrated* beyond all reasonable doubt that the blood circulates. It is with the Harveian method that I propose to concern myself in this lecture, and with why after he had demonstrated "the passage of the blood from the veins into the arteries and of the manner in which it is transmitted and distributed by the action of the heart" he was constrained to write: "But what remains to be said upon the quantity and source of the blood which thus passes, is of a character so novel and unheard-of that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom become a second nature. Doctrine once sown strikes deep its root, and respect for antiquity influences all men. Still the die is cast, and my trust is in my love of truth, and the candour of cultivated minds."

In this passage Harvey hints at the bases, the reasons for human beliefs. Translated into modern terminology these resolve themselves into four groups—the methods of tenacity, authority, intuition, and science or reflective inquiry.

Method of Tenacity

Tenacity, obstinacy, perseveration, call it what you will, is the spring of many of the doctrines we hold to be true. The pain of a new idea, said Walter Bagehot, is one of the greatest pains to human nature. "It is as people say, so upsetting; it makes you think that after all your favourite notions may be wrong, your firmest beliefs ill founded; it is certain that till now there was no place allotted in your mind to the new and startling inhabitant; and now that it has conquered an entrance, you do not at once see which of your old ideas it will not turn out, with which of them it can be reconciled, and with which it is at essential enmity."

And Wilfred Trotter (1932), in his "Commemoration of Great Men"—and I commend not merely this but all that he wrote to your attention—said: "The mind delights in a static environment, and if there is any change to be itself the source of it. Change from without, interfering as it must with the sovereignty of the individual, seems in its very essence to be repulsive and an object

of fear. A little self-examination tells us pretty easily how deeply rooted in the mind is the fear of the new, and how simple it is when fear is afoot to block the path of the new idea by unbelief and call it scepticism, and by misunderstanding and call it suspended judgment."

A glance at our medical textbooks establishes that habit or inertia makes it easier for us to continue to believe a proposition simply because we have always believed it. Fables about the value of drugs and other forms of therapy, and of such diagnostic measures as percussion, persist because we close our minds to all contradictory evidence. History may not repeat itself but the writers of textbooks do, and their reiteration, be it true or false, strengthens our beliefs. Moreover, the interests of ourselves, our country, our religion, our business or profession—all these and a host of others—will determine how far we insulate ourselves from contrary views and opinions. And since we have different interests we shall cling to different beliefs. Thus the method of tenacity is incapable of deciding between conflicting views.

Method of Authority

Secondly, as a basis of belief there is the method of authority, the appeal to an accepted source which in the highest degree is regarded as infallible. Two forms of appeal to authority must be clearly distinguished. One is both reasonable and inevitable. In the practice of medicine, for example, no one man can have the time, even if he had the ability, to find out all knowledge for himself. He accepts the carbohydrate values of certain foodstuffs given by competent authorities; he does not question that specific patterns in an electrocardiogram indicate a posterior cardiac infarction, or that herpes zoster is a virus infection. But he retains the right to question the authorities if his own experiences cause him to doubt their dicta; there are other authorities to whom he can appeal; and, indeed, if he is prepared to do so he can acquire the competence and experience himself with which to test the validity of the pronouncements of authority.

The second form of appeal to authority is fundamentally different. It "invokes an external source, which it invests with infallibility and finality to give sanction to beliefs." This is the basis of many of our religious beliefs and our political affinities even to-day, and in the history of science it has played a sinister and obstructive part. Even Vesalius in 1543 was content to teach the Galenic doctrine of the ebb and flow of blood, which, as I shall later describe, demanded a perforated ventricular septum. He wrote: "The septum of the ventricle, composed as I have said of the thickest substance of the heart, abounds on both sides with little pits impressed in it. Of these pits, none, so far at least as can be perceived by the senses, penetrate through from the right into the left ventricle, so that we are driven to wonder at the handiwork of the Almighty, by means of which the blood sweats from the right into the left ventricle through passages which escape human vision."

You will observe that he permits himself to express not doubt at the teaching of Galen but wonder at the handiwork of the Almighty, who could create a ventricular septum which allowed the passage of blood though no perforations are visible; but perhaps his true belief is hinted at in a later writing, when he confessed that he "accommodated his statements to the dogmas of Galen not because he thought that these were in all consonant with truth but because in such a new great work he hesitated to lay down his own opinions, and did not dare to swerve a nail's breadth from the doctrines of the Prince of Medicine."

The influence of authority is perhaps most strikingly exemplified in the sentence of the Inquisition on Galileo in 1633 for maintaining that the earth goes round the sun. Recollect that this was five years after Harvey had published *De Motu Cordis* and you will better appreciate the courage and magnitude of Harvey's contribution. For in his time the methods of tenacity and authority dominated anatomy and medicine. The anatomist saw only what his mind had been attuned to see by the prior dicta of his teachers; he selected, perhaps unconsciously, what confirmed accepted doctrine. The purpose of dissection in Harvey's time was not to ascertain new facts but to demonstrate the truth of Galenic teaching; the assistant dissected the body, and the lecturer, seated apart, recited the appropriate passages from the works of Galen.

There were a few anatomists, however, prepared to dispute the authority of Galen. Of these, Matheus Realdus Columbus, a man of dubious integrity, who succeeded Vesalius at Padua in 1544, was the most outspoken, for in his *De Re Anatomica Libri XV*, published in 1559 after his death (a fact which might explain his frankness), occurs this indictment of his fellow anatomists: "But for these it is enough that Galen said so. What? To think that some folk in our time swear to the dogmas of Galen about anatomy so that they dare to assert that Galen ought to be taken as gospel, and that there is nothing in his writings which is not true! It is wonderful how men are carried away by this doctrine; and the princes of the anatomy offer it to the rabble. Yet no one sees how much this is to be blamed. Who indeed is there who never offends? But of this enough and more than enough."

Any chapter in the history of human thought will reveal that there can be no uniformity or stability of belief for *Homo sapiens*—the species with the inquiring, the inquisitive mind—which is based on authority, for authorities differ.

Method of Intuition

Is there a better guarantee of stable beliefs than those we have thus far discussed? Some have chosen and urged the method of intuition, the acceptance of truths which when uttered are seen to be and are accepted as self-evident, and they point in support to the utterances of the prophets and poets. But intuitions must be tested by experience, for intuitions are only self-evident within an accepted framework.

It was at one time "self-evident" that the earth was flat, and that the sun moved round the earth; to some it is self-evident that polygamy is a sin; and most people would accept such intuitions as that every effect must have a cause, and that the axioms of Euclidian geometry are true. For most propositions self-evidence has been claimed, yet it is not difficult to establish that early training, inherent desires, and current knowledge play a large part in the formulation of our intuitions, and the certainty and authority with which we utter them is no guarantee of their validity.

Method of Science or Reflective Inquiry

It is the fourth method of arriving at truth, the method of science or reflective inquiry, which is the essence of my theme. Scientific method has been so often described that it may seem unnecessary to elaborate its content and its form, but there are certain aspects of it which in

relation to Harvey's work need elaboration if his contribution to the stream of human thought is to be properly assessed. It is customary to describe three main stages in arriving at a scientific truth. First, there is the observation of significant facts; secondly, a hypothesis is formulated which, if true, would account for the facts; and thirdly, from the hypothesis are deduced consequences, whose validity can be tested by observation or experiment.

This is, I suggest, an over-simplification. The first stage of most discoveries is the chance observation, which in not a few instances has been associated with the false assumption. From the time that King Hiero asked Archimedes to test his suspicion that his artificers were alloying gold with silver in his crown, and Archimedes, by chance, noticed that in his bath he displaced water equal to the volume of his body and realized at once that, weight for weight, the lighter alloy would displace more water than the heavier gold, to Fleming's observation on *Penicillium notatum*, the path of the history of science is strewn with the fruits of accidental observations.

But we must not forget with Pasteur that "chance only visits the mind that is prepared." The chance observation lights the spark only in the mind of the receptive, and he responds by a tentative, a very tentative, hypothesis or hypotheses which lead him to seek *significant* facts, by observation or experiment. The operative word is "significant." There must be critical discrimination in the selection of apposite data; there must be lack of bias, and face value must not mislead. It is a mark of scientific ability to be able to distinguish the significant facts and to know where and how they may be found. In other words, "observation of significant facts" is not uncontrolled observation, but observation with a purpose. Meandering aimlessly and unguided in the realm of nature is rarely a profitable pursuit. When the significant facts are assembled possible explanations are formulated; an attempt is made to produce order out of chaos; for science is interested in systems and classes, in generalizations.

It is here that formal logic plays its part. But formal logic is not scientific method. It is an instrument which demonstrates to us that if certain propositions are true others also are true, but logic does not establish the truth of our initial premises. Formal logic aids us in devising ways of formulating hypotheses explicitly and accurately. If alternative hypotheses are available logic helps us in the next stage of our scientific method; it helps us to develop the consequences of these alternative hypotheses so that when compared with other observable phenomena we can test which hypothesis is in harmony with the observed facts.

To summarize, the stages in the method of science as exemplified by its history are: (i) the chance observation; (ii) the immediate reactive hypothesis; (iii) the search for significant facts which confirm or refute the initial hypothesis or (iv) lead to further hypotheses (induction), which can (v) be tested by observation and experiment (deduction).

It is perhaps necessary to re-emphasize, for those who hold the Baconian view that the mere orderly arrangement of data would make the right hypothesis obvious, that at each stage of scientific inquiry ability (it may be intuition) often amounting to genius is indispensable. As Butterfield (1949) has observed: "Of all forms of mental activity the most difficult to induce, even in the minds of the young who may be presumed not to have lost their flexibility, is the art of handling the same bundle of data as before, but placing them in a new system of relations with one another, by giving them a different framework, all of which virtually means putting on a different kind of thinking-cap for the moment." But any logically trained mind, once the sequence is pointed out, must of necessity accept the conclusion or question the accuracy of the observations or the validity of the logical processes which led to the hypothesis.

The Galenic Doctrine

Let us within this scheme of belief consider the contribution which Harvey made to the knowledge of the heart and blood vessels. Until his day, and indeed for many years after in places where the methods of tenacity and authority held sway, the universal teaching was the Galenic doctrine. This regarded the heart as a source of heat, an innate God-given property persisting from the beginning to the end of life. Food particles passed from the gut by the portal vein to the liver, where a crude blood of base nutritive quality (said to be endowed with "natural spirit") was manufactured and, passing to the right side of the heart, was sent by flow and ebb to irrigate the tissues and organs. Diastole of heart and veins occurred at the same time. The "natural spirit" flowed (*a*) through the venae cavae to all the tissues and (*b*) through the artery-like vein (what we now call the pulmonary artery) to the lungs, for their nutrition; and (*c*) through invisible pores of the ventricular septum to the left side of the heart. The left heart received also air direct from the trachea and bronchi and through skin and tissues, which not only cooled the innate heat of the heart but by mixing with the blood seeping through from the right heart gave rise to the "vital spirit" which was conveyed again by ebb and flow, with synchronous diastole of heart and arteries, to the tissues, endowing them with their "vital" functions.

In the process of forming "vital spirit," attributed to a fermentative activity, fuliginous vapours arose which were carried to the lungs and tissues for excretion. The brain had its special function: from the arterial blood which is received it distilled off the "animal spirit" (the breath of the soul), which was carried along nerves for movement and sensation.

Galen's Critics

The Galenic view had its critics even before Harvey's day. That air passed direct from lungs to heart had been doubted by Leonardo da Vinci, who found it impossible to pump air into the heart through the trachea and bronchi. Vesalius, as we earlier saw, had been unable to demonstrate the septal pores. Michael Servetus had published in 1553 an earlier written work, *Restitutio Christianismi*, in which he inferred that the passage of blood from right ventricle to left "does not, as is generally believed, take place through the median wall septum of the heart, but by a signal artifice the subtle blood is driven by a long passage through the lungs." He then repeats the Galenic view that "it is mixed with the inspired air, and by expiration is cleansed from its fumes. And so at length it is drawn in a complete mixture, by the left ventricle through the diastole, stuff fit to become the vital spirit." His reasons for accepting the lesser or pulmonary circulation merit recall. He writes: "This view is confirmed by the conspicuous size of the artery-like vein which would not have been made so large and so stout, and would not discharge from the heart itself such a power of very pure blood into the lungs, for the mere purpose of nourishing these organs. Nor would the heart serve the lungs in this manner, especially since at an earlier date in the embryo on account of

the little membranes of the heart, the lungs themselves are up to the hour of birth nourished from other sources, as Galen teaches."

Columbus, too, had in 1559, in the work to which I earlier referred, rejected the view that blood passed from right to left ventricle through the septum, and he enunciated the pulmonary circuit. But he was a proved plagiarist in that he falsely claimed to have discovered the stapes which from Fallopius we know to have been earlier described by John Phillip Ingrassias, of Palermo; and he may well have seen a copy of the *Restitutio* of Servetus and claimed the discovery as his own.

It was Andreas Caesalpinus, professor of medicine at Pisa, great both as scholar and as disputant, who came closest to Harveian views in his opposition to Galen, and he incorporated his conclusions in two books. In the first, *Quaestiones Peripateticae,* published in 1571, he states, from a study of the valves of the heart and their directional opening and closing, that the heart in systole propels blood into the aorta and pulmonary artery, and in diastole receives blood from the venae cavae and pulmonary vein. And again, in his *Quaestiones Medicae* in 1593, he appears to have recognized that blood flows from arteries to veins, and along the veins to the heart. He noted also that veins when ligated swell on the far side—"a fact well known by experience to those who let blood"—and he recognized that this was in opposition to Galenic teaching. But, though Caesalpinus clearly formulated the pulmonary circulation and groped after a systemic circulation, he was making assertions unsupported by careful observation or experiment; and his views did not influence the teachings of his contemporaries.

Harvey in Padua

Whatever contributions da Vinci, Vesalius, Servetus, Columbus, Caesalpinus, and even Fabricius may have made to the idea of the circulation of the blood, they are insignificant when compared with Harvey's. He stands alone by virtue of his *methods* rather than by his *discovery,* great as were to be the repercussions of that discovery on the growth of scientific medicine.

But, given that he was a man of genius, how was his mind prepared for the rich harvest it was later to yield? The field was ploughed and the seeds first sown in the University of Padua, which as late as 1670 was described as "the Imperial University for Physic of all others in the world." It played an impressive part in freeing Harvey's mind, for of all European universities it was the least shackled in the fetters of authoritarianism. It had fallen under the rule of Venice in 1404, and Venice was at that time and for long after the most anticlerical State in Europe. Experimental and quantitative methods of investigation were there early introduced into the physical and biological sciences, and it is not surprising that in a university so highly secularized as Padua doubts were early harboured about the part which final causes play in natural philosophy. The question "How?" assumed greater importance than "Why?"; and the answer to "How?" in a university which sheltered Copernicus and Galileo at important periods of their lives had naturally a large mechanical bias. Thus it was that Harvey, in contrast to his predecessors and indeed contemporaries, professed both to learn and to teach anatomy, not from "books but from dissections; not from the positions of philosophers but from the fabric of nature"; and for him the heart "is in a piece of machinery in which, though one wheel gives movement to another, yet all the wheels seem to move simultaneously."

That Harvey should turn to the heart for his major interest can occasion no surprise. The pulse and breathing were problems of movement in living organisms suggested by the kinetics of matter which he had heard discussed at Padua. Moreover, with Aristotle, he regarded (as he writes in his introduction to *De Motu Cordis*) "the heart of animals as the foundation of their life, the sovereign of everything within them, the sun of their microcosm, that upon which all growth depends, from which all power proceeds." I suspect that this panegyric was influenced, however, by the need for an appropriate analogy with which to dedicate his work to his patient and monarch, that "most illustrious and indomitable prince, Charles, King of Great Britain, France, and Ireland, Defender of the Faith."

Whilst Harvey was in residence in Padua, Fabricius, his master and friend, was perfecting his knowledge of the valves of the veins which he was to record in 1603 in the small treatise *De Venarum Ostiolis.* This must have excited Harvey's interest, though there is nothing to show that he appreciated at that time the significance of the direction of the orifices of these valves or that he rejected Fabricius's interpretation of their function on the basis of Galenic doctrine—namely, that they were there to slow the flow and check the accumulation of large quantities of blood at the periphery.

Harvey's predecessors had known that when veins were cut or ligated blood flowed out of them in the direction of the heart, but so attached were they to Galenic doctrine that they explained it as "blood behaving irregularly when tortured by such experiments, rushing off in the wrong direction like a fluttering, frightened hen." Osler quotes Boyle as saying that in the only conversation he ever had with him Harvey acknowledged that a study of the valves of the veins had led him to the discovery of the circulation of the blood. Yet I suspect that a chance observation was the spark which set alight the conflagration which consumed Galenic doctrine, an observation to which no author seems hitherto to have drawn attention.

In order to demonstrate that the arteries were filled with blood and not air, as Erasistratus had maintained in naming them, Galen had carried out a simple experiment. "If you include a portion of the artery between two ligatures," he wrote, "and slit it open lengthways, you will find nothing but blood"; and, as Harvey comments, "thus he proves that the arteries contain blood only." But Harvey went further: "We too may be permitted to proceed by a like train of reasoning: if we find the same blood in the arteries as in the veins, after having tied them in the same way, as I have myself repeatedly ascertained, both in the dead body and in living animals, we may fairly conclude that the arteries contain the *same blood as the veins, and nothing but the same blood.*"

Is it not likely that this observation started a train of reasoning in Harvey's mind? He had been tutored in the Galenic teaching that the veins are filled with a crude blood containing "natural spirit" and the arteries with a lighter blood replete with "vital spirit"; yet Harvey believed that the blood he saw in the arteries and veins was the *same*—an inaccurate observation when critically assessed, but surely the most probable source of the inference that, since the blood is the same, there must be continuity or communication between arteries and veins. With this in mind Harvey then sought for significant facts, but before so doing he disposed of certain hypotheses by revealing their inconsistencies with known facts; indeed, the introduction to *De Motu Cordis* is a model critical review of past work. There is no doubt that in Harvey's mind the

idea of the circulation was formulated early, for in his notes to his Lumleian Lectures at the College of Physicians in April, 1616, he writes of it in a curious mixture of Latin and English:

"constat per fabricam cordis sanguinem per pulmones in Aortam perpetuo transferri, as by two clacks of a water bellows to rayse water constat per ligaturam transitum sanguinis ab arteriis ad venas unde perpetuum sanguinis motum in circulo fieri pulsu cordis." ("It is proved through the structure of the heart that blood is constantly transferred through the lungs into the aorta, as by two clacks of a water bellows to raise water. It is proved by ligatures that blood passes from arteries to veins whereby the heart's beat produces a perpetual motion of blood in a circle.")

Mechanics of the Heart

With the bare idea of a circulation in his mind he sought for significant facts, but he sought them in relation to a significant question, which merely to ask, let alone to answer, was a remarkable innovation, for in the true spirit of science he isolated from a mass of irrelevant considerations the one which was amenable to scientific treatment—namely, the mechanics of the heart. His predecessors had asked, "Why?" about the heart and concerned themselves with "heat, spirit, and perfection," which, as Harvey rightly said, must be "decided upon other grounds." Harvey asked, "How?" and only occasionally did he deviate from this question.

The first task of the scientist is to find how he may make his most significant observations, and what material is best suited for his task—a point illustrated in recent years, for example, by the use of the giant axon of the squid in experiments on nerve conduction, and by T. H. Morgan in selecting the fruit-fly, *Drosophila,* for his genetic studies because of its rapid reproduction and its clearly defined chromosomes. Now, Harvey writes:

"When I first gave my mind to vivisections, as a means to discovering the motions and uses of the heart, and sought to discover these from actual inspection, and not from the writings of others, I found the task so truly arduous, so full of difficulties, that I was almost tempted to think, with Fracastorius, that the motion of the heart was only to be comprehended by God. *For I could neither rightly perceive at first when the systole and when the diastole took place, nor when and where dilatation and contraction occurred, by reason of the rapidity of the motion, which in many animals is accomplished in the twinkling of an eye, coming and going like a flash of lightning;* so that the systole presented itself to me now from this point, now from that; the diastole the same; and then everything was reversed, the motions occurring, as it seemed, variously and confusedly together. My mind was therefore greatly unsettled, nor did I know what I should myself conclude, nor what believe from others. I was not surprised that Andreas Laurentius should have written that the motion of the heart was as perplexing as the flux and reflux of Euripus had appeared to Aristotle."

But Harvey was not defeated, and he found his suitable material in cold-blooded animals with slowly beating hearts and in the dying warm-blooded animal when the heart begins to flag.

Harvey's Test of his Views

Between the crude formulation of his hypothesis and the publication of his *De Motu Cordis* Harvey was engaged in collecting data from human anatomy (for he held that design indicated function), from comparative anatomy, from embryology, from animal experiments, and from clinical observations which would test his views. Only a few examples can be quoted, but especially significant are his observations on the structure of the valves of the veins and on the arrangement of the circular and longitudinal fibres of the heart; on his condemnation of those who "confine their researches to the human body alone, and that when it is dead," and who "upon the ground of one particular proposition should proceed to draw general conclusions." So he turned to comparative anatomy and embryology, and thus he argues from the fishes with a single ventricle and no lungs, through amphibians with lungs and a single ventricle, and the human foetus with its unidirectional foramen ovale and ductus arteriosus, leading to the probability that in warm-blooded animals the passage from vena cava to aorta is accomplished through the substance of the lungs.

His experiments included the application of ligatures in the living animal, perfusions, and experimental observations on man, including those illustrated in *De Motu Cordis* which revealed with certainty the centripetal one-way flow of blood in the veins and the absolute bar afforded by the valves to a peripheral venous reflux. His clinical observations were accurate (for example, he knew of the insensitivity of the heart muscle to pricking and pinching), and they were apposite to his thesis. He denied that the arterial wall itself originated the pulse, because false aneurysms pulsated though they had no arterial covering, and because blood spurts in regular jets out of even the calcified artery, whose rigid wall prevents pulsation. He calls in evidence of the circulation the general spread in the body of "contagions, poisons from wounds, bites of serpents and rabid animals, lues venerea, and the like" even though "the part first infected remains sound." Indeed, so clear are his observations and so cogent his reasoning that I would insist on every medical student having *De Motu Cordis* as a set book for his preclinical studies.

Quantitative Considerations

But there is yet another form of argument which Harvey introduces, as Singer (1928) emphasizes, for the first time in biological literature; that is, the *quantitative* considerations which would be expected to flow from the Galenical theory.

"Let us assume," writes Harvey, "whether arbitrarily or from experiment, the quantity of blood which the left ventricle of the heart will contain when distended to be, say, two ounces, three ounces, or one ounce and a half—in the dead body I have found it to hold upwards of two ounces. Let us assume further, how much less the heart will hold in the contracted than in the dilated state; and how much blood it will project into the aorta upon each contraction—and all the world allows that with the systole something is always projected, a necessary consequence demonstrated in the third chapter, and obvious from the structure of the valves; and let us suppose as approaching the truth that the fourth, or fifth, or sixth, or even the eighth part of its charge is thrown into the artery at each contraction; this would give either half an ounce, or three drachms, or one drachm of blood as propelled by the heart at each pulse into the aorta; which quantity, by reason of the valves at the root of the vessel, can by no means return into the ventricle. Now in the course of half an hour, the heart will have made more than one thousand beats, in some as many as two, three, and even four thousand. Multiplying the number of drachms propelled by the number of pulses, we shall have either one thousand half ounces, or one thousand times three drachms, or a like proportional quantity of blood, according to the amount which we assume as propelled with each stroke of the heart, sent from this organ into the artery; *a larger quantity in every case than is contained in the whole body!* In the same way, in the sheep or dog, say that but a single scruple of blood passes with each stroke of the heart, in one half-hour we should have one thousand scruples, or about three pounds and a half of blood injected into the aorta; but the body of neither animal contains above four pounds of blood, a fact which I have myself ascertained in the case of the sheep.

"Upon this supposition, therefore, assumed merely as a ground for reasoning, we see the whole mass of blood passing

through the heart, from the veins to the arteries, and in like manner through the lungs.

"But let it be said that this does not take place in half an hour, but in an hour, or even in a day; any way it is still manifest that *more blood passes through the heart in consequence of its action, than can either be supplied by the whole of the ingesta, or than can be contained in the veins at the same moment.*"

And so by advocacy, cogent and unassailable, we too must conclude with Harvey that:

"Since all things, both argument and ocular demonstration, show that the blood passes through the lungs and heart by the force of the ventricles, and is sent for distribution to all parts of the body, where it makes its way into the veins and porosities of the flesh, and then flows by the veins from the circumference on every side to the centre, from the lesser to the greater veins, and is by them finally discharged into the vena cava and right auricle of the heart, and this in such a quantity or in such a flux and reflux thither by the arteries, hither by the veins, as cannot possibly be supplied by the ingesta, and is much greater than can be required for mere purposes of nutrition; it is absolutely necessary to conclude that the blood in the animal body is impelled in a circle, and is in a state of ceaseless motion; that this is the act or function which the heart performs by means of its pulse; and that it is the sole and only end of the motion and contraction of the heart."

Passages from Arteries to Veins

Yet there was a missing link in Harvey's demonstration—the channels of communication between arteries and veins, which were to be revealed by Malpighi in 1661. With the aid of his microscope he was to see the capillaries of the frog's lung. But in retrospect it seems strange to us that *Harvey did not himself perform a simple yet crucial perfusion experiment to show that the passages from arteries to veins are direct and continuous.* He was not unacquainted with the technique of perfusion, and had used it to demonstrate that water injected into the pulmonary artery passes into the left ventricle. In a letter to Paul Marquand Slegel, dated "London, this 26th of March, 1651," Harvey, then over 70 and racked with gout, relates yet another experiment devised to demonstrate the pulmonary circulation.

"Having tied the pulmonary artery, the pulmonary veins, and the aorta, in the body of a man who had been hanged, and then opened the left ventricle of the heart, we passed a tube through the vena cava into the right ventricle of the heart, and having at the same time attached an ox's bladder to the tube, in the same way as a clyster-bag is usually made, we filled it nearly full of warm water and forcibly injected the fluid into the heart, so that the greater part of a pound of water was thrown into the right auricle and ventricle. The result was that the right ventricle and auricle were enormously distended, but not a drop of water or of blood made its escape through the orifice in the left ventricle. The ligatures having been undone, the same tube was passed into the pulmonary artery and, a tight ligature having been put round it to prevent any reflux into the right ventricle, the water in the bladder was now pushed towards the lungs, upon which a torrent of the fluid, mixed with a quantity of blood, immediately gushed forth from the perforation in the left ventricle; so that a quantity of water, equal to that which was pressed from the bladder into the lungs at each effort, instantly escaped by the perforation mentioned. You may try this experiment as often as you please: the result you will still find to be as I have stated it."

The last sentence makes it clear that Harvey was well aware that consistent uniform results must ensue if the experiment is valid for scientific induction.

There are errors, many errors, in both observation and interpretation in *De Motu Cordis*, and as a speculator on ultimate causes Harvey was not far removed from his physiological predecessors for two thousand years (see Curtis, 1915). These do not detract from Michael Foster's (1901) appraisement of this work. "His wonderful book," wrote Foster in his *History of Physiology*, "or rather tract, for it is little more, is one sustained and condensed argument, but an argument founded not on general principles and analogies but on the results of repeated 'frequent appeals to vivisection' and ocular inspection. He makes good one position, and having done that advances on to another, and so marches victoriously from position to position until the whole truth is put clearly before the reader, and all that remains is to drive the truth home by further striking illustrations."

But I would suggest that Harvey's book did more than achieve its *scientific* purpose. It attacked and laid bare the shallowness of the conventional mind; it pressed for the acceptance of rational truth even if the apparent foundations of revelation and authority be undermined in the process. If man is a reasoning being, it taught, he must pursue his findings wheresoever they lead him in order, as Harvey himself avowed, that "what is true may be confirmed, and what is false set right by dissection, multiplied experience and accurate observation." If I am to describe the mind of Harvey I can do no better than borrow the words of one of Harvey's patients, Francis Bacon, of whom Harvey had cynically remarked that "he wrote philosophy like a Lord Chancellor," and who, in his *Proemium*, thus flatteringly describes himself—"A mind nimble and versatile enough to catch the resemblance of things, which is the chief point, and at the same time, steady enough to fix and distinguish their subtle differences; . . . endowed by nature with the desire to seek, the patience to doubt, fondness to meditate, slowness to assert, readiness to reconsider, carefulness to dispose and set in order; and neither affecting what is new nor admiring what is old, and hating every kind of imposture."

Conclusion

In the turmoil in which we who spend most of our days and nights in practising and teaching medicine and in trying to fashion its future there is a great need for the refreshing, calming, and cultural diversion of the literature and scholarship of our calling. The time which we can devote to reading, research, and meditation becomes less as the complexity of our lives increases. Yet there is nothing, even in the demands of our many-sided vocation, that compels us to abate our interest in our ancient masters, and especially in the workings of their minds. I have taken advantage of the opportunity which this occasion offers to express opinions and formulate judgments upon a historical and philosophical theme. I pray my critics will in justice remember, what I shall certainly not forget, that these are necessarily the work not of an expert but of an amateur

BIBLIOGRAPHY

(In the pasages quoted from the works here listed there are no italics in the originals.)

Butterfield, Herbert (1949). *The Origins of Modern Science*. Bell, London.
Cohen, Morris R., and Nagel, E. (1934). *An Introduction to Logic and Scientific Method*. Harcourt, Brace, and Co., New York.
Curtis, J. G. (1915). *Harvey's Views on the Use of the Circulation of the Blood*. Columbia Univ. Press, New York.
Foster, Sir Michael (1901). *Lectures on the History of Physiology*. Cambridge Univ. Press.
Harvey, William, *On the Motion of the Heart and Blood in Animals*, translated by Willis (1889). Bell, London.
Power, D'Arcy (1897). *William Harvey*. Unwin, London.
Singer, Charles (1928). *A Short History of Medicine*. Clarendon Press, Oxford.
Trotter, Wilfred (1932). *British Medical Journal*, **1**, 317.
Wolf, A. (1928). *Essentials of Scientific Method*. Allen and Unwin, London.

MILD CUSHING'S SYNDROME DUE TO ASPIRIN

BY

J. B. COCHRAN, M.B., B.Sc., F.R.F.P.S., M.R.C.P.

R. D. WATSON, B.Sc.

AND

J. REID, M.D., M.R.C.P.

(From the Clinical Chemotherapeutic Research Unit of the Medical Research Council in the Gardiner Institute of Medicine, University of Glasgow)

Since Hench, Kendall, Slocumb, and Polley (1949) first reported the results of treating rheumatoid arthritis with 17-hydroxy-11-dehydrocorticosterone ("compound E," or cortisone) disturbing side-effects have been observed following prolonged treatment which suggest the development of a mild Cushing's syndrome. The effects which have been recorded are rounding of the facial contours, hirsutism, acne, dorsal fat pad, glycosuria and diminished glucose tolerance, sodium retention leading to oedema, alkalosis, hypertension, and alteration of psyche. Hench and his colleagues (1950) state that there is no characteristic pattern for the development of side-effects. In their series of 23 rheumatoid patients treated with cortisone or A.C.T.H. the commonest side-effects were mild and occurred in eight patients. The effects noted in these cases were "mild acne, mild hirsutism, rounding of the face, and mild irritability." According to Baehr and Soffer (1950) side-effects occur more often during the treatment of acute conditions such as disseminated lupus erythematosus than in rheumatoid arthritis.

The metabolic effects of cortisone as summarized by Carlisle (1950) are retention of sodium and water early in the course of treatment, especially on high dosage, followed by spontaneous diuresis on continued administration of the hormone or after its discontinuation. High dosage has caused increased excretion of potassium with metabolic alkalosis in some cases, and the continued administration of large doses usually produces a negative nitrogen balance. Carlisle, in describing the clinical effects of cortisone in acute rheumatic fever, states that, in addition to the beneficial effects on arthritis, pyrexia is abolished in one to four and a half days, tachycardia in three and a half to five days, and in some cases a bradycardia follows; the E.S.R. becomes normal within 12 to 18 days; haemoglobin value increases by as much as 2.4 g. within three weeks in patients in whom the pretreatment levels are low; and in almost every instance cortisone causes a slight increase in the values for serum albumin and a reduction in the values for serum globulin.

The following report is of a patient suffering from a third attack of acute rheumatic fever who under treatment with aspirin developed signs of a mild Cushing's syndrome, which disappeared as the acute attack subsided and aspirin dosage was reduced. The clinical and metabolic effects observed during aspirin therapy resemble closely those attributed to cortisone.

Case Report

A girl aged 13 was admitted to hospital on September 29, 1950, suffering from an acute attack of rheumatic fever of one week's duration. This was her third attack, and the clinical findings on admission included severe general prostration, pyrexia (104° F.—40° C.), tachycardia (120 a minute), rapid respiratory rate (44 a minute), a dry coated tongue, and a dry warm skin. The heart was grossly enlarged, the apex beat being distinctly palpable on the anterior axillary line. Apical systolic and diastolic murmurs were present and the veins of the neck were overfilled, though there was no peripheral oedema or hepatic enlargement. The lower lobe of the left lung was collapsed. An electrocardiogram suggested pericarditis, and a portable *x*-ray film of the chest showed the cardiac outline of mitral valvular disease. The collapse of the left lower lobe was probably due to pericardial effusion and cardiac dilatation. The other clinical features were acute arthritis of the joints of the second and third fingers of both hands, both wrists, and the right elbow.

The patient was given a standard diet, and on September 30 administration of a dihydroxybenzoate in doses of 1 g. daily was started, and was continued for four days. This substance is at present under test, and will be reported on later. The acute arthritis disappeared within 24 hours, the temperature and rapid respiratory rates began to fall, but there was only a slight drop in the pulse rate. Improvement was thought to be too slow, so it was decided to change to aspirin treatment on October 4. Aspirin was given in doses of 1 g. five times daily, and the temperature, pulse, and respiratory rates continued to fall.

On the second day of aspirin treatment the face appeared to have become rounded and it looked "puffy," although there was no pitting on pressure. During the next 10 days the pulse and respiratory rates slowly settled and the temperature remained about 98–99° F. (36.7–37.2° C.). On October 17, 13 days after the start of aspirin treatment, acne was observed on the front of the chest and along the hair margin of the forehead. It later spread to the shoulders and back. A specimen of urine was found at this time to reduce Benedict's solution, producing a yellowish deposit. On account of a possible salicylate fallacy, a fermentation test with controls was set up; this showed the abnormality to be a reducing sugar. It was noticed that for some days the patient had been extremely morose, would not respond to questions, and never smiled, and this demeanour seemed to be out of proportion to the malaise of her illness. She continued to improve under aspirin therapy, and on October 19 the dosage was reduced to 1 g. thrice daily. Next day the face looked a little less "puffy," and from this point cheek measurements, using special callipers, were recorded. By November 2 each cheek had shown a reduction in thickness of 1.5 mm. Aspirin dosage was further reduced to 1 g. twice daily on October 23, and to 1 g. daily on October 28 for a further four days. The rounding of the facial contours and acne gradually disappeared and she lost her surly demeanour.

A glucose tolerance test was carried out on the day after a reducing sugar was found in the urine. The blood sugar (Folin and Wu) showed a high fasting level (163 mg. per 100 ml.), rising during the following two hours well above the normal renal threshold, and the urine contained glucose. A sudden fall to levels below 130 mg. occurred at two and a half and three hours. The next day the fasting level was 147 mg. Further tests showed that glucose tolerance returned to normal as aspirin dosage was reduced (Fig. 1).

The effects of treatment on the E.S.R. (Westergren), haemoglobin level, temperature, pulse, and respiratory rates are shown in Fig. 2. The temperature reached normal limits within two days of beginning aspirin therapy, but the pulse rate fell more slowly and reached normal on the twelfth day. A few days later the patient developed a bradycardia, which lasted six days. The E.S.R. fell from an initial level of 82 mm. to 12 mm. an hour within three weeks of beginning aspirin treatment. Increase in haemoglobin value by 2.8 g. occurred within four weeks.

The results of fluid, chloride, and nitrogen balance studies are shown in Fig. 3. During the first 10 days of aspirin treatment water and chloride were retained and the output of nitrogen greatly exceeded intake. During the next 15 days the volume of urine relative to the fluid intake progressively increased, and this was accompanied by an increased output of chloride and a steady diminution in nitrogen output.

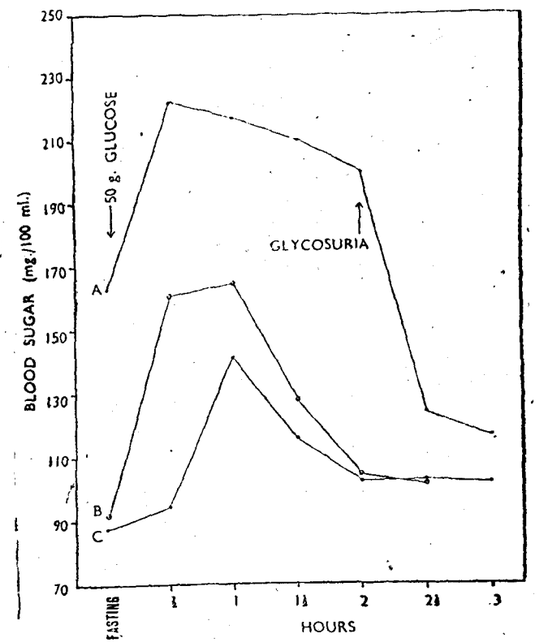


FIG. 1.—Glucose-tolerance curves after the ingestion of 50 g. of glucose following a 12-hour fast. Curve A was obtained at the height of aspirin therapy; curves B and C were obtained later, when aspirin was withdrawn.

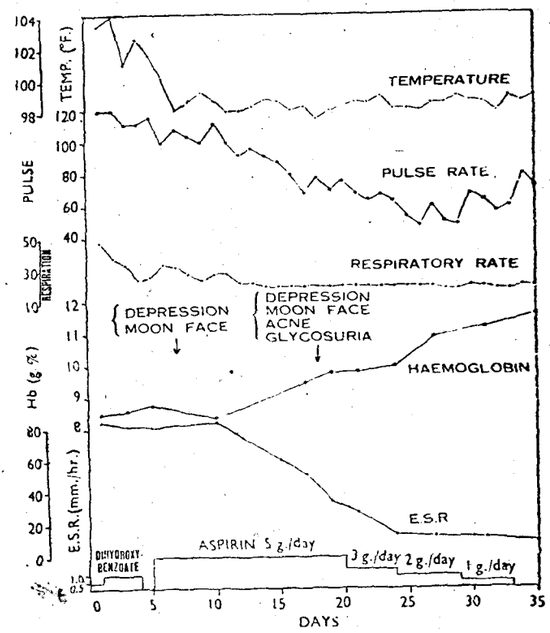


FIG. 2.—Effect of therapy on haemoglobin, E.S.R., temperature, pulse, and respiratory rates. The times of appearance of the side-effects suggesting Cushing's syndrome are indicated.

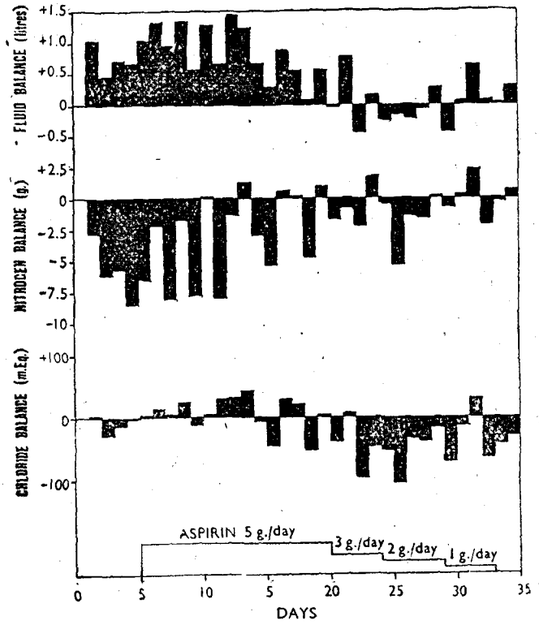


FIG. 3.—Effect of therapy on fluid, chloride, and nitrogen balance

During the course of treatment the albumin–globulin ratio fell to normal from its original reversed state. Serum albumin rose by 2.3 g. and globulin fell by 1.7 g. Plasma fibrinogen fell from its original high level of 0.77 g.% to 0.42 g.%.

Ketosteroid excretion (Tompsett and Oastler, 1946) was estimated daily from October 17 to 30 and showed no significant alteration. The daily output varied between 5.4 and 8.8 mg

Discussion

The clinical and metabolic effects of aspirin in this patient are identical with those previously reported (Reid, Watson, and Sproull, 1950). The effect of aspirin on pyrexia, tachycardia, E.S.R., and haemoglobin level compares favourably with that reported for cortisone. The two substances have the same effect on fluid, chloride, and nitrogen balance and on plasma protein. The similarity is further strengthened by the development under aspirin therapy of side-effects suggesting mild Cushing's syndrome.

If aspirin and cortisone have a similar action certain important considerations arise. Aspirin may stimulate the adrenal cortex to produce cortisone or may act in this way via the pituitary and the secretion of A.C.T.H.; or the two substances may have an identical peripheral action Aspirin and cortisone appear to differ in one respect. The former produces a respiratory alkalosis, while the latter causes a fixed base alkalosis. This discrepancy may be explained by the great difference in therapeutic dosage of the two substances. The comparatively large doses of salicylate lead to accumulation of the drug in the plasma. displacement of equivalent amounts of bicarbonate, and a raised plasma *p*H (Reid, Watson, and Sproull, 1950). As plasma *p*H depends on the ratio $H_2CO_3 : NaHCO_3$, any reduction in bicarbonate must be accompanied by an equivalent reduction in the concentrations of plasma H_2CO_3. This may be achieved by increasing alveolar volume, which lowers alveolar CO_2 concentration and

therefore plasma H_2CO_3. The clinical counterpart of this physiological adjustment is the slow deep breathing on salicylate administration.

It is realized that a single case has been cited as evidence of a possible common action of aspirin and cortisone, but on examination of our records of previous cases of acute rheumatism treated with sodium salicylate we find that frequent reference is made to puffiness of the face and acne-like lesions on the face, front of chest, and back. In fact, puffiness of the face may be observed in almost every patient receiving full therapeutic doses of salicylate, and it tends to be most pronounced in children. Most of these patients also had a reducing substance in the urine which was assumed to be a salicylate fallacy. However, addition of salicylic acid, sodium salicylate, and aspirin to normal urine in concentrations greater than we have ever encountered in the urine of patients under treatment failed to show any reduction of Benedict's solution. This does not exclude the presence of reducing substances other than glucose, but it may well be that the reductions previously observed were partly if not wholly due to glucose. These retrospective observations suggest that the development of mild Cushing's syndrome during intensive salicylate treatment is not uncommon, but there are many points requiring further investigation before any final conclusion may be drawn. Nevertheless, it is thought that this initial report is justified in view of the significance of the findings.

Summary

The clinical and metabolic effects of aspirin in the treatment of acute rheumatism resemble closely those attributed to cortisone.

A case is presented, and others referred to, in which the similarity in action of the two substances is further strengthened by the development under aspirin treatment of side-effects suggesting a mild Cushing's syndrome.

The effects observed were rounding of the facial contours, acne, diminished glucose tolerance, glycosuria, and alteration of the mental state.

Some important considerations arising out of this conception are discussed.

We thank Professor J. W. McNee for his advice and generous help in providing facilities for this work. We are also indebted to Mr. S. L. Rae for the ketosteroid estimations.

REFERENCES

Baehr, G., and Soffer, L. J. (1950). *Bull. N.Y. Acad. Med.*, **26**, 229.
Carlisle, J. M. (1950). *British Medical Journal*, **2**, 590.
Hench, P. S., Kendall, E. C., Slocumb, C. H., and Polley, H. F. (1949). *Proc. Mayo Clin.*, **24**, 181.
—— —— —— —— (1950). *Arch. intern. Med.*, **85**, 545.
Reid, J., Watson, R. D., and Sproull, D. H. (1950). *Quart. J. Med.*, **19**, 1.
Tompsett, S. L., and Oastler, E. G. (1946). *Glasg. med. J.*, **27**, 281.

The British Standards Institution has issued a British Standard for one-mark bulb pipettes. *Sixteen sizes of pipette from 1 ml.* to 100 ml. capacity are specified, being those most in demand for general laboratory use. Full dimensions are given, but, in accordance with current practice in British Standards for laboratory glassware, only the essential ones are listed as mandatory, the remainder being given for the guidance of manufacturers. Standard methods are included for the determination of capacity and delivery time, and tolerances listed for both. An appendix gives the sizes of glass tubing recommended for the manufacture of these pipettes. Copies of this standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1 (2s. post free). The Institution has also issued standards for hospital beds and other hospital equipment, and for paper boxes for pills, creams, powders, pastes, etc.

EVALUATION OF TREATMENT IN INTERMITTENT CLAUDICATION*

BY

J. T. SHEPHERD, M.B., M.Ch.

Lecturer in Physiology, Queen's University of Belfast

Arteriosclerosis is by far the commonest cause of intermittent claudication, and numerous drugs and operations have been advocated for the treatment of this condition. Any effective treatment must increase the distance a patient can walk, either by increasing the blood flow to the affected muscles or by reducing the pain which occurs on exercise.

Direct measurement of the distance a patient can walk is the common method of assessing treatment. This has two disadvantages. First, if improvement does occur it is impossible to say whether this is due to an increased blood flow to the muscles or to a pain-relieving action of the drug. Secondly, it does not allow the limbs to be tested separately. Often both legs are affected by the disease, but the earlier onset of pain in the more severely affected one may stop the patient walking before pain is felt on the other side.

An alternative method for evaluating treatment is described which does not suffer from these disadvantages.

Methods

The method employs an ergograph to determine the amount of work a patient can perform and a venous occlusion plethysmograph to enable the blood flow through the calf to be measured after the exercise.

The ergograph has already been briefly described (Shepherd, 1950). The patient, by depressing a footboard on plantar flexion, raises a weight. The footboard is so arranged that the axis of its movement passes through the ankle-joint (Goetz, 1942) and, as the leg is kept horizontal, with the knee flexed through an angle of about 60 degrees, the posterior calf muscles perform most of the work.

On the return stroke, as the ankle is dorsiflexed, the speed of the falling weight is controlled by a brake (Fig. 1). Alternate contraction and relaxation of the muscles is therefore possible, the posterior calf muscles being relaxed on dorsiflexion instead of having to resist the descent of the weight. This is important, because it leads to a large difference between the amount of work that can be done by the normal and the arteriosclerotic subject. The normal adult male of whatever build can make 500 contractions at a rate of 24 a minute and show no sign of fatigue or pain at the end. The number of contractions that can be made by arteriosclerotics with symptoms of claudication varies according to the severity of the disease, but even mild cases are generally forced to stop by pain and fatigue in the affected muscles before they have completed 200 contractions. The ergograph could also be adapted for testing the extensor muscles of the leg so that work is performed on dorsiflexion only. In practice this has never been done, as in all our patients pain on exercise was limited to the posterior calf muscles. The movement of the foot-board is transmitted to an indicator. A mark is placed on a scale behind the indicator, and by pushing to this mark the foot-board moves through an angle of 33 degrees and the subject lifts a 5.5-kg. weight a distance of 26 cm. By arranging

*This work was carried out during tenure of a British Medical Association scholarship.

the pointer of a metronome to move parallel to this indicator the subject, guided by the metronome, works at a constant rate. This allows accurate comparisons to be made.

Blood flows are recorded through the calf of the leg after exercise by means of a light celluloid plethysmograph (Shepherd, 1950) applied to the leg before exercise. Grant (1938) pointed out that any material departure from the resting forearm blood flow after local exercise can be attributed to a change in muscle circulation. It is probable that the same is true of the calf, and that recordings made after exercise represent mainly muscle blood flow. With the technique described, the first recording can be started within a second of the cessation of exercise

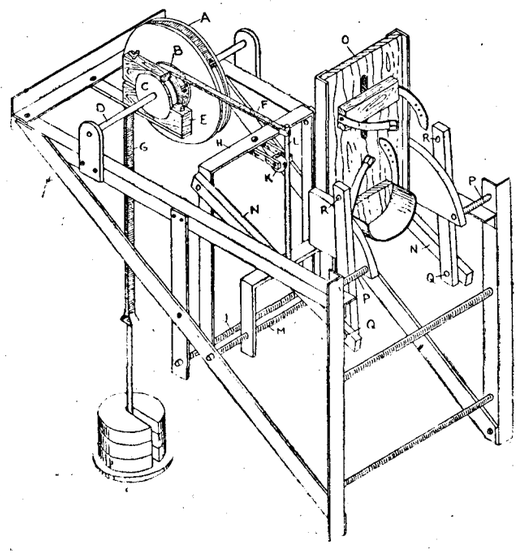


FIG. 1.—The ergograph. Framework made from light angle-iron and attached to the end of a couch so that the machine overhangs one end. Pulleys A, B, and C are mounted on axle D. Pulleys B and C are connected through a free-wheel device free from back-lash; A and B are permanently fastened together. A wooden block E encircles pulley C and the frictional force can be adjusted by means of two wing nuts. The brake-block is shown cut away to enable pulleys to be seen. The foot is strapped to the footplate O; the plate swings about the axles P. The footplate and attachments are counterbalanced by a weight not shown.

As the foot is plantar-flexed the connecting rods N move towards the right and pull lever H, which can swing about axle J, also towards the right. Roller K, attached to lever H, pushes to right a second lever L, swinging about axle M. A leather belt F, one end attached to lever L, passes round and is fastened to pulley B. As lever L moves to right the belt causes pulley B to rotate, and with it pulley A. Pulley C is kept stationary by means of the brake-block. A second belt G, one end attached to pulley A, carries a hanger on which the 5.5-kg. weight is placed. The rotation of A causes the weight to be raised.

On the return stroke, as the foot moves backwards and the weight falls, all three pulleys move together, the speed of the falling weight being controlled by the brake. This enables the foot to return to the dorsiflexed position without any force being exerted on it by the falling weight, since levers H and L can move independently

Results

Observation of the number of contractions that a subject can make on the ergograph, working at a rate of 24 contractions a minute, with the limb circulation both free and occluded, combined with a study of the calf blood flow after exercise, enables the deficiency of the circulation to the muscles to be assessed

In the occasional case in which the cause of the pain is in doubt this procedure may enable vascular deficiency to be ruled out. The following case is an example.

A man aged 49 complained of having had attacks of cramp in the left calf for two and a half years. He was able to make 500 contractions without pain or fatigue. The plethysmographic record showed normal pulsations. The immediate post-exercise flow was 23.2 ml. per 100 ml. calf a minute, and this was followed by a return to the resting level in two minutes. In addition, when exercise was carried out with the circulation occluded by a thigh cuff inflated to 200 mm. Hg. which was released just before the first post-exercise recording, the immediate flow was 33.4 ml., indicating that a considerable potential reserve was available (Fig. 2). This is a normal response to these tests.

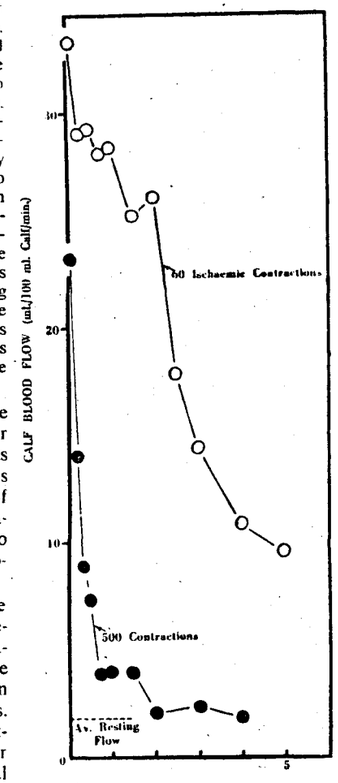


FIG. 2.—Patient aged 49. Normal pattern for the calf circulation. Normal pulsations on plethysmogram. 500 contractions of left calf without symptoms. Initial high flow with a rapid recovery to resting level. With 60 ischaemic contractions of left calf the immediate post-exercise flow is higher than with 500 normal contractions, indicating the potential reserve available.

The pattern of the calf blood flows after exercise in patients with arteriosclerosis and symptoms of intermittent claudication falls into two main groups (Shepherd, 1950).

Group A.—The plethysmographic record shows pulsations, but they are usually smaller than in normal subjects. The immediate post-exercise flow is lower than in the normal individual, and the flow subsequently declines very slowly to the resting level (Fig. 3). Ischaemic exercise carried on to claudication does not increase the post-exercise flow.

Group B.—The plethysmographic record shows either very small pulsations or none at all. The immediate post-exercise flow is much lower than in the normal subject, but instead of declining slowly to the resting level it gradually increases to a maximum some time after the cessation of the exercise and then declines to the resting level. The maximum level reached in these cases is invariably much less than the immediate post-exercise flow in normal individuals (Fig. 4). This pattern and the initial flow are unchanged if the exercise is carried out with the circulation arrested in the leg

Treatment of Intermittent Claudication with "Padutin"

Werle and Multhaupt (1937) found that the injection of padutin, an insulin-free pancreatic extract, caused an

increase in the skin temperature of the fingers. On the other hand, Abramson *et al.* (1941) found no change in the resting blood flow to the hand, leg, or forearm after the intramuscular injection of four biological units. Allen *et al.* (1946) state that the exact mechanism of relief of the pain of claudication by tissue extracts is not well understood, but that the extract seems to prevent in some way the chemical changes which produce pain in exercised ischaemic muscles.

In the present experiments the effect of padutin has been tested on eight male patients with arteriosclerosis whose ages ranged from 44 to 57 years, average 52. The primary complaint in all cases was intermittent claudication. None were diabetic, and the skin in all cases was healthy. The calf blood flow after exercise showed a Group A pattern in four, and a Group B pattern in four. Treatment lasted from 12 to 21 weeks, average 16.

The general routine was as follows. The patient made five visits before any treatment was started. On the first visit he practised on the ergograph in order to become familiar with the exercise, but no observations were made. At each of the following four visits the claudication index and the calf blood flow after exercise were measured. By claudication index is meant the number of contractions the patient could make before pain and fatigue in the affected muscles forced him to stop. Owing to the dependence of the claudication index on the determination of the subject, it was thought desirable to have four baseline observations.

The drug was given by weekly intramuscular injection: usually 1 ml. (three biological units) weekly for the first two weeks, then 2 ml. weekly until the last four weeks, when the dose was usually increased to 3 ml. In addition, the patient took the drug by mouth (10 biological units per ml.): 10 drops three times a day for the first two weeks, then 20 drops increased to 30 drops in the last four weeks. The claudication index and post-exercise calf blood flows were usually determined at weekly or occasionally fortnightly intervals throughout the period of treatment. Recordings were made about 15 minutes after the injection, but in some cases were also made before the injection was given, in order to rule out the possibility of the injection itself reducing the claudication index. No undesirable symptoms were reported.

In neither group was there any evidence that the drug relieved the claudication or increased the calf blood flow after exercise. Fig. 3 shows the post-exercise calf blood flow before and at the end of treatment in a patient with a Group A pattern. The pattern and the extent of the blood-flow response were unchanged and the average of the four determinations of the claudication index before treatment was not materially different from that at the end of treatment. Fig. 4 shows the post-exercise calf blood flow in a patient with a Group B pattern before and after treatment. The results of all the tests on this patient are shown in Fig. 5. It will be noted that there is no marked change in the calf blood flow or claudication index during the treatment.

It was often difficult to reconcile the patient's own assessment of changes in his condition with the objective measurements in the laboratory. Some patients thought they were improved about the middle of treatment, and two said that they could walk a mile whereas formerly they could walk only 200 yards. All, however, at the end of treatment felt there was no substantial improvement. Even during the time of alleged improvement the laboratory measurements showed no increase in claudication index or post-exercise blood flow.

All the patients smoked from 8 to 35 cigarettes a day, the average consumption being 20. Four ceased smoking for almost two months during treatment, with no important difference in their claudication index or their calf blood flow after exercise. Four patients, at one of their tests, smoked a cigarette and inhaled the smoke during exercise, with no change in the calf blood flow or the number of contractions carried out. In seven of these eight cases treated with padutin the circulation through the other calf was tested. Four showed a normal response, two a Group A response, and one a Group B response (Fig. 6).

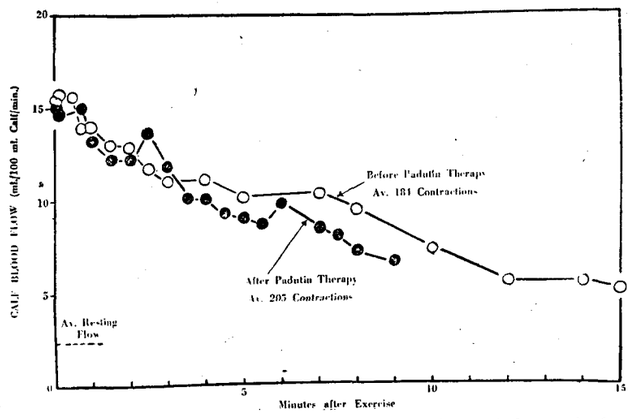


FIG. 3.—Group A pattern. Post exercise calf blood flow before and after 14 weeks' treatment with padutin in a patient aged 44. No change in blood flow and little alteration in number of contractions that can be made on the ergograph.

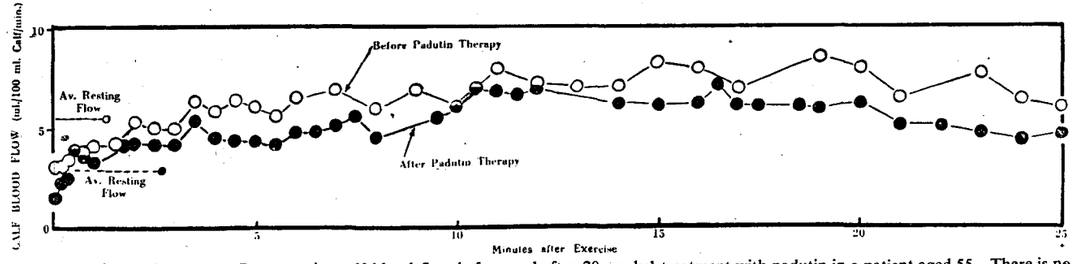


FIG. 4.—Group B pattern. Post-exercise calf blood flow before and after 20 weeks' treatment with padutin in a patient aged 55. There is no increase in blood flow as a result of treatment. Note that in this case the immediate post-exercise flows are lower than the average resting flows.

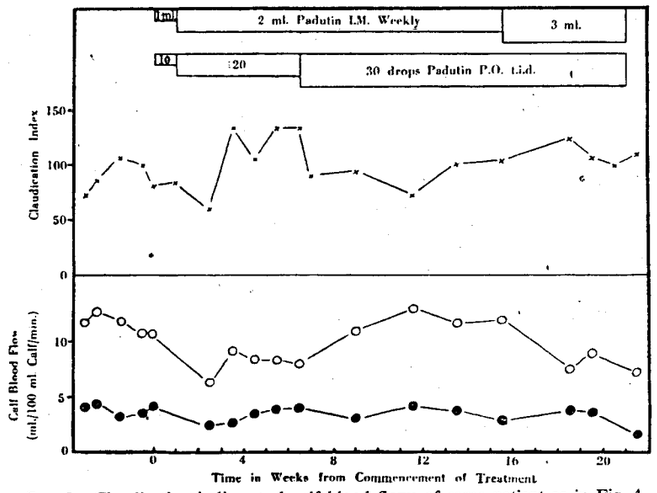


FIG. 5.—Claudication indices and calf blood flows of same patient as in Fig. 4. Black circles represent immediate flow after the exercise, and the open circles the maximum flow attained. The amount of padutin given is shown at the top of the figure. / This patient received the maximum dose for a longer period than the average.

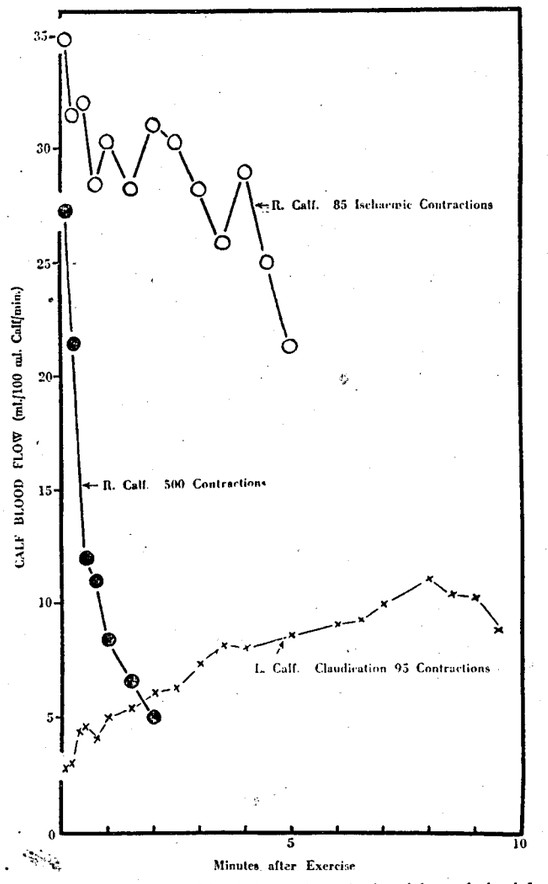


FIG. 6.—Post-exercise blood flows through the right and the left calf of same patient as in Figs. 4 and 5. Right calf shows a normal response, left calf a Group B response.

Prediction of the Effects of Sympathetic Neurectomy

In a series of 10 cases of arteriosclerosis with a healthy skin, whose primary complaint was claudication, an attempt was made to determine the effect of acute release of sympathetic control on the calf blood flow after exercise. Five of these cases had a Group A response to exercise, and five a Group B. Two methods were used. In the first the claudication index and the post-exercise calf blood flow were measured before and after heating the subject by wrapping him in blankets and immersing one arm in stirred water at 43° C. (Gibbon and Landis, 1932). Heating lasted one hour, unless the resting calf blood flow reached a steady maximum sooner. In the second method the claudication index and the calf blood flow after the exercise were first determined, and, after allowing one hour for recovery, the subject was asked to make the same number of contractions, during the last 18–24 of which 500 mg. of tetraethylammonium bromide (T.E.A.B.) (Acheson and Moe, 1945, 1946) was injected intravenously The calf blood flow was again determined immediately after the exercise. This procedure was used because of the brief action of T.E.A.B.

In four patients both these methods were used on separate occasions, in three T.E.A.B. only, and in three indirect heating only. In no case did either method increase the calf blood flow after the exercise, nor did indirect heating increase the claudication index.

Effects of Lumbar Sympathectomy

Eight cases have been examined before lumbar sympathectomy, including three from the series just described Four of these were in Group A and four in Group B. These patients also were non-diabetic and had healthy skins ; their primary complaint was of intermittent claudication. Five had one cold foot, but the skin temperature of the toes of this foot rose to 31.5–34.5° C. in response to indirect heating (Gibbon and Landis, 1932). The other three also showed a similar rise on the more affected side.

After lumbar sympathectomy there was in no case any conclusive evidence of improvement either in calf blood flow after exercise or in the claudication index. Fig. 7 shows, for example, the blood flow before and eight weeks after sympathectomy in a patient with a Group A response The blood flow was also determined at 5, 14, and 19 weeks after the operation, with similar results. The claudication index averaged 77 before and 79 after operation. A typical patient who showed a Group B response made 173, 120, 150, and 150 contractions 7, 8, 8½, and 9 weeks after the operation respectively, whereas his previous best was 140 contractions. There was no improvement in his calf blood flows in any post-operative test (Fig. 8). All these patients said that their exercise tolerance had not been improved by the operation.

Discussion

In order to assess any treatment of intermittent claudication it is desirable to study both the claudication index and the calf blood flow during exercise. The latter may bear no relation to the resting calf blood flow, so that the demonstration of an increase in resting calf flow is of no significance. The flow immediately after exercise is probably similar to that during the relaxation periods in exercise

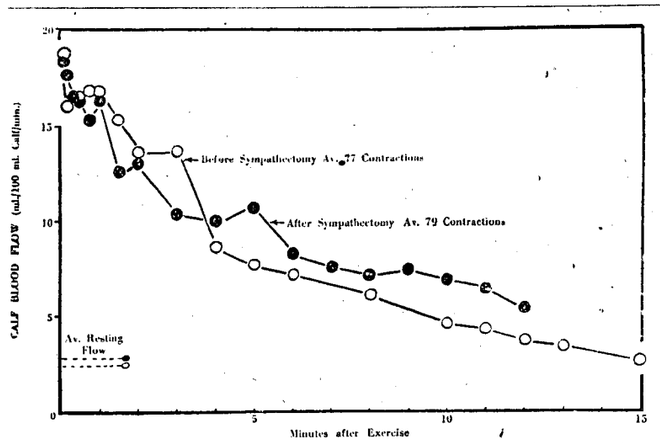


FIG. 7.—Group A pattern. Post-exercise calf blood flow before and eight weeks after removal of the first, second, and third lumbar ganglia in a patient aged 50. Similar flows were obtained 5, 14, and 19 weeks after operation. Skin temperature and skin resistance of foot after sympathectomy showed no change in response to indirect heating carried out by immersing the hand, forearm, and as much of the arm as possible in a stirred water-bath at 44° C. In view, however, of the findings of Boyd and Monro (1949) it is unlikely that all the vessels in the leg were completely denervated.

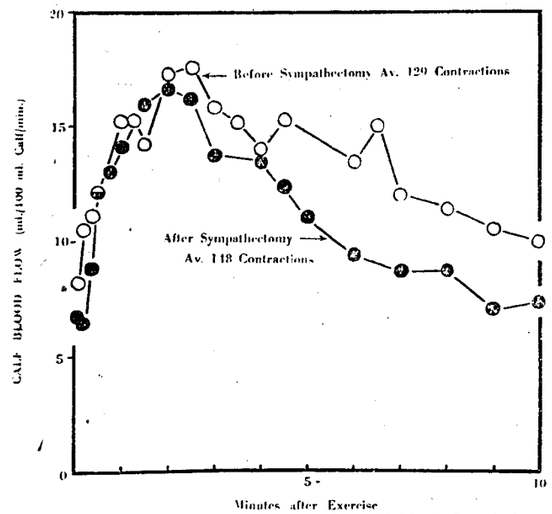


FIG. 8.—Group B pattern. Post-exercise calf blood flow before and eight weeks after sympathectomy in a patient aged 47. Similar flows were obtained seven and nine weeks after operation.

It is a much better, though still indirect, index of the blood flow during exercise than is the resting blood flow. It can also be determined simply and with precision. For these reasons its use is recommended, and it has been employed in this work. The ergograph does not, of course, exactly reproduce normal walking conditions, but it allows the blood flow to be measured after standardized exercise. To do this after walking involves some delay.

The values obtained for the claudication index were not constant for any one patient but varied somewhat on different occasions. In order to reduce these differences as much as possible it is essential for the subject to have a preliminary practice on the ergograph. After becoming familiar with the exercise his claudication index should be determined on at least four separate occasions. It is important to tell him to carry on until compelled to stop. The knee must be kept at the same angle throughout the series, because when it is more extended the subject is often able to perform many more contractions.

On pooling all results, 95% of the claudication indices and immediate post-exercise calf blood flows before treatment lay between 38% and 17% respectively above and below the mean for each individual. Any increase that was less than these values after treatment cannot be considered significant. The stage of the disease did not seem to affect the range of variation, in the same individual on different occasions, of either the claudication index or the immediate post-exercise blood flow. There was no evidence in any of the patients tested in the present series that padutin or lumbar sympathectomy caused a significant change in the claudication index or the immediate post-exercise calf blood flows.

The patients' own statements during treatment are occasionally misleading. They may, in an attempt to convince themselves that they are getting better, go further by walking more slowly, or overestimate the distance walked, or drive themselves further in spite of pain. For instance, four of the patients in the middle of their course of treatment with padutin said that their walking distance was increased, but their claudication index was found to be unchanged.

Since the condition may be progressive, the fact that the claudication index and the calf blood flow after exercise remained more or less unchanged during padutin treatment might indicate that this drug prevented a deterioration in the patient's condition. Before beginning treatment two of the patients were examined for four and six months respectively, during which time there was no deterioration in the calf blood flow after exercise. However, to obtain definite evidence on this point it would require two large groups, one acting as a control.

If during treatment there had been any definite evidence of improvement in the claudication index in these patients without a change in the calf blood flow following the exercise, it would have been necessary to control the results by treatment with a placebo in order to rule out the possibility of psychological improvement. As no improvement was found, this was not thought to be necessary.

The tests described with indirect heating and T.E.A.B may be useful in assessing whether sympathectomy can be expected to cause at least a temporary (Barcroft and Walker, 1949 ; Lynn and Barcroft, 1950) increase in the calf blood flow immediately after exercise. Three patients who had no increase of their post-exercise calf blood flow during heating or after T.E.A.B. also had no increase after sympathetic neurectomy.

Finally, these results deal only with claudication and the calf blood flow, not with the effect of padutin or sympathectomy on the temperature or circulation of the foot. All but one of the sympathectomized patients had a warm foot after the operation; and five of them felt that this made it worth while.

Summary

A method is described in which an ergograph and a light celluloid plethysmograph were used to measure the claudication index and the post-exercise blood flow through the calf.

The use of this method in the evaluation of treatment in intermittent claudication is discussed.

In eight cases of arteriosclerosis in which the primary complaint was intermittent claudication, padutin, administered both by mouth and by intramuscular injection over periods of 14–21 weeks, had no effect on the claudication index or the post-exercise blood flow through the calf.

Eight cases of arteriosclerosis with claudication examined before and at varying times after sympathetic neurectomy showed no evidence of improvement in the claudication index or the post-exercise blood flow through the calf.

I would like to thank Mr. E. J. Finnan, M.Sc., of the Department of Civil Engineering, Queen's University of Belfast, who designed and constructed the ergograph; also the patients, who willingly co-operated. I would also like to thank Messrs. Bayer Products, Ltd., for their co-operation and for the supplies of padutin.

REFERENCES

Abramson, D. I., Zazeela, H., and Schkloven, N. (1941). *Amer. Heart J.*, **21**, 756.
Acheson, G. H., and Moe, G. K. (1945). *J. Pharmacol.*, **84**, 189.
—— —— (1946). Ibid., **87**, 220.
Allen, E. V., Barker, N. W., and Hines, E. A., jun. (1946). *Peripheral Vascular Diseases*, p. 716. Saunders, Philadelphia.
Barcroft, H., and Walker, A. J. (1949). *Lancet*, **1**, 1035.
Boyd, J. D., and Monro, P. A. G. (1949). Ibid., **2**, 892.
Gibbon, J. H., jun., and Landis, E. M. (1932). *J. clin. Invest.*, **11**, 1019.
Goetz, R. H. (1942). *Amer. Heart J.*, **23**, 782.
Grant, R. T. (1938). *Clin. Sci.*, **3**, 157.
Lynn, R. B., and Barcroft, H. (1950). *Lancet*, **1**, 1105.
Shepherd, J. T. (1950). *Clin. Sci.*, **9**, 49.
Werle, E., and Multhaupt, G. (1937). *Münch. med. Wschr.*, **84**, 407.

INTRAMUSCULAR HEPARIN

BY

D. GORDON ABRAHAMS, M.A., M.D., M.R.C.P.
Senior Registrar, Institute of Cardiology, National Heart Hospital

It is generally considered that heparin is the most efficient and the safest anticoagulant in common clinical use. However, satisfactory therapy with this drug has hitherto necessitated frequent intravenous injections, which are irksome to both patient and doctor. Since heparin cannot be given by mouth, a method of administration which avoids the intravenous route and decreases the frequency of injections would have obvious advantages. Attempts to achieve this have been made in the past with various preparations of "depot" heparin, incorporated in Pitkin menstruum or other media. These have not proved completely successful.

A concentrated aqueous solution of heparin, 25,000 units per ml., for intramuscular injection has recently come on the market. This paper describes trials with this preparation carried out on 20 cases at the Institute of Cardiology.

Methods

All clotting times were determined by the method of Dale and Laidlaw (1911–12). Objections have been raised to this test, since it employs capillary blood. However, most authorities agree that all methods of estimating clotting time are unsatisfactory, and that techniques employing capillary blood are no more inaccurate than those in which venous blood is used. Moreover, the Dale and Laidlaw method is easy to carry out, gives an excellent end-point, and avoids the necessity for repeated venepuncture on the same patient. It was therefore admirably suited to the present type of study. The normal clotting time determined with this technique is two and a half to three minutes.

It was necessary to establish a criterion for adequate anticoagulation when using this method. This was done by injecting a standard dose of heparin intravenously into normal subjects and measuring by Dale and Laidlaw's method the extra time before clotting occurred.

Fig. 1 shows the average delay of clotting at ten-minute intervals in 16 normal subjects following the intravenous injection of a standard dose of heparin. The dose used was 100 units per kilogram body weight, and in a subject of average weight this amount approximates to a therapeutic dose. The shape of the curve in Fig. 1 should be particularly noted. The sharp rise following injection and the abrupt descent show that the drug is eliminated rapidly from the blood stream when given intravenously. After one hour the delay of clotting was two minutes. It was felt that a satisfactory blood level of heparin should exist for one hour after the intravenous injection of a therapeutic dose, and accordingly this was the criterion for adequate anticoagulation adopted in this work.

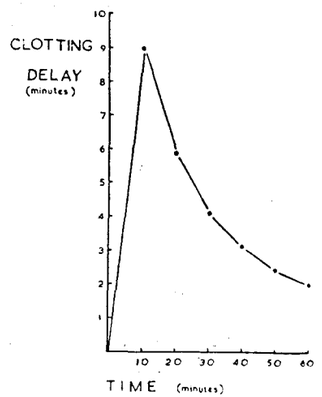


FIG. 1.—Average curve obtained in 16 normal subjects after an intravenous injection of 100 units of heparin per kg. body weight. Delay of clotting = actual clotting time minus control clotting time.

Results

The usual dose of heparin when given intravenously is about 30,000 units a day. It was reasonable to suppose that intramuscular injection would demand higher dosage, and trial and error showed that a single dose of 35,000 to 40,000 units given intramuscularly would delay clotting satisfactorily for twelve hours. The results obtained were extremely uniform, with only minor variations from patient to patient.

Fig. 2 shows the curves from two patients. After a single intramuscular injection of 37,500 units of heparin (1.5 ml. of solution) the delay of clotting has been plotted for twelve hours. Both these curves differ markedly from that obtained following intravenous injection (Fig. 1). With intramuscular injection, clotting is never considerably prolonged even in the initial stages, and the anticoagulant effect is very well maintained. This would seem to show that the drug is absorbed from muscle at a constant

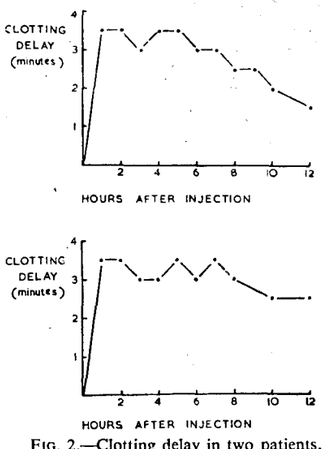


FIG. 2.—Clotting delay in two patients, followed for twelve hours after an intramuscular injection of 37,500 units of heparin.

rate. Even after twelve hours the delay of clotting is still adequate when judged by the criterion previously stated.

The problem of long-term anticoagulant therapy with intramuscular heparin was also studied in the same way.

Fig. 3 shows the dosage of heparin and the delay in clotting times in one patient over a period of four days. An initial dose of 37,500 units of heparin was given intramuscularly, followed by injections of 25,000 units (1 ml. of solution) twelve-hourly. The delay of clotting was satisfactory throughout and there was some indication that the dosage of heparin could be decreased after the initial stages. This was shown by the increase in the delay of clotting after the first two or three days. It therefore seems probable that either the dosage of heparin may be decreased after this time or the time interval between injections may be increased.

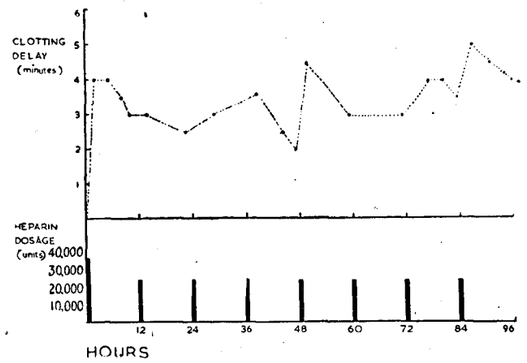


FIG. 3.—Long-term anticoagulant therapy with intramuscular heparin.

Discussion

There are some disadvantages to the intramuscular injection of heparin. It was at first found that the injection was attended in some patients by local pain. This, however, was satisfactorily overcome by the simultaneous injection of procaine : 1–1.5 ml. of a 1% solution of procaine should be given in the same syringe as the heparin. This has no effect on the action of the drug and considerably diminishes the pain.

The discomfort of the injection may also be ameliorated by injecting into the vastus lateralis muscle, and not into the buttock upon which the patient has to lie.

Very occasionally a haematoma may develop at the site of injection. This is not a common complication, and was encountered only twice during the course of this work. Bauer *et al.* (1950) reported five significant haematomata in a series of 41 patients treated with intramuscular heparin. These workers used large needles for the injection, presumably because of the consistence of their heparin solution. The heparin solution used in the present work was aqueous, and so this disadvantage was overcome. Indeed, a fine needle, 18–20 gauge, should be used, and not the ordinary intramuscular needle. In this way the possibility of trauma is reduced to a minimum, and haematomata can usually be avoided. Elaborate precautions are unnecessary when making the injection, but care should always be exercised.

Hitherto, treatment with anticoagulant drugs has almost invariably demanded admission of the patient to an institution. This has been rendered necessary by the numerous intravenous injections required for heparin therapy, and by the frequent laboratory tests which must always be done to control dicoumarol dosage. Neither of these factors need be considered when heparin is given intramuscularly. The clotting time is never grossly prolonged, and the risk of haemorrhage is extremely slight. The results obtained in this investigation indicate that the treatment may be conveniently and safely carried out in the home. If this conclusion is confirmed by subsequent work, the use of an anticoagulant in domiciliary practice would constitute a significant advance for both patient and doctor.

Summary and Conclusions

The possibility of giving heparin by intramuscular injection has been studied in 20 patients. A concentrated aqueous solution of heparin of strength 25,000 units per ml. was used. Results indicate that this is a satisfactory method for short-term or long-term anticoagulant therapy.

An initial dose of 1.5 ml. of this solution followed by 1 ml. twice daily is recommended as a scheme of dosage.

Local pain and occasional haematomata which may result are discussed, and the way in which these disadvantages may be prevented or minimized is indicated.

I wish to thank Dr. Paul Wood, Director of the Institute of Cardiology, for his advice and encouragement, and the physicians of the National Heart Hospital for permission to carry out this work on patients in their care.

REFERENCES

Bauer, G., Boström, H., Jorpes, E., and Kallner, S. (1950). *Acta med. scand.*, **136**, 188.
Dale, H. H., and Laidlaw, P. P. (1911–12). *J. Path. Bact.*, **16**, 351.

'ANAESTHESIA IN THE NEWBORN*

BY

G. JACKSON REES, M.B., Ch.B., D.A.
Demonstrator in Anaesthetics, University of Liverpool

The newborn infant differs so greatly from the adult in his anatomy and physiology that the approach to anaesthesia in the two groups must be quite different. In the past there has been a tendency to adapt to infants those methods of anaesthesia which have proved to be of value in adults. The time has come to consider the problem of anaesthetizing the newborn in relation to their peculiar physiology.

During early life the ribs of an infant are disposed almost horizontally when the infant is in the erect position. Movements of the ribs can therefore produce only insignificant effects on the capacity of the thoracic cage, and costal respiration is practically impossible.

The Neonatal Lung

In addition to the relatively poor mechanism for its ventilation, the neonatal lung itself is a comparatively rudimentary structure. The area available for respiratory exchange is small in comparison with that of the adult lung: the amount per cubic centimetre of lung volume is half that of adult lung tissue, and the respiratory surface of the lungs per kilogram of body weight is about one-third that of the adult (Engel, 1947). To compensate for these deficiencies, as well as for the high oxygen consumption per kilogram of body weight, the infant has a rapid respiratory rate.

The infantile tracheo-bronchial tree is to some extent adapted to function in these circumstances, and the area of

*Read to the Section of Anaesthetics at the Annual Meeting of the British Medical Association, Liverpool, 1950.

the cross-section of the trachea of the newborn infant per unit of lung volume is twice that at 12 months. The sagittal diameter of the trachea of the neonatal infant is variously quoted as 3.6 to 5.7 mm. and of the adult as 15 to 20 mm. The diameter of the adult trachea is four to five times greater than that of the infant. If the forces governing the rate of flow of gases through the trachea follow Poiseuille's law, it would follow that an increase in the rate of flow in the child's trachea would produce an effect on the resistance to respiration 4^4 times greater than the increase in resistance produced by the same increase in the rate of flow through the adult trachea. In other words, if an increase in the rate of flow through an adult trachea increases the resistance to respiration by, say, x, the same increase in the flow rate through an infant's trachea would increase the resistance by $256x$.

On theoretical grounds, then, it is desirable that any technique employed for anaesthetizing young babies should not tend to increase the respiratory volume per minute, and should, if possible, reduce the amount of mechanical energy required for pulmonary respiration.

In addition to these mechanical differences between adult and neonatal respiratory systems, there seem to be certain differences in the sensitivity of the respiratory centre. The experiments in which Snyder and Rosenfeld (1937) observed the activity of the respiratory centres of post-mature foetal rabbits showed that smaller reductions in blood carbon-dioxide levels were required to produce acapnia in the young animals than in the maternal animals.

The immature state of the neuromuscular system in the newborn eliminates some of the problems which are met with in adult anaesthesia. The adult type of reaction to the irritation of an endotracheal tube under light anaesthesia is not seen in infants. The so-called "bucking" is impossible in children under 3 months of age, because until this time the cervical muscles are not capable of raising the head from the pillow. The only sign of irritation of the trachea under light levels of anaesthesia is a disturbance in the rhythm of respiration.

Similarly, deep levels of anaesthesia or heavy curarization are not necessary to produce muscular relaxation, because muscle tone is virtually non-existent in the newborn. During abdominal operations on young infants, intrusion of the abdominal contents into the operative field is sometimes very troublesome, but factors other than muscle tone appear to be mainly responsible for this. The infant at birth has an abdomen adapted to accommodate an alimentary tract which is devoid of gas, and thereafter the intestines acquire their gaseous content. It would seem inevitable that this, combined with the purely diaphragmatic type of respiration, would produce protrusion of the gut through the wound on opening the child's abdomen soon after birth.

The relative absence of muscle tone in infants can easily be demonstrated by artificial ventilation of the lungs under light anaesthesia; in small babies it is possible to inflate the lungs by the application of surprisingly low pressures, in sharp contrast with the resistance to inflation which the adult patient exhibits under similar conditions.

This ease with which the neonatal lungs can be inflated, combined with the small reduction in blood CO_2 required to produce acapnia, permits easy control of the respiration in young infants. In this respect the behaviour of the lightly anaesthetized infant bears a striking resemblance to the curarized and anaesthetized adult. Control of the respiration is extremely desirable in infants because it relieves the respiratory muscles of their whole load, and in abdominal surgery does much to prevent the pushing out of the abdominal contents. There is one theoretical objection to this procedure—there must be a shift of the oxygen dissociation curve of the blood to the left, thus reducing the peripheral oxygen tension. Barcroft (1946), however, showed that in newborn mammals the arterial oxygen saturation is only 75%, because the permeability of the pulmonary alveolar walls to oxygen is lowered, and that high oxygen atmospheres are able to raise the saturation level. In neonatal anaesthetic practice, then, a high oxygen atmosphere would more than compensate for the shift in the dissociation curve produced by artificial hyperventilation.

Use of Muscle Relaxants

In the light of these observations it is necessary to consider the use of muscle relaxants in the newborn. In anaesthetic practice generally these drugs can be used to reduce the dose of anaesthetic agent required for the production of good operating conditions because: (1) they reduce respiratory movements and enable adequate ventilation of the lungs to be carried out by the intermittent application of positive intrapulmonary pressures, without the use of excessive pressures; (2) they produce muscular relaxation in the surgical field; and (3) they reduce the effects of irritation by endotracheal tubes.

In the newborn, as has already been shown, control of the respiration is easily obtained at light levels of anaesthesia without the use of relaxants: muscle relaxation does not appear to be of major importance in the production of good operating conditions, and the usual untoward effects of endotracheal-tube induction are not seen. On these grounds it can be said that the use of relaxant drugs in anaesthesia is contraindicated in the newborn patient, and I have abandoned these drugs in such cases.

In view of the desirability of keeping the patient's respiratory activity at minimal levels and the relative absence of muscle tone, cyclopropane would seem to be an ideal anaesthetic drug for neonatal patients. The type of respiration which it produces would minimize the pushing out of the abdominal contents by the movements of the diaphragm, and the lack of muscle-relaxing properties would not be disadvantageous. There are, however, certain other effects which, I feel, render it undesirable. During surgical operations there is undoubtedly a greater loss of blood from those patients who are anaesthetized with cyclopropane, and this becomes a point of major importance in choosing an anaesthetic agent for a patient whose total blood volume is 300–400 ml. Prolonged administration of this drug to very small infants seems to produce in the early post-operative period a shock picture comparable to that often seen after its use in adults. For these reasons I consider that cyclopropane has little value in anaesthesia for the newborn, and that diethyl ether is the principal anaesthetic agent of choice, provided that the respiratory effect is reduced by controlled respiration produced by hyperventilation.

Operative Risk

The operative risk in newborn infants at term is slight, but it increases rapidly during the first week of life. This is in part due to the fact that the continuance of the abnormal state which the operation is designed to rectify increases the risk in some cases, but there is evidence to show that the resistance of all newborn mammals to physiological abuse becomes reduced during early extrauterine life. Glass *et al.* (1944), in a series of experiments on rabbits, estimated their survival time when they were subjected to

complete anoxia at term and at various days after term, and found that if the survival time in minutes was plotted graphically against the age of the animal the curve showed a regular decline from 30 minutes at term to 2 minutes at 20 days.

In those cases in which there is obstruction at some level of the alimentary tract the impairment of respiratory function by the aspiration of regurgitated fluid increases with time, and reflects on the operative risk; but this can be minimized by continuous aspiration of the pharynx in the pre-operative period.

In general, it can be said that the optimum time to operate is during the first 24 hours of life, or at the earliest period at which the blood urea and the urinary chlorides can be brought to normal levels.

Premedication

Some authorities have recently recommended that premedication of very young infants with morphine should be done. Leigh and Belton (1948) suggest a dose of 1/400 gr. (0.16 mg.) of morphine for 7-lb. (3.2-kg.) babies. This treatment appears to facilitate the smooth maintenance of anaesthesia, and would seem desirable if respiration is not to be aided or controlled. It does, however, make the induction of anaesthesia by inhalation agents—a tedious process at best—a very prolonged procedure.

Atropine should be given in all cases, and a dose which can be used on all newborn cases is 1/200 gr. (0.32 mg.).

Endotracheal Intubation

There are certain anatomical differences between the largest of newborn infants and adults that produce greater technical difficulties in the former. The infant larynx occupies a higher position in the neck in relation to the vertebrae, and the axis of its lumen tends to pass forwards as well as downwards. With the descent of the larynx which takes place in later life the forward angulation disappears (Tucker, 1932).

The complication of endotracheal intubation in young children that is most to be feared is subglottic oedema, the danger of which following instrumentation was first pointed out by Chevalier Jackson. Gillespie (1939) says that this oedema is the result of streptococcal invasion of abrasions produced by trauma during laryngoscopy, and that if care is taken during inhalation the risk is negligible. In his own published series of 70 cases of children under 18 months he does not report one instance of this complication. I have not met any case of respiratory stridor, nor have I seen any evidence of laryngeal oedema at post-mortem examination, following endotracheal intubation of neonatal infants. On the other hand, necropsy has revealed varying degrees of tracheitis, including one case in which there was on the anterior wall of the trachea a small circular ulcer similar to those reported recently by Dwyer *et al.* (1949). These lesions do not seem to have contributed towards the fatal outcome in these cases.

The advantages to be derived from intubation are very great, in that the tube ensures a reliable airway and enables the lungs to be readily inflated, and is an invaluable insurance against the dangers of gastric regurgitation, which is very common in the obstructive group of cases.

Apparatus

If CO_2-absorption apparatus is used on the newborn the only suitable standard equipment is the ¼-lb. (114-g.) Waters type of absorber described by Cope (1947). This has certain inherent disadvantages which greatly impair its value. Despite the fact that it is designed to reduce dead space, those parts of the apparatus which lie between the patient's respiratory tract and the soda lime have a considerable internal capacity. When the absorber is connected to an endotracheal tube its positioning is difficult if a considerable length of tubing is not used between the endotracheal tube and the absorber.

During the operation the Ayre's T-piece is very much easier to handle than the Cope absorber, and the internal capacity between the gas inlet and the patient is very small, so that with adequate flows of gas rebreathing is minimal. Artificial ventilation may be carried out by attaching a double-ended bag (B.L.B. type) to the exhaust tube, the open end of which is fitted with a vulcanite tap. This tap can be adjusted so that the intermittent pressure applied to the bag expels the amount of gas required to maintain the equilibrium of the system.

Thoracic and Abdominal Operations

I have now adopted a routine technique based on the views set out in this paper for anaesthetizing newborn infants for thoracic and abdominal operations.

The child is brought to the theatre dressed in a gamgee jacket and bonnet, and with the limbs bound in cotton-wool. An intravenous drip is run into one leg, and in cases in which there is alimentary obstruction a tube is passed into the stomach or, when there is oesophageal atresia, to the site of the obstruction. The thoracic cases that are cyanosed are brought up in an oxygen tent, and are transferred to the operating table only when the induction of anaesthesia is about to begin. The child lies on an electric pad on the table.

Induction of anaesthesia is effected by leading gases from a continuous-flow machine to beneath a Schimmelbusch mask covered by a thick layer of gauze, and separated from the patient's face by a thick layer of gamgee tissue.

Initially the gas flow is at the rate of 2 litres of oxygen a minute, maintained for one minute. At the end of this time 100 ml. of CO_2 a minute is added, and, finally, ether vapour to the limit of the patient's tolerance.

When the child breathes the full vapour concentration of ether regularly, the largest possible endotracheal tube is inserted, and this is connected by the shortest possible length of rubber tubing to an Ayre's T-piece.

The gas flow is adjusted to give a 50% O_2 and N_2O mixture flowing at a total rate of 3–4 litres a minute, and the ether vapour is turned off until the child shows movement of the limbs. In the meantime the mouth is packed with sterile ribbon gauze and the endotracheal tube is fixed. Ether is added to the mixture in concentrations just high enough to prevent movement.

The patient is now placed in the correct position for the operation, and a double-ended bag is fitted to the exhaust limb of the Ayre's T-piece. When the incision is made the respiration is brought under control by intermittent positive pressure applied by squeezing the bag, and the child is kept from spontaneous breathing throughout the operation.

Anaesthesia is maintained at the lightest possible level, and in view of the difficulty of eliciting and interpreting the signs of anaesthesia in these cases the ether vapour is turned off at intervals of 20 minutes for a period long enough to allow a return of some movements of the limbs. In this way rapid recovery after operation is ensured.

The method has proved to be extremely satisfactory, and the babies appear to be in much better condition post-operatively than those in whom spontaneous respiration was allowed to continue throughout the operation, or in

whom deeper levels of anaesthesia were attained. There seems to be rather less bleeding, and the surgeon is unhampered by respiratory activity.

REFERENCES

Barcroft, J. (1946). *Researches on Pre-natal Life*, p. 258. Blackwell, Oxford.
Cope, R. W. (1947). *Proc. R. Soc. Med.*, **40**, 540.
Dwyer, C. S., Kronenberg, S., and Saklad, M. (1949). *Anesthesiology*, **10**, 714.
Engel, S. (1947). *The Child's Lung*, p. 257. Arnold, London.
Gillespie, N. A. (1939). *Brit. J. Anaesth.*, **17**, 2.
Glass, H. B., Snyder, F. F., and Webster, E. (1944). *Amer. J. Physiol.*, **140**, 609.
Leigh, M. D., and Belton, M. K. (1948). *Pediatric Anesthesia*, p. 1. Macmillan, New York.
Snyder, F. F., and Rosenfeld, M. (1937). *Amer. J. Physiol.*, **119**, 153.
Tucker, G. (1932). *J. Amer. med. Ass.*, **99**, 1899.

OBSTETRIC ANALGESIA AND PLACENTAL INSUFFICIENCY

BY

E. H. SEWARD, M.A., B.M., D.A., D.Obst.R.C.O.G.
Research Assistant, Nuffield Department of Anaesthetics, Radcliffe Infirmary, Oxford

For the relief of pain in labour the combination of general medication and intermittent inhalation analgesia can be very effective and is suitable for all types of labour. Relief from pain is effectively obtained by careful antenatal preparation, by careful supervision during labour, by the judicious use of analgesic drugs such as pethidine, and by inhalation of a mixture that provides analgesia within 15 seconds. Success depends largely on the quality of the psychological management. The mother will be satisfied only if she appreciates the rationale of the method—that she will be aware of uterine contractions and will feel the baby delivered, but will not feel pain.

I closely supervised pain relief in a series of 200 labours, including 141 primiparae, selected at random but with every prospect of normal delivery. The patients had received no antenatal preparation for analgesia. Supervision and reassurance during labour were therefore exacting, but 89% admitted that analgesia was adequate. Subsequent experience has emphasized the well-known fact that antenatal preparation makes supervision in labour easier and more effective. Failure to obtain adequate analgesia has been due to lack of co-operation (or inadequate preparation for labour), to continuous backache at the end of the first stage of labour (needing higher dosage of analgesic drug), and to labour being well advanced on arrival in hospital.

In the 200 cases the inhaled mixture was either 0.5% trichlorethylene in air or 75% nitrous oxide with 25% oxygen, in both of which mixtures the oxygen content is at least as great as that of air. The commonly used 50% nitrous oxide with air provides only 10% oxygen: inhalation of such a mixture lowers the arterial oxygen tension to below 50 mm. Hg (McQuiston, Cullen, and Cook, 1943). This fall in tension is rapid. Examination with an oximeter (G. af. Geijerstam, 1949—personal communication) has shown that when a woman in labour inhales 4 litres of pure nitrous oxide in about 10 seconds the percentage saturation of her blood with oxygen falls from the normal 96% to 69% within 20 seconds, that is, to an oxygen tension of about 40 mm. Hg. The particular value of intermittent inhalation is to provide pain relief with negligible respiratory depression in the baby. It is important that the analgesic should not contribute to oxygen lack, which is a potent and insidious depressant of nervous function. The following considerations suggest that even intermittent inhalation of an oxygen-deficient mixture may contribute to intrauterine asphyxia when placental function is impaired.

Oxygen Transfer to Foetus

It is generally agreed that the passage of oxygen from mother to foetus is a matter of diffusion across the placenta, and that there is an oxygen-tension gradient towards the baby. Eastman (1930) has calculated that the probable oxygen tension in the placenta available to umbilical-vein blood during labour is 40–50 mm. Hg, compared with the 90 mm. Hg of maternal arterial blood. Whatever the actual figures may be, transfer is facilitated by devices such as an arrangement of vessels in the placenta whereby the streams of maternal and foetal blood run parallel but in opposite directions, so that umbilical-vein blood has maximum exposure to maternal arterial blood (Spanner, 1935); by the large numbers of foetal blood cells for oxygen transport (Windle, 1941); and by a difference in the oxygen dissociation curves of the two bloods which promotes the passage of oxygen across the tissue barrier. With a maternal arterial oxygen tension of 50 mm. Hg or less, the oxygen-tension gradient across the placenta is considerably reduced and possibly abolished.

There is little doubt, too, that a progressive decline in the saturation of the blood reaching the foetus takes place towards the end of gestation, and the point at which labour occurs is variable. Windle (1945) points out that, so long as normal healthy conditions prevail in the placenta, a reservoir of oxygen in combination with haemoglobin is present to provide for the needs of the foetus. This constitutes a factor of safety equivalent to at least 40 ml. of oxygen in the human at term, and enables the foetus to survive severe oxygen lack in the mother for short periods of time. The safety margin may be reduced by ageing of the placenta, by partial separation of the placenta, and by conditions in the placenta involving deposition of fibrin and ischaemic necrosis of villi.

Intrauterine Asphyxia

It is commonly accepted that changes in the foetal heart rate afford evidence of intrauterine asphyxia. This change in rate is similar to that seen in asphyxia in the adult where there is a preliminary acceleration followed by bradycardia The cardiac acceleration is thought to be due to reduced vagal restraint together with increased sympathetic drive The acceleration is later converted to positive vagal slowing, due either to a rise in arterial blood pressure acting via the carotid and aortic nerves or to a central discharge (McDowall, 1938).

A similar effect is seen in asphyxia neonatorum: when a baby takes occasional gasps with a long pause between, the pulse becomes progressively slower between gasps, but rises to the normal rate within a few seconds after a gasp which introduces oxygen into the lungs. When regular respiration is established the rate remains at 120–140 a minute. This implies that the vascular reflexes concerned in asphyxia of the adult are well developed in the foetus at the end of pregnancy, though the tachycardia mechanism may not operate. Barcroft (1946) wrote that there is a good chance of there being some vagus control before birth in man, but that it is not necessarily always present. It has been demonstrated experimentally in the goat that clamping the umbilical cord causes foetal bradycardia (Helliwell and Hutton, 1950).

Uterine Contractions and Oxygen Transfer

The weak pre-labour contractions of the uterus can lower the oxygen content of maternal placental blood (Windle and Steele, 1938). It is thought that the changes in foetal heart rate in relation to uterine contraction in labour are mainly asphyxial in origin owing to impairment of placental circulation and hence of oxygen transfer (Schultze, 1871). These changes are not invariable. In some labours there is no change in foetal heart rate during a contraction. In many there is a bradycardia during the contraction followed by a return to resting level as the contraction passes off. Waters and Harris (1931) described how the bradycardia may often be prevented by the mother's inhaling of oxygen.

Perhaps when the foetal heart rate does not vary during contractions either the reflexes are not fully developed or the placental reserve compensates for the impairment of placental circulation; or perhaps the slowing is due to pressure on the foetal head, for this often occurs when the head is subjected to pressure, such as when it is passing through the pelvic brim in a trial of labour, when the stretched cervix is sliding over it at the time of full dilatation, or when traction is applied with the obstetric forceps. The cause of the bradycardia in these circumstances is almost certainly a local asphyxia due to slowed circulation through the brain as a result of cerebral compression. Another factor which may operate was suggested by Leff (1932)—that uterine contraction squeezes blood from the placenta into the foetus, raises the pressure in the foetal circulation, and slows the heart according to Marey's law.

It is reasonable to regard foetal bradycardia during labour as being caused by local asphyxia in the medulla of the foetal brain, due either to pressure on the foetal head or to a general asphyxia of the foetus.

Placental Insufficiency

Asphyxia of the foetus may be enhanced by maternal oxygen deficiency. Under normal healthy conditions there is enough placental reserve to tide over temporary crises. When placental function is not normal it is clearly dangerous to lower the maternal arterial oxygen tension even during uterine contractions.

In a maternity department handling abnormal cases the foetal heart rate has from time to time been observed to give rise to anxiety while the mother inhales 50% nitrous oxide and air, whereas pure oxygen or 75% nitrous oxide with 25% oxygen seems to improve the foetal condition. Thus placental reserve is not always sufficient to withstand the impact of a uterine contraction and a low maternal arterial oxygen tension. A fall in the foetal heart rate of 10 beats a minute during uterine contraction is within normal limits. If the fall is greater than this, especially if the membranes are intact, then nitrous oxide and air should not be used for pain relief. Sometimes foetal bradycardia during a contraction for which the mother inhales nitrous oxide and air may not develop if she inhales nitrous oxide and oxygen. Waters and Harris described how foetal distress often follows in a labour in which there is foetal bradycardia during uterine contraction.

Thus the effect of a uterine contraction on the foetal heart rate can afford an indication of the placental reserve, though of course placental insufficiency is not the only cause of foetal distress in labour. The point is illustrated by a case described recently by Ewart Williams (1949—personal communication).

Pregnancy in a multipara with hypertension, oedema, and albuminuria was allowed to continue with some misgivings until 36 weeks, when labour began spontaneously. With the weak contractions of early labour there was a marked foetal bradycardia during the contraction and arrhythmia between contractions. Inhalation of oxygen by the mother restored the foetal heart rate to a steady rhythm, and contractions caused only slight bradycardia. The baby was delivered by caesarean section. The placenta was small, grossly infarcted, and degenerate on naked-eye examination. The placental reserve was so small that the impact of even weak uterine contractions was enough to cause obvious foetal distress.

If placental function is suspect, or if labour shows the reserve to be small, then maternal arterial-oxygen tension should be maintained and nitrous oxide and air avoided. Maternal oxygenation should also be maintained during labour lasting more than 24 hours. In a series of prolonged labours, with normal labours as controls, there was a significant increase in nucleated red corpuscles of cord blood, suggesting possible foetal oxygen lack. Again, if general anaesthesia is used for forceps delivery for foetal distress, induction of anaesthesia with pure nitrous oxide may be convenient for the anaesthetist but endanger a foetus already in distress.

Conclusion

Intermittent inhalation analgesia can play a valuable part in relief of pain in labour. Nitrous oxide and air has been used in countless thousands of labours without harm: in normal labour there is a reserve which more than compensates for any oxygen deficiency it may cause. Nitrous oxide and oxygen mixtures can, however, provide better relief of pain by virtue of the higher nitrous oxide content that can be used. At the same time they maintain the maternal arterial–oxygen tension, the importance of which has been emphasized by Greenhill (1947). Under certain conditions a fall in the maternal arterial-oxygen tension during labour is dangerous for the baby. Such conditions are when the placental reserve is suspect, as in pre-eclamptic toxaemia and premature separation of the placenta; when uterine contractions reveal a small placental reserve by their effect on the foetal heart rate; when labour is prolonged; and when labour occurs in the presence of erythroblastosis foetalis. In these circumstances intermittent inhalation of a nitrous oxide and oxygen mixture is advisable, as it is also when the mother is embarrassed by cardiac disease, pulmonary disease, or anaemia.

A mixture of 75% nitrous oxide with 25% oxygen has already been reported as giving good results (Seward, 1949a). This mixture maintains normal oxygenation while providing a high proportion of nitrous oxide for pain relief. In more than two years' use it has proved satisfactory for self-administration under the supervision of midwives trained in the use of nitrous oxide and air. Suitable apparatus should provide intermittent flow of the constant mixture at not less than 25 litres a minute; should include a reservoir bag of 6–7 litres capacity; and should incorporate a device whereby the nitrous oxide is automatically cut off when the oxygen supply fails. The apparatus designed by Warming and reported elsewhere (Seward, 1949b) has proved satisfactory in use. A refinement can be added so that the mother may inhale pure oxygen between contractions and nitrous oxide and oxygen during contractions when the foetus is distressed. Such apparatus is necessarily cumbersome because of the necessary cylinders, which restrict its convenient use to institutions.

I acknowledge with thanks the facilities afforded by the Nuffield Department of Obstetrics and Gynaecology, and the Area Department

of Obstetrics and Gynaecology, Oxford. The labour ward sisters and nursing staff have at all times been most helpful and co-operauve. Mr. D. J. Finney, of the Lectureship in Design and Analysis of Scientific Experiment, University of Oxford, kindly provided assistance with some statistical problems.

REFERENCES

Barcroft, Sir Joseph (1946). *Researches on Pre-natal Life.* Blackwell, Oxford.
Eastman, N. J. (1940). *Bull. Johns Hopk. Hosp.*, **47**, 221.
Greenhill, J. P. (1947). *J. Obstet. Gynaec. Brit. Emp.*, **54**, 577.
Helliwell, P. J., and Hutton, A. M. (1950). *Anaesthesia*, **5**, 4.
Leff, M. (1932). *Amer. J. Obstet. Gynec.*, **24**, 898.
McDowall, R. J. S. (1938). *The Control of the Circulation of the Blood.* Longmans, London.
McQuiston, W. O., Cullen, S. C., and Cook, E. V. (1943). *Anesthesiology*, **4**, 145.
Schultze, B. S. (1871). *Der Scheintod Neugeborener.* Jena.
Seward, E. H. (1949a). *Lancet*, **2**, 781.
—— (1949b). *Proc. R. Soc. Med.*, **42**, 745.
Spanner, R. (1935). *Z. Anat. EntwGesch.*, **105**, 163.
Waters, R. M., and Harris, J. W. (1931) *Curr. Res. Anesth.*, **10**, 59.
Windle, W. F. (1941). *J. Paediat.*, **18**, 538.
—— (1945). *The Harvey Lectures, 1944-5*, p. 236.
—— and Steele, A. G. (1938). *Proc. Soc. exp. Biol., N.Y.*, **39**, 246.

Medical Memoranda

Vulvovaginitis in a Child due to Shigella flexneri

It has been pointed out by various writers that organisms other than the gonococcus may give rise to vulvovaginitis in children. Haemolytic streptococci, staphylococci, and possibly Petit's bacillus have been found to be responsible for the condition (Topley and Wilson, 1946—referring to Hardy, 1941, and Osmond, 1944), and it is generally held that diagnosis of gonorrhoeal infection in children should never be made unless the gonococcus is demonstrated by cultural methods. The following case affords further evidence in support of this view.

CLINICAL HISTORY

A girl aged 7 was brought to hospital by her mother, who was worried because the child had a copious vaginal discharge for 24 hours. She was normally under the care of an African nursemaid.

Examination revealed a very heavy vaginal discharge of thick creamy pus. There was a moderate inflammatory reaction in the vulvar region. Vaginal swabs and smears were obtained, and, in view of the severity of the condition and the presence of Gram-negative diplococci in the stained direct smear, intensive treatment with penicillin was instituted. After 72 hours' treatment there seemed to be no marked improvement. Further laboratory investigations (see below) indicated a more specific line of treatment, and sulphaguanidine was given orally and sulphaguanidine powder by vaginal insufflation. The discharge ceased within 48 hours from the beginning of this therapy. Up to one month after leaving hospital there was no sign of recurrence of the discharge.

LABORATORY INVESTIGATION

The smear sent to the laboratory was stained by Gram's method and showed very numerous polymorphonuclear cells and some Gram-negative intracellular organisms, coccal in shape, occurring in small groups and arranged in pairs within these groups. As the child had an African nursemaid gonococcal infection was thought to be not unlikely, and cultural examination for the gonococcus was decided upon.

Two swabs were sent for examination, the second because of some delay which occurred between the taking and the arrival at the laboratory of the first. Both swabs were plated on blood agar and incubated at 37° C. in an atmosphere of approximately 10% carbon dioxide. The plates were examined after 24 hours' incubation. The blood agar inoculated with the first swab showed a few colonies of *Staphylococcus albus* and a few greyish, circular, low convex colonies, about 1 mm. in diameter, which were suggestive in appearance of a coliform type of organism. The blood agar inoculated with the second swab gave a heavy growth of the greyish colony in pure culture. Both plates were incubated for a further 24 hours, but no other colonies developed.

Films made of the colonies from both plates showed a Gram-negative cocco-bacillus about 1 μ in length and 0.5 μ in width. One colony from each plate was subcultured on agar slopes and, after incubation at 37° C., inoculated into tubes of lactose, glucose, mannitol, dulcitol, sucrose, and peptone water. In each case acid was formed in glucose and mannitol; there was no change in lactose, dulcitol, or sucrose; indole was not produced and the organism was non-motile.

Slide agglutination tests performed with polyvalent Flexner I and polyvalent Flexner II sera showed agglutination with the former only. Suspensions of the organism were prepared, using mercuric iodide and potassium iodide in buffered formol-saline, and tested for agglutination in tube against polyvalent Flexner I and the individual sera making up polyvalent Flexner I. *Sh. flexneri* V, W, and Z. There was agglutination to a dilution of 1 in 250 with polyvalent Flexner I and *Sh. flexneri* W; *Sh. flexneri* V showed agglutination to 1 in 25, but agglutination was not observed with *Sh. flexneri* Z.

Inquiries elicited that the girl had had diarrhoea some seven days previous to the onset of the vulvovaginitis. No one else in the family or any of the African house-servants admitted to having had diarrhoea or dysentery, so it was decided to examine specimens of faeces and rectal swabs from the child over the next 14 days. The first stool was fluid, but macroscopically no blood was seen, though microscopically red blood cells were observed together with abundant pus cells. Later specimens were more formed, and the pus cells and erythrocytes were considerably reduced in number. The swabs and faeces were inoculated on desoxycholate-citrate agar (Hynes's modification) but *Sh. flexneri* was not isolated.

In view of the findings of the direct examination, however, there was strong presumptive evidence of a bacillary dysentery infection, and the inability to isolate the organism from specimens of faeces might be accounted for by the fact that the patient was being treated with sulphaguanidine.

W. J. MCGINNESS, M.B., Ch.B.,
Medical Officer, Tanganyika Territory.
R. C. TELLING, F.I.M.L.T.,
Superintendent, Bacteriological Section, Medical Laboratory, Dar-es-Salaam.

REFERENCE

Topley, W. W. G., and Wilson, G. S. (1946). *Principles of Bacteriology and Immunity*, 3rd ed. Arnold, London.

Herpes Zoster Provoked by Smallpox Vaccination

In view of the correspondence on the subject of herpes zoster since the day that Bókai (1892) first noted the clinical association of the condition with varicella, the following case may be of interest.

CASE REPORT

A Chinese man aged 22, who had previously been vaccinated successfully on two occasions, was again vaccinated on November 12, 1949. This was successful, producing a small reaction in the skin over the right deltoid muscle. On November 22 he complained of pain in the right arm and the right side of the neck. A skin eruption began on the arm on the following day, and he was admitted under my care on the 25th, when he had an obvious and extensive herpes zoster from the root of the neck down the outer aspect of the right arm to the thumb. He also had widespread varicella-like discrete lesions on the trunk and face (herpes generalisatus). The dry crust of his

recent vaccination was still present, and separated normally on November 27. The course of the illness was uneventful, and he was discharged about ten days after admission.

COMMENT

This case may be an example of the activation of a latent virus disease by another virus disease. A similar sequence of events has previously been reported. The Committee on Vaccination in London (1928) suggested that vaccination may precipitate encephalitis in persons harbouring the latter virus. Levaditi and Nicolau (1926) noted that the injection of the rabies virus in rabbits produced death from latent neurovaccinia. Madonick (1946) reported a case of herpes zoster in which vaccination (in a patient twice previously vaccinated) provoked encephalitis. The herpes began on October 26, vaccination was performed on October 30, and encephalitis developed on November 7.

In Singapore herpes zoster seems to be more common and less severe than in the U.K. The above case was the most severe I have seen on the island. Vaccination of the skin served by the fifth sensory root provoked a subsequent severe herpes involving particularly the fifth and sixth roots on the same side. This case seems to be of importance as illustrating that there are dangers attached to smallpox vaccination, and possibly to autovaccination of vesicle fluid, as a therapeutic measure in cases of herpes zoster and herpes simplex.

I wish to thank Brigadier J. T. Collins, D.M.S., F.E.L.F., and Colonel C. P. Chambers, O.C., B.M.H., Singapore, for permission to publish.

KEMBLE GREENWOOD, M.B., M.R.C.P.Ed.,
Major, R.A.M.C.
Dermatologist, Military Hospital, Singapore;
Lecturer in Dermatology to the University of Malaya.

REFERENCES

Bókai, J. Ungar (1892). *Arch. f. Med.*, **1**, 159.
Committee on Vaccination (1928). Report. M.O.H., London.
Levaditi, C., and Nicolau, S. (1926). *C. R. Soc. Biol., Paris*, **94**, 114.
Madonick, M. J. (1946). *Arch. Neurol. Psychiat., Chicago*, **56**, 434.

Torsion of the Gall-Bladder

Torsion of the gall-bladder is a rare condition, fewer than 80 cases having been reported in the literature. No recorded case has been diagnosed correctly pre-operatively in spite of the well-known and classical paper by Rendle Short and Paul (1934), which describes the symptomatology with great clarity and points out that a pre-operative diagnosis should be possible. The importance of making the diagnosis lies in the facts that the operation for cure is extremely simple and quick; that pre-operative treatment can be reduced to a minimum; that recovery is uneventful; while the mortality rate is directly reciprocal with the delay in operating. In the age group in which most of these cases occur—that is, 60–80—both doctor and particularly patient wish to avoid operation wherever possible, and the delay has usually arisen through giving expectant treatment on a diagnosis of acute cholecystitis.

If, however, the condition is borne in mind, the necessity for operation, together with its ease and rapidity of performance, can be plainly expressed to the patient, and the mortality rate should fall considerably from the 16% estimated by Smith (1936).

CASE REPORT

The patient, a woman aged 77, was admitted to Southmead Hospital, Bristol, on September 27, 1949. Four days previously she had had an attack of acute abdominal pain which was very severe. Retching occurred but there was no vomiting. Her bowels had not been opened for three days, but an enema gave a good result. Her temperature was 97.4° F. (36.3° C.) and a swelling which was tender was felt on the right side below the umbilicus. The next day the abdomen was less distended and an enema produced only flatus + + +. The following day there was no vomiting but the patient still complained of pain in her right side. An enema gave a good result. This state continued throughout the following 24 hours, but the swelling was becoming more tender. She was admitted to hospital four days after the onset of pain.

On admission she was seen to be a very frail old lady in severe pain. Her temperature was 98.4° F. (36.9° C.). Her tongue was dry; heart and lungs N.A.D. There was no jaundice. The abdomen was distended and tympanitic. A hard swelling which was extremely tender but quite mobile was present in the right iliac fossa. The extreme tenderness made full examination difficult. A doubtful provisional diagnosis of twisted ovarian cyst was made, but it was evident that there was some mischief in the abdomen which required laparotomy.

Operation.—Through a paramedian incision the gall-bladder presented itself wrapped in the omentum, black, distended to the size of a pear, and with a few green spots of incipient perforation. It was twisted in a clockwise direction through three complete turns around its oedematous pedicle of cystic duct and artery. Its removal was extremely simple, but the cystic artery was so arteriosclerotic that the first ligature did not occlude it. There were no stones. Convalescence was uneventful.

COMMENT

This case was misleading in that the swelling itself was so low in the abdomen: otherwise the fluctuating course of the illness, and a mobile tender lump in a frail old lady, should have enabled a correct diagnosis to be made.

Since Rendle Short and Paul's paper the balance between clockwise and anticlockwise rotation has been levelled, and to date the ratio is about 50–50. The clockwise rotation is attributed to peristalsis in the stomach (Barber, 1939), while the anticlockwise is due to colonic movements. This is a plausible theory, but does not explain why a gall-bladder lying with a free pedicle and exposed to these movements for upwards of 60 years should suddenly rotate. In my case the cystic artery which entered the pedicle above the cystic duct was a true bill "pipe-stem" artery and acted as a strut around which the pedicle must revolve, as any to-and-fro movement was impeded. The condition of the arteries has not previously been noted, but some arteriosclerotic change could be expected in the general age group, and the position of such an artery in relation to the duct might explain the direction of rotation.

The lower age limit has, however, fallen to 5 years (Cuervo, 1939), but it is easier to understand such congenital anomalies causing trouble in the first decades. In the case quoted by Berry (1939) there was a rough vehicular ride to initiate the process. In Gowland's (1946) case the attacks had been repeated over many years.

I wish to express my thanks to Dr. Phillips, medical superintendent at Southmead Hospital, for permission to publish this case.

K. P. S. CALDWELL, M.A., M.B., F.R.C.S.

REFERENCES

Barber, A. H. (1939). *British Medical Journal*, **2**, 1272.
Berry, W. H. (1939). *J. Amer. med. Ass.*, **112**, 1580.
Cuervo, S. and T. (1946). *Arch. Soc. Estud. clin. Habana*, **33**, 295.
Gowland, M. M. (1946). *Canad. med. Ass. J.*, **54**, 485.
Short, A. R., and Paul, R. G. (1934). *Brit. J. Surg.*, **22**, 301.
Smith, W. (1936). *Lpool med.-chir. J.*, **44**, 139.

There are 86,876 dentists in the United States, one for every 1,733 persons, according to the American Dental Association.

Reviews

THE SCIENCE OF GENETICS

The Elements of Genetics. By C. D. Darlington, F.R.S., and K. Mather, F.R.S. (Pp. 446; 88 figures. 25s.) London: George Allen and Unwin. 1949.

There must be many medical men who are wondering where the science of genetics has got to and would like to have a comprehensive but relatively brief account, without, of course, popularization. This is just the book they are waiting for, provided that they are prepared to take some trouble over a subject which must remain difficult, however skilful the presentation. Some medical men are allergic to mathematics, even if they would not go so far as to say, as does one friend, that they feel quite sick if they see a square-root sign. Two of these chapters will defeat them. A much smaller number are baffled by visualizing three dimensions, finding that embryology, for example, is a very difficult subject. It is, however, only the unfortunates, if there are any such, who suffer from both disabilities who should be advised that the book is not for them.

Professor Darlington and Professor Mather have written a very concise textbook of only 374 pages, not counting glossary and index. The principles of the subject are not obscured by detail. Yet it is a very bold attempt at a complete synthesis of knowledge up to the present time. In such a book the gaps must be filled in by intelligent speculation, and this is part of their plan. It is at this point that the book may perhaps be criticized, for often it is not clearly indicated where what is generally accepted ends and the speculation begins. But this is not a serious disadvantage for those in other branches of science who want a conspectus of the subject. Apart from its excellence as a general textbook this volume should appeal especially to those whose main interests lie in the human field: there is much reference to viruses and micro-organisms and to genetics and the cancer problem, as well as a particularly interesting chapter on man himself.

J. A. FRASER ROBERTS.

GUIDE-BOOK TO BRITISH MEDICINE

The British Encyclopaedia of Medical Practice. Abdominal Emergencies to Anus Diseases. Under the general editorship of the Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. Volume I. Second edition. (Pp. 786; 148 figures. £3.) London: Butterworth. 1950.

The second edition of the *British Encyclopaedia of Medical Practice* needs no introduction. Lord Horder has now assumed the general editorship formerly held by the late Sir Humphry Rolleston, and he contributes a brief foreword, while retaining, as an engaging act of piety, the scholarly introduction written by his predecessor for the first edition. The articles are arranged in alphabetical order, this volume beginning with "abdominal emergencies" and ending with "diseases of the anus." "Medical practice" is used in the widest sense, embracing, in this volume alone, medicine *sensu stricto*, surgery, gynaecology, obstetrics, tropical diseases, dermatology, anaesthesia, and rhinology. The articles are concise, and emphasis is laid on the practical rather than on the academic aspects. The contributors are acknowledged experts in their subjects, and it is perhaps invidious to select particular articles for mention. The excellence of Mr. Zachary Cope's account of "abdominal emergencies" was to be expected; the sections on "aneurysm" and "myocardial infarction," respectively by Dr. Maurice Campbell and Dr. Evan Bedford, are concise and lucid expositions of the subjects; and Mr. Gabriel's description of "diseases of the anus" is a contribution of great practical value.

If the aim of the editor is to provide a handbook to which the general practitioner may turn for illumination and practical guidance this first volume suggests that he has been abundantly successful in achieving it. It is not, nor indeed does it set out to be, a rival to the great systems of medicine, and in this respect its title may be misleading. As an example of book production this volume ranks high, even for one of Messrs. Butterworth's publications. It is superbly printed on fine calendered paper, and the many half-tone blocks are flawlessly reproduced. It is perhaps a little disquieting to note that the publishers found it necessary to employ a firm of printers in Vienna.

R. BODLEY SCOTT.

LECTURES ON ANATOMY

Vorlesungen über Topographische Anatomie. By Professor O. Grosser. (Pp. 354; 313 figures. 46s.) Vienna: Springer. 1950.

This volume consists of the lectures given by Professor Otto Grosser at the German University in Prague. It is a common practice in German universities for the professor to publish such a book for the benefit of the students who have attended his lectures, for it is of the utmost value to them. It is thus not exactly a textbook, for it is in such an abbreviated form as to be unintelligible to anyone not already familiar with the subject. This very brevity, however, is an advantage not only to those for whom it is intended but to those with some familiarity with human anatomy who wish to revise and extend their knowledge.

Unless this is appreciated the first chapter would fill any student with despair, for the author describes the brain and central nervous system in so compressed a form that only an advanced student could possibly understand it. Yet these are obviously the notes of very brilliant lectures from which the expert may gather hints of real value for his own work. With a very moderate knowledge of German he will have no difficulty with the language, for the expression is simple and entirely avoids the complex sentences so dear to the German mind.

There are ample illustrations, mostly reproduced from such famous classics as Toldt and Sobotta, and, although they do not attempt to emulate the superb artistic value of the originals, they are quite serviceable. One original drawing of the brain by Lepier, with the surrounding skull and overlying sutures, is of the highest quality and a real pleasure to study. Many of the diagrams will be useful to lecturers on anatomy, but in some of the illustrations, as so often happens, the artist has buried the essential points in a mass of irrelevant detail.

The book is plainly the result of a profound knowledge of human anatomy and a wide experience of teaching. It will well repay careful study by those engaged in the teaching of a difficult subject.

HENRY SOUTTAR.

TREATMENT WITH QUINIDINE

Quinidine in Disorders of the Heart. By Harry Gold, M.D. (Pp. 115. 16s.) London: Cassell and Co. 1950.

Any book that will help to overcome fear and prejudice concerning quinidine is welcome. In this country, especially, its toxic effects have been long overemphasized and its action and value improperly appreciated. This book offers a much-needed corrective. Though the book is written primarily for general practitioners, the author's belief that students and specialists may also find it helpful is justified. The facts given and the opinions offered are based on pharmacological and clinical research, extensive reading, intimate contact with postgraduate difficulties, and practical experience over 25 years.

The many actions of quinidine are described. The side-effects are shown to be the direct result of some of these actions and, while undesirable under certain circumstances, are not necessarily toxic. Thus, quinidine lowers the blood pressure by reducing the peripheral resistance: such a side-action is undesirable when the drug is given intravenously to stop paroxysmal ventricular tachycardia in a shocked patient, and may cause immediate syncope; but a similar side-action is common to many drugs which prolong the refractory period of heart muscle and depress cardiac excitability—for example, procaine.

Although the author admits that there are patients who are allergic to quinidine and who may react to it by developing urticaria, purpura, or asthma, he has never encountered such a case himself, and does not give a test dose before beginning treatment. His observations on dosage are interesting. He wisely points out that the toxic dose of a drug is that which produces toxic symptoms, and the therapeutic dose is that which has the desired effect. It is no surprise to learn, then, that he has a number of patients who have been taking 30 to 60 gr. (2–4 g.) of quinidine daily for years.

The latter half of the book is on quinidine therapy in particular conditions. This is also helpful and informative.

As a whole, the work is an unpretentious handbook. It is written in a free narrative style, and is not illustrated. There are no references in the text, but a useful bibliography is appended. It provides just the sort of information that students and practitioners need.

PAUL WOOD.

COMMUNITY HEALTH

Personal and Community Hygiene Applied. By Jesse Feiring Williams, M.D., Sc.D., and Gloyd Gage Wetherill, M.A., M.D. (Pp. 610: 147 figures. £1.) Philadelphia and London: W. B. Saunders Company. 1950.

The preface tells us that this book is the natural development of an earlier book—*Personal Hygiene Applied.* It is a development that recognizes the significance of community problems and the social as contrasted with the individual aspects of health and hygiene.

The book is not written for the specialist. It opens with a general survey of the health problems which confront the individual. We are first given a list of 10 headings to embrace all the physical, mental, and emotional facets of health. For full positive health the individual must be adequately provided with each one of the 10 abilities which are listed—for example, ability to engage in mental and physical activity; to recover efficiently from the effects of activity; to resist fatigue in extraordinary situations; to exert strength in certain muscle groups; to act with others in harmonious groups; to experience, express, and control emotions; and so on. Thus the concept of positive health is taken to include adjustment within the social situation in which the individual finds himself.

In following chapters the authors consider more specific aspects of personal health. Thus they give simple straightforward information and advice on care of the skin, posture, fatigue and rest, food and nutrition, and so on. The pattern followed is logical: the data are presented clearly and simply. Though a paragraph heading "A Trip through the Respiratory Passage" may surprise or even shock the medical graduate, to the reasonably intelligent public it probably stimulates the imagination and offers adventure and interest.

If the first half of the book is primarily written for the lay reader, the last seven chapters, which discuss community problems, are appropriate to medical and non-medical reader alike. The study of social medicine and community health is sufficiently new to need greater publicity among the medical profession. But interest in community health, which is defined as "the quality of life in a community that is marked by the effort of people to live at their best and to help others in the community to do likewise," is clearly not the prerogative of doctors. Doctors, engineers, chemists, psychologists, and indeed every citizen—all are directly and intimately concerned. The causes and methods of prevention of disease are discussed in two of these chapters. Besides the obvious aspects with which public health authorities have for a long time been concerned, questions of occupational diseases and accidents are included here.

Some of the subjects mentioned are touched upon too briefly and insufficient evidence is provided to support the claims. Thus, for example, the paragraph on noise is far from adequate. Lighting, heating, and ventilation are all dismissed in short paragraphs. The chapter on the work of the public health authorities can do no more than give the briefest survey, but even this is sufficient to arouse the interest and satisfy some of the curiosity of the reader.

J. M. MACKINTOSH.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

A Pharmacopoeia for Chiropodists. By J. N. le Rossignol, F.Ch.S., and C. B. Holliday, M.P.S. 5th ed. (Pp. 264. 8s. 6d.) London: Faber and Faber. 1950.

A Synopsis of Anaesthesia. By J. A. Lee, M.R.C.S., L.R.C.P., M.M.S.A., D.A., F.F.A.R.C.S. 2nd ed. (Pp. 354. 15s.) Bristol: John Wright. 1950.

Recent Advances in Chemotherapy. By G. M. Findlay, C.B.E., Sc.D., M.D., F.R.C.P. Vol. 2. 3rd ed. (Pp. 597. 36s.) London: J. and A. Churchill. 1951.

A Synopsis of Surgical Anatomy. By A. L. McGregor, M.Ch., F.R.C.S. 7th ed. (Pp. 778. 25s.) Bristol: John Wright. 1950.

Hatha Yoga. By T. Bernard, M.A., Ph.D., LL.D. (Pp. 104. 15s.) London: Rider. 1950.

Acquisitions Récentes en Anesthésie et Réanimation. By Professor B. Johnson. (Pp. 74. 250 francs.) Paris: L'Expansion Scientifique Française. 1950.

Chirurgie du Cœur. By Professor F. D'Allaines and others. (Pp. 346. 1,200 francs.) Paris: L'Expansion Scientifique Française. 1950.

Handbuch der Virusforschung. Edited by Professor R. Doerr and Professor C. Hallauer. 2nd supplementary vol. (Pp. 425. 111s.) Vienna: Springer. 1950.

Cytology of the Human Vagina. By I. L. C. de Allende, M.D., and O. Orías, M.D. (Pp. 286. 55s.) London: H. K. Lewis. 1950.

L'Année Thérapeutique en Ophtalmologie. Vol. 1. Edited by G. E Jayle and A. Dubois-Poulsen. (Pp. 414. No price.) Paris: L'Expansion Scientifique Française. 1950.

A Textbook of the Practice of Medicine. Edited by F. W. Price, F.R.S.Ed., C.M.Ed., F.R.C.P., Hon.M.D.Belf. 8th ed. (Pp. 2,076. 45s.) London: Geoffrey Cumberlege. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY DECEMBER 23 1950

A TOAST TO BACCHUS

Christmas is by some celebrated as a Saturnalia, the eating and drinking festival of the year. Wine and mead and spirits flow into unaccustomed stomachs, and beer, the national drink since 1500, softens our sorrows and spreads an air of tolerance and social warmth. Alcohol is one of the oldest drugs known to all mankind, and for hundreds of centuries has played a role in religious ceremonies and in the art of healing. Modern pharmacology has taught us how much of the teachings of tradition to accept, and what must be discarded. To-day we know that alcohol is no cerebral stimulant, but a gentle anaesthetic which lulls criticism and judgment to sleep; that the warmth of whisky in the stomach, the glow which spreads over the body and out along the limbs to frozen toes and fingers, is no new life-saving heat but a wanton spending of the body's own carefully preserved internal store, a rush of warm blood from the depths as the vessels of the skin are forced to open up. We know, too, that alcohol stimulates gastric secretion—hence the value of a glass of sherry before dinner—and provides energy for work, seven calories for every gramme.[1] Fourteen pints of beer, containing 4.5% alcohol, provide 3,500 calories, a reasonable day's energy ration without other food. Alcohol is one of the few substances absorbed directly from the stomach, and within five or ten minutes of a drink the liver is already beginning to oxidize it to acetaldehyde and acetate, which joins in the cycles of intermediary carbohydrate metabolism.

But beer, like wine, is more than alcohol. It contains vitamins. Though vitamin B_1 is notoriously absent, and many of the chronic alcoholic's symptoms are, like beriberi, traceable to this avitaminosis and not to some toxic property of the drink, beer is rich in riboflavin and nicotinic acid (0.5–1.7 μg. per ml. and 15 μg. per ml. respectively).[2] Thus a daily four pints of beer will satisfy the human requirements of riboflavin. This is of more than academic interest at a time when food supplies are short, and particularly important to peoples who may in natural circumstances enjoy but a very limited diet. Missionaries have sometimes quite properly tried to suppress the evils of drink among their native converts, only to find them falling mysteriously ill: the ban on native beer removes the native's only source of vitamin-B complex. Platt and Webb,[3] in a study of Kaffir beer, which is brewed from maize, point out that, while maize-eaters are notoriously liable to pellagra, this nicotinic-acid-deficiency disease is never seen among maize-beer drinkers because during brewing the fermenting yeast synthesizes nicotinic acid and riboflavin, so that the drink contains more than the grain from which it is made.

But for us in Britain this Christmas drink is a pleasure, not a stern necessity. We shall be less concerned with the balance of our diet than with other kinds of balance. In the great days of drinking, in the eighteenth century, a man might sit down after dinner and drink his way through four bottles of port (containing 20% alcohol by volume). He achieved this by a combination of time and practice. Food in the stomach, particularly if fatty, slows alcohol absorption; with practice the liver comes to oxidize it quicker; and with plenty of time a man may spin out his cups to keep a constant level of optimism and good fellowship.

It is said[4] that a pint of whisky or seven average bottles of beer will produce drunkenness in the average man, but few of us to-day will have the opportunity to test the first part of this statement. By the standards of our ancestors[4] we are an abstemious if not degenerate race. Gone are the days when pale ale was a breakfast drink for ladies and for boys at school, and sherry a mid-morning break. Gone too are the days of cheap gin, a sip of spirits to keep the baby quiet, and a row of infant corpses with cirrhosis of the liver. Yet a nursing mother may safely take her modest glass of stout with the best, for alcohol does not get into her milk.[1]

Talk about drink is apt to raise passions quite as fierce as those let loose by the actual consumption of liquor. The literature is immense, the debate endless. Yet medical opinion has never been against the drinking of wine and ale within reason. Hospital residents have often been served with free beer as part of their emoluments, hospital patients have often had stout prescribed as part of their diet, and textbooks sometimes indicate what wine may be allowed. It may be that the National Health Service will change this too. At least one hospital is in future to provide its residents with free journals instead of free drink, and whisky, in spite of the patient's plea, is not available on an E.C.10. "Dr. A., Please Sir would you kindly leave a prescription for me to get some Benedictine and surgical spirit. Thank you," and: "Dear Dr. B., I am writing on behalf of my sister, and as she has got a very bad cold, and also as I have heard that it is possible to have a prescription for whisky under the National Health Scheme, I hope you will give her son one. . . ." How many of us there are who get appeals of this kind! The modern planned State is the direct inheritor of the Puritan tradition. Yet a little of Merrie England still lingers on in the season from Christmas to New Year, and its symbol is the glass that cheers.

[1] Goodman, L., and Gilman, A., *The Pharmacological Basis of Therapeutics*, 1941, Macmillan, New York
[2] Drummond, J. C., and Moran, T., *Nature, Lond.*, 1944, 153, 99.
[3] Platt, B. S., and Webb, R. A., *Proc. Nutrit. Soc.*, 1946, 4, 132.
[4] Drummond, J. C., and Wilbraham, Anne, *The Englishman's Food: Five Centuries of English Diet*, 1939, Cape.

FERTILITY AND INTELLIGENCE

The Royal Commission on Population was set up in 1943 and issued its report[1] in 1949. During the course of its deliberations it considered not only the total decline in the fertility of the people but also the ageing of the population which resulted from this decline, the danger of the continuance of the decline in the next decades, the different rates of decline in fertility in the different sections of the population, and also the possible effects of the continuance of this differential fertility. Since the publication of the report there has been much discussion about the effect which differential fertility might have on the quality, as distinct from the quantity, of a population and in particular upon the national "intelligence." To define intelligence in a way that would be generally accepted has always been a matter of great difficulty. Moreover, there has been, and remains, much disagreement about the value of the various methods of test used in the measurement of this attribute and also about the extent to which it is genetic in origin. Another subject of controversy has been the suggestion that the differential fertility rates which are known to exist are leading to the disproportionate reproduction of the less intelligent sections of the population. The fifth volume[2] of the *Papers of the Royal Commission* contains the data which were presented by certain authorities about the relation between intelligence and fertility. Most of this evidence has appeared in the form of papers or books since 1944, and refers to the final report of a survey carried out in 1947 by a special committee of the Scottish Council for Research in Education,[3] which found a rise in the average intelligence quotient, but some of it is additional.

The evidence which was put before the Commission was derived from a variety of investigations of both selected and unselected groups of children and was concerned with the relation between the I.Q.s of children and the sizes of the families to which they belong. Certain matters are clearly not in dispute. Fertility is different in the different social groups, and it also varies within a given social group. There is some conflict of opinion about which of these differences is the greater. The highly intelligent within the population are less fertile than the average, and those of very low intelligence are even less fertile, but here again there is a disagreement about the extent of the difference. An attribute of a general kind which can be called intelligence is inherited in part, but the relative roles of nature and nurture in its fashioning still remain matters of speculation.

The main points made by the majority of the individual authorities who presented memoranda on this subject were that the negative correlation found between the I.Q.s of children and the sizes of the families to which they belong must necessarily mean that a progressive decline in national intelligence is proceeding; that the magnitude of this decline, estimated either directly or indirectly, is of the order of $1\frac{1}{2}$–3 points per generation; that the differences in the quality called "intelligence" between social classes are far less than are the differences within a particular class; and, finally, that much more evidence of the same kind as that presented to the Commission is needed—and also better methods for the testing of children—before final judgments can be made.

With these views Professor J. B. S. Haldane is not in agreement. He points out that in certain investigations it has been revealed that within a particular social class a positive correlation of parental intelligence with fertility exists. He shows that the data presented are not themselves sufficient to permit any firm conclusions to be based upon them, and suggests that it may well be that, among other influences, natural selection and mutation counteract any decline in national intelligence that might be a possible outcome of differential fertility. In his view it is imperative that an argument of this kind must be based upon knowledge of the genetic basis of this attribute "intelligence," and that before any prediction can be made it is necessary to know to what extent mating occurs between individuals of the same level of intelligence within a population and also what percentage of the extremes, above or below the average, marry and reproduce.

The possibility of a decline in the national intelligence is thus still a matter for argument. It seems unlikely that the additional knowledge that is needed can emerge from a repetition and extension of the investigations that have so far been carried out, and it is improbable that much more can be gained from the study of the I.Q.s of children alone. One complicating feature is that the rating of the child by the tests at present in use does not necessarily have any relation to what is considered intelligence in the adult: the worlds of children and of adults are different, and so are the qualities which make for success in both these worlds. The tests that are used for the measurement of intelligence may be of some value in the educational sphere; they measure an attribute in the child that is of definite importance in conventional schooling. But as yet there is no test which provides a complete assessment

[1] *Report of the Royal Commission on Population*, 1949. London: H.M.S.O. See leading article in the *British Medical Journal*, 1949, 1, 1127.
[2] *Papers of the Royal Commission on Population*, vol. 5, 1950. London: H.M.S.O.
[3] *The Trend of Scottish Intelligence*, 1949, London. See also leading article in the *British Medical Journal*, 1949, 2, 969.

of the qualities that make for success in the adult world. In fact there is no general agreement about what constitutes success of this kind. This being so, it follows that the intelligence of the future population cannot be assessed from the results obtained from intelligence tests of the children now within it. It is generally agreed that about half or three-quarters of the attribute measured by these intelligence tests is closely associated with the genetic endowment of the individual, but what is not yet known is the relative value to the adult of this portion of the individual's total intelligence, compared with the remaining half or quarter which is an acquisition and therefore subject to the influence of improving standards of living, of education, and of experience generally.

THRUSH IN INFANTS

The general belief that oral thrush is a benign disease of infants which scarcely merits attention is a dangerous illusion. Several publications in recent years have shown that serious complications are relatively common and often prove fatal. Thrush is caused by the fungus *Monilia albicans*, which is saprophytic to man except in conditions specially favourable to it. Such conditions occur in the mouth of the young infant and the vagina of the pregnant woman, for both possess acid secretions with an unusually high *p*H close to the optimal for this organism. This is the principal reason for the high incidence of oral thrush in early infancy and vaginal thrush in pregnancy, though low immunity is also a predisposing factor in the former. Ludlam and Henderson[1] and Anderson and his colleagues[2,3] demonstrated by repeated routine swabbing of the mouth in newborn infants that infection of the mouth with *Monilia albicans* in the neonatal period almost always causes thrush lesions within two to eight days, and they pointed out that the much higher incidence of bacteriological thrush than of recorded clinical thrush at this period of life is due to failure to recognize minor degrees of the latter. After infancy, however, infection of the mouth with this organism seldom if ever causes thrush lesions unless there is pre-existing disease, such as herpetic stomatitis. Todd[3] isolated the thrush fungus from the mouth in 14% of 1,000 healthy adults, none of whom developed thrush.

The characteristic greyish-white adherent colonies and plaques of oral thrush are most often seen on the tongue, but usually affect several parts of the buccal cavity. As a rule the lesions cover only a relatively small part of the mucosa at the height of the disease; there are no symptoms, and the infection gradually subsides. But such a benign course should never be assumed, for the disease may progress and cause fatal lesions in the alimentary tract or elsewhere. There is thus a potential danger in every case of thrush, particularly in premature and debilitated infants. It is impossible to estimate the incidence of extrabuccal thrush lesions, but in post-mortem examinations of infants they have been shown to be quite common. In severe cases of oral thrush the infection is more likely to spread down the alimentary tract than in mild cases and to reach either the pharynx or oesophagus or both. Several series of thrush oesophagitis discovered at necropsy have been reported. In this country Ebbs[4] found the infection in 22 infants under 1 year, and Ludlam and Henderson in 20 newborn infants, while Lederer and Todd[5] discovered 21 cases in a series of 204 post-mortem examinations on infants up to 12 months old. Invasion of the stomach and intestines is very uncommon. Ludlam and Henderson observed gastric lesions in four of their cases of oesophagitis in the newborn; Lederer and Todd reported lesions of the ileum in three infants with thrush oesophagitis and in one with pharyngitis. Lesions in the colon were found in two of Ebbs's cases. Macgregor and Henderson[6] described thrush ileitis in two premature infants, one of whom had oesophagitis and the other no detectable thrush lesions elsewhere. The diagnosis of extrabuccal thrush lesions is a matter of conjecture, and can generally be made with certainty only at necropsy; but the presence of oral thrush, which may require careful search, or the demonstration of *Monilia albicans* in films or cultures made from oral swabs or from the stools, should at least suggest the possibility of this infection in ailing infants in whom no other cause of illness can be found.

Severe thrush causes ulceration of the underlying mucosa, with consequent secondary infection by pyogenic organisms. In oesophageal infections a pseudomembrane may be formed. The lesions then become acutely inflamed, and painful if in the mouth, pharynx, or oesophagus. The infant looks ill, loses appetite, and may have difficulty in swallowing if the pharynx and oesophagus are affected. Regurgitation is another common feature of oesophagitis, and vomiting—sometimes associated with haematemesis—dehydration, and loss of weight may also occur. In such severe infections vomited matter may be aspirated by the weakly infant, with fatal results, either from sudden suffocation by occlusion of the main air passages or more often from aspiration bronchopneumonia. The thrush fungus can usually be found in inhaled foreign matter and inflammatory exudate, but seldom invades the bronchopulmonary tissues. Infection of the middle ear is an occasional complication: Lederer and Todd found the mastoid infected in 5 of 21 infants with oesophagitis. In large thrush lesions there is deep penetration of the mycelial strands with invasion of lymphatics and venules and, rarely, of surrounding structures. Organisms thus gaining access to the blood stream usually perish, but occasionally set up metastatic lesions in distant parts of the body. Several cases of *Monilia albicans* meningitis have been described, and Lederer and Todd reported two instances of metastatic thrush lesions in the kidneys. The same authors also found the hitherto unreported complication of empyema in two infants with thrush oesophagitis, and they showed that there had been a direct spread from the oesophagus by penetration of the mycelium through the oesophageal wall and parietal pleura. Septicaemia and pyaemia caused by secondary pyogenic invaders of thrush lesions, usually *Staphylococcus aureus*, are probably more common than metastatic lesions: Lederer and Todd observed this complication in five cases, one of which also had renal metastatic lesions.

The incidence of thrush is much higher in nurseries, where opportunities for cross-infection usually abound, than in the home. It is also much higher in bottle-fed than in breast-fed infants, because feeding utensils may be contaminated. Ludlam and Henderson found that in a maternity hospital infants with oral thrush excrete viable organisms in the stools and usually have infected hands. They also isolated the organism from pooled breast milk used for feeding premature infants, and from the fingers of nurses engaged in feeding infants. Aerial dissemination of the spores rarely occurs. The slightly higher incidence of oral thrush in the infants of mothers with vaginal thrush may be due to direct inoculation of the mouth at birth, but is more likely to be caused later by indirect infection from the hands of the mother. There is no doubt that cross-infection resulting from faulty nursing technique is the principal reason for the high incidence of thrush in nurseries. Where the danger of cross-infection exists the infants' mouths should be carefully inspected daily, and those who show the earliest sign of thrush, as of any other infection, should be isolated immediately. The application of gentian violet, 1% in aqueous solution twice daily, in the early stage of oral thrush usually checks the spread of the lesions and causes their disappearance within a week.

1 *Lancet*, 1942, **1**, 64.
2 *Amer. J. Dis. Child.*, 1944, **67**, 450.
3 *Amer. J. Hyg.*, 1937, **25**, 212.
4 *Arch. Dis. Childh.*, 1938, **13**, 211.
5 Ibid., 1949, **24**, 200.
6 Ibid., 1943, **18**, 186.

BACTERIOLOGICAL GRADING OF ICE-CREAM

The Regulations[1] introduced for the processing and heat-treatment of ice-cream "mixes" (and the increasingly effective methods of detection and supervision of excreters of enteric bacilli) have helped to make ice-cream safer. Because no laboratory test can guarantee the absence of pathogens there is a need for a reliable test of general bacterial cleanliness. This has been for some years the concern of a subcommittee of the Public Health Laboratory Service, which has recently issued the last of four reports.[2-5] The evidence submitted by the committee indicates that ice-cream can be examined for bacterial contamination in a simple and practical way by the methylene-blue test, the principles of which are the same as in the test applied to milk. The technique of the test was described in 1949.[3] In order to show latent contamination the reductase tube containing the sample and the dye must be pre-incubated in a water-bath at 20° C. for 17 hours. Provisional gradings are as follows: grade 1 fails to reduce methylene blue in 4 hours; grade 2 reduces in 2½–4 hours; grade 3 in ½–2 hours; and grade 4 in 0 hours—i.e., is decolorized on removal from the 20° C. water-bath.

Some early reports on this test seemed to indicate that it was too severe and did not reflect the degree of cleanliness or contamination. These complaints have been investigated and answered by the committee, the members of which were unable to detect the existence in ice-cream of any non-bacterial substance capable of reducing methylene blue. A complaint was also examined that the presence of aerobic spore-bearing bacteria of no hygienic significance was responsible for the failure of certain makers with good equipment to attain grade 1. It was found that these thermoduric bacteria were in fact responsible, in a small percentage of cases only, for grade 2 results when grade 1 might have been expected. But, as the committee points out, organisms of this type are a potential cause of food-poisoning, and their presence usually indicates imperfect cleansing and sterilization of plant. The committee also discussed the claims of other tests favoured by certain workers. The sampling and experimental errors of the plate count are numerous, and it has special disadvantages as a test for ice-cream, which is difficult to measure accurately because of its physical characters and contains bacterial aggregates unevenly disintegrated by the various methods used for homogenization. It is more costly and time-consuming than the methylene-blue test. The coliform test, which is also subject to large sampling errors, takes count of one group of bacteria only, and the presence of *Bact. coli* Type I (so classified on the basis of the 44° C. MacConkey broth test) does not have the same significance as in water examination, since these organisms in ice-cream classified as grades 1 and 2 were found mostly to be irregular types, presumably not of faecal origin. The methylene-blue test has been criticized because its results could not be related with those of the plate-count and coliform tests, but in view of the variable results given by the latter any close correlation would be surprising.

The conclusion is that the methylene-blue test is a satisfactory method for the bacteriological grading of ice-cream. Samples must be carefully collected, and the hygienic quality of ice-cream from any one producer must be judged on a series and not on a single sample. It is gratifying to learn that a steady increase in cleanliness has been observed during the last three years, for all who are concerned about methods of food handling in general know how much progress has yet to be made. A final point of

1 Ice Cream (Heat Treatment, etc.) Regulations, 1947. See annotation in the *British Medical Journal*, 1946, **2**, 584.
2 *Mon. Bull. Min. Hlth*, 1947, **6**, 60.
3 Ibid., 1948, **7**, 84.
4 Ibid., 1949, **8**, 155.
5 Ibid., 1950, **9**, 231.

practical importance is that the efforts of the producer may be vitiated by the practice common among retailers of keeping the serving-spoon in a jar of water which in warm weather rapidly becomes heavily contaminated with bacteria.

ASPIRIN AND CORTISONE

We mentioned in last week's *Journal* that the Ministry of Health is to distribute small quantities of cortisone and A.C.T.H. to selected hospitals, but this, of course, will not mean any slowing down of the search for substitutes for these substances which might have similar effects in rheumatoid arthritis and other diseases. The great interest shown recently in the use of deoxycortone acetate and ascorbic acid exemplifies this tendency, though, as it turned out, this treatment was ineffective.[1 2] The paper by Drs. J. B. Cochran, R. D. Watson, and J. Reid in this issue suggests a new approach to the problem by pointing out certain similarities between the action of aspirin and of cortisone in acute rheumatic fever. They observed acne, rounding of the face, and a reduction of glucose tolerance in a patient under treatment with aspirin for acute rheumatism, and they suggest that the development of a mild Cushing's syndrome during intensive salicylate treatment is not uncommon. The general similarities between the effects of salicylates and cortisone in the treatment of acute rheumatism are obvious. Both substances bring about a rapid relief from pain, an improvement in the arthritis, a fall in pulse rate and temperature, and a reduction of the erythrocyte sedimentation rate. Both prevent relapse so long as administration is continued. Neither can be said to be curative, though both seem to hold the disease at bay and to give the patient an opportunity to make his own recovery. Indeed, the introduction of salicylate therapy for acute rheumatism in 1875 must have raised many of the questions that have been asked more recently about the advantages and disadvantages of cortisone. The Glasgow workers support their contention that the two substances may have a common action in acute rheumatism by comparing the metabolic effects of salicylate therapy, which were recently reported in detail by Reid, Watson, and Sproull,[3] with those of cortisone. They refer in particular to the changes in sodium, potassium, water, and protein metabolism, though in so far as the last is concerned it is not clear whether the negative nitrogen balance noted by them in acute rheumatism is due to salicylate therapy or whether it may be present in any acute febrile illness. On the other hand, there are arguments against the possible common action of aspirin and cortisone. Among the diseases in which cortisone is of benefit, acute rheumatism alone responds in dramatic fashion to aspirin. It seems possible, though not yet certain, that cortisone may prevent the occurrence of heart lesions in acute rheumatism, while it is doubtful whether salicylates have any such effect. Cochran and his colleagues emphasize that the two substances cause alkalosis by different means, though they consider that this may be explained by differences in the doses commonly used. Possibly the occurrence of features suggesting Cushing's syndrome may be an expression not of aspirin therapy but of a large endogenous production of cortisone and other steroids as a part of the patient's reaction to his disease. As the authors recognize, there are many points requiring investigation before any final conclusions may be reached about their most interesting suggestion. It will be important to compare the metabolic effects of salicylates with those of cortisone in non-rheumatic subjects, and it would be interesting to know more about the metabolic features of acute rheumatism uninfluenced by salicylate therapy, though it is hardly justifiable to withhold such treatment.

[1] Copeman, W. S. C., *et al.*, *British Medical Journal*, 1950, 1, 1007.
[2] Quin, C. E., Mason, R. M., and Knowelden, J., ibid., 1950, 2, 810.
[3] *Quart. J. Med.*, 1950, **19**, 1.

ELECTRON MICROSCOPY

As with other new instruments, the successful use of the electron microscope demands knowledge of a practical kind. This is usually the last to be systematized, being inadequately covered both in conventional textbooks and in original publications, which for the most part are concerned with results. However, as instruments multiply, it becomes increasingly desirable that such information should be placed on record and that experience won the hard way should be shared with others. There are also points on which it is well that a wider audience should be informed. Electron microscopy is a technique of research from which the best value is often obtained in conjunction with other methods, as was well demonstrated by Cooper, Rowley, and Dawson[1] when they used it in conjunction with the radioactive tracer method to provide a virtually conclusive proof that the action of penicillin is within the bacterium and not on the cell wall. Such uses can become common only when there is a fairly wide knowledge of both the strength and the limitations of the method: for the contribution it can make will not otherwise be apparent to those with problems to present. There are also other matters—such as the degree of reliance to be placed on magnification figures, and the extent of distortion which is possible within a single picture—on which others concerned with interpretation may be in need of guidance.

For all these reasons the Royal Microscopical Society and the Electron Microscopy Group of the Institute of Physics have earned gratitude by their co-operation in producing a practical treatise which contains references up to 1949 and, through successive processes of editing, has been adequately systematized. Its origin was a meeting of British electron microscopists which was held at Hampstead in 1945. Draft articles were supplied by some 10 authors and edited by Dr. D. G. Drummond into a composite treatise, published in a typescript edition by the Institute in 1948. Further notes were written for a summer school in electron microscopy which was held at Cambridge in the same year, and additional material has been collected from original publications and conferences. The end-result is a treatise—in effect a complete issue of the Society's journal[2]—in which individual contributions, though acknowledged, are no longer recognizable. To obtain full benefit it should be studied as a whole, and it may be hoped that many concerned with the use of electron microscopy may be induced to do so. Chapters on basic techniques and on the calibration of magnification and resolving power are common to all uses. From the latter it may be learnt that the repeat patterns on certain diatoms have proved of value as working standards and that, with further improvements in instruments, the particles of a plant virus may prove still more satisfactory. A serious point to be noted is that the assignment of magnification figures is a matter of difficulty, and that uncertainties of the order of 10% are to be expected. Chapters of specifically medical interest deal with airborne particles, micro-organisms, and biological tissues.

[1] *Nature, Lond.*, 1949, **164**, 842.
[2] *J. R. micr. Soc.*, 1950, **70**, Pt. 1, 1–141.

ANAESTHESIA IN THE NEWBORN

With increasing refinements in the surgical treatment of congenital abnormalities more newborn infants are likely to be operated on than a few years ago. To keep pace with surgical advance anaesthetists must readjust their approach to the anaesthesia of these very small patients. Local analgesia is still the choice of many surgeons, but if general anaesthesia can be used with safety to the child and at the same time provide a quieter field for the surgeon it is likely to replace regional infiltration, as it has done in other difficult operations. What the anaesthetist has to try to develop is a technique which overcomes the resistance in the infant's air passages, avoids excessive rebreathing, and maintains light anaesthesia. Respiration in the neonatal period is normally accomplished by the diaphragm and abdominal muscles, with very little thoracic movement. An effect of the infant's relatively large body surface is seen in the comparatively large respiratory minute volume at this time. In the newborn it is 838 ml., compared with 7,100 in the adult. Measured per kilo of body weight, it is 239.5 ml. and 101.5 ml. respectively. The larger value in the infant appears to be the result of rapidity rather than of depth in breathing, since its tidal air volume is about 19 ml. and the vital capacity 170 ml. Anatomically, the infant's tracheobronchial tree is adapted to counteract the comparatively small area available for respiratory exchange, and, as Dr. G. Jackson Rees mentions in his paper published on another page, the area of the cross-section of the trachea in the newborn is twice that at twelve months in proportion to the lung volume. Snyder's work on rabbit foetuses of varying maturity has shown the great sensitivity of the respiratory centre to the lack of carbon dioxide. His experiments indicate that a certain level of carbon dioxide is essential for the maintenance of foetal respiration. However, it still remains to be shown whether or not the chemical regulation of the breathing before birth is the same as that following delivery. Therefore the newborn infant cannot be relied on to react to varying concentrations of carbon dioxide in the same way as the foetus, even if the latter is post-mature.

The moderately asphyxiated newborn infant registers a definite objection to the insertion of an endotracheal tube, but, as Rees states, the infant is unable to exhibit the reflex contractions of the cervical muscles which are seen in the adult. The observable reactions of the infant are an active pharyngeal reflex and a facial appearance of being on the point of crying. But under light anaesthesia the facial sign is absent, and the only sign then present on insertion of an endotracheal tube is a disturbance of respiratory rhythm. *X*-ray photographs of the newborn, taken at intervals from birth to about twenty-four hours after delivery, show increasing quantities of air in the gastro-intestinal tract. The entrance of air inevitably causes crowding of the abdominal cavity. This and the diaphragmatic breathing peculiar to the newborn tend to cause turbulence in the operative field—an added difficulty for the surgeon. Fortunately, natural conditions can be used to ease the anaesthetist's task. Because of the relative absence of muscle tone in infants their lungs can be artificially ventilated with very low pressures, a process impossible in the average adult; and the rapidity with which acapnia occurs allows easy control of respiration.

TREATMENT WITH HEPARIN

The increasing use of anticoagulants brings to the fore the need for an agent that is safe, effective, easy to control, and convenient to administer. No such agent yet exists. Owing to the difficulty in controlling dicoumarol and similar substances, and the grave risks attached to overdosage, attempts have been made to find a more convenient way of administering heparin, which is certainly the safest and most effective anticoagulant. It is, however, still expensive. Up to the present time heparin has usually been given in hospital by intravenous injection; Gunnar Bauer[1] has recently described the results obtained over a nine-year period at the Mariestad Hospital, Sweden. In an article in this issue Dr. D. G. Abrahams describes the effects of intramuscular heparin. He obtained satisfactory prolongation of the clotting time by giving 25,000 units twice a day. Such dosage may be kept up for two or three weeks or even longer. If heparin is to be used in this way in general practice it is necessary that the complications should be fully recognized. Wood[2] has discussed these in his description of heparin therapy. Abrahams says that local pain may be satisfactorily overcome by the simultaneous injection of 1–2 ml. of 1% procaine. It is only fair to point out, however, that, although this prevents immediate pain, marked discomfort may arise an hour or two later. Again, local bleeding is common rather than "very occasional," and may be extensive. Patients should certainly be warned that bruising may occur, and that it need cause no alarm. Over the past few years quite a large number of patients have been treated with intramuscular heparin in their homes, on the whole successfully, and, so far as is known, safely. A satisfactory dose is 15,000–20,000 units intramuscularly with 1–2 ml. of 1–2% procaine; this may be given twice daily to an adult without danger. Clotting times can be estimated occasionally to make sure the dose is adequate, but are unnecessary as a precaution against overdosage (unless larger doses are used). The chief indications for heparin therapy include thrombophlebitis, phlebothrombosis, acute peripheral arterial occlusion, and severe or complicated cardiac infarction. Treatment should be continued for two to three weeks. As a rule general practitioners should seek expert advice before embarking on a course of heparin injections.

We announce with great regret the sudden death of Sir Leonard Parsons, F.R.S., in Birmingham on December 17. He was 71 years old.

[1] *Angiology*, 1950, **1**, 161.
[2] *Diseases of the Heart and Circulation*, 1950, London.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE TREATMENT OF LUMBAR DISK LESIONS

BY

JAMES CYRIAX, M.D.

Physician to the Department of Physical Medicine, St. Thomas's Hospital

Much confusion exists on this subject. Some years ago the main difficulty was to appear credible when attributing such well-known conditions as lumbago, fibrositis, and sciatica to so recent a discovery as a disk lesion. Now that the diagnosis has become widely accepted, medical men have found themselves in a therapeutic quandary. Traditional measures such as drugs (apart from analgesics), radiant heat, diathermy, massage, exercises, injecting nodules, and "taking the waters" have suddenly lost their last vestige of theoretical justification. Little has so far come forward to replace these abandoned types of "treatment"; and the distress of doctors and patients at the apparent absence of effective conservative measures is heightened when they find out that the only radical treatment is an operation—by no means always successful—warranted only in extreme cases.

This therapeutic nihilism is quite unjustified, for there are a number of simple treatments, none a panacea, each with its due proportion of successes. Few patients prove unrelievable if conservative means are intelligently employed, and it is only for some of these few that surgery need be contemplated at all.

Prophylaxis

Realization that disk protrusion is very common and that maintenance of the lumbar lordosis provides the main safeguard against this phenomenon is proceeding slowly. Aesthetic considerations have held the foreground for a century, and it is difficult now to get gymnasts to realize that a reasonable degree of lordosis in children is a great advantage in later life (see Fig. 1). School medical officers can see to it that exercises towards trunk flexion (see Fig. 2) are carried out sparingly, and that, unless marked kyphosis is present, no effort is made to flatten school-children's lumbar spines. If any individual cannot reach forwards far enough to touch his toes he must not be encouraged to practise this useless range of movement. Adult women's backache often dates from lying in bed in "the nursing mother's position"—that is, many pillows propping the thorax and no proper support at the lumbar spine, which droops into kyphosis all day. No wonder the posterior longitudinal ligament finally stretches and the beginnings of disk protrusion are laid down. All patients, including puerperal women, should lie flat when they have no reason to be sitting up, and as soon as their condition permits they should turn and lie prone for several periods each day

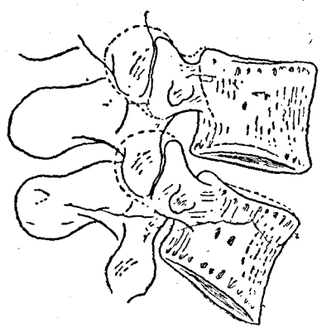


FIG. 1.—Joint space in extension. Tracing of *x*-ray photograph of the four h lumbar intervertebral joint in a normal subject, bending backwards. Note that the front of the joint space is ¼ in. (1·25 cm.) wide, but the back only 3/16 in. (0.5 cm.). In this position backward movement of the intervertebral disk is virtually impossible.

Industrial medical officers can help by arranging that weights are presented to workers at a proper level and by showing them how to lift safely. Since an attack of disk protrusion is clearly an industrial accident, they can also save their firms much money in this way. Builders can put in sinks at a higher level than has hitherto been customary, and so on. The makers of car seats are among the worst offenders; these are so shaped that it is all but impossible to maintain a lordosis while sitting in a front seat.

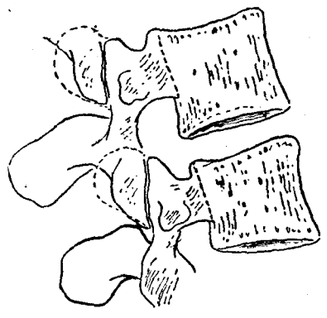


FIG. 2.—Joint space in flexion. The same subject as in Fig. 1, bending forwards. The joint space is now 5/16 in. (0.8 cm.) wide in front, and ¼ in. (0.6 cm.) behind.

Manipulation

Naturally if something is out of place the most obvious treatment is to restore it to its proper position and then maintain it there. Therefore, unless some good reason exists, manipulative reduction should be attempted at once. This measure is universally adopted when a torn meniscus in the knee-joint has moved, but it has been left largely to osteopaths to reduce cartilaginous subluxations at the spinal joints. Without realizing it, they have been doing so for years, to the recurrent discomfiture of doctors. When one considers how unskilled many lay manipulators are and how faulty are their views on the nature of the disorder under treatment; when, too, one remembers for how many years patients with severe disk lesions have been manipulated—often without benefit, it is true, but also without hurt—even under anaesthesia by medical men, it is evident that the present change of front towards emphasizing the dangers of manipulating the lumbar spine represents too great a swing of the pendulum.

The first decision that has to be made is whether the displacement is reducible or irreducible by manipulation. The reason for the two different responses to manipulation is anatomical. Protrusions may consist primarily of a fragment of annulus fibrosus or of nuclear material with an intact annulus. R. H. Young, in an analysis of cases coming to laminectomy, showed that in 56% of his cases the protrusion was cartilaginous, and in 44% pulpy. My impression is that in patients not requiring operation the

proportion is more like two cartilaginous protrusions to one pulpy. Manipulation can, of course, reduce a cartilaginous displacement but cannot affect a pulpy protrusion; this, by contrast, can nearly always be made to ooze back into position by gradual means. Thus the first major decision—whether or not manipulation should be attempted—rests on an evaluation of the symptoms and signs differentiating a nuclear from an annular protrusion. These are set out below.

Differentiation of Cartilaginous from Pulpy Protrusions

The history is often indicative. For example, a patient bends forwards and feels some aching in his back, which gets worse later in the day. Next morning he finds himself unable to get out of bed because of severe lumbago. This history indicates a protrusion that has gradually

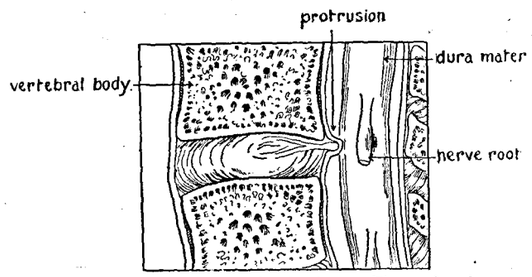


FIG. 3.—Pulpy protrusion causing lumbago. The nucleus has protruded backwards, the annulus remaining intact (after R. H. Young). Manipulation is unlikely to succeed; sustained traction or recumbency is effective.

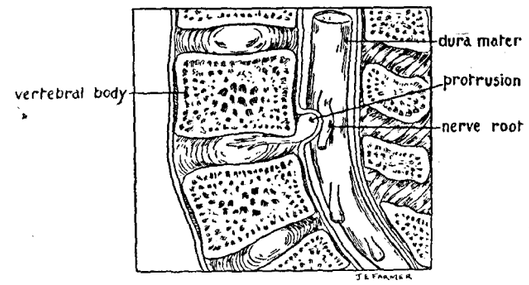


FIG. 4.—Pulpy protrusion causing sciatica. The protrusion has increased in size and has passed postero-laterally. As a result the pressure on the dura mater is released but the nerve root is severely squeezed (after R. H. Young).

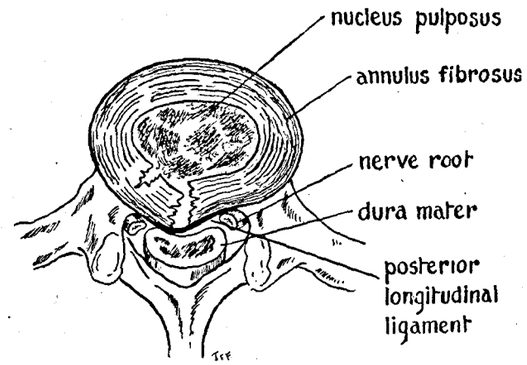


FIG. 5.—Cartilaginous protrusion causing lumbago. The annulus is cracked and hinged. Reduction by manipulation should be simple.

increased in size—that is, one consisting of nuclear material (see Figs. 3 and 4). By contrast, the patient who is subject to attacks initiated by a click in the back followed by agonizing lumbar pain fixing him in flexion has clearly suffered an abrupt cartilaginous displacement (see Fig. 5). Pulpy protrusions are rare in the elderly; hence any protrusion in a patient aged 60 and over, especially if lumbar osteo-arthritis is present, is almost certainly reducible by manipulation, whether causing lumbar, gluteal, or sciatic symptoms.

Primary postero-lateral protrusions causing sciatica are nearly always irreducible by manipulation. This is indicated when a patient with a low lumbar disk lesion states that his pain began in the calf or thigh without previous backache. Naturally a central displacement impinges first against the dura mater, thus causing backache before it sets up sciatica; primary postero-lateral protrusions never touch the dura at all, hence premonitory backache is absent.

Another type of history characterizes the self-reducing disk lesion; in such a case manipulative reduction may well succeed there and then, but brings only a few hours' relief. The patient wakes comfortable, and as the day goes on backache appears and becomes slowly more severe, especially if he stoops or lifts. A night's rest once more abolishes the pain. Naturally, if the posterior bulge at the joint recedes spontaneously as soon as the stress on the joint ends, only to recur when the joint is made to bear weight again, the reduction brought about by manipulation is equally unstable and ephemeral. Manipulation carried out at a time when no displacement is present is, of course, quite pointless.

A similar history characterizes what I have named the "mushroom phenomenon." In an elderly patient, backache accompanied by bilateral sciatica comes on after about 10 minutes' walking or standing and is abolished as soon as he rests. It is often mistaken for intermittent claudication. *X*-ray examination shows that the joint space



FIG. 6.—*Anterior disk protrusion.* All the disk substance has passed forwards and lies enclosed between two large osteophytes. The intervertebral space has disappeared.

at, usually, the fifth lumbar level has disappeared, the disk substance being displaced forwards and lying as a round ball between two large osteophytes (see Fig. 6). Anterior protrusion proceeds silently, causing no symptoms until the disk has been ground to pieces and the compression of weight-bearing causes capsular bulging all the way round the joint. The posterior component then irritates both the dura mater and the nerve roots. This lesion is difficult to treat and seldom responds to manipulation.

Referred rectal, penile, or coccygeal pain, paraesthesiae felt in the scrotum, or a complaint of difficulty in micturition may indicate a protrusion imperilling the lower sacral roots. Since the important danger of manipulation in an unsuitable case is lasting urinary incontinence, I regard this type of referred pain as contraindicating manipulation. Not having attempted it in such a case, I naturally cannot be sure to what extent this apparent danger is real.

Of the physical signs, the appearance of the patient's back is the most informative. Lateral deformity of the lumbar spine when he is viewed standing still, or apparent when he bends forwards, indicates a protrusion that has gradually increased in size until it visibly interferes with joint movement. A cartilaginous displacement does not get larger; a pulpy protrusion can; hence considerable lateral deviation indicates irreducibility. I have also found that reduction by manipulation is difficult, at times impossible, in patients whose most painful movement is side flexion *towards* the painful side.

Marked neurological signs should be taken as an indication of irreducibility, whether the lesion was originally of cartilage or pulp. Displacement of a fragment of annulus may later be followed by extrusion of nuclear material along the line of the fracture. This leads to severe compression of the nerve root and proportionate interference with conduction. Thus, weakness of more than one muscle in the leg, combined with, say, loss of ankle-jerk, cutaneous analgesia, or much gluteal wasting, shows that this secondary effect has supervened.

A disk lesion at the unstable joint resulting from spondylolisthesis is treated in the same way as an ordinary disk lesion.

Technique of Manipulation

Manipulation, then, is carried out unless a contraindication exists. Anaesthesia must be avoided; for the patient stands up after each repetition so that he can judge the effect on his pain and the manipulator can assess any change in the range of movement. The patient lies prone on a firm couch 15 inches (38 cm.) high and various manual pressures are applied at the appropriate lumbar level. If these fail, rotation strains should be tried. If manipulative reduction is attempted in this careful way aggravation can be certainly avoided. However, this treatment may require two or three repetitions and an adequate session may last half an hour, hence it is my practice to delegate almost all this work to physiotherapists trained—as all our students are—in these methods. Few doctors have time, inclination, or a suitable couch for carrying out such manœuvres themselves; moreover, these have in practice been found suited to delegation.

Other Treatments

When manipulative reduction is contraindicated or fails, less satisfactory methods have to be tried.

Sustained Traction

Sustained traction is the method of choice for ambulant patients with pulpy herniations whose symptoms warrant treatment. Distraction at the affected joint has two effects. (1) Increase in the interval between the vertebral bodies, thus enlarging the space into which the protrusion must recede. (2) Tautening of the joint capsule. Naturally, when the slack is taken up, the ligaments joining the vertebral bodies exert centripetal force all round the joint; this tends to squeeze the pulp back into place. Thus, sustained traction merely represents a way of achieving in a very short time the same effect as rest in bed for some weeks.

Bands encircle the patient's mid-thorax and pelvis as he lies on the traction couch (see Fig. 7); they are attached to

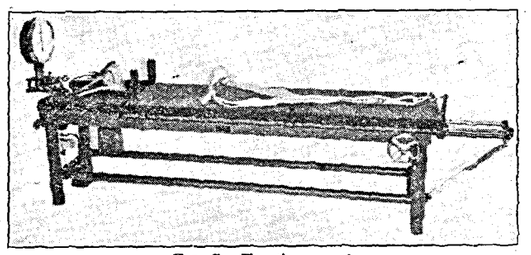


FIG. 7.—Traction couch.

hooks at the head and foot of the couch. The greatest possible traction that he will permit is then applied for as long as is reasonable. In practice, 200–300 lb. (91–136 kg.) is applied for two or three periods of 20 minutes each with, say, five minutes' rest between whiles. The longer the patient can stand the traction, the more effective it becomes. This treatment is carried out daily until he is well; and this takes one to two weeks.

Sustained traction is useless for the reduction of cartilaginous displacements; these have to be clicked back. Manipulation during traction, however, is sometimes called for in difficult cases, but is not often much of an improvement on manipulation alone.

Recurrence after laminectomy is distressingly common and in my experience hardly ever relievable by manipulation. By contrast, sustained traction may be successful.

Epidural Local Analgesia

The injection for epidural analgesia is regarded as difficult and dangerous by some authorities. So far I have used this method on out-patients more than 10,000 times without ill effect and have found it impossible to introduce the needle properly in less than 1% of all cases. There are three main indications:

1. In acute lumbago the cause of the pain is a central posterior protrusion impinging on the dura mater. If this membrane is anaesthetized by 50 ml. of 0.5% procaine, introduced extrathecally via the sacral canal, the protrusion presses on a membrane no longer sensitive and all pain ceases for the duration of the analgesia—that is, one to two hours. During this time a patient can move freely, perform some essential work, or go home to bed. He can be manipulated during local analgesia. Often, as a result of the free active joint movement obtained, he succeeds in himself initiating reduction; hence the infiltration is often followed by a large measure of lasting relief.

2. Persistent lumbar or sciatic aching *after* reduction of a prolapsed disk may prove troublesome; it is apparently due to persistent local bruising of the dura mater. One or two epidural injections usually suffice to stop it.

3. Chronic backache, especially if it is more severe at night than by day, associated with only slight articular signs at the lumbar spine can often be lastingly abolished by one induction of epidural local analgesia.

Recumbency

This is the traditional treatment for both lumbago and sciatica; though tedious and time-consuming, it is regularly effective in the end. It brings about reduction by abolishing the compression factor at the affected joint. The more severe the symptoms—*not* the signs—the more is recumbency both called for and welcomed. In sciatica the pain may not begin to abate for the first two days and the patient may insist on getting out of bed to walk about the room. Though this may bring slight temporary relief, it postpones the initiation of reduction. Hence the patient should receive enough analgesics, usually morphine, to keep him quietly resting for the first day or two. As soon as he can, he must lie supine with a small pillow under his lumbar area and only one under his head. This maintains his lordosis—that is, keeps the front of the joint as open as possible. In this position the articular contents tend to move anteriorly, away from the dura mater or nerve root. Patients with sciatica should be kept in bed until straight-leg raising is painless at full range. No one should be kept in bed until all the neurological signs recede, for these may take months to disappear; indeed, an absent ankle-jerk may never return.

Patients in severe pain, with marked weakness of the muscles controlling the foot coming on in, say, less than a week from the onset of sciatica, should be put to bed at once. The mild discogenic backache that so many people experience is usually unaffected by recumbency; sometimes it makes it worse.

Spontaneous Cure

Backache shows little tendency to spontaneous cure; it may last, or recur, during a patient's whole lifetime. Sciatica, however, nearly always gets well of itself in about 12 months. The two exceptions are: (*a*) after laminectomy this does not happen, and sciatica may then persist for years; and (*b*) after the age of 60 spontaneous cure with the lapse of time is improbable.

Young patients with sciatica are sometimes seen showing clear evidence of a pulpy herniation, at a low lumbar level, of some months' standing. The pain often amounts to only an ache; the patient has a cheerful demeanour and sleeps well. Examination shows a symmetrical lumbar spine when he stands upright, lateral deviation on attempted flexion, 45 degrees limitation of straight-leg raising on one side only, and slight neurological signs. Treatment is not called for, except epidural local analgesia, which sometimes lastingly diminishes the pain, and the patient can safely be advised merely to await spontaneous cure. This takes place by erosion of bone at the posterior aspect of the vertebral body, the displacement becoming accommodated in a situation where it no longer presses on anything sensitive and from which redisplacement is impossible. Hence patients who get well by awaiting erosion appear thereafter no more liable to sciatica than normal people. This is an important point, for the only alternative treatment in these cases is laminectomy, which, however successful it may be, cannot afford the patient comparable security from recurrence.

The tendency to lumbago often ceases spontaneously between the ages of 50 and 60. As age advances, the spinal joints stiffen and osteophytes, both cupping the disk and limiting articular movement, make their welcome appearance.

Laminectomy

This is to be avoided as far as possible, but operation should not be unreasonably withheld. In the best hands the results are far from perfect; immediate cure is not always secured and eventual recurrence is regrettably frequent, even in patients who never go back to heavy work. The three main indications are:

Gross Lumbar Deformity.—A young patient should not be left to recover spontaneously from sciatica or—less often—backache causing marked persistent lumbar deformity. Though he may recover as regards pain, the deformity remains permanent.

Incipient Drop-foot.—A patient who develops increasingly pronounced weakness of the dorsiflexor muscles of the foot must be warned, so that he may choose between laminectomy and a permanent weak foot. In such cases pressure atrophy may cause complete insensitivity of the nerve root; as a result, pain is abolished and straight-leg raising quickly reaches full range; at the same time the palsy becomes complete. The patient, concerned as he has been with his pain, is apt mistakenly to believe himself to be improving; unless his foot is examined, the doctor may be led to share in this error.

Intractable Severe Pain.—Care should be taken to make sure that the physical signs present are in proportion to the symptoms. Instances of laminectomy performed for hysteria are, in my experience, on the increase. On the whole, the worse the symptoms and signs are before the operation, the better the result.

Arthrodesis

Arthrodesis is the operation of choice in spondylolisthesis causing sufficient local capsular pain, or setting up traction on the relevant lumbar nerve roots with consequent bilateral sciatica. It is the only effective treatment for anterior protrusion of the whole disk (mushroom phenomenon), and is well worth carrying out in patients under 60. It is also indicated in recurrence after laminectomy if conservative measures fail.

Prevention of Recurrence

Advice to the Patient

The mechanics of lumbar disk protrusion must be explained to the patient, who often imagines that septic foci, choice of food or underclothing, or damp working conditions affect his back. He must be told that so long as his lumbar spine is held in lordosis the joint tilts so that the front is more widely open than the back; in this position movement backwards of the loose part of the disk is virtually impossible (Fig. 1). He must be shown how to stand, sit, bend, and lift, using his knees rather than his back. Neurosis is prevented by explaining that the disorder is purely mechanical, and not the precursor of a crippling disease capable of spreading to other parts of the body. With some exceptions he can go on doing whatever he did before; it is, merely the way of doing it that has to be changed.

Patients who find that bending forward hurts often practise this movement vigorously, hoping thus to overcome what to them appears stiffness. This movement defeats its own ends by tending to increase the degree of posterior protrusion. Well-meaning friends often urge exercises on patients with backache; these are all at best harmless. In most hospitals only prone-lying trunk-extension exercises are now prescribed; this is a great advance. They do, however, have two disadvantages over the avoidance of active exercises altogether: (1) When the sacrospinalis muscle contracts it first compresses the spinal joints as far as they will go; it is only when this slack has been taken up that the extension movement begins. (2) The greater the mobility at a joint containing a fragmented meniscus, the greater the liability to internal derangement.

Hence exercising the joint towards *full* extension is less satisfactory than maintaining it as still as possible in *slight* extension.

Support

A Plaster Jacket.—This is a method in great vogue at the moment, but I believe it is seldom worth the discomfort it entails. It is usually employed wrongly—that is, in the hope of securing reduction rather than of maintaining it. It is a mistaken policy to put a patient with an annular protrusion into plaster, for I have reduced such displacements by one manipulation after as long as six months' vain immobilization. By contrast, pulpy herniations do sometimes reduce themselves slowly in plaster, but these are the simple ones that do so much more quickly when treated by sustained traction or recumbency. The results of treating sciatica with and without a plaster jacket do not appear significantly different. It is a palliative measure useful for relieving acute symptoms. Moreover, I have found that patients with gall-stones, peptic ulcer, or merely prone to indigestion usually cannot tolerate plaster; neurasthenic patients with disk lesions demand the removal of the cast within a few days. It is thus only in the exceptional case that plaster is required. One untenable reason for immobilization has been expressed: that rest in plaster allows the broken cartilage to unite. Intra-articular cartilage has no blood supply, therefore it cannot heal at a spinal joint any more than at the knee-joint. The real indication for a plaster jacket is—as for a fracture—the maintenance of reduction in cases of marked instability until a bespoke corset is ready. If a good corset cannot be obtained in a few days, and the patient keeps having recurrences, a plaster jacket may be kept on until the corset is ready.

A Corset.—Whereas a plaster jacket cannot be worn for longer than some months, and thus cannot provide lasting protection against recurrence, corsets, renewed each year or two, can be worn indefinitely, thus affording permanent security. If the two steels are accurately moulded to the lumbar curve, lordosis is maintained and the joints steadied. Moreover, if the patient bends too far forwards or sags as he sits, the front of the corset presses unpleasantly against his lower ribs—a salutary reminder.

Repeated crippling attacks of internal derangement in spite of adequate precautions once more raise the question of laminectomy.

Figs. 3 and 4, which appeared originally in the author's book *Osteopathy and Manipulation*, are reproduced by kind permission of the publishers, Messrs. Crosby Lockwood and Sons, Ltd.

The total number of administrations of analgesia given by midwives in the domiciliary midwifery service in London during the first six months of the present year was 4,929, or 66% of all the confinements which the midwives attended. This applies to all classes of midwives, those of the L.C.C. and of the District Nursing Association and the hospital district midwives. It is stated that the opportunity of receiving analgesia is given in all cases. The confinements where it is not recorded as having been administered consist mainly of those attended by doctors (concerning which no information is available of the analgesia or anaesthetic administered), women who do not wish to receive analgesia, women who are medically unfit for its administration, and confinements where labour is precipitate. All the 123 L.C.C. midwives, the 30 midwives employed by district nursing associations, and the 84 employed by hospitals on district work are qualified to administer analgesia. The percentage of confinements in which analgesia is administered has risen steadily. For L.C.C. midwives alone, the percentage of confinements in which analgesia was administered was 34 in 1948, and 68 in the first six months of 1950.

MARS AND AESCULAPIUS

A NEW ZEALAND MEMORIAL ORATION

BY

Sir ARTHUR PORRITT, M.Ch., F.R.C.S.

[*During his recent visit to New Zealand, his native country, Sir Arthur Porritt delivered an oration at the biennial meeting of the New Zealand Branch of the British Medical Association. The oration was the first to be given in memory of members of the New Zealand Medical Corps who lost their lives in the two world wars. We print below an abridged version of an address which must have given special pleasure to its audience.*]

This address must perforce to some extent be personal, but it is my aim to draw from these personal reminiscences deductions which may help to provide such practical and constructive answers to some of our national, professional, and individual problems as one feels would have been endorsed by those whom we are remembering to-day. In the main they were not dramatic heroes, they were not military geniuses, nor were they giants of the medical and scientific world. They were good New Zealanders; good doctors, and our friends, welded together in an inflexible purpose by the furnace of war.

Hence my title—Mars, the god of war, and Aesculapius, the god of medicine. Mars was always represented as a powerful, eager, virile youth (not the helmeted blood-stained brute of modern cartoons), and Aesculapius as an old bearded man, slightly bent, and leaning on a staff around which was entwined a serpent, the emblem of wisdom. The legendary end of Aesculapius is sad and yet prophetic. As a result of a complaint laid by Pluto that mortals were dying too slowly (presumably thanks to the good offices of Aesculapius), and that therefore Hades was being depopulated, Zeus slew him with a thunderbolt. It is comforting to remember, however, that, at the request of Apollo, Zeus subsequently placed Aesculapius amongst the stars for ever and ever, thus symbolizing medicine in perpetuity. . . .

It is from two angles, therefore, that I wish to speak of those of our friends who have gone on—as New Zealanders and as doctors—broadly, though not entirely, in relation to the two cataclysms through which most of us have passed during the last few decades. When one thinks of these last fifty years—Edwardian comfort and complacency, the rude awakening of 1914–18, the spurious artificial prosperity and depression of the inter-war period, the second holocaust, and the years of inevitable reaction, with the stark realities of moral and economic failure lurking just round the corner—is it any wonder that those who have lived five generations in one should feel some measure of instability, should find it difficult to assess their values, should perhaps feel older than their age, and should search consciously or unconsciously for some firm rock of faith to which to cling?

I feel that those we honour to-day had found such a rock. They were New Zealanders. Let us not shut our eyes to the fact that with a short history of little more than one hundred years we have a great tradition. . . . In this young country few of us have got beyond the third generation of New Zealanders, but our grandfathers and fathers were of rugged stock—independent, God-fearing, self-reliant—the real pioneers. Their legacy of virility and stout-hearted adventure has been intensified by the lovely country of our birth. . . . Most of us know far too little of this country of ours—its history, its economic assets, its development, its wealth of beauty in scenery and flowers and birds. It should be impressed on every New Zealand child that so far as his circumstances allow he should aim to know his own country inside out before he travels from its shores.

The New Zealand Soldier

[Sir Arthur Porritt went on to speak of three groups of New Zealanders who had helped to put the country "on the map" during the last 30 or 40 years—the New Zealand Divisions in two world wars, New Zealand athletes and sportsmen, and certain noteworthy individuals, such as Lord Rutherford in science, Sir William Marris in diplomacy, and Sir Harold Gillies and Sir Archibald McIndoe in medicine. Of the New Zealand soldier he said:]

New Zealand had produced some doughty fighters in the Boer war, but it was the 1914–18 war which first really brought them to the fore as a national military entity. Their deeds of derring-do in the Middle East, in Gallipoli, in France, carried out with a dash which would have been almost bravado had they not been accompanied by a steely discipline and precision such as might have been expected more from seasoned regulars than from casual volunteers, their morale, comradeship, and friendship became by-words in the British armies. Their record has proved to be one which even another and greater war and thirty intervening years have not dimmed in perspective.

[Here, before passing to some personal reminiscences of the Second New Zealand Division, Sir Arthur Porritt mentioned that one of the original band who went with the First Expeditionary Force to Samoa in 1914 and ultimately returned to New Zealand in 1919—a doctor and a soldier—was to his great delight present on this occasion: the orator's father (Dr. E. E. Porritt, F.R.C.S., of Wanganui, N.Z.).]

During two years' service with the British Army in the Middle East in 1941–2 I personally saw much of the Second New Zealand Division from a medical angle. The medical officers of that division and its attendant military hospitals were my contemporaries and friends of Otago days. I do not think there was a New Zealand hospital in the Middle East that I did not find excuse to visit at some time during that period.

At work in a British unit and generally unrecognized as a New Zealander, it was a great joy to me to hear the constant and repeated praise of the New Zealand Division, not only as a fighting force but as individuals. . . . It was always a great delight to me to have New Zealand patients in the six to seven hundred—sometimes a thousand—surgical beds of my division, and I like to think that to those patients it was a consolation to find a New Zealander in charge. At one time after Greece and Crete we had well over 500 New Zealanders in at the same time. Nor did the liaison stop there. One of my best surgical specialists was a New Zealander, and so was the British consulting surgeon to the Middle East—a well-known character to most of you—General "Jock" Monro. I feel it is not my province to trace that historical pilgrimage from Alamein to Tripoli, to Sicily, and on to Italy in detail, but I should be lacking in my bounden duty if I did not underline the enormously stimulating effect the New Zealand Division obtained from its quite unique leadership. Here was a New Zealander of New Zealanders, whose inspiring personal example, apart altogether from his military genius, was almost enough by itself to ensure the success of any formation. As a soldier, as a sportsman, as an individual, Sir Bernard Freyberg has certainly done his fair share in putting New Zealand "on the map."

[After referring to the popular welcome of the New Zealand soldier in the home country, Sir Arthur Porritt mentioned the sportsmen and athletes of New Zealand. New Zealand had just had the honour of staging the first post-war and "biggest ever" Empire Games, which had been an unparalleled success.]

Here in the development of a thousand friendships through a common interest in sport lies one strengthened link in the chain of the Empire. Furthermore, to those of us who are doctors these games should embody the ideal of national physical fitness. In New Zealand the standard is already high. Let us strive not only to maintain but to raise it. A life without health is less than a life, a nation without health is at best second-best, an empire without health is on the way out. The future of medicine undoubtedly lies not in curing diseases but in maintaining health.

[In mentioning some New Zealand achievements in sport he spoke of the exploits of Jack Lovelock—"an Aesculapian like ourselves." "I can see him now in that gigantic stadium in Berlin . . . a seeming pygmy among giants, but with superb track sense and an inflexible determination to succeed, run the best eight milers off their feet to register New Zealand's first athletic Olympic victory in record time."]

Expatriate New Zealanders

[Reference to some famous New Zealanders in the world of affairs brought him to one controversial point which should not be glossed over.]

They are all expatriate New Zealanders. How does it come about that their great work has been done elsewhere? In many cases it is sheer force of circumstances; in others the lack of facilities sufficient to allow them adequately to exhibit their skill and ability to the full. In neither of these eventualities need New Zealand accept any blame, for blame there is none, on either side. Nor need she bemoan her loss, for such men do infinitely more to enhance her prestige in the world at large by remaining outside her shores than, with the inevitably limited facilities available, by staying in New Zealand.

Let us admit frankly, however, that this by no means answers the whole question, and it would seem a matter of no small importance in New Zealand's present stage of development to restrict to a very definite minimum this export of brains she badly needs. This is a matter for politicians, educationalists, and industrialists alike. Too many good young New Zealanders in varied fields of activity go or are sent abroad to widen their experience and extend their knowledge, and, having done so, find to their great disappointment that New Zealand makes no attempt to encourage their return, and that if they do come back reasonable opportunities are unobtainable. This state of affairs can and should be remedied. Spending of money—even State money—on worthy objects can often in the long run be an economy, and what more worthy object than a young New Zealander specially trained in his own particular sphere who wishes to devote his talents to his own country?

[He then spoke of New Zealand doctors, nearly all of them, like himself, graduates of Otago University.]

New Zealand graduates in pre-war days were accepted at face value—known to be well-trained, skilful doctors. They still are, but not perhaps to quite the same extent. Reasons for this lie on both sides of the world. Within the limits of the clinical material available a New Zealand graduate can bear comparison with the best, and probably win. Such were the doctors with whom the New Zealand Division was blessed. Add to their professional background the possibilities of a wide experience of travel and of the closer co-operation and opportunities for friendship and understanding which come automatically with military service, and you will appreciate what a chosen band they were.

Under their very eyes, through their own hands, the stimulus of war was being applied to medicine. Mars, with one hand reaping that terrible harvest of human lives, was with the other prodding Aesculapius along to prodigious feats. Just as the first world war established orthopaedic surgery as an entity, so has the second opened up vast possibilities in the surgery of the chest, of the brain, of the blood vessels. Three handmaidens of surgery contributing to this result are the dramatic improvement in anaesthetic methods, the immensely increased use of the life-saving blood transfusion, and the advent of first the sulphonamide drugs and then penicillin and the antibiotics. Many of us came to divide our medical war into three stages—the pre-sulphonamide, the sulphonamide, and the penicillin.

In the first, the stage of the B.E.F. in France in 1939–40, sepsis in war wounds and septicaemia were still rife; in the second, the stage of the Middle East campaigns, the sulphonamides had to a very large extent prevented generalized infections, but every local wound was potentially if not actually septic; in the third, the stage of Normandy, of Italy, of the Far East, penicillin made septic wounds the exception rather than the rule.

[The orator described other wartime advances in medicine—the advent of drugs which had almost abolished dysentery and typhoid in armies fighting in hot climates; the improvement of mechanization whereby surgery was gradually taken right forward to the wounded man in small units; the arrival of the nursing sister in these forward surgical units, bringing with her that human touch essential to preserve the flickering flame of life in severely wounded men.]

The Service Doctor

But it was not only in these direct ways that stimulus and interest came to the Service doctor. More than ever before he became invaluable as a "back-room boy," studying and elucidating problems which had a great if incalculable effect upon many of the major campaigns. By this I mean such problems as the efficient protection of life and limb in tanks and armoured vehicles; the variety of food and clothing to provide the correct level of sustenance and cover in a dozen different climates; the study of remedies to prevent sea-sickness in assault landings; the investigation of effects of variation in atmospheric pressure and speed on pilots and submarine personnel; and many other fascinating problems in which it was found that clinical knowledge, physiological data, and scientific fact were of prime importance.

Just one other point perhaps remains to be considered. In the war we were working in a regimented State-controlled service. Were the results efficient? Were the personnel satisfied and happy in their work? In all fairness the answers must be, by and large, that they were. Why, then, does a civilian State service go so largely against the grain?

Admittedly the circumstances are different. However much we would like it to be so in these difficult times of peace, we know that the sense of urgency to achieve cohesion of purpose at any personal sacrifice is not of anything like the same potency. Let us remember, too, that in the Services both doctor and patient were being clothed, fed, transported, and generally cared for free of individual cost. Let us not forget that in all medical services it was only when the cast-iron bureaucracy of administration, excellent as it admittedly was, had been made reasonably malleable by the unquenchable clinical flame of those large numbers of our professional colleagues temporarily under arms that a really co-ordinated and efficient service resulted. There were many hard lessons learned on both sides, but it was worth it. No machinery, however good, will run a profession. The economic as well as the efficient administration of any medical service depends upon its ability to encompass the personal idiosyncrasies of both patient and doctor within reasonable limits. Because the profession, being doctors, realized the many difficulties of achieving this end, they would appear to have lost the "kudos" for the conception of a comprehensive medical service for all; but it was a medical idea and ideal long before it became one of the more important planks in a political platform.

What the ideal State medical service should achieve is that no individual is denied the facilities medicine has to offer. By "facilities" I mean institutions—hospitals, sanatoria, health centres—also instruments and drugs. These are the inanimate objects that can be nationalized to the great advantage of all, particularly if good medical advice is taken on how it should be done. It is not the idea of the State schemes which is at fault; it is the precipitate, relatively thoughtless implementation of them that has led to so many unfortunate complications. . . .

I believe strongly that there is a great deal of good in most of these schemes, but such good will be watered down just to the extent to which any particular scheme inhibits the incentive, the initiative, or the independence of either partner—the doctor or the patient. It is not the politician of to-day who will suffer from an ill-conceived scheme, but the patient of the future. Such a possibility we, as medical men, must prevent at all costs. As a profession, from the very nature of our work we are, and have proved ourselves to be, poor hands at producing a united and concerted effort. A man who, night and day, is facing up to the responsibility of dealing with the individual physical and psychological problems of his fellow men is, generally speaking, not adept at formulating overall plans to cope even with a large series of circumstances and conditions, and far less a large series of people.

But at least each of us can take out of the back cupboard his moral values and see to what extent they allow him to support this scheme or part of a scheme or strongly oppose another. I am sure that we all now have to make this individual effort if we are to ensure the best treatment for our present and future patients, safeguard a generation of the profession still unborn, and be as good doctors as God and Otago University may make us. . . .

[Reverting, as he concluded, to his main theme, a tribute to the men of the N.Z.M.C. who lost their lives in war, Sir Arthur Porritt said:]

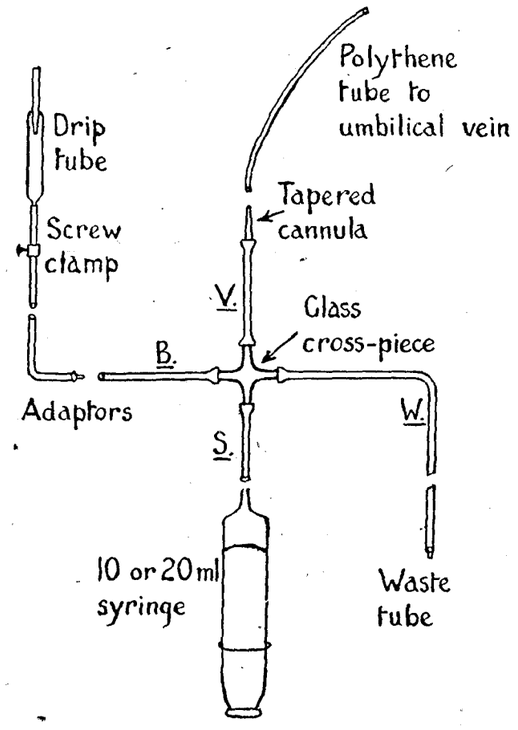
Time in his comforting and effortless way is steadily deadening that sense of personal and professional loss we felt when these good men departed. He has pushed Mars back—well back, we trust—into the shadows of the past, but he has led out a rejuvenated Aesculapius into the limelight—one might say the floodlight—of to-day and the future.

The second annual report of the Scottish Society of the History of Medicine says that an increasing number of North of England members are being enrolled. Three meetings were held during the year: a discussion on the teaching of the history of medicine; a paper on the history of British dentistry since 1685; and a full day devoted to papers by two distinguished American visitors on the history of Johns Hopkins University and on the life and work of John Morgan, founder of the first medical school in America (Philadelphia, 1765), followed by a pilgrimage to places of medical interest round Edinburgh.

Preparations and Appliances

THE "CAMBRIDGE" EXCHANGE TRANSFUSION OUTFIT

Dr. C. B. V. WALKER, director of the Regional Transfusion Centre, Cambridge, writes: The technique of exchange transfusion via the umbilical vein in cases of haemolytic diseases of the newborn was first developed by Diamond (1947) in the U.S.A., and the apparatus required has been described by Mollison *et al.* (1948) in this country. A modification of this apparatus has been tried clinically with success in the Cambridge Regional Blood Transfusion Centre. The main points of difference are: (1) that the use of three-way stopcocks has been entirely dispensed with, and irritating delays due to the joints



becoming dislodged in the course of the transfusion have been obviated; and (2) a tapered cannula has been incorporated into the outfit, which not only prevents leakages due to a poor fit between the polythene tube and the cannula on account of variations in the internal diameter of the polythene tube, but the operator can select the size of tubing he wishes to use, on clinical considerations, and fit it forthwith to the outfit without previously ascertaining that a tightly fitting cannula is available.

As shown in the diagram, the set comprises a cross-piece made of ¼-in. (0.6-cm.) glass tubing, each arm of which is 1 in. (2.5 cm.) in length, and is corrugated to give a firm purchase for the attachment of a rubber tube. In the following description the letters B, V, W, and S refer to the arms of the cross-piece connected to the blood bottle, umbilical vein, waste, and syringe respectively. Arm B is provided with about 3 in. (7.5 cm.) of rubber tubing mounted with a female Record-fitting adaptor, as used in the distal part of the normal administration set supplied by the National Transfusion Service. This adaptor is designed to receive the corresponding male adaptor of the Transfusion Service outfit. Arm V has 2 in. (5 cm.) of rubber tubing mounted with an Alban Andrews tapered cannula, and is designed to receive polythene tubing of a reputed internal diameter of 1 mm. or 1.5 mm. as desired by the operator. Arm W has a rubber tube about 2 ft. 6 in. (75 cm.) long mounted at the distal end by a male adaptor; this is the tube by which the extracted blood is run to waste. Arm S has 2 in. (5 cm.) of rubber tubing mounted with a metal adaptor to take a 10-ml. or 20-ml. Luer-fitting syringe.

It is desirable that the length of rubber in arms V and S be kept as short as possible, to minimize the amount of "dead space" in the outfit. The exact length of rubber on arm B is unimportant.

If an operator prefers to use a Record type syringe, it is a simple matter for tube S to be fitted with a suitable adaptor when the outfit is being assembled. The only other equipment needed consists of two haemostat forceps.

A bottle of suitable blood is fitted with a standard giving set in the ordinary way, air in the delivery tube is removed, and the screw clamp closed. The set is then connected to arm B of the exchange outfit. Haemostats are clamped on the rubber of arms V and S, and the syringe is attached to arm S. The screw clamp of the standard set is then adjusted to deliver a fast drip through the waste pipe, arm W, and when this has been done the rubber of arm B is at once clamped with the haemostat from arm S. Then a polythene tube of suitable diameter, 1 mm. or 1.5 mm., is introduced into the infant's umbilical vein and connected to the tapered cannula. The clamp on arm V is transferred to arm W (waste), and the syringe is filled with the infant's blood by suction. The clamp is then returned from arm W to arm V and the blood in the syringe is discarded.

The exchange transfusion may now begin. The clamp on tube B is transferred to tube W and the syringe filled from the bottle of blood. The clamp on tube V is transferred to tube B. The syringe is emptied into the umbilical vein and refilled from the vein by suction. The clamp on tube W is transferred to tube V and the syringe emptied through the waste pipe. The clamp on tube B is then transferred again to tube W and the cycle repeated until the whole 500 ml. in the bottle has been used.

The point to note is that once the exchange transfusion has begun the two haemostats circulate between tubes B, W, and V in that order, and the vacant tube is clamped, at the appropriate point in the cycle, by the use of the haemostat from the preceding tube, the above convention being kept in mind.

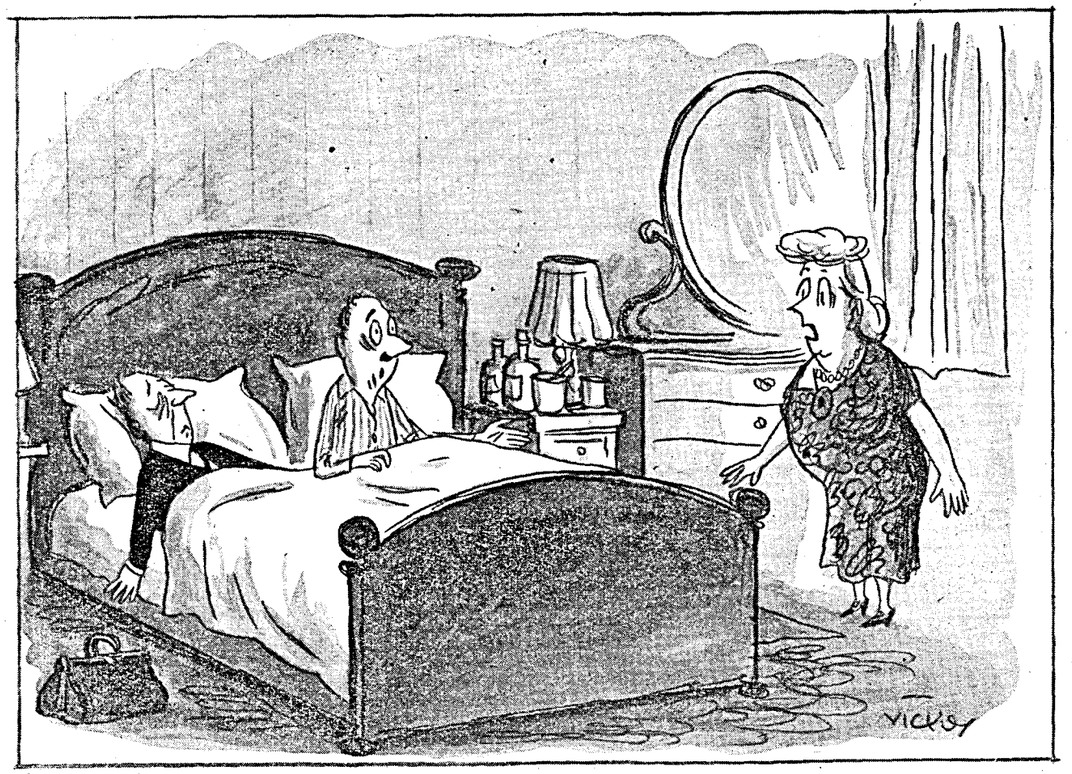
The outfits, as issued by the Cambridge Centre of the National Transfusion Service, are supplied in a "cellophane" wrapper in a 2×4×11-in. (5×10×27.5-cm.) tin, which also contains a standard giving outfit minus the distal needle unit, and also two 8-in. (20-cm.) lengths of sterile polythene tubing of 1 mm. and 1.5 mm. internal diameter packed separately in straight glass tubes with cotton-wool plugs and cellophane wrappers. The polythene is sterilized by steaming at atmospheric pressure in the autoclave for 30 minutes on three successive days (Tyndall's method). It should be noted that the contents are packed in the tin after sterilization. It follows that the outsides of the cellophane wrappers are not to be regarded as sterile.

A further distinct advantage in this type of outfit consists in the fact that all parts are easy to dismantle, inspect, and clean thoroughly before reassembly, and the design lends itself to multiple production at a Regional Transfusion Centre. It has been found almost impossible to be sure that the metal three-way stopcocks of the original method have been cleansed completely from fragments of residue from previous use.

REFERENCES

Diamond, L. K. (1947). *Proc. R. Soc. Med.*, **40**, 546.

Mollison, P. L., Mourant, A. E., and Race, R. R. (1948). *Rh Blood Groups and Their Clinical Effects*. Medical Research Council Memorandum No. 19. London: H.M.S.O.



"The Doctor was *so* tired, Dear."

HAPPY CHRISTMAS!

The Editor and his staff, in sending the usual greetings of the season, are aware that the serried columns of portentous print of the *B.M.J.* keep them impersonally remote from their readers. This, of course, has its advantages. When the man with the burning message finds the chill waters of editorial disapproval poured on it he at least doesn't feel that his best friend has pushed one of his disks out. He can pour out the vials of his wrath on that somewhat monolithic abstraction the Editor. But behind the severe black-and-white of our austere pages there are human chaps at work, back-room boys all, longing at times to burst out into licentious song, but restrained all the time by professional decorum and—believe it or not—a desire to be fair even to the most unfair.

Some readers have begged us to be funny. We must reply in the terms of an article in a contemporary journal: "This type of personality was absent in 10% of their patients." Nice to think you can have an absent personality. The funny things are there if you look for them. We find them, in a quite unbiased way of course, in other journals. At this time of the year this message comes straight from the heart of a leading article: "The part played by heavy meals shortly before bathing deserves critical examination." One can see those heavy meals gallantly playing their part before the severe eye of a dyspeptic critic. And for those who go in for higher thinking comes this reassurance from a reviewer: "A brief section takes the reader as far as he needs to get a proper grasp of the betatron, the synchroton, and the latest form of linear accelerator." This irresistibly called up a picture of Harpo Marx grasping, and quite properly, a linear accelerator. Knowing how easy it is to err, our editorial hearts beat an extrasystole of sympathy when we read this confession from a contemporary: "By an error which we much regret, we last week printed under this heading the review of a different book. The proper review will be published shortly." And from the same and highly esteemed organ of opinion came this startling—the only word to use is—revelation: "Most people seem to think that the vaginal passage runs straight up and down the body—a misapprehension sustained by the usual neat diagrams showing the uterus poised on top of the vagina." Some misapprehension!

Editorial humour being in short supply, we have invited two whose wit in cartoon and verse has pierced many a dark corner to illumine the contemporary medical scene. Vicky and Sagittarius are impressed with two things—the overworked doctor and the over-doctored patient. They are the expert witnesses, and what they say is there to be seen and read.

May we close by hinting that medical editors share with their colleagues in practice the privilege of being driven too hard. Our noses are dipped alternately in the paste-pot and the ink-bottle. With difficulty the editorial head is kept above paper, and the printer's devil is ever at his elbow. And after each week's journal has gone to bed there is the sudden waking in the night and a horror that what had better not be committed to print is now beyond recall. Then the pangs of conscience about unanswered letters and an ever-mounting pile of unread manuscripts. A long correspondence about a rejected manuscript from a foreign colleague ended by his remarking, "I am not trying to make of you a jumping Kangaroo, but I suppose not all the obstacles impossible to be removed or to be overcome." On this hopeful note we shall soon enter the New Year.

[Cartoon is by Vicky of the *News Chronicle*.]

THE DOCTOR AND THE MINISTER

"Now that we have got the National Health Service based on free prescriptions, I shudder to think of the ceaseless cascade of medicine which is pouring down British throats."—Mr. Aneurin Bevan.

The queues were grousing cheerfully
Beside the Doctor's door;
They would not go away without
The mixture as before,
And this was odd, because he said
They needed it no more.

The Doctor and the Minister
Were sitting hand in hand,
They wept like anything to see
The mixtures in demand.
"If they could be reduced by half,"
They sighed, "it would be grand!"

"One hundred million pounds per ann.
For mixtures we must vote.
The liquid doses that each day
Flow down the nation's throat,
If emptied out, would make a sea
On which the Fleet might float."

"The time has come," the Doctor said,
"To talk of vitamins,
Of carbohydrates, mineral salts,
And calories and greens,
Of fats, fresh air and exercise,
Biology and beans.

"But *Mist. Pot. Brom. et Nuc. Vom.* has
An almost mystic charm,
And if it does but little good,
It works but little harm."
"The Health Bill," sobbed the Minister,
"I view with grave alarm."

"I sympathize," the Doctor sighed,
"But still I greatly fear
If *Mist. Sod. Cit.* should be cut down,
Your votes would disappear."
"I know it," said the Minister,
And shed a bitter tear.

"You patients," cried the Doctor, "who
By bottles are allured,
Can run away and play to-day;
Your aches and pains are cured."
"If that is so," the patients said,
"Then why are we insured?"

The oldest patient winked his eye
But budged not from the spot.
"Tell that to the Marines," he said,
"We've come for you-know-what!"
"Nine million bottles seem," remarked
The Minister, "a lot."

The patients cried, "It's most unkind
To cross us off the list.
The doctors don't know everything—
Our aches and pains persist."
The Doctor rudely cried, "O, *Nux!*"
Then sadly wrote, "*Rep. Mist.*"

The Doctor and the Minister
Saw nothing could be done
As happy queues went skipping off
In search of Christmas fun;
Which was not odd, because they had
A bottle, every one.

SAGITTARIUS.

Correspondence

Displaced Registrars

SIR,—As a general practitioner I would like to protest at the recent cut in registrars. The registrars have stated their own personal problems, but let the rest of the profession realize what these dismissals mean. Before, the axe has fallen on hospitals and hospital expansion; now it is falling on the personnel of the service. How long before it will be our turn? Can we expect to improve our own conditions either in capitation rate or working conditions if we make no attempt to prevent this injustice?

Not only is any future improvement of the specialist services postponed by this cut, but it immediately throws 1,100 doctors into the general-practitioner market, and they could be used to dilute it. If the number of registrars is too many there must be an immediate need for increasing the number of posts with a specialist's status, otherwise there will be a fall in the quantity of out-patient consultations and in in-patient treatment. If there has been an excessive influx of the younger members of the profession into registrar jobs this is due to the unattractiveness of general practice, which implies the need for a reduction in the maximum number on the lists with an increase in the capitation rate.

In these matters the whole profession should work together and demand the withdrawal of this cut, and remove uncertainty from the future for registrars, for their future is ours.—I am, etc.,

Abersychan, Pontypool, Mon. A. S. JARMAN.

Training Registrars

SIR,—Now that the somewhat overdue review of registrar appointments is being undertaken is it not time for an equitable scheme for the training of consultants to be considered? At the moment there appear to be two classes of registrars, those at the teaching hospitals and those in the non-teaching hospitals. This has led to a very unfair discrimination in obtaining appointments, since the registrars from the non-teaching hospitals applying for consultant posts are often turned down on account of their lack of academic training. Would it not be better if the responsibility for the training of consultants and specialists could be fully undertaken by the teaching hospitals, with their university and academic background, and at the same time the large amount of practical experience offered by the non-teaching hospitals utilized in their training?

The following suggested scheme has been discussed with many of our colleagues, and met with their whole-hearted support.

The training of consultants and specialists shall be the entire responsibility of the teaching hospitals within the region. The number of trainee specialists entering upon a course of training each year shall be a fraction greater than the number of consultant and specialist vacancies occurring each year, in order to provide for wastage and competition. It is thus a definite trainee/vacancy ratio. The scheme should provide for a six-year training in which each trainee spends part of the time in the centre and part at the periphery. There shall be trainee posts six times the number of the estimated yearly output of trained specialists.

These trainee posts shall be allocated one-half to the recognized teaching hospitals and one-half to selected peripheral hospitals. The trainee shall move each year in accordance with a rotation plan such as first year in teaching hospital, second year in peripheral hospital, third year in teaching hospital, fourth year in peripheral hospital, fifth year in peripheral hospital, sixth year in teaching hospital.

The remainder of the peripheral hospitals in a region should have added to their staffs such further consultants or junior registrars as assistants as may be deemed necessary to carry out the work in each case.

Each year the vacancies in consultant posts should be open to competition by the specialists trained in accordance with this scheme or by consultants already in other posts.

The scheme is elastic and can be applied equally to each and every branch of consultants and specialists, since the number of trained specialists coming out each year bears a definite ratio

to the number of vacancies in each branch. Some alteration in the set-up of the teaching hospitals is inevitable, but as against this the whole of the training will be under their direct control. The consultants in the selected peripheral hospitals have an added incentive to keep their standard up to that of the teaching hospitals. The scheme eliminates the variation in standing of a trainee, since each receives both central and peripheral training, and at any stage it can be observed in which direction he is developing, and the training adjusted accordingly.

If the principle is accepted by the teaching hospitals, in order to set the scheme in operation the present registrars who are willing to transfer could be selected and appointed; the remainder should be allowed to finish their appointments under their existing contracts.—We are, etc.,

L. M. BILLINGHAM,
J. W. LACEY.

Chelmsford.

Registrars and Health Service Policy

SIR,—The proposed treatment of registrars is entirely uneconomic; these men have received long, expensive, and sometimes State-aided training; they have had the benefit of considerable experience in their specialties; they are, in fact, particularly valuable members of the profession. Secondly, the plan is both unjust and inhumane; these registrars, frequently with war service behind them, were misled by suggestions that there would be a great increase in the number of specialist jobs under the Health Service; they were encouraged to carry on training by Government grants and supernumerary appointments. It therefore behoves consultants to stand solidly behind them and see that the plan is altered.

The problem is obvious—too many training for too few jobs—and it can be tackled at both ends. First, we need more consultant appointments, and, if it is financial stringencies that are preventing them, there are many obvious ways of saving money in the Service—e.g., charging for spectacles, dentures, appliances, board and lodging while in hospital, etc. Furthermore, we should if necessary offer our merit-award money for the payment of new consultants. Secondly, we should slow down training. This should be done as any manufacturer would do if faced with a diminished demand for his goods: not by destroying stocks of the finished product but by slowing down production at the beginning until all the stocks are used. This policy would be achieved by allowing all present senior registrars who are suited to their jobs to remain in them indefinitely if they so desire, with the knowledge that in perhaps eight years there will be consultant posts for all who are of sufficient calibre. This blocking of the senior posts would discourage new entrants into the ranks of trainee specialists, and better be discouraged at the start than after full training.

Finally, I would add this. We are seeing the result of miscalculation and incompetent planning; are we sure that the same problem will not arise in regard to general practitioners? Each year our medical schools turn out more doctors—I believe my own school is planning to turn out twice as many as before the war—and yet I understand that the money available for paying general practitioners is constant. Are these increased numbers of doctors required, and, if so, can they be paid? This must be thought out now and not left until we are faced with large numbers of unemployed doctors.—I am, etc.,

PAUL HICKINBOTHAM.

Leicester.

Producing Anaesthesia of Trigeminal Nerve Distribution

SIR,—I am most interested in the letter (December 9, p. 1334) from Messrs. Brodie, Hughes, and Small, describing the occasional difficulties they have met with in resecting the third division of the sensory trigeminal root. Certainly the fibrous septum they describe running from the ganglion far into the sensory root might explain the difficulty of infiltrating the whole root with alcohol, but it would not explain the preservation of sensation in the mandibular branch unless a bundle is overlooked or intentionally left uncut in mistake for the motor root.

To obviate this, I would suggest using Frazier's method, which he adopted and published in 1919, for saving the motor root. He describes this root as issuing from beneath the ganglion, wrapped in bundles of sensory fibres, which he separates with the use of a faradic electrode, cutting only the fibres which do not respond by contraction of the temporal muscle.

I have included Frazier's account in a "History of the Treatment of Trigeminal Neuralgia," which the editor of the *Postgraduate Medical Journal* asked me to write, and which will appear shortly.—I am, etc.,

WILFRED HARRIS.

London, N.W.1.

SIR,—I would refer Mr. Brodie Hughes and Mr. J. M. Small (December 9, p. 1334) to Sicard (1932), who after a painstaking anatomical study of 42 cases wrote: "Nous pensons donc pouvoir conclure que, dans 25% environ des cas, *la racine motrice contient des fibres sensitives* soit par l'intermédiaire d'une grosse radicule venant directement du ganglion de Gasser, soit par l'intermédiaire d'une anastomose plus ou moins grêle avec une radicule sensitive. Ces fibres permettent d'expliquer la persistance ou le retour d'une légère sensibilité que l'on observe parfois dans le domaine du maxillaire inférieur après neurotomie totale et conservation de la racine motrice" (his italics). His drawings are convincing. The closer to the pons a sensory rhizotomy is made, the more likely the escape of these overcrossing fibres, so that one would expect the relapse rate to be higher after suboccipital than after subtemporal rhizotomy. This has been the experience of Olivecrona (1947), who found the respective rates to be 17.7% and 8.5%, and of Guidetti (1950), who found them to be 17.9% and 8.3%.

The immediate post-operative persistence of both sensation and the pain of tic douloureux despite complete sensory rhizotomy can probably be explained in no other way. For a delayed return of sensation and pain after initially adequate anaesthesia there is another possible explanation. Ganglion cells were found scattered in the sensory root in one human case by Stibbe (1936) and in three by Ferner (1940); if the sensory root were divided distal to such cells, the centrifugal fibres arising from them might regenerate.

When tic douloureux in the mandibular division is cured by rhizotomy, yet some sensation persists there, a third explanation must be considered—namely, overlap of the trigeminal area with that of the cervical nerves. Lewy (1938) claimed to demonstrate by quantitative electrical tests that this overlap always existed, though usually not demonstrable by ordinary clinical methods.—I am, etc.,

JOHN PENMAN.

London, W.1.

REFERENCES

Ferner, H. (1940). *Z. Anat. EntwGesch.*, **110**, 391.
Guidetti, B. (1950). *G. ital. Chir.*, **6**, 13.
Lewy, F. H. (1938). *Amer. J. med. Sci.*, **196**, 564.
Olivecrona, H. (1947). *Acta psychiat., Kbh., Suppl.*, **46**, 268.
Sicard, A. (1932). *Ann. Anat. path.*, **9**, 281.
Stibbe, E. P. (1936). *Brit. J. Surg.*, **24**, 122.

Antihistamines and the Common Cold

SIR,—I have read the report (August 19, p. 425) and articles on the use of antihistamines in the prevention and treatment of the common cold with considerable interest but real disappointment, and I would like to reply.

The antihistamines, when used in the therapy of the common cold, probably are effective in correcting disturbed physiology only. They have little or no effect either upon the pathogenic organisms causing the disease or upon its fully developed pathology. The early symptoms of the common cold as well as those of many other infections and varieties of trauma of the respiratory tract represent disturbed physiology, with developing acute inflammatory oedema as the demonstrable lesion. As such it is reversible. Sneezing, rhinorrhoea, lacrimation, and the unproductive cough are actually exaggerated and often inappropriate physiological responses to non-specific irritant stimuli. The reaction is diffuse when caused by physical agents and inorganic chemicals. When due to viruses or bacteria, it assumes an allergic character and becomes sharply localized. When this sharply circumscribed oedematous process progresses to the point where necrosis begins to appear in the involved tissue, it becomes true pathology, is irreversible, and there is no drug or other form of therapy that will affect the lesion favourably. This can occur within six hours or less. It is believed

that this stage of the initial lesion of the common cold is analogous to the urticarial weal and the lesion of herpes simplex in humans, and to the Arthus phenomenon in laboratory animals.

There are several variable factors at play in every case where the common cold is contracted. Among these are

(1) The nature of the irritant. If it is due to a virus, or bacteria, or products from their growth, the degree of virulence is important.
(2) The size of the dosage implanted and, in the case of living organisms, the rapidity of growth.
(3) The immunity, if any, of the patient to the irritant then present.
(4) The general state of health at the time of the attack. This is governed by pre-existing pathology, the diet, vitamin intake, fatigue, and the degree of emotional adjustment
(5) The ability, or lack of it, to control the temperature and humidity of the immediate environment.

Further, it should be recognized that there are two groups of conditions and diseases which are often confused with the infectious common cold due to a virus, and are believed to have been included in most reported series of cases, including my own. These are

(*a*) "Traumatic," "allergic," or pseudo colds due to non-infectious irritants. They occur in every month of the year, in every country, in every climate, and as a group yield readily to antihistamine therapy.

(*b*) Respiratory diseases due to other viruses such as the influenzas, atypical pneumonias, measles, and those due to bacteria such as the streptococci, the exact diagnosis of which is often missed. These predominate in the winter months when human resistance is at its lowest ebb, and with the exception of those due to bacteria are refractory to all treatment.

According to our present knowledge the antihistamines accomplish their effects principally by blocking histamine and the action of acetylcholine. Thus the dose becomes the amount required to neutralize the effects of these chemicals, and not a stated number of milligrams. Furthermore, it has been my own experience that if symptoms are allowed to reappear after the first dose has been taken the cold will usually mature regardless of subsequent treatment, indicating the development of an irreversible lesion. Thus the neutralizing effect must be sustained as long as the irritant acts.

From the above it would seem reasonable to believe that colds have been and can be aborted when antihistamines are taken in adequate dosage while the initial lesion is in the stage of disturbed physiology and is still reversible, and when the effect of the drug is sustained during the action of the irritant. Those symptoms of the common cold due to disturbed physiology, and which result from the spread of the infection over the mucous membrane, can be alleviated even after the true pathology of the disease has developed.

But once definite pathology has developed no treatment can be more than palliative. The contradictory statistics reported to date accurately reflect the type of work that has been done and the results obtained. As yet no adequately scientific report has been made concerning the effect of antihistamines upon the experimentally induced cold.

I should add that all these opinions are my own, and must not be taken as representing the views of the Navy Department or the naval service at large.

—I am, etc.,

JOHN M. BREWSTER,
Captain (M.C.), U.S. Navy.

Philadelphia, Pa.

Causes of Death in Diabetes

SIR,—Always one appreciates comments on a printed paper, and especially some of the perfectly good points made by Dr. J. M. Sen Gupta (November 4, p. 1061). It was not my intention to give a detailed statistical presentation, because such material is available in other publications, including the pamphlet on Studies in Diabetes.

As regards the third paragraph, the reason that the total of the percentages exceeds 100 is that the item "gangrene" is a part of the total for cardiovascular renal diseases. If that entry of gangrene had been *indented* (see May 13, Table II, p. 1096) the misunderstanding would have been avoided.

I am sending the writer another publication to cover what he mentions, and will forward the same to anyone who wishes these.—I am, etc.,

ELLIOTT P. JOSLIN.

Boston, Mass.

Urethra Obstructed by Crystals

SIR,—I should like to report the case of a child of 13 months who had retention of urine, due to a collection of crystals in the urethra.

The child, a boy, suffered from bronchopneumonia, and was given 2 dr. (7 ml.) "cremor-merazine," followed by 1 dr. (3.5 ml.) every eight hours with 10 gr. (0.65 g.) potassium citrate. It is possible that an over-anxious mother increased the dose. The child's symptoms cleared quickly, but on the third day he became very ill, and was in obvious pain. On examination the doctor discovered a very much distended bladder which was not relieved by the usual remedies. As the child was in such pain an anaesthetic was given, and the bladder was emptied by the passage of a ureteric catheter. The urine contained crystals which could be seen by the naked eye and were confirmed by the pathologist's report. The child made an uneventful recovery.

I have seen two previous cases this year of ureteric obstruction following "sulphamerazine," one of which had to be relieved by the passage of a ureteric catheter, but this is the first case of urethral obstruction that I have seen, nor have I seen a case reported.—I am, etc.,

J. T. RICE-EDWARDS.

Newport, Mon.

Erythrocyte Sedimentation in Anaemia

SIR,—Dr. Richard Terry's admirable article (December 9, p. 1296) disposes so effectively of the method of "correction for anaemia" in the estimation of the E.S.R. that it is a pity that he thought it necessary (p. 1297) to make a ritual genuflexion in the direction of the Wintrobe technique. Surely once one has concluded that correction for anaemia is neither necessary nor desirable, the last argument in favour of this technique is disposed of. From a practical point of view the Wintrobe technique is very troublesome owing to the difficulty of filling and cleaning narrow blind-ended tubes, and the contraction of the scale from 200 to 100 mm. necessitated by the desire to use the tube as a haematocrit in order to be able to "correct for anaemia" makes the test less discriminating than the Westergren. Moreover, in my experience and that of others with whom I have discussed the problem, the Wintrobe technique gives much less reproducible results than the Westergren, when the same amount of technical skill and care is used. The only point that might still be adduced in favour of the Wintrobe technique is that since the double oxalate mixture does not affect the sedimentation rate while the citrate solution does, the Wintrobe is therefore a more "correct" method. Since, however, the E.S.R. is in the last analysis an empirical measurement of a little-understood phenomenon, surely our method of estimation should be such as can be carried out easily and reproducibly, rather than one whose advantages are purely theoretical.—I am, etc.,

B. M. WRIGHT.

Penarth, Glam.

SIR,—I was interested to read the article (December 9, p. 1296) by Dr. Richard Terry. His conclusion that "hypochromic anaemia neither invalidates the Westergren E.S.R. nor necessitates correction" reminds me of my conclusion in my paper in the *Edinburgh Medical Journal* (1945), **52**, 132, where I deduced that "the blood sedimentation diagram is parallel to the degree of anaemia only in anaemias due to haemorrhage and pernicious anaemia. In other types of anaemia there is no correlation between B.S. diagram and the degree of anaemia. The corrections of the B.S. results in anaemias are meaningless."

Having carried out until to-day almost 11,000 E.S.R. tests, many hundreds with different anaemias, I am more convinced now than five years ago that cases with different degrees of anaemia may have the same E.S.R., and cases with the same degree of anaemia different E.S.R.s, so that correction of the E.S.R. in anaemias seems really to be incorrect.—I am, etc.,

H. DLUGOSZ.

Wrexham, Denbighshire.

SIR,—I apologize for reviving an old controversy, but the recent article by Dr. Richard Terry (December 9, p. 1296) has raised several points which I wish to examine in the light of

my own experience. I beg leave to review this subject from a theoretical and practical standpoint to clarify my argument.

When the theory of sedimentation is examined it becomes clear that the sedimentation rate (S.R.) depends mainly on the size of the sedimenting particle. As this is determined mainly by the formation of large rouleaux or aggregates of cells it is unlikely that the size of the individual cell will be an important factor, although it may have a subsidiary influence—e.g., Bendien *et al.* (1932). The formation of aggregates of cells is in turn dependent on plasma factors, mainly on fibrinogen and globulin, but in a complicated protein balance—e.g., Gordon and Wardley (1943). This plasma protein balance has been termed "sedimentin" for convenience by Day (1939). If it is assumed that the *plasma* sedimentin concentration is the same in anaemic blood as in normal blood, the total *blood* sedimentin concentration will be increased in anaemic blood as there is more plasma (and fewer erythrocytes) in a sample of such blood. This increase in sedimentin would cause larger rouleaux and an increased S.R. Furthermore, as the percentage volume of packed cells (P.C.V.) is increased in anaemia, the sedimentin will have fewer cells to influence, and hence the effect will be correspondingly greater. It follows that the velocity of sedimentation in anaemic blood will be proportional to the speed in normal blood multiplied by $\frac{45\ (100 - \text{P.C.V.})}{55 \times \text{P.C.V.}}$, when P.C.V. is the observed percentage volume of packed cells, and 45% is the normal packed cell volume (Kellett, 1947). This calculation based on a double effect of anaemia agrees better with the correction chart of Rourke and Ernstene than the simple proportion correction of Della Vida. As aggregation is a result of surface action it would be more correct to say that the S.R. depends on the amount of sedimentin acting on the total surface of all the erythrocytes, but the above conception is sufficient to explain why the P.C.V. is a better single measure for correction than either the haemoglobin or erythrocyte count.

I have examined by the Wintrobe technique a series of bloods from cases of uncomplicated idiopathic hypochromic anaemia and pernicious anaemia. In 50% of cases of both types of anaemia I found the S.R. increased in proportion to the degree of anaemia as measured by the P.C.V., and in these cases the S.R. fell as the P.C.V. rose during recovery from the anaemia. In the other 50% of cases the S.R. was raised considerably less than might be expected from the P.C.V. determination. Hence, although I cannot agree with Dr. Terry in theory, some of my own results lend partial support to his findings. It is interesting to note that other authors who have found normal results fairly constantly in anaemia and oppose correction for anaemia have, like Dr. Terry, used a technique with citrate as an anticoagulant (Bouton, Cutler, Davis (1946), Day (1939), Reichel (1936), Smith (1938), Schuster, Sugarman, Westergren). On the other hand those who favour correction have used oxalate or heparin (Britton, Collins, *et al.* (1939), Ham and Curtis, Hynes and Whitby, Rourke and Ernstene, Wintrobe). Some workers have suggested that the greater length of the Westergren tube may avoid the anaemia error by reducing the effect caused by packing of cells on the base of the tube, or the retarding force of upward currents of displaced plasma. However, these ideas would not explain the acceleration which I would expect from the primary increased aggregation of cells in anaemia. Dr. Terry has drawn attention to the stabilizing effect of citrate in the Westergren technique, and it is possible that it is the anticoagulant which has caused the above divergence of results and views. It is interesting to note that Drs. R. J. G. Sinclair and J. J. R. Duthie in a recent article (December 2, p. 1257) obtained results in Westergren tests which suggested that anaemia was having an influence on the S.R., but that *oxalate* was used as the anticoagulant.

Dr. Terry states that in anaemic blood the concentration of citrate in the plasma is less, and that therefore its stabilizing effect should be less. This conclusion is fallacious, as the effect will depend on the mode of action of the citrate. It may be postulated that the stabilizing effect of citrate is due to some type of protective action on the surface of the red cells preventing rouleaux formation. Then, as the *amount* of citrate per *erythrocyte* is greater in anaemic blood, one would expect the greater stabilizing effect which the author found.

The occurrence (though less often) of a normal S.R. in anaemic blood tested by Wintrobe's oxalate method needs further explanation. Dr. Terry points out that plasma protein changes occur in anaemia which are not considered in correction methods. I agree with him, and believe that in chronic anaemias there is a tendency to stabilization brought about by changes in the plasma proteins, sometimes by a reduction in plasma fibrinogen. The question arises whether or not it is necessary to correct the S.R. for anaemia. In my opinion it is necessary in theory, but not necessary in routine clinical work. Against all complicated correction procedures it may be argued that correction may be unnecessary in some cases, that in others the anaemia may be part of the disease, and that the result is not clinically reliable in 100% of cases. I would therefore advocate a simple method of performing this very complex test, so that the time saved may if necessary be used for some unrelated method of assessment of toxaemia (such as the Arneth count).—I am, etc.,

Bradford. H. S. KELLETT.

REFERENCES

Bendien, W. M., Neuberg, H., and Snapper, I. (1932). *Biochem. Z.*, **247**, 306.
Collins, D. H., *et al.* (1939). *Ann. rheum. Dis.*, **1**, 333.
Davis, L. J. (1946). *Practitioner*, **157**, 13.
Day, G. (1939). *Tubercle*, **20**, 364.
Gordon, C. M., and Wardley, J. R. (1943). *Biochem. J.*, **37**, 393.
Kellett, H. S. (1947). M.D. Thesis, Univ. Cantab.
Reichel, H. (1936). *Blutkörperchensenkung*, Springer, Berlin.
Smith, C. H. (1938). *Amer. J. Dis. Child.*, **56**, 510.

Marking Varicose Veins

SIR,—The importance of multiple ligation of varicosities, combined with ligation of the internal or external saphenous vein at the groin or knee, is well recognized. With the patient in the erect position the larger channels can often be more easily palpated than seen, and communications with the deep system can be felt as holes in the deep fascia. The usual method of marking the suitable sites for ligation, by the use of an aqueous or alcoholic solution of dye, often fails because the dye runs when the limb is painted with the skin antiseptic. I have found that methyl violet dissolved in a cellulose cement, such as "durofix," adheres firmly to the skin; it resists the usual pre-operative cleaning and occasionally has to be scraped off with the knife. A greasy skin should be wiped with ether or acetone before applying the dye.—I am, etc.,

Plymouth. EDRIC WILSON.

Myocardial Infarction after Tetraethylammonium Therapy

SIR,—I agree with Dr. D. J. Livingstone (September 23, p. 713) that it could be "thought that in these cases tetraethylammonium therapy was at least a contributory cause of the acute cardiac lesions." I do not, however, see any conclusive evidence for this supposition. To my mind the lacking evidence could have been obtained if any intense drop in blood pressure had been revealed in consequence of the injections, especially if the signs of acute myocardial infarction had developed within a couple of hours of one of these injections.

Acute myocardial infarctions following an intravenous injection are not exceedingly rare. This is well known. I remember several such cases myself. One of them stands out most vividly in my memory.

A somewhat obese man in the middle forties got an intravenous injection of tetraethyliodophenolphthalein at five in the afternoon. He was a heavy smoker, but did not reveal any signs of coronary trouble until that time. Immediately after the injection he felt "just rotten." He experienced a profuse sweating and was afraid he would faint. He had to lie down. After ten minutes he felt much better and the *x*-ray examination was performed. On driving home he suddenly felt an excruciating pain in the left side of the chest, with dyspnoea. He had to stop; the pain got unbearable, and he could not move, but after about a quarter of an hour the pain lessened and he was just able to drive home. Completely exhausted, he could hardly climb the stairs to his flat on the second floor. The pains again got stronger, and his physician had to give him a morphine injection, repeated within half an hour. I saw the patient the next morning. The temperature was 101° F. (38.3° C.), blood pressure 75/110 mm. Hg. Humid rales were heard at both bases. The blood count gave 15,600 white cells. The electrocardiographic finding was that of a left-sided infarction. The patient recovered from this incident but was never the same man again. He developed a congestive heart failure and died about three years later.

I completely agree with the author that great care should be exercised in the use of tetraethylammonium chloride in any patient showing evidence of arteriosclerosis, especially, I would add, if the drug be given intravenously. Or, rather, it should never be given intravenously in people over 40.—I am, etc.,

Sydney, Australia. CHARLES ENGEL.

Fibrillation and Flutter

SIR,—Dr. G. L. Foss (December 2, p. 1252) in his interesting account of the treatment of thyrotoxicosis with 2-mercaptoimidazole records the conversion of auricular fibrillation to flutter. This he regards as a possible toxic manifestation, not mentioned in the literature. In theory, a stage of flutter may occur in every change from fibrillation to sinus rhythm, and I have been accustomed so to regard the flutter that is sometimes seen in thyrotoxic heart disease in the course of treatment. It follows that no medication is required beyond continuation of the antithyroid drug already in use. Here is a case in point.

A man aged 49, referred to me with fibrillation that I considered to be *thyrotoxic in origin*, developed flutter after two weeks on methyl thiouracil. After seven days' further treatment this reverted to sinus rhythm without the use of quinidine or digitalis. Each stage was confirmed electrocardiographically. Sinus rhythm persisted during the three and a half years that I had him under subsequent observation.

I think that Dr. Foss has been unduly harsh with himself in regarding this case of flutter as toxic in origin, and that, even if not mentioned in the literature, the sequence of events that I have described has been observed a number of times.—I am, etc.,

Cheam, Surrey. C. P. PETCH.

Euthanasia

SIR,—There are a few points in your very fair and, if I may say so, sympathetic leading article (December 9, p. 1318) on which I should like to comment, and one or two small corrections to be made. I will deal with the latter first.

(1) You more than once refer to "incurable disease," which term at once raises the objection that "diseases incurable to-day may be curable to-morrow." In my Society's Bill, as introduced in the Lords in 1936, the term "incurable disease" is not once employed; we only mentioned "incurable illness," which is quite another matter. There will always be incurable illness no matter what advances are made by medical science.

(2) You refer to the nearest relatives having to be informed. It is true that in the original draft of the Bill I did bring in the "nearest relatives," but we decided, under legal advice, to leave them out entirely in the revised Bill introduced by Lord Ponsonby.

(3) You state that "euthanasia is to be administered by the medical practitioner named in the permit." This also is not quite correct. Our Bill provides (Sect. 5 (1)): "Euthanasia *shall* not be administered by any person other than a medical practitioner licensed for the purpose." As a matter of fact, owing to the objection continually raised that "it is a doctor's business to cure and not to kill," my Society has now decided that when our Bill next comes forward the above clause, 5 (1), *shall be amended* by inserting the words "or other suitable person" after "medical practitioner." Incidentally, I may mention that it was never contemplated that many, if any, doctors in general practice would care to undertake this duty, even though it would be an act of pure mercy. In these days of *motor transport only* a very small number of "euthanisors"—or should we call them "mercy operators"?—would be required to serve the whole country, at least for some time to come. Moreover, our Bill does not stipulate that even the "euthanasia referee" need necessarily be a doctor—he might well be a lawyer. So that under *our Bill all* that would be asked of the medical profession would be the two medical certificates, testifying to what were matters of fact in the doctor's opinion, and there would be no actual obligation even to provide these. Hence the argument, so often used, that what is proposed would place an intolerable burden of responsibility upon the medical profession, and would confer upon it a power which might easily be abused, is entirely due to misapprehension and has no foundation in fact.

When Lord Chorley's motion in favour of voluntary euthanasia was debated in the Lords on November 28 (*Journal*, December 9, p. 1338) all the five medical peers present spoke against it. This, of course, was very unfortunate from our point of view and scarcely gave the motion a chance, but I may perhaps recall that the first president of our Society, who but for his untimely death would have introduced our Bill himself, was the late Lord Moynihan, the eminent surgeon and a past-president of the Royal College of Surgeons; also that one of our vice-presidents was the late Sir Humphry Rolleston, a past-president of the Royal College of Physicians. To-day, some 170 distinguished members of the profession, all of "Who's Who" status, and including 30 who have been knighted, have given us permission to use their names as being in sympathy with our objects.

As regards the religious objection, it is true that the Archbishop of York spoke strongly against the motion, but I would recall that when our Bill was before the Lords in 1936 the then Archbishop of Canterbury, although he voted against the Bill, said: "I must confess that this is, to me, a very difficult question, one in which principle and compassion contend, so that I find it not at all easy to make up my mind"; and I may mention that a number of distinguished churchmen, including the Dean of St. Paul's, have given us permission to use their names as being in sympathy.

Similarly, although the Lord Chancellor spoke strongly against the motion, we have a number of distinguished lawyers who are with us, and one of our vice-presidents was, until he retired, a judge of the High Court.

In concluding your leading article you say (quoting Lord Horder): "The good doctor will distinguish between prolongation of life and the unnecessary prolongation of the act of dying." Surely the "unnecessary prolongation of the act of dying" is very nearly if not quite what my Society is contending for.

It is often asserted that we are asking for the "right to kill." May I suggest that what we are asking for is rather "the right to die" (subject to certain necessary restrictions and safeguards), and for the right of *the sufferer to receive* such assistance from others as may be required in the exercise of this right.—I am, etc.,

Leicester. C. KILLICK MILLARD,
Hon. Sec., Voluntary Euthanasia Legalization Society.

SIR,—It was with profound disquiet that I read your leading article (December 9, p. 1318), where a subject of such gravity as euthanasia is discussed without so much as a reference to the fundamental issue which is at stake—I refer to the moral implications.

I would recommend, therefore, lest this issue be overlooked by irrelevant controversies over such matters as bureaucratic procedure, morale of the sick-room, and diagnostic errors, that we keep constantly before our minds those words of St. Paul: "None of us lives as his own master and none of us dies as his own master. While we live, we live as the Lord's servants, when we die, we die as the Lord's servants; *in life and in death* we belong to the Lord" (Romans xiv. 7–8).—I am, etc.,

Croydon. F. J. MOYNIHAN.

Cost of Academic Clinical Office

SIR,—If a wealthy man likes to indulge in lavish expenditure on travel, books, societies, journals, entertainment, etc., he is of course entitled to do so. In a nutshell the gravamen of Academicus (December 2, p. 1275) appears to be that he cannot eat his cake and have it. Possibly an ingenuous and spendthrift millionaire with an income of £100,000 and an expenditure of £99,800 might convince himself that he earns less than an Asiatic labourer, but he would convince nobody else—least of all the Asiatic labourer.—I am, etc.,

London, W.8. GEOFFREY G. SHERRIFF.

A Failing Policy

SIR,—The *title of your leading article* in the *Journal* (December 2, p. 1262) suggests that things might have been otherwise, and in the text you attribute failure to the Minister. Does not the real failure rest on those who agreed, against the wishes of the majority, to operate a policy which was doomed to failure? Certain powerful sections of the profession "saw their way" to operate parts of the scheme, and they evidently overruled the counsels of those who perceived in the main administrative framework an insuperable obstacle to sound planning. It is more likely that the historian of the future will be more astounded at this aspect than at the Minister who may have failed subsequently to develop some particular aspects of the scheme.

The White Paper of the Coalition Government, the schemes of the British Medical and other Associations, and the Bill itself all bore the hall-marks of political or medico-political expediency. No medical administrator of experience would have

produced a scheme which arbitrarily divided a personal health service into three lopsided divisions with no effective provisions for co-ordination or balanced economy. Certainly, no one whose vision went beyond the narrow confines of politics or the more specialized branches of curative medicine would have forgotten the vital role of preventive medicine. To forget that infectious-diseases hospitals, sanatoria, and, to a considerable extent, maternity hospitals were later adnexa of preventive medicine is on a par with the naive assumption that epidemics have had their day, that tuberculosis is a "general" rather than an infectious disease, and that all that remains of preventive medicine can be reduced to such simple terms as vaccination and immunization.

Having made a case, Sir, for the readjustment of the economy of the service, including the remuneration of those engaged in it, you conclude by saying that payment, or the lack of it, has nothing to do with the present discontent and disillusionment of the profession. Surely that is illogical. Let us face facts, if ever we are to advise the Minister on how best he can spend what money the Treasury will give him. At the present time the allocation of money for health services is roughly in the ratio of 1:12:24 for local health authorities, executive councils, and hospital boards respectively. Hospital administrative costs have shown the most spectacular increases without any increase in the number of available beds. It is almost impossible to obtain an analysis of these costs, but specialists' salaries are known to be a major item, and overhead costs, due to the cumbersome and wasteful system of management by boards, have shocked all who formerly managed the same hospitals.

Having dealt with statistics for more years than I care to remember, I know their limitations, and I am going to suggest that never have there been so many men, especially young men, in receipt of full specialist remuneration. Herein lies, I think, the failure to encourage the budding specialist. Having filled up the establishment there is little chance of succession for many years to come, and it is going to be a very difficult matter to persuade those who have suddenly made the grade that they must forgo some of their remuneration in order to bridge the gap which separates them from their less successful colleagues. The position of the *established* general practitioner, as compared with the entrant to general practice, is somewhat similar. The established doctor in either branch has experienced in the main a definite improvement in his finances as a result of the Act, and we know that the same holds true for dentists and opticians. If the Treasury can spare no more money, then some of this extra remuneration must be applied to the gradual advancement of recruits. I am aware that general practitioners, dentists, etc., are working hard for their money, but I have the impression that the unexpanded hospital service is top-heavy with specialists. Advice is of little use if it cannot be applied in practice—i.e., in hospital. Even in this age of substitution free spectacles or cough mixtures count for little to the chronic sick in their lonely attics, or to the bedridden consumptive awaiting admission to a sanatorium.

Some assume that the clock could be put back where it was on July 5, 1948, but that is manifestly impossible. The vesting date for practices, as well as for hospitals, is as irrevocable as that for the mines. It would appear to be an inevitable, if ironic, conclusion that the only way in which the profession can recast the health services in some semblance of a workable and economic proposition which will improve the health of the people and will, at the same time, attract recruits is to ask the Minister to introduce full State medicine. Those who may recoil, however, from such a suggestion should reflect on just how much they have gained or lost by their insistence on retaining what is little more than a travesty of freedom. We have been saddled with boards and councils whose members in the main know little of medical administration. In order to keep them on the rails they have been issued with directive circulars and supplied with technical officers. Some boards have ignored this guidance, and their management on the whole has not been of a high order. Nevertheless they represent expenditure which could be dispensed with. In a full State service they would disappear and the Minister himself would be directly responsible to Parliament. In their place there would be a small number of higher administrative officers—call them Civil Servants if you will—but the whole service, being highly technical, would inevitably develop on the advice of its technicians. Promotion would be a gradual process determined by the quality and service of the individual. At least we would be spared the unedifying spectacle of laymen being canvassed by prospective general practitioners, of specialists meeting in secret to share out distinction awards, and of the wide anomalies existing between those doing comparable work. The whole artificial and expensive barriers between regions, areas, and branches of the service would likewise disappear, with an improvement in balance and a great saving in man-power and money. There should be sufficient funds left over to provide and staff a number of hospital beds and perhaps one or two experimental health centres. As a realist, can one seriously lay much emphasis on health centres or on the Minister's failure to provide them? Until such time as practitioners pool their patients (an undesirable step) it is unlikely that they will favour communal consulting-rooms.

Finally, I would make a plea that the profession permit those who, by experience and training, have some knowledge of how a full service can be planned to draw up a draft scheme for the future, others having tried and failed.—I am, etc.,

Kirkcaldy. JAMES R. W. HAY.

Pulmonary Complications of Pertussis

SIR,—The annotation on this subject (November 18, p. 1162) states that in an article of mine I did not confirm previous suggestions that the high incidence was related to the severity of the disease. The article referred to contains figures to show that the incidence of pulmonary collapse rises with the severity of the disease.

My series of cases is also referred to as unselected, and it is said that 21% had persistent collapse for more than a year. The series was in fact selected, as all the cases were sufficiently severe to require admission to hospital, and the figure 21% refers to severe cases only.—I am, etc.,

London, S.W.1. DAVID NICHOLSON.

POINTS FROM LETTERS

Psychiatry and the Common Cold

Dr. M. C. ANDREWS (Wembley, Middlesex) writes: Is Dr. H. M. Feldman (November 11, p. 1120) serious when he writes about the emotional cause of the common cold? When I have toothache or a pain in my stomach I suffer from "a decrease of objective feelings of normal affection and sociability, and a tendency to self-absorption, a mood of irritability, and restlessness. . . ." This does not make me think I am suffering from "a basic mental conflict involving some interpersonal relationship." I suspect I have dental caries or have eaten bad food.

Technique of Ventrosuspension

Dr. E. HESKETH ROBERTS (London, W.1) writes: Statistics in gynaecological literature of the results of ventrosuspension by round ligament procedures are insufficient for the guidance of operators; the multiplicity of methods suggests there is scope for improvement, and it has not been emphasized sufficiently that there is a disturbing percentage of sequelae. . . . I found in 1945 that iliac pains were completely avoided by anchoring the plicated or shortened round ligament to the anterior wall of the uterus (utero-teretial suspension), instead of the anterior abdominal wall. . . . But occasional recurrence of retroversion was not prevented until the technique of utero-vesical suspension was added in 1946 . . . a foreshortening of the incised and lifted utero-vesical and para-vesical peritoneum to within 1 cm. of the bladder and stitching it to the upper anterior uterine surface (and laterally beyond the plicated round ligament but in front of the Fallopian tubes, which undergo no distortion). In 1947 I came to the conclusion that this foreshortening with advancement of the peritoneum was the essential portion of the operation to prevent recurrence, but that the utero-teretial plication was probably necessary to ensure sound healing and organization of the utero-vesical peritoneal suture line. After this deduction I substituted 40-day chromic catgut No. 3 for the fascial suture used in the 1946 plication. The relief of tension by plication of the inner two-thirds of the ligamenta teretia enables the use of a continuous suture of No. 1 chromic catgut for the peritoneum, thus diminishing the risk of adhesions due to the free ends of interrupted sutures. In four years I have had no recurrence of retroversion or iliac pains; follow-up is maintained for two years, and it is hoped to give more exact figures later. . . .

Obituary

HENRY MACCORMAC, C.B.E., M.D., F.R.C.P.

With the death of Dr. H. MacCormac on December 12, at the age of 71, after a long and painful illness, dermatology is deprived of one of its most eminent exponents. For about 40 years, and with seemingly increasing energy as he grew older, he applied himself ruthlessly and in defiance of failing health to the pursuit of his ideals. That he achieved his goal not only in this country but internationally is beyond doubt. To his British honours and degrees were added honorary membership of the leading dermatological societies of America, France, Belgium, and Denmark.



Elliott and Fry]

It was almost entirely due to his strenuous and persistent advocacy that skin diseases came to be recognized as an important cause of disablement and military wastage, and a classical contribution from his pen in the *British Journal of Dermatology and Syphilis* in 1917 on "Skin Diseases and their Treatment under War Conditions" is a lasting testimony to his efforts in that cause as well as to his skill and lucidity as an author. The C.B.E. which he was awarded in 1919 was an official recognition of the outstanding services he had rendered. During the first world war he was also awarded the Médaille d'Honneur de l'Assistance Publique for his services to the civilian population at and around Hardelôt-Plage, where, as a lieutenant-colonel in the R.A.M.C., he was in medical charge of No. 25 General Hospital for skin and gassed cases.

The son of John MacCormac, of Belfast, MacCormac graduated M.B., Ch.B. in 1903 at Edinburgh, and after coming to London soon established himself as assistant bacteriologist and medical registrar to out-patients at the Middlesex Hospital. Research work on the histology of cutaneous cancer probably accounts for his initial interest in dermatology and for his appointment as assistant in the dermatological department under Dr. J. J. Pringle, the acknowledged peer of such contemporaries as Radcliffe Crocker and Sir Malcolm Morris. To the experience gained there MacCormac added a study of the wealth of material at the St. Louis Hospital, Paris, under Professors Darier and Sabouraud. After taking the M.R.C.P. in 1909 he was appointed, on the death of his chief, physician to the skin department at the Middlesex Hospital. From that time he became prominent as a regular contributor to the literature and to the discussions and demonstrations of clinical cases at the Dermatological Section of the R.S.M. His name figures frequently in almost every volume of the *British Journal of Dermatology and Syphilis* since 1908. Not content with his clinical and teaching duties at the Middlesex Hospital and a growing private practice, he held dermatological posts at the Infants' Hospital, Vincent Square, St. John's Hospital for Skin Diseases, and the Seamen's Hospital, Greenwich, at the last institution gaining much valuable experience in the diagnosis and treatment of venereal diseases.

He became secretary of the Section of Dermatology of the R.S.M., and later president both of the Section and of the British Association of Dermatology. An honour he esteemed highly was the Lumleian Lectureship in 1945 at the Royal College of Physicians. He had been elected Councillor of the College in 1941. Among his later activities he sponsored and produced two films—on scabies and industrial dermatitis—and he was the first dermatologist to be appointed a medical referee. While he never wrote a textbook, he made himself responsible for the entire English edition of Jacobi's *Atlas of Dermochromes* (fourth edition), a work of the greatest value to students.

MacCormac—"Mac" to his many friends—never lost his inimitable Irish humour. An inexhaustible fund of topical anecdotes and a notable oratorical talent rendered him an indispensable adjunct to innumerable social and professional occasions. He was a loyal and lovable friend, and a generous supporter of many a young beginner. He held the unvarying affection and confidence of many grateful patients. He will be sorely missed by them and all his colleagues. Deepest sympathy is extended to his devoted wife, who for many years was his veritable right hand and secretary, and to a son at school.—H. C. S.

F. R. B. writes: To one whose difficult task it was to follow Dr. Henry MacCormac in some of his hospital work his death now, early in his retirement, causes profound sorrow. The details of his career will be more fully known and better recorded by his contemporaries; a younger man has perhaps had an equal opportunity of appreciating his great kindliness and generosity. Although in failing health, it was his great pride to keep on with his work, and his unspoilt, sprightly sense of humour, sometimes ironical but never unkind, gave his conversation an effervescent quality. It was difficult to believe that he could ever have been more light-hearted and youthful in outlook than he was in his seventies. Since the beginning of his illness last summer it has been obvious that it is not only among his colleagues and old pupils that "Harry Mac" will be missed, for innumerable patients have expressed their concern and sent messages of sympathy. His unfailing courtesy and kindly understanding will never be forgotten.

W. BROOKE PURDON, D.S.O., O.B.E., *M.C.*, M.B.

Major-General William Brooke Purdon, who was at one time Commandant and Director of Studies at the Royal Army Medical College, died in London on December 1, aged 68. He had been Ulster Agent in London since 1946. Brooke Purdon was born in Belfast and educated at Queen's College, where he studied medicine. He graduated M.B., B.Ch. in 1906, and joined the R.A.M.C. a year later. During the first world war he was awarded the D.S.O. and the *M.C.*, and was also mentioned in dispatches three times. In 1913 he took the D.P.H., and it was as a hygiene specialist that he became well known after the war. In 1923 he was appointed O.B.E. and an officer of the Venerable Order of the Hospital of St. John of Jerusalem. He was Assistant Director of Hygiene at the War Office from 1930 to 1934, and later became Professor of Hygiene at the Royal Army Medical College. During the second world war he was for nearly five years medical superintendent of Queen Mary's Hospital, Roehampton. From 1938 to 1941 he was honorary surgeon to the King. In 1946 he gave up his medical career to become the Agent in London of the Northern Ireland Government, and in this post he was remarkably successful. During his younger days he was a good rugby player, being capped for Ireland

several times. At the time of his death he was president of the London Irish Rugby Club.

Mr. Leon Gillis writes: We grew to know Major-General Brooke Purdon well during the war years when he was medical superintendent of Queen Mary's Hospital, Roehampton. As a doctor he served his patients to a far greater extent than if he had specialized in medicine or surgery. It is not only the physician or surgeon who can help his fellow men but it is also the good administrator. Here was a personality who was beloved by all who knew him. His cheery face and kindly expression will long be remembered at the hospital. To those of us who knew him intimately the depth of feeling that he showed for all people was something to be wondered at. He was the embodiment of kindness, and visited his patients through the most critical days of their illness with encouraging words. He was always ready to give credit where credit was due, and the discipline of the hospital was a thing to be admired. He had a host of friends throughout the world who kept up a regular correspondence with him. His fund of stories seemed endless, and the occasions were few when his extraordinary memory could not produce an appropriate narrative. He enjoyed a full life and died a man without enemies.

S. WATSON SMITH, M.D., F.R.C.P.

We announce with regret the death on December 15 of Dr. S. Watson Smith, a Past-President of the B.M.A. and a consulting physician at the Royal Victoria and West Hants Hospital, Bournemouth.

Sydney Watson Smith, a native of Dundee and son of the late Colonel W. Smith, J.P., qualified at the University of Edinburgh in 1903, proceeding M.D. in 1925. After qualifying he was house-surgeon and house-physician at the Dundee Royal Infirmary, and then continued his post-graduate studies in Edinburgh and London, eventually, in 1907, going into practice in Dundee, where he worked extremely hard. Although he had been a keen Territorial, failing health before the first world war compelled him to resign his commission. However, he succeeded in getting into the R.A.M.C., but was invalided out in June, 1918. Early in 1919 he began to practise in Bournemouth, becoming a consulting physician there in 1924. In 1925 Dr. Watson Smith took the Membership examination of the Royal College of Physicians of Edinburgh, and three years later that of the Royal College of Physicians of London. He was elected F.R.C.P.Ed. in 1930, and in 1938 the London college elected him to its Fellowship. Among the appointments he held in these years and subsequently were those of honorary consulting physician and honorary consulting dermatologist to the Royal Victoria and West Hants Hospital, and honorary consulting physician to the Royal National Sanatorium at Bournemouth. His advice was sought by colleagues over a wide area, including parts of the counties of Hampshire, Dorset, and Wiltshire. He made a detailed study of the severe typhoid epidemic at Bournemouth in 1936 and published an account of it in a booklet.

In 1934 the B.M.A. held its Annual Meeting at Bournemouth, and Dr. Watson Smith was then elected President of the Association. Those who were fortunate enough to be present at that meeting remember what an outstandingly generous host he was. In his presidential address he characteristically pleaded for a rational approach to medical climatology. Within the B.M.A. Dr. Watson Smith carried out much useful committee work, serving on the Council from 1934 to 1936 and on many of the Association's committees.

Dr. O. C. Carter writes: I had the privilege and pleasure of knowing Watson Smith intimately over a period of many years. I knew him as a consultant whose wisdom, knowledge, and advice were of inestimable help to me in the conduct of general practice, and I knew him as a friend and as a patient. During the preparation for the Annual Meeting of the B.M.A. in Bournemouth in 1934, as honorary local general secretary, I came a great deal in contact with Watson Smith as President-Elect, and during that year of preparation he spared nothing in time or energy. No one who attended the Bournemouth meeting will ever forget the magnificence of his presidential reception in the Pavilion, the cost of which was defrayed by him personally. He was the editor of the *Book of Bournemouth*, which was produced specially for the meeting and is now very hard to come by.

In 1935 he led the first world tour of the Association at the time of the Annual Meeting in Melbourne, where he installed the late Sir James Barrett as his successor in the presidential chair. Later he wrote the official chronicle of the world tour. During the time he was chairman of the local medical war committee—he was unanimously elected to this office in 1938, and he held it until illness forced him to give it up in 1944—I was its secretary, and he carried out his work with thoroughness, ability, and complete impartiality. Many have lost a great friend, a man of integrity, generous character, and great kindliness, and the profession has lost a noble colleague who was held in high esteem. He made no enemies, and no one begrudged him the great success which he made in his professional career.

Dr. FRANCIS MOLISON MILNE, consultant physician and pathologist to the Dundee Royal Infirmary, died in Dundee on October 28. He graduated M.A. with honours at St. Andrews University in 1897, and then proceeded to take the degree of B.Sc. He was interested in marine biology and was for a time assistant to Professor M'Intosh. He then turned to medicine and graduated M.B., Ch.B. in 1904. After a resident appointment at the Infirmary, he came to London as assistant to the pathologist at the London School of Clinical Medicine. In 1909 he returned to Dundee as assistant to the professor of pathology in the University of St. Andrews. In the same year he took the D.P.H. and was appointed lecturer in clinical pathology in the university, a post which he held until 1933, when he became a lecturer in clinical medicine. From 1919 to 1933 he was also physician for diseases of the skin at Dundee Royal Infirmary and in 1933 was appointed a visiting physician. He retired in 1938. Frank Milne was the possessor of a phenomenal memory. He was an interesting and inspiring teacher, seen at his best in impromptu clinical teaching, and many of his students, who will have learned of his death with deep regret, realize to the full the debt they owe to him for the clinical knowledge they acquired under his enthusiastic guidance in the medical out-patient department. Temperamental, yet one of the kindliest of men, his many quiet acts of practical kindness are cherished memories to very many of his colleagues and patients alike. Intensely interested in his fellow-men, he had innumerable friends and acquaintances in all parts of Scotland and in all walks of life. He had a fine knowledge of pictures and of books, and for 22 years had been a householders' representative on the Dundee Public Libraries Committee. He will be mourned by very many, both of the Town and of the Gown.—G. R. T.

W. F. D. writes: I pay tribute to Frank Milne after 35 years of his friendship—as teacher, senior colleague in forensic work, family physician, and finally beloved patient. Gifted with an encyclopaedic mind, knowledgeable beyond most in many diverse interests, his very diversity prevented him from becoming a genius. As a teacher he was ahead of his time—urging us students to do clinical pathology and post-mortem work not in the curriculum, and encouraging us to seek ward work in the Poor-Law hospital while its doors were still officially closed to students. In medico-legal work his help was invaluable; at necropsies, in framing reports, and in preparing evidence for the courts he had a knowledge of legal points and a balanced sense of fairness which made him an ideal adviser and critic. With apparently no spare time, he yet could give hints on gardening, nature study, bee-keeping, and holiday touring which always proved useful and practical. Soon after he retired war came. As his contribution to war work he took over the duties of skin specialist at Aberdeen. Travelling to and from that city proved arduous, and the trials of an early air raid precipitated a seizure. Crippled in body, his mind was unharmed, and with dauntless courage he continued to play his part as citizen and friend till a few weeks before his death. Many in Dundee besides his colleagues and patients loved and honoured the man and mourn his passing.

GEORGE HUGH CULVERWELL, Chief Home Office Inspector under the Cruelty to Animals Act, died on December 9, at the age of 63. His parents lived in Co. Down, and after leaving school he studied medicine at Trinity College, Dublin, where he was Stewart Medical Scholar in Natural Science. Among other academic distinctions he won the Purser Medal in physiology and the Dublin University Biological Association Medal. He graduated M.B., B.Chir. in 1913 and proceeded M.D. a year later. He took the D.P.H. in 1914. After serving in the R.A.M.C. during the 1914–18 war Culverwell spent a short period as school medical officer for Berkshire County Council. From there he went to the Home Office as a medical inspector in the reformatory and industrial schools department. His main preoccupation in this position was with the diet of the children. There was at that time an alarmingly high tuberculosis rate among them, and Culverwell tackled the problem from the public health standpoint. As a result of his work the diet of the boys and girls in these schools was greatly improved, particularly their milk allowance, and not only did the tuberculosis rate go down but the rate of growth of the children increased quite significantly. This achievement was assisted by the departmental sympathy which he mobilized, but it was nevertheless a remarkable one, and set a new standard for the care of deprived and delinquent children. For his work in the Children's Branch at the Home Office Culverwell was appointed O.B.E. In 1936 he transferred to that branch of the Home Office which administers the Cruelty to Animals Act of 1876 (experiments on living animals). Here for ten years he served as inspector. This period included the difficult war years, when his place of work was moved on a number of occasions, and the travelling he had to do was made more arduous by the circumstances of the war. In 1946 Culverwell became chief inspector, and remained in this position until his final illness.

W. L.-P. writes: In many ways Culverwell was one of the old school of administrators—unhurried, just and conscientious, and with an utterly inflexible standard of integrity and fair dealing. He would take infinite pains to explain to those who wanted to know the intricacies of the Act he was called upon to administer, and also to understand and solve the problems facing licensees under the Act. In all things he took the long view, for he was a man of clear vision, and would never commit himself to an opinion, or an action, until he was satisfied that it was correct and practicable both immediately and remotely. He never spared himself, for it was not his nature to give only half his energies to his work. Had he been differently constituted he might have been able to ease up in recent years, but as it was he was fully engaged right up to his last brief illness. His personal charm and courtesy endeared him to many, particularly to his more intimate friends, and those of his colleagues who had worked closely with him realize what a great loss his death brings. He was always ready with help and advice, and it was always good advice that he gave. If any man earned a quiet retirement it was Culverwell, but his own exacting nature and his sense of duty denied him this reward. He leaves a widow, a daughter, and a son.

Medico-Legal

ALLEGED 360-DAY PREGNANCY

The House of Lords by a majority (Lord Oaksey dissenting) on December 14 allowed the appeal of the husband who brought a divorce suit on the grounds that a baby born 360 days after the possible date of conception was not his.

On August 13, 1946, the wife gave birth to a child which weighed 8¼ lb. and was apparently normal in every way. The husband contended that he had been serving in Germany with the R.A.F. between August 17, 1945, and February 9, 1946, and that the child had been conceived in October or November, 1945, when he had no access to his wife. Judge Burgis, sitting as a Divorce Commissioner, first heard the petition and dismissed it, and the Court of Appeal ordered a rehearing. This took place before Mr. Commissioner Blanco White on March 24, 1949.[1]

Mr. Commissioner Blanco White said he was satisfied on the medical evidence that the child could not have been conceived as late as 186 days before the birth. Gestation periods of 346 days in 1947 and 349 days in 1948 had previously been accepted, and in this case the Commissioner, on the court's judicial knowledge of natural laws, could not say that 360 days was an impossible period, and he was not satisfied beyond reasonable doubt that adultery had been committed.

On July 22, 1949, the Court of Appeal by a majority (Lord Justice Denning dissenting) directed a new trial and gave leave to both sides to appeal to the House of Lords.[2] Lord Justice Denning then said that he would have been for allowing the appeal and granting a decree nisi.

In his judgment in the House of Lords Lord Simonds said[3] that the question that had then presented itself to the Commissioner was whether the fact that at least 360 days had elapsed between the last possible intercourse between husband and wife and the birth of the child, together with the medical evidence, put it beyond reasonable doubt that the child was not the child of the husband. The Commissioner had answered that question in the negative. Lord Simonds thought it clear that the Commissioner did not consider he would be justified in finding that adultery had been committed merely on the ground of lapse of time without medical evidence, and he found that the medical evidence adduced was unsatisfactory.

The appeals raised a question of peculiar difficulty which might be stated in this way: If a husband proves that his wife has given birth to a normal child 360 days after he could have had intercourse with her, and no proof of any adulterous intercourse by her is given, what, if any, further evidence is required that the child is not his child?

The utmost that a court of law could demand was that it should be established beyond all reasonable doubt that a child conceived so many days after a particular coitus could not be the result of that coitus. The court had judicial knowledge of the normal period of human gestation, but could the court altogether, and, if not altogether, within what limits, disregard the abnormal? Could the court find as a fact that adultery had been committed if the period of gestation had been abnormal and no evidence to explain it had been adduced? He thought it would appear fantastic to any ordinary man or woman that a normal child born 360 days after the last intercourse of a man and a woman was the child of that man, but the difficulty lay in drawing the line.

After referring to other long periods of gestation that had been accepted he said he must come to the conclusion that an additional period of 11 days, making 360 days in all, ought not to be regarded as making the vital difference so that the court could, without any further evidence, regard adulterous intercourse as proved beyond all reasonable doubt. In the present case the only medical evidence was that of one doctor.

[1] *British Medical Journal*, 1949, 2, 181.
[2] Ibid., 1949, 2, 337.
[3] *The Times*, December 15, 1950.

Lord Simonds said he had no hesitation in accepting that evidence as adequate to justify a finding that beyond all reasonable doubt the child was not the child of the husband. The doctor had not claimed to have studied the problem of the "maximum period from the time of sexual intercourse to the time of the impregnation of the ovum." But, said Lord Simonds, it was sufficiently clear from his answers that, while recognizing the possibility of some interval between coitus and fertilization, he regarded as impossible an interval which would defer the birth of a normal child to 360 days after coitus. Lord Simonds thought the doctor was entitled to say that as a matter of competent medical opinion without having made a special study of the subject. The Commissioner had not been justified in disregarding his evidence but should have made a decree for divorce.

The appeal of the husband was allowed, the cross-appeal of the wife dismissed, and the cause remitted to the High Court in order that a proper decree might be made.

Lord Oaksey said he was in favour of dismissing the petition and allowing the cross-appeal.

Universities and Colleges

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—J. A. Ardis, Laura M. Barlow, A. S. Clark, Ruth A. Cohen, R. B. Davis, J. R. E. Dobson, O. Elgarem, A. Elithorn, W. Fabisch, L. Ford, G. J. Goldberg, J. T. Hutchinson, W. A. MacIlrath, H. E. S. Marshall, J. K. W. Morrice, B. J. Phillips, R. M. Phillips, H. Pozner, A. A. Robin, E. Rosenthal, T. Schlicht, R. D. Scott, D. B. Stone, D. L. C. Thomas, W. L. Tonge, J. Towers, W. H. Trethowan, H. de B. Warren, C. H. A. Wedeles, A. C. Woodmansey, T. A. Wylie. (All with Mental Diseases (Psychiatry) in Part B.) The following candidates passed in Part A only: D. Anton-Stephens, P. G. Aungle, E. D. Barlow, F. B. E. Charatan, M. B. Contractor, W. A. Cramond, H. W. D. Davies, H. Duschinsky, Herta Graz, S.-E. Hamid, A. G. Hucker, M. A. Jackson, W. G. Joffe, J. C. Kerridge, C. S. Lindsay, C. Milne, D. W. Moynagh, J. Pullicino, E. Roderic-Evans, S. Smith, G. F. Spaul, S. J. G. Spencer, B. Steinberg, H. P. Tarnesby, G. I. Tewfik, Letitia E. Woodvine, D. M. Zausmer.

The following have been appointed, or nominated for appointment or reappointment, as representatives of the University on the governing bodies indicated in parentheses: Professor E. T. C. Spooner, M.D. (St. Thomas's Hospital Medical School); Professor L. P. Garrod, M.D., F.R.C.P. (Kentish Educational Foundation, St. Albans); N. A. Thorne, M.D. (Mandeville Street and Upton House).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Westminster Medical School:* Mr. A. Lawrence Abel, Mr. S. O. Aylett, and Mr. David Levi (Surgery); Mr. A. B. Evans (Obstetrics and Gynaecology); Dr. Ronald Jarman (Anaesthetics); Dr. J. L. Lovibond (Medicine). *Royal Free Hospital School of Medicine:* Miss A. Josephine M. T. Barnes (Obstetrics and Gynaecology); Dr. Helen E. Dimsdale (Medicine); Mr. H. D. Johnson (Surgery). *National Institute for Medical Research:* Dr. W. S. Feldberg, F.R.S. (Physiology and Pharmacology). *King's College Hospital Medical School:* Mr. A. J. Heriot (Surgery). *Middlesex Hospital Medical School:* Dr. F. D. Howitt (Physical Medicine). *St. Mary's Hospital Medical School:* Dr. J. W. Litchfield (Medicine); Dr. E. Neumark (Pathology). *St. George's Hospital Medical School:* Sir William Paul Mallinson, B.M., M.R.C.P. (Mental Diseases). Mr. H. R. Wolfe has been granted probationary recognition as a teacher of surgery at University College Hospital Medical School for two years from October, 1950.

The following, who are already recognized teachers at undergraduate medical schools, have been recognized also as teachers at the institutes of the British Postgraduate Medical Federation indicated and in the subjects shown in parentheses: *Institute of Obstetrics and Gynaecology:* Mr. D. H. Macleod and Mr. W. N. Searle (Obstetrics and Gynaecology). *Institute of Ophthalmology:* Mr. A. G. Cross, Mr. E. F. King, and Mr. J. G. Milner (Ophthalmology).

The Leavesden Hospital, Abbots Langley, Watford, Herts, and the St. Pancras Hospital Mental Observation Unit (University College Hospital Group) have been added to the list of recognized institutions at which students may take the course on mental diseases for the M.B., B.S. degrees.

UNIVERSITY OF BIRMINGHAM

The new hostel for students in residence at Dudley Road Hospital, Birmingham, during their training in obstetrics came into use on December 1. The Council and the regional hospital board have agreed that the building shall be called the Hilda Lloyd Hostel in recognition of Professor Lloyd's distinguished work as professor of obstetrics and gynaecology and of the time and energy which she has given to the scheme.

The following lectures have been arranged to be delivered at Edgbaston: January 15, 1.45 p.m., Professor K. Mather, D.Sc., F.R.S., Professor of Genetics in the University, "Genetics and Human Affairs"; March 1, 1.45 p.m., Professor J. F. D. Shrewsbury, Professor of Bacteriology in the University, "Henry VIII: A Medical Study"; March 9, 1.45 p.m., Professor Shrewsbury, "St. Anthony's Fire."

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on December 4, with the President, Mr. Walter W. Galbraith, in the chair, the following were admitted Fellows of Faculty *qua* Physician: J. O'D. Alexander, T. Chelvarajah, J. S. Creighton, A. S. Douglas, R. M. Kapadia, Joan B. Landsman, S. A. Mannan, G. C. Provan, W. G. Whyte.

Medical News

Unique Medical Library

One of the world's finest private collections of books on medical history, the library of Dr. Erik Waller, of Stockholm, has recently been placed at the disposal of the library of Upsala University, and will shortly be transferred there as a separate unit. The collection, which comprises over 20,000 volumes and about 5,000 dissertations, contains 150 incunabula and has long been internationally famous. Dr. Waller, who recently celebrated his 75th birthday, started his collection 40 years ago, his principal interest being in old manuscripts, of which there are over 50 dating from the thirteenth century. Later he turned his attention to building up a representative collection of works by the great masters of surgery and medicine. Among the many valuable volumes is one of the very few known copies of Andreas Vesalius's *Tabulae Anatomicae Sex*, published in 1538; several rare books by William Harvey, discoverer of blood circulation; and a complete set of works by and about the father of surgery, Ambroise Paré. Dr. Waller's library also contains the first medical book printed in Sweden (on pestilence), written by Lemnius, physician to King Erik XIV in the sixteenth century, and a valuable collection of the works of Linné (Linnaeus), including his doctoral thesis.

"Oesophageal Speech after Laryngectomy"

A 10-minute talking film has been made by Campbell Harper Films Ltd., Edinburgh, for the C.O.I. and the Department of Health for Scotland, to show to patients about to undergo laryngectomy, and to medical students and medical staffs, what a man without a larynx can do to talk aloud by means of controlled belching. The film was shot in Glasgow, mostly at the special club run by Mr. T. O. Howie, Surgeon to the Ear, Nose and Throat Department of the Victoria Infirmary. Patients after laryngectomy learn to speak again and lead completely normal lives, working amid the noise of an engineering shop, speaking on the telephone, dictating letters, and so on. The club, which is unique in Britain, enables the new patient to gain hope and confidence and lose his shyness when surrounded by others who have successfully learned to talk again. This rehabilitation could only have been adequately recorded by a talking motion picture, and an excellent film has been made of it at a very low cost (£750). The idea might well be extended to other disabilities.

R.A.F. Institute of Pathology and Tropical Medicine

To mark the twenty-fifth anniversary of the founding of the Institute the Director-General of the R.A.F. Medical Service (Air Marshal Sir Philip C. Livingston) and the Senior Consultant in Pathology (Air Vice-Marshal T. C. St. C. Morton) held a reception and lunch at Halton, Bucks, on December 12. Air Marshal Sir Harold Whittingham, wartime Director-General, spoke at the lunch, and demonstrations of the work of the Institute were on view.

Penicillin Spoils Cheese-making

Cows given penicillin as treatment for udder inflammations discharge enough of the antibiotic in their milk to kill the bacteria essential for normal cheese-making. This is still so when the milk from a cow under treatment is mixed with the milk of 200 normal cows, and consequently is a serious threat to the cheese industry. In Sweden, according to the Swedish International Press Bureau, steps are now being taken jointly by the dairymen and the Veterinary Board to ensure that penicillin is used only when really necessary, and that the milk from treated cows is kept separate.

Film Censorship

According to *The Times* the British Board of Film Censors will introduce a new category in the New Year. The X certificate will be applied to films wholly adult in theme or treatment, and no one under 16 will be admitted to them. It replaces the old H certificate, which was given only to horrific films, and follows the recommendation of the Departmental Committee on Children and the Cinema (see *British Medical Journal*, July 8, p. 96).

Wills

Dr. Waldemar Shipley West, late consulting physician, the Royal Bucks Hospital, left £8,524; Dr. Horace Potts, who practised in Great Yarmouth for 50 years, left £4,519; Dr. Harold Warburton Lewis, left £11,876; Dr. Angus Duncan Macpherson, assistant medical secretary of the British Medical Association from 1904 to 1935, left £50; Dr. Andrew Stewart Wilson, late resident physician and resident surgeon (ophthalmic), Aberdeen Royal Infirmary, left £25,865; Dr. Wyndham Anstruther Milligan, for 50 years practising in Mayfair, left personal estate in England and Scotland valued at £48,506. Dr. Ivor Isaac Price, senior consultant surgeon to the Whittington Hospital, London, N.19, and late senior resident surgeon and deputy medical superintendent at St. Mary (Islington) Hospital, left estate, "so far as at present can be ascertained," valued at £7,909.

COMING EVENTS

International Congress of Military Medicine

The 13th International Congress of Military Medicine and Pharmacy will be held at Paris in 1951 (June 17–23) and is open to all doctors, pharmacists, dentists, veterinary surgeons, and administrative officers on the active or reserve lists of all armed forces. The scientific meetings will be taken under the following heads: principles of tactical organization for first aid for large numbers of wounded; organization of training and provision of a career in military medicine; medical problems raised by aerial and submarine navigation; medical aspects of defence against atomic, biological, and chemical warfare; the role of the military pharmacist. Additional papers may be read if they are submitted before April 1, 1951. Full information can be obtained from the Secretariat-General of the Congress, Section Technique du Service de Santé, 8 bis, Rue des Récollets, Paris 10e.

Paris Course on Rheumatism

A course open to foreign as well as French doctors will be held from January 29 to February 4 under the direction of Professor M. F. Coste, of the Hôpital Cochin. Clinical demonstrations, laboratory technique, and lectures on recent advances are planned. Full information may be obtained from Dr. P. Galmiche, Hôpital Cochin, 27, Rue du Faubourg St. Jacques, Paris 14e.

Twenty-sixth Annual Congress of Anaesthetists

The twenty-sixth Annual Congress of Anaesthetists, sponsored by the International Anesthesia Research Society, will be held in London from September 3 to 7, 1951. Short papers will be read in the mornings and there will be demonstrations at various London hospitals. Scientific discussions and business meetings will be held in the afternoons. There will be an exhibition of apparatus and drugs, and facilities for scientific exhibits by anaesthetists. Anaesthetists who wish to attend are requested to write as soon as possible to a member of the London Committee stating whether they wish to read a paper, and, if so, its probable length. Manufacturers should address their inquiries to Mr. A. Charles King. The following are the members of the London Committee: Dr. R. W. Cope, Dr. Vernon Hall, Dr. Ronald Jarman, Mr. A. Charles King, Dr. C. B. Lewis, Dr. G. S. W. Organe, Dr. C. F. Scurr, and Dr. W. D. Wylie. Papers should be submitted before March 15, 1951, to Dr. R. W. Cope, University College Hospital, London, W.C.1.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

McLaren.—On December 7, 1950, at Westbay Nursing Home, Broughty Ferry, Dundee, to Patricia Annette (formerly Taylor), wife of Mr. William J. McLaren, F.R.C.S., a son.

DEATHS

Babington.—On December 10, 1950, at Margate General Hospital, James William Herbert Babington, M.D., Major, I.M.S., Ret., of 24, Devonshire Gardens, Margate.

Culverwell.—On December 9, 1950, George Hugh Culverwell, O.B.E., M.D., D.P.H., of Salthouse, Thorniaw Road, West Norwood, London, S.E.

Davies.—On December 5, 1950, at Stroud General Hospital, Albert Barnes Davies, M.R.C.S., L.R.C.P., aged 89.

Dempsey.—On November 25, 1950, Timothy Gerard Dempsey, M.B., B.Ch., of 28, Marvels Lane, London, S.E., late of Dublin.

Emerson.—On December 2, 1950, at Pershore House, Pershore, Herbert Bree Emerson, M.R.C.S., L.R.C.P., aged 82.

Fisher.—On December 6, 1950, at her home, St. Kitts, Uxbridge Common, Middlesex, Emma Christiana Rolfe Fisher, L.R.C.P.&S.Ed., L.R.F.P.S.Glas.

Forrest.—On December 7, 1950, at Delgany, Maple Road, Harpenden, Herts, James Aquilon Forrest, M.B., C.M., Surgeon Captain, R.N., retired, aged 79.

Frew.—On December 1, 1950, John Frew, M.B., Ch.B., D.P.H., of 103, Howard's Lane, Putney, London, S.W.

Galloway.—On December 9, 1950, at Hill Cot, Salcombe Hill, Sidmouth, Andrew Fleming Galloway, M.D., late of 11, Finsbury Square and Clarence Gate Gardens, London.

Graham-Yooll.—On December 11, 1950, at the Royal Infirmary, Edinburgh, Ralph William Graham-Yooll, M.B., Ch.B., of Cairnton, West Linton.

Kelly.—On November 28, 1950, at Douglas, Isle of Man, Thomas Kelly, L.R.C.P.&S.I.&L.M., 1, Salisbury Terrace, Douglas.

Kyffin.—On December 13, 1950, John Kyffin, M.R.C.S., L.R.C.P., of Windfall Cottage, Brookside, Oxford, formerly of Penrhyn, Gosport, aged 84.

Logie.—On December 6, 1950, at 90, Graham's Road, Falkirk, William Jamieson Logie, M.B., Ch.B.

Lyle.—On December 2, 1950, John Beattie Lyle, M.D., of Broxbourne, Barnsley Road, Wakefield, Yorks, aged 68.

MacKay.—On November 30, 1950, suddenly, in hospital, George Ross MacKay, M.B., Ch.B., of 20, Upper Tooting Park, London, S.W., aged 49.

Martyn.—On December 5, 1950, at 33, Berry Drive, Paignton, Gilbert John King Martyn, M.D., D.P.H., late of Bath, aged 81.

Muir.—On December 9, 1950, at White Cottage, Marley, Exmouth, John Muir, O.B.E., M.B., Ch.B., beloved husband of Dr. Jessie S. Muir (formerly McEwen).

Taylor.—On December 3, 1950, at Sunbury-on-Thames, Alexander John Reid Taylor, M.B., Ch.B.

Willmore.—On December 8, 1950, at the Westminster Hospital, James Graham Willmore, O.B.E., M.D., M.R.C.P., of Edgehill Farm, Petworth, Sussex.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications in the week ended December 9 were: paralytic 73 (90); non-paralytic, 31 (38); total, 104 (128). The figures for the previous week, compared with which there was a total decrease of 24, are in parentheses.

Uncorrected notifications for the corresponding week in 1947 and 1949 totalled 76 and 134 respectively. Total uncorrected notifications for 1950 to and including the week under review are 8,483. The corresponding figures for 1947, 1948, and 1949 are 9,003, 2,308, and 6,617 respectively.

County areas with the most numerous notifications in the week under consideration were: Lancs 9, Warwick 9, Middlesex 7, Kent 6, Somerset 6, London 5, Surrey 5. Nineteen county areas in England notified no cases. The only notifications in Wales were Caernarvon 1 and Glamorgan 1. The decrease in incidence of the disease in England and Wales is well maintained.

Measles

The biennial peak in the notifications of measles is due to occur in the early months of next year. Already the complaint has reached epidemic proportions. During the past two months the number of cases has increased at the rate of 1,000 a week. For the week ending December 2 there were 12,323 notifications. This is a steeper increase than that which occurred in the last epidemic period, but is offset by the fact that in 1948 the build-up, in the country as a whole, during the late summer and autumn was more substantial.

The incidence of summer cases this year was most marked in the Potteries and the north-east, but these districts have been relatively free in recent weeks. The majority of cases are now occurring in the counties around London, in Lancashire, and in Yorkshire (East and West Ridings). Of the county boroughs, Kingston-upon-Hull has been affected considerably more than any other. In November almost 3,000 cases were notified from this source. By contrast, the comparable figure for Newcastle-upon-Tyne was 15. The infection is reported to be of a comparatively mild form.

Dysentery

One of the chief features of the returns for infectious diseases during this year has been the large number of notifications of dysentery. During the week 856 cases were notified. This total exceeded the record high level of the preceding week by 230. Many of the large outbreaks have persisted over several weeks and have proved difficult to control. In practically all the outbreaks the Sonne type of organism has been responsible for the infection. The largest current outbreak is in Leicester C.B. Sporadic cases had been notified in this city up to the 31st week of this year, when the notifications rose from 2 to 22. In the following 18 weeks 651 cases were notified. Other notable outbreaks in the earlier part of the year included those at Yorkshire West Riding, where the notifications during the 7th to 14th week ranged from 110 to 205. The principal centres of infection during this period were Sheffield C.B., Leeds C.B., Bradford C.B., where 572, 252, and 134 cases, respectively, were notified during the eight weeks. Over 100 notifications a week were also reported in this county during the 18th–21st weeks. The largest returns during this four-week period were Sheffield C.B. 127 and Bradford C.B. 164. In the 12th and 13th week the notifications in Durham exceeded the 100 mark due to outbreaks in Blaydon U.D. and Starley U.D. During the week ending June 3, 180 cases were notified in Lancashire, of which Oldham C.B. contributed 78.

During the week ending December 2 the largest returns were: Lancashire 171 (Southport C.B. 42, Irlam U.D. 33, Oldham C.B. 15, Manchester C.B. 13, Liverpool C.B. 13, Bootle C.B. 9); Leicestershire 131 (Leicester C.B. 112); Yorkshire West Riding 93 (Saddleworth U.D. 23, Sheffield C.B. 21, Brighouse M.B. 12, Shipley U.D. 12); Durham 49 (Gateshead C.B. 13, Darlington C.B. 10, Stanley U.D. 10); Monmouthshire 46 (Newport C.B. 25, Abercarn U.D. 11, Risca U.D. 9); Shropshire 43 (Market Drayton U.D. 27, Drayton R.D. 9); Northumberland 26 (Newcastle-upon-Tyne C.B. 13, Rothbury R.D. 13); London 24; Cumberland 21 (Penrith U.D. 13); Surrey 20 (Esher U.D. 9); Essex 19 (Romford M.B. 10); Glamorganshire 16 (Cardiff C.B. 12); Kent 13 (Canterbury C.B. 9); Northamptonshire 12 (Kettering M.B. 12); Warwickshire 12 (Birmingham C.B. 10); Carmarthenshire 12.

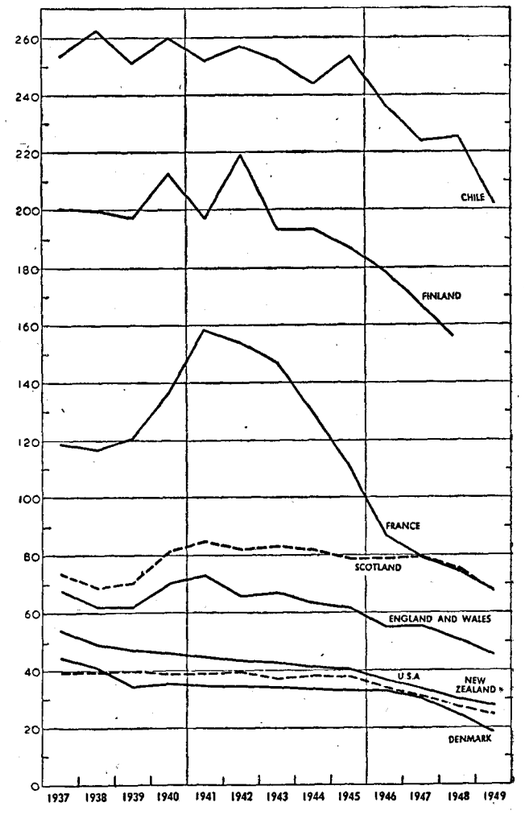
Infectious Diseases

A further rise was reported during the week in the trends of measles and whooping-cough. The notifications of measles in England and Wales are now five times the number recorded in mid-September. The increase in the incidence of whooping-cough has not been so spectacular, because this disease has been running at a high level for several months, but it is now at the highest peak ever recorded. The incidence of dysentery in Scotland remained high; 73 of the 147 cases were notified in Glasgow. In England and Wales the notifications were the largest ever recorded, the largest centre of infection being Leicester C.B. 112. The other features of note in the returns were a small increase in primary acute pneumonia in Scotland and a small outbreak—5 cases—of paratyphoid fever in the burgh of Motherwell and Wishaw.

Mortality from Tuberculosis

The graph below shows deaths from tuberculosis per 100,000 inhabitants in certain countries from 1937 to 1949. It is reproduced from the *Epidemiological and Vital Statistics Report* (October, 1950) of the World Health Organization.

Mortality from Tuberculosis in Certain Countries, 1937–49: Rates per 100,000 Inhabitants



An article by Dr. J. B. McDougall, head of the tuberculosis section of W.H.O., discusses tuberculosis mortality in various countries for which "reasonably reliable" statistics are available. He says of England and Wales, "The most remarkable fact is that in view of the wartime experience the rates for the war years were not higher." He considers that our system of rationing of essential commodities, particularly food, "had much to do with the stemming of tuberculosis mortality during these critical years."

The steeply falling rates in France since 1943 are difficult to account for, and apparently French authorities are not unanimous about the cause. The most important single factor is thought to be the rise in the general standard of living. Dr. McDougall comments that Denmark "remains unique in its position concerning tuberculosis mortality." Fatal primary tuberculosis in young children especially is almost eradicated.

Week Ending December 9

The notifications of infectious diseases in England and Wales, during the week, included: scarlet fever 1,264, whooping-cough 4,431, diphtheria 49, measles 14,076, acute pneumonia 573, acute poliomyelitis 104, dysentery 933, paratyphoid fever 2, typhoid fever 6.

No. 48

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (b) London (administrative county) (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	32	4	11	1	—	26	6	14	—	—
Deaths		1	1				1	—		
Diphtheria	45	6	13	4	4	90	11	29	6	6
Deaths	—	—	—	—	—	—	—	—	—	—
Dysentery	856	24	147		4	159	10	94	—	—
Deaths		—			—				—	—
Encephalitis, acute	—	—	—		2	—	—	—	—	—
Deaths		—		—			—			
Erysipelas			26	10	1			35	10	5
Deaths							—			
Infective enteritis or diarrhoea under 2 years				31	12				28	
Deaths	21		2	5	—	18	2	4	3	2
Measles*	12,323	1210	241	136	126	1,654	31	23	92	116
Deaths†		—	—	—	—			—	—	—
Ophthalmia neonatorum	33	4	11		—	38	1	5	1	—
Deaths										
Paratyphoid fever	8	—	5(B)		—	7	—	—	—	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	497	28	4		11	715	42	7	4	6
Deaths (from influenza)‡	28	5	2	—	—	33	5	1	1	—
Pneumonia, primary	198	28	254	¶	13	274	58	350	28	5
Deaths				6					11	
Poliomyelitis, acute	128	3	7	2	1	156	16	7	2	3
Deaths§	5	—		—		6	1			
Puerperal fever			6				—	10		
Deaths										
Puerperal pyrexia‖	94	7	3	1	—	70	11	3	—	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,434	93	233	108	40	2,755	183	284	157	274
Deaths†		—	—	1	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	1	—	—	2	1	9	—	1	11	—
Deaths	—	—	—		—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,458	417	637	53	25	981	36	82	44	45
Deaths	6	—	1	—	—	2	—	—	—	—
Deaths (0–1 year)	210	29	26	21	11	251	37	51	46	4
Deaths (excluding stillbirths)	5,635	851	773	205	154	5,481	893	632	185	133
Annual death rate (per 1,000 persons living)			15·5					12·7	11·5	
Live births	6,664	1061	750	361	198	6,841	1067	835	264	197
Annual rate per 1,000 persons living			15·1					16·7	16·4	
Stillbirths	190	16	25			169	22	21		
Rate per 1,000 total births (including stillborn)			32					25		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

Any Questions?

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

Glandular Fever

Q.—*Is there any specific treatment for glandular fever? If not, how should a case be treated?*

A.—There is no specific treatment for glandular fever. Recovery is invariable and there are no sequelae. The only value of a drug would be to cut short an attack, and there is no evidence that any therapy has this effect, although it has been claimed for innumerable methods of treatment.

Sulphonamides should not be given, as the bone marrow is in a sensitive state and a catastrophe may follow.

When the tonsils are severely affected with membrane formation, as in the anginose form, penicillin is of undoubted value, but not in other clinical forms. In ordinary cases with much enlargement of the cervical glands it is customary to cover the neck with cotton-wool. Otherwise treatment is purely symptomatic.

Rheumatoid Arthritis and Cortisone

Q.—*A patient, aged 64, with very severe long-standing rheumatoid arthritis, tells me that she has friends in America who would send her a supply of cortisone. Is it advisable to administer this drug in general practice? If so, what is the dosage, etc.?*

A.—In a long-standing case of rheumatoid arthritis neither cortisone nor A.C.T.H. (adrenocorticotrophic hormone) will repair existing damage. They act as a protection against the disease but are not in themselves a cure.

Cortisone should not yet be used in general practice. Experimental work is now being done to discover the best regime of treatment. It is particularly important to avoid overdosage and to determine the minimal amount for maintenance therapy. At this early stage in the use of cortisone laboratory control is necessary.

Backache in Bed

Q.—*What is the cause of pain in the lumbar region developing during recumbency in bed, the pain ceasing soon after rising and remaining in abeyance during the day, only to recur during the night? The pain is not uncommonly found in young adults in whom there is no reason to suspect arthritic changes in the spine. What are the cause and significance of this paradoxical symptom?*

A.—The commonest cause of a backache which develops during recumbency is an unsuitable bed—namely, one with a mattress which sags in the middle. Such a bed almost invariably aggravates backache, whatever its cause. The likely sites of pain are the interspinous ligaments and the capsule or other structures surrounding the zygapophysial and sacro-iliac joints. Pain is due to distortion of these structures resulting from the abnormal posture in lying. Symptoms are less likely to arise from muscle, for as a rule muscular pain comes on with exertion and is relieved by rest.

In a young adult complaining of backache, the diagnosis of ankylosing spondylitis should be considered, and, if necessary, the sacro-iliac joints should be *x*-rayed. Ankylosing spondylitis often starts with pain felt after a night in bed; it is usually months and sometimes years before the physical signs of joint disease are clinically manifest.

Keeping Vaccine Lymph

Q.—*How long will vaccine lymph remain active if kept in a refrigerator?*

A.—The Therapeutic Substances Regulations relating to vaccine lymph lay down that the container in which the lymph

is issued for sale shall bear a statement that the potency of the vaccine lymph cannot be assured for more than seven days from the date of completion of manufacture, unless the lymph is kept continuously at a temperature below 10° C. (50° F.), when the potency can be assured for 14 days; provided that it shall be permissible to state that if the lymph is kept continuously below 0° C. the potency can be assured for at least twelve months.

A temperature of 10° C. or 50° F. is approximately equivalent to the temperature of a domestic refrigerator. These regulations are conservative, and there is little doubt that the lymph will retain adequate potency for longer periods than those stated above. However, since there is no control of the conditions under which the lymph may be stored, neither the manufacturer nor the issuing authority can accept responsibility for the potency of the lymph if kept beyond these periods.

Twins and their Finger-prints

Q.—*Can identical twins be distinguished from each other by their finger-prints?*

A.—The distinction between monozygotic identical twins is best made on finger, palm, or toe prints (with decreasing certainty of differentiation). Cherrill, the New Scotland Yard expert, has yet, in spite of a special study of twin 10-print records, to find identical features. Newman, H. H. (*J. Hered.*, 1940, **31**, 119 and 419), has made an extensive survey of the genetics of the subject, and its criminal aspects have been studied by Johannes Lange in his *Crime as Destiny* (1931), Geo. Allen and Unwin, London. It is clear that in personality, character, and the minutiae of identity data no indistinguishable twins have yet been observed.

Prolonged Oestrogen Therapy

Q.—*A patient discovered that a few milligrams of stilboestrol, given to restrain lactation after a stillbirth, vastly improved a seborrhoeic dermatitis. Since then she has been taking 1 mg. every other day. The only untoward effect is that menstruation has become slightly irregular. If she stops the drug her skin condition relapses. (a) Is it harmful to continue stilboestrol indefinitely, if the menstrual flow does not become heavier? (b) Is libido likely to be affected? (c) Are her chances of conception altered?*

A.—(*a*) Continuous oestrogen therapy almost always leads to menstrual disturbances associated with intermittent or prolonged and sometimes heavy bleeding. Another possible sequel of long-continued oestrogen therapy is fibro-adenosis (generalized nodularity) of the breast with tenderness or pain. There may also be fluid and salt retention, with increase in weight. There is little evidence of permanent damage to the pituitary due to the inhibitory action of oestrogens. Nor is there sufficient evidence to say that exogenously administered oestrogen may be carcinogenic, though endogenous oestrogen may predispose to cancer. (*b*) No. (*c*) Continuous oestrogen therapy may inhibit ovulation.

It would be better to give the stilboestrol in doses of 0.5 mg. daily for the first 21 days of each 28-day cycle. This dose should not inhibit ovulation in any cycle (though a daily dose of 2 mg. probably would), and the week's rest from treatment in each month should lead to successful avoidance of the disturbances mentioned above. This dose, however, may prolong the cycle to five or six weeks. In that case the dose will need to be adjusted (either down to 0.3 mg. daily or up to 1 mg. daily) so that the period is not delayed.

Prolonged Quinidine Therapy

Q.—*Would the indefinite administration of quinidine sulphate, in a total dosage of 3 gr. (0.2 g.) daily, for the control of auricular fibrillation, cause any harmful effects? The case I have in mind is a man of 38 who had his first attack of auricular fibrillation about 10 years ago. Normal rhythm was restored, and he had no further treatment until six months ago, when he had another attack. This has responded to quinidine, the rhythm remaining normal so long as small doses are given. On withdrawing the drug, fibrillation begins again.*

A.—Quinidine in the dosage stated may be given indefinitely without harmful effects. Indeed, the dose could be increased considerably without fear. The usual amount given to prevent auricular fibrillation is 3–6 gr. (0.2–0.4 g.) three times a day. In his book on quinidine (*Quinidine in Disorders of the Heart*, reviewed at p. 1426 of this issue) Harry Gold states that one of his patients took 60 gr. (4 g.) daily for 14 years without ill effect. When, at the end of that time, auricular fibrillation could no longer be prevented the dose was increased to 75 gr. (5 g.), but this caused impairment of hearing and blurring of vision.

If quinidine does not cause toxic symptoms within the first five days of treatment, such symptoms will not arise later if the dose is not increased.

Post-operative Paralysis of Compressor Urethrae

Q.—*Is paralysis of the compressor urethrae muscle known to occur after a "punch operation" for the removal of an enlargement of the intravesical part of the median lobe of the prostate? If so, how is this paralysis caused? What are the prognosis and treatment?*

A.—Paralysis of the compressor urethrae after a "punch operation" may be due to over-stretching of the muscle from the introduction of a large instrument, or to division if a cut is made too low. In the former case ultimate recovery is likely, but in the latter the incontinence is likely to remain until subsequent fibrosis produces the opposite effect—namely, stenosis. Electrical treatment is not very certain in its results, but plastic operations have been used successfully in some cases to restore continence. It may well be, however, that an individual patient is best assisted by the wearing of an incontinence bag.

Rubber Sponge and Varicose Ulcers

Q.—*How should rubber sponge be used in the treatment of varicose ulcers?*

A.—The object of the rubber sponge is to produce extra pressure over the ulcer and its oedematous surroundings, especially in the case of ulcers in the malleolar sulcus. The rubber pad, which is preferably coated on one side with adhesive, can be used in the following way: an Unna's paste bandage is used to bandage the leg in the usual way, and the rubber pad, which has chamfered edges and is much larger than the ulcer, is then placed over the site of the ulcer. The pad is now pressed down on the ulcer by an elastic bandage or, if the patient is sensitive to these, by means of a strong elastic bandage in the day-time and a crêpe bandage at night. The extra pressure on the ulcer surface generally promotes rapid healing.

Coeliac Disease

Q.—*What are the latest views on the treatment of coeliac disease in a child of 3 years?*

A.—Recently the treatment of coeliac disease has been mainly dietetic. In particular the possible importance of carbohydrate-containing foods in aggravating some aspects of the syndrome has received attention (Sheldon, W., 1949, *Arch. Dis. Childh.*, **24**, 81). It would seem advisable to limit fats and to confine carbohydrate-containing foods to those best tolerated by the patient. A diet with a high-protein content is advantageous. Folic acid and other members of the vitamin-B complex do not appear to have any specific remedial action.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 30 1950

ATYPICAL PNEUMONIA*

BY

C. H. STUART-HARRIS, M.D., F.R.C.P.
Professor of Medicine, University of Sheffield

[WITH SPECIAL PLATE]

The existence of cases of pneumonia distinct anatomically from lobar pneumonia or bronchopneumonia and possessing a correspondingly diverse clinical course and aetiology has, of course, been recognized for a number of years. The era of treatment of pneumonia with specific antipneumococcal sera seemed to coincide with the recognition of such cases as indicated by Rufus Cole (1936), and the twin characters of lack of response to therapy and an unusual radiographic appearance in the chest led to the separation of such "atypical" cases from the main group of the pneumonias.

The use of the sulphonamide drugs only served to emphasize the unusual characters of atypical pneumonia, as even those sulphonamide derivatives active against the pneumococcus failed to influence its course. Then from 1938 onwards a number of authors in the U.S.A. (Reimann, 1938; Kneeland and Smetana, 1940; Longcope, 1940) published accounts of cases of atypical bronchopneumonia in young adults, some of which were of an unusual severity, though recovery was ultimately complete. These authors inclined to the view that they were in fact dealing with a new disease entity, though this view has since been challenged by others who consider that the widespread use of sulphonamides and, later, of penicillin has merely thrown the existence of unresponsive cases of atypical pneumonia into sharp relief.

Meanwhile the wider use of radiology in the investigation of influenza-like illnesses led to the discovery that such cases often showed areas of lung involvement radiologically, though clinical examination had failed to indicate such changes. Gallagher, in 1934, thus reported a series of sporadic cases in preparatory-school boys in Pennsylvania and regarded the lung lesions as being instances of "pneumonitis." His later series of cases in Massachusetts in the year 1939 to 1940 (Gallagher, 1940) partook much more of the character of an infectious disease.

About the same time, Bowen (1935) and Allen (1936), writing from U.S. Army stations, described radiologically similar cases of "pneumonitis" discovered among the hotchpotch of acute respiratory diseases seen in recruits and others during or even apart from outbreaks of so-called influenza. Thus the stage was set in the U.S.A. for a ready recognition of cases of acute respiratory disease with pulmonary lesions other than ordinary influenzal bronchopneumonia, when in 1942 and subsequently the opening phases of the war in America produced the inevitable wave of respiratory infections in Service establishments. The term "primary atypical pneumonia" thus sprang into existence and quickly displaced earlier terms, including that used by Scadding (1937) in describing a group of sporadic cases in England as "disseminated focal pneumonia."

Towards the end of the war explosive outbreaks of atypical pneumonia in the Allied Armies in Italy renewed interest in the condition, particularly as these were the first instances of actual outbreaks in British troops, and the brilliant work of Robbins and his associates (1946) in discovering that these outbreaks were due to the rickettsia of Q fever, *R. burneti*, served only to emphasize the aetiological obscurity of the earlier cases.

Though it must be clearly recognized that there are many respiratory-tract conditions in which a pneumonia atypical in course and character can be shown to exist, this paper is limited to a discussion of the syndrome of primary atypical pneumonia.

Primary Atypical Pneumonia

Definition and Aetiology.—This condition is best regarded as a syndrome of infection of the respiratory tract characterized by a varied symptomatology, by particular radiological changes in the lung, and by a lack of therapeutic response to sulphonamides or to penicillin. It is abundantly clear that the syndrome may be reproduced by many agents, chiefly of the virus or rickettsial group, and particularly the psittacosis group of viruses, *R. burneti*, and the influenza viruses. But by far the largest number of cases have yet to be proved aetiologically to be due to a particular agent, and the clinical account which will be given is largely based on such aetiologically unknown cases.

Epidemiology

Apart from Gallagher's account (1940), in which he considered that he was dealing with an infectious disease, many of the earlier reports consisted of sporadic unconnected cases Nevertheless, even among such cases transmission to other members of the family, or to doctors or nurses in contact with the patient, was described. Nor is it possible to say that such case-to-case contact was due

*Read in opening a discussion at a combined meeting of the Sections of Medicine and of Pathology and Bacteriology at the Annual Meeting of the British Medical Association, Liverpool, 1950.

to the operation of a particular causative agent, for though Eaton *et al.* (1941) described the recovery of a virus of the psittacosis group from cases in one such local outbreak, recent accounts from Scandinavia (Hogeman, 1948; Ginsberg, 1948) and the U.S.A. (Jordan, 1949) indicate that family transmission is possible and even frequent in cases of aetiologically unknown atypical pneumonia. The fact that the incubation period is prolonged (5 to 19 days) has been stressed by many workers from Gallagher onwards, and it is clear that such a long period may lead to the concealment of transmission by contact.

As seen in Service establishments in the U.S.A. in 1942 and onwards, cases of atypical pneumonia occurred in proportion to the general incidence of acute respiratory disease. Thus Dingle and co-workers at Fort Bragg (Commission on Acute Respiratory Diseases, 1944a) found a ratio of about 1 to 10 between cases of atypical pneumonia and the numbers of cases of acute respiratory disease. Such sporadic cases of atypical pneumonia bore no discoverable relation to cases of influenza virus infection or to psittacosis (Dingle, 1945), though transmission experiments in human volunteers, using filtered sputum and garglings, yielded successful results (Commission on Acute Respiratory Diseases, 1946).

The picture derived from these studies seemed to be that atypical pneumonia was a sporadic endemic disease. But it is necessary to emphasize that the Fort Bragg workers (Commission on Acute Respiratory Diseases, 1944b) and also Reimann (1947) have continually stressed the view that cases of bronchitis unaccompanied by atypical pneumonia and possibly other clinical conditions may in fact be caused by the same agents as those concerned in the cases of actual pneumonia. This may account for the increased incidence of atypical pneumonia during outbreaks of unspecified acute respiratory disease. All workers are, however, agreed that no considerable increase in incidence in cases of primary atypical pneumonia is usually experienced during outbreaks of actual influenza virus infection.

Until last year I had had no personal experience of cases of atypical pneumonia associated with influenza virus infection. However, during the influenza A outbreak of February and March, 1949, a number of cases of atypical pneumonia occurred both in Catterick Camp and among nurses at Leicester, and in at least two of four such cases serological proof was obtained that influenza virus A was concerned in the disease. A similar experience was earlier recorded by Zeigler and others (1947).

In Great Britain, cases of primary atypical pneumonia have been essentially sporadic in incidence, though Herxheimer and McMillan (1942) recorded a protracted outbreak in schoolboys. It must be pointed out that it is unlikely that school outbreaks of so-called influenza have in the past been sufficiently investigated radiologically for any evidence regarding the existence or otherwise of atypical pneumonia to be available. Nursing populations are, however, investigated more extensively from this point of view, and my colleagues Drs. Gifford and Worth have not unearthed any such cases in Sheffield in the past two years, though Dr. Joan Walker, at the Leicester Royal Infirmary, has been more successful. The recent occurrence of cases of Q fever among the staff at the Royal Cancer Hospital (MacCallum *et al.*, 1949) indicates the need for careful investigation of cases of acute respiratory disease of an unusual character. It is, moreover, clear from the experience in the Allied armies in Italy that Q fever may at times produce outbreaks of atypical pneumonia as explosive as influenza epidemics, and the high communicability of *R. burneti* has been stressed by laboratory outbreaks such as those at the National Institute of Health, Bethesda (Spicknall *et al.*, 1947).

Finally, the major stress of the incidence of primary atypical pneumonia has in the past fallen upon young adults, but the true incidence of infection by the causative agents of this syndrome must await the further delineation of these agents in the laboratory.

Clinical Features

The clinician's problem is twofold. First, the possibility exists that some of the simple cases of febrile acute respiratory disease occurring at any season of the year may exhibit radiological changes in the chest if, in fact, an *x*-ray examination can be made. Such opacities may be merely small areas of collapse as described by Ramsay and Scadding (1939) in cases of colds in those attending a tuberculosis clinic, or they may be actual instances of primary atypical pneumonia. Secondly, cases of pneumonia, particularly those not responding to treatment by sulphonamides or penicillin, may be admitted to hospital, and among these there may be examples of the syndrome of primary atypical pneumonia. It is perhaps necessary to stress that the latter cases may at first attract attention not so much by reason of the extent of consolidation but because there may be a clinical absence of such signs though radiological changes are demonstrable. Two such patients recently under my care at the Royal Hospital, Sheffield, may serve to illustrate the latter type of case.

Case 1

A housewife aged 29 was admitted to hospital on February 4, 1950, having been treated at home for a week as a case of pneumonia. Two weeks before admission cough and sputum, shivering, and sweating began, and these continued. There was some pain over the left costal margin a week before admission and also some malaise, but no headache, sore throat, or nasal symptoms.

On admission cough was frequent and irritating, and sputum was mucopurulent without blood. In spite of the low degree of pyrexia (100.6° F.—38.1° C.), tachycardia up to 110 was present and the patient was unusually dyspnoeic and cyanosed. Signs in the chest consisted of impaired percussion at the right base, numerous rales over the right middle and lower lobes, and a few rales at the left base. There was no bronchial breathing. A radiograph (Plate, Fig. 1) showed extensive mottling in the right lower and mid-zones, but there was also some mottling in the left lung; these changes persisted for 10 days after admission, with slower resolution in the right than in the left lung (Fig. 2). Sputum showed the normal range of nasopharyngeal flora. The leucocyte count was 10,400 with some shift to the left, and later 7,400. The sedimentation rate was 47 mm. (Wintrobe). The serum on the day of admission showed cold agglutinins in a titre of 1 in 1,200 using 0.2% group O cells, and had increased five days later to 1 in 2,000, and in a further eight days to 1 in 4,000. Convalescent serum did not fix complement with antigens of Q fever rickettsiae or psittacosis virus, nor did a rise in titre of antibodies for influenza viruses A or B accompany the disease.

Treatment with penicillin for the first two days after admission was changed to "aureomycin" because of the general clinical picture and the absence of response, but no immediate improvement was seen on a dosage of 2 g. daily, and the patient did not begin to enter convalescence clinically until two weeks after admission. The sedimentation rate did not fall until one month after admission. Of the patient's four family contacts, two had minor respiratory illnesses while the patient was in hospital, and one of these had a cold agglutinin titre of 1 in 128, two of the others being negative.

Case 2

A housewife aged 28 was admitted to hospital on January 12, 1950, having been treated by her doctor at home for a week as a case of pneumonia.

Six days previously she felt cold and unwell, and shivered. There was some pain, worse on coughing, over the left lower chest. The cough was at first dry; but, later, sticky pale sputum without blood was raised with difficulty. She received treatment with sulphonamide tablets but did not improve, nor did improvement follow the administration of penicillin at home. Headache, anorexia, and constipation were the only other symptoms noticed. There was no sore throat or coryza, nor was the voice hoarse.

On admission there was a low irregular fever, the patient was dyspnoeic though the respirations were not raised above 30, and there were periods of tachycardia up to 136. The chest showed slightly diminished movement and diminished air entry with only slight impairment of percussion over the right lower lobe. There were rales but no bronchial breathing. Radiographs showed some mottling over the right lower lobe, but four days later a remarkable miliary pattern of mottling was present in both lungs (Fig. 3). Sputum yielded a predominant growth of a pneumococcus which was sensitive to penicillin. The leucocyte count was 10,600 with a shift to the left, the sedimentation rate was 8 mm., and five days later the white cells numbered 11,600. The serum showed a cold agglutinin titre of 1 in 256 on admission and 1 in 10,000 five days later, rising to 1 in 20,000 eight days after this. The spleen was felt for the first time four days after admission.

Treatment with penicillin for the first six days produced no clinical improvement though the temperature fell. Aureomycin in a dosage of 0.5 g. six-hourly, given for four days, produced subjective improvement and a remarkable clearing of the *x*-ray shadows (Fig. 4). Sputum, if anything, increased, but was still raised with difficulty and was stringy and colourless. Convalescence was, however, slow and the enlargement of the spleen persisted even after discharge. The cold agglutinin titre had begun to fall four weeks after admission, but was elevated above normal for some further weeks. The convalescent serum did not fix complement with antigens of Q fever rickettsiae or psittacosis virus, nor did a rise in titre of antibodies for influenza viruses A or B accompany the disease.

This patient's relatives comprised four intercommunicating family groups, and, among 15 persons actually or remotely in contact with her, four cases occurred which were diagnosed by family doctors as cases of pneumonia, though none were admitted to hospital. Two of these cases fell ill nine days after the onset of illness in the patient, and the other two 15 days after the second illness. Eleven relatives were tested for cold agglutinins; one showed a titre of 1 in 800, two a titre of 1 in 256, and one a titre of 1 in 128, the remainder being 1 in 32 or less.

Comment

The patients were housewives aged 28 and 29, and had been ill at home in bed for a week, receiving treatment from their doctors as cases of pneumonia. Before admission symptoms had begun with shivering, cough, and malaise, the shivering having continued on and off in the second case but not in the first. Headache was present in one but not in the other. Both patients had an irritating paroxysmal cough, dry at first but later accompanied by a sticky mucopurulent sputum without blood. Neither had coryza, sore throat, or hoarseness of the voice. Both had complained of some pain over the lower chest, though this was not typically pleuritic in character.

The clinical picture in both these patients was that of a low fever, tachycardia, and an unusual degree of respiratory distress. Cough was both irritating and productive after admission. In Case 1 a respiration rate of 50 a minute was recorded, and the patient was cyanosed but the other was not. Physical signs in the chest in Case 2 consisted of little apart from rales, but Case 1 was cyanosed and showed some impairment of percussion at one base. *X*-ray changes exceeded in degree the clinical findings and are best visualized by inspection of the illustrations. Thus Case 2 showed a patchy mottling in the right lower zone and later an extensive miliary pattern of mottling in both lungs in spite of treatment with penicillin. Seven days after treatment with aureomycin the chest appeared clear radiologically. Case 1 exhibited a different radiographic picture on admission, with a dense opacity in the right lobe but also some mottling in the left lung. Treatment with aureomycin produced little change in the right lung though the left lung cleared seven days later.

Both patients had strikingly raised cold agglutinin titres. In Case 1 the titre was 1 in 1,200 on admission two weeks after the onset of symptoms, and 13 days later it was 1 in 4,000 (0.2% red cells). Case 2 had a cold agglutinin titre of 1 in 256 on admission and 1 in 20,000 13 days after admission and 19 days from the onset. The leucocyte count was 10,000 in both patients on admission, though this fell later and reached leucopenic levels in Case 2. A pneumococcus was present in the sputum in small numbers in Case 1 and in larger numbers in Case 2, but treatment with penicillin produced no obvious improvement. Aureomycin 0.5 g. six-hourly produced a remarkable clinical improvement in Case 2 but no clear-cut change in Case 1. Both patients were ill for at least three weeks and convalescence was slow.

Inquiry regarding the family contacts of Case 1 was negative, but of 15 individuals closely or remotely in contact with Case 2 no fewer than four suffered illnesses treated at home as cases of pneumonia by their family doctors. These illnesses occurred 10 and 21 days after the onset of symptoms in the patient herself. At least three of 11 relatives tested for cold agglutinins showed raised titres varying from 1 in 256 to 1 in 800.

These two cases illustrate most of the points emphasized by the large number of case reports in the literature. The fact that they were clinically ill enough to be regarded as cases of pneumonia yet lacked the dullness and bronchial breathing of ordinary pneumonic consolidation fitted in well with the radiological changes. The latter are often described as a veiling or hazy opacity, either hilar or peripheral in distribution, and cannot be said to conform to any one pattern, though the density is usually less than in bacterial pneumonia. Both mottled and homogeneous opacities occur as shown in the illustrative films of Cases 1 and 2. The absence of haemoptysis at the onset or of sharp pleural pain are also points worthy of emphasis. The benign prognosis even without specific therapy is a classical feature of the syndrome. Though some fatal cases have been reported by Parker and his associates (1947), it is exceptional for death to occur. On the other hand, some of the illnesses associated with agents of the psittacosis group have been fatal, as was the result in the elderly patient with Q fever at the Royal Cancer Hospital (Whittick, 1950).

Diagnosis

It seems remarkable that any syndrome due to a diversity of aetiological agents should nevertheless fail to exhibit characteristics corresponding to the various causes. Yet this seems to be true of primary atypical pneumonia. Q fever, for instance, is a general disorder with rickettsiaemia, yet without rash or constant enlargement of the spleen. The symptom complex is described as headache, chilliness, malaise, muscular aching, anorexia, cough, and pleuritic pain—which is clearly in no way

distinctive from that of atypical pneumonia. The fever may be trivial or may last more than a week, and the chest signs emphasized by most observers are rales in the absence of classical features of consolidation. These findings hold both for sporadic cases in the U.S.A. (Denlinger, 1949) and for the outbreaks in Italy (Robbins and Ragan, 1946; Feinstein *et al.*, 1946).

I was privileged to see a few patients in Italy under the care of Lieutenant-Colonel R. W. D. Turner in 1944, and two features which then seemed to me to differ from those of primary atypical pneumonia as seen in England were the frequent onset with sharp pleuritic pain and the fact that the lung opacity was often dense and suggestive of bacterial pneumonia, though other cases exhibited the typical hazy pattern already described. It is obvious that no sharp clinical distinction exists between Q fever and other members of the primary atypical pneumonia syndrome. The fact that radiological differences exist is suggested by a recent paper from California (Jacobson *et al.*, 1949) which analyses the *x*-ray findings in 77 cases of Q fever. Hilar and vascular engorgement was absent in these cases, and the lung opacities, often segmental or lobar in situation, were usually homogeneous rather than patchy, and rarely migratory.

Differentiation of cases of infection due to the psittacosis group of viruses is equally difficult clinically, for though severe and even fatal cases may be encountered there is evidence that ordinary benign cases of the atypical pneumonia syndrome due to psittacosis may also occur.

Atypical pneumonia due to the influenza viruses is, I believe, uncommon, and insufficient cases have been described for any diagnostic criteria to have been established other than laboratory data. But the resemblance of simple influenza and mild cases of atypical pneumonia is obvious, and the same may be said of ordinary febrile catarrh or acute respiratory disease.

Recognition of primary atypical pneumonia of uncertain aetiology depends upon the total clinical picture as already described, but may be assisted by serological tests such as the cold agglutination of human red cells and the agglutination of the streptococcus M.G. of Thomas *et al.* (1943). The position seems to me to be that, if the clinical picture is suggestive of an atypical pneumonia rather than influenza or lobar pneumonia, the finding of a raised cold agglutinin titre is an added support to the diagnosis, particularly if a rise in titre of the agglutinin accompanies the later stage of the disease. But rises in cold agglutinin titre to levels in excess of the usually accepted average range can certainly occur in many other conditions, such as glandular fever or as, for instance, in a recent case of influenza from whose garglings a strain of influenza virus B was obtained. This patient had a cold agglutinin titre of 1 in 128 on the first day of illness, rising to 1 in 512 a week later. Similar instances have been recorded by American workers.

It seems highly probable that the initially raised titre in such cases may be due to some recent infection such as primary atypical pneumonia, and that influenza stimulates an anamnestic response. I have little personal experience of the use of the streptococcus M.G., but it is stated that the results parallel those obtained in the cold agglutination test, though they may not coincide in individual cases.

Treatment

Until a year or so ago no treatment had been found to influence the course of primary atypical pneumonia except perhaps that due to psittacosis. In this disease penicillin, either alone or combined with sulphonamides, was reputed to have some effect. The introduction of aureomycin has fundamentally changed this position, as it is reputed (Brainerd *et al.*, 1949) to be active against psittacosis, Q fever, and the ordinary case of atypical pneumonia. The rickettsia of Q fever is, it is true, somewhat more resistant to aureomycin than most of the other rickettsiae, but encouraging results have been obtained in California (Lennette *et al.*, 1948; Brainerd *et al.*, 1949).

A number of authors (Kneeland *et al.*, 1949; Finland *et al.*, 1949; Collins *et al.*, 1950) have reported excellent results with primary atypical pneumonia of undetermined aetiology using doses of 2 to 4 g. a day for three or four days. The series reported by Meiklejohn and Shragg (1949) was noteworthy because of the use of controls alternating with the aureomycin cases but treated by penicillin. The fact that aureomycin is active against most bacteria associated with pneumonia makes such a controlled trial essential in the evaluation of the drug in primary atypical pneumonia. If for no other reason than the multiple aetiology of the syndrome, further therapeutic trials appear desirable.

Summary

Primary atypical pneumonia is a syndrome of respiratory-tract infection characterized by varied symptomatology, by radiological changes of a particular character, and by lack of therapeutic response to the sulphonamides or to penicillin.

The syndrome became recognized with increasing frequency from 1934 to 1940 partly because of the introduction of sulphonamides and the wider use of radiology, but possibly also because of its occurrence in young adults in a severe form. The psittacosis group of viruses, *R. burneti*, and the influenza viruses are established causes, but only of a minor percentage of cases of the syndrome.

Epidemiology varies from sporadic cases to explosive outbreaks, according to the causative agents. Family infection and case-to-case spread is found not only in psittacosis infections but also in cases of undetermined epidemiology. The incubation period is 5 to 19 days. The incidence increases during outbreaks of undefined acute respiratory disease.

Clinical features are those of a benign respiratory-tract infection with cough and sputum, fever, malaise, and headache. Signs suggest a bronchitis rather than a true consolidation. Radiographs reveal more extensive changes than the clinical signs suggest, and hazy opacities or diffuse mottling may be found contrasting with the denser opacity of bacterial pneumonia. Q fever may cause onset with pleuritic pain, but is not distinct clinically from other atypical pneumonias.

Diagnosis depends on the total clinical picture, but may be aided by cold agglutinin tests in that form of the syndrome of undetermined aetiology. Laboratory investigations are essential to the diagnosis of the particular agent concerned in the syndrome.

Treatment by aureomycin gives considerable promise of success in atypical pneumonia of undetermined aetiology, in Q fever, and, possibly, in psittacosis.

I wish to thank Dr. J. L. Grout, radiologist to the United Sheffield Hospitals, for permission to quote and to reproduce the radiological findings in the two patients. Cold agglutinin tests quoted were the work of Dr. M. Gatman, to whom I am indebted; and Dr. D. A. Tyrrell investigated the family illnesses quoted. I wish to thank Dr. B. P. Marmion of the Central Public Health Laboratory, Colindale, for allowing me to quote the results of the complement-fixation tests for Q fever and psittacosis in the two illustrative cases.

REFERENCES

Allen, W. H. (1936). *Ann. intern. Med.*, **10**, 441.
Bowen, A. (1935). *Amer. J. Roentgenol.*, **34**, 168.
Brainerd, H., Lennette, E. H., Meiklejohn, G., Bruyn, H. B., and Clark, W. H. (1949). *J. clin. Invest.*, **28**, 992.
Cole, R. (1936). *Ann. intern. Med.*, **10**, 1.
Collins, H. S., Wells, E. B., Gocke. T. M., and Finland, M. (1950). *Amer. J. Med.*, **8**, 4.

Commission on Acute Respiratory Diseases (1944a). *Amer. J. publ. Hlth*, **34**, 335.
—— (1944b). Ibid., **34**, 347.
—— (1946). *Bull. Johns Hopk. Hosp.*, **79**, 97.
Denlinger, R. B. (1949). *Ann. intern. Med.*, **30**, 510.
Dingle, J. H. (1945). *Bull. N.Y. Acad. Med.*, **21**, 235.
Eaton, M. D., Beck, M. D., and Pearson, H. E. (1941). *J. exp. Med.*, **73**, 641.
Feinstein, M., Yesner, R., and Marks, J. L. (1946). *Amer. J. Hyg.*, **44**, 72.
Finland, M., Collins, H. S., and Wells, E. B. (1949). *New Engl. J. Med.*, **240**, 241.
Gallagher, J. R. (1934). *Yale J. Biol. Med.*, **7**, 23.
—— (1940). Ibid., **13**, 663, 769.
Ginsberg, H. S. (1948). *Acta med. scand.*, **131**, 475.
Herxheimer, H. G. J., and McMillan, A. J. (1942). *British Medical Journal*, **2**, 513.
Hogeman, O. (1948). *Acta med. scand.*, **131**, 466.
Jacobson, G., Denlinger, R. B., and Carter, R. A. (1949). *Radiology*, **53**, 739.
Jordan, W. S., jun. (1949). *Amer. J. Hyg.*, **50**, 315.
Kneeland, Y., Rose, H. M., and Gibson, C. D. (1949). *Amer. J. Med.*, **6**, 41.
—— and Smetana, H. F. (1940). *Bull. Johns Hopk. Hosp.*, **67**, 229.
Lennette, E. H., Meiklejohn, G., and Thelen, H. M. (1948). *Ann. N.Y. Acad. Sci.*, **51**, 331.
Longcope, W. T. (1940). *Bull. Johns Hopk. Hosp.*, **67**, 268.
MacCallum, F. O., Marmion, B. P., and Stoker, M. G. P. (1949). *Lancet*, **2**, 1026.
Meiklejohn, G., and Shragg, R. I. (1949). *J. Amer. med. Ass.*, **140**, 391.
Parker, F., Jolliffe, L. S., and Finland, M. (1947). *Arch. Path.*, **44**, 581.
Ramsay, H., and Scadding, J. G. (1939). *Quart. J. Med.*, **8**, 79.
Reimann, H. A. (1938). *J. Amer. med. Ass.*, **111**, 2377.
—— (1947). *Medicine*, **26**, 167.
Robbins, F. C., and Ragan, C. A. (1946). *Amer. J. Hyg.*, **44**, 6.
—— Rustigian, R., Snyder, M. J., and Smadel, J. E. (1946). Ibid., **44**, 51.
Scadding, J. G. (1937). *British Medical Journal*, **2**, 956.
Spicknall, C. G., Heubner, R. J., Finger, J. A., and Blocker, W. P. (1947). *Ann. intern. Med.*, **27**, 28.
Thomas, L., Mirick, G. S., Curnen, E. C., Ziegler, J. E., jun., and Horsfall, F. L., jun. (1943). *Science*, **98**, 566.
Whittick, J. W. (1950). *British Medical Journal*, **1**, 979.
Ziegler, J. E., Curnen, E. C., Mirick, G. S., and Horsfall, F. L., jun. (1947). *Amer. J. med. Sci.*, **213**, 268.

PRIMARY ATYPICAL PNEUMONIA*

BY

S. P. BEDSON, M.D., F.R.C.P., F.R.S.

Professor of Bacteriology, University of London

As my remarks will be concerned with the aetiology of this condition and its laboratory diagnosis I shall begin by defining what I understand by the term "primary atypical pneumonia," because not all, apparently, think alike on this point. For me this term refers to a clinical syndrome produced by a variety of infective agents, among which certain viruses, a rickettsia (*R. burneti*), and a fungus (*Coccidioides immitis*) have already been identified. Others would remove from this group those cases due to the psittacosis viruses, *R. burneti*, and *C. immitis*, and reserve the name primary atypical pneumonia for cases caused by the somewhat ill-defined virus of Eaton *et al.* (1942) and possibly, in addition, some as yet unidentified virus. While approving this endeavour to break down the conglomerate mass of atypical pneumonias into a number of aetiological entities, it seems to me that it would be most unfortunate if it resulted in the definition of a disease entity named "primary atypical pneumonia."

In my opinion the term should be used to describe a train of symptoms or cease to be employed. And although the name primary atypical pneumonia for this syndrome has little to recommend it I have no alternative to suggest. Certainly the term "virus pneumonia," which some would put in its place, strikes me as most unsuitable, for, apart from the fact that a rickettsia and a fungus figure among the causal agents of this syndrome, it is by no means every virus pneumonia which qualifies for inclusion in the group. Pneumonia due to the influenza viruses, for instance, does not, in my opinion, conform either in clinical pattern or in histological change to the pneumonia which we label "primary atypical"; and the giant-cell pneumonia of Hecht and the virus pneumonitis of infants described by Adams (1941) are further examples, though admittedly the virus aetiology of these two last conditions rests only on histological evidence.

I mention giant-cell pneumonia because I have had the opportunity of examining material from two cases which occurred at the London Hospital. Both occurred in infants in early convalescence from varicella, and death was due to a bacterial bronchopneumonia, but the histological changes of this terminal condition did not obscure the presumably earlier ones characterized by the formation of giant cells, often draped around the alveolar walls. Nuclear and cytoplasmic acidophil inclusions were numerous in these cells, and one is tempted to conclude that they represent parasitism by the varicella virus, a varicella pneumonia which had preceded and predisposed to the secondary bacterial infection. A similar giant-cell pneumonia has, however, been described in measles.

Primary atypical pneumonia might be described as an infective process of various aetiology, often with an indefinite onset, and characterized clinically by moderate fever, malaise, and a cough which is harassing though largely unproductive, at any rate during the first week of disease. Characteristically, there is a paucity of physical signs in the chest and the pneumonic changes might be overlooked were it not for *x*-ray examination; the shadows thus revealed are lacking in density owing to the incompleteness of the consolidation. Those cases which have come to post-mortem examination have shown histological lung changes which have been very similar whether the cause has been a virus of the psittacosis group, some other virus, or Q fever.

These changes, usually described as interstitial pneumonia, consist in a thickening of the alveolar walls due to congestion and infiltration with mononuclear cells and an exudate into the alveoli composed of serum, fibrin, red blood corpuscles, mononuclear cells, desquamated alveolar cells, and occasional polymorphonuclear leucocytes. Characteristically the exudate varies considerably from one part of the lung to another. It is usual to say that a failure to respond to sulphonamides is a distinctive feature of primary atypical pneumonia, but it must not be forgotten that a few strains of psittacosis virus are sulphonamide-sensitive. I have seen three human cases which undoubtedly responded to this treatment, and others have been described (Hinshaw, 1940).

Aetiology: Viruses of the Psittacosis Group

Turning now to the causation of this syndrome, the first group of agents that I would like to consider is the psittacosis viruses, and I mention them first, not because they play a preponderant part in the production of this condition, but because psittacosis virus was the first recognized cause of atypical pneumonia. I should perhaps point out for the benefit of those who have not followed the literature of this subject that psittacosis is not just one virus as at first believed, but a group of closely related viruses. And the primary hosts of these viruses are not

*Read in opening a discussion at a combined meeting of the Sections of Medicine and of Pathology and Bacteriology at the Annual Meeting of the British Medical Association, Liverpool, 1950.

confined to psittacine birds, but extend to many other avian species—various finches, sea birds, the pigeon, duck, and domestic fowl.

The name of ornithosis virus is used by some authorities for those avian strains which differ in minor ways from the original psittacosis virus. There is also evidence that the primary host range of this group of viruses may include mammals, for the virus of cat pneumonia described by Baker (1942) seems to belong to the group, and, more recently, Roca-Garcia (1949) has described naturally occurring infection of opossums in South America. There is even a suggestion that some strains of psittacosis virus have become adapted to man, using him as their only natural host: the S.F. virus of Eaton, Beck, and Pearson (1941) and the Louisiana pneumonitis virus (Larson and Olson, 1946) are examples in point; the readiness with which they pass from man to man is an important and striking feature of these strains.

The practical importance of all this recent work on the oecology of the psittacosis viruses is, of course, that the chance of man's contracting psittacosis is very much greater than was at one time believed. As already mentioned, some authorities would exclude psittacosis from the group of primary atypical pneumonias, and, while it must be admitted that the severe case of psittacosis, with its attendant toxaemia and typhoid state, presents a picture unlike that of primary atypical pneumonia, this is not true of the milder cases which constitute the majority of human infections with the psittacosis viruses. Human psittacosis, like any other infectious disease, can vary considerably in severity, and it is not by any means all cases of psittacosis that develop signs of pneumonic involvement; some of these infections may even be inapparent (Bedson, 1939).

Serological Investigation

Many of the milder cases with pneumonitis would have remained indistinguishable from the mass of primary atypical pneumonia had they not been picked up by the laboratory in the course of routine serological investigation. The diagnosis of psittacosis is essentially a matter for the laboratory, and though isolation of the virus is undoubtedly the most satisfactory evidence which can be adduced in support of this diagnosis it is not always practicable. The virus is best sought in the sputum, but this material is usually scanty or may even be absent, and the alternative procedure for obtaining material from the pneumonic foci by lung puncture can hardly be recommended as a routine. So the laboratory has to rely on the indirect evidence afforded by the complement-fixation test.

In this connexion it has to be observed that the antigen used as a routine in the psittacosis complement-fixation test is the heat-stable group antigen which is not only common to the viruses of the psittacosis group but also to lymphogranuloma venereum (L.G.V.) virus and other viruses belonging to the psittacosis-lymphogranuloma group. This means that a positive result indicates no more than infection with a virus of the psittacosis-lymphogranuloma group, and its correct interpretation can be made only in the light of the clinical findings. And, as in the case of any diagnostic serological tests, the demonstration of a rising titre of antibodies is much better evidence of active infection than the finding of even a high titre on a single occasion. There is evidence (Bedson *et al.*, 1949) that absorption of the serum with the group antigen discloses a specific antibody which can then be detected by complement fixation, the fresh unheated virus being used as antigen, but technical difficulties make it unsuitable as a routine procedure.

Skin Test

The question of whether a skin test might be of service in the diagnosis of psittacosis is worth investigation, though there is already a suggestion that infection with these viruses does not lead to the development of skin sensitivity to the same extent as in L.G.V. In the latter condition the percentage of reactors to the Frei test is high, approximately 95, and, since the active antigen in this test is the heat-stable group component which L.G.V. virus shares with psittacosis virus, one might expect that a heated preparation of psittacosis virus would successfully replace the orthodox Frei antigen, and that cases of psittacosis would give a positive Frei reaction. The former conjecture is more or less true: though there are some divergences between the skin reactions given by cases of L.G.V. to heated psittacosis and L.G.V. virus, the concordance is high (Bedson *et al.*, 1949). And, as Eaton, Beck, and Pearson (1941) have shown, the Frei test may be positive in psittacosis: they obtained five positive results in eight cases. I think it would be worth while skin-testing all cases of human psittacosis, using in parallel the orthodox Frei antigen and a similar preparation made from psittacosis virus. Those that reacted positively to one or both might then be tested with the acid extracts of the two viruses, which preliminary findings suggest contain the species-specific antigens (Barwell, 1949; Bedson *et al.*, 1949).

Incidence

Before leaving the question of the relationship of the psittacosis viruses to primary atypical pneumonia it might be useful to attempt some estimate of the proportion of cases with this aetiology. Where this rests on the demonstration of the virus in morbid material we are on sure ground, but extensive investigations on this point are few. Meiklejohn, Beck, and Eaton (1944) isolated viruses belonging to the psittacosis group from sputum and lung-puncture material in 10 out of 250 cases, and in a smaller group of 33 cases Glover and his colleagues (1948) obtained one positive result. As might be expected, serological evidence of infection with these viruses in atypical pneumonia is not only more abundant but places the incidence higher.

Smadel (1943), using the psittacosis complement-fixation test, demonstrated a rising titre of antibodies in 10 out of 45 sporadic cases of primary atypical pneumonia in eastern States of the U.S.A., and Eaton (1945), in reviewing the work done on this problem during the war, concludes that some 10% of the cases of this syndrome are due to viruses of the psittacosis group. My own experience during the war led me to a somewhat similar estimate. Relying alone on the demonstration of antibody by means of the psittacosis complement-fixation test, 9 out of 120 cases were diagnosed as psittacosis. The incidence of primary atypical pneumonia has returned to its pre-war sporadic level, but the investigations now being made by the Virus Reference Laboratory of the Public Health Laboratory Service should, in time, give us further and more conclusive evidence on this point.

The Virus of Eaton

It is not my intention to make more than a passing mention of those cases of this syndrome which are due to *C. immitis*, since infection with this fungus is confined to certain localities in North America. Nor shall I do more than refer to the virus of lymphocytic choriomeningitis as a possible cause of an occasional case. I propose now to pass to a consideration of the virus described in 1942 by Eaton, Meiklejohn, van Herick, and Talbot. Earlier I referred to it as ill-defined, but in doing so I was not questioning its existence so much as registering the doubt, which, to my mind, still exists concerning its relationship to respiratory disease in man.

This virus was first isolated by the intranasal inoculation of cotton-rats with sputum obtained early in the disease. Difficulty was experienced in adapting it to the cotton-rat, and there seems to have been some doubt concerning the six strains finally established. In the end it was concluded (Eaton, 1945) that they were in all probability a latent virus of the cotton-rat. However, Eaton and his colleagues (1944) have shown that a virus can be obtained from cases of primary atypical pneumonia by the inoculation of 12-day eggs with filtered sputum by the amniotic route.

Presumably this virus is the same as that with which they started in their earlier experiments; it can be maintained in eggs but, unfortunately, produces little or no visible change in the embryo, and one has to rely on subinoculation of hamsters and cotton-rats to demonstrate its presence. Nasal inoculation of these animals produces lung lesions in some 75%, and neutralizing antibodies for this virus are found in human convalescent sera. Whether or not Eaton's virus is responsible for those cases of primary atypical pneumonia not caused by known infective agents—the psittacosis viruses, *R. burneti, C. immitis*, and lymphocytic choriomeningitis—the vast majority in fact, remains to be shown, but there is good evidence that they are of virus aetiology. The absence of a demonstrable bacterial cause, the histological findings in the few cases that have come to necropsy, and the transmission of the condition to human volunteers by means of filtered sputum (Commission on Acute Respiratory Disease, 1945, 1946) all support such a conclusion.

The literature on primary atypical pneumonia during the recent war contains a number of claims that viruses have been obtained from this condition; but some of these claims were subsequently withdrawn, and in other instances the virus was lost before it could be characterized and its relation to the human disease established. The virus of feline pneumonia of Blake, Howard, and Tatlock (1942) possibly merits consideration, but, apart from this, Eaton's virus holds the field, though I should be surprised if his virus alone was responsible for this large group of atypical pneumonias.

Cold Agglutinins

It was hoped at one time that the occurrence in the serum of abnormal concentrations of cold agglutinins for human group erythrocytes might be of assistance in defining this group of primary atypical pneumonias, of which Eaton's virus is the possible cause. The original and independent observations of Peterson, Ham, and Finland (1943) and of Turner (1943) suggested that an increase in these antibodies was peculiar to primary atypical pneumonia among respiratory infections, and subsequent work by these and other investigators largely confirmed this.

When Eaton (1945) observed that this increase in cold agglutinins did not occur in cases of atypical pneumonia due to the psittacosis viruses—a finding in line with my more limited experience—and the same was said to be true of Q fever (Caughey and Dudgeon, 1947), it looked as though the development of cold agglutinins might be of service in defining the group of atypical pneumonias in which Eaton's virus was supposedly concerned. The development of agglutinins for the M.G. streptococcus had apparently the same significance; the development of these two kinds of antibody, though entirely distinct, occurred very largely in parallel. But more recent work has shown (Finland, Joliffe, and Parker, 1948; Morgan and Finland, 1948) that an increase in the titre of cold agglutinins can undoubtedly occur in psittacosis pneumonia, and, though there is no suggestion that this is more than an occasional happening, that it occurs at all seems to rob this test of much of its value.

It may be that the development of agglutinins for the M.G. streptococcus will prove a more useful test for the identification of atypical pneumonia not due to the psittacosis viruses or *R. burneti*. Further work on this point and on the usefulness of cold agglutination is required: the survey being made by the P.H.L.S. will no doubt supply the answers to these questions. But more important, obviously, is the provision of precise information concerning the causation of the large number of cases of primary atypical pneumonia which still remains unknown.

References

Adams, J. M. (1941). *J. Amer. med. Ass.*, **116**, 925.
Baker, J. A. (1942). *Science*, **96**, 475.
Barwell, C. F. (1949). *Nature*, **164**, 1013.
Bedson, S. P. (1939). *Proc. 6th Pacific Sci. Congr.*, **5**, 353.
—— Barwell, C. F., King, E. J., and Bishop, L. W. J. (1949). *J. clin. Path.*, **2**, 241.
Blake, F. G., Howard, M. E., and Tatlock, H. (1942). *Yale J. Biol. Med.*, **15**, 139.
Caughey, J. E., and Dudgeon, J. A. (1947). *British Medical Journal*, **2**, 684.
Commission on Acute Respiratory Disease (Fort Bragg) (1945). *J. clin. Invest.*, **24**, 175.
—— (1946). *Bull. Johns Hopk. Hosp.*, **79**, 97.
Eaton, M. D. (1945). *Calif. west. Med.*, **63**, 113.
—— Beck, M. D., and Pearson, H. E. (1941). *J. exp. Med.*, **73**, 641.
—— Meiklejohn, G., and van Herick, W. (1944). Ibid., **79**, 649.
—— —— —— and Talbot, J. C. (1942). *Science*, **96**, 518.
Finland, M., Joliffe, L. S., and Parker, F., jun. (1948). *Amer. J. Med.*, **4**, 473.
Glover, R. E., Humphrey, J. H., Joules, H., and Van Der Walt, E. D. (1948). *Thorax*, **3**, 214.
Hinshaw, H. C. (1940). *Proc. Mayo Clin.*, **15**, 657.
Larson, C. L., and Olson, B. J. (1946). *Publ. Hlth Rep., Wash.*, **61**, 69.
Morgan, H. R., and Finland, M. (1948). *Amer. J. clin. Path.*, **18**, 593.
Peterson, O. L., Ham, T. H., and Finland, M. (1943). *Science*, **97**, 167.
Roca-Garcia, M. (1949). *J. infect. Dis.*, **85**, 275.
Smadel, J. E. (1943). *J. clin. Invest.*, **22**, 57.
Turner, J. C. (1943). *Nature*, **151**, 419.

The December issue of *The Practitioner* (price 4s.) contains an important symposium on the medical aspects of atomic warfare, in which, in addition to orthodox and straightforward simple articles on such subjects as nuclear physics and the pathology of radiation injuries, a Home Office adviser describes and illustrates how to assess the probable casualties and damage from an atomic-bomb explosion in a built-up area; and the adviser in surgery to the Ministry of Health sketches the proposed first-aid and hospital organization in the event of war. In industrial areas the central hospitals will become lightly manned casualty transit centres, while most medical and nursing staff will move out to peripheral cushion hospitals situated on main roads and close to railways. Base hospitals will contain special centres and be either for acute or for "recovering" patients (continuous specialist supervision no longer needed), who will be transferred from the cushion hospitals by ambulance train or coach as soon as their primary treatment has been completed. The hospital service will be controlled from Whitehall through the regional hospital boards and through medical officers of the Ministry of Health posted at Army Command and Civil Defence Region headquarters. The First Aid service will be an integral part of the hospital service, and first-aid stations will be based on selected cushion and base hospitals. Each station will comprise a fixed first-aid post at the parent hospital, together with three mobile first-aid sections and a mobile gas cleansing unit, for each of which two light cars and a van will be provided, with a motor-cyclist as messenger. Ambulances will be the responsibilit. of the local health authority.

BLOOD VESSELS OF A GASTRIC ULCER

BY

JAMES A. KEY, F.R.C.S.

(From the Department of Surgery, King's College, Newcastle-upon-Tyne)

[With Special Plate]

It is no new idea that acute ischaemia can cause necrosis of the gastric mucosa. Disse (1904) claimed that the arteries supplying the gastric mucosa in man are virtually end-arteries, each one supplying 4 mm.² of surface mucosa, and that blockage of one or more of these vessels would cause local necrosis. Various theories have been suggested by Hofmann and Nather (1921) on how such a block may be produced. They present a long list from which to choose, including compression from without by the muscle coats of the stomach, spasm of the arteries, and thrombosis and embolism.

Recent work by Barlow (in the press) shows, however, that the vessels of the gastric submucosa and mucosa are not anatomical end-arteries, but that they anastomose freely with each other. Examination of Barlow's dissections suggests that it would require an extensive vascular block to render a patch of mucosa ischaemic. It is true, nevertheless, that the vessels in and around a chronic gastric ulcer show widespread occlusions; but in an acute ulcer this is by no means the case.

During the past year specimens of gastric ulcer removed at operation in our department have been examined by the methods of microangiography, designed to show the vessels without impedance of other tissues.

Method

On removal of the resected portion of stomach at operation the specimen is placed in a saline bath at 37° C., and kept there until injection is completed. A suitable artery, usually the left gastric or right gastro-epiploic, and the largest of the accompanying veins are cannulated. The cut ends of the stomach are clamped or oversewn to prevent leakage. A 10% solution of colloidal silver iodide is then injected into the artery at a pressure of not more than 160 mm. Hg, 70–90 ml. being the average quantity entering the vessels. In some cases 10–15 ml. of a solution of 10% bismuth oxychloride ("chlorbismol") is injected after the silver iodide. Bismuth oxychloride has a particle size too large to enter the capillaries, and it outlines the larger vessels very clearly. The vessel used for injection is then ligated, the stomach filled with cotton-wool to limit distortion, and the whole specimen immersed in 10% formalin for 24 hours.

After fixation the stomach is cut along the greater curvature, opened out mucosa uppermost, and radiographed. A further period of formalin fixation follows for 24–48 hours. Transverse sections 400 μ thick are made through the ulcer itself and for varying distances proximal and distal to it along the line of the lesser curve. These sections are then examined by the technique of microarteriography (Barclay, 1947).

Results

Normal Stomach

A transverse section of the normal healthy stomach in the line of the lesser curve shows a characteristic vascular pattern (Plate, Fig. 4), so regular and well defined that it is easy to detect the normal anatomical layers of the stomach wall. The vessels of the mucosa are rich and complex and those of the underlying submucosa present a typical ordered pattern. The vessels supplying the external muscle coats are seen as a longitudinal band running across the zone near the bottom of the section.

Chronic Ulcer

Figs. 1 and 2 show radiographs of two stomachs each containing a chronic gastric ulcer of the lesser curve, the first situated at the centre of the lesser curve and the other approximately 5 cm. from the pylorus. In both there is a well-marked ischaemic zone around the ulcer in which the larger vessels do not outline. Elsewhere the vessels of the stomach show normal filling.

Section through the ulcer itself shows that the floor of the ulcer consists of bloodless tissue throughout the whole thickness of the stomach wall; in this area there is a complete absence of all but very fine vessels (Fig. 3). The vessels of the mucous membrane, on the other hand, are normally filled right into the edge of the ulcer. The general picture contrasts sharply with that seen in a transverse section of the normal stomach.

Furthermore, sections taken from the lesser curve some distance from a chronic ulcer show that these changes extend as an ischaemic core quite deep to the mucosa for 1–2 cm. along the lesser curve. Fig. 6 shows such a section taken 1.6 cm. from the edge of a chronic gastric ulcer. There is a well-marked ischaemic zone in the centre of the section, with absence of all but very fine vessels. The overlying submucosa shows a marked derangement of the normal vascular pattern, although the vessels of the mucous membrane are normally filled. The appearances are those of an ischaemic process deep in the stomach wall, which undermines and eventually destroys the mucosa.

This method of microradiography demonstrates vividly the old pathological teaching, extensive vascular block and derangement around a chronic ulcer. It has been a constant finding in all the specimens of chronic gastric ulcer examined.

Such an ischaemic state might well explain why an ulcer does not heal, but rather persists and even spreads. It is not, however, evidence that such a vascular condition caused the original ulcer. It is indeed much more probable that the vascular block is the result of a chronic inflammatory state producing changes not dissimilar to those found in chronic ulceration elsewhere in the body.

An attempt was made, therefore, to find and examine small acute ulcers. Such ulcers are not commonly found in gastrectomy specimens, but occasional ones were detected remote from chronic ulcers and also in specimens removed urgently for haematemesis.

Acute Ulcer

The typical appearance of a transverse section through an acute ulcer is shown in Fig. 5. There is a marked increase in the blood vessels in the submucosa. Their arrangement is haphazard and diffuse, and the alteration of vascular pattern in the submucosa extends widely beyond the point where the mucosa is breached. The mucosal vessels themselves are well filled and appear to be normal right into the ulcer defect, and at one edge the mucosa has collapsed almost as if the foundations on which it rests have been disrupted.

The normal pattern (Fig. 4) contrasts as vividly with the vessels of an acute ulcer as it does with the appearances in a chronic ulcer, but in a very different way. The acute ulcer presents a picture of an acute vascular disturbance

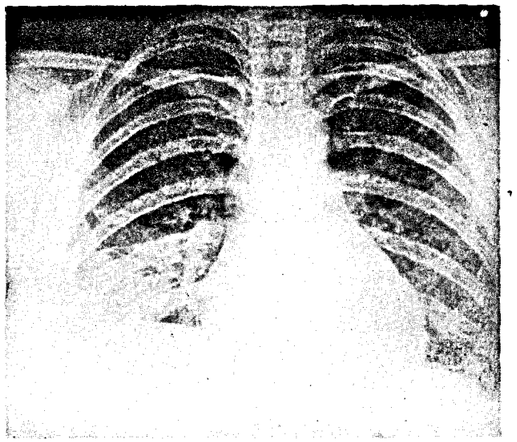


Fig. 1.—Case 1. Radiograph on February 7, 1950, ten days from onset. Moderately dense opacity right base, fine clouding left lung. Lateral view indicated involvement of both lower and middle lobes on right side.

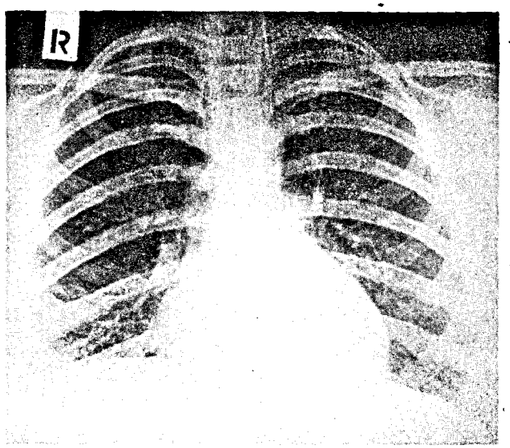


Fig. 2.—Case 1. Radiograph on March 7. Resolution complete left lung, almost complete right base. Clearing of latter first evident on February 17, but comparatively slow in progress.

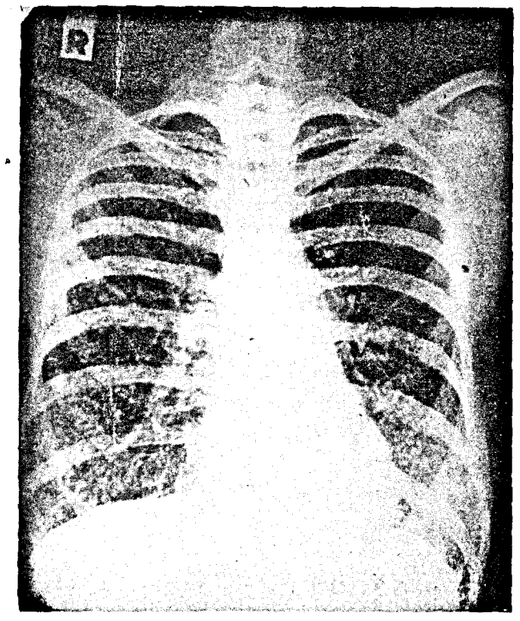


Fig. 3.—Case 2. Radiograph on January 17, 1950, twelve days from onset. Coarse mottling both lungs, uniformly distributed. No localized consolidation.

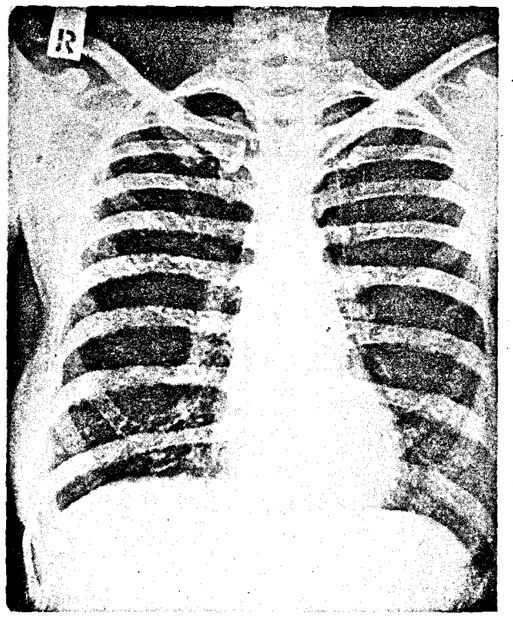
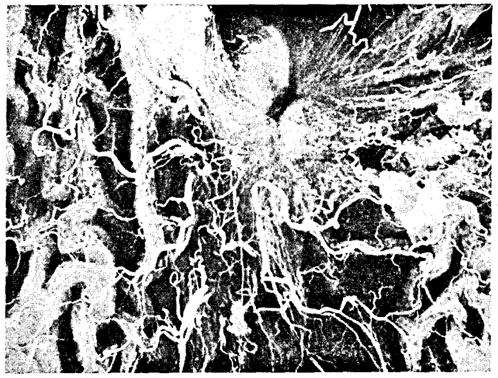
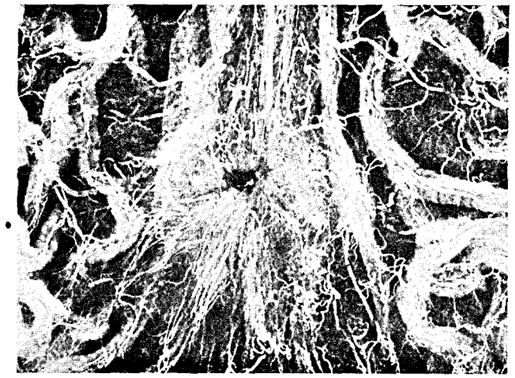


Fig. 4.—Case 2. Radiograph on January 24. Lungs now completely clear.





FIGS. 1 and 2.—Surface radiographs (× 78) of two specimens of chronic gastric ulcer situated on the lesser curve. The vessels have been injected with colloidal silver iodide. Each ulcer shows a well-marked surrounding ischaemic zone with absence of all but fine vessels.

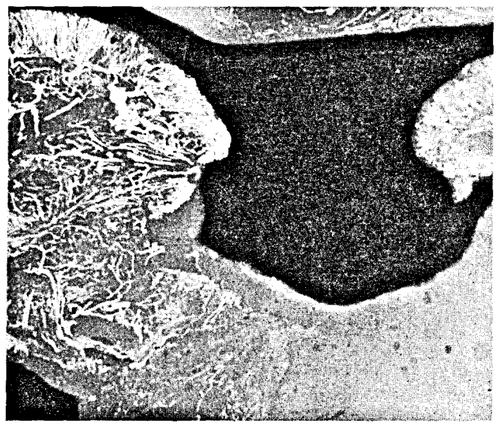


FIG. 3.—Transverse section (× 4) through the centre of a chronic gastric ulcer showing the well-marked ischaemic base, with only an occasional fine vessel running through it, and the normal filling of the vessels of the mucous membrane right up to the ulcer edge. (Section 400 μ thick.)

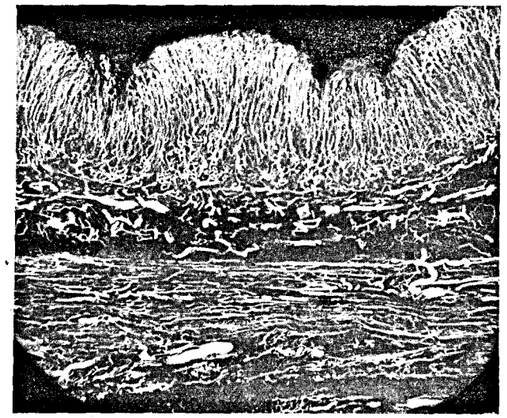


FIG. 4.—Transverse section (× 8.8) of normal stomach wall in the centre of the lesser curve. The vessels in the mucosa are well filled and the normal vessel pattern in the underlying submucosa is clearly seen. The fine vessels running longitudinally near the bottom of the section are those of the external muscle coats. (Section 400 μ thick.)



FIG. 5.—Transverse section (× 8.8) through the centre of an acute ulcer showing an increase in the size and number of vessels. Their arrangement is haphazard and diffuse and extends widely beyond the point where the mucosa is breached. (Section 400 μ thick.)

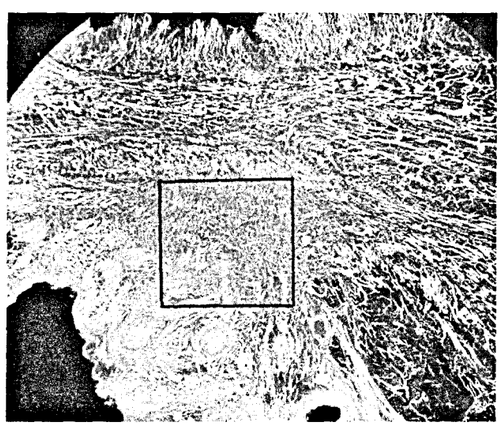


FIG. 6.—Transverse section (× 4.4) through the lesser curve 1.6 cm. from the edge of a chronic gastric ulcer. The outlined ischaemic area deep in the muscle wall is shown containing only fine vessels. (Section 400 μ thick.)

occurring chiefly just under the mucous membrane—a hypervascularity and derangement, an increase in vessels, and not an ischaemia.

Discussion

The method of studying vascular patterns in simple gastric ulcer by microradiography lends support to the hypothesis that in peptic ulcer an acute vascular disturbance occurs in the submucosa close to the mucous membrane, and that the breach of the mucosa itself results from this underlying vascular derangement.

Such a hypothesis is of interest when compared with the observations of Wolf and Wolff (1943) on their patient, Tom, who had a large gastric fistula. They noted that in states of acute emotion the exposed gastric mucosa became engorged and turgid, and finally produced here and there an acute erosion which bled from its congested edges.

The nature of the vascular disturbance found in association with acute ulcers has not so far been determined, but further studies by microradiography, and by coloured intravascular injections of arteries and veins, show that venous stasis is a predominant feature. That such a type of acute vascular reaction can produce ulceration elsewhere in the body is common knowledge. The surgeon called upon to operate on strangulation of the bowel often sees it.

It should be of interest to pursue the study of the vascular derangement of the stomach mucosa.

Summary

The vascular pattern of the normal lesser curve of the stomach, of a chronic ulcer, and of an acute ulcer, as shown by microradiography, are compared.

In a chronic ulcer there is widespread vascular occlusion in the base of the ulcer and extending along the line of the lesser curve deep to the mucosa.

In an acute ulcer there is an acute vascular disturbance occurring chiefly just under the mucous membrane—a hypervascularity and not an ischaemia.

It is a pleasure to acknowledge the continued advice of Professor F. H. Bentley in this investigation, and the assistance of Mr. J. E. Rogers, Mr. W. G. Leslie, and Mr. J. B. Wilson, of the departmental laboratories, in the preparation of specimens and microradiographs.

REFERENCES

Barclay, A. E. (1947). *Brit. J. Radiol.*, **20**, 394.
Barlow, T. E. (in the press). *J. Anat.*
Disse (1904). *Arch. mikr. Anat.*, **63**, 512.
Hofmann, L., and Nather, K. (1921). *Arch. klin. Chir.*, **115**, 650.
Wolf, S., and Wolff, H. G. (1943). *Human Gastric Function.* Oxford Univ. Press, London.

The shock of the two colliery disasters, at Knockshinnoch and at Creswell, which took place within three weeks of each other in September, may have obscured the fact that mining is actually getting safer in this country. Accident statistics recently issued by the Ministry of Fuel and Power in its *Statistical Digest for 1948 and 1949* display very clearly that, though between the wars there was little or no improvement in the safety record, since 1941 every year except 1947 has shown a further decrease in deaths and reportable injuries. Thus the numbers killed in 1920, 1930, and 1940 were 1,103 (or 0.88 per 1,000 men employed), 1,013 (1.07 per 1,000), and 923 (1.20 per 1,000) respectively, whereas in 1945 the figure had dropped to 550 (0.76), and in 1948 and 1949 had sunk to 460 (0.62)—less than half the average pre-war value. The reportable injuries show a similar though less striking trend: 4,287 (3.4 per 1,000) in 1920, 3,237 (4.2) in 1940, but only 2,180 (2.9) in 1949.

OBSERVATIONS ON BLOOD FLOW IN HUMAN INTESTINE

BY

JOHN GRAYSON, M.Sc., M.D.
B.M.A. Research Scholar, 1949–50
(From the Department of Physiology, University of Bristol)

In the past most of our information concerning the visceral circulation has been derived from animal experiments. It is difficult, however, to apply the results of such experiments direct to man, for anaesthesia, operative interference, and species difference are incalculable factors. There is urgent need for the better understanding of circulatory responses in human viscera, especially as regards their relation to the control of peripheral resistance. Indirect studies have been made in such structures as the liver (Bradley *et al.*, 1945) and the kidney (Goldring *et al.*, 1940).

Friedman and Snape (1946) and Shoshkes (1948) observed colour changes in colostomies and used them mainly in the investigation of local applications of drugs. Almy and Tulin (1947) made direct proctoscopic observations in young adults to demonstrate colonic responses to stress, but the role of the intestinal blood vessels in the integration of the circulation as a whole is still inadequately understood.

In a previous investigation of the problem I also used patients on whom the operation of colostomy had been performed, employing the temperature and colour of the intestinal protrusions surrounding the abdominal stoma to detect intestinal blood-flow change in these subjects. It was shown that vascular responses in the skin were often accompanied by opposite reactions in the bowel (Grayson, 1949a). Thus cutaneous vasodilatation produced by warming the body was accompanied by a pronounced diminution in bowel blood flow, whereas during the cutaneous vasoconstriction produced by cooling a limb an increase in bowel blood flow occurred. Again, during the spontaneous fluctuations which occasionally occur in the skin of a subject at rest, opposite fluctuations were usually observed in the bowel. In other experiments the intravenous administration of the dihydrogenated alkaloids of ergot—"hydergine" or dihydroergocornine—which act mainly as cutaneous vasodilator drugs, was followed by a marked diminution in bowel blood flow which accompanied the rise in skin blood flow (Grayson and Swan, 1950).

Although such opposed vascular responses have been a striking feature of the previous investigations, the skin and bowel circulations do not inevitably show opposite responses to all stimuli. For example, intravenous adrenaline or *nor*adrenaline produces vasoconstriction in both skin and bowel (Grayson and Swan, 1950). Again, where prolonged heating of the body produces a rise in rectal temperature the initial diminution in bowel blood flow already referred to is followed by an increase. Similarly, in experiments where the rectal temperature was lowered a diminution in bowel blood flow occurred (Grayson, 1949b). In these examples the blood flow changes in skin and bowel were similar and not opposite.

The present paper, however, is concerned only with the opposed reactions that take place between skin and bowel and their possible significance in the maintenance of blood pressure.

Methods

The temperature of any animal tissue exposed to an environment at a temperature different from that of the blood depends in part on the blood flow through the organ and can be used to detect blood-flow change. This

principle has been applied to the investigation of blood-flow reactions in many organs (Schmidt and Pierson, 1934; Barcroft and Millen, 1939), and is the basis for the wide use of skin-temperature measurements in the clinical assessment of cutaneous blood-flow change (Parmenter and Benedict, 1929).

In the present work the same principle was used to detect blood-flow changes in the tissue of exposed colostomies, caecostomies, or ileostomies. The experimental procedure, with its limitations, has been described elsewhere (Grayson, 1949a; Grayson and Swan, 1950). Briefly, however, temperatures were measured by means of fine needle thermocouples inserted into the mucosa or muscle layer of the colostomy, connected to a moving-coil galvanometer, whose movements were recorded continuously on a kymograph by means of a manually operated mechanical device (Schmidt and Pierson, 1934). The subjects, in general, were in late middle life and often in poor physical condition; the information refers only to the mucous or muscular coats of the bowel—ileum, caecum, or colon—not to the splanchnic area as a whole; but the method has afforded valuable qualitative information concerning the circulation in the human intestine.

Results

The following experiments were intended to relate the bowel blood-flow changes which occur during heating or cooling of the body to blood-pressure changes, and to investigate the mechanism by which such changes are effected.

Methods

The temperature of the muscle coat of the colostomy was recorded, together with the temperature of the dorsum of the right index finger and, where possible, the rectal temperature. Blood pressure was measured by the auscultatory method. Cutaneous vasodilatation was produced by covering the body with blankets. The area of skin exposed to the room air was thus reduced, and the total reflex vasoconstrictor effect of cold at the body surface thereby diminished, which permitted passive dilatation without change in rectal temperature. Cutaneous vasoconstriction was produced either by removing blankets from a subject previously covered, thus increasing the peripheral cold stimulus, or by immersing a limb in cold water.

Effect of Decreasing Cold

In the experiment shown in Fig. 1 the effects accompanying reflexly induced cutaneous vasodilatation are shown. The subject was an elderly man with a colostomy of the descending colon, performed nine months previously. He lay on a couch throughout, and temperature and blood-pressure observations were made as described above. The initial readings were taken with the subject completely exposed to the room air at 20° C. He was then covered with blankets, except for the colostomy and a small area of abdominal wall surrounding it. The skin temperature of the right index finger rose rapidly, and simultaneously the systolic and diastolic blood pressures began to drop. After 25 minutes of warming, the blood pressure reached a minimum and then rose again to resting levels. The colostomy temperature began to fall with the rise in skin temperature and continued to fall while the blood pressure was rising. Similar results were obtained in eight other cases. In some cases the bowel reactions were also accompanied by a distinct pallor of the colostomy.

Removing cold stimulus from the body surface thus produced a diminution in blood flow in the bowel. The fact that the diminution in bowel flow continued even during the rise in the blood pressure which occurred after 25 minutes of warming suggested that it was due to an active intestinal vasoconstriction and was not, therefore, simply a passive effect of falling blood pressure.

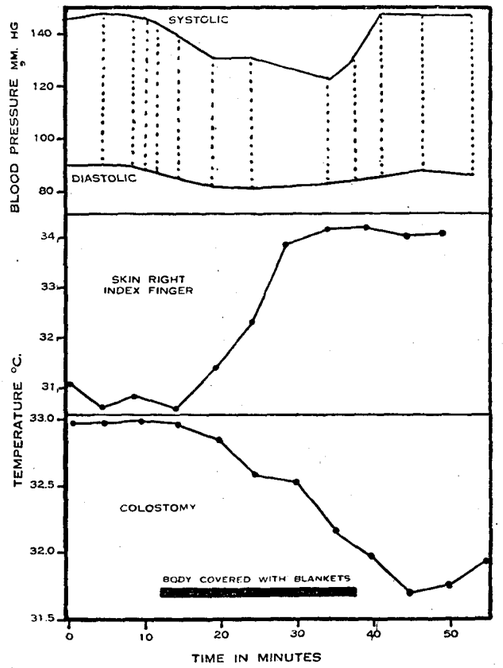


FIG. 1.—Blood pressure and temperature reactions—colostomy and skin—during removal of cold stimulus. The subject was exposed to the room air for 40 minutes before covering.

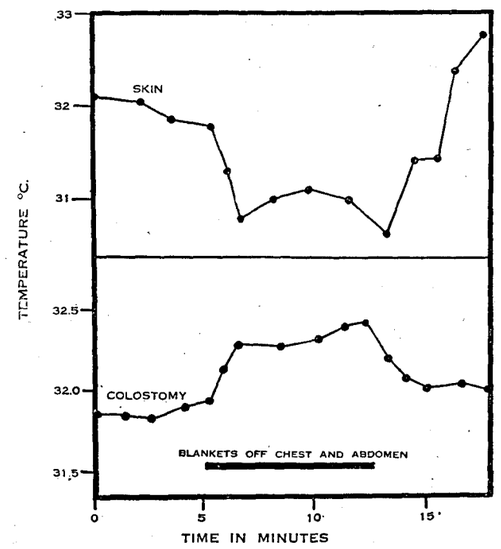


FIG. 2.—Temperature reactions—colostomy and skin—on exposing the body surface to cold. The subject was covered for 40 minutes before exposure to the room air.

Effect of Increasing Cold

Experiments were performed on subjects previously covered with blankets for resting periods of half an hour. Peripheral cold stimulus was increased by uncovering a part of the body or by immersing a limb in cold water.

Fig. 2 shows the effect of exposing the upper abdomen and chest to the cold of the room. There was no drop in rectal temperature. There was a rise in systolic and diastolic blood pressures, a drop in skin temperature from the right index finger, and an increase in the temperature of the exposed colostomy. On covering the abdomen and chest again the blood pressure, skin temperature, and colostomy temperature returned to resting levels. Similar results were obtained on all occasions. In some cases in which the colostomy tissue was pale to start with there was visible flushing. Cold stimulus therefore caused an increase in the bowel blood flow. In some cases the blood pressure returned to resting levels while the bowel temperature was still rising, suggesting that the increase in bowel blood flow was the result of vasodilatation in the bowel blood vessels.

Similar results were obtained when a limb was immersed in water, provided no change occurred in rectal temperature. Fig. 3 shows the result of an experiment in which an arm was immersed in a stirred water-bath at 16° C. Vasodilatation took place in the bowel and was maintained until after the rectal temperature had fallen. Fig. 4 shows the result of an experiment where an arm was immersed in cold water for 12 minutes after previous occlusion of its circulation by means of a sphygmomanometer cuff inflater to 200 mm. Hg. Immersion of the occluded limb produced a marked increase in colostomy temperature and flushing of the bowel, which accompanied a pronounced drop in skin temperature from the opposite index finger (not shown in diagram) and a rise in blood pressure. The blood pressure began to fall after five minutes' immersion and returned slowly to baseline. Release of the occlusion pressure produced a fall in rectal temperature, a further drop in the temperature of the opposite index finger, and a fall in bowel temperature below its original resting level.

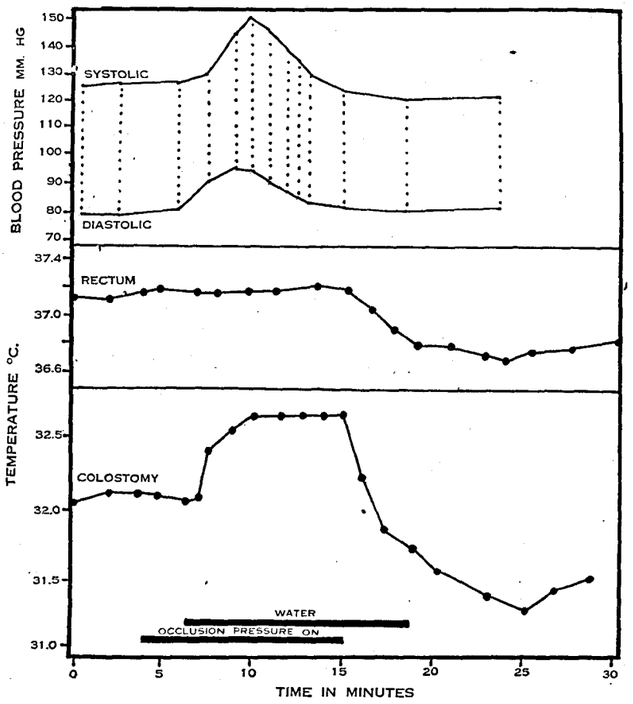


FIG. 4.—Blood pressure and temperature records—colostomy and rectum—following occlusion of the right arm and immersion in water at 16° C.

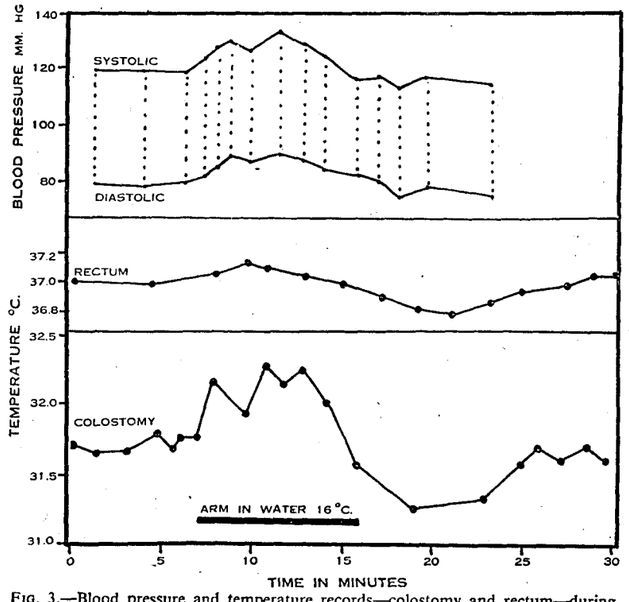


FIG. 3.—Blood pressure and temperature records—colostomy and rectum—during immersion of an arm in water at 16° C.

Effect of Locally Applied Procaine Hydrochloride on Bowel Responses

The investigation of the nervous pathways which may be involved in the control of the intestinal circulation afforded considerable difficulty. The efferent nerves supplying the colostomy cannot be easily blocked; nor has a colostomy subject been found on whom a total sympathectomy has been performed. It is hoped that recent work with new techniques may give a direct answer to this problem, but meanwhile an indirect approach has been found necessary, using local analgesic infiltrated direct into the colostomy tissue.

In one experiment a patient with two abdominal stomata was used. The intestinal tissue surrounding the upper stoma was infiltrated with 0.5 ml. of procaine hydrochloride, and the tissue of the lower stoma with 0.5 ml. of physiological saline—both solutions warmed to 32.5° C.—just

below initial bowel temperatures. The temperature of the procaine-infiltrated stoma rose from 32.6° to 33.5° C. and remained steady at the new level. The temperature of the lower stoma was unaffected by saline infiltration. In 15 experiments in which the procedure was used procaine infiltration caused an increase in recorded colostomy temperature. The extent of the increase depended in part, however, on the initial temperature of the bowel.

Fig. 5 shows the results of three experiments in which procaine was infiltrated near the recording thermocouple. The colostomy temperature after infiltration rose from

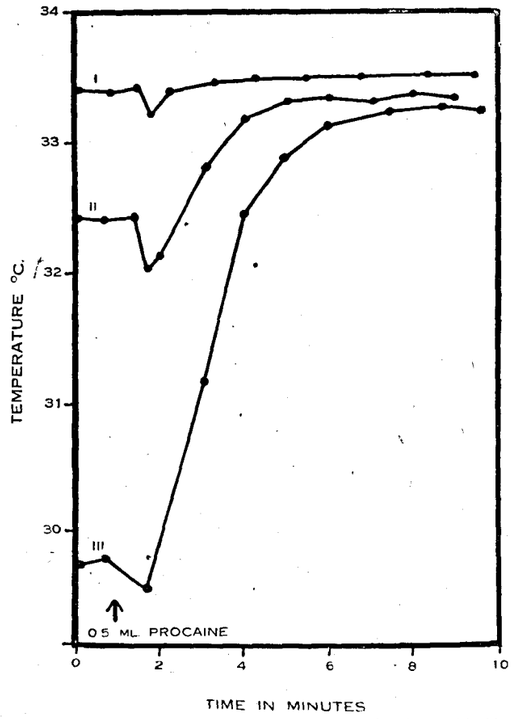


FIG. 5.—Effect of local infiltration of procaine hydrochloride on colostomy temperature in three subjects. The solution in each case was warmed to just below the initial colostomy temperature.

29.7°, 32.4°, and 33.3° C. to about 33.5° C. Colour changes were also observed, and colostomies which were pale or pink in colour flushed bright red after procaine infiltration. Colostomies which were already red and hot showed no colour change. It must be concluded, therefore, that infiltration with procaine causes relaxation of vasomotor tone in the colostomy tissue.

Effect of Intravenous Adrenaline in the Presence of Local Procaine

Intravenously administered adrenaline or *nor*adrenaline has previously been shown to produce vasoconstriction in the human bowel (Grayson and Swan, 1950). Fig. 6 shows the results of intravenous *nor*adrenaline administered to a colostomy subject with two abdominal stomata, the upper stoma having previously been infiltrated with 0.5 ml. of 1% procaine. A similar drop in bowel temperature occurred in both stomata. Similar results were obtained in two other experiments using adrenaline, and it is concluded that the action of circulating adrenaline or *nor*-

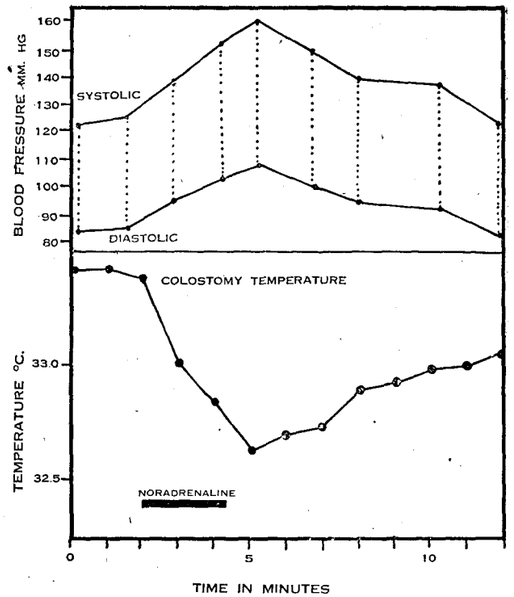


FIG. 6.—Effect of intravenous *nor*adrenaline on the temperature of a procaine-infiltrated colostomy. The lower stoma of the same colostomy—not infiltrated—showed a similar drop.

adrenaline is undiminished by the presence of local procaine. Procaine has already been shown to abolish the resting tone of the blood vessels of the colostomy. It must be concluded, therefore, that adrenaline or *nor*adrenaline plays little part in the maintenance of this tone.

Action of Heat and Cold in the Presence of Procaine

Fig. 7 shows the result of an experiment using a colostomy subject with two abdominal stomata. The upper stoma was infiltrated with 0.5 ml. of 1% procaine. The lower stoma remained unanaesthetized. The subject was covered with blankets and the legs placed in hot water. The skin temperature of the lower, unanaesthetized, stoma fell concomitantly, whereas no change occurred in the temperature of the upper, anaesthetized, stoma.

In a different subject, the left arm was immersed in cold water. Vasoconstriction occurred in the skin with an increase in recorded bowel temperature. The arm was removed from the cold water and immersed in water at 36° C. The skin temperature and the colostomy temperature returned rapidly to resting levels. The bowel was then infiltrated with 0.5 ml. of 1% procaine. Its temperature rose from 32° to 33.9° C. Placing the arm in cold water now had no effect on the bowel temperature. Similar results were obtained in two further experiments using different subjects.

In these experiments, therefore, infiltration of the bowel with procaine prevented the intestinal vasoconstrictor action of external heat and the intestinal vasodilator action of external cold. In view of the fact that the action of adrenaline or *nor*adrenaline is unaffected by the presence of procaine these effects in the unanaesthetized subject cannot have been brought about by the circulation of these sympathomimetic drugs. It is not possible, unfortunately, to be certain of the precise action of locally infiltrated procaine. The experiments show that it relaxes vasomotor

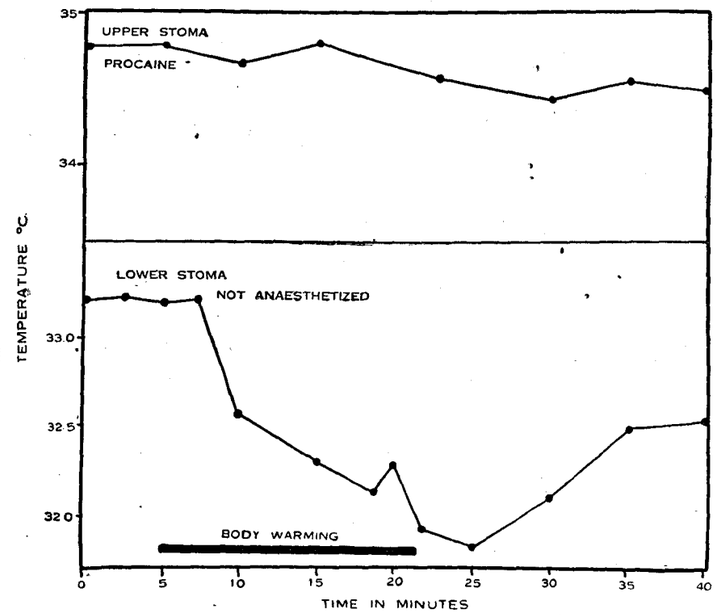


FIG. 7.—Effect of locally infiltrated procaine on the intestinal vascular response to heat

tone, but whether this is accomplished through blockage of the terminal ramifications of the vasomotor nerves or through some direct action on the blood-vessel wall it is not yet possible to say.

Discussion

Almy and Tulin (1947), using direct proctoscopic examination of the intestinal mucosa in man, showed that stress resulting from mechanically induced headaches or painfully cold stimuli produced hypertension, pallor of the skin, and a significant engorgement of the mucosa. In the present work similar effects were frequently produced by much more moderate stimuli. Thus, cooling the body surface caused a rise in blood pressure, vasoconstriction in the skin, and vasodilatation in the bowel. On the other hand, warming the body surface produced opposite effects. It seems that under a variety of conditions, apart from those described by Almy and Tulin, there is a relation between the cutaneous circulation, the blood pressure, and the intestinal circulation. The mechanism of the skin reactions will be considered first.

Cutaneous blood-flow changes in response to alterations in external temperature were once thought to be largely initiated by minute fluctuations in blood temperature and mediated through the sympathetic nerves (Pickering, 1932). Although there can be little doubt that big changes in blood temperature exert central vasomotor effects, recent work leaves little doubt that cutaneous vascular responses of the type used in the present work are mainly reflexly initiated in the skin and occur regardless of change in blood or rectal temperature (Kerslake and Cooper, 1950). Exposing the abdominal wall to the cold of the room initiates reflex cutaneous vasoconstriction; covering the body with blankets removes the surface stimulus of cold and produces passive vasodilatation (Grayson, 1950).

The changes in bowel blood flow which accompany the cutaneous reactions are not brought about simply by alterations in blood pressure. A diminution in bowel flow often occurred with a rising blood pressure, and an increase in bowel flow has been observed while the blood pressure was falling. The intestinal vascular responses must therefore be due to active vasoconstriction or vasodilatation. Three possible mechanisms suggest themselves. Intestinal vascular responses could be brought about by the liberation of some unspecified humoral agent; they could be effected by direct skin-initiated reflexes, analogous to the cutaneous vascular responses; or they could be the reflex result of the blood-pressure changes which occur during heating or cooling the body.

Friedman and Snape (1946) showed that mild pain or apprehension produced blanching of the mucosa of a child's colostomy. This was thought to be an effect of adrenaline liberation. In the present experiments, however, procaine infiltration of the colostomy eliminated the possibility of adrenaline or noradrenaline being humoral agents responsible for the intestinal vasoconstriction accompanying body-warming. Thus it is not likely that reflex stimulation or inhibition of the suprarenal medulla is responsible in any way for the effects described. It is hard to picture any alternative humoral mechanism which could act similarly, and it seems most probable that the intestinal vasoconstriction and vasodilatation observed in these experiments are brought about through efferent nervous pathways.

The present work does not finally answer the question of the initiating mechanism where the bowel blood-flow reactions are opposite to those in the skin. The possibility that cooling the skin produces vasodilatation in the bowel through direct reflex pathways cannot be eliminated. But it should be remembered that opposed reactions in the skin and bowel occasionally occurred spontaneously without stimulation of the skin. The intravenous administration of hydergine or dihydroergocornine, again, produces opposed skin and intestinal responses. These drugs act principally on the skin vessels, producing profound vasodilatation and a drop in blood pressure. They also cause vasodilatation when applied direct to the bowel wall, yet when administered intravenously they produce marked intestinal vasoconstriction. It is hard to avoid the conclusion that intestinal vasoconstriction is produced, here, in response to general circulatory demands, the need for a decreased intestinal blood flow overriding the local vasodilator action of the drugs.

In all the reactions which have been considered a change in blood pressure was a constant feature. Thus removal of cold stimulus from the surface of the body produced cutaneous vasodilatation accompanied by a drop in blood pressure which preceded the intestinal vasoconstriction. Again, cutaneous vasoconstriction was accompanied by a rise in blood pressure which preceded the intestinal vasodilatation. It is suggested that these intestinal effects might well be the result of blood-pressure changes which act through carotid sinus, aortic, or other similar reflexes to modify intestinal vasomotor tone and thereby restore the peripheral resistance. If further work should confirm this

suggestion it is evident that the vascular responses described are fundamental to the peripheral regulation of blood pressure.

Summary

Blood-flow changes in human intestine have been detected by means of temperature records from the exposed intestinal tissues of colostomies.

Cold stimulus applied to the body surface produces cutaneous vasoconstriction, intestinal vasodilatation, and a temporary rise in blood pressure.

Removal of cold stimulus from the surface of the body produces cutaneous vasodilatation, intestinal vasoconstriction, and a temporary fall in blood pressure.

Procaine hydrochloride infiltrated into the exposed bowel relaxes vasomotor tone and prevents the occurrence of vasoconstriction in response to heat and of vasodilatation in response to cold, although the vasoconstrictor action of intravenous adrenaline or *nor*adrenaline is not affected.

It is suggested that the intestinal effects are brought about reflexly through the alterations in blood pressure.

I am grateful to Professor R. J. Brocklehurst for his help and advice, and to Mr. C. J. Wilks for technical assistance.

REFERENCES

Almy, T. P., and Tulin, M. (1947). *Gastroenterology*, **8**, 616.
Barcroft, H., and Millen, J. L. E. (1939). *J. Physiol., Lond.*, **97**, 17.
Bradley, S. E., Inglefinger, F. J., Bradley, G. P., and Curry, J. J. (1945). *J. clin. Invest.*, **24**, 890.
Friedman, M. H. F., and Snape, W. J. (1946). *Fed. Proc.*, **5**, 30.
Goldring, W., Chasis, H., Ranges, H. A., and Smith, H. W. (1940). *J. clin. Invest.*, **19**, 739.
Grayson, J. (1949a). *J. Physiol., Lond.*, **109**, 439.
—— (1949b). Ibid., **110**, 13P.
—— (1950). Ibid., **111**, 39P.
—— and Swan, H. J. C. (1950). *Lancet*, **1**, 488.
Kerslake, D. McK., and Cooper, K. E. (1950). *Clin. Sci.*, **9**, 31.
Parmenter, H. S., and Benedict, F. G. (1929). *Amer. J. Physiol.*, **87**, 633.
Pickering, G. W. (1932). *Heart*, **16**, 115.
Schmidt, C. F., and Pierson, J. C. (1934). *Amer. J. Physiol.*, **108**, 241.
Shoshkes, M. (1948). *Gastroenterology*, **10**, 305.

HEXAMETHONIUM BROMIDE IN DUODENAL ULCER

BY

L. D. W. SCOTT, M.D., M.R.C.P.
A. W. KAY, M.D., F.R.C.S.
M. M. O'HARE, M.B., M.R.C.P.

AND

J. A. SIMPSON, M.B., M.R.C.P.

(From the Peptic Ulcer Clinic, Western Infirmary, and the Southern General Hospital, Glasgow)

Paton and Zaimis (1949) have shown that hexamethonium produces blockade of autonomic ganglia. When given intramuscularly it constantly inhibits gastric secretion and motility (Kay and Smith, 1950a). When given by mouth it has a similar though less constant action (Kay and Smith, 1950b). These properties suggest that it may be of value in the treatment of duodenal ulcer.

To evaluate a method of treatment for duodenal ulcer is peculiarly difficult, for it must be based almost entirely on the subjective evidence of the relief of symptoms, and, moreover, there is the danger that improvement due to spontaneous remission may be attributed to the treatment. This paper reports a therapeutic trial designed to avoid these fallacies.

Method of Study

Selection of Cases.—Twenty male patients were taken from those attending the Peptic Ulcer Clinic at the Western Infirmary. Their ages ranged from 21 to 62 years. All had both clinical and radiological evidence of duodenal ulcer and had had symptoms for more than six years. All were suffering severe disability which was refractory to medical treatment and which would ordinarily have merited gastrectomy. Patients known to have pyloric stenosis were excluded, but one patient accepted for trial was later found to have this complication.

Plan of Trial.—Alternate patients were allocated to one of two groups. Group A received hexamethonium bromide (500 mg. at 8 a.m., 2 p.m., and 8 p.m.). Group B received a powder of similar bromide content and similar taste and appearance, consisting of potassium bromide (3 gr.–0.2 g.) made up to bulk with lactose. In all other respects the treatment and assessment of the two groups were identical. The allocation of patients to the two groups and the dispensing of the appropriate powders was done by one of us (L. D. W. S.), who took no part in assessing the results. The assessment was made by A. W. K., who had no means of distinguishing the two groups until the completion of the six-months period of observation. At the outset of this investigation little was known of the side-effects produced by the prolonged oral administration of hexamethonium bromide. It was therefore considered necessary to admit the patients to hospital for six weeks. Thereafter they returned to work and were treated as out-patients for a further 18 weeks. All patients were given ordinary diet from the main kitchen of the hospital unless they complained of severe dyspepsia. Alkali was used only when pain was severe. The patients were encouraged to be up and about during the day and were allowed home on pass one day a week, leaving hospital after lunch and returning at night. After discharge from hospital they were encouraged to take ordinary diet and resume full activities.

Clinical Assessment.—Success or failure in treatment was judged on clinical grounds. The assessment was made on a numerical basis. While in hospital, twice a day each patient was asked by the ward sister if he had any dyspepsia, and the answer was recorded on a chart. If there had been no complaint of any gastric upset a nought ("0") was recorded. Water-brash, heartburn, or discomfort was represented by "1," mild pain by "2," fairly severe pain by "3," and very severe pain by "4." After leaving hospital patients were instructed to keep a similar pain chart. They reported weekly, when further assessment was made by interrogation.

Clinical Results

Group A.—Of the 10 patients treated with hexamethonium bromide six completed the course of 24 weeks. Four were adjudged to be greatly improved, three having remained symptom-free for from 14 to 20 weeks, and the fourth complaining of occasional mild heartburn lasting no more than 10 minutes at a time. Two continued to have mild symptoms. One defaulted after eight weeks though suffering no more than mild dyspepsia at that time. One patient, after seven weeks' treatment without relief, was found to have pyloric stenosis. Two patients suffered severe relapses after periods of improvement and were assessed as failures in the 15th and 23rd weeks.

Group B.—Of the 10 patients treated with potassium bromide, two completed the trial of 24 weeks. None remained symptom-free throughout the period of observation. Two, though continuing to have dyspepsia, were regarded as somewhat improved. The remainder either gained no relief, or relapsed and were accounted failures, in the 2nd, 4th, 7th, 10th, 11th, 12th, 13th, and 15th weeks.

Side-effects

As hexamethonium bromide given by intramuscular injection is known to cause hypotension in some individuals, particular attention was paid to the cardiovascular system. At first the blood pressure and the pulse rate were recorded twice daily, but in the absence of any noteworthy changes these observations were made only once daily in the later stages of the patients' stay in hospital. A close watch was kept for syncopal attacks, and daily inquiry was made regarding faintness and lightheadedness. Inquiry was also made concerning difficulty in reading as a result of paralysis of accommodation, and a daily note was made of the size of the pupils. The occurrence of constipation, which might conceivably follow the continued use of a ganglionic blocking agent, was also recorded. Since the two groups of patients were indistinguishable, these records were necessarily made in all cases and were not confined to those patients taking hexamethonium bromide.

Group A.—In the group taking hexamethonium bromide the side-effects were with one exception slight or inconstant. The exception was a patient who experienced difficulty in reading while in hospital and who had a minor syncopal attack due to hypotension after dismissal. The dose of the drug was then reduced to 500 mg., taken on retiring, and no further trouble was experienced. This patient developed achlorhydria in response to the drug and was ultimately classed as greatly improved. While in hospital two patients in this group had lightheadedness on standing up and four experienced blurring of vision. These side-effects were noticed only during the first week of treatment or after testing the patient's response to hexamethonium bromide. In this test the patient fasted for a period of seven hours and it seems clear that side-effects are much more likely to occur when the drug is taken in the fasting state. It was further noted that the development of side-effects did not necessarily parallel the change in gastric acidity; hypotension and hypochlorhydria might occur separately. In the continued trial, four patients complained of constipation, which responded to simple measures.

Group B.—Of those patients given potassium bromide, one complained of difficulty in reading for a period of 24 hours and two developed constipation, which they attributed to the treatment.

Effects on Gastric Acidity

Gastric analyses were begun at 9 a.m., after a 12-hour fast. The fasting juice was aspirated, and specimens were removed at half-hour intervals thereafter for three hours. Special precautions were taken to empty the stomach at each aspiration. The volume of each specimen was measured and free and total acids estimated, using the usual double indicator.

Before beginning treatment, two such tests were made on successive days in each case. These analyses were intended to show the gastric acidity in the untreated patient and to serve as a control for future observations.

Subsequently, gastric analysis was made four hours after the administration of a powder. This analysis was intended to serve as a test of each patient's response to hexamethonium bromide, and the interval of four hours was chosen, since it is known that when the drug is effective by mouth a lowered acid level can be expected at this time (Kay and Smith, 1950b).

Once treatment had been started, at weekly intervals an "interval gastric analysis" was made 13 hours after the last dose of powder. These tests were planned to demonstrate any possible cumulative effect resulting from continued administration of the powder.

Results of Gastric Analyses

The results of two preliminary control analyses on each patient confirmed that the level of gastric acidity in any individual may vary from time to time even under standard conditions. Allowance had to be made for this before crediting any observed alteration in acidity to the treatment.

Group A.—In the group of 10 patients taking hexamethonium bromide three developed achlorhydria, as judged by Töpfer's reagent, in response to a test dose. The anacidity persisted during the three hours of the test. Two of these patients were eventually regarded as greatly improved (Fig. 1). One patient, who also became symptom-free, showed a substantial reduction in acid level. An unaffected acid level was found in the remaining six patients; one of these became symptom-free (Fig. 2). In four cases "interval gastric analyses" showed some reduction in the level of gastric acidity, which was maintained throughout the period of observation in hospital (Fig. 3). There was, however, no evidence of progressive diminution of the acid level in response to continued treatment. We

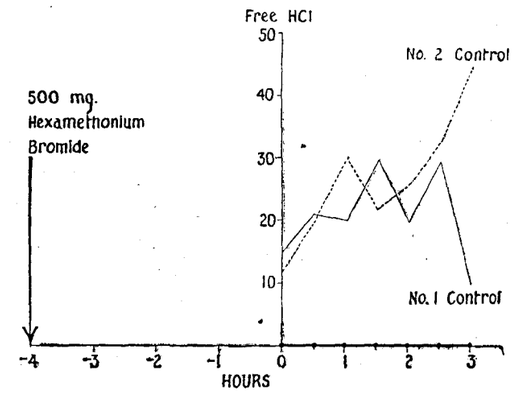


FIG. 1.—Case showing achlorhydria after a test dose of hexamethonium bromide. (The readings for the treated case lie on the base line.) This patient became symptom-free.

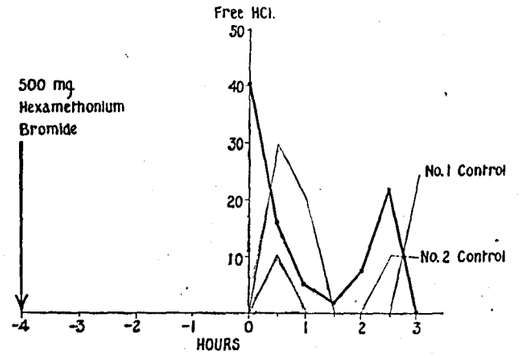


FIG. 2.—Case showing an unaffected acid level after a test dose of hexamethonium bromide. This patient became symptom-free.

have therefore been unable to show that hexamethonium bromide has any cumulative action on the gastric secretion of hydrochloric acid.

Group B.—None of the patients taking potassium bromide showed any change in the acid level that could be attributed to it even on the most optimistic evaluation.

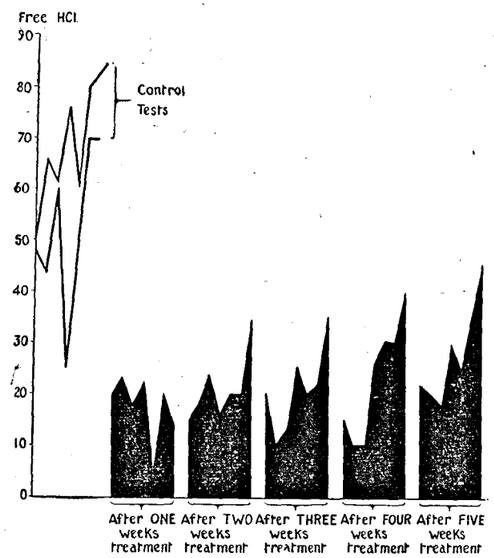


FIG. 3.—Case showing a consistent reduction in acid level as judged by weekly test meals, done 13 hours after the last dose of hexamethonium bromide.

This observation was of importance, since it also showed that the rest in hospital, the freedom from home cares, and the diet taken would not of themselves result in a lowering of gastric acidity.

Discussion

We have already referred to the difficulties in the way of assessing accurately the results of treatment in duodenal ulcer. In particular, there is the fallacy of attributing to the method of treatment under survey improvement due to spontaneous remission. Moreover, in view of the small number of cases in this series and the short period of observation, it is clearly not justifiable to come to any definite conclusion. The results obtained so far do, however, give some evidence of the value of hexamethonium.

It should be noted that all the cases were of the most severe type and completely refractory to orthodox medical treatment. It is therefore not surprising that in Group B (potassium bromide) only two of the ten cases showed partial improvement. On the other hand, in Group A (hexamethonium bromide) the almost complete relief of symptoms in four cases and the partial relief in another two suggest that hexamethonium may be of value in the treatment of duodenal ulcer. If this is so, it remains to be seen how it acts.

We have shown that when taken by mouth the drug can lower the acid level in some cases. However, this action is inconstant and may not be responsible for the clinical improvement. In Group A we observed indisputable lowering of the gastric acidity in four cases. Three of these were ultimately classified as successes and one as a failure. On the other hand, we were unable to show any fall in acidity in one patient who became symptom-free. It is not yet certain that patients showing a marked lowering of gastric acidity at the beginning of treatment will continue to do so after prolonged administration of hexamethonium. Since this drug has a greater effect on gastric acidity in the fasting subject (Kay and Smith, 1950b), its eventual place in the treatment of peptic ulcer may be to control nocturnal hyperacidity. On the other hand, too much attention may have been paid to change in gastric acidity and the action of hexamethonium as an inhibitor of gastric motor activity ignored. Study is continuing on this point.

Useful information has been gained about the side-effects after prolonged administration of hexamethonium. With one exception these effects were slight and the patients were able to continue normal work. Lightheadedness and blurred vision were infrequent, and occurred during the first few days of treatment or when the patient had been fasting. Serious constipation did not occur. The one exception complained of blurred vision and had a minor syncopal attack due to hypotension, but became symptom-free on a single dose of 500 mg. of hexamethonium bromide on retiring. Although the side-effects were infrequent and of a minor nature, we suggest that care should be used, especially in the early days of treatment and when the drug is taken in the fasting state.

Summary

A controlled investigation of the treatment of duodenal ulcer by hexamethonium bromide is reported. While not conclusive, it provides evidence of marked improvement in four and some improvement in two of the ten treated cases. The clinical improvement was not always accompanied by demonstrable reduction in the acidity of the gastric juice. Side-effects occurred most often at the beginning of treatment or when the drug was given to fasting patients.

We are indebted to Professor C. F. W. Illingworth for his direction and helpful criticism throughout this investigation. We wish to acknowledge the assistance given by Dr. A. N. Smith, Dr. Mary Forbes, and Dr. John Raeside. Our thanks are also due to May & Baker Ltd. for generous supplies of hexamethonium bromide.

REFERENCES

Kay, A. W., and Smith, A. N. (1950a). *British Medical Journal*, **1**, 460.
—— —— (1950b). Ibid., **2**, 807.
Paton, W. D. M., and Zaimis, E. J. (1949). *Brit. J. Pharmacol.*, **4**, 381.

An international standard for the adrenocorticotrophic hormone (A.C.T.H.) has been established by the Expert Committee of the World Health Organization on Biological Standardization. The committee also set up international standards for fifteen other biological substances, including anti-Rh, anti-A, and anti-B blood-grouping sera; lecithin and cardiolipin, recently introduced with great success in diagnostic tests for syphilis; tubocurarine, used to obtain muscular relaxation of the patient in anaesthesia; streptomycin and dihydrostreptomycin, the latter being considered to be less toxic than streptomycin and therefore less likely to produce side reactions; aureomycin and terramycin, two new antibiotics which have proved successful where penicillin has previously failed; and diphtheria toxoid, for immunization against diphtheria. A standard was also set up for hyaluronidase (spreading factor), used for intracutaneous injections in small children where intravenous injections would be difficult or impossible. A W.H.O. Expert Committee which had been asked to investigate the possibilities of producing dried smallpox vaccines for the Tropics, where it has been difficult, owing to climatic conditions, to conserve liquid smallpox vaccines in a fresh and active state, recently set up guiding principles to be followed by manufacturers of dried vaccines.

POLIOMYELITIS IN LONDON IN 1949

BY

G. E. BREEN, M.D., D.P.H., D.O.M.S.
Late Epidemiologist, London County Council

AND

B. BENJAMIN, B.Sc., F.I.A., F.S.S.
Statistician, Public Health Department, London County Council

After a respite of but one year poliomyelitis struck again at the population of London County. In 1948, in London as elsewhere, the incidence of the disease fell to the endemic level of the years preceding the first explosion of 1947, but in 1949 the second epidemic occurred of much the same proportions as the first. In 1947 there were 702 "corrected notifications" in London, with a fatality rate of 7%; in 1949 there were 668 corrected notifications, with a fatality rate of 7.1%. There were, however, peculiar differences between the two epidemics, which are recorded here to add to the patient accumulation of evidence which may yet provide the solution to the epidemiological riddle presented by poliomyelitis.

Timing

Both summers were on the whole hot and dry compared with the damper, cooler summer of 1948. The climatic conditions are compared in Table I. It will be seen that the summer rainfall in 1947 and 1949 was much lower than in 1948, whereas the temperatures were higher. The epidemic rise began almost at the same time in the two years.

As has already been recorded in detail (Daley and Benjamin, 1948), the rise in notifications in 1947 occurred in the week ending May 31, while in 1949 the disease became epidemic about the middle of June. Whereas, however, the first epidemic gathered momentum rapidly, especially during July, and reached a sharp peak at the end of August, the 1949 outbreak grew slowly, so that even in July there was doubt whether it would reach the proportions of the 1947 outbreak. The notifications, however, climbed gradually and steadily through August, remained more or less stationary in September and October, and finally reached a late peak at the beginning of November. Decline was at first as rapid as in 1947, but through December the incidence stabilized at an abnormally high level, and the usual

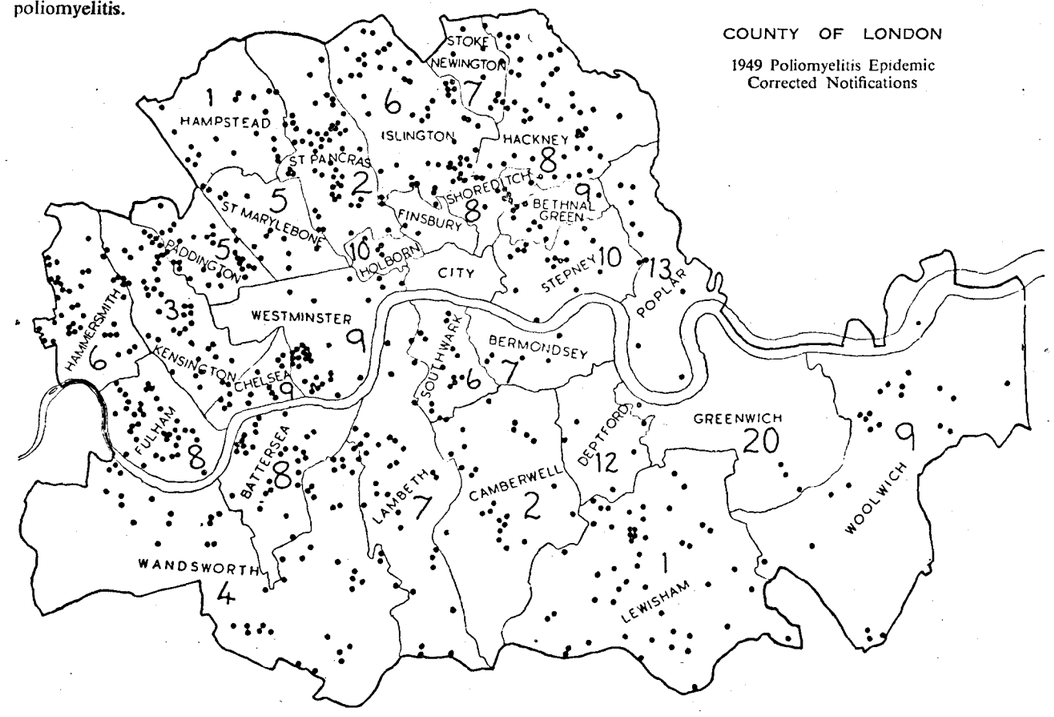


TABLE I.—*Weather Conditions 1947–9 (From the Royal Observatory, Greenwich)*

Month	Mean Daily Temperature (° F.)			Mean Degree of Humidity*			Mean Weekly Rainfall†					
	1947	1948	1949	1947	1948	1949	1947		1948		1949	
June	62·7	58·4	57·9	68	74	70	0·55		0·53		0·18	
July	66·2	61·0	67·0	72	71	58	0·14	0·25	0·25	0·57	0·20	0·22
August	68·7	60·6	64·3	62	77	65	0·08		1·00		0·26	
September ..	63·6	58·3	64·8	70	74	71	0·35		0·22		0·27	
October	52·6	52·6	56·6	77	79	82	0·03		0·46		1·01	
November ..	46·2	47·0	44·4	79	85	83	0·27		0·45		0·55	
December ..	42·4	44·0	43·1	84	85	81	0·51		0·28		0·35	

* Saturation equals 100. Humidity is measured at intervals throughout the day.
† Rain collected in a gauge whose receiving surface is 5 in. (12·7 cm.) above the ground. The figures are the means of the sums of the weekly rainfall.

interepidemic level was not reached until the middle of January, 1950.

There is no obvious climatic reason why the 1949 epidemic curve should have begun to rise so slowly, but it is possible that the fall in temperature during September may have checked any tendency to an accelerated rise, and the sharp drop in temperature (with rising humidity) in late October may have contributed to bringing the outbreak to an end. In 1947 the epidemic curve began to fall with the temperature, but the rapid decline, despite a high average temperature, suggests that the epidemic had exhausted itself regardless of climatic changes.

Geographical Distribution

The distribution of cases* in London in 1949 is shown in the accompanying map. This picture is strikingly at variance with that for 1947 (Daley and Benjamin, 1948), when, though there were isolated areas with a statistically significantly higher or lower incidence than average, the complete map gave a general impression of wide scatter, no area escaping. In 1949 the incidence was higher to the north of the Thames than to the south, and there were wide areas—for example, in Deptford and Greenwich—without recorded cases.

The numbers in the map indicate the week of epidemic rise in notifications (week ending June 18=1) in each borough. Here again there are differences. In 1947 any suggestion of spread from foci was effaced by the rapid diffusion of the attack throughout the county. The slower epidemic rise of 1949 made it possible to discern directions of spread, of which there may have been two main streams: (*a*) from Hampstead in the north-west, southward and eastward, the eastward branch finally turning south to take in Deptford and Greenwich; (*b*) from Lewisham in the south-east in a north-westward and westward direction.

Age Distribution

Here the most striking difference between the two epidemics is discernible (Table II). For some time observers in the U.S.A. have noted that the age incidence of the disease has tended steadily to rise, an observation that was confirmed in London in 1947, when only 27.9% of cases occurred in children under the age of 5 (Table III). But in 1949 the age incidence returned abruptly to its former proportion, and 53.3% of the cases occurred among children under 5. This is appreciably higher than the figure of 41.8% for the "endemic" years 1937 to 1946. Not, indeed, since 1932 has so high a proportion of cases occurred in children under 5.

TABLE II.—*Age Distribution of Poliomyelitis Cases,* 1937–49*

Age Group in Years	Cases									
	1937–46		1947		1948		1949			
	No.	%	No.	%	No.	%	No.			%
							M	F	Total	
Under 1 ..	22	3·7	32	4·5	8	5·7	23	20	43	6·4
1–4 ..	228	38·1	164	23·4	39	27·6	181	132	313	46·9
5–9 ..	143	23·9	169	24·1	19	13·5	68	55	123	18·4
10–14 ..	74	12·4	88	12·5	24	17·0	30	20	50	7·5
15–24 ..	82	13·7	129	18·4	22	15·6	27	36	63	9·4
25+ ..	49	8·2	120	17·1	29	20·6	37	39	76	11·4
Total ..	598	100	702	100	141	100	366	302	668	100

TABLE III.—*Cases* of Poliomyelitis and Polio-encephalitis*

Year	Total No.	Under 5 Years of Age	
		No.	%
1921–3	209	116	55·5
1924–6	266	152	57·1
1927–9	206	117	56·8
1930–2	182	107	58·8
1933–5	225	112	49·8
1936–8	280	114	40·7
1939–41	159	72	45·3
1942–4	88	41	46·6
1945	70	22	31·4
1946	39	14	35·9
1947	702	196	27·9
1948	141	47	33·3
1949	668	356	53·3

* "Cases" here and elsewhere in this article means "corrected notifications."

Possible Association with Inoculation

There has been a full discussion elsewhere (Bradford Hill and Knowelden, 1950) of the possibility that in some cases, and in certain circumstances, poliomyelitis may follow immunization, and since investigations are still proceeding it is not proposed to comment on this feature at present. We should stress, however, that this association, even if proved, is *not* responsible for the sharp differences in age distribution as between 1947 and 1949.

All cases notified in London were closely investigated in order to trace any history of recent inoculation.† Out of a total of 356 cases under age 5 only 58 had any such history, and only in 33 did any genuine association between paralysis and injections appear to be established; in 8 there was some doubt, and in the remaining 17 the doubt was considerable. These additional cases may have accentuated the eventual character of the outbreak, but they are not relatively numerous and cannot be the cause. We must also remember that some unrecognized "immunization" cases may—and perhaps must—have occurred in 1947. Inoculation trauma may be an important problem, but it did not colour the epidemiological picture in London in 1947 or 1949 to any important extent.

Sex

The usual preponderance of males was seen, especially between the ages of 1 and 4, where there were 181 male to 132 female cases—a ratio of 1.37 to 1, compared with 1.34 to 1 in 1947 (Table IV).

TABLE IV.—*Male/Female Ratio in 1947 and 1949*

Age	1947	1949
Under 1 year	1·67	1·15
1–4 years	1·34	1·37
5–9 ,, ...	1·64	1·24
10–14 ,, ...	1·20	1·50
15–24 ,, ...	0·68	0·75
25+	1·14	0·94
Total	1·21	1·21

In view of the small numbers involved the differences between the ratios in 1947 and 1949 cannot be regarded as statistically significant. Taken together, they indicate that the excess of males is greater at younger ages and is actually replaced by an excess of females after age 15.

Diagnosis, Progress, and Fatality

By courtesy of the medical superintendents of the hospitals concerned the following statistics were obtained of their poliomyelitis admissions in 1949, and they are compared with similar figures for 1947 (Table V).

TABLE V.—*Diagnosis, Progress, and Fatality in 1947 and 1949*

Sample from London Hospitals	No. of Cases		% of Confirmed Cases	
	1947	1949	1947	1949
Admitted with diagnosis of poliomyelitis	686	655	—	—
Diagnosis confirmed	391	354	100	100
Paralytic cases	255	218	65	62
Residual paralysis	159	162	41	46
Deaths	20	25	5	7

† "Recent inoculation" means inoculation within the four weeks preceding notification.

Multiple Cases

In 1949 more than one case in the same family was reported 14 times; in 1947 this occurred 27 times. This difference is not statistically significant. Multiple cases in 1949 were more numerous north of the river (11) than south of the river (3). Indeed, there were more multiple cases in St. Pancras (4) than in all South London. The numbers involved were, however, so small that the results cannot be regarded as statistically significant.

Discussion

The most striking features, then, of the 1949 epidemic are (*a*) the return of the age incidence to its usual level, and (*b*) the geographical distribution. In regard to age incidence, it seems reasonable to suppose that the herd immunity of the population was raised considerably during the 1947 epidemic. Thus infants born after the middle of 1947 may have had a very much lower herd immunity than the remainder of the population. It is mainly the increased incidence in the first two years of life that has caused the alteration in the percentage age distribution.

If we compare the numbers of cases at each age in 1949 with those which would have been expected if the same total of cases had been distributed as in 1947 (Daley, 1948) we obtain the differences shown in Table VI.

TABLE VI.—*Difference in Actual and Expected Cases for 1949*

Age	Actual Cases, 1949	Expected on 1947 Distribution	Difference
0–	43	30	+13
1–	116	42	+74
2–	87	45	+42
3–	73	31	+42
4–	37	38	−1
5–9	123	161	−38
10–14	50	84	−34
15–24	63	123	−60
25+	76	114	−38
Total ..	668	668	

It will be seen that the largest difference, both absolutely and relatively, is in infants between 1 and 2 years of age, and that differences are positive—that is, actually greater than expected—for infants who at the time of the 1947 epidemic were under 18 months of age and who presumably were not exposed to infection as much as older infants. Many of them would have been young enough possibly to have had some temporary protection from their mothers if the latter had experienced an infection—clinical or subclinical—at any time.

The number of cases occurring in 1949 in each borough at ages 0–14 has been compared with that expected on the basis of the average county rate, and the excesses and deficiencies have been worked out. The following are regarded as statistically significant: Hammersmith, +14.7 (high); Kensington, +13.0 (high); St. Pancras, +14.9 (high); Westminster (City), +12.3 (high); Finsbury, −4.9 (low); Poplar, −7.4 (low); Deptford, −8.5 (low); Greenwich, −12.5 (low); Lewisham, −13.1 (low); Bermondsey, −7.0 (low); and Lambeth, −13 8 (low). In general, boroughs north of the river had an incidence higher than average, while the converse was true of the southern boroughs. A greater number of births in the north than in the south might be a possible explanation of this phenomenon, but in fact the infant population (0–4 years) forms a smaller proportion of the total in the north than in the south (7.6 as compared with 8.8).

Higher local immunity after the 1947 epidemic might perhaps have influenced the local distribution of cases—high-incidence areas in 1947 having a low incidence in 1949—but the relationship is not a simple one. In 1949 Hammersmith, Kensington, St. Pancras, and Westminster showed a higher-than-average incidence; and, while Kensington and St. Pancras were areas of notably lower-than-average incidence in 1947, Westminster was only slightly so and Hammersmith was not so at all. Again the low-incidence areas in 1949 were Finsbury, Poplar, Deptford, Greenwich, Lewisham, Bermondsey, and Lambeth. Of these Lewisham, Bermondsey, Deptford, and Finsbury had a higher-than-average incidence in 1947, but Lambeth and Greenwich were only average, and Poplar was much lower than average in *both* epidemics.

Boroughs, of course, are not closed communities; on the contrary, neighbouring communities affect each other, and this prevents their behaving as independent variables. Consider two neighbouring communities A and B. Suppose that in 1947 A had higher-than-average incidence while the incidence in B was only average. Let us assume that from causes other than relative immunity the incidence in B in 1949 is much higher than average; it would constitute a large reservoir of infection so close to A as perhaps to outweigh the advantage of the immunity gained by the high incidence of A in 1947, and so lead to A again having a higher-than-average incidence. This would need to happen only to a small extent to upset the simple correlation between 1947 and 1949; in fact, it did happen only to a small extent, and not in any instance where deviations from average were statistically significant in both years. Examples are Fulham, Chelsea, and Hackney—above average in 1947, surrounded or bordered by high incidence in 1949, and again above average in that year.

Conversely, there will be some boroughs which experienced low incidence in 1947 and which would be expected to be above average in 1949 but failed to be because they were surrounded by small reservoirs of infection. Examples of this are Stepney and Poplar, Camberwell, Greenwich, and Woolwich. The result is to obscure the effect of the 1947 epidemic in modifying the herd immunity in 1949, and, by the same token, it invalidates any attempt on this occasion to relate the inter-borough variations to social factors such as housing or economic environment.

Summary

An account is given of the outbreak of poliomyelitis in 1949 in the administrative County of London. The effect of the earlier outbreak in 1947 in raising herd immunity may perhaps be seen in the much younger age distribution of cases, which reverses the trend of the last twenty years, and to some extent in the changed geographical distribution of cases.

A sample of hospital admissions indicates that the percentage of paralytic cases was approximately the same as in 1947.

Sex ratios were not significantly altered. The fatality rate (approximately 7%) was the same in both outbreaks. The 1949 outbreak showed a more leisurely development both in time and in space than the previous epidemic.

Our thanks are due to Sir Allen Daley for permission to publish this account and for helpful criticism; to Dr. J. S. Anderson, Grove Hospital; Dr. J. F. Armstrong, Brook Hospital; Dr. H. S. Banks, Park Hospital; Dr. W. H. Kelleher, Western Hospital; and Dr. R. Swyer, St. Ann's Hospital, for their kindness in furnishing statistics of their poliomyelitis admissions in 1949.

REFERENCES

Daley, Sir Allen (1948). *Proc. R. Soc. Med.*, **41**, 52.
—— and Benjamin, B. (1948). *Med. Offr*, **80**, 171.
Hill, A. Bradford, and Knowelden, J. (1950). *British Medical Journal*, **2**, 1.

Medical Memoranda

Gummatous Infiltration of Oesophagus Masquerading as Carcinoma

The operation of transthoracic partial oesophagogastrectomy has passed the experimental stage and is now regarded rightly as the routine procedure in the operable case of cancer of the lower oesophagus. This extensive operation, performed as it is on patients often debilitated by slow starvation, carries with it a mortality above that of most standardized procedures for the resection of carcinoma elsewhere. It therefore behoves the surgeon to be very certain of his diagnosis before embarking on the operation, and the report of the following case may serve as a reminder that other pathological conditions may mimic malignant disease.

CASE REPORT

The patient, a man aged 77, first attended hospital in May, 1948, with a five-months history of increasing difficulty in swallowing solid food. He felt as if the food stuck at the lower end of the sternum, and on frequent occasions he had regurgitated his meal almost as soon as he had taken it. At the time when he was first seen he had reduced his diet to semisolids and fluids only. He did not complain of pain, and he denied marked loss of weight. There was no relevant past history. The patient was an intelligent but frail old man showing signs of loss of weight. Except for obvious anaemia there were no abnormal physical signs. Blood examination showed: Hb, 38% ; R.B.C., 2,830,000 ; C.I., 0.68 ; W.B.C., 5,600 ; and W.R., ++. A barium swallow was reported as showing "undoubted carcinoma of lower third of the oesophagus," and comparison with a film taken three months previously showed considerable extension of the disease. The patient was admitted for oesophagoscopy and biopsy. At the time of the instrumentation there was a technical failure and the procedure was abandoned. It was considered that, as radical resection would not be possible in view of the frail condition of the patient, further instrumentation was not desirable. He was referred to St. Bartholomew's Hospital with a view to treatment by irradiation, but it was considered that he was unlikely to benefit by this form of therapy.

Over the next few months, contrary to all expectation, the patient's condition did not deteriorate and it became obvious that doubt must be cast on the diagnosis. He was readmitted for oesophagoscopy, and a granular area at the lower end of the oesophagus was observed. Biopsy from this area revealed no carcinoma. In view of the very strongly positive W.R. the patient was put on iodides, and within a short time his swallowing had improved dramatically. He now eats any food without discomfort or difficulty, and at nearly 79 years of age is in very good health.

COMMENT

In view of the strongly positive W.R. and the marked improvement on iodides, it can be assumed reasonably that the patient was suffering from a gummatous infiltration of the oesophageal wall. Such cases, although rare, are well recognized, and Guyot (1931) was able to collect 55 cases from the literature when reporting two from his own practice. The symptoms produced by this lesion are indistinguishable from those associated with a carcinoma, and the resulting stenosis may be as complete. Even with antisyphilitic treatment subsequent dilatation of the resulting stricture may be necessary. Perforation of a gummatous lesion has also been reported (Rodrigo Sabalette and Garcia Martinez, 1945).

A positive W.R. is not always present to help the diagnosis, and of course such a finding is a common accompaniment of carcinoma. Oesophagoscopy may leave the surgeon quite sure that he is dealing with a malignant lesion, and Abel (1929) reports a case in which the lesion appeared so typical of carcinoma that, in spite of a negative biopsy, the condition was treated with radium applicators. Subsequent progress of the disease and further repeated biopsies left no doubt that the condition was due to a gummatous lesion. Leucoplakic patches may sometimes be seen in the oesophageal mucosa above the site of a gummatous infiltration, but ultimately the diagnosis must depend on repeated biopsies, persistently negative for carcinoma, and the response of the symptoms to antisyphilitic treatment.

STANLEY O. AYLETT, F.R.C.S.,
Surgeon, Metropolitan Hospital.

REFERENCES

Abel, A. L. (1929). *Oesophageal Obstruction*, p. 146. Oxford Medical Publications, London.
Guyot, R. (1931). *Ann. Oto-laryng.*, p. 505.
Rodrigo Sabalette, P., and Garcia Martinez, E. (1945). *Med. clin.*, 4, 105.

Oedema of Glottis Treated by Tracheotomy

A generation ago emergency tracheotomy was largely performed in cases of laryngeal diphtheria, but, fortunately, since the widespread use of immunization in this country it is now rarely necessary. That it may still be required occasionally is shown by the following case.

CASE REPORT

A road-sweeper aged 34, of good physique and in good health, reported sick at 1.30 p.m. on September 26, 1949, complaining of difficulty in swallowing of recent onset. Examination showed an apparently normal throat. An anodyne was prescribed and he was sent home to rest. At 4.30 p.m., on an urgent call, he was seen at home and was obviously very ill ; a respiratory stridor was audible throughout the house. The patient was pacing the room, occasionally grasping a bed rail in an effort to draw breath. Unable to speak, he made signs that he was choking. It was obvious, in view of his wild behaviour and "bad" colour, that there was a need for tracheotomy.

At 4.35 p.m. a vertical midline incision was made from the cricoid level downwards for 1½ in. (3.75 cm.), without anaesthetic. Much dark blood oozed from the purplish tissues. The trachea was identified by touch. After displacing the pretracheal muscles to either side and extending the incision downwards better exposure was gained. The point of a pair of aural forceps penetrated the trachea below the first ring, acting as a guide to the scalpel, which was used to divide three rings below this point. A blast of air indicated restoration of an airway. There was improvement in the general condition, and bleeding ceased with oxygenation of the tissues. A temporary tracheotomy tube was fashioned from a wide-bore male rubber catheter in which air-holes were cut ; it was secured by a safety-pin before introduction. The patient was noticeably shocked, and the initial cyanosis had given way to a greyish tinge ; there was extensive sweating.

To ease respiration he was kept upright during conveyance to hospital, and the edges of the trachea had to be kept apart with aural forceps. In the operating theatre a metal tracheotomy tube was inserted without difficulty. No anaesthetic was required. He was then transferred to a warm bed and given an injection of morphine, ¼ gr. (16 mg.), later repeated. Penicillin was injected to prevent respiratory complications. On the following day continuous glucose-saline to a total of 2 litres was given intravenously because of the inability to swallow.

Recovery was gradual. On September 27 he was still unable to breathe through mouth or nose. The fauces were swollen symmetrically as in bilateral quinsy, but differed in that the tonsils were healthy and the tissues pale and watery ; his temperature was 98.4° F. (36.9° C.). A diagnosis of oedema of the glottis seemed to be indicated. On September 28 he breathed through his nose. Extension of the oedema below the mandible caused a "double chin." Next day he started a light diet. Oedema of the fauces was subsiding, and on September 30 the tube was removed. Subsequent progress was satisfactory, and the patient returned to work three weeks later.

The origin of the oedema of the glottis was investigated, but no definite conclusions were reached. Questioning on September 27 did not elicit a history of the patient having been stung by a wasp or bee on the previous day. He had not felt a pain in the throat whilst eating his lunch. It seems likely that local trauma to the throat was responsible, and that this occurred during the lunch meal. In spite of the lack of positive evidence the possibility that he swallowed a wasp without noticing cannot be excluded.

COMMENT

The treatment of allergic oedema of the glottis may be said to depend upon the stage at which the condition is recognized. Many, perhaps most, cases may be seen at an early stage before any considerable swelling has occurred, as when a patient can report with certainty that he has been stung in the throat. Here treatment by an immediate subcutaneous injection of adrenaline, followed by full doses of antihistamine drugs, may be completely successful. Other cases are, for various reasons, seen at a later stage. These include patients in remote country districts where distance obviates early consultation. The absence of a clear-cut history, as in this case, may lead to a late diagnosis. Here the need for tracheotomy, as shown by severe and increasing asphyxia, may arise.

My thanks are due to Dr. H. O. Lyne and the staff of the Whitby War Memorial Hospital for their valuable help in the management of this case.

J. D. LITTLE, B.M., B.Ch.

Oesophageal Foreign Body Precipitating Dissecting Aortic Aneurysm

In the case reported below it is probable that the disturbance incident on a realization by the patient that she had swallowed a fish-bone precipitated commencing aneurysm of the aorta in a predisposed subject. The eventual cause of death was rupture into the pericardium. The double pathology must be extremely rare, and for this reason the case is recorded.

CASE REPORT

The patient, a woman aged 44, was admitted to hospital as an emergency case at 10.30 p.m. on January 29, 1950. Two hours before admission she swallowed a fish-bone (plaice) and immediately coughed and had a severe substernal pain ; the severity was such that she broke into a sweat. She vomited twice on her way to hospital ; on the second occasion the vomit consisted of some frothy blood-stained fluid containing two small fish-bones. The substernal pain did not change in character or position after the vomiting.

Examination showed her to be a pale woman who, although in pain, was stoical, cheerful, and in full possession of her faculties. The temperature and pulse were normal. Examination of the heart and lungs revealed no abnormality. The blood pressure was 140/80. Indirect laryngoscopy showed a healthy larynx and clear pyriform fossae.

Oesophagoscopy was performed under general anaesthesia about half an hour after admission. The oesophagoscope was passed easily. As it went through the cricopharyngeus a little blood-stained froth came into view. A vertical superficial laceration about 1 cm. in length was present on the right postero-lateral wall of the oesophagus at 37 cm. from the incisor teeth. No foreign body was found.

Soluble sulphadimidine 1 g. was ordered to be injected four-hourly, and it was decided to give nothing by mouth for eight hours.

Recovery from the anaesthetic was normal. The substernal pain persisted and omnopon ½ gr. (22 mg.) was given for its relief at 3 a.m. on January 30. At 7.15 a.m. the patient became cyanosed over the face, neck, and chest, and the neck veins were congested. The pain shifted from the substernal region to the epigastrium. It is not known if the onset of this cyanosis was sudden, because she was not under continuous observation and it might have been gradual over about half an hour. On examination she was found to have a pulse of 120, with a poor volume. The blood pressure was 90/60. The lungs were normal to percussion and auscultation, and the heart sounds were normal. There was a slight epigastric fullness and a little guarding over the right upper rectus.

She was given continuous oxygen with a B.L.B. mask, and radiographs of the chest taken with a portable machine were normal.

At about 10 a.m. she was examined by Mr. R. G. Macbeth and Dr. E. M. Buzzard. By then her blood pressure had improved a little and was 110/80. It was decided that she was suffering from a cardiac failure. There was no evidence of an acute abdominal condition or of respiratory disease. Nikethamide 1 ml. hourly was ordered, and she was given hourly drinks of glucose and lemon-water. The oxygen was continued.

A physician under whose care she had been previously was consulted by telephone during the day. He stated that she was a hypertensive, though this was apparently not known to the patient or to the doctor who had sent her into hospital. A diagnosis of coronary thrombosis was suggested.

Her condition improved during that day, and the following night the epigastric pain slowly disappeared, but cyanosis always returned when the oxygen was withheld.

The next day an electrocardiogram was done, but the typical appearances of coronary thrombosis were not seen. Throughout this day her condition was unchanged. The next morning, February 1, the pulse rate was 80 and the blood pressure 190/120, but the cyanosis and engorgement of the neck veins persisted. At 9.30 a.m. she suddenly died just as an examination was about to be made of her heart.

Post-mortem Summary.—Spontaneous rupture of aorta with dissection and eventual rupture into the pericardium causing haemopericardium and death. Ante-mortem superficial laceration of the posterior wall of the oesophagus. Early nephrosclerosis.

Histological examination of the aorta showed an increase in sudanophil material in the media but no unequivocal findings of cystic medionecrosis. It is possible that the findings indicate an early stage in the development of this condition. Evidence of hypertensive changes was also found.

I would like to thank Mr. R. G. Macbeth, into whose ward the patient was admitted, and Dr. E. M. Buzzard. My thanks are also due to Dr. R. A. Sladden, who performed the post-mortem examination.

E. H. HADFIELD, B.M., B.Ch.,
Department of Otolaryngology,
Radcliffe Infirmary, Oxford.

The Ministry of Health announces that enrolments in the National Hospital Service Reserve in England and Wales at the end of September reached 4,573, an increase of 1,350 since last June. Membership consists of 372 trained nurses and 4,201 auxiliaries. The immediate target for the Reserve is 30,000. Wales has recruited a total of 840 members. In England the South-west Metropolitan Hospital Region has enrolled the highest number of recruits, the total reaching 627 ; the Newcastle Hospital Region came next with 387 ; and Sheffield R.H.B. a close third with 386.

Reviews

ATOMIC WEAPONS

The Effects of Atomic Weapons. Prepared for and in Co-operation with the U.S. Department of Defense and the U.S. Atomic Energy Commission, under the Direction of Los Alamos Scientific Laboratory, Los Alamos, Mexico. (Pp. 456; illustrated. £1 5s. 6d., or $3.) New York, Toronto, London: McGraw-Hill Book Company, Inc.

This book, despite five editors and 90 contributors in 438 pages of text, gives a straightforward and comprehensive account of the effects of the atomic explosions in Japan and at Bikini. It is designed as a source of scientific information for those with some technical knowledge who are engaged in planning civil defence.

It starts with an account of the principles underlying an atomic explosion, with a few words about nuclear structure and isotopes and an account of nuclear fission, chain reaction, the production of fissionable material, and fission products. This brief introduction is followed by a longer section describing an atomic explosion, first in the air and secondly under water, taking in turn the effects of shock, the physical damage from blast, the thermal radiation and incendiary effects, the radiations emitted, and the radioactive contamination that results.

The section on the measurement of nuclear radiations deals first with the properties and effects of ionizing radiations, then the instruments used for measuring them, and finally their measurement with particular relation to the detection of radioactive contamination following an explosion. Decontamination is then discussed, and the rest of the book is about protection and the effects on those who are exposed.

The book has been well edited, it is easy to read, and will be most useful to those responsible for civil defence. It does not gloss over the appalling effects of atomic explosions, and makes it clear that such an attack on an unprepared city might produce tens of thousands of casualties. These would mostly be due to burns and wounds, but several thousand cases of radiation sickness would be added as a new feature for civil defence to cope with. It makes it equally clear that preparation and warning would largely restrict the casualties to the main zone of blast; they might well be reduced to a quarter or less. The writers do not discuss the organization, preparation, and techniques required to deal with such situations, nor do they give any information about the hydrogen bomb.

Much of this information has been known to those working in civil defence for some time. Those responsible are of the opinion that, terrible as an atomic attack would be, it could be faced by a resolute, trained, and informed public. This book will help by providing information, and as such is welcome. It is unfortunate that in an otherwise excellent production the quality of many of the photographs reproduced should be so bad.

D. W. SMITHERS.

SLIT-LAMP MICROSCOPY

Spaltlampen-mikroskopie des hinteren Augenabschnittes. By Karl Hruby. (Pp. 164; 52 illustrations. M. 28.60.) Vienna and Innsbruck: Urban and Schwarzenberg. 1950.

The practice of slit-lamp microscopy is at present almost exclusively confined to the anterior segment of the eye. The usual techniques allow the study of the anterior vitreous, but the technical difficulties in obtaining a view of the deeper layers and of the fundus are such that, though fundus examination is feasible by special attachments to the slit-lamp, such examinations are infrequent. In his monograph on slit-lamp examination of the posterior segment of the eye, K. Hruby discusses fully the means that have been adopted to obtain an optical section of the deeper layers of the eye, and describes his own device of a pre-set lens −55D, which seems a less exacting procedure than the use of a special contact lens; in fact some of the more recent models of slit-lamps are equipped with the lens he designed.

No matter what device is used, slit-lamp microscopy of the posterior segment of the eye involves a small angle between the axis of observation and the axis of illumination. This makes the localization of depth difficult, and the diffuse red light from the fundus makes an optical section also difficult to obtain. The favourable conditions in the anterior segment of the eye therefore do not exist here. Within the limits thus imposed it is none the less possible to obtain valuable information that cannot be got otherwise. A whole series of membranes in the vitreous and retina can be differentiated. Posterior vitreous detachment, which in the past has largely been a pathological conception, can be shown as a clinical entity. Its bearing on retinal detachment arising from tears due to shrinking of adherent vitreous is obvious. The recognition of different types of vitreous detachment has become possible, as has differential diagnosis between the various types of vitreous haemorrhage. Disturbance in the normal relationship between a retinal detachment and the well-demarcated vitreous, induced by a diathermy puncture which perforates the retina and penetrates into the vitreous, has become apparent. Such punctures produce a sub-vitreal in addition to a sub-retinal fistula, and post-operative vitreous haemorrhage is a possible consequence. A striking development is the possibility of distinguishing between oedema and hole formation at the macula.

These are some of the considerations brought out in Hruby's excellent monograph. It is to be hoped that the technical difficulties presented by slit-lamp examination of the posterior segment of the eye will not deter further studies.

ARNOLD SORSBY.

HISTORY OF GYNAECOLOGY

The Genealogy of Gynaecology. History of the Development of Gynaecology Throughout the Ages. 2000 B.C.–1800 A.D. By James V. Ricci, A.B., M.D. With excerpts from the many authors who have contributed to the various phases of the subject. Second edition, enlarged and revised. (Pp. 494. $8.50.) Philadelphia: The Blakiston Company. 1950.

This work first appeared in 1943, and it has now been reprinted in an enlarged and revised edition. Dr. Ricci, who is clinical professor of gynaecology and obstetrics in New York Medical College, has produced a scholarly work which has obviously entailed a long and strenuous period of study.

Having adopted the bibliographic route of approach to his subject, he gives numerous quotations from the older writers, and also many case histories which may still be read with interest and profit by the present generation of gynaecologists. Particularly interesting are his earlier chapters on the ancient and mediaeval periods, and these indeed form the major portion of the treatise, only the last hundred pages being devoted to developments since the Renaissance. Extracts are given from the Kahun Papyrus, which forms what is probably the earliest known textbook of gynaecology. The gynaecology of Hippocrates and, of course, that of Soranus of Ephesus are studied in detail. Although the Arabian writers reveal some progress in the subject, as also do the works of the women practitioners of the School of Salerno, it was not until anatomy was established on a sound basis that gynaecology assumed a scientific aspect, and not until the eighteenth century that it became firmly adopted as a special branch of medicine.

An ample bibliography accompanies each chapter: for example, the section on the eighteenth century is followed by a list of no fewer than 704 references. Although this wealth of detail interferes a little with the readability of the historical narrative, it is probable that the author intended his book to be mainly a work of reference, and as such it will certainly prove invaluable to the gynaecologist as well as to the medical historian. There are no illustrations and no index of subject-matter, only an index of personal names—defects which might well be remedied in future editions.

DOUGLAS GUTHRIE.

FORENSIC MEDICINE

Lehrbuch der gerichtlichen Medizin. Edited by Professor Albert Ponsold. (Pp. 568; 169 figures; bound, M. 49 or $11.65.) Stuttgart: Georg Thieme. 1950.

This is a textbook of forensic medicine addressed to both the medical and legal professions, and the use of technical terms has accordingly been reduced to a minimum. It is a clear and straightforward presentation of current opinion and accepted procedures and covers much the same ground as the larger English works. The author has enlisted the help of no fewer than 16 collaborators—a sufficient indication of the specialized nature of the subject to-day.

Of the less technical articles two deserve special mention. The first is a 65-page treatise on medical ethics by Professor E. Schmidt, of Heidelberg. This is an able and comprehensive discussion of the doctor's obligations and reflects the true Hippocratic spirit. Although written with constant reference to German law, much of it is of general application. It demonstrates the doctor's need of both professional associations and defence societies. The second article is one on forensic psychiatry, by another Heidelberg professor, H. J. Rauch. This is full of good sense and equally well written. It shows the value of medico-legal societies in enabling doctors and lawyers to gain clearer conceptions of each other's functions and problems. How far societies of the various types mentioned exist in Germany is not clear.

The book deserves to be widely read in Germany; its appeal to foreigners will naturally be limited. It may help teachers of forensic medicine with the presentation of material; it may also be useful to those interested in German law, and such readers may be assisted by the excellent *Manual of German Law* recently published by H.M. Stationery Office for the Foreign Office.

RAYMOND WHITEHEAD.

DICTIONARY OF PSYCHO-ANALYSIS

Freud: Dictionary of Psycho-analysis. Edited by Nandor Fodor and Frank Gaynor. (Pp. 208. $3.75.) New York: Philosophical Library, Inc. 1950.

The editors of this dictionary were inspired to provide a glossary of psycho-analytical terms by quoting from the most unimpeachable source of information—namely, the writings of Freud. The only comparable publication is the *Glossary of Psycho-analytical Terms* published as a research supplement to the *International Journal of Psycho-analysis*, but this is mainly for the use of translators, for it contains few definitions and gives no references.

Valuable as the present volume may be for those who are already passing familiar with psycho-analytical theories, it does not fulfil the publisher's expectation that it will satisfy the needs of the general reader. Its defects are indeed manifest on the first page. "Abstinence—sexual" is dismissed with a reference to the distinction between abstinence from sexual activity in general and abstinence from heterosexual intercourse in particular. And the layman will scarcely be enlightened by the bald information that "Adaptability—cultural" is the personal capacity for transformation of egoistic impulses under the influence of the erotic impulses. On the same page "Aggression," a concept vital to psycho-analytical theory, is dealt with in three somewhat superficial and unsatisfying references. In the case of "Abasia," the definition proves to be a clinical reference to the unconscious symbolism of walking in cases of hysteria.

Obviously the success of such a venture depends on the judgment of the editors; and in this instance they have often done less than justice to the wealth of material at their disposal. The idea of the book is, however, an excellent one, and a second edition should be prepared as soon as possible in which much more copious and informative quotations are given and the date of each paper is inserted in the margin. As it stands, a mixture of undated citations is calculated to give the uninformed reader misleading impressions.

EDWARD GLOVER.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received.

La Psychologie des Tuberculeux. By Dr. M. Porot. (Pp. 211. 6.50 Swiss francs.) Neuchatel: Delachaux et Niestle. 1950.

Cirrosis Hepaticas. By Professor D. Rubio and others. (Pp. 313. No price.) Madrid: Sociedad Española de Patologia Digestiva y de la Nutricion. 1949.

Die Suprapubische Prostatektomie. By Professor T. Hryntschak. (Pp. 166. M. 24.) Vienna: Wilhelm Maudrich. 1951.

Diseases of Children's Eyes. By J. Hamilton Doggart, M.A., M.D., F.R.C.S. 2nd revised ed. (Pp. 304. 42s.) London: Henry Kimpton. 1950.

Traité de Médecine. Edited by Professor A. Lemierre and others. Vol. 9. (Pp. 853. 2,400 francs.) Paris: Masson. 1949.

Etudes Pratiques de Vectographie. By E. Donzelot and others. (Pp. 249. 2,800 francs.) Paris: L'Expansion Scientifique Française. 1950.

The Catholic Nurse. By B. D. Johnson, M.R.C.S., L.R.C.P., D.A. (Pp. 160. 6s.) London: Burns, Oates and Washbourne. 1950.

An Introduction to the Study of Viruses. By K. M. Smith, F.R.S. (Pp. 106. 10s. 6d.) London: Sir Isaac Pitman. 1950.

Hormone Assay. Edited by C. W. Emmens. (Pp 556. $10.) New York: Academic Press Inc. 1950.

Diseases of the Heart and Circulation. By P. Wood, O.B.E., M.D., F.R.C.P. (Pp. 589. 70s.) London: Eyre and Spottiswoode. 1950.

Surgeons Twoe and a Barber. By D. McDonald. (Pp. 295. 42s.) London: William Heinemann. 1950.

Anopheles and Malaria in the Near East. By H. S. Leeson, F.R.E.S., R.A.M.C., and others. (Pp. 223. 35s.) London: H. K. Lewis. 1950.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY DECEMBER 30 1950

PUBLIC HEALTH SALARIES

In the second half of 1948, when there was much discussion about the remuneration of consultants and of general practitioners, efforts were at the same time being made to improve the lot of those many medical men and women in the Public Health Service who were by professional standards being underpaid. Attempts were made to set up Whitley machinery to review the terms and conditions of service of doctors in the Public Health Service, and it seemed that this review was being blocked by the associations of local authorities, due no doubt to their fear of the repercussions on their other professional employees if the salaries of medical officers were brought into some sort of relationship to the remuneration of general practitioners and consultants recommended by the Spens Committees. When met in January, 1949, the Council of the B.M.A. decided to inform the Minister of Health of "the serious unrest and dissatisfaction among members of the Public Health Service occasioned by the continued delay in opening negotiations on the new scales and conditions of service." The Council also decided that, if by February 28, 1949, negotiations had not been started through Whitley machinery, advertisements from local authorities would not be accepted by the *British Medical Journal*. The *Lancet*, *Public Health*, and the *Medical Officer* agreed to take a similar line of action. As negotiations were not started, such refusal to accept advertisements came into operation. It was not until March 16, 1950, that both staff and management were able to avail themselves of the conciliation mechanism afforded by the Whitley Council Committee "C." The discussions continued over four months, and during this period agreement was reached on a number of important points. There remained over, however, a number of matters principally concerned with levels of remuneration on which there was a conflict of opinion between the management and the staff side. Fortunately, however, both agreed to submit those matters on which there was disagreement for arbitration before the Industrial Court set up in accordance with the provisions of the Industrial Courts Act, 1919. It is interesting to note that the case was presented to the Industrial Court by counsel for both sides, the management side having given a lead in this direction.

A table on the first page of this week's *Supplement* (which sets forth an abridged version of the Court's own summary of its award) shows for quick comparison the salaries on the Askwith scale in operation up to this moment, the adjustment claimed by those representing the staff, the offer made by the management side, and, fourthly, the award of the Court. For example, an assistant medical officer's present maximum is £935 a year; the staff claimed that the maximum should be increased to £1,680; the management offered a maximum for its higher grade of £1,100; the Court's maximum is £1,150. For a medical officer of health there was no maximum laid down in the Askwith scale, this depending on the discretion of the authority; the staff side claimed a highest maximum (that is, for a population of 600,000 or over) of £3,600; the management offered a maximum of between £2,400 and £3,000; the Court awarded a maximum (that is, for population of between 400,000 and 600,000) of £3,000. We understand that the offer made by the management side to the Industrial Court was higher than the offer it had been willing to discuss with the Whitley Committee.

It may be worth while drawing attention to some of the principal points of the award. First of all, those in the Public Health Service will be pleased with the decision of the Court that the application of the award should be national—that is, include Scotland as well as England and Wales. The management side wanted to introduce a number of grades of assistant medical officers and of senior medical officers, and it is particularly satisfactory that the Court has taken the staff view that such grades are undesirable and in its award does not allow for them. The Court has also accepted the staff contention that for part-time work medical officers of health should be remunerated on the basis of the Spens formula for consultants. The Court has also made an award of £100 a year to the medical officer of health who is employed by more than one authority. All the approximately 2,000 medical officers concerned in the award will go to the appropriate point in the new scale—that is to say, each officer will be placed at the point in the new scale which he would have reached had the scale been in force when he was appointed to his present post. In any negotiation no side can get all that it wants, and the staff side are disappointed that the awards to assistant medical officers and senior medical officers were not higher. The Court has referred back to the Whitley Committee the question of mixed appointments and also appointments held by deputy medical officers of health and divisional or area medical officers.

It was just a year and a half ago that the whole question of arbitration was keenly debated by the Annual Representative Meeting and subsequently discussed between the B.M.A. and the Ministry of Health and in the Committee Stage of the National Health Service (Amendment) Bill.[1] In the House of Commons Mr. Aneurin Bevan was supported by Mr. Walter Elliot, speaking for the Opposition, that arbitration should not be compulsory, and he approved of the Minister's suggestion to create a special section of the Industrial Court concerned with the National Health Service. Mr. Bevan made this statement: "If both sides agree to go to arbitration, obviously the Minister would accept the consequences."[2] He emphasized that if the Minister agreed to go to arbitration this involved acceptance of the results, though he added the rider that the House of Commons would always have the power to throw out any regulation the Government might issue in connexion with an award by the Court. Although the Minister is not directly involved in the present case, it is assumed that both the staff side and the management side—that is, both public health officers and local authorities—will accept the award, even though the award has no binding legal force. It would obviously be absurd for either party going voluntarily to arbitration to say in effect that it would accept the arbitration award if favourable to itself and reject it if it was unfavourable. The very fact of agreeing to go to arbitration implies acceptance of the arbitrator's decision. Although those representing the medical officers will feel disappointed over some of the decisions of the Court, nevertheless they must feel that they have made substantial gains. For the profession generally it is satisfactory to observe that the use of the conciliation machinery afforded by the Whitley Council has cleared up a number of points of difference between the staff and management and that voluntary resort to arbitration has, with the exceptions mentioned, resolved the deadlock.

[1] *British Medical Journal*, 1949, **1**, 762, 948.
[2] Ibid., 1949, **2**, 63, 145.

HAEMOLYTIC DISEASE OF THE NEWBORN

The discovery and application of a rational therapy for haemolytic disease of the newborn have followed a pattern set by earlier important advances in medicine. First the new knowledge became widely disseminated and utilized. Then ancillary but essential diagnostic and therapeutic discoveries were made and almost at once generally applied. At the same time other variations and refinements in treatment arose locally which were not universally accepted as improvements. It is probable that the diagnosis and treatment of haemolytic disease of the newborn in the larger towns of Great Britain and many other countries are now as efficient as present knowledge permits. There is still much room for improvement in areas without the facilities offered by an efficient blood-grouping laboratory, but at the main centres any dramatic improvement in treatment must await some further fundamental discovery such as might lead to effective antenatal prophylaxis or treatment. This does not mean that any one school is achieving the best possible results, for that could come only from the adoption of all possible improvements in technique, however small they might be. Such improvements can be discovered only by a statistical assessment of the results obtained by empirical variations in method. The total effect of many small improvements brought to light in this way might be substantial.

Thus, now, as after other basic medical discoveries, a time has come to pause for reflection. The stream of theoretical discoveries with a direct clinical application has slowed, so that any assessment now undertaken will not tend to be confused by the uneven application of major improvements in diagnosis and therapy. Every encouragement ought now to be given to the initiation of comparative studies and to the analysis and publication of records of the investigation and treatment of large numbers of cases.

The diagnosis of immunization by the Rh factor is a relatively simple matter, but the assessment of the prognosis for a given pregnancy is one of great difficulty, likely to cause anxiety not only in prospective parents but in pathologists and clinicians as well. The publication last year by Mollison and Cutbush[1] of an account of their investigation of the criteria of severity of the disease has placed this type of inquiry on a much firmer basis. Davidsohn[2] in a later paper covered part of the same ground and reached several of the same conclusions. Opinions differ about the prognostic value of maternal-serum examination, but there is general agreement that a high titre of incomplete anti-D indicates a poor prognosis. In rare cases, such as one described by Davidsohn, a rise in titre may occur in a previously immunized woman carrying an Rh-negative foetus. While the titre of antibody is thus less important as a guide to prognosis than the woman's previous obstetric history, the time of first appearance of antibody is probably of importance, since Murray and Taylor[3] conclude that the presence of antibody in the first four months of pregnancy indicates previous immunization. They consider that the presence of antibody throughout pregnancy is as unfavourable as a previous history of haemolytic disease. Other workers lay less stress on the importance of repeated antibody tests.

Mollison and Cutbush have shown that from the moment of birth much more definite conclusions can be reached. It is essential, however, that in every case

[1] *British Medical Journal*, 1949, **1**, 123.
[2] *Blood*, 1949, **3**, Suppl. **2**, 139.
[3] *J. Obstet. Gynaec. Brit. Emp.*, 1949, **56**, 741.
[4] *New Engl. J. Med.*, 1949, **241**, 799.
[5] Van Loghem, J. J. Personal communication, bringing up to date results exhibited at the International Society of Haematology, Cambridge, August, 1950
[6] *J. Obstet. Gynaec. Brit. Emp.*, 1947 **54** 281.

a specimen of cord blood should be carefully taken. Later examinations of capillary blood are, by comparison, almost useless. The most important test is the estimation of cord haemoglobin. Infants with less than 8 g. per 100 ml. are very likely to die within 24 hours of birth, while those with more than 14.5 g. will probably recover without treatment.

Antenatal testing of the mother and the testing of the child at birth are only preliminary steps to the important one of treating the affected child, and it is here that the assessment of the effects of differences in practice are of the greatest importance. The best method of assessment is by means of surveys planned in advance, but much can be learned from the analysis of existing records of hospitals which treat large numbers of cases. It is, however, almost useless to compare the results obtained in successive periods of time. The comparison must be between cases treated within the same period, and they should be studied by a clinician and a statistician who are both aware of the possible hidden fallacies of such a method. One of the most important of all institutions treating cases of haemolytic disease of the newborn is the Children's Medical Centre, Boston, where the pioneer work of Dr. L. K. Diamond and his colleagues has greatly influenced the treatment of this disease. Serious consideration must therefore be given to the observation of Allen, Diamond, and Watrous[4] that in a series of 179 cases of the disease all infants given exchange transfusions with female blood survived, compared with only 80% of those similarly treated with male blood. The number, 42, treated with female blood was somewhat small, but the result is nevertheless highly significant in the statistical sense. The authors themselves have analysed the data with very great care in order to detect possible statistical fallacies. The most important of the possible sources of error is the selection of blood with a high packed-cell volume for the more seriously affected children: such blood would more commonly be of male origin. Such selection had probably taken place, but a separate analysis of the more serious cases still showed a markedly significant superiority in female blood.

These findings, if confirmed, must be taken fully into consideration in planning treatment, but the difficulties of applying them are such that most clinicians will probably demand independent evidence, and especially will they require to see series of cases treated with statistical control applied at the time rather than afterwards. One such series has already been made known by Van Loghem and his colleagues,[5] who have given exchange transfusions with male blood to 151 infants and with female blood to 68 infants, the mortalities being respectively 17.2 and 16.2%, an insignificant difference.

If indeed female blood is eventually proved to have a specific therapeutic value, then it will be necessary for the National Blood Transfusion Service to supply selected female Rh-negative blood for all cases of haemolytic disease. This would be an immense and difficult task, requiring among other things a special increase in one part of the donor panel, which would take considerable time and effort to achieve. Therefore, until superiority of female blood is finally established, it should be reserved for use by clinicians who will co-operate fully in obtaining statistically analysable results.

Both in antenatal investigation and the treatment of established cases there are still many relatively minor details to be learnt, and all who have extensive and uniform series of cases ought to consider analysing and publishing them. It is still uncertain what are the chances of an Rh-negative woman married to an Rh-positive man becoming immunized by pregnancy. Boorman, Daley, and Dodd[6] have made a valuable contribution to this study, but the number of cases studied antenatally must be multiplied many times before an accurate estimate of the chances of immunization can be made for all possible combinations of ABO groups of both partners (which markedly influence the result), with both heterozygous and homozygous Rh-positive husbands.

When it comes to treatment the number of variables is so great that no single investigator can adequately cover them all. The best hope of reaching firm conclusions would appear to lie in co-operative researches such as the therapeutic trials at present being organized among a number of centres by the Blood Transfusion Research Unit at the British Postgraduate Medical School.

LOSS OF VISION

To Government Departments, economists, and sociologists a census of the population provides valuable knowledge about the country's needs for food, houses, and materials of all kinds. In a smaller way the register of blind persons is equally helpful—for instance, to the pensions department for estimating the cost of pensions for the blind; to the National Institute for the Blind, the county associations, and local authorities for arranging training and visiting and for estimating the staff required; and to ophthalmologists and sociologists for assessing the value of their work to the community and for determining the direction of future research. Under the aegis of the Medical Research Council Professor Arnold Sorsby has compiled a memorandum[1] on the causes of blindness in England and Wales which should prove a valuable document to those engaged in the care of the blind and the prevention of blindness. The report contains a mass of facts, and from these the author draws certain conclusions and makes some forecasts about the future. He refers once again to an old difficulty—the definition of blindness—and his sensible remarks about this will be read with special interest by those who are called on to complete the forms of certification.

In the chapter entitled "The Changing Background" Sorsby quotes figures endorsing his view that the almost total eradication of ophthalmia neonatorum as a cause of blindness is one of the outstanding medical advances of the present century. He points out that this was achieved, first, by preventive measures such as the Credé method of instilling silver nitrate into the eyes of newborn infants, secondly by legislation, notification, and systematic treatment, and finally by academic research which led to the use of the sulphonamides and penicillin. The reduction in blindness from phlyctenular ophthalmia in children is also shown in figures; the older generation of ophthalmologists well recognizes the great change in the incidence of this now rare disease resulting from better hygiene, better feeding, school medical inspection, and, not least, the removal of patients from the slums to the country. The value of vaccination is again shown by the smallpox figures: in a period up to 1814 "two-thirds of those who applied for relief" (at the Liverpool Institute) "had lost their sight by smallpox," but well before the end of the nineteenth century this disease had ceased to be a significant cause of blindness in England and Wales.

The form (B.D.8) for certification of a blind person divides the causes of blindness into five groups. In 1948 there were 77,390 registered blind persons in England and Wales, 7,586 of them having been admitted to the register in that year. An analysis of 17,430 certificates showed that 59.9% of the blind came into the first group, which includes congenital, hereditary, and developmental defects (9.9%), complications of myopia (10.8%), primary glaucoma (13.4%), and senile cataract (24.6%). Infectious and bacterial causes (12.3%) make up the second group, traumatic causes (1.6%) the third group, general diseases (11.6%) the fourth group, and diseases of unknown aetiology—such as optic atrophy, iridocyclitis, choroidal lesions—the last group (14.6%). When the cause of blindness is dissimilar in the two eyes trauma takes a much higher place, being the reason for loss of sight in nearly one-third of the cases in this category. In 5% the cause was sympathetic ophthalmia. Some 25,000 people are blinded from glaucoma, myopia, and the congenital anomalies. There is no reason to assume that this number can be reduced in the immediate future (except perhaps in the case of glaucoma, and that would require a perfect organization in the ophthalmic branch of the National Health Service). About 20,000 people are blind from cataract, but effective treatment could reduce this number by at least one-third. In the fairly recent past the infectious diseases were the cause of blindness in about 10,000 individuals. In the near future such a figure may seem as much a matter of past history as blindness from smallpox had become by the end of the last century. Professor Sorsby writes:

> "With full allowance for a continuing decline in the frequency of blindness from infectious diseases and for the possible elimination of a substantial proportion of blindness from cataract, an optimistic assessment would still leave well over 50,000 irremediably blind in the country. Since 'senile' causes of blindness are so prominent in any analysis of the blind population, the present shift towards an older population emphasizes that this estimate may well be too low."

Rehabilitation schemes have been of great benefit to the blind and also to the partially sighted. The Faculty of Ophthalmologists has given full support to the expansion of this work,[2] and it is evident that the Ministry of Health is working in the same direction, for under the National Assistance Act of 1948 power has been given to local authorities to establish observation registers of partially sighted persons and to allow them to use the welfare services to which the blind are entitled.[3] Prior to 1948 some voluntary associations were prepared to watch and help those who had serious defects of vision. Before a new name is added to the register of partially sighted persons certification by an ophthalmologist is necessary, and the new form of blind certificate will incorporate particulars relating to the partially sighted. The ophthalmologist will be asked to consider whether the applicant (though not blind) is substantially and permanently handicapped by defective vision due to congenital causes, illness, or injury. Such registers are now coming into use and are undoubtedly serving a useful purpose. The patient is seen by a home visitor, if possible within a fortnight of his registration, in his own home, and on her report the local authority generally decides what line to take. All the welfare services of the local authority are at the patient's disposal—such as instruction in Braille and handicrafts. In some cases a partially sighted person may be eligible for admission to convalescent or residential homes run by voluntary societies, and his industrial training may be undertaken by the Ministry of Labour under the Disabled Persons (Employment) Act, with the exception of those who are liable to become blind within two to four years. There is a certain amount of variation in the interpretation of the scheme and in the work of the rehabilitation officer: but the lot of the partially sighted is often most difficult to alleviate, and this provision by the State for their care is of great assistance. It is hoped that in the future its scope will be extended.

[1] *The Causes of Blindness in England and Wales*, 1950. London: H.M.S.O.
[2] Faculty of Ophthalmologists, First Annual Report, 1945-6, London.
[3] Ministry of Health Circular, 150/48.

ATYPICAL PNEUMONIA

The treatment of pneumonia with sulphonamides, which adequately control the common bacterial causes of this condition, threw into relief a group of ill-defined infections which failed to respond to such treatment. This group is now divisible into three categories: they are Q fever, due to *Rickettsia burneti* and only recently recognized as existing in this country, infection with one of the psittacosis group of viruses, and "primary atypical pneumonia," which is also a virus disease. Two papers in this issue give valuable accounts of these conditions. That by Professor C. H. Stuart-Harris traces the steps by which the last-named came to be recognized as a separate entity, and describes the features of a remarkable outbreak as well as the clinical picture of the disease itself. Professor S. P. Bedson precedes an account of the aetiology and laboratory diagnosis of all these forms of pneumonia by proposing that the term "primary atypical pneumonia" should be applied, if used at all, to all of them. Terminology is, of course, always difficult when aetiology is uncertain, as it inevitably is when such a case is first seen. Unfortunately there seem to be no clinical features by which any of these infections can be distinguished from the rest. Perhaps the term "atypical" or "non-bacterial" pneumonia would best describe the group and any aetiologically undiagnosed case. If the cause can be ascertained specific names already exist for the disease due to two of them, and it remains to find a satisfactory term for the third.

The test for cold agglutinin affords the criterion in diagnosing infections in the third category—"primary atypical pneumonia" in the narrow sense of the term—and fortunately this is an investigation which any laboratory can undertake. The serological tests for psittacosis and Q fever are much more specialized, and although the Public Health Laboratory Service will undertake them there is inevitably considerable delay before the answer is available. Probably the great majority of sporadic cases are never fully diagnosed: the best opportunity for studying such infections is when they occur in outbreaks. Fortunately all three groups respond to treatment with the newer antibiotics, and the time may come when such treatment will be found so generally successful that the niceties of laboratory diagnosis will be regarded as superfluous. Or will the universal employment of these drugs bring to light a form of non-bacterial pneumonia unresponsive to them, and thus presumably due to a hitherto unrecognized agent?

VASCULAR CHANGES IN GASTRIC ULCER

The blood supply of the stomach is of obvious importance in the study of acute and chronic gastric ulcers. The method of microradiography described by Mr. J. A. Key in this issue demonstrates clearly the well-known vascular block in the neighbourhood of a chronic ulcer. It is generally accepted that this change is probably secondary to the ulcer and increases with its chronicity, and it is easy to visualize a stage being reached when the ischaemic base of the ulcer could no longer either contract sufficiently or nourish the regenerating epithelium. Failure to heal is then not a result of the inadequacy of the physician or the neglect of the patient but of the ischaemia induced by the chronic ulceration. It is likely that such ulcers may persist for years, often with long periods of freedom from pain, yet remaining a constant menace to the patient. A clear conception of the ischaemic ulcer will be a help to the clinician when he has to treat a persistent ulcer and may encourage him to recommend operation.

The development of acute gastric ulcers appears to be related more to hyperaemia than to ischaemia. Key observed hypervascularity and local derangement of the blood vessels in acute ulcers, which supports the hypothesis that an acute vascular derangement close to the submucosa is the first change and that the breach in the mucosa is secondary. The nature of this vascular disturbance is not fully defined, but venous stasis appears to be a prominent feature. It is possible that these observations may link up with the studies of Davies and Longmuir[1] on the experimental production of acute ulcers in the isolated frog mucosa. They found that acute ulcers occurred when acid secretion was rapid and there was insufficient CO_2 to neutralize the alkalis formed concomitantly with acid in the oxyntic cells. The necrosis of cells was due not to the external action of acid but to the internal effect of the unneutralized and equally potent alkali. With dilatation of the small vessels and venous stasis the blood supply to the individual secreting cell might well be reduced and the requirement of the cells for the essential CO_2 might no longer be met. Ivy, Grossman, and Bachrach[2] state that all haemorrhages into the mucosae which have been directly observed, except those due to mechanical trauma, have been preceded by congestion of the mucosa. Haemorrhagic erosions have been produced by a certain concentration of intravenous caffeine sodium benzoate and histamine. Caffeine causes considerable capillary and venous engorgement at a time when histamine is stimulating secretion.[3] Wolf and Wolff[4] noted the development of acute haemorrhagic erosion when the exposed gastric fistula in their much discussed patient Tom became engorged and turgid. The factors which promote venous engorgement in the stomach may repay further study. Localized thrombosis of veins of the mucosa or submucosa has not been reported, and little is known about the contractability of the muscularis mucosae, which might conceivably occlude venous return. Partial occlusion has occurred with a sustained intragastric pressure of water of 10–20 cm., with resulting foci of haemorrhages and haemorrhagic erosions.[5]

TUBERCULOUS STUDENTS

The Tuberculosis and Diseases of the Chest Group Committee of the B.M.A. referred in its recent report to the special needs of students who contracted tuberculosis, suggesting that "the development of some scheme to enable the student to continue his studies and to have early rehabilitation while still under medical supervision would be of great value." In our correspondence columns this week the trustees of the British Student Tuberculosis Fund describe the plans which have been made to meet these needs and appeal for contributions towards the sum of £50,000 required to establish and equip a suitable centre. The committee of students responsible for carrying out the preliminary work collected much useful information abroad. "They manage these things better in France" seems to be as true of the treatment of students with tuberculosis as of the matters to which the phrase more commonly refers, and for reasons as little obvious. Besides the luxurious sanatorium of St. Hilaire de Touvet and three centres in the Black Forest, the French have institutions at Villiers-sur-Marne in Picardy, at Besançon in Burgundy, at Belledonne in the Isère Department, and three centres in Paris—in all a total of over 1,000 beds. In these centres students are treated in a university atmosphere and can to a large extent continue their studies while under medical care. The incidence of pulmonary tuberculosis in students is much higher in France, but the needs of the individual student in Britain are just as great, and there has been strong feeling that a scheme similar if simpler than the French might well be introduced here. Just before the war tentative approaches were made by the British Medical Students' Association to the Ministry of Health about the setting up of a sanatorium for students. But the great cost of a fully equipped sanatorium and the serious shortage of nurses put such a scheme out of the question.

Accordingly, when late in 1949 the British Medical Students' Association, the International Student Service, the National Union of Students, and the Scottish Union of Students formed a co-ordinating committee to consider what could be done for students with tuberculosis, it was agreed to aim at setting up not a full-scale sanatorium but a cross between that and what the French call a "post-cure," with the latter, as it were, dominant. In other words, what the committee wanted was a centre run in conjunction with a university to which a student could go as soon as his sputum was negative and he was well enough to get up for a few hours a day. In such a centre he would be encouraged to return to his course of study, but, if this should prove impossible owing to the practical nature of the course, he would at least have a chance of spending his time profitably in an academic atmosphere instead of vegetating in a hospital ward. The French experience shows the remarkable value of quite a small amount of teaching from visiting tutors supplemented by a good library and—less tangible but not less important—an atmosphere conducive to work. It is unfortunate that clinical medical students should be incapacitated by tuberculosis about five times as commonly as the general run of students, for, apart from engineers, it is the clinical medical student for whom the centre can offer least in the way of rehabilitation. Nevertheless, clinical medical students are just as anxious for the introduction of the centre as their less susceptible colleagues, for, after all, occupational therapy for a cobbler is not necessarily cobbling. During 1950 the co-ordinating committee, now augmented by representatives of the university medical officers and the various national organizations interested in tuberculosis, has investigated the different aspects—medical, organizational, educational, and financial—of setting up such an institution, drawing freely for advice from the "Fondation 'Sanatorium des Etudiants de France'" and from those who are in charge of sanatoria in this country. It is to be hoped that its work will have the success it deserves.

HERPES ZOSTER AND THE NEW ANTIBIOTICS

The newer antibiotics have proved of value in the treatment of various rickettsial diseases, of lymphogranuloma venereum, and atypical, so-called virus, pneumonia. These, however, are not typical virus diseases. Herpes zoster is an affection associated with the presence of a filterable virus. It runs a self-limited course, is not usually of much significance or severity, and clears to leave no serious sequel other than a few small scars. There is more than a suspicion that it may upon occasion be provoked by emotional disturbance. All these features will make the clinician cautious of any claims suggesting that a new therapeutic measure is effective in the treatment of this disease or is a specific remedy. Results must be carefully assessed against the yardstick of the natural history of zoster. Antihistaminic drugs were recently hailed as the appropriate treatment of zoster, and the present tendency is to claim first place for the newer antibiotics. It would seem quite certain that "aureomycin" and "chloromycetin" are in no sense a specific remedy either for herpes zoster or for herpes simplex. Good results have attended the treatment of several series of cases now reported—treatment generally conducted in hospital. The results are not, however, so good as to convince the impartial clinician that they are significant so far as zoster itself is concerned, and there is no laboratory evidence to suggest that these antibiotics have any specific effect upon the virus. Both herpes zoster and herpes simplex have been observed to arise and to spread in patients receiving these antibiotics for other reasons.[1 2]

Occasionally herpes zoster has serious complications. The lesion may involve a vital structure such as the eye; secondary infection may start gangrenous ulceration in the tissues affected; and there may be spread of infection to motor elements causing paralysis, or spread through the central nervous system giving rise to encephalitis. One troublesome complication is post-herpetic neuralgia, which is apt to arise within the distribution of the affected dorsal roots in elderly patients. If aureomycin or chloromycetin can be shown to control any of these complications it may have a place in treatment, especially in the elderly, provided there are no serious side-effects.

Finland and his colleagues[3] reported some success with aureomycin in a series of 24 cases of herpes zoster, but the results were not assessed against those which might have been obtained in a parallel series, untreated or treated by other means. Dawson and Simon[4] also reported good results with chloramphenicol in four relatively young patients, but no success in two cases of post-herpetic neuralgia. Most reports suggest that these antibiotics tend to prevent further spread both in herpes zoster and in herpes simplex infection,[5 6] and this may be by control of secondary infection or by some non-specific effect of the antibiotic on the tissues. There is not yet sufficient evidence that these drugs have any advantage over those already in use, but further controlled investigations are required before a firm answer is possible.

1 *Biochem. J.*, 1948, **42**, 621.
2 *Peptic Ulcer*, 1950, p. 194. Philadelphia.
3 Roth, J. A., and Ivy, A. C., *Gastroenterology*, 1944, **2**, 274.
4 *Human Gastric Function*, 1943, London.
5 Burgess, J. P., Scott, H. G., and Ivy, A. C., *Arch. Intern. Med.*, 1932, **49**, 439.

1 Rook, A. J., and Upjohn, C. C., *Lancet*, 1950, **1**, 835.
2 Schoenbach, E. B., *J. Mt Sinai Hosp.*, 1949, **16**, 71.
3 *New Engl. J. Med.*, 1949, **241**, 1037.
4 *Sth. med. J., Nashville*, 1949, **42**, 696.
5 Baer, R. L., and Miller, O. B., *J. Invest. Derm.*, 1949, **13**, 5.
6 Bereston, E. S., and Carliner, P. E., ibid., 1949, **13**, 13.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

BRONCHIECTASIS

BY

F. P. LEE LANDER, M.D., F.R.C.P.

Assistant Physician, Brompton and Royal Free Hospitals

The clinical picture of bronchiectasis detailed by Laennec was one of heavy infection existing in the walls of dilated bronchi and in the surrounding interstitial tissue. This was demonstrated at post-mortem examination. With modern techniques these dilated bronchi can be demonstrated in the living patient, and it is now known that dilated bronchi can exist without producing any respiratory disturbances at all. Such cases are referred to as "dry" or "uninfected" bronchiectasis.

Further studies have shown that the bronchial walls dilate and lengthen with each inspiration, and that they are not rigid tubes of unvarying calibre. Also, if any part of the intrathoracic contents shrinks, the bronchi dilate beyond their normal inspiratory size, this being part of the compensating mechanism. Should this shrinkage of the parts of the lung be temporary, then the bronchial dilatation may also be temporary.

If, as is often the case, the shrinkage of part of the lung is due to an infective cause, this infection will affect the dilated bronchi and the surrounding interstitial tissue, and produce secretions which will stagnate in the incompetent dilated bronchi. The intensity and the virulence of the infection vary, and may produce a very variable clinical picture. Of equal importance to the virulence of the infection are the number and the distribution of the affected bronchi.

Aetiology

The most common causes of bronchiectasis are the respiratory disorders of childhood. First and foremost is whooping-cough, followed very closely by measles, with its attendant bronchopneumonia. Primary lung tuberculosis in the child often leaves behind, in healing, an area of atelectasis and bronchiectasis. Bronchitis and asthma add their quota to the total. Inspired foreign bodies, which include debris from nasal and oral infections, contribute a small number of cases. The frequency with which tracheotomy scars are seen in the necks of adult sufferers suggests that in the past diphtheria claimed a few cases. In early adult life pulmonary tuberculosis begins to play a part in the causation of bronchiectasis, and as life advances this becomes more common. Finally, in middle and later life bronchial carcinoma produces a number of cases in which bronchiectasis is an unimportant part of a more devastating complaint.

Symptoms

As has already been stated, many cases are completely symptomless and are discovered accidentally. These require no treatment. Those persons, however, who seek advice because of disability due to infected bronchi give a very characteristic history. Their lives are chequered by one respiratory disease after another, starting in childhood with an attack of whooping-cough. Bronchitis, pneumonia, and pleurisy occur and recur, and in the intervals between they have chronic cough with copious purulent sputum. Occasional slight haemoptyses may occur. In many patients the cough and sputum disappear in the summer or during spells of dry weather. When the infection is more virulent, the child may show retarded growth, both physically and mentally. So much of the lung may be at fault that dyspnoea is a prominent feature.

As adult life is attained, a certain stability is reached and acute episodes become less frequent, without, however, any amelioration of cough and sputum. Dyspnoea becomes more pronounced as life progresses, and by the age of 40 it is the most distressing symptom. Occasionally haemoptyses occur of such a size that they may overshadow the other symptoms. In a few cases haemoptyses at infrequent intervals may be the only complaint. This point should be kept in mind when investigating and treating cases of haemoptyses. In the past, many patients have spent months in sanatoria on account of this symptom, which later has been shown to be due to dilatation of the bronchi and not to tuberculosis.

Signs

The signs of bronchiectasis may be as fugitive as those of pulmonary tuberculosis. There may be only an area of diminished breath sounds to suggest that emphysema is masking the deeper-lying dilated bronchi. In more marked cases, especially those of lobar distribution, dullness to percussion, with either absent breath sounds or loud bronchial breathing, is present. Numerous rales may be heard in the suspected area. Displacement of the heart to the affected side is present in unilateral cases. When the upper lobe is at fault deviation of the trachea to the side of the faulty lobe is found. Clubbing of the fingers is a variable finding, and in some cases may be very pronounced. Its presence seems to depend on the extent to which lung is involved rather than on the degree of dilatation or the intensity of infection. This is a generalization which has many exceptions.

Though bronchiectasis can occur in any part of the lung, lower-lobe disease is the most common. As the result of intensive investigation, involvement of isolated segments of the lung is being found more often. These questions of distribution of the disease are of great importance in planning treatment for the individual case.

Radiological Appearances

Bronchiectasis can be diagnosed with some degree of certainty from a plain radiograph of the chest. The ultimate diagnosis depends, however, on the display of dilated bronchi outlined by a radio-opaque oil.

The radiological changes suggesting the presence of bronchiectasis are of two main varieties: (1) atelectasis and (2) the compensatory mechanisms which attend collapse: localized emphysema, displacement of the mediastinum, and distortion of the diaphragm all point to a diagnosis of bronchiectasis (see Figs. 1 and 2). The dilated bronchi themselves throw no shadow. Occasionally dilated bronchioles and alveoli have a "soap-bubble" appearance.

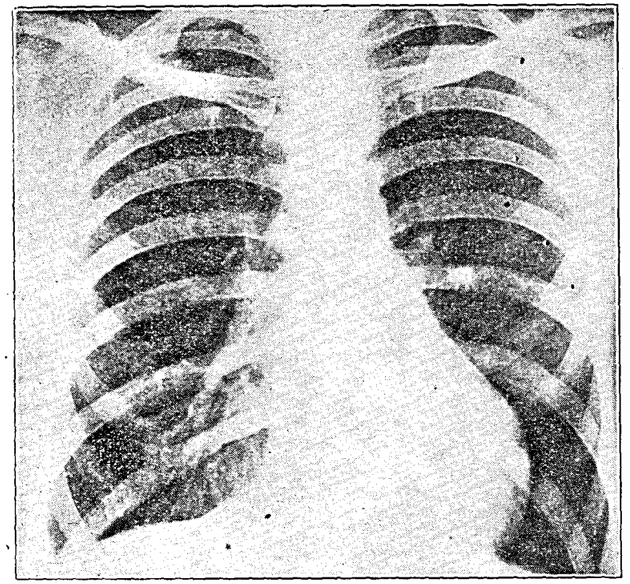


FIG. 1.—Radiograph of chest of a man aged 40 who attended on account of a small haemoptysis. The heart is displaced to the left, and there is a localized area of emphysema in the left costophrenic angle.

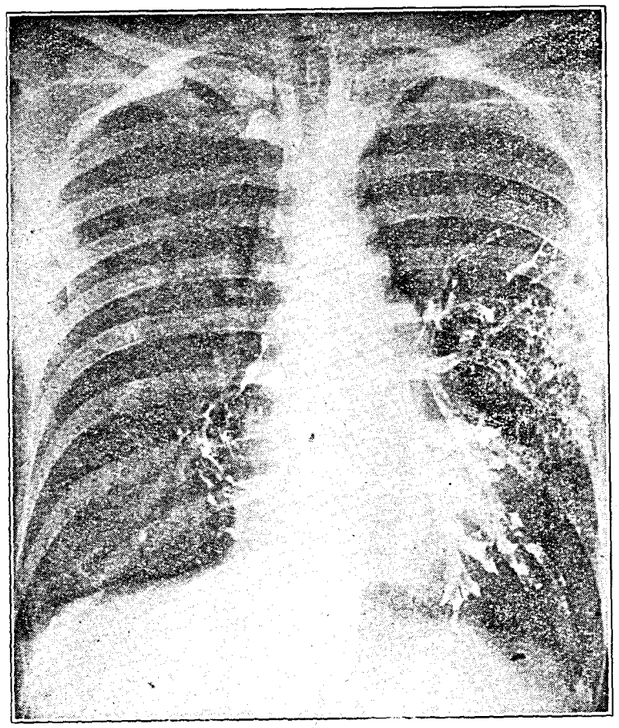


FIG. 2.—Bronchogram of the same patient as in Fig. 1. The diagnosis of bronchiectasis is confirmed.

Differential Diagnosis

It is of great importance when considering the diagnosis of bronchiectasis to look further and to try to determine the cause of the condition. Thus foreign bodies and neoplasm must be considered, and, if necessary, bronchoscopy must be performed to exclude these causes. A stricture with partial occlusion of a main bronchus must be considered because of the greater liability to recurrent infection in these cases. Recurrent bronchitis and unresolved pneumonia may mark an underlying bronchiectasis.

The diagnosis is made by outlining all the bronchi in both lungs with radio-opaque oil. This technique is complicated and time-consuming, and should be done only in a department used to the procedure.

Treatment

The treatment of bronchiectasis lies in the eradication of infection in the dilated bronchi. This can be accomplished by posturing the patient so that he empties his bronchi at frequent intervals, and by giving him the drug specific to the organisms found in his sputum. The posture to be adopted depends on the bronchi which are affected. If they are anterior to the bifurcation of the trachea the patient should lie on his back on a bed, with the foot raised 6 to 9 in. (15 to 23 cm.) from the ground. If the left lung is involved he should lie partly on his right side; if the right lung is affected he should lie partly on his left side. If the bronchi involved lie posterior to the bifurcation of the trachea the patient must lie on his face mainly on the unaffected side, again with the foot of the bed raised. This raising of the bed can be accomplished by putting the bar connecting the legs of the bed on a low chair.

At first, sleeping all night in this position is necessary; more drastic postures can be adopted during the day. These consist of hanging over the edge of the bed so that the chest is almost vertical, head down. Upper-lobe disease, of course, does not need these postures, as the patient is draining his bronchi in the normal upright position.

The best results are obtained if this posturing is combined with a course of penicillin injections. Half a million units of procaine penicillin intramuscularly for 14 days in those whose sputum contains a majority of penicillin-sensitive organisms may produce complete cessation of the sputum. In some the sputum continues, though with decreased bulk, owing to the persistence of Gram-negative organisms. In such cases a short course of streptomycin injections, 1 g. a day for five days, will help. If the original sputum examination shows a large number of Gram-negative organisms, then combined streptomycin and penicillin can be used.

Penicillin by inhalation does not give any better results than penicillin by intramuscular injection, but in a case with a large amount of purulent sputum and widespread disease both

methods can be used simultaneously. The inhalation can be given by means of a Collinson inhaler, but this method needs an oxygen cylinder; there are many portable "atomizers" on the market which are efficient, and many of them can be hired. The amount to be inhaled is about 5 ml., containing 100,000 units. The inhalations should be repeated three or four times a day.

The advances in surgical technique in recent years and the discovery of the sulphonamides and antibiotics have made lobectomy and pneumonectomy safe procedures. The mortality from these operations is probably less than the overall mortality from bronchiectasis. For this reason, many physicians and surgeons advocate operative treatment in all cases of bronchiectasis. This attitude is a lazy one, and ignores the possibility of giving an individual prognosis. All physicians must have seen patients with bronchiectasis who have lived long and useful lives in spite of their complaint. From the study of individual cases, by repeated examinations with radio-opaque oil, it can be shown that bronchiectasis is not always, or even often, a progressive disease. Whether the life of a bronchiectatic patient is worth living depends on the mental attitude of the sufferer, not on the presence of dilated bronchi.

If a patient is not prepared to practise postural drainage or to face the possibility of recurring infections necessitating a further course of penicillin injections, then the surgical removal of the affected lobes must be advised. Similarly, there are patients to whom the burden of their complaint is so overwhelming that surgery offers the best chance of a happy life. Lobectomy may be a life-saving procedure in certain cases—for example, in the case with recurring, ever-increasing haemoptyses, and also in the case of a virulent infection which is only partially or temporarily controlled by antibiotics.

Some patients suffer so severely from recurrent infections which, although controlled at the time by antibiotics, nevertheless disorganize their lives so much that they are unable to earn a living. Such a case is best treated by the surgical removal of the diseased areas. It is the physician's duty to consider whether a patient would best be treated by surgery. The practicability of operation is decided by the surgeon.

In cases in which all five lobes of the lung are involved, surgical removal of the disease is obviously impossible, but bilateral disease is not of itself a contraindication to operation. No patient should be advised to have a bronchiectatic area of lung removed until the full benefit of a course of postural drainage and penicillin treatment has been obtained. Nor should operation be advised for at least a year after the presence of the bronchiectatic lesion has been first demonstrated.

Complications

Chronic bronchitis is such a common complaint in the temperate zones that great care should be exercised in determining whether the symptoms present are not in fact due to this complaint rather than to the presence of a few dilated bronchi.

The occurrence of tuberculosis in cases of bronchiectasis is frequent enough to raise the question of whether the bronchiectasis may not have been tuberculosis from the start In some cases, however, there is no doubt that the bronchiectasis was present first, and that the tuberculous infection occurred at a later date. There is no evidence to suggest that a subject with bronchiectasis is more liable to develop pulmonary tuberculosis than a person with normal lungs.

Cerebral abscess is a complication which occurs in a number of the more severely infected cases. Its incidence has not been established, though figures as high as 15% were given when bronchiectasis was diagnosed only in the very severe cases—before the introduction of bronchography in 1922. Amyloid disease is so rare a complication that it may be said not to constitute a risk.

Repeated infections in the bronchiectatic area are really part of the natural history of the disease, and this complication is by far the most frequent and the most serious hazard.

Prognosis

The outlook for uninfected cases of bronchiectasis is good. Such patients are able to lead a useful, full-employed life, marry and have children, and live to a ripe old age. The danger of a second infection lurks in the background, but with modern antibiotics this complication is not as serious as it was in the past.

Where the infection is virulent, death may occur a few months after the onset, or during a succeeding lung infection, but here again modern therapy will probably control the infection and render the case suitable for surgery.

Where the disease is very widespread and beyond the scope of surgery the outlook is not so good, and if the infection cannot be controlled by antibiotics, then life is not likely to be prolonged. Cases of this severity, however, are rare.

During the first year of the disease it is always possible that re-expansion of the lung will occur, and infection die out; consequently, the bronchiectasis may also disappear.

Most mortality figures were established before the modern improvements in diagnosis, and all of them were produced before the introduction of modern therapy. At the best they cannot help in evaluating a particular patient's chances of survival.

HEBERDEN SOCIETY

The annual general meeting of the Heberden Society was held on December 8 and 9 at Westminster Hospital Medical School, with Dr. W. S. C. Copeman, the president, in the chair. The president for 1951, Sir Henry Cohen, was elected, with Lord Horder as president-elect. During the meeting it was announced that Professor E. C. Kendall had accepted an invitation to give the Heberden Oration for 1951.

The society was welcomed to the medical school by Sir Adolphe Abrahams, the dean, and the first session was devoted to addresses on the endocrine aspects of rheumatic disease by Professor E. C. Dodds and Dr. Peter Bishop.

I.—ENDOCRINE ASPECTS OF RHEUMATIC DISEASE

Professor E. C. DODDS said that he proposed to give a brief account of the physiology and biochemistry of the suprarenal glands. In their history there were two dates of principal concern: the first was 1563, when these very unobtrusive bodies were first discovered and were given the name of suprarenal capsules; and the other 1849, when Addison drew attention to the importance of the suprarenals in the disease that bears his name. His description was remarkably succinct:

> "The leading and characteristic features of the morbid state to which I would direct attention are anaemia, and general languor, and debility, a remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of colour of the skin occurring in connexion with a diseased condition of the suprarenal capsules."

Between those two dates, so far as the suprarenal glands were concerned, there was a complete blank in history.

In 1856 Brown-Séquard proved that in animals removal of the suprarenals was attended by symptoms similar to those of Addison's disease, followed always by death. This observation stimulated physiologists and biochemists to attempt the preparation of a suprarenal extract capable of keeping adrenalectomized animals alive. This was achieved in 1929, when Swingle and Pfiffner produced by a complicated process a stable product which they called "cortin." Cortin was standardized on adrenalectomized dogs and cats, and it was shown to be possible to keep the animals alive more or less indefinitely by its use. This work was followed by an intensive chemical investigation, but it was not until 1934 that Mason and Kendall, at the Mayo Clinic, isolated a crystalline material from the suprarenal cortex. It was then quickly shown that there were a large number of substances in the suprarenal cortex which had life-saving properties for the adrenalectomized animal, but which differed in certain biological characteristics. One type of substance had its effect mainly on the deposition of glycogen in the liver, and another primarily on electrolyte distribution.

Cortisone and its Analogues

Professor Dodds then gave a brief account of the chemistry of the steroids, to which group all these cortical substances belonged. In showing the formulae he said that they looked very complicated, and their synthesis was quite a task in itself; indeed, the total synthesis of these various substances had not yet been reached. One of the most important of the substances isolated from the adrenal cortex was corticosterone. This would maintain the life of the adrenalectomized animal, but mainly it acted on the glycogenic mechanism. In 1936 a substance was isolated by Kendall and his colleagues which was known as 17-hydroxy-11-dehydrocorticosterone; this was cortisone, which produced the extremely dramatic changes of which Dr Bishop would speak later. Cortisone was first prepared from ox suprarenals, but large-scale production by this method was out of the question, as the yield was so minute. On the other hand, the problem of total synthesis on any scale approaching the commercial was almost equally formidable. However, work on this was being undertaken in this country under the direction of Sir Robert Robinson.

All the cortisone made to-day was made from a derivative of the bile acids, by a synthesis worked out by Professor Reichstein. There were 30 stages in the synthesis, and this and the limited amount of bile acid available accounted for the relative shortage of the final product.

What were the prospects of producing an analogue? When the work on cortisone was first published everybody tried to find a substitute, and there had been high hopes—and still were—that a substance might be prepared which would bear the same relation to cortisone as stilboestrol bore to oestrone—namely, a cheap, simple substance which had the same biological action as the naturally occurring product but could be made easily. Up to the present there was no evidence that this could be done, but that might be simply because investigators were not working on the right lines. It was interesting to note that any molecular modification of cortisone (except substitution of an OH group at 11) was attended by complete loss of activity.

Finally, Professor Dodds referred to adrenocorticotropic hormone (A.C.T.H.), the preparation of which presented a less difficult problem. It was possible to collect pituitaries, obtain an extract from the anterior lobe, purify it, and produce A.C.T.H. economically.

Pituitary Control of the Suprarenal Cortex

Dr. P. M. F. BISHOP said that about a year ago he gave a talk to a group of rheumatologists and suggested that he need not apologize for trying to teach them the elements of endocrinology, because he imagined their ignorance of that subject was as great as his own of rheumatology. During the past year, however, the endocrine education of the rheumatologist had outstripped the rheumatological training of the endocrinologist, thanks largely to Professor Hans Selye's oration to the Heberden Society (*British Medical Journal*, 1950, **1**, 1362 and 1383), to Dr. Hench's more recent visit, and to many other events which had brought the two subjects closer together.

The pituitary secreted a number of hormones besides that which nourished the adrenal cortex. Professor Selye had indicated how the pituitary might be stimulated to produce adrenocorticotropic hormone in excess by the various stresses which could provoke the "alarm reaction."

The speaker then described Compounds E (cortisone) and F, which were secreted by the adrenal cortex, and the substances responsible for the excretion of 17-ketosteroids in the urine. There was also to be extracted from the adrenal cortex an amorphous fraction which had so far resisted crystallization, so that little was known about it from a chemical point of view. It was known to prolong life in adrenalectomized rats, and it was believed that it was actually secreted by the adrenal cortex itself. Furthermore, there was associated with the adrenal cortex, though not necessarily secreted by it, a factor which could be relatively easily synthesized and was available in the form of deoxycortone (D.C.A.), and was mainly concerned in mineral and water metabolism. This had the properties of causing retention of sodium chloride and water, regulating the circulating blood volume, increasing the excretion of potassium, and controlling the blood pressure, so that in Cushing's syndrome there was a tendency to a lowered serum potassium, and in Addison's disease hypotension with a raised serum potassium and weight loss.

In cases of adrenocortical over-activity, the clinical features might be either those of Cushing's syndrome or of the adrenogenital syndrome. Those were the two extremes, and a series of symptom-pictures lying between them might also occur. In the adrenogenital syndrome, for instance, some of the symptoms of Cushing's syndrome, such as hypertension, might be seen. In treating patients with A.C.T.H. there was a possibility of undesirable side-effects due to the over-activity of the adrenal cortex. Rounding of the face was characteristic of Cushing's syndrome and was probably related to an alteration of fat metabolism. Other side-effects were acne, hypertrichosis, amenorrhoea, hypochloraemic alkalosis, hypertension, and osteoporosis; the last was a rare effect, but had been described in a few cases. These side-effects might be seen with either A.C.T.H. or cortisone overdosage.

The relationship between the adrenal cortex and the adrenocorticotropic hormone was particularly interesting. Stress stimulated the pituitary so that there was excessive secretion of A.C.T.H., while at the same time there was diminished secretion of growth hormone, lactogenic hormone, and gonadotropic hormone. It had been suggested that the central receptors of stress impulses might be situated not in the pituitary itself but in the hypothalamus, whence the impulses might be transmitted to the pituitary.

Experiments had been undertaken to find out whether A.C.T.H. was the only stimulating factor to the adrenal cortex. It was well known that during stress the adrenal gland produced adrenaline, and there was no doubt from experimental work that adrenaline could stimulate the pituitary to produce excessive adrenocorticotropic hormone, so that the sympathetic nervous system might well play a part in promoting the secretion of A.C.T.H.

When the level of cortical hormones in the plasma rose the production of A.C.T.H. was inhibited. But in stress it was possible that, although the cortex was stimulated to produce its hormones in excess, the tissues were particularly receptive, so that the final amount of cortical hormones circulating in the blood stream would be less than normal, and would thus continue to provide a stimulus for the further production of A.C.T.H. It was possible, therefore, that in stress there were two other factors besides the direct stimulus to the pituitary—namely, the stimulus from adrenaline and the stimulus from the diminished circulation of cortical hormones in the blood.

Various clinical trials had been reported in which insulin had been used with cortisone, and it had been suggested that this would lower the dose of cortisone necessary. That work had not been confirmed, and indeed there were a good many contradictions about it.

Risks of Cortisone and A.C.T.H. in Tuberculosis

Dr. Bishop then discussed the effect of cortisone and A.C.T.H. on tuberculous lesions. One of the experimental observations had been that cortisone prevented the formation of granulation tissue, and thus it had seemed that cortisone might prove helpful in allowing anti-tuberculous chemotherapeutic agents better access to the tubercle bacilli. But in fact cortisone did not break down already formed granulation or connective tissue, and experiments with A.C.T.H. and *para*-aminosalicylic acid and streptomycin had shown that there was no real improvement effected by the addition of A.C.T.H. Quite apart from that, however, recent work by Hart and Rees at the National Institute for Medical Research had shown that in mice with experimentally produced chronic pulmonary tuberculosis the administration of cortisone had given rise to severe exacerbations of the disease and a high mortality. In mice, unlike the human, there was no fibrous-tissue reaction, and what was seen was probably due to a lymphocytic response or possibly to depression of mitosis in the tissues.

Was it wise, then, to treat cases of Addison's disease with cortisone? It seemed an obvious application, but if the disease was due to tuberculous involvement of the adrenals an old tuberculous lesion might easily be reactivated. It was certainly necessary to be sure that a patient was not suffering from tuberculosis before administering either cortisone or A.C.T.H., and with that word of warning he would leave the subject at the present moment.

A vote of thanks to the two speakers was proposed by Dr. W. S. C. Copeman.

II.—STUDIES IN RHEUMATIC DISEASE

The annual meeting was continued on December 9 at Westminster Hospital Medical School under the presidency of Dr. W. S. C. Copeman.

Psoriasis Arthropathica

Dr. F. FRANÇON, of France, gave a short communication on psoriasis arthropathica. This condition, he said, was not common, but every physician would meet with several cases in his practice. It appeared to be more common amongst women, though psoriasis itself was more common amongst men. Clinical manifestations fell into two groups: in the first the condition began insidiously, starting in the joints of the fingers, and was followed by anaemia, muscular wasting, and loss of weight; in the second group, which was the more frequent, there was some fever and an acuter arthritis, and either large or small joints might be affected. Both types tended to run a chronic course. During the acute phases a gradually increasing number of joints were affected, but between these acute phases there were remissions, sometimes lengthy. As remissions were spontaneous it was difficult to assess the value of therapeutic procedures, but he had found a certain value, as a routine treatment, in gold injections given intravenously. But the treatment must be under close supervision, and irritating ointments on the skin must be avoided while gold was given.

Biochemical Changes in Rheumatic Fever

Dr. JAMES REID described an attempt to discover the abnormal changes in acute rheumatic fever by simultaneous biochemical and clinical investigations during treatment with salicylates. The findings were briefly as follows: disappearance of the acute manifestations, such as fever, tachycardia, and acute arthritis, was associated with the transfer of water from the cells to the extracellular fluids, increase in nitrogen and potassium excretion, and retention of sodium and chloride. At this point the patient passed from the acute rheumatic to the convalescent phase, in which the principal features were weakness, fatigue, and high sedimentation rate. The transition from the convalescent phase to normal, indicated by a progressive fall in the sedimentation rate, was associated with the removal of the excess water from the body by diuresis, an increase in the excretion of sodium and chloride, and a diminution in nitrogen and potassium output.

The main clinical and biochemical changes resulting from the administration of A.C.T.H. and cortisone were the same in character as with salicylates. The suggestion of a common action was strengthened by the observation that, in addition to similarity of clinical and biochemical effects, the side-effects were also similar. Salicylates could produce a mild Cushing's syndrome, with swelling of the face and acne.

Splenectomy for Rheumatoid Arthritis

Dr. FRANCIS BACH reviewed a small series of patients treated some years ago by splenectomy, and also in more detail the laboratory and clinical investigations in a second group on whom this operation had been performed within the last two years. He suggested that the spleen should be considered as an endocrine organ, which possibly played a part in the mechanism of rheumatoid arthritis. He was not suggesting that the spleen should be removed in all cases of rheumatoid arthritis, but that the spleen and bone marrow should be studied. In the 'thirties various cases of Still's disease in which splenectomy had been performed were reported, and in 1938 splenectomy was done in three of his own patients who were suffering from active and advanced rheumatoid arthritis, and during the last two years another small group had been subjected to the operation. The clinical improvement following splenectomy had impressed him: In some of the cases the rheumatoid arthritis had remained, even over 12 years, relatively inactive. The "fire" had gone, and the patients were left with the "ashes." In no instance had there been a flare-up. He thought that his few results might well encourage some to study in more detail the relationship between the spleen, the adrenal cortex, and the bone marrow.

Familial Ankylosing Spondylitis

Dr. R. M. MASON described a family in which there were three established cases of ankylosing spondylitis, with clinical and radiological confirmation, also one suspected case, and in the father's ancestry two presumptive cases. The cases in the living family were in the father and two children, and in another daughter the condition was suspected. The father's maternal grandfather was reported to have had a disability which resembled that of ankylosing spondylitis, and so had one of his sons. The disease might have been transmitted through the mother of the present head of the family, though she herself was not affected. All the members of this family, however, lived under the same external environment in Cambridgeshire, and it was possible, though unlikely, that the environment contained the operative factor.

Several members cited experiences of this condition with possibly some familial character.

Psychological Factors

Dr. C. J. M. CLARK read a short paper on psychological factors in the assessment of rheumatoid therapy. He stressed the importance of such factors in influencing the nature and severity of the symptoms in rheumatoid arthritis, and suggested that this influence was affected by alteration in the intensity of pain appreciation, thereby modifying joint pain, tenderness, and range and performance tests. To eliminate these effects when evaluating new therapeutic substances in rheumatoid arthritis, he advocated the use of an inert control substance without the knowledge of either the patient or those in clinical charge of him; also the arrangement for a preliminary period of observation and assessment, and the simultaneous assessment of all available objective data, such as measurement of joint swelling, temperature observations, and laboratory tests.

In reply to questions Dr. Clark confessed that he by no means understood the mechanism of these psychological factors. Some patients improved although they had no faith in the therapeutic substance or placebo presented to them. Another point was the way in which the effect of the placebo wore off for no apparent reason. Yet another factor not easy to understand was the latent period before improvement occurred; also the reason why some patients responded to one type of placebo and not to others.

Nova et Vetera

AN EIGHTEENTH-CENTURY MEDICAL DIARIST

The Diary of Sylas Neville, 1767–1788. Edited by Basil Cozens-Hardy, D.L., M.A., F.S.A. (Pp. 357; *illustrated.* £1 1s.) London: Oxford University Press (Geoffrey Cumberlege).

Diarists achieve popularity by exploiting their own personalities in their strength and weakness, by describing the social life of an age that has disappeared, or by recounting great events which they have lived through, whether as participants or spectators. The diary of Sylas Neville comes into the first and second classes. It has a special interest for medical readers because the author entered Edinburgh University as a medical student at the age of 30 in the year 1771, and he took an M.D. degree there in 1775. When his journal opens, in 1767, he is living in lodgings in London. He is a violent Republican who looks back to the "glorious days of the Commonwealth" and celebrates January 30 as the day of the "deserved death of the tyrant Charles I" by dining on calf's head and drinking the health of the King's judges in champagne and claret. When he goes to the theatre to see Garrick as Richard III and is squeezed out of the crowded pit, he consoles himself by the thought that he would not have received much pleasure if he had "got in, as that calf-headed son of a whore, George III, was there." He is a devotee not only of the theatre but also of music and the arts, and he belies the common conception of the eighteenth-century Englishman by being a lover of natural beauty. Like those other diarists Pepys and Boswell, he is not blind to feminine beauty, but congratulates himself that "every connexion I have had with women of the town was accompanied with my earnest endeavours for their reformation." He is a great sermon-taster, ardently anti-Roman, and is most religious when the small circumstances of his life go awry through his own fault: "Something very disagreeable happened. I wish it may not be attended with any bad consequences. O Lord, strengthen me to put my trust in Thee." When things go well he is correspondingly grateful, as on the unexpected appearance of his lost luggage: "I return thanks to God for that mercy."

Studentship in Edinburgh

He set up an establishment at Scratby House, in Norfolk, but when his fortune ebbed (in one year he spent nearly four times his income) he disposed of his lease and went to Edinburgh to study physic. The intellectual life of Edinburgh, "the Athens of the North," was then at its zenith, and the university was as distinguished in medicine as it was in history and philosophy. He began by attending Alexander Monro's lectures on anatomy and Joseph Black's lectures on chemistry. The medical student of that day found his curriculum as full as it is in 1950: "It would take half a man's lifetime to read all he showed us to-day, and some of them are not worth reading as may be seen from the notes I took of the lecture. This study is begun. I wish to God it was finished!" A little later he records that Dr. Hutton told him that the more medical knowledge is acquired the more it is realized how little efficacious is the art of medicine, but the physician may do much good "by affording that satisfaction which attends the persuasion of being under the care of a skilful person."

Neville was a hypochondriac, and he availed himself fully of the expert opinion that surrounded him in Edinburgh. Having an inflamed eye, he consulted Professor Home concerning it one afternoon and then took advantage of Professor Monro's advice the same evening, reminding himself that "medical assistance gratis is one advantage the students have." He was sometimes aware of the cause of the disturbances of his somatic functions: "Very ill all yesterday with the pain in the stomach, headache, etc., which I attribute to vexation arising from a dispute with Russell [his mistress] last night." He must have hoped that his fellow members of the Medical Society would not be equally percipient, for, having heard that the society had imposed some fines for non-attendance, he wrote the following appeal in the Society's book: "'S.N.' appeals that his eyes continue so much affected that he is hardly able to go on with any business, and besides he has for two weeks past a return of the stomach complaints, to which he is exceedingly liable, and therefore hopes that the Society will sustain this as a sufficient excuse for his bad attendance." He frequently consulted the beloved and famous Professor of Medicine, William Cullen, concerning his indigestion, and when Cullen had finished a lecture on dyspepsia he turned to Neville and said, "Doctor, I wish I could cure your dyspepsia; I should think half a dozen lectures well bestowed!"

The diary gives a full description of his progress in Edinburgh—his friendships, his enmities, his dirty lodgings, his "vivas" conducted in the Latin tongue, his M.D. thesis in Latin on the *Prognostick in Fevers*, and his culminating honour of presidency of the Medical Society. His first communication to the Medical Society was a commentary on an Aphorism of Hippocrates which he read and defended on Christmas Eve, 1774, as he writes, "Much better than I expected, as it was the first time of my speaking at public business and in the Latin tongue. I thank God for this mercy." His second paper was on the "Use of Wine in Typhus," which he "recommended in the warmest manner." The diary contains much comment on medical education which is not irrelevant to-day. For example, William Cullen said to him that "it is a bad lecture that is delivered in language for printing; that it is too stiff and formal; that even the correcting an error in expression makes a greater impression on the hearers and affords an opportunity for illustration by comparing the two expressions." It would be a mistake to assume that it was in 1950 that serious attention was first given to the subject of medical pedagogy.

His Epitaph

From Edinburgh he went to London to the lectures of John Hunter, "an ill-natured, waspish creature." He then lived in Italy for three years, forgetting the theory of medicine and ignoring its practice, the while his financial embarrassment was steadily increasing. He settled in Norwich, hoping in half-hearted fashion that practice would come to him, but for obvious reasons it never did. He lived in Norwich till he died in his 100th year, spending some of his leisure in writing dishonest begging letters to wealthy noblemen, and, curiously enough, these letters were not entirely unproductive, for in the last forty years of his life he subsisted almost entirely on charity. His epitaph is written in a letter by Sarah Read, his illegitimate daughter, who achieved respectability as headmistress of a school in Hertfordshire. "I am much surprised," she writes, "that a man of Dr. Neville's abilities should have so greatly abused them throughout the whole course of a long life. . . . He possessed every blessing that the world can bestow, yet they were all lost in folly and inconsistency, looking after the things of this world which he never attained and entirely losing sight of a Blessed Eternity. . . . But he is gone to give up his awful account and it does not become me to censure."

For those interested in the medical history of the eighteenth century, the diaries of Sylas Neville have an especial value. Mr. Cozens-Hardy has edited them with scholarly care and put us greatly in his debt. Neville is not a Pepys or a Boswell, but his diary equals in interest that of Parson Woodforde. Mr. Cozens-Hardy states in his introduction that "limitation of space made it necessary to cut down the very full account of his five years as a medical student." Edinburgh medical graduates will not be alone in wishing to have the Edinburgh diary printed as Sylas Neville wrote it.

D. V. HUBBLE, M.D.

According to the annual report for 1949–50 of the Central Office of Information the cost of publicity for the campaign for immunization against diphtheria was about £30,000 for the year. A survey showed that about half the mothers of immunized children under 5 years old had been induced to get their children treated as a result of the propaganda. Deaths from diphtheria in England and Wales have shown a drop every year since 1941, when the publicity campaign started, and numbered 85 in 1949.

Reports of Societies

ROYAL SOCIETY OF MEDICINE

THE PRACTICE OF EXPERIMENTAL MEDICINE

Professor R. A. McCANCE, president of the Section of Experimental Medicine, gave his inaugural address on December 12. It was entitled "The Practice of Experimental Medicine," and in it the speaker discussed the moral, ethical, and legal aspects of experimental work on human beings.

This was a delicate matter which demanded the serious thought and consideration of all those interested in medicine to-day. Professor McCance pointed out that, although Claude Bernard's writings entitled him to be regarded as the "father" of experimental medicine, John Hunter, Jenner, and Harvey had been brilliant exponents of it long before his time. The speaker then went on to a definition of the word "experiment." This should always involve a change of conditions with subsequent observation of the results. In one sense the attempt to cure an individual patient might be regarded as an experiment if the results were observed and followed up, but for the present discussion he preferred to extend the definition of the term to include anything done to a patient which was not generally accepted as being for his direct therapeutic benefit or as contributing to the diagnosis of his disease.

The study of man must always take first place in any department of experimental medicine, although much of the work could often be done on animals. Species differences sometimes introduced difficulties, however, and one of the attributes that made for success in experimental medicine was the instinct which told the investigator when to check his results on a second species and, above all, when to turn from animals to man.

Experiments on Man

If one wished to make experiments on animals in this country one had to comply with the law and obtain a licence from the Home Office, and no one would wish to do otherwise. Human beings were the only mammals for which a vivisection licence was not required; but the use of one's fellow-creatures as experimental animals raised all kinds of issues which had never been seriously faced.

Professor McCance discussed the position as regards both patients in hospital and normal healthy people. The experiment might be one of commission, and consist of making some test on a person for which there was no obvious or immediate need. Equally, it might be one of omission and consist of withholding treatment from a "control." How much should be done without asking the person's permission? No experiment could be carried out on healthy persons without their co-operation and consent, but when a person came into hospital many investigations and tests were made as part of the hospital routine, and it was easy, without upsetting the patient in any way, to make other simple tests which, although they might help to define the effects of disease on function in general, might be of no direct benefit to the particular patient concerned. If an investigator decided to ask a patient's permission to make some investigation on him, he was at once up against the difficulty of explaining exactly to a patient the nature and object of his work. He could tell the patient only in very general terms what his experiment would involve, explain the nature of the risk (if there was any), and ask for his co-operation. The whole responsibility always lay with the investigator. The patient trusted the staff of the hospital, of which the investigator was one, and the investigator, knowing this, might dispense with the formality of asking for "permission" when his tests simply involved procedures which were commonplaces of clinical practice. He generally preferred to take the patient into his confidence over anything more elaborate, and this was where conscience and judgment became so important. Patients should be aware that at the best hospitals experimental work was carried out, not only for the advantage of the immediate sufferers but also for the benefit of mankind, and that they themselves owed incalculable advantages to work of this kind which had already been done on others. In actual fact patients rarely refused permission for investigations to be made on them, and many appreciated the extra attention which it involved. Opposition to experimental work was more likely to come from the physicians under whom the patients had been admitted, and from the nursing staff. There was one fundamental difference between the investigator and the physician. A good investigator must be interested primarily in his problem. The physician was concerned all the time with his patients. The physician was sometimes apt to be rather intolerant of the investigator, forgetting that the treatment he was prescribing was the result of experimental medicine, and that what he would have regarded as an unjustifiable experiment 20 years ago might have become one of his standard diagnostic or therapeutic procedures.

The basis of all successful experimentation was control of the conditions, and for much work in experimental medicine normal men and women were far more suitable than patients in hospital wards. In enlisting subjects, it was always a great help to have made the same experiment on oneself first and to be prepared if necessary to do so again. An experienced laboratory worker was probably the ideal experimental subject, though much useful work had been done with students, Service personnel, and also with groups of conscientious objectors during and just after the war.

Professor McCance concluded with the following words: "The medical profession has a responsibility not only for the care of the sick and for the prevention of disease but for the advancement of knowledge upon which both depend. This third responsibility can only be met by investigation and experiment, and from the nature of things it is always likely to remain the task of a few men and women specially gifted or trained for the purpose. Some of these people have in the past sacrificed considerable wealth for the mental satisfaction of their work. This may not have to be so in the future, but all such practitioners have a right to expect the fullest co-operation from their medical colleagues, from nurses and other assistants, from hospital managements, from patients and relatives, and from the community at large."

MANCHESTER MEDICAL SOCIETY

Dr. J. H. KELLGREN, in discussing pain as an aid to diagnosis before the Section of Odontology of the Manchester Medical Society, said that the study of experimentally produced pain in normal human subjects had led to the development of a useful vocabulary for describing the different pains of disease and injury.

The simplest description of pain was in terms of its distribution and time-intensity curve. Thus a needle pricking the skin produced a momentary pain felt at a point which could be located with considerable accuracy, while cardiac angina was a continuous steady pain felt widely within the chest and often spreading into the arm and jaw. There were three fundamentally different types of pain, subserved by different types of nerve fibre and accompanied by different reflex phenomena—namely, the aching-deep, the pricking-burning (first cutaneous), and the itching-stinging (second cutaneous) types.

Toothache

The teeth gave rise to only two forms of sensation—pressure and pain; thus behaving in this respect like all deep somatic tissues. Stimulation of carious teeth with an alternating current produced toothache of maximal intensity for a few minutes, the pain spreading widely in the face and head, with lacrimation and injection of the conjunctiva; later, the face felt stiff, and diffuse pain developed in the face and head. This was accompanied by deep tenderness of the muscles and periosteum and by cutaneous hyperalgesia, lasting for many hours, with abnormal sensitivity in the tooth to mechanical and electrical stimuli and to cooling. Anaesthesia of the sensitive tooth which was the source of pain invariably produced complete relief.

Pain, however, might be referred to the teeth from other structures such as the temporal and masseter muscles, or be due to irritation of the dental nerves somewhere along their courses to the brain. In these instances the tooth would probably not be so abnormally sensitive to stimuli, and anaesthetizing the tooth would have only a moderate and variable effect upon the pain. The temporomandibular joint may be another source of obscure pain felt deeply in the face, local analgesia of the joint helping to establish the source of pain.

The effect upon pain of alterations in the local circulation was also of interest; in the head the arteries were closely surrounded by pain nerves, and an abnormal amplitude of pulsation in the arterial tree caused severe pain as in migraine and the histamine headache. In these conditions arterial occlusion relieved the pain. Venous congestion might also have a marked effect upon pain in various conditions.

Correspondence

Thiouracil and Vertigo Epidemica

SIR,—Dr. C. Barrington Prowse in his paper (December 9, p. 1312) describes, under the heading of "a toxic effect of thiouracil hitherto undescribed," a complex of symptoms which rather suddenly appeared during the treatment of a case of thyrotoxicosis with thiouracil. The patient complained of difficulty in focusing her eyes; she had horizontal nystagmus, felt "light-headed," and stated that everything she looked at "seemed to be jumping about." After another four days she developed intense vertigo, and movements caused nausea and sickness. During the next three weeks she gradually improved.

I should like to draw your attention to the fact that the described illness in every regard is similar to cases observed and published in the Scandinavian countries under the heading of "vertigo epidemica" or "neurolabyrinthitis epidemica." Many observations of epidemic appearance of these symptoms—more or less prominent—have been made. The strong horizontal nystagmus was a characteristic phenomenon in the cases observed.

I suggest that the symptoms observed in Dr. Barrington Prowse's case have not been side-effects of thiouracil, but have been complicating vertigo epidemica or neurolabyrinthitis epidemica.—I am, etc.,

Bispebjerg Hospital, Copenhagen. E. MEULENGRACHT.

Tuberculosis as a Prescribed Disease

SIR,—In your annotation (December 9, p. 1321), referring to my dissension from a recommendation of the Industrial Injuries Advisory Council that tuberculosis may be presumed to have been contracted at work up to two years after employment ceased, you state:

"He also considers that there should be a definite minimum qualifying period of six months' employment (the council's recommendation is six weeks) before the presumption is permitted that the infection was a result of previous employment."

I fear you have confused two issues. The council's recommendation of six weeks (with which I am in agreement) is in respect of a person who enters the nursing profession and contracts the disease within the first six weeks of such entry, because the consensus of medical opinion is that the period of incubation is six weeks, and therefore if a person shows the disease within the first six weeks the odds are that she acquired it before starting nursing.

As the council's recommendation at present stands, however, a nurse who shows the disease only *after* giving up her work need have worked no minimum qualifying period whatsoever before being eligible for benefit. Consequently, to take the extreme, a woman might enter the profession and be attached to a T.B. sanatorium for one day only, and 23 months afterwards contract the disease. As she can prove that for the period of one day (or even, say, one week) she was in "close and frequent contact" she will get the benefit of presumption. This, to my mind, is taking matters too far, which is why I ventured to dissent, and suggested that in order to obtain the benefit of presumption a person must have been in the nursing profession for a minimum period of six months.

I am aware that it is open to the Ministry to rebut the evidence, but I am informed on the highest medical advice that rebuttal in the case of a person who can prove "close and frequent contact" would be extremely difficult. You will also appreciate that there is no quantum of time laid down in respect of "close and frequent contact."—I am, etc.,

London, S.W.1 T. A. E. LAYBORN.

Truth about Tuberculosis

SIR,—Please accept my thanks for the publicity you have given to the urgent need for a thorough overhaul of our tuberculosis service (e.g., December 16, p. 1373). For over 20 years I have tried to interest our profession in the idea that this disease of tuberculosis should and could be prevented and cured. We all know that many cases of tuberculosis do in time get cured by nature and not by any medical treatment, and yet no one has shown the profession and the public how it is done. I trust that you will force the Ministry of Health to inform the public what happens to all those persons who have had our sanatorium treatments. Let the public now be told the truth. Is it a fact that nearly 50% of all sanatorium patients have died from tuberculosis within five years of their admission? Do patients get admitted into our sanatoria when there is no chance of their either getting cured or having their disease permanently arrested?—I am, etc.,

Itchingfield, near Horsham. S. G. TIPPETT.

Tuberculosis and the Health Service

SIR,—When I read the headlines (taken from the Report of the Tuberculosis Group) in the *Birmingham Mail*, December 14, "Tuberculosis Provisions a 'National Scandal,' Sufferers Die Without a Chance in Life," and the headlines in the *Daily Mail*, December 15, "We Could End T.B. in a Generation, Doctor Points the Way," with the statement that "tuberculosis could be wiped out in a generation if there were more nurses, more beds, better after-care, more machines for mass radiography, and isolation of infected persons," I was shocked. Is there any truth? It was a relief to see your leader of December 16 (p. 1373), and, like many others, I wished that the following words from it had been given at least equal publicity: "Behind all the discontent and argument stand the facts that *the mortality from tuberculosis is decreasing rapidly*, that the number of new cases is increasing, that *the average age at the time of first infection with tubercle bacilli is rising*, and that *the expectancy of life of tuberculous persons is lengthening*."

If it were realized by the members of the general public that most of us have had tubercle and have recovered from it without knowledge or treatment, that the statements which I have italicized are true, and that the increased number of new cases has merely come from the application of more and more tests—i.e., mass radiography, etc.—they would be less scared by the propaganda of fear to which our tuberculosis experts are subjecting them. Cleveland has just completed its mass radiographic survey of 688,204 people with 23 *x*-ray units, to find that it has 27% less tuberculosis cases than was estimated—i.e., about the same percentage as we have; but it has its slums, as we have.

I have carefully read through the Report of the Tuberculosis Group. Is not the dominant note self-interest? Read these recommendations:

"A chest clinic serving, as recommended, a population of 200,000 would need an establishment of one consultant, two assistant physicians, and an appropriate staff of registrar grade. The lay staff would comprise one almoner, five health visitors and clinic nurses, and five clerks."

"A large full-time clinic for chest diseases (all kinds) established in a general hospital will require its own permanent and specially trained auxiliary staff."

"The medical officer of health should delegate the supervision of the work of these visitors to the physician for chest diseases." Why?

"A first class *x*-ray unit and provision for tomography is regarded as essential if the necessary quality and comparability of radiographs are to be maintained. The radiologist should be willing to leave the routine reporting to the chest physician." Naturally.

"Regular consultation sessions between sanatorium physicians, physicians concerned with clinic work, and other interested persons (especially thoracic surgeons) should become routine practice both in clinics and sanatoria." More and more sessions.

"Medical staff, especially in sanatoria, may have to be increased during the summer to allow for holidays."

"No medical officer should remain in mass radiography for less than one year or more than two." Why?

"The terms of service for chest physicians must, therefore, be the same as for other consultants."

Such are the modest terms for the chest physician. But what about his handmaids, the nurses? Are they to be upgraded? Let us see:

"... inclusion of tuberculosis in the general nursing curriculum and the regular secondment [surely enforcement is better English?] for three months of all student nurses from general hospitals to hospitals specializing in chest diseases."

"Voluntary secondment of trained staff for six or twelve months would also be most useful."

"Nurses in general training who present minimal lesions to be advised to accept temporary secondment to sanatorium nursing." (As it could be said that the majority of radiographs of nurses show some minimal lesions, what a power is to be given to the chest physician: he would never be in want as long as the general hospital had nurses. But I found a study of the case histories in the *Prophit Tuberculosis Survey* rather ominous in this respect.)

In the light of these recommendations I am fully in agreement with the final request of the Tuberculosis Group that "this comprehensive and forward-looking report should receive the attention it deserves." And, having disposed of it, we should endeavour to get our available slender resources devoted to bettering those things which we have proved are lowering fast the death rate: improvement in the housing of the people to a state which would permit the general practitioner to treat the patients in the best place—the home—and the provision of good, fresh, wholesome, nourishing, cheap food. For, as the Brookings Research Institution report recently stated, "Standard of living has more influence on health than has quantity of medical care." It has been my experience that increase in the number of staff leads not to a reduction, as one would expect, but to an increase in the number on the waiting-list. Every man and woman has something which the doctor could advise on or treat.—I am, etc.,

Birmingham. JAMES F. BRAILSFORD.

SIR,—It is indeed unfortunate that the Tuberculosis and Diseases of the Chest Group committee did not have as a member a director of a mass radiography unit. This would have prevented it coming to such dogmatic and misguided conclusions on the working of these units. Most chest physicians are already fully occupied and will not relish the descent upon them of large numbers of harassed patients waiting for diagnoses to be made on their radiographs. Following a miniature film, the patient will have been recalled to the unit for a large film and then referred to his general practitioner, who may, or may not, refer him to a chest clinic. This procedure may possibly occupy up to two weeks or more, especially in the case of a busy chest clinic working on an appointment system. All the time a patient is waiting to hear the result of his radiograph, and, having been recalled for a large film, he is undergoing a severe mental strain. To prolong this time unnecessarily is indeed cruel, and in the long run bad propaganda for the mass radiography service.

The medical director of a mass radiography unit should be competent to make a diagnosis on the majority of large films, and indeed his work will lose a lot of interest to him if he is not prepared to do so. Only three or four persons out of every 1,000 examined are found to have active tuberculosis. Most of the remaining cases of abnormalities come under the heading of minimal lesions or presumably inactive disease. These cases constitute the biggest difficulty in diagnosis. Where there is any doubt about activity radiologically, the patient should be seen by the medical director for a clinical examination, which should include the taking of a personal and family history, sputum examination, etc. He can then advise and, in many cases, allay the patient's worst fears. As a result of the examination it may be thought that the patient should be under observation, and his practitioner can be advised to refer him to the chest clinic at a later date for a further radiograph. To refer all cases of inactive disease immediately to the clinic is unnecessary, time-consuming to the patient, and additional work for the chest physician.

Whether a mass radiography unit should follow up cases with minimal lesions, rather than pass them on to the chest clinic, must depend very much on the area covered, as a patient cannot be expected to travel long distances to the unit when there is a chest clinic much nearer his home.

The committee does not give its reasons for suggesting that a medical officer should not remain in mass radiography for more than two years. At a recent conference of medical directors it was the general opinion that a career could be made in mass radiography and that the work did not become tedious. It must be remembered that a unit director has the unique experience of reporting on 1,000 chest *x*-ray films a week. Being medical director of a unit making 40,000 examinations a year is not a full-time occupation, provided he has the assistance of an efficient organizing secretary and can confine himself to clinical work and the general direction of the unit. The medical director should preferably also be in charge of a chest clinic serving a population of about 40,000, or, if this is impracticable, act as assistant at a larger clinic. It is quite wrong to think that his time-table "is so irregular as to prevent him fitting into a clinic time-table." Clinic work enables a medical director to keep abreast of modern trends in the prevention and treatment of tuberculosis, and also helps him to appreciate the difficulties of chest physicians to whom his cases are referred. Most mass radiography units serve the areas of several chest clinics and are likely to do so for some time to come. The unit should be in the charge of a medical officer who can co-operate with all the chest physicians concerned, and not under the direction of one of them.—I am, etc.,

Aylesford, near Maidstone. G. I. REES-JONES.

Dead Bodies in Water

SIR,—The correspondence you have received on this subject (December 16, p. 1389, and earlier) may appear to be of academic rather than practical interest, but I would draw your correspondents' attention to an article by a Special Correspondent in *The Times*, December 12, p. 5, entitled "High Speed Flying—Research into Stress and Strain on Pilots." Among other things the writer describes experiments carried out at the R.A.F. Institute of Aviation Medicine, Farnborough, on the design of a new life-jacket, and states: "... At Farnborough these jackets are tested in a water tank to discover, for example, the way in which an *unconscious man* will float, and—typical of the thoroughness of the institute—the subject is actually anaesthetized while in the water." The italics are mine.

It is true that the above experiment relates only to an unconscious man, but I suggest that the attitude assumed by a body of either sex in the water may be of importance for searching aircraft of the Air Sea Rescue Service. If the pilot of a spotting aircraft was able to judge, by some simple criterion, whether the body was male or female and alive or dead, then, especially in times of war, it would prevent other lives and craft being risked until such time as the corpse could be retrieved. Such knowledge may also assist a pilot in peacetime when searching an area in which several aircraft or ships are known to have foundered, or in flood disasters. In the latter case the point mentioned by Dr. Willoughby, whether the element in which the body is found is salt or fresh water, may be important.—I am, etc.,

London, E.7. J. A. COPPING.

Exercises in the Bath

SIR,—In answer to Sir Adolphe Abrahams's criticism (December 9, p. 1329) of my paper (November 18, p. 1153) I reply that the expression oxygen pulse is well known as expressing the amount of oxygen used per beat of the heart, in oxidizing waste products. The table showed that the total oxygen used in Togna's case was much greater in exercise in the air than in exercise in the bath. So, too, it was of course very much greater in the case of the famous marathon runner. A remarkable result was that Togna's oxygen pulse-rise equalled that of the marathon runner when doing most of his exercises in the bath. This I attribute to the fact that Togna by years of exercise in the bath has developed his muscles and lessened his adipose tissue to a great extent. The figures given in my table confirm those found by Professor G. P. Crowden. I emphasize the oxygen pulse-rise as expressing the efficiency of the circulation in removing waste products. If Sir Adolphe Abrahams had studied Togna's pamphlet, to which I apologize for not giving the reference, published by the Caxton Press, he would, I think, have not made an unmerited sneer at "effortless splashing about in warm water." He would have realized that the exercises are designed to bring every muscle into action, and self massage of the muscles and the skin in all parts, which result in an efficient oxidation everywhere, and this without undue effort or strain.

"The corpulent middle-aged and elderly" will not have "the psychical advantage of believing that they are even surpassing their more vigorous self-exhausting brethren," but will find great advantage to their health.

Dr. N. J. Ainsworth will also find the answer to his letter in Togna's pamphlet, and Togna, I know, would be glad to demonstrate his exercises to these critics.—I am, etc.,

Lowestoft. LEONARD HILL.

Congenital Deformities

SIR,—Having read with interest Dr. A. K. Duraiswami's article on "Insulin-induced Deformities in Chick Embryos" (October 28, p. 1002) it would be as well to point out that any application, even tentative, to congenital deformity in humans would be premature. His findings that insulin applied to the growing chick embryo during the organo-genetic period causes stunting of growth, associated at different periods with skeletal abnormality or generalized imperfect bone formation, with the suggestion that certain human abnormalities may be caused in a similar way, might lead to confusion of thought on this difficult subject.

Mr. Denis Browne's use of the word "foetus" (December 2, p. 1277) without qualification is misleading in this respect.

In a paper I gave recently I pointed out that certain deformities, including congenital pseudarthrosis and club-foot, can be accounted for by spatial impairment occurring at the 7th to 10th week of intrauterine life, a period when organo-genesis is ending and the foetus becomes rigid (i.e., capable of acting as a lever) and fills the uterine cavity for the first time.—I am, etc.,

Sheffield. G. C. GORDON.

Popliteal Ligation for Post-phlebitic Leg

SIR,—Division of the superficial femoral vein in Scarpa's triangle having proved of but temporary value, the protagonists of this principle, nothing daunted, have transferred their attentions to the lower end of the main deep venous trunk. It is perhaps an advantage that they have slid down the venous banister at one fell swoop and not stopped at the various landings in Hunter's canal, for at least when this method has proved itself a failure they can go no further.

As I understand Mr. A. J. Walker's recent paper (December 9, p. 1307), his thesis is that when the main deep venous channel of the lower limb is incompetent, following recanalization of a thrombotic process, it is useless in the erect posture and should be divided, the limb blood returning to the heart via a collateral deep circulation. Surely it is to be expected that as the collateral veins slowly open up to accommodate the increased flow their valves will cease to meet in the midline and they too will become incompetent. In the course of time (follow-up time), we shall be left without any competent deep veins in the lower limb, in contradistinction to the original condition, when at least we had a certain proportion.

No doubt it will be argued that the incompetent superficial femoral vein is of no value at all and therefore its removal from the circulation can do no harm. I submit that this argument is based on false premises, for, even if we admit (and it has yet to be proved) that in the erect posture the flow within it is retrograde and the collateral veins are bearing the brunt, this is not so at night, for during recumbency the incompetent vein can act like any hollow tube and pass blood centripetally to the heart, thus relieving the strain on the collateral veins; following popliteal ligation the collateral veins have no such respite. It must be remembered that the average person spends at least one-third of his life in bed.

Of the 27 legs Mr. Walker lists as having been followed up, 23 still showed oedema. As oedema is the main cause of gravitational ulceration, it is to be expected that the hopes expressed for an eventual happy result will remain unfulfilled.

Finally, Sir, the most adequate commentary upon the success of this procedure is provided by the patients themselves, for it is noted that out of the 26 patients followed up only 11 thought they had benefited. It would be interesting to learn whether these 11 patients are at the 3-month or 15-month end of the follow-up table.—I am, etc.,

London, W.1. STANLEY RIVLIN.

Heredity and Leg Ulcers

SIR,—With regard to the most interesting article by Dr. S. T. Anning (December 9, p. 1305), I note that in his group of cases he states that "the presence of a familial tendency to ulceration is usually associated with the inheritance of varicose veins." I am wondering whether he has also noted something which has always intrigued me, and that is that so frequently the same type of varix is transmitted from parent to child. For example, "athletic veins" may be transmitted, and, in cases where the main saphenous vein appears to be normal, "hair veins" only will be seen in successive generations. Furthermore, one frequently sees a similar pattern in the arrangement of the varices in both mother and child.

I do not know whether this observation has been noted elsewhere, but there is no doubt that in a varicose clinic this further remarkable facet of heredity may be observed.—I am, etc.,

London, W.1. R. ROWDEN FOOTE.

Transmission of Kala-azar

SIR,—Two letters (November 4, 1060; December 9, p. 1333) have appeared recently in the *Journal* claiming that the "sandfly theory" has been exploded, and expressing great concern that the textbooks should no longer deceive their readers by statements that kala-azar is transmitted by sandflies but should confine themselves to facts. This opens up a big question: what exactly is a fact?

There is a story—which I feel sure must be a classic but which I only heard in a sponsored broadcast in the United States—of a British professor of medicine (or of some medical subject) who concluded his course of lectures with the remark, "Gentlemen, probably half that I have told you in the course of these lectures is untrue; unfortunately, I don't know which half," or words to that effect.

The fact that kala-azar is transmitted from man to man by the agency of sandflies of several species is as established a fact as the majority of statements that appear in textbooks. It is the opinion of an overwhelming majority of those qualified by experience to express an opinion on this subject, and no arm-chair criticisms by scientists, or others, who have had no practical experience of kala-azar, or of the other leishmaniases, is likely to upset a theory based on the work of scores of research workers in many countries over a period of many years.

The critics complain that those in a position to do so have not attempted to answer their criticisms. This is not very surprising. No new facts have been brought to light, and, although some of the criticisms point out genuine gaps in the story of the transmission of kala-azar by sandflies, we (if I may include myself among those who helped to build up the sandfly theory) are fully aware of these and hope that our successors in this field will attempt to fill them. Other criticisms are based on false premises and yet others are merely silly. Many of the founders of the sandfly theory have left that particular field, are now otherwise busily engaged, and are not unnaturally unwilling to engage in a battle of words

I will not embarrass you by answering their numerous criticisms point by point, as this would occupy many pages of your valuable

journal, but perhaps, Sir, you will allow me space to make one comment by way of justification on each of the types of criticism specified above.

It is of course obvious that sandflies do not feed on raisins in nature. The fact, however, that they readily feed on raisins in the laboratory indicates that they are not pure blood feeders, as was at one time supposed. In the wild state they have a wide choice from the juices of fruits and latices of plants. The nature of their choice might explain some of the apparent anomalies in the distribution of kala-azar.

There is no justification for the statement that the sandfly *Phlebotomus argentipes* lives only five days in nature, just because in one particular experiment survival for longer than five days could not be demonstrated. In the laboratory they will live for several weeks under conditions of temperature and humidity which they could enjoy in nature in the endemic areas, at least for several months in the year.

The suggestion that throughout the whole of the monsoon months sandflies could never find a dry enough spot to "bite" on the skin of man is merely silly.

Although the late Dr. Clifford Dobell never, as far as I remember, took any active part in the investigation of this particular problem, one would naturally respect his opinion. It is therefore a great pity that the contents of his letter were not made public earlier in order that one might have ascertained which were the particular criticisms that he considered valid, and also possibly why he chose this indirect method of expressing his disapproval of the sandfly theory.—I am, etc.,

Journal of Tropical Medicine and Hygiene. L. EVERARD NAPIER.

Modified Caesarean Section

SIR,—Dr. John P. Erskine may have raised a very valid criticism (December 9, p. 1335) of a T-shaped incision in the lower uterine segment for caesarean section, although I have never seen it used nor heard of its being employed until now. A few years ago I saw a "silent" uterine rupture in a patient who had had a previous classical and a previous lower-segment caesarean section. The resulting T-shaped scar had given way at the juncture of the two incisions, and the intact membranes were bulging through. The rupture was discovered in the course of an elective repeat caesarean section, performed after labour had just started. As the result of this case, I wondered if it were a wise procedure to perform a lower-segment section where there had been a previous low classical operation, unless the lower-segment incision could be placed well below the lower end of the vertical one. There may be a similar danger in a T-shaped incision in the lower segment. At any rate, I consider that it is safer to gain further access by turning up the ends of the transverse lower-segment incision—that is, by making it U-shaped.—I am, etc.,

Manchester. T. F. REDMAN.

Orf in Man

SIR,—I was interested in the letter from Dr. A. K. Rankine about orf in man (December 2, p. 1279). I have seen a few of these cases in my time, and always associated with sheep. Might not these cases be due to sheep pox? The loculated pearly blister is a little suggestive.—I am, etc.,

Kirriemuir. R. D. CAMPBELL.

Hexamethonium in Hypertension

SIR,—With reference to the use of hexamethonium bromide in the treatment of hypertension (A. Campbell and E. Robertson, October 7, p. 804), I would like to record a case of severe hypertension in a girl who received quite large doses of penta- and hexamethonium bromide without any significant change in her blood pressure.

She was 16 years old, height 65 in. (163 cm.), weight 117 lb. (53 kg.), and found to have a blood pressure of 210/140 mm. Hg at routine examination.

Special tests revealed no apparent cause for her hypertension. Renal function was good, her fundi normal, and urine examination revealed no red cells or casts. Renal radiographs showed very slight dilatation of her right renal pelvis. Radiograph of her heart and E.C.G. were normal.

A screening test was performed with 17 mg. of compound 933F intravenously to exclude a phaeochromocytoma. This produced a sharp rise in blood pressure, a so-called negative response.

After three days' rest with barbiturate sedation the blood pressure settled down to an average level of 200/140 mm. Hg.

Pentamethonium bromide was commenced in doses of 25 mg. intramuscularly 8-hourly, and rapidly increased to 100 mg. 8-hourly as the blood pressure did not fall. Readings such as 180/140 (lying), 160/125 (sleeping), and 180/150 (standing) were representative. For several more days, during which mydriasis was noted, the dose was increased to 150 and then 200 mg. 8-hourly with no effect.

At this stage 75 mg. was given intravenously. The lowest reading following this was 180/135 mm. Hg.

Injections were abandoned and 750 mg. of hexamethonium bromide was given 6-hourly as tablets: again with no response. Increasing the dose to 1 g. and then 2 g. four times a day gave readings such as 220/150 (lying), 180/125 (sleeping), 185/150 (standing).

The trial ended at a dosage of 2.5 g. 6-hourly with the patient complaining of some nausea and inability to focus. The patient was not questioned about constipation. She has now been referred for further investigation with a view to sympathectomy.

This case seemed ideal for a trial of these ganglionic blocking agents, as vascular degeneration had not yet appeared. Although I cannot offer an explanation for this failure I hope to have the opportunity for further trial of what appear very promising drugs.—I am, etc.,

Sydney, Australia. ZELMAN FREEMAN.

Red Cell Stippling in Poisoning

SIR,—I should like to draw attention to the fact that substances which belong to the same chemical group of heavy metals have a similar action on red blood corpuscles, or, more precisely, that bone marrow made anoxaemic by poisons of a certain chemical group shows similar biological response. This may not seem surprising, but I could not find any reference to the fact that basophil stippling of red blood corpuscles can occur alike in chronic lead, bismuth, and mercury poisoning.

It is a well-known fact that the blood picture of patients suffering from chronic lead poisoning shows a secondary anaemia and punctate basophilia or stippling. I took the opportunity of examining the blood of patients who had received comparatively large doses of bismuth or mercury by injections or as ointment, as used in antisyphilitic treatment in the days before penicillin. These patients showed no sign of bismuth or mercury poisoning, but, just as in lead poisoning, supravital staining with brilliant cresyl revealed basophil stippling of the red blood cells.—I am, etc.,

London, W.9. W. GROSS.

Emotions and the Skin

SIR,—The interesting findings of two American authors to which you refer in your annotation (December 9, p. 1322), though running counter, as you say, to prevailing clinical opinion, are very much in agreement with now fairly generally accepted views on psycho-dynamics. While it may be difficult to distinguish between hostility and resentment, one cannot fail to see that language has coined quite a number of words, all expressing some sort of enmity, but by no means of identical meaning. The slightly different shades to which they appear to give expression correspond with the chiaroscuro in the texture of the hostile sentiment, which in its emotional organization quite naturally shows infinite varieties. There is, I think, unanimity regarding the part sublimation plays in the process of sentiment formation. Though sublimation is not necessarily preceded by repression, there can be no sublimation without inhibition of primitive instinctual drives, and whether a healthy sentiment emerges or a morbid complex would very much depend on circumstances. In conditions of illness, whether purely mental or associated with physical disease, one invariably finds inhibitory factors of a high degree of intensity, the elimination of which alone quite frequently removes symptoms. The absence, therefore, of aggressive fantasies during a period in which urticaria is present would not indicate the absence but the inhibition or repression of aggressive sentiments. If repressed, hostility is "not felt" and "there is nothing the patient can do." Nothing, indeed, but develop urticaria (or neurosis) from emotional constipation. And the cure depends on the purgatory effect of emotional discharge.

The results which Drs. Shorvon, Rook, and Wilkinson (December 9, p. 1300) obtained through "abreaction" methods would appear to be to some degree only in agreement with these views. But it should be noticed that the authors, though emphasizing that their method works through the release of pent-up emotions originating in traumatic experiences, also say that it is not necessary to "abreact specific incidents accurately." This would confirm the view that the curative effect lies in a "general release of tension and aggression." The histories of the five cases published would appear to support this. They make it also quite clear that treatment has "of course" to be supplemented by other psychotherapeutic measures, including social readjustment.

Though the use of drugs may present an improvement on the original Breuer–Freud technique, producing a semi-hypnotic state, which I have been practising in suitable cases ever since the Swiss psychiatrist Ludwig Frank revived it in 1913, it should be remembered that, unless it has been made part only of a psychotherapeutic plan, abreaction has generally been found unsatisfactory.

On the other hand, the beneficial effect of the release of inhibited affect may have been underestimated in the past. It is certainly not incidental that the rediscovery of cure by "disinhibition" and excitation was made in America, where Andrew Salter (*Conditioned Reflex Therapy*, Creative Age Press, N.Y.) claims to achieve miraculous cures of practically all neuroses by the "reconditioning" of inhibited emotions. His method is simple enough and could be employed by any practitioner interested in psychotherapy and not put off by Salter's "disinhibited" view that psycho-analysis "should go out in the jungle and die." Strangely, his conditioned-reflex therapy does not at all clash with analytical methods, so long as they are "active." In fact, child analysts, romping with their little patients and allowing themselves not only to be loved but also to be kicked in the transference situation, have long been using similar methods.

The theoretical foundation of the conditioned-reflex therapy, based as it is on Pavlov and behaviourism, is over-simplified, but it has the advantage of being expressed in physiological terms, the desirability of which is stressed, Sir, in the last sentence of your annotation.

Whether "feeling-talk" works equally well in this country remains to be seen. Anyway, I have made use of it in a few suitable cases and must say it refreshed not only the patient but myself as well.—I am, etc.,

London, N.W.11. B. C. SAALER.

Survival on Less than One Kidney

SIR,—In the *British Medical Journal* of August 26, 1939 (p. 445), I reported the case of a woman of 39 in whom the whole of the left kidney and nearly 30% of the right one were removed for calculus and sepsis. It is interesting to report that the patient, now 52 years of age, is in perfect health and has just completed a strenuous motor tour of Europe. She places no restrictions on her solid or liquid diet, and there is no infection in the urine or symptoms of ill-health of any kind. The blood pressure, which was 164/90 mm. Hg at the time of the operation, remains on the high side. She is short of veins and not anxious to have pyelograms, but the plain shadow of the right kidney is large and circular. As observations on the effect of removal of more than 50% of the total kidney substance are uncommon, this annotation to my original article of 1939 may be of interest.—I am, etc.,

Johannesburg. R. CAMPBELL BEGG.

B.M.A. Policy

SIR,—I write to congratulate Dr. R. Prosper Liston on his letter (December 16, p. 1389). All that he says is only too true, and it is essential that the B.M.A. should produce, without further delay, a plain simple statement of constructive character, to make known to the Minister and to the public the necessary alterations to produce a satisfactory Health Service.

Recent Guild meetings in this area have emphasized the fact that most doctors are chiefly interested in improving the existing Health Service, rather than in demands for larger capitation rates, and it is imperative that the B.M.A. should produce a positive policy to improve the Health Service. Only this, I think, will unite all branches of the medical profession.—I am, etc.,

Stonehouse, Glos. W. G. MURRAY-BROWNE.

British Student Tuberculosis Fund

SIR,—Though such centres are well known abroad and though the need for such a centre has recently received recognition in the B.M.A. Report on Tuberculosis, there exists in this country no particular institution in which students with tuberculosis can receive medical treatment while continuing their studies. The British Co-ordinating Committee for Student Health, which represents the British Medical Students' Association, the International Student Service, the National Union of Students, the Scottish Union of Students, the British Tuberculosis Association, the Joint Tuberculosis Council, the National Association for the Prevention of Tuberculosis, the Tuberculosis Group Committee of the B.M.A., the Association of University Teachers, the Association of Principals of Technical Institutions, and the Associations of Teachers in Colleges and Departments of Education, is organizing a Trust Fund with the primary object of establishing such a centre, and the committee would, through the courtesy of your columns, like to invite donations, large and small, to this fund.

It is quite impossible at the present moment to set up a full-scale sanatorium treating students in all stages of tuberculosis. It is intended that the centre now proposed should cater for students already sufficiently recovered to be able to take advantage of the educational facilities that it is part of the scheme to provide. It is at this stage that occupational therapy—and for a student his education is occupational therapy—is of most help; it is at this stage that the present inability to continue his studies is most disheartening to the student, and, most conveniently, it is at this stage that the demand for skilled nursing is least. Even from the point of view of the treatment of tuberculosis in the non-student population, the centre is likely to prove an asset, since the transfer of students to the centre from sanatoria would lead to the earlier freeing of sanatorium beds.

The arguments for setting up a centre especially for students do not apply exclusively to those usually called "students," and for this reason it is intended to make the centre available to senior as well as junior members of universities and other institutes of higher education, to research students as well as undergraduates, to university and college teachers as well as those *in statu pupillari*.

Any donations to the fund should be sent to one of us, c/o British Student Tuberculosis Fund, Tavistock House South, Tavistock Square, London, W.C.1. Cheques should be made payable to the British Student Tuberculosis Fund.—We are, etc.,

F. R. G. HEAP.
C. R. MORRIS.
ALAN F. ROOK.

London, W.C.1.

POINTS FROM LETTERS

Haematemesis from Leeches

Dr. W. L. FERNANDO (Kandy, Ceylon) writes: There is a very simple method I employ to remove leeches, which are very common in this district in Ceylon. Touch the leech with a piece of common salt or pour a little salt water into the nose (if there): the leech falls out like a ball. Some people use the skin of a lime, or lime juice (see *Journal*, October 14, p. 891; November 4, p. 1058).

Obituary

Sir LEONARD PARSONS, M.D., F.R.C.P. F.R.C.O.G., F.R.S.

Sir Leonard Parsons, known throughout the world as an authority on diseases of children, died suddenly in Birmingham on December 17, aged 71. For many years he was one of the leaders of the medical profession in Birmingham, having been professor of paediatrics and dean of the faculty of medicine in the university and physician to the Queen Elizabeth Hospital and the Children's Hospital.

Leonard Gregory Parsons was born in Birmingham in 1879, and was educated at King Edward's School and Birmingham University. Graduating M.B., B.S. in 1905, he proceeded M.D.(London) in 1907. Two years later he became a Member of the Royal College of Physicians of London, and thereafter he rose steadily to high rank in his profession, being appointed to the honorary staff of many hospitals in and around Birmingham. He always greatly valued his short period as a general practitioner, and it is significant that he developed his special interest in paediatrics during his many years of work as a general physician. He commenced his long career as a lecturer with the Arris and Gale Lecture at the Royal College of Surgeons in 1912. Elected a Fellow of the Royal College of Physicians in 1923, he was Goulstonian Lecturer in the following year. In 1928 he gave the Ingleby Lecture at the University of Birmingham, in 1931 the Radford Memorial Lecture at the University of Cincinatti, in 1937 the Withering Lecture at Birmingham, in 1938 the Schorstein Memorial Lecture at the London Hospital, in 1943 the first Charles West Lecture at the Royal College of Physicians, in 1945 the Blair-Bell Lecture at the Royal College of Obstetricians and Gynaecologists, in 1946 the Blackader Lecture in Banff before the Canadian Medical Association. He gave the Harveian Oration at the Royal College of Physicians this year on October 18, when he took as his subject "The Influence of Harvey and his Contemporaries on Paediatrics." Only a fortnight ago he gave the Harben Lectures at the Royal Institute of Public Health and Hygiene.



Walter Stoneman, London.

Honours fell in a continuous shower on Leonard Parsons. In 1930 he was vice-president of the International Congress of Paediatrics in Stockholm; in 1932 he was president of the Section of Disease in Childhood of the Royal Society of Medicine, and in the same year was vice-president of the Section of Diseases of Children at the Annual Meeting of the B.M.A.; from 1942 to 1945 he was president of the British Paediatric Association; and in 1942 he was awarded the Moxon Medal by the Royal College of Physicians. The Royal College of Obstetricians and Gynaecologists elected him a Fellow in 1944. He was awarded a knighthood in 1946 in recognition of his fine work for children during the war years. In 1948 his election as a Fellow of the Royal Society for his studies on child health and the wasting disorders of children was a final distinction which gave him great satisfaction: among clinical paediatricians only Parsons and the late Sir Thomas Barlow have achieved this honour in the present century. In 1948 also he was president of the Section of Child Health at the Cambridge meeting of the B.M.A.

During the first world war Parsons served in the R.A.M.C. For two years he was in charge of the medical division of the 36th General Hospital, British Salonika Force, being attached to the Serbian Army. Later he was in charge of the medical division of the 48th General Hospital. For his services he was awarded the Order of St. Sava of Serbia in 1917. In the second world war his knowledge and experience proved of the greatest value to the Ministry of Health. Not only was he Hospital Officer, No. 9 Region, but he was always at hand to give wise advice on the development of the child health services at a time when the promotion of such services was of the greatest importance to the nation.

We are indebted to Professor A. V. Neale for the following appreciation: With the passing of Sir Leonard Parsons the British medical profession and many of his numerous friends abroad will detect a loss which will be in many ways irreparable. To those of us who have, so to speak, grown up under his guiding hand and spirit there is a great deal which can never be put down in the written word. His whole professional life has been an ebullition of activity, with a constant emphasis on the exploration of the causes and treatment of disease in infancy and childhood. Sir Leonard's ability to combine those forces necessary to the truth and exactitudes of research with the pleasant human relations of team activity were outstanding, and a twinkling of an eye or a slight raising of the brow meant more than mere approval or disapproval—it meant one was either accepted or not. His genial face nearly always radiated a sense of mental comfort which attracted all, whether it be a visiting professor or a newly arrived medical clerk.

It is doubtful if any contemporary has covered a wider range of daily effort and conscientious attention to a multitude of responsibilities. His amazing abilities to expand his interests and duties almost continuously, and long after he officially retired from his hospital appointments, kept all his friends in constant wonder, and more so because he at no time showed any failing mental strength or wish to evade any service to which he thought he could make a personal and experienced contribution. It may be truly said that he canalized his life to continued work, so much so that his junior colleagues were always somewhere behind when it came to the latest publications on some topic or technique. In fact it is doubtful if anyone will ever know how Sir Leonard could keep increasing the spatial width of his reading and writing. To one who had an intimate knowledge of his methods in the preparation of some of his famous lectures, it was clearly seen that there was a most uncommon power of concentration on detail, and before the finished article had appeared in print it had probably been sifted and almost rewritten a dozen times. Anyone who has followed "L. G.'s" career will have noticed an evolution of the lecturer's art in putting forward pure and plain English, coupled here and there with some apt stanzas, usually from his beloved Milton. It is probably correct to say that his favourite poem was Francis Thompson's "Ex Ore Infantum," and one of the last things the writer heard him speak upon was his pleasure that this poem had been included in a recent broadcast in the Children's Hour.

In the field of paediatrics and child health he was a great leader at a time when it was highly important for the public and the profession to understand that this was a vast and widening field of activity, in which at last the serious things of early life and the realities concerned with mental and physical health in the formative years would receive attention, especially in the mind of the undergraduate and postgraduate, with, ultimately, an appropriate diffusion throughout the medical profession.

In all this Sir Leonard achieved greatness, more especially so in "fathering" a fine school at Birmingham, wherein can be seen an invaluable legacy in the way of clinical tradition, fine buildings (including the now well-known "Parsons Block" for sick infants), and an influence which will pass on to his successors as a noble testimony of what is right, just, and honourable in human relationships. In the University of Birmingham his service as dean of the Faculty of Medicine has been both distinctive and distinguished. He had the ability to get things done and to find the right people for the staff. The spirit of corporate unison in the various departments is a testimony to his work. Anyone who visited him in his dean's office was always pleasurably received in the finely panelled room, which seemed to match in dignity and simplicity the man who was aware of everything and everyone going on or about the place.

His earlier researches are best recorded in his studies on renal rickets, coeliac disease, and dyshaematopoietic anaemia. He later gave strong and lasting views on "rhesus incompatibility" and, in fact, suggested the generic group name "Haemolytic Disease of the Newborn." In 1933 the comprehensive *Disease in Infancy and Childhood* appeared and set a new high standard in English medical publication: his co-editor in this work was the late Sir Gilbert Barling. At the present time his last book, *Advances in Paediatrics*, is just off the press, and many of his friends will no doubt cherish a copy in affectionate memory of a great author and editor. Without doubt "L. G." regarded his recently delivered Harveian Oration as a suitable time and place to expound his mature and profound philosophy, and for many months he had been in a spiritual communion with his great predecessor, to such an extent that he pictured Harvey reading the Gospel of St. Luke at the Battle of Worcester.

His love for his colleagues and friends was ever apparent, and no man has left a greater mark of respect, especially in the Midlands. We are reminded that "holiness not merely energizes; by its divine reinforcement of the will it wrings from the body the uttermost drop of service, it averts age, and secures a vital vigour to the last."

G. E. G. writes: Sir Leonard Parsons's great international repute rests securely on the foundation of his work in paediatrics and in medicine. Of his long record of service to the hospitals, especially the Children's Hospital and Medical School of Birmingham, as a clinician and teacher, and of his promotion and direct participation in research right up to the time of his death, others are better qualified to write. He took a leading part in the reorientation of paediatric thinking which has led to the present emphasis on the teaching of child health rather than of children's diseases. Here was an active clinician who yet could pursue research up to the very end of his career and, more important still, teach and inspire a whole generation of young aspirants in paediatrics in whom his work will live on. His mark is clearly to be seen on many of the new paediatric departments which are now developing.

Such a life would have seemed full enough to any man, but Sir Leonard also found time to contribute a notable share to the planning and administration of hospitals. In 1939 he was Group Officer for the Emergency Medical Service in Birmingham and later Hospital Officer for the Midland Region. In 1943 he was one of the small band of hospital surveyors, and undertook a strenuous and detailed survey of the Sheffield–East-Midlands Region. Later still he was one of the small group of senior consultants which was responsible for the Ministry's memorandum on the development of consultant services. He was a member of the Birmingham Regional Hospital Board and of the board of governors of the United Birmingham Hospitals, and during all this time carried on his work as dean of the medical school. The tale of his activities is so long as to seem beyond the power of any one man, yet he did it all well and neglected none of it. Few of his contemporaries can have had so wide an influence on the development of medicine.

Above all this, Sir Leonard was respected and loved as a man. He had qualities of character which led many to him in time of trouble, and none lacked solace, as the writer has great reason to know. He leaves such a gap in the lives of many as none can fill, and the sympathy of all who knew them must go to Lady Parsons, who shares in full measure his own great qualities.

Professor K. D. Wilkinson writes: Early in 1912 Leonard Parsons was appointed assistant physician to the General Hospital in Birmingham, and from that date we were closely associated. It was slowly that I came to know him, for he was always rather shy and diffident, so that he appeared to teach with a conscious effort—indeed, sometimes he seemed to prefer listening to talking. Both teaching and writing appeared to be rather a toil at first, and his writings used to show signs of hard work, while his lectures were somewhat hesitant. Leonard always did what he considered his duty however hard that might be; he never spared himself or gave up trying, and gradually he became both an able speaker and an accomplished writer.

He had many difficulties to contend with. When the first world war began he was an impecunious young physician who had only just begun to make a living, for practice came slowly to a physician in those days, and hospital work consisted entirely of long and wearisome out-patient sessions. He was married and had two children, yet in 1916 he went out to Salonika and was away for three years. After he came back he slowly built up a practice, and established his reputation as an able clinician, as an outstanding paediatrician, and as a brilliant research worker. He worked hard to elucidate those problems associated with the disorders of children and when he could afford it financed the laboratory work necessary for the research to advance. He had a special capacity for stimulating the enthusiastic co-operation of many younger men, so that the problems of anaemia and endocrine disorders were solved.

No one who worked with him failed to respond to his influence, and all who came to know him developed a personal affection for him and a great regard for his ability and integrity. One of his outstanding characteristics was a real, active, personal faith, which made him unwilling to miss his Sunday public worship. He did not smoke or drink alcohol. In all the 38 years of our friendship I have never known him say an unkind word of anyone; indeed, his judgments were inclined to be unduly generous, and at all times he was eager to do a kind action even at personal inconvenience.

Sir Leonard was seldom ill, and he enjoyed a wonderfully happy home life, for his wife was always eager to conserve his energies for his work, and his son fulfilled his highest hopes by following in his footsteps with conspicuous success. He leaves a great circle of friends who rejoice in the memories of his friendship while they mourn his loss.

HENRY MacCORMAC, C.B.E., M.D., F.R.C.P.

E. R. A. M. writes: Henry MacCormac will be remembered with affection and admiration in the industrial field, as well as in university and hospital circles. He was a medical referee under the Workmen's Compensation Acts for many years and was appointed to the Advisory Panel on Dermatological Problems in Industry when it was constituted by the Minister of Labour and National Service in 1942. Perhaps he found it a relief to apply his talents to matters which affect the economies of so many people and as an outlet for his great humanity. His wisdom and philosophy, his tactful and unassuming approach to controversial matters, inspired a solution to many difficulties, and very welcome was his gift of humour when argument toiled on too long. He was generous in thought and word and courageous when courage was necessary, and his comradeship and these other fair qualities will keep his memory fresh in circles where men have to get together to get things done. (An obituary notice of Dr. Henry MacCormac was published in last week's *Journal*.)

Mr. ERNEST ETHELBERT HUGHES, who was for many years on the surgical staff of the Ancoats Hospital, Manchester, died on November 5. He was born in Hale, Cheshire, in 1879, the third son of a family of seven. He was educated locally, and on leaving school he qualified as a dispenser. For a while in this capacity he worked as assistant to a doctor near his home, and at the same time prepared for his preliminary medical examination. As an undergraduate in Manchester he worked hard and took many prizes. He joined but little in the athletic side of university life, but already he showed a serious musical appreciation. In 1904 he graduated M.B., Ch.B., and for six months was a house-physician at the old Manchester Royal Infirmary. On leaving hospital he went for a time as assistant in a general practice to a doctor in Cheshire (and devoted his spare time to learning the 'cello). Before long he had made up his mind to go in for surgery as a career. In 1907 he became resident surgical officer at the Manchester Children's Hospital, and in 1908 he was appointed demonstrator of anatomy at the university. In 1912 he was admitted F.R.C.S. and was awarded the gold medal in the Ch.M. examination at Manchester. The following year he became resident surgical officer at the Royal Infirmary. During the first world war he saw service as a surgeon in Mesopotamia, Egypt, East Africa, India, and France. He returned home in 1919, and the following year was appointed surgeon to the Ancoats Hospital. Other surgical appointments came to him, but it was at Ancoats where his main life work lay. Though working as a general surgeon, he had developed a special interest in genito-urinary surgery, and before long he started the special department which later became a notable feature of the Ancoats Hospital. He was a member of many surgical societies and associations: in 1935 he was elected president of the Manchester Surgical Society. His contributions to medical literature were not numerous, but they were carefully presented and were mainly in his special line of genito-urinary surgery. He was of a sensitive, retiring nature, and, though by no means unapproachable, his shyness prevented more than a comparatively few knowing him well. He had an extraordinary capacity for work, and at one period of his life went for 10 years without a holiday. He read widely, and his verbal knowledge of Shakespeare was prodigious. He played golf regularly and loved a game of bridge. By his juniors he will long be remembered as a friendly teacher and a careful and dexterous surgeon, thoughtful for and attentive to his patients and their friends and considerate to his colleagues and his nurses. He married in 1922, his wife also being a member of the medical profession.—E. S. B.

JAMES GRAHAM WILLMORE, who died in London on December 8, at the age of 70, was for many years a medical officer at the Ministry of Pensions. He studied medicine at the Westminster Hospital, qualifying in 1906. Nearly 20 years later he graduated M.D., C.M. at McGill University, where he won the Sutherland Gold Medal. In 1924 he was admitted M.R.C.P. His early interest in tropical diseases and pathology was shown in his appointment as physician to the Bacteriological and Quarantine Service of Egypt and as pathologist to the Queen Charlotte Hospital. In 1918 he published an article on "Dysentery in the M.E.F." Willmore began his long service with the Ministry of Pensions in 1921, and he spent almost all his time in its hospitals. He became a principal medical officer in 1932, and for many years acted as consultant in medicine and pathology both at Queen Mary's Hospital, Roehampton, and at the headquarters of the Ministry. He was also consultant physician to Mount Vernon Hospital, Hampstead. He retired from the Ministry in 1946, and a year later he was appointed O.B.E. Willmore was always a student, ever seeking new discoveries and new lines of thought. He read widely, and his retentive memory enabled him to bring readily to bear on any problem the researches and opinions of workers in many fields. He delighted in the intricacies of pathology, and the diagnostic approach to rare or aberrant symptoms rejoiced his heart. While sometimes the trees were the more fascinating, he did not forget the wood, and his clinical judgment and practice were broadly and soundly based on a wealth of knowledge and experience. Some 20 years ago he lost through accident the sight of one eye, and that of the other steadily decreased almost to blindness. But with admirable courage he made his diminishing vision serve him to the uttermost. His alert, inquiring, inquisitive mind accorded well with a trim, active body, blended with true courtesy of manner and kindness of heart. "Willie" was dear to all who knew him and will live in their memory as one to whom the ideals and purpose of his profession were everything, and in whom learning, modesty, and enthusiasm made the physician all of us would wish to be.—A. S.

Dr. E. DOROTHEA BLUNT, who was for 20 years in practice in Hastings, died there on November 1, at the age of 49. She was educated at Oxford High School, the London School of Medicine for Women, and the Royal Free Hospital, graduating M.B., B.S. in 1927. After qualifying, Dr. Blunt took the post of gynaecological obstetrical house-surgeon at her own hospital, and then became assistant M.O.H. for maternity and child welfare in Birmingham. She remained interested in obstetrics, and took the D.R.C.O.G. in 1937 while in general practice. In 1929 she came to Hastings as partner to the late Dr. Conroy Morgan, and after his retirement continued in practice alone. Somewhat shy and retiring by nature, Dr. Blunt nevertheless built up a large practice and was looked on by her patients as a friend as well as a doctor. She never refused a plea for help either from her patients or her colleagues, and was quite unsparing of time and energy if she felt she could be of use to anyone. She served on the local panel committee for many years, and, after 1948, on the local medical committee of the executive council; she was also on the house committee of St. Helen's Hospital and on the tuberculosis care committee, and had several times been on the executive committee of the Hastings Division of the B.M.A. Her balanced judgment and sound comments were invaluable in committee work. She was an active member of the Order of St. John, being a divisional surgeon, and had reached the rank of Serving Sister. For many years her health had been very poor, but in spite of her friends' persuasions she refused to curtail her work and carried on under immense difficulties until 36 hours before her death.—C. N. W.

Medical Notes in Parliament

The Registrar's Future

On December 15, on the motion to adjourn for Christmas, Sir HUGH LUCAS-TOOTH raised the question of hospital registrars and of the circular *Review of Appointments to Registrar Grades*. Registrars, he said, were trained and qualified doctors, the pick of the profession. They were salaried members of the hospital staff and, although not fully qualified specialists, did specialist work without supervision, acquiring skill with a view to becoming fully qualified specialists or consultants. Registrars had existed in hospitals for a long time, and since the inauguration of the National Health Service their numbers had greatly increased. The country had then been told that the present 5,200 specialists, for the most part-time, would be increased to 7,500 full-time specialists. The increase was to be of the order of 100%.

Mr. A. BEVAN asked when the profession had been told this.

Sir HUGH replied that the increase had been set out in *Development of Consultant Services*, published about the time the National Health Service Bill was introduced. This document had been republished early in 1950.

Mr. BEVAN said they were not told that at all in that document.

Sir HUGH LUCAS-TOOTH replied that a large proportion, if not all, of the medical profession had understood the document as he did. He went on to say that hospitals had been told they could and should increase the numbers of registrars on their staffs. That increase had been needed because of the added work of the hospitals. The result was that the country now had some 2,800 registrars on hospital staffs, about 1,400 being senior registrars. A high proportion of these senior registrars were over 30 years old and probably facing their heaviest family responsibilities. He admitted that 2,800 registrars were too many. The hospitals could not at present absorb the new specialists who would come forward from the establishment. Something had to be done. Mr. Bevan had faced the situation by bringing out the circular under discussion. Sir Hugh asked the Government what figure it had in mind if it no longer aimed at 7,500 specialists, and when it intended to achieve the new total.

Not Economy

He accepted an assurance already given by Mr. Bevan that he had not been prompted by economy in the action he had taken. Indeed, it was obvious. Mr. Messer, chairman of the Central Health Services Council, had said that the registrars would have to be replaced by consultants, hospital medical officers, or general practitioners, who would cost far more. The circular had struck dismay in the breasts of all those concerned with the Health Service. Even the Socialist Medical Association had put a warm protest to the Minister. To tell men who had already had their careers disorganized by the war that they could seek posts overseas or in the Forces was the epitome of psychological ineptitude. There was a sense of injustice and of personal waste among those affected, and a waste to the community of the effort and time required to train these men. Too many patients were chasing too few doctors, dentists, and hospital beds. That caused trouble in other departments of the Health Service and was at the root of the present difficulty. Something must be done to bring the demand for hospital beds and specialist attention into line with supply, but the circular under discussion would aggravate the trouble.

Mr. F. MESSER said he thought it his duty to convey to Mr. Bevan the widespread feeling aroused by the circular. A registrar was a man who had decided to follow a particular line in medicine or surgery. It was not easy for him to switch. In a teaching hospital he followed his specialty, and in addition a large part of his time was taken up with teaching others. It was obvious that at present there were too many registrars, but the Minister's approach to the matter might have been made differently so that those who believed he had a case for reducing the number of registrars could have discussed with him how this could be done with the least hardship. In Mr. Messer's region nine major hospitals would be affected by implementation of the circular. He said that in these they could not have unskilled people doing the work which the registrars were doing. Unless there was a comparable addition to replace the registrars they would have to close 400 beds. His region was about to lose 80% of its registrars. He urged Mr. Bevan to consult the teaching hospitals and the regional boards before he implemented his circular.

Mr. HENRY BROOKE said the regional hospital boards had not been consulted over the drafting of this circular but were expected to maintain the quality and quantity of hospital service despite it.

The Minister's Reply

Mr. ANEURIN BEVAN said he was glad that the question had been raised and in so temperate a manner. That was, however, not the atmosphere in which it had been discussed in some of the medical journals and some of the daily newspapers. It was about time that some publicists developed a responsible attitude towards the Health Service. The situation concerning registrars was clear. There were admittedly more registrars than the Ministry could find consultant posts for. It was not he who had appointed the registrars. Responsibility for that lay with the hospital boards and the teaching hospitals.

Sir HUGH LUCAS-TOOTH said these had been given encouragement.

Mr. MESSER pointed out that management committees, not regional boards, were responsible for the appointment of registrars.

Mr. BEVAN accepted the correction. The position was a direct consequence of the fact that authority lay with the teaching hospitals and the management committees. To Sir Hugh Lucas-Tooth's assertion that the Ministry had encouraged a lavish appointment of registrars, Mr. Bevan replied that the language of the booklet to which Sir Hugh had referred was very cautious. It was incorrect to say that the Ministry of Health led people to believe that there might be such an enlargement in the number of consultants as the number of registrars appointed would indicate. What happened was that a large number of doctors returned from the Forces and were anxious to take posts in the hospitals for training as consultants. Under that pressure many more posts had been provided than were reasonable. Considering the extraordinary increase he believed that what the Ministry had done was justified. The circular suggested that for England and Wales the totals should be 600 senior registrars and 1,100 registrars. It asked boards to consult and submit proposals about training posts for each region within the total. It proposed steps for bringing existing numbers and new recruits down to the approved establishment, and suggested alternative arrangements at this level of staffing when the volume of hospital work necessitated them.

Misunderstandings

Practically every pronouncement on this matter had been wrong. The *British Medical Journal*, which ought to know better, quoting, with unusual enthusiasm, the Socialist Medical Association, had said that the circular showed a total failure to understand the importance of the contribution made by registrars to the hospital service. One could not have, in a responsible journal, a more juvenile misunderstanding. Sir Hugh Lucas-Tooth had pointed out that, if the number of registrars was cut drastically, some people must be found—it might be the same people—to do the work. That, said Mr. Bevan, was exactly what the Ministry said. It was the result of consultations with representatives of the medical profession, to whom the whole matter had been made perfectly clear.

Dr. CHARLES HILL intervened to point out that the circular had made it plain that the employment of substitutes, who would be the same people doing the same work, was intended as a strictly interim arrangement.

Mr. BEVAN said that was so. Medical teams were going round the country setting out the establishments for the hospitals. Hospital work must be carried on by adequate establishments. All the Ministry was trying to do was to relate the number of trainees to the number of consultant posts which might be available.

Sir HUGH LUCAS-TOOTH asked whether Mr. Bevan had obtained agreement in his consultations.

Mr. BEVAN said agreement was not obtained. The Ministry of Health represented the interests of the community as a whole. Its critics were a specialized sectional interest.

Mr. HUGH LINSTEAD remarked that Mr. Bevan had not got agreement with the regional hospital boards, the management committees, or the medical profession.

Mr. BEVAN retorted that he expected to get agreement with the House of Commons. He hoped the House was considering whether the claims of certain people had been balanced against the claims of the community as a whole.

Mr. LINSTEAD said the House that day had no opportunity to express an opinion.

Mr. BEVAN said the question of registrars was to be discussed by the regional hospital boards. The Ministry hoped to have their observations by the beginning of the year. Before the issue of the circular a full explanation of the position had been sent on July 6 to the Joint Committee of Consultants and Specialists, with statistical information. The draft of the circular had been twice discussed with their representatives. The profession had recognized the need for action, but had not agreed with the exact form it should take. That was not unusual. The proposed number of trainee posts had been related to an annual demand of 150. The number needed to replace wastage was unlikely to be more than 100 in any of the next five years. The Ministry was increasing the specialist posts.

What was wrong in saying that posts were available in the Colonial Medical Service? More doctors were needed there.

Conditions of Appointment

Mr. LINSTEAD said that registrars, according to the Ministry of Health's conditions for their appointment, had assumed they had a four-year appointment before them.

Mr. BEVAN replied that their appointments were reviewed from year to year to see if they were making the grade. The circular did not invalidate his assertion. The circular did allow for an increase in specialist posts, but it was unwise to enlarge the number of these posts until the Ministry had the hospitals in which work could be found for specialists. He remarked that the number of trainees at present was nearly 3,000. In 1938 it was not more than 750. The proposed new total of 1,700 was nearly two and a half times the figure before the war.

Dr. HILL asked whether the figure of 750 included all the categories which had been renamed registrars.

Mr. BEVAN replied that it represented all those considered to be in training for specialist posts. He said that in one London hospital, a teaching hospital, the number of in-patients in 1949 was down by one-quarter, compared with 1938. The number of out-patients was up by one-sixth. But the number of registrars was two and a half times as great.

General Practitioners and Hospitals

He hoped to get selected general practitioners to do some of the work in the hospitals. He desired that the general practitioner should be more closely associated with hospital work. Resistance to this often came from inside the medical profession. It must not be assumed that complete harmony existed between specialists and general practitioners. When management committees and regional boards tried to arrange that general practitioners should have access to hospitals, the difficulty had sometimes been with the consultants concerned. The Ministry was anxious to ensure that, when new people were required, some should be general practitioners working part-time.

Mr. WALTER ELLIOT said the Opposition would take the earliest opportunity to have a more extended discussion on registrars.

Distinction between Hospital Staff and Trainees

Mr. BEVAN said the longer the discussion the more he would be pleased. The suggested number of registrars for each region must be divided between teaching and non-teaching hospitals and between different specialties. He would invite regional hospital boards to comment on the new establishments. Revert-

ing to the circular, Mr. Bevan said its main purpose was to have in future sufficient doctors to do the normal work of the hospital, and also an identifiable number of registrars who were training to be consultants. In the past the necessary general hospital work had been performed by persons who at the same time were training to be consultants. Because of this there had been a tendency to enlarge the category of registrars.

Cancer Propaganda

On December 14 Brigadier F. MEDLICOTT asked Mr. Bevan to make it more widely known that valuable remedial measures could be taken in many instances if cancer was diagnosed in its early stages.

Mr. ANEURIN BEVAN replied that the Central Health Services Council had recently advised that it was undesirable at the present time for any cancer publicity to the general public to be carried out by the Government.

Malaria Control.—Campaigns are in progress in Mauritius, the coastal belt of British Guiana, Tobago, and a number of experimental areas in East and West Africa. In Cyprus steps are being taken to prevent re-importation of malaria-carrying mosquitoes, of which the island was declared free at the beginning of 1950. The question of total eradication in hyper-endemic areas in Africa was examined at the Malaria Conference held at Kampala from November 27 to December 9 under the joint auspices of the World Health Organization and the Commission for Technical Co-operation in Africa south of the Sahara.

Day Nurseries.—About 13,000 children under the age of 2 are attending day nurseries.

Cleanliness.—The Minister of Food has instructed the agents of his department in the meat trade to issue suitable overalls and head-coverings to meat porters and make their wearing of them compulsory.

Conveniences.—Neither the Minister of Transport nor the Minister of Health has power to make regulations for compulsory provision of public conveniences at omnibus stations and termini.

Universities and Colleges

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Old Regulations:* H. G. Arnall, R. B. Haigh, J. M. Midgley, R. E. Raworth, Gertrude H. G. Robinson. *New Regulations:* D. Ashworth, Margaret Bentley, Constance M. Bevan, J. C. Canney, E. H. Cooper, D. Davies, B. Didsbury, J. Ellis, G. R. Gates, R. Hinchcliffe, J. T. W. Howe, G. Howitt, T. R. Hunter, A. Hyman, J. E. Kench, J. H. Latchford, M. B. Raby, Carolyn C. Rigby, Kathleen M. Rushton, Janet Savatard, H. Selcon, Lorna J. Shankland, A. Sippert, G. Sullivan, D. W. Sumner, S. E. Sutton, Olive M. Thomas, C. F. H. Vickers, Margaret R. Walley, B. Ward, G. R. Whittaker, D. Wolman.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Z. Finkelstein, L. G. Nicol, Margaret I. Platt, Susanne Shafar, T. P. Smith.

The Services

A *Supplement* to the *London Gazette* has announced the following awards:

Four Clasps to the Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) J. C. MacKay, O.B.E., M.C., T.D., R.A.M.C.

Three Clasps to the Territorial Efficiency Decoration.—Lieutenant-Colonel T. A. S. Samuel, M.C., T.D., R.A.M.C.

1st Clasp to the Territorial Efficiency Decoration.—Colonel H. Sissons, O.B.E., T.D., late R.A.M.C.; Lieutenant-Colonel W. Bowater, M.C., T.D. (retired); and Majors C. K. D. Edwards, T.D., T. T. S. Hall, M.B.E., T.D., and A. McN. Tomlinson, T.D., R.A.M.C.

Territorial Efficiency Decoration and 1st Clasp.—Honorary Lieutenant-Colonel H. S. Allen, O.B.E., late R.A.M.C.; Lieutenant-Colonels A. P. McEldowney, W. D. F. Lytle, O.B.E., and D. H. Young, O.B.E.; Major (Honorary Lieutenant-Colonel) T. McK. Robb; and Major C. N. Suter, R.A.M.C.

Territorial Efficiency Decoration.—Major N. H. H. Longton and Captain F. E. D. Griffiths, R.A.M.C.

Medical News

Popular Health Journal

Family Doctor is the title of the new popular health magazine which the British Medical Association is publishing next year. It is being brought out under the general direction of the Editor of the *British Medical Journal* and edited by Dr. I. H. Flack, formerly assistant editor of the *Journal*. The first issue will be on sale at the bookstalls on March 20, 1951. A monthly magazine, it will be fully illustrated, and the price will be 1s. It should prove of particular interest to doctors and their families and to all workers in the public health service.

Family Doctor is a new attempt to provide education in healthy living. Its 72 illustrated pages will include articles on how the body works, antenatal care, difficult children, whooping-cough, first-aid, and on such general topics as playing-fields, the Boat Race, cookery, and spring-cleaning. It is hoped that the medical profession will do what it can to establish *Family Doctor* as the most important medium of popular health education in this country. A special order form has been included with the subscription forms sent to every member of the British Medical Association in the past few days. The subscription of 14s., which includes postage, ensures that *Family Doctor* will be sent direct from B.M.A. House to addresses in the United Kingdom and overseas. Alternatively, local newsagents are ready to accept orders and arrange for regular delivery.

Peckham Health Centre

The Pioneer Health Centre at Peckham, which has been closed since March, has just been bought by the London County Council for about £60,000. According to a *Daily Telegraph* report, an antenatal centre and day nursery are to be opened there, while the swimming-bath, gymnasium, and lecture hall will be used by the education service. Later it is planned to open a National Health Service health centre, with special maternity and child-welfare facilities. It is expected that the full scheme will cost £126,000.

Research in Social Medicine at Oxford

The annual report of the Institute of Social Medicine, of which the late Professor J. A. Ryle was first director, describes some of the investigations in progress there. Among the long-term studies, the child health survey is now in its fifth year and 580 of the children are more than 1 year old, so that some conclusions on normal growth and development are already possible. In particular, the current generalization that smaller babies grow more rapidly and catch up with the larger babies at one year has not been substantiated. The 5-year-olds, and also many undergraduates, are being somatotyped by Sheldon's method, in which photographs of each individual are taken in three standard positions against a grid, and the individual's dimensions thus recorded and later compared with his psychological development. The average heights and weights of Oxford undergraduates have been found to be approximately the same now as forty years ago, but still taller and heavier than other young men of the same age, as judged from National Service medical examinations. A big investigation on tuberculosis in industry has already shown that morbidity rates are higher in large than in small boot and shoe factories (see *British Medical Journal*, 1949, 1, 926), which may be correlated with the relatively poorer ventilation of large workshops. The pattern of tuberculous infection found in Northampton suggests that the disease can spread from one house to neighbouring households.

The 1951 Census

On Sunday, April 8, 1,200 census officers (normally the registrars of births and deaths), and 50,000 enumerators, will conduct the national census in England and Wales. There will be some new questions since the last census in 1931—the age at completion of full-time education, availability of piped water supply, and queries on certain other household arrangements. The age at which a person has the right to make a separate confidential return, instead of providing information to the head of the household, has been lowered from 21 to 16. A preliminary report showing the number of people of each sex in each district of the country will be issued in June, 1951. A further early report will be based on a detailed analysis of 1% of all the returns, but the full record will come out in instalments over a period of years. The total cost is estimated to be £1,250,000.

North of England Obstetrical and Gynaecological Society

At a meeting in Liverpool on October 27 Mr. F. J. Burke described some interesting cases of placenta accreta. In one no decidua had formed in the cavity of the uterus and the placenta had eaten its way through the posterior wall right to the peritoneal cavity. The main cause of placenta accreta was a defect in or absence of the basal decidua, a thin but vital layer which prevents excessive infiltration of the trophoblast. It was usually said that the villi are attached to muscle, but Mr. Burke said he found that the invading villi appeared to exert a destructive effect on the muscle fibres over a wide area; they were replaced by a thick layer of hyaline or fibrinoid tissue. Dr. M. B. Bruce reported a case of twins in which a double placenta had been delivered between the first and second child, both infants surviving; and Mr. Vincent Corbett read a short paper on the aetiology of foetal malformation, based on the records of the Liverpool Maternity Hospital.

Ulster Paediatric Society

At a meeting on Tuesday, December 12, with Dr. Robert Marshall in the chair, Professor W. F. Gaisford spoke on "Recent Developments in Antenatal and Neonatal Paediatrics."

In Brief

At the recent celebration of fifty years' unbroken work at the Lebanon Hospital for Mental and Nervous Disorders, Asfuriyeh, near Beirut (see *Journal*, November 4, p. 1069), the medical director, Dr. W. M. Ford Robertson, and two Lebanese members of the local committee—Drs. Amin Khairallah and Joseph Hitti—were decorated by the President of the Republic with the golden medal of the Lebanese Order of Merit.

Sir Gordon Gordon-Taylor, consulting surgeon to the Middlesex Hospital and the Royal Navy, left London on December 19 for a four-week visit in Pakistan arranged by the British Council.

COMING EVENTS

British Association of Physical Medicine

A short course of lectures on the various aspects of physical medicine will be delivered on Fridays and Saturdays, January 5–13, and will be suitable for candidates preparing for Part II of the Diploma in Physical Medicine. Further details can be obtained from the honorary secretary, British Association of Physical Medicine, 45, Lincoln's Inn Fields, London, W.C.2.

Tuberculosis Health Service

A conference on "The Administration of the Present and Future Tuberculosis Health Service" will be held at 2.15 p.m. on Saturday, January 13, in the Cowdray Hall of the Royal College of Nursing, with Dr. Philip Ellman in the chair and Dr. G. E. Godber, deputy chief medical officer of the Ministry of Health, the principal speaker. The fee, including tea, is 4s. 6d., which should be paid before January 6 to the Secretary, Public Health Section, Henrietta Street, London, W.1.

Subnormal Children

Three courses will be held in 1951 on educationally subnormal children and mental defectives. The courses are intended especially for school medical officers and certifying officers. They are organized by the University of London in co-operation with the National Association for Mental Health. The following are the dates of the courses: February 19–March 9; April 16–May 4; and October 1–19. Full particulars may be obtained from the Educational Secretary, National Association for Mental Health, 39, Queen Anne Street, London, W.1.

International Society of Surgery

The 14th congress will be held in Paris, September 24–29, 1951, the fiftieth year of the Society's existence, under the presidency of Professor René Leriche. Instead of a series of comprehensive reports on selected topics, eleven problems of the day have been chosen and speakers have been selected to give the addresses and open the discussions. Anyone attending the congress may take part in the discussions (five-minute limit) by writing to their delegate to the Scientific Council before August 1. The British delegate is Sir James Learmonth, 22, Braid Avenue, Edinburgh, 10. The subjects and speakers selected are:

(1) "Pulmonary Resection for Tuberculosis."
(2) "The Future of the Cavity Remaining after Pneumonectomy," C. Price Thomas (London).
(3) "Extracorporeal Circulation to Facilitate Surgery of the Cavities of the Heart," Jongbloed (Utrecht).
(4) "Restorative Vascular Grafts and the Effect of Cold on the Tissues as Related to Transplantation," E. Rehn (Freiburg im Breisgau).
(5) "Allergy and Abdominal Surgery," P. Valdoni (Rome).
(6) "Surgery of the Sympathetics and Vascular Diseases of the Brain," A. De Sousa Pereira (Porto).
(7) "Spontaneous Internal Fistulas of the Biliary System," P. Mirizzi (Cordoba, Argentine).
(8) "The Post-operative Malady," E. Elman (St. Louis).
(9) "Influence of the Conceptions of Speranski, Leriche, and Ricker Upon the Future of Surgery," C. Henschen (Basle).
(10). "Sequelae of Post-operative Venous Thrombosis," C. Bauer (Mariestad) and H. Peiper (Mayence).
(11) "Portal Hypertension," A. Blakemore (New York).

SOCIETIES AND LECTURES

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

Monday

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—January 1, 3.45 p.m., "*Blood Grouping and Transfusion*," by Dr. H. F. Brewer.

Tuesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—January 2, 5 p.m., "*Hysteria Cutis*," by Dr. W. J. O'Donovan.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—January 2, 5 p.m., "*Science and Art of Refraction*," by Dr. T. H. Whittington.

Wednesday

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—January 3, 5 p.m., "*X-ray Technique*," by Dr. C. W. McKenny.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—January 3, 3.45 p.m., "*Disorders of Bone Metabolism*," by Professor N. F. Maclagan.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—January 3, 5.30 p.m., "*Headaches*," by Mr. L. H. Savin.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At General Infirmary at Leeds, January 3, 8 p.m., "*Anaesthesia for Babies and Children*," by Dr. Robert Cope.

Thursday

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, Great Ormond Street, London, W.C., January 4, 5 p.m., "*Low Potency Prescribing*," by Dr. D. M. Cameron.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—January 4, 5 p.m., "*Cutaneous Syphilis*," by Dr. J. L. Franklin.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—January 4, 3.45 p.m., "*Blood Grouping and Transfusion*," by Dr. H. F. Brewer.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—January 4, 5.30 p.m., "*Diseases of the Blood Connected with Oto-rhino-laryngology*," by Sir Lionel Whitby.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—January 4, 5 p.m., "*Methods of Examination*," by Mr. C. M. Shafto.

Friday

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—January 5, 5 p.m., film of a hemispherectomy performed by Mr. R. A. Krynauw.

●ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—January 5, 5.30 p.m., "*Physiology of the Eye*."

APPOINTMENTS

DOLTON, E. G., M.B., B.S., F.R.C.S., Thoracic Surgeon to Stoke-on-Trent Group of Hospitals.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—*Part-time Orthopaedic Registrars (Registrar Grade)*: B. M. Hay, M.B., Ch.B., F.R.C.S.. J. D. Cronin, M.B., B.S., F.R.C.S.

LIVINGSTONE, F. D. M., M.B., B.Chir., D.P.H., Medical Officer of Health, Warwickshire United Districts, and Central Area Medical Officer, Warwickshire County Council.

NELSON, A. JOHN, M.B. Ch.B., D.P.H., Consultant in V.D. Control, New York State Department of Health, Albany, New York.

WITTKOWER, ERIC, M.D., Associate Professor of Psychiatry, McGill University, Montreal, Canada, from March, 1951. Dr Wittkower graduated M.D. at the University of Berlin in 1924, and in 1936 he took the Scottish Conjoint qualification. He is Consultant Psychiatrist on the staff of St. Bartholomew's Hospital and the Tavistock Clinic. He takes up his duties at McGill University in March, 1951.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Fisher.—On December 14, 1950, at King's College Hospital, London, S.E., to Sheila (formerly Penny), wife of Dr. Oliver Fisher, M.R.C.P., a son.

DEATHS

Banks.—On December 17, 1950, at "Mervyn," Lanark, Thomas Wilson Banks, M.B., C.M.

Ford.—On December 18, 1950, at Hertford County Hospital, Alma Percy Ford, M.R.C.S., L.R.C.P., D.P.H., The Arches, Digswell, Welwyn, Herts.

Hughes.—On December 14, 1950, Muriel Hughes, M.B., Ch.B., D.P.M., of Capesthorne, Wythenshawe Road, Northenden, Manchester.

Larkam.—On December 8, 1950, Edward Thomas Larkam, M.D., D.P.H., of 978, Warwick Road, Acocks Green, Birmingham, aged 84.

Lowe.—On December 12, 1950, at sea, John Russell Lowe, M.B., B.Ch., Rostrevor Road, Rathgar, Dublin, Eire, aged 28.

MacCormac.—On December 12, 1950, at his home, 71, Bathgate Road, London, S.W., Henry MacCormac, C.B.E., M.D., F.R.C.P., 23, Wimpole Street, London, W.

McEldowney.—On December 8, 1950, at his home, 205, London Road, Portsmouth William Patrick McEldowney, M.B., B.Ch., aged 87.

McGlashan.—On December 15, 1950, at University College Hospital, William Reid McGlashan, M.B., Ch.B., D.P.M., of Ellingham, St. Martin's, Guernsey C.I.

MacVea.—On December 12, 1950, at Netherton, Ayr, George Anthony MacVea, L.R.C.P. &S.Ed., L.R.F.P.S.Glas., of Belingwe, Turnberry, Ayrshire.

Parsons.—On December 17, 1950, at Hillfield, Four Oaks, Birmingham, Sir Leonard Gregory Parsons, M.D., F.R.C.P., F.R.S., aged 71.

Wainwright.—On December 10, 1950, George Bertram Wainwright, O.B.E., M.B., B.Ch., of Freelands, South Cerney, Glos., formerly of Winchester.

EPIDEMIOLOGICAL NOTES

Infectious Diseases

The chief features of the returns during the week were a further large increase in the number of notifications of measles and a large rise in the number of cases of dysentery. The record high level of dysentery in England and Wales in the preceding week was exceeded by 77, and in Scotland the incidence was very high. The chief centres of infection in the two countries were Leicester C.B. 130 and Glasgow 59. The outstanding return for measles was from Lancashire, where there were 934 more cases than in the previous week.

Whooping-cough

The returns of whooping-cough for the past four weeks in England and Wales have been the highest ever recorded since notification of this disease was started 11 years ago, and they are about five times the level of the corresponding period of last year. 20.000 more cases of whooping-cough have been notified this year than in the same period last year and about 10,000 more than in 1948.

During the recent weeks one-third of the total cases have been notified in London and the adjacent counties of Surrey, Kent, Essex, and Middlesex, while one-sixth of the notifications were contributed by Lancashire. The number of deaths per 10.000 cases in the great towns for the first 49 weeks of the year was 28 in 1950, 65 in 1949, and 59 in 1948. It would appear probable from these rates that the increase in the number of notifications is one of book-keeping and that it does not represent a real increase in the incidence of the disease.

Week Ending December 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,348, whooping-cough 4,503, diphtheria 50, measles 14.223, acute pneumonia 684, acute poliomyelitis 107, dysentery 1,214, paratyphoid fever 5, typhoid fever 2.

No. 49

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 9.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	33	3	12	2	1	37	4	26	—	—
Deaths		—	1				2	—		
Diphtheria	49	8	19	1	2	87	7	37	3	1
Deaths	1	—	—	—	—	3	—	—	—	—
Dysentery	933	37	170	2	6	133	14	73	—	3
Deaths		—			—				—	—
Encephalitis, acute	2	—	—	—	—	—	—	—	—	—
Deaths		1					—			
Erysipelas			25	5	4			31	10	3
Deaths							—			
Infective enteritis or diarrhoea under 2 years				15	13				33	
Deaths	16		4	—	—	13	—	4	1	1
Measles*	14,076	1236	183	136	144	1,596	26	22	89	119
Deaths†		1	—	2	—			—	—	—
Ophthalmia neonatorum	34	4	7		—	38	3	5	—	1
Deaths										
Paratyphoid fever	2	—	4(B)		—	5	1	1(B)	—	2(B)
Deaths	—		—		—	—		—	—	—
Pneumonia, influenzal	573	31	13		6	734	26	12	1	11
Deaths (from influenza)‡	34	4	4	1	2	23	6	3	—	—
Pneumonia, primary			246	¶				287	35	
Deaths	236	32		8	18	236	48		12	7
Poliomyelitis, acute	104	5	4	3	3	134	15	1	2	—
Deaths§	7	—		—		11	—			
Puerperal fever			4				—	5		
Deaths										
Puerperal pyrexia‖	89	13	10	1	—	57	7	7	—	1
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,264	91	210	96	41	2,855	214	249	123	269
Deaths†		—	—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	6	2	1	—	1	4	—	—	3	—
Deaths	—	—	—		—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,431	394	650	53	30	893	33	59	16	52
Deaths	8	1	2	—	1	—	—	—	—	—
Deaths (0–1 year)	248	33	38	9	13	263	37	42	16	11
Deaths (excluding stillbirths)	5,639	868	771	236	171	5,222	873	702	184	136
Annual death rate (per 1,000 persons living)			15·5					14·1	11·4	
Live births	6,255	955	793	327	200	6,595	1047	849	308	224
Annual rate per 1,000 persons living			15·9					17·0	19·1	
Stillbirths	165	28	22			193	27	15		
Rate per 1,000 total births (including stillborn)			27					17		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.
† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published
‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.
‖ Includes puerperal fever for England and Wales and Eire.
¶ Primary pneumonia no longer notifiable in Eire.

Any Questions?

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

Repeated Abortions

Q.—*A patient, aged 24, has been pregnant at least three times without a pregnancy progressing beyond four months. Three years ago, after being married for nine months without apparently conceiving, she developed increasingly severe dysmenorrhoea. A dilatation and curettage was performed, and she conceived shortly afterwards, but had a miscarriage at three and a half months, her membranes rupturing spontaneously four days before painful uterine contractions developed. A further curettage two years later showed a carneous mole. She conceived again nine months later (in June this year), and all appeared well until at 20 weeks she had a further rupture of membranes at night when asleep, and a complete abortion four days later. W.R. negative; Rh positive; and no history of intercourse for the two months prior to the last abortion. This case history does not seem typical of the usual "habitual" abortion, and I would be grateful for suggestions about treatment or investigation. Is vitamin E indicated in this type of case?*

A.—The unusual feature of this abortion habit is the suggestion that rupture of the membranes is the first part of the mechanism of the abortions. This immediately raises the possibility of an incompetent internal cervical os, which by failing to support the membranes leads to abortion—a mechanism which has been studied by A. F. Lash and S. R. Lash (*Amer. J. Obstet. Gynec.*, 1950, 59, 68). In this case it may be that the dilatation of the cervix for dysmenorrhoea resulted in tearing at the level of the internal os. This possibility should be investigated, and hysterography should be carried out to exclude an intrauterine septum or other malformation. If the findings are negative a glucose-tolerance test is indicated to make certain that a diabetic or prediabetic state is not present. Other investigations should include an estimation of the basal metabolic rate, careful blood-pressure records, and possibly renal function tests.

The treatment will depend on the results, but empirical measures such as the administration of vitamin E should be used only when very full investigation has failed to reveal the cause.

Cystine Calculi

Q.—*A multipara, aged 28, had her right kidney removed three years ago because of stone formation. I understand that the stones, which had completely disorganized the kidney, were mixed cystine and phosphatic stones. Since recovering from her operation she has formed at occasional intervals cystine stones in the remaining kidney. These have once or twice blocked the ureter with alarming suddenness, but fortunately each one has been fairly quickly passed. We have tried to keep the urine alkaline, the patient has been put on large quantities of milk, and her renal tract is kept under observation by x-ray. What further measures should be taken to prevent the formation of these stones?*

A.—Cystine calculi are attributable to a metabolic error about the essential nature of which we are ignorant. We can, therefore, seek to control their occurrence only in the following ways: (1) By free diuresis. (2) By continuous alkalinization of the urine. (3) By maintenance of an adequate vitamin-A level. (4) By sterilization of any urinary tract infection.

With the exception of alkalinization all these measures are applicable to the prevention of stone from whatever cause. There being only one kidney, it is clear that the patient is constantly at risk from obstruction. Fortunately cystine calculi are usually visible by *x*-ray, despite statements to the contrary.

and since their surface is smooth they can usually be passed down the ureter and voided. If a calculus lodges in a dependent calyx every effort should be made to move it while it is still small. Skipping and, even better, horse-riding may be recommended. If these measures fail the patient should be placed in such a position that the mouth of the calyx is its lowest point, and percussion or vibration should then be instituted over the organ. Prior to this manœuvre sufficient fluid should be given to promote thorough diuresis. Control of infection is almost always possible nowadays with adequate typing and antibiotic sensitivity assays.

Buried Alive

Q.—*An Indian yogi recently spent eight hours in a pit 6 ft. × 6 ft. × 6 ft. (1.82 m. × 1.82 m. × 1.82 m.), which was covered over with planks and earth. If it be assumed that the man was small and that his basal metabolic rate was at the lower limit of normality, can this feat be regarded as being remarkable?*

A.—Assuming the yogi's chamber to be airtight, and his metabolism to be that of an ordinary man sitting at rest, the carbon dioxide in the air would rise after eight hours to about 3% and the oxygen fall to about 17%. These changes in the respired air would be smaller in proportion to the sluggishness of yogi metabolism and the leakiness of the roof. The metabolism of soil itself is too slow to affect the issue. Vitiation of the air to this degree would have only trivial effects, chiefly a slight deepening of the respiration, and a mild headache on returning to a normal atmosphere. Considerably worse conditions have been experienced by respiratory physiologists and submarine crews without harm. If, however, the yogi spent 24 hours in the pit, it would indeed be worthy of remark.

Intravenous Procaine

Q.—*What are the indications for intravenous procaine? What unpleasant reactions have been recorded from its use?*

A.—Procaine belongs to a group of compounds known as "alkamine esters," all of which have a similar basic structure. Their main action may resemble that of atropine, curare, an antihistaminic, or a local analgesic. Whatever the main action, they all show the other effects to a lesser degree. Procaine, like several other local analgesics, also has a quinidine-like action on the heart.

Procaine in suitable dilution can therefore be used intravenously for a wide variety of conditions. As a general analgesic, it may be administered for the relief of pain—for example, in burns or after operation. In peripheral vascular disease it is said to be equally as effective as sympathetic block. As an antihistaminic it not only controls the irritation of urticaria but also terminates the attack. Procaine is as potent as quinidine on the heart, and its prophylactic use in cardiac surgery reduces or eliminates serious arrhythmias.

Individual tolerance for procaine varies greatly, and it is advisable to run the intravenous drip slowly, increasing the rate gradually until the desired effects are obtained. As a guide, not less than 15 minutes should be taken to give 0.5 g. (as a 0.2% solution) of the drug to a fit adult. In the debilitated a much longer time should be allowed.

Signs of approaching overdose are tinnitus, aphonia, and tremor. If these are ignored, consciousness may be lost and convulsions ensue. If at any moment the injection is stopped, recovery occurs promptly owing to the rapid breakdown of procaine in the body.

For further information the reader is referred to a recent review of the subject by Mushin, W. W., and Rendell-Baker, L., *Lancet*, 1949, **1**, 619.

Treatment of Epispadias

Q.—*A 5-year-old school-child suffers from dribbling urinary incontinence which accompanies a second-degree epispadias. Operative treatment is postponed till a later age, and parental care is rather poor. What is the best management of such a case, particularly in school? Are any large-sized pads available, and would their use, with ointment, be helpful? What are the chances of a reconstructive operation restoring some degree of continence?*

A.—There are residential schools in some localities which cater for children with these disabilities. Inquiries should be made of the lady almoner at the hospital the child is attending. No special pads are made, and very frequent changes of napkins are needed to prevent the child from getting sore. Soreness is best relieved by putting the child at bedtime on a pad of wool without napkins. Zinc and castor oil ointment should be applied several times a day to hasten healing of the skin. The prospect of regaining sphincteric control after operation is entirely dependent on the extent of the malformation. Unless there are special contraindications the child should be old enough at 5 for operation to be undertaken.

Tumour in Abdominal Wall

Q.—*What is the best treatment for desmoid tumours of the rectus abdominis? A woman of 29 had her first confinement, which was normal, two years ago. During the last three months she has noticed a painless swelling developing just to the left and below the umbilicus. This consists of a hard ovoid tumour about the size of a Jaffa orange; its margins are not too well defined. Histological examination of the tumour is not yet complete. The patient is otherwise perfectly well.*

I understand that x-ray therapy produces only slight response in desmoid tumours, so a radical excision has been recommended. This would prove a formidable undertaking in this patient, and I would like to know if it is the best procedure.

A.—From the description, the tumour in the abdominal wall may prove to be a fibrosarcoma rather than a desmoid. This is the more likely since it appeared almost two years after the pregnancy and seems to have grown very rapidly. This worsens the prognosis. Whichever diagnosis proves correct, the tumour is not likely to prove sensitive to irradiation, and this form of therapy is most suitable as an adjuvant. The mainstay of treatment must be wide excision if this is at all possible, and the gap in the abdominal wall must be closed by flaps of muscle or aponeurosis, appropriate movement of the integument, and by grafting. A preliminary dose of not more than 1,500 r should tend to limit the chance of recurrence, and if surgery is wholly out of the question long-continued therapy at a low dosage is the only alternative.

Guaiacol

Q.—*Is there any danger in the intramuscular injection of guaiacol, made up in either sterilized olive oil or pure chloroform?*

A.—Certainly guaiacol should never be given in chloroform by intramuscular injection. It can be given by this route in olive oil, but even so the injection is not free from danger, and if guaiacol is to be given at all it should be given by mouth. However, in 1938 guaiacol preparations were removed from *New and Nonofficial Remedies* (published by the American Medical Association) because there was no evidence that they have a therapeutic value (*J. Amer. med. Ass.*, 1938, **110**, 209). The toxic effects of guaiacol are similar to those of phenol. Locally it has an irritant action; generally it causes cardiovascular collapse.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.) TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

29-7-50

SECRETARIAT LIBRARY 1 1951 MADRAS GOVERNMENT

SUPPLEMENT

containing

Reports on the Work of the Association

Health Service News

General Medical Council

Meetings of Branches and Divisions

Service Appointments

Correspondence, etc.

VOLUME II, 1950

JULY TO DECEMBER

LONDON

BRITISH MEDICAL ASSOCIATION

TAVISTOCK SQUARE, W.C.1

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 8 1950

British Medical Association

ONE HUNDRED AND EIGHTEENTH ANNUAL MEETING, LIVERPOOL AND SOUTHPORT, JULY 13-21, 1950

President-Elect: Sir HENRY COHEN, M.D., F.R.C.P., F.F.R., J.P., Professor of Medicine, University of Liverpool.
Local General Secretary: T. R. ROBERTON, M.B., CH.B., D.P.H., B.M.A. Regional Office, Medical Institution, Mount Pleasant, Liverpool, 3.
Executive Officer: G. A. PECK, B.Sc., B.M.A. Regional Office, Medical Institution, Mount Pleasant, Liverpool, 3.
Local Science Secretary: A. MACDONALD, M.D., Department of Bacteriology, School of Hygiene, Mount Pleasant, Liverpool, 3.

PROGRAMME

SCIENTIFIC SECTIONS

The clinical and scientific work will be divided among twenty Sections, meeting on Tuesday, Wednesday, Thursday, and Friday, July 18, 19, 20, and 21. All the Sections will meet in the University, apart from the Clinical Demonstrations.

Below is a list of the names of the Sections and officers appointed to each, together with programmes.

ANAESTHETICS

President: KATHARINE LLOYD-WILLIAMS, M.D., F.F.A. R.C.S. (London).

Vice-Presidents: T. CECIL GRAY, M.D., F.F.A. R.C.S., D.A. (Liverpool); N. S. WALLS, M.B., Ch.B., M.Sc., Ph.D., D.A. (Birkdale); H. J. BRENNAN, M.D., F.F.A. R.C.S., D.A. (Manchester).

Hon. Secretaries: J. B. HARGREAVES, M.R.C.S., L.R.C.P., D.A., 17, Beach Lawn, Waterloo, Liverpool, 22; WILLIAM W. MUSHIN, M.B., B.S., F.F.A. R.C.S., D.A., Department of Anaesthetics, The Royal Infirmary, Cardiff.

Official Reporter: Dr. W. W. MUSHIN.

Meeting-place: Lecture Theatre, Physics Building.

Tuesday, July 18.—10 a.m., *Paper:* Applied Pharmacology in Anaesthesia for Abdominal Operations, by Dr. STUART C. CULLEN (U.S.A.). 2.30 p.m., *Paper:* Resuscitation of the Newborn, by Dr. G. ORGANE (London), followed by Dr. R. J. MINNITT (Liverpool). Tea interval, followed by *Paper:* Anaesthesia in the Newborn, by Dr. T. N. P. WILTON (Bristol), followed by Dr. G. JACKSON REES (Liverpool).

Wednesday, July 19.—2.30 p.m., *Papers:* Analgesia in Anaesthesia, by Dr. L. RENDELL-BAKER (Cardiff); Sudden Death during Operation due to Undetected Paraganglioma, by Dr. S. B. DARBISHIRE (Ulverston); An Artificial Respirator, by Dr. J. ESPLEN (Liverpool); Some Therapeutic Applications of Nerve Blocks, by Dr. ERIC STEELE (London).

ANATOMY AND PHYSIOLOGY

President: Professor A. DURWARD, M.D., F.R.S.Ed. (Leeds).

Vice-Presidents: Professor R. A. GREGORY, M.R.C.S., L.R.C.P., Ph.D. (Liverpool); Professor J. M. YOFFEY, D.Sc., M.D., F.R.C.S. (Bristol); Professor G. M. WYBURN, M.B., Ch.B., F.R.F.P.S. (Glasgow).

Hon. Secretaries: T. G. RICHARDS, M.D., "Whiteheys," College Avenue, Formby, Lancs; J. G. WARBRICK, M.B., Ch.B., Department of Anatomy, University of Glasgow, Glasgow.

Official Reporter: Professor J. M. YOFFEY.

Meeting-place: Anatomy Theatre, Medical Building.

Wednesday, July 19.—10 a.m., (1) *Film:* The Lymphatics, by Professor J. M. YOFFEY (Bristol). (2) *Discussion:* Tissue Grafting. To be opened by Professor G. M. WYBURN (Glasgow). 2.30 p.m., *Symposium* on Histology and Physiology of the Suprarenal Cortex. To be opened by Dr. M. H. POWER (Mayo Clinic, U.S.A.), Biochemical Studies of Patients with Hypofunction or Hyperfunction of the Adrenal Cortex; followed by Mr. K. C. RICHARDSON (London), Histology and Histochemistry of the Adrenal Cortex; Dr. G. W. HARRIS (Cambridge), Neural Control of A.C.T.H. Secretion; Dr. M. VOGT (Edinburgh), Control of the Activity of the Adrenal Cortex; and Professor J. M. YOFFEY (Bristol), The Adrenal Cortex and Lymphoid Tissue.

CHILD HEALTH

President: Professor NORMAN B. CAPON, M.D., F.R.C.P. (Liverpool).

Vice-Presidents: R. W. BROOKFIELD, M.D., F.R.C.P., Ph.D., D.P.H. (Liverpool); Professor WILFRID GAISFORD, M.D., F.R.C.P. (Manchester); WILFRID SHELDON, M.D., F.R.C.P. (London).

Hon. Secretaries: JOHN D. HAY, M.D., M.R.C.P., D.C.H., 12, Rodney Street, Liverpool, 1; GEORGE NEWNS, M.D., M.R.C.P., 27, Devonshire Place, London, W.1.

Official Reporter: Professor W. S. CRAIG.

Meeting-place: Chemistry Theatre, Gossage Buildings.

Tuesday, July 18.—10 a.m., *Discussion:* The General Care of the Physically Handicapped Child. To be opened by Dr. C. D. S. AGASSIZ (Carshalton), Clinical Aspects; followed by Dr. H. M. COHEN (Birmingham), Administrative Aspects; Dr. M. D. SHERIDAN (London), Aspects of the Handicap of Deafness; and Dr. ALAN MABERLY (London), Psychological Aspects.

Wednesday, July 19.—10.15 a.m., *Clinical Demonstration* at Child Health Department, Alder Hey Hospital, Liverpool. 2 p.m., *Discussion:* Surgical Conditions in the Newly Born: Diagnosis, Prognosis, and Treatment. To be opened by Mr. DENIS BROWNE (London), followed by Mr. R. H. FRANKLIN (London) and Dr. G. J. REES (Liverpool), Anaesthetic Aspects.

Thursday, July 20.—10 a.m., *Discussion:* Breast-feeding. To be opened by Dr. F. C. NAISH (York), The Achievement of Successful Breast-feeding; followed by Dr. H. K. WALLER (Tunbridge Wells), Mr. K. C. RICHARDSON (London), and Mr. E. C. FAHMY (Edinburgh). 4 p.m., The Dawson Williams Prize Lecture by Professor A. A. MONCRIEFF (London), Child Health and the Future.

Friday, July 21.—10 a.m., *Discussion:* Epidemiology in Relation to Child Health. To be opened by Professor S. G. GRAHAM (Edinburgh), Infection in the Maternity Hospital; followed by Dr. W. N. PICKLES (Aysgarth), Infection in the Private House; Dr. R. McL. TODD (Liverpool), Infection in the Hospital Ward; Dr. K. M. HIRST (London), Infection in Nurseries; and Dr. J. C. RYLE (Shrewsbury), Infection in Schools.

DERMATOLOGY

President: R. STOPFORD-TAYLOR, D.S.O., M.B., Ch.B., F.R.C.S.Ed. (Liverpool).

Vice-Presidents: GODFREY BAMBER, M.D., F.R.C.P. (Liverpool); JOHN FRANKLIN, M.D., M.R.C.P. (London); A. O. FERGUSSON ROSS, M.D., D.P.H. (Liverpool); C. W. MACKENZIE, M.B., B.Ch., M.R.C.P. (York).

Hon. Secretaries: NETTA HAY, M.D., 12, Rodney Street, Liverpool; GEOFFREY A. HODGSON, M.B.E., M.D., 143, Cathedral Road, Cardiff.

Official Reporter: Dr. J. T. INGRAM.

Wednesday, July 19. Meeting-place: School of Tropical Medicine (Combined Meeting with Section of Tropical Medicine).—10 a.m., *Discussion:* Parasitology in Relation to Dermatology. To be opened by Professor R. M. GORDON (Liverpool) and Dr. R. M. B. MCKENNA (London). Invited speakers: Colonel NAPIER, Brigadier BOYD, and Dr. DOUGLAS FRESHWATER (Liverpool).

Thursday, July 20. Meeting-place: Chemistry Theatre, Muspratt Laboratories.—10 a.m., *Discussion:* The Uses and Abuses of Chemotherapy in the Treatment of Venereal Diseases. To be opened by Dr. ROBERT LEES (Manchester) and Dr. S. M. LAIRD (Ipswich). Invited speakers: Dr. D. J. CAMPBELL (Sheffield), Dr. D. I. WILLIAMS (London), and Dr. A. S. WIGFIELD (Worcester). Afternoon, (1) Dermatological Clinical Meeting in Liverpool Royal Infirmary. (2) Venereological Clinical Meeting, Demonstrations of Cases of Lymphogranuloma Venereum and Chancroid.

DISEASES OF THE CHEST AND TUBERCULOSIS

President: H. MORRISTON DAVIES, M.D., M.Ch., F.R.C.S. (Ruthin).

Vice-Presidents: O. F. THOMAS, M.R.C.P., D.P.H. (Liverpool); T. HOLMES SELLORS, D.M., M.Ch., F.R.C.S. (London); J. L. LIVINGSTONE, M.D., F.R.C.P. (London).

Hon. Secretaries: F. RONALD EDWARDS, M.D., Ch.M., F.R.C.S., 75, Rodney Street, Liverpool, 1; A. F. FOSTER-CARTER, D.M., Brompton Hospital Sanatorium, Frimley, Aldershot, Hants.

Official Reporter: Dr. A. F. FOSTER-CARTER.

Meeting-place: Surgery Theatre, Medical Building.

Wednesday, July 19.—10 a.m., *Discussion:* Resection of Lung for Pulmonary Tuberculosis. To be opened by Dr. O. F. THOMAS (Liverpool), followed by Mr. RONALD EDWARDS (Liverpool), Mr. JOHN BICKFORD (Liverpool), and Mr. J. R. BELCHER (London). 2.30 p.m., *Discussion:* The Clinical Interpretation of Pain in the Chest. To be opened by Dr. DONALD LEEMING (Southport), followed by Dr. RHODES ALLISON (Manchester).

Thursday, July 20 (Combined Meeting with Section of Preventive Medicine).—10 a.m., *Discussion:* The Care of the Tuberculosis Patient in the Home. To be opened by Professor F. R. G. HEAF (Cardiff), followed by Dr. R. GRENVILLE-MATHERS (Wallasey) and Dr. W. GRAY (Liverpool). 2.30 p.m., *Clinical-Pathological Demonstration* given by the members of the staff of the Liverpool Thoracic Surgery Centre at Aintree Hospital.

GERIATRICS

President: C. O. STALLYBRASS, M.D. (Heswall).

Vice-Presidents: J. P. HERON, M.Ch.Orth., F.R.C.S. (Huyton, near Liverpool); J. H. SHELDON, M.D., F.R.C.P. (Wolverhampton); MARJORY W. WARREN, M.R.C.S., L.R.C.P. (Isleworth).

Hon. Secretaries: ROBERT KEMP, M.D., M.R.C.P., Newsham General Hospital, Anfield, Liverpool, 6; L. Z. COSIN, F.R.C.S., Oxford United Hospitals, Cowley Road, Oxford.

Official Reporter: Dr. TREVOR HOWELL.

Meeting-place: Lecture Theatre, Physics Building.

Thursday, July 20.—10 a.m., *Discussion:* Activity in Advancing Age. To be opened by Dr. MARJORY WARREN (West Middlesex Hospital), followed by Mr. J. P. HERON (Liverpool), Orthopaedic Disabilities; Dr. TREVOR HOWELL (Battersea), Arthritic Difficulties; Dr. HIRSCH (Brussels), Arteriosclerosis; Dr. ROBERT EVANS (Liverpool), Pulmonary Fibrosis; *Occasional Paper:* Mortality in Geriatric Surgery, by Dr. LOUIS CARP (New York). 2 p.m., *Clinical Demonstration* at Newsham General Hospital (late Belmont Road Hospital).

Friday, July 21.—10 a.m., *Discussion:* The Link between Hospital and General Practice in the Treatment of Elderly Patients. To be opened by Dr. C. T. ANDREWS (Truro), followed by Dr. VISCHER (Basle), Dr. I. HARRIS (Bootle), Dr. A. FRANKLIN (Garston), Dr. E. L. ROBERTS (Formby), and Dr. K. B. GIBSON (Liverpool). 2 p.m., *Clinical Symposium* on the Overall Care of Old People in the Community. To be held at Fleetwood Road Hospital, Southport.

MEDICAL GENETICS

President: C. P. BLACKER, M.D., F.R.C.P. (London).

Vice-Presidents: Professor L. S. PENROSE, M.D. (London); Professor A. SORSBY, M.D., F.R.C.S. (London); J. A. FRASER ROBERTS, M.D., F.R.C.P. (London).

Hon. Secretary: C. O. CARTER, B.M., B.Ch., M.R.C.P., Department of Morbid Anatomy, Hospital for Sick Children, Great Ormond Street, London, W.C.1.

Official Reporter: Dr. J. A. FRASER ROBERTS.

Meeting-place: Anatomy Theatre, Medical Building.

Thursday, July 20.—10 a.m., *Discussion:* Contribution of Genetics to Medical Practice. To be opened by Professor L. S. PENROSE (London), followed by Dr. R. R. RACE (London), Some Practical Aspects of Blood-group Genetics; Dr. J. A. FRASER ROBERTS (London), A Clinic for Genetic Advice; and concluded by Professor F. A. E. CREW (Edinburgh).

MEDICINE

President: E. N. CHAMBERLAIN, M.D., F.R.C.P. (Liverpool).

Vice-Presidents: H. S. PEMBERTON, F.R.C.P. (Liverpool); Professor ROBERT PLATT, M.D., F.R.C.P. (Manchester); P. H. O'DONOVAN, M.D., F.R.C.P. (Nottingham).

Hon. Secretaries: E. WYN JONES, M.D., F.R.C.P., D.P.H., 31, Rodney Street, Liverpool, 1; C. ALLAN BIRCH, M.D., F.R.C.P., D.C.H., Millside, Slades Hill, Enfield, Middlesex.

Official Reporter: Dr. K. M. A. PERRY.

Tuesday, July 18. Meeting-place: Arts Theatre, Victoria Building.—10 a.m., *Discussion:* Modern Conceptions and Therapeutics of Cardiac Failure. To be opened by Professor E. P. SHARPEY-SCHAFER (London), followed by Dr. RICHARD BAYLISS (London), Dr. PAUL WOOD (London), and Dr. WILLIAM EVANS (London).

Wednesday, July 19. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Surgery).—10 a.m., *Discussion:* Ulcerative Colitis. To be opened by Professor T. L. HARDY (Birmingham) and Mr. A. HEDLEY WHYTE (Newcastle), followed by Dr. J. W. PAULLEY (Ipswich) and Mr. HAROLD C. EDWARDS (London). 2.30 p.m. (Combined Meeting with Section of Pathology and Bacteriology), *Discussion:* Atypical Pneumonia. To be opened by Professor C. H. STUART-HARRIS (Sheffield) and Professor S. P. BEDSON (London), followed by Dr. THOMAS ANDERSON (Glasgow), Dr. JANET NIVEN (London), and Dr. M. G. P. STOKER (Cambridge).

Thursday, July 20. Meeting-place: Lecture Theatre, Engineering Building.—10 a.m., *Discussion:* Antihistamine Compounds. To be opened by Professor J. H. BURN (Oxford), Pharmacological Aspect; and Professor D. M. DUNLOP (Edinburgh), Clinical Aspect; followed by Dr. LESLIE GAY (Baltimore). *Occasional Paper:* Present Position with Regard to Vitamin B_{12}, by Dr. J. F. WILKINSON (Manchester), followed by Dr. DOUGLAS RIDING (Liverpool).

NEUROLOGY

President: Professor Sir HUGH CAIRNS, K.B.E., D.M., F.R.C.S. (Oxford).

Vice Presidents: S. P. MEADOWS, M.D., F.R.C.P. (London); HUGH GARLAND, T.D., M.D., F.R.C.P. (Leeds); G. F. ROWBOTHAM, F.R.C.S. (Newcastle-upon-Tyne).

Hon. Secretary: A. SUTCLIFFE KERR, F.R.C.S., 75, Rodney Street, Liverpool, 1.

Official Reporter: Dr. T. ROWLAND HILL.

Meeting-place: Room 31, 1st Floor, Victoria Building.

Thursday, July 20.—10 a.m., *Discussion:* The Diagnosis and Treatment of Pain in the Upper Limb. To be opened by Dr. M. J. MCARDLE (London) and Dr. M. KREMER (London) on the medical aspect, followed by Dr. J. W. D. BULL (London) (radiological), Mr. W. R. HENDERSON (Leeds) (neurosurgical), Mr. D. LLOYD GRIFFITHS (Manchester) (orthopaedic), and Mr. D. M. MORRISSEY (Birmingham) (costoclavicular syndrome). 2 p.m., Visit to the Spinal Injury Unit at Southport Promenade Hospital. Short Talks by Mr. A. SUTCLIFFE KERR (Liverpool) (general management of paraplegia) and Mr. J. COSBIE ROSS (Liverpool) (urological aspect of paraplegia); followed by demonstrations in the wards, Physiotherapy and Recreational Departments.

Friday, July 21.—10 a.m., *Discussion:* The Treatment of Parkinsonism. To be opened by Dr. HUGH GARLAND (Leeds) and Dr. G. E. SMYTH (Manchester), on the medical aspect, followed by Dr. DENIS LEIGH (London) (new drugs and psychological) and Professor GEOFFREY JEFFERSON (Manchester) (neurosurgical).

OBSTETRICS AND GYNAECOLOGY

President: A. A. GEMMELL, M.D., F.R.C.S.Ed., F.R.C.O.G. (Liverpool).

Vice-Presidents: E. CHALMERS FAHMY, M.B., Ch.B., F.R.C.S.Ed., F.R.C.P.Ed., F.R.C.O.G. (Edinburgh); CHARLES D. READ, M.B., F.R.C.S.Ed., F.R.C.O.G. (London); PERCY MALPAS, M.B., Ch.B., Ch.M., F.R.C.O.G. (Liverpool).

Hon. Secretaries: C. MCINTOSH MARSHALL, M.B., F.R.C.S., 84, Rodney Street, Liverpool, 1; IAN JACKSON, M.B., Ch.B., F.R.C.S., M.R.C.O.G., 104, Harley Street, London, W.1.

Official Reporter: Mr. C. GORDON LENNON.

Meeting-place: Lecture Theatre, Engineering Building.

Tuesday, July 18.—10 a.m., *Discussion:* Tuberculosis and Pregnancy. (*a*) Genital Tuberculosis, by Mr. J. STALLWORTHY (Oxford); (*b*) Phthisis and Pregnancy, by Dr. R. C. COHEN (Braintree).

Wednesday, July 19.—10 a.m., *Discussion:* Prevention of Prolapse. (*a*) The Prophylactic Use of Forceps, by Professor R. A. LENNIE (Glasgow); (*b*) Episiotomy, by Mr. J. D. FLEW (London); (*c*) Delivery after Repairs, by Mr. BRYAN WILLIAMS (Middlesbrough); (*d*) Value of Antenatal Exercises, by Mr. R. NEWTON (Manchester). 2.30 p.m., *Discussion:* Certain Common Obstetrical and Gynaecological Problems. (*a*) Postmaturity. To be opened by Mr. C. J. K. HAMILTON (Liverpool) and Mr. W. MILLS (Birmingham); (*b*) Diagnosis of Early Pregnancy, by Mr. F. STABLER (Newcastle-upon-Tyne); (*c*) Postmenopausal Bleeding, by Professor A. M. CLAYE (Leeds).

OCCUPATIONAL HEALTH

President: DONALD HUNTER, M.D., F.R.C.P. (London).

Vice-Presidents: A. THELWALL JONES, M.D., M.R.C.P., D.P.H. (Liverpool); M. W. GOLDBLATT, M.D., D.I.H. (Welwyn); LESLIE NORMAN, M.D., M.R.C.P., D.P.H. (London).

Hon. Secretaries: EDMUND HOLLAND, M.R.C.S., L.R.C.P., Medical Director, Mersey Docks Medical Service, Dock Office, Liverpool, 3; R. S. F. SCHILLING, M.D., D.P.H., D.I.H., Nuffield Department of Occupational Health, University of Manchester, Manchester, 13.

Official Reporter: Dr. R. S. F. SCHILLING.

Meeting-place: Lecture Theatre, Arts Building.

Tuesday, July 18.—10 a.m., *Discussion:* Organic Phosphorus Insecticides. To be opened by Dr. P. LESLEY BIDSTRUP (London), The Symptoms, Signs, and Treatment of Poisoning by Organic Phosphorus Insecticides; followed by Dr. F. A. DENZ (Carshalton), Toxicology of the Organic Phosphorus Insecticides as Judged by Animal Experiments.

Wednesday, July 19.—10 a.m., *Discussion:* Medical Examination in Industry. To be opened jointly by Dr. LESLIE NORMAN (London) and Dr. THELWALL JONES (Liverpool).

OPHTHALMOLOGY

President: A. MCKIE REID, *M.C.*, T.D., F.R.C.S., D.O.M.S. (Liverpool).

Vice-Presidents: W. M. MUIRHEAD, M.B., Ch.B., D.O.M.S. (Sheffield); P. ELDON GORST, M.D. (Liverpool); J. R. WHEELER, F.R.C.S. (Belfast).

Hon. Secretary: D. L. CHARTERS, M.B.E., M.B., Ch.B., D.O.M.S., 66, Shrewsbury Road, Birkenhead, Cheshire.

Official Reporter: Mr. HARRY COOPER.

Meeting-place: Lecture Theatre, Physiology Building.

Tuesday, July 18.—10 a.m., *Papers:* Radiation, Light, and Illumination, by Dr. J. N. ALDINGTON (Preston). 11 a.m., Refraction Clinics, by Mr. P. ELDON GORST (Liverpool). 12 noon, Colour-vision in the Central Fovea, by Dr. E. N. WILLMER (Cambridge). St. Paul's Eye Hospital, Old Hall Street, will be open for inspection during the afternoon of Tuesday, July 18, by members of the Section.

ORTHOPAEDICS

President: B. L. MCFARLAND, M.Ch., F.R.C.S. (Liverpool).

Vice-Presidents: NORMAN ROBERTS, M.B., Ch.B., F.R.C.S. (Liverpool); H. OSMOND-CLARKE, C.B.E., M.B., B.Ch., F.R.C.S. (London); H. J. SEDDON, D.M., F.R.C.S. (London).

Hon. Secretaries: GORONWY E. THOMAS, M.B., Ch.B., M.Ch., F.R.C.S.Ed., 31, Rodney Street, Liverpool, 1; K. I. NISSEN, M.D., F.R.C.S., 140, Harley Street, London, W.1.

Official Reporter: Mr. NORMAN CAPENER.

Meeting-place: Lecture Theatre, Physiology Building.

Wednesday, July 19.—10 a.m., *Discussion:* Tuberculous Arthritis of the Hip-joint. To be opened by Mr. H. J. SEDDON (London), followed by Mr. R. S. GARDEN (Preston), Clinical Features; Mr. DILWYN EVANS (Cardiff), Conservative Treatment; Mr. E. WARDLE (Liverpool), Surgical Treatment; and Dr. J. DOBSON (Wrightington), Prognosis.

Thursday, July 20.—9.30 a.m., (1) Treatment of the Short Leg. Mr. G. E. THOMAS (Liverpool), General Features; Mr. F. G. ALLAN (Birmingham), Surgical Lengthening; and Mr. A. L. EYRE-BROOK (Bristol), Surgical Shortening. (2) Professor W. MERCER (Edinburgh), Acute Osteomyelitis; Mr. H. OSMOND-CLARKE (London), Hidden Dislocations; Mr. F. W. HOLDSWORTH (Sheffield), Supracondylar Fracture of the Humerus; and Mr. N. ROBERTS (Liverpool), Treatment of Trochanteric Fractures of the Femur.

Friday, July 21.—2 p.m., *Clinical Demonstration* at the Royal Infirmary.

OTO-RHINO-LARYNGOLOGY

President: I. SIMSON HALL, M.B., Ch.B., F.R.C.P.Ed., F.R.C.S.Ed. (Edinburgh).

Vice-Presidents: TERENCE CAWTHORNE, F.R.C.S. (London); Professor VICTOR LAMBERT, M.D., Ch.M., F.R.C.S. (Manchester); JOHN MCGIBBON, O.B.E., M.B., B.S., D.L.O., J.P. (Liverpool).

Hon. Secretaries: BARBARA M. L. ABERCROMBY, M.B., B.S., D.L.O., 65, Rodney Street, Liverpool, 1; R. B. LUMSDEN, M.B., Ch.B., F.R.C.S.Ed., 35, Drumsheugh Gardens, Edinburgh, 3.

Official Reporter: Mr. NORMAN JORY.

Thursday, July 20. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Radiology).—2.30 p.m., *Discussion:* Carcinoma of the Larynx. To be opened jointly by Dr. M. LEDERMAN (London) and Mr. C. P. WILSON (London), followed by Dr. J. J. STEVENSON (London) and Professor V. LAMBERT (Manchester).

Friday, July 21. Meeting-place: Lecture Theatre, Arts Building.—10 a.m., *Discussion:* Deafness in Children. To be opened by Mr. R. R. SIMPSON (Hull), followed by Mr. J. H. OTTY (Bradford) and Dr. T. S. LITTLER (London).

PATHOLOGY AND BACTERIOLOGY

President: Professor H. L. SHEEHAN, M.D., D.Sc., F.R.C.P., F.R.C.O.G. (Liverpool).

Vice-Presidents: Professor A. W. DOWNIE, M.D., D.Sc. (Liverpool); W. H. GRACE, M.D., F.R.C.P. (Hoole Village, near Chester); J. V. WILSON, M.D., M.R.C.P. (Harrogate).

Hon. Secretaries: CHARLES A. ST. HILL, M.B., Ch.B., Royal Southern Hospital, Fazakerley, Liverpool, 9; GEORGE DISCOMBE, M.D., Central Middlesex Hospital, Acton Lane, London, N.W.10.

Official Reporter: Professor ROBERT CRUIKSHANK.

Tuesday, July 18.—9.30 a.m., Opening of Pathological Museum, Department of Pathology, University, by Professor

H. L. SHEEHAN (Liverpool). 10 a.m., *Meeting-place:* Anatomy Theatre, Medical Building, *Discussion:* Recent Advances Made with the Aid of New Methods of Microscopy. *Speakers:* Dr. R. BARER (Oxford), Dr. A. F. HUGHES (Cambridge), Dr. A. S. MACFARLANE (Hampstead), and Mr. J. SMILES (Hampstead).

Wednesday, July 19. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Medicine).—2.30 p.m., *Discussion:* Atypical Pneumonia. To be opened by Professor C. H. STUART-HARRIS (Sheffield) and Professor S. P. BEDSON (London), followed by Dr. THOMAS ANDERSON (Glasgow), Dr. JANET NIVEN (London), and Dr. M. G. P. STOKER (Cambridge).

Thursday, July 20. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Surgery).—10 a.m., *Discussion:* Renal Failure. To be opened by Professor IAN AIRD (London) and Professor J. H. DIBLE (London), followed by Dr. E. M. DARMADY (Portsmouth), Dr. G. M. BULL (with Dr. A. M. JOEKS and Dr. K. G. LOWE) (London), and Mr. R. W. REID (Colchester).

PREVENTIVE MEDICINE

President: Professor W. M. FRAZER, O.B.E., M.D., M.Sc., D.P.H. (Liverpool).

Vice-Presidents: Professor F. GRUNDY, M.D., D.P.H. (Cardiff); Professor A. BRADFORD HILL, D.Sc., Ph.D. (London); RONALD B. BERRY, M.D., D.P.H. (Wallasey).

Hon. Secretaries: ANDREW B. SEMPLE, M.D., D.P.H., Public Health Department, Gordon House, Belmont Grove, Liverpool, 6; S. C. GAWNE, M.D., D.C.H., D.P.H., Health Department, County Offices, Preston.

Official Reporter: Dr. HAMILTON HOGBEN.

Tuesday, July 18. Meeting-place: Chemistry Theatre, Muspratt Laboratories.—10 a.m., *Discussion:* Social Medicine. To be opened by Professor J. M. MACKINTOSH (London), followed by Dr. J. KERSHAW (Colchester) and Dr. F. HALL (Lancashire County).

Wednesday, July 19. Meeting-place: Chemistry Theatre, Muspratt Laboratories.—10 a.m., *Discussion:* Social Medicine from the Point of View of the Medical Officer of Health. To be opened by Dr. FRASER BROCKINGTON (Yorkshire County, West Riding), followed by Dr. J. GREENWOOD WILSON (Cardiff).

Thursday, July 20. Meeting-place: Surgery Theatre, Medical Building (Combined Meeting with Section of Diseases of Chest and Tuberculosis).—10 a.m., *Discussion:* The Care of the Tuberculosis Patient in the Home. To be opened by Professor F. R. G. HEAF (Cardiff), followed by Dr. R. GRENVILLE-MATHERS (Wallasey) and Dr. W. GRAY (Liverpool).

PSYCHIATRY

President: Professor Sir DAVID K. HENDERSON, M.D., P.R.C.P.Ed. (Edinburgh).

Vice-Presidents: F. HOPKINS, M.D. (Liverpool); Professor T. FERGUSON RODGER, M.B., Ch.B., F.R.C.P.Ed., D.P.M. (Glasgow); THOMAS A. MUNRO, M.D., F.R.C.P.Ed., D.P. (London).

Hon. Secretaries: MURIEL BARTON HALL, M.D., 41, Rodney Street, Liverpool, 1; E. HOWARD KITCHING, M.D., M.R.C.P., D.P.M., 22, St. John Street, Manchester, 3.

Official Reporter: Dr. ELIOT SLATER.

Meeting-place: Room 31, 1st Floor, Victoria Building.

Tuesday, July 18.—10 a.m., *Discussion:* The Psychological Involvements of Child-bearing. To be opened by Dr. EDWARD GLOVER (London), followed by Professor W. I. C. MORRIS (Manchester), Professor E. W. ANDERSON (Manchester), and Dr. ELIZABETH TYLDEN (London).

Wednesday, July 19.—10 a.m., *Discussion:* The Role of the Psychiatric Social Worker. To be opened by Dr. J. B. S. LEWIS (London), followed by Professor D. R. MACCALMAN (Leeds), Miss K. M. LEWIS, and Miss E. THOMAS. 2.15 p.m., *Clinical Demonstration:* Modern Techniques in Child Psychiatry, including electroencephalography, psychometry, projection techniques, speech therapy, serial drawings, and puppetry at Liverpool Psychiatric Clinic, 10, Croxteth Road, Liverpool, 8. (Tea will be provided.)

RADIOLOGY

President: J. S. FULTON, C.B.E., T.D., M.D., F.R.C.P.Ed., F.F.R., D.R.Ed. (Liverpool).

Vice-Presidents: P. H. WHITAKER, M.D., D.M.R.E. (Liverpool); R. FAWCETT, M.D., F.F.R. (Ulverston); Professor A. S. JOHNSTONE, M.D., F.R.C.S., F.F.R. (Leeds).

Hon. Secretaries: E. L. RUBIN, M.D., F.F.R., D.M.R.E., 57, Rodney Street, Liverpool, 1; F. E. CHESTER-WILLIAMS, M.R.C.S., L.R.C.P., F.F.R., Regional Radium Institute, Royal Infirmary, Bradford.

Official Reporter: Dr. J. W. D. BULL.

Thursday, July 20.—10 a.m., *Meeting-place:* Lecture Theatre, Arts Building. *Discussion:* Some Aspects of Bronchiectasis. To be opened by Dr. J. C. H. MACKENZIE (Leicester) followed by Dr. F. WHITWELL (Liverpool) and Dr. F. J. PRIME (Liverpool). 2.30 p.m., *Meeting-place:* Arts Theatre, Victoria Building (Combined Meeting with Section of Oto-Rhino-Laryngology). *Discussion:* Carcinoma of the Larynx. To be opened jointly by Dr. M. LEDERMAN (London) and Mr. C. P. WILSON (London), followed by Dr. J. J. STEVENSON (London) and Professor V. LAMBERT (Manchester).

SURGERY

President: Professor CHARLES WELLS, F.R.C.S. (Liverpool).

Vice-Presidents: J. B. OLDHAM, F.R.C.S. (Liverpool); Professor R. MILNES WALKER, M.S., F.R.C.S. (Bristol); L. R. BROSTER, O.B.E., D.M., M.Ch., F.R.C.S. (London).

Hon. Secretaries: W. M. BEATTIE, M.Chir., F.R.C.S., 45, Druids Cross Gardens, Liverpool, 18; REGINALD S. MURLEY, M.S., F.R.C.S., St. Bartholomew's Hospital, London, E.C.1.

Official Reporter: Professor IAN AIRD.

Tuesday, July 18. Meeting-place: Surgery Theatre, Medical Building.—10 a.m., *Discussion:* "Varicose" Ulceration. To be opened by Dr. GUNNAR BAUER (Mariestad, Sweden), followed by Professor A. M. BOYD (Manchester), Dr. STUART MCAUSLAND (Liverpool), and Mr. A. C. BREWER (Liverpool).

Wednesday, July 19. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Medicine).—10 a.m., *Discussion:* Ulcerative Colitis. To be opened by Professor T. L. HARDY (Birmingham) and Mr. A. HEDLEY WHYTE (Newcastle), followed by Dr. J. W. PAULLEY (Ipswich) and Mr. HAROLD C. EDWARDS (London).

Thursday, July 20. Meeting-place: Arts Theatre, Victoria Building (Combined Meeting with Section of Pathology and Bacteriology).—10 a.m., *Discussion:* Renal Failure. To be opened by Professor IAN AIRD (London) and Professor J. H. DIBLE (London), followed by Dr. E. M. DARMADY (Portsmouth), Dr. G. M. BULL (with Dr. A. M. JOEKS and Dr. K. G. LOWE) (London), and Mr. R. W. REID (Colchester).

Friday, July 21. Meeting-place: Surgery Theatre, Medical Building.—10 a.m., *Discussion:* Burns. To be opened jointly by Mr. R. P. OSBORNE (Liverpool) and Mr. J. P. REIDY (London), followed by Mr. A. B. WALLACE (Edinburgh) and Dr. HERBERT M. BAITINGER (Gary, Indiana).

TROPICAL MEDICINE

President: Professor R. M. GORDON, O.B.E., M.D., Sc.D., F.R.C.P. (Liverpool).

Vice-Presidents: Professor T. H. DAVEY, O.B.E., M.D., D.T.M. (Liverpool); A. R. D. ADAMS, M.D., F.R.C.P., D.T.M. (Liverpool); J. S. K. BOYD, O.B.E., M.D., D.P.H. (London).

Hon. Secretary: D. R. SEATON, M.B., M.R.C.P., D.T.M., School of Tropical Medicine, Pembroke Place, Liverpool, 3.

Official Reporter: Dr. F. HAWKING.

Meeting-place: School of Tropical Medicine.

Wednesday, July 19 (Combined Meeting with Section of Dermatology).—10 a.m., *Discussion:* Parasitology in Relation to Dermatology. To be opened by Professor R. M. GORDON (Liverpool) and Dr. R. M. B. MCKENNA (London).

Thursday, July 20.—10 a.m., *Discussion:* Intestinal Parasites of Man in Great Britain. To be opened by Professor J. J. C. BUCKLEY (London) and Dr. C. A. HOARE (London).

REGISTRATION FEE AT ANNUAL MEETINGS

The expenditure arising in connexion with the Annual Meeting has in the past been met from a guarantee fund raised by the local profession, supplemented by a grant from the Council of the Association. The Council considers that the time has come when the proportion of the expenses falling upon the local profession should be minimized. With this object in view the Council, while continuing the central grant, has decided that members attending the Annual Meeting (other than members of the Representative Body and overseas visitors) should be asked to pay a fee of one guinea towards the expenses of the Meeting. The fee of one guinea will be payable when members register at the Reception Office, St. George's Hall, Liverpool.

BADGES

Members will not be admitted to the Scientific Sections unless wearing badges. They should therefore make a point of being at the Reception Office, St. George's Hall, by *9.30 a.m.* on the first day of their attendance at the Annual Meeting in order to register and obtain their handbook, badge, registration card, and tickets.

Officers of Scientific Sections should inquire for special badges at the Reception Office.

TICKETS

It is regretted that no tickets for functions or excursions can be issued in advance.

All tickets for functions at Southport will be available from July 13 at the A.R.M. Inquiry Office, Floral Hall, or at the Ladies' Club, Prince of Wales Hotel.

All tickets for functions at Liverpool will be available from July 17 at the Reception Office, St. George's Hall, or at the Ladies Club, Adelphi Hotel.

REGULATIONS REGARDING DRESS

Robes with hoods (scarlet, if available) are to be worn at: the Official Religious Service, Tuesday, July 18, at 3 p.m.; the President's Address, Tuesday, July 18, at 8.30 p.m.; and the President's Reception, Tuesday, July 18, at 9.30 p.m.

Robes are *not* to be worn at Civic Receptions at Liverpool or Southport.

Robes may be hired from Messrs. Ede and Ravenscroft, Ltd., 93, Chancery Lane, W.C.2, or Messrs. Ravenscroft and Willis, 4, Hardman Street, Liverpool, 1, and early application is advised, as the supply of gowns is limited. A representative of Messrs. Ravenscroft and Willis will be in attendance at each of the functions at which robes will be worn.

Evening Dress (Tails or Dinner Jacket) with Decorations is to be worn at the President's Reception, Annual Dinner, and both Liverpool and Southport Civic Receptions.

Evening Dress without Decorations should be worn at the Representatives' Dinner and the Representatives' Dance.

OFFICIAL RELIGIOUS SERVICE

The Official Religious Service will be held in Liverpool Cathedral on Tuesday, July 18, at 3 p.m. and the sermon will be given by The Right Rev. The Lord Bishop of Birmingham. Those wishing to take part in the Procession should be at St. James' Schools (opposite Cathedral main door) at 2.15 p.m. prompt. The procession will move off at 2.45 p.m. Members not taking part in the procession and members of the public should be in their seats in the Cathedral by 2.30 p.m.

CAR PARKING

Windscreen labels may be obtained at the Reception Offices in Southport and Liverpool.

Free Car Parking is available in Southport on the Foreshore, Sea Bathing Lake, Floral Hall, Pleasureland, and Eastbank Street.

The charge for car parking in Liverpool is 6d. a day up to 6 p.m. and 1s. after 6 p.m.

SOUTHPORT CORPORATION FACILITIES

The Southport Corporation has kindly offered the free use of the following amenities, and tickets will be available at the A.R.M. Inquiry Office and at the Ladies' Club: Bowling Greens, Victoria Park (weekdays only); Tennis Courts, Victoria Park: Municipal Golf Links, Park Road; Pitch and Putt Course, Princes Park (weekdays only); Sea Bathing Lake, Princes Park: Pier; Deck and other chairs on the Foreshore, the Promenade, and for Band performances in the Municipal Gardens and the Floral Hall Gardens; Car parks on the Foreshore and at the Sea Bathing Lake, Floral Hall, Pleasureland, and Eastbank Street.

BANKING FACILITIES

The Westminster Bank will have a temporary office at the Annual Meeting Exhibition at Liverpool this year, where full banking services will be available for the convenience of exhibitors and the medical profession attending the meeting. Mr. G. W. Hales, manager of the Tavistock Square Branch, will be in charge of this office and will welcome any inquiries.

TIME-TABLE OF MEETING

Key

R—Events available for members of Representative Body and Ladies accompanying them.
L—Events primarily arranged for Ladies.
U—Events for all Members and Ladies accompanying them.
*Academic Robes should be worn.

SOUTHPORT

Wednesday, July 12

8.30 to 10.30 p.m.—R. Sherry Party (by invitation of Southport Division)—Floral Hall, Southport.

Thursday, July 13

9.00 a.m.—A.R.M. Inquiry Office open—Floral Hall, Southport.
9.30 a.m.—Ladies' Club open for registration—Prince of Wales Hotel.
10.00 a.m.—*Annual Representative Meeting*—Floral Hall.
11.00 a.m.—Civic Welcome to Representatives—Floral Hall.
1.00 p.m.—Lunch to Overseas Representatives—Prince of Wales Hotel.
1.30 to 5.45 p.m.—L.1. Visit to Horrockses Cotton Mills, Preston. Ticket 6s., including Tea.
2.30 to 5.30 p.m.—L.2. Coach Tour to Rufford. Ticket 6s., including Tea.
7.00 for 7.30 p.m.—R. Representatives' Dinner—Prince of Wales Hotel. Ticket 15s., including wine.
7.00 for 7.30 p.m.—L. Representatives' Ladies' Dinner, Palace Hotel. Ticket 15s., excluding wine.
9.30 p.m.—Representatives' Dance—Palace Hotel. Ticket 5s.

Friday, July 14

9.00 a.m.—A.R.M. Inquiry Office open—Floral Hall.
9.30 a.m.—*Annual Representative Meeting*—Floral Hall.
9.30 a.m.—Ladies' Club open—Prince of Wales Hotel.
10.00 a.m.—L.3. Coach Tour to Rufford. Ticket 4s. 6d.
1.30 to 5.45 p.m.—L.4. Visit to Horrockses Cotton Mills, Preston. Ticket 6s., including Tea.
2.00 to 6.00 p.m.—L.5. Coach Tour to Wirral and Chester. Ticket 11s., including Tea.
8.30 p.m.—R. Civic Reception—Floral Hall.

Saturday, July 15

9.00 a.m.—*Council Meeting*—Council Chamber, Town Hall.
9.00 a.m.—A.R.M. Inquiry Office open—Floral Hall.
9.30 a.m.—Ladies' Club open—Prince of Wales Hotel.
9.30 a.m. to 12.30 p.m.—L.6. Coach Tour to Hodder Valley. Ticket 8s. 6d.
10.00 a.m.—Annual Representative Meeting—Floral Hall.
2.00 to 6.00 p.m.—L.7. Visit to Liverpool Cathedral (Builders' Day). Ticket 6s. 6d., including Tea.
7.30 p.m.—Glasgow Graduates' Dinner—Prince of Wales Hotel.
8.00 p.m.—Welsh Dinner—Royal Hotel.
Dancing.
Theatre.

Sunday, July 16

10.45 a.m.—Church Service, Christ Church.
Golf, Tennis, etc.
9.30 a.m. to 6.30 p.m.—R.8. Coach Tour to Ruthin Castle and North Wales. Ticket 18s., including Lunch and Tea.
9.30 a.m. to 6.00 p.m.—R.9. Coach Tour to Windermere. Ticket 22s., including Lunch and Tea.
8.00 p.m.—R. Representatives' Concert—Floral Hall.
Aberdeen Graduates' Dinner—Palace Hotel.

Monday, July 17

9.30 a.m.—*Annual Representative Meeting*—Floral Hall.
9.30 a.m.—Ladies' Club open—Prince of Wales Hotel.
12.30 p.m.—*Annual General Meeting*—Floral Hall.
Council Meeting—Council Chamber, Town Hall (at conclusion of A.R.M.).

LIVERPOOL

Monday, July 17

2.00 to 9.00 p.m.—Reception Room open for registration—St. George's Hall.
2.00 p.m.—Ladies' Club open for registration—Adelphi Hotel.
4.00 p.m.—Ladies' Committee "At Home" to visiting ladies—Ladies' Club, Adelphi Hotel.
7.30 for 8.00 p.m.—Edinburgh Graduates' Dinner—Adelphi Hotel.

Tuesday, July 18

9.00 a.m.—Official Opening of Exhibition by President—St. George's Hall.
9.00 a.m.—Reception Room open for registration—St. George's Hall.
9.30 a.m.—Ladies' Club open—Adelphi Hotel.
9.30 a.m.—Opening of Pathological Museum by Professor H. L. Sheehan, M.D., D.Sc., F.R.C.P., F.R.C.O.G., at Department of Pathology, University.
10.00 a.m.—*Scientific Sections*—University.
10.30 a.m. to 12.30 p.m.—L. Visit to City Library.
2.15 p.m.—Members will robe in St. James' School for Official Religious Service, and procession will be formed.
2.45 p.m.—Procession leaves St. James' School for Cathedral.
3.00 p.m.—U*. Official Religious Service, Liverpool Cathedral. The Service will be conducted by the Dean of Liverpool Cathedral and the Sermon will be given by the Right Rev. the Lord Bishop of Birmingham.
3.30 p.m.—Roman Catholic Service in the Crypt of the Metropolitan Cathedral, followed by Tea at Mount Pleasant Convent. Preacher: His Grace the Archbishop of Liverpool.
4.30 p.m.—Medical Women's Federation Tea Party—Medical Institution, Mount Pleasant.
4.30 to 5.30 p.m.—British Council Reception for Overseas and Foreign Delegates—British Council Centre, 1, Basnett Street (Buffet Tea).
4.30 to 5.30 p.m.—Tea for Ladies accompanying Overseas Delegates at 65, Rodney Street (by invitation of Mrs. Abercromby).
5.00 p.m.—B.M.A. Films, St. George's Hall.
8.30 p.m.—U*. *Adjourned Annual General Meeting and President's Address*—Picton Hall.
9.30 p.m.—U*. President's Reception, University.

Wednesday, July 19

8.30 a.m.—Annual Breakfast of the Medical Prayer Union—Adelphi Hotel.
9.00 a.m.—Reception Room open—St. George's Hall.
9.00 a.m.—Exhibition open—St. George's Hall.
9.30 a.m.—Ladies' Club open—Adelphi Hotel.
9.30 a.m.—Pathological Museum open—Department of Pathology, University.
9.30 a.m. to 6.00 p.m.—L.12. Coach tour to Conway and North Wales. Ticket 19s. 6d. (including Lunch and Tea).
10.00 a.m. to 1.00 p.m.—L.11. Visit to Lady Lever Art Gallery, Port Sunlight. Ticket 3s.
10.00 a.m.—L. Notts Ladies' Challenge Cup Golf Competition—Formby Ladies' Golf Club.
10.00 a.m.—U. Childe and Leinster Cup Golf Competition—Birkdale Golf Club.
10.00 a.m.—*Scientific Sections*—University.
1.15 p.m.—Irish Graduates' Lunch—Reece's Restaurant, Parker Street.
2.00 p.m. to 6.00 p.m.—U.10. Visit to Bidston Observatory Ticket 7s. 6d., including Tea.
2.00 p.m.—U.14. Visit to Distillers Company (Biochemicals), Ltd., Speke.
2.30 p.m.—*Scientific Sections*—University.
2.30 p.m.—*Overseas Conference*—Medical Institution, Mount Pleasant.
5.30 p.m.—Empire Medical Advisory Bureau Cocktail Party for Overseas and Foreign Delegates—Medical Institution, Mount Pleasant.
8.30 p.m.—U. Civic Reception—Town Hall.

Thursday, July 20

9.00 a.m.—Reception Room open—St. George's Hall.
9.00 a.m.—Exhibition open—St. George's Hall.
9.30 a.m.—Ladies' Club open—Adelphi Hotel.
9.30 a.m.—Pathological Museum open—Department of Pathology, University.
9.30 a.m. to 6.00 p.m.—L.16. Coach Tour to Windermere. Ticket 20s., including Lunch and Tea.
9.30 a.m. to 6.00 p.m.—L.17. Visit to Chester. Ticket 15s., including Lunch and Tea.
10.00 a.m. to 12.30 p.m.—L.15. Visit to Pilkington's Glass Works, St. Helens. Ticket 3s. 6d.
10.00 a.m.—Treasurer's Cup Golf Competition—Royal Liverpool Course, Hoylake.
10.00 a.m.—*Scientific Sections*—University.
2.00 p.m.—Sailing Match at West Kirby. B.M.A. v. West Kirby Sailing Club.
2.00 to 6.00 p.m.—U. Visit to Evans Biological Institute, Runcorn.
2.00 to 6.00 p.m.—U.19 Visit to Sudley Hall, Speke Hall and Aerodrome. Ticket 5s., including Tea.
2.30 p.m.—*Scientific Sections*—University.
4.45 p.m.—B.M.A. Films—St. George's Hall.
7.30 for 8.00 p.m.—Annual Dinner—Adelphi Hotel. Ticket £2 2s., including Wines.
8.30 p.m.—Wallasey Division Dance (with buffet supper)—Hotel Victoria, New Brighton. Ticket £1 1s.

Friday, July 21

9.00 a.m.—Reception Room open—St. George's Hall.
9.00 a.m.—Exhibition open—St. George's Hall.
9.30 a.m.—Pathological Museum open—Department of Pathology, University.
9.30 a.m.—Ladies' Club open—Adelphi Hotel.
10.00 a.m. to 12.30 p.m.—L.20. Coach Tour of Wirral. Ticket 4s.
10.00 a.m.—*Scientific Sections*—University.
2.00 to 6.00 p.m.—U.21. Coach Tour to Beeston, Delamere, and Chester. Ticket 9s., including Tea.
2.00 to 6.00 p.m.—U.22. Motor launch trip on Mersey.
2.30 p.m.—*Scientific Sections*—University.
8.30 p.m.—U. Popular Lecture by Dr. C. O. Stallybrass, D.P.H., Picton Hall. "Epidemics Old and New."

REMUNERATION OF GENERAL PRACTITIONERS

PREPARATION FOR TERMINATION OF CONTRACTS

A Special Conference of Representatives of Local Medical Committees from all parts of Great Britain was held in the Great Hall of B.M.A. House, London, on June 29. The Conference was summoned to receive a report from the General Medical Services Committee on the negotiations with the Ministry of Health regarding the remuneration of general practitioners under the National Health Service Act and to consider recommendations. Dr. W. JOPE (Blantyre, Lanarkshire) presided, and was supported by Dr. E. A. GREGG (Chairman of Council) and Dr. S. WAND (Chairman of General Medical Services Committee).

Opening Statement

Dr. WAND said that a reference to Spens and the global sum would be noted in the report. The Committee had pressed the Government time after time to give some indication of the global figure which might be taken to represent Spens, but had been refused. The Government of course recognized that a pronouncement of the global value required to implement Spens at the 1950 value of money would disclose the betterment factor now being paid, and this might embarrass the Government in other fields. The Committee claimed that the global sum should be continuously adjusted in respect of the number of doctors in the Service and the amount of work done, and it was impossible to adjust something which had not been precisely defined.

When they met the Minister in April it was quite clear that he did not appear to regard Spens as a continuing factor, and indeed he was at some pains to tell them that if the number of doctors should, say, double itself within a certain time, and thereby reduce the work of the individual, it would not be reasonable to pay them the same amount for that reduced amount of work. That, the Committee argued, was quite contrary to the spirit of Spens.

Dr. Wand went on to remind the Conference that what the profession was now getting was 40% betterment. This betterment was a most important factor. It was betterment for which they were fighting. They were still 30% below the 70% betterment which they had claimed two years ago, and indeed now they had to ask whether even that 70% was sufficient. The cost of living and practice expenses had gone up in recent months. In February last Mr. Gaitskell said that if £1 was represented as 100 in 1938 it should now be represented only as 52. This meant that the proper betterment factor to-day would be considerably over 70%.

The Whitley and arbitration machinery was coming into operation. The basis of arbitration through Whitley was being discussed. The other Services included in the N.H.S. were agreed that the proposed arbitration machine was not satisfactory. For instance, the Minister was given the right to refuse arbitration. Another quite important point was the constitution of the arbitration tribunal, to which they took exception. It would be seen from the report that unilateral action by the Minister was feared. Whether that fear was well founded or not the representatives were in a position to determine just as well as the members of the Committee.

The Down-grading of General Practitioners

At the meeting with the Minister on April 3 last the deputation emphasized very strongly the down-grading of general practitioners. The Minister expressed his sympathy and indicated that in the National Health Service if general practice was not attractive enough it would not be in the interests of the Service. There was no doubt that at the Ministry there was now a much larger measure of sympathy with general practitioners than formerly. The Minister had made a request for some information about practice expenses, and when they challenged the net remuneration which was arrived at from a calculation of the gross as set out by the Ministry they did indicate that the practice expense position was a very important factor. Therefore it was not unreasonable in the light of that that the Minister should have asked that practice expenses should be the subject of inquiry. He had then told them that he wanted their co-operation in effecting certain economies in the Service. They pressed him hard that the results of such economies should be applied for the betterment of general-practitioner remuneration, but he could not undertake that that would be done. He did say, however, that, if economies were brought about in one field, any moneys thereby saved would not necessarily revert to the Treasury. The Minister was at great pains to indicate that no cuts had been made in general-practitioner remuneration, but shortly afterwards they did have a "cut" in the shape of the increased tax on petrol which had the effect of reducing their net income, and this impost could not be passed on to others in the same way as business people passed it on to their customers.

As practitioners they had done their best to carry out this Service under great difficulties and in face of enormous demands. It was true that they had had a few improvements—increased mileage allowance, something more for the maternity services, and the Government was now going to pay the 8% for assistants for superannuation purposes. There were certain overall factors to be considered—the wage-freeze policy of the Chancellor, the White Paper on economies, the economic position of the country, and, within the last few days, the new international trouble. But the difficulty at the moment was not the Minister of Health or the Ministry: it was the Treasury and the Chancellor. There was now in the general-practitioner field an excess of incomes at the lower end of the scale, while at the upper end of the scale the single-handed practitioner with a full list could not get to within hundreds of pounds of the amount received by the consultant of the same age even without the merit award. General practitioners were doing a 7-day week and a 24-hour day, and they could be forgiven if they looked with bewilderment upon the pharmacists and dentists whose remuneration had been set out in the White Paper on the cost of the Service. The position was intolerable. When they entered the Service they were told that their lot was to be made easier, but the Government had done nothing to bring that about. Costs had become immeasurably heavier to-day, and some of the burden of work which would otherwise have been carried by the health centre was still carried by doctors' wives. He wished to stress the point that incentive had gone out of the life of the general practitioner. The Minister in his last reply made reference to the fact that normally the Whitley machinery would operate in any dispute. It was for that Conference to make important decisions. They might perhaps say that the latest offer was another example of Government procrastination. On the other hand, they might say that after two years' negotiation the Ministry was not unsympathetic with the G.P.'s case, and they were on the eve of some progress.

Termination of Contracts

Dr. Wand added that withdrawal was the most serious step they could take. It was a step which, if decided upon, must be decided deliberately and with a full knowledge of all its implications. It must be realized that the threat of withdrawal might lead to compulsory arbitration. The idea that withdrawal was a bluff and that a threat was sufficient must be put out of their minds.

"The time has come, without any shadow of doubt, when we must make a decision. We have fought very hard indeed by negotiation to get justice, but our hands are now being forced. We are a unique group of people doing a unique job, and it is high time that the conditions of our work and the difficulties under which we labour should be recognized and that we should be properly rewarded." (Applause.)

Dr. A. B. DAVIES (Walsall) moved:

That the Conference places on record the fact that at no time, either before or since the appointed day, has the remuneration of general practitioners been agreed.

He said that this was merely a statement of fact, but it was essential to inform the public, the Press, and some members of their own profession that they were not fighting for an increase of something which had been agreed, but for a settlement of something which should have been agreed before they came into the Service.

The motion was carried.

Criticism of Negotiations

The following motion was on the agenda in the name of Swansea:

That this Conference expresses strong disapproval of the method by which negotiations have so far been conducted, and suggests that the General Medical Services Committee should invoke the aid of a highly experienced advocate in preparing and presenting the profession's case to the Minister.

Dr. C. H. DAVIES, in moving this on behalf of Swansea, said that he wished to pay his own personal tribute to the Committee, but the fact remained that they had not made any large impression on the Minister. He was not at all surprised that they were unable to cope with the astute minds at the Ministry. All along the Minister had retained the initiative. This report on the remuneration of general practitioners which was before the present Conference was an abject confession of failure. In March, 1949, a conference agreed that the central pool should be increased by some £16m. What had happened about that? Nothing—except that another inquiry was in the offing. There was the utmost discontent among general practitioners at the inadequacy of their remuneration in comparison with other members of the Health Service. So far all that they had had was a little extra mileage allowance and some increase in vaccination fees. He thought the Committee should employ the services of a skilled advocate to assist it.

Dr. W. N. MAPLE (East Sussex) said he was in agreement with the second half of the Swansea motion but not with the first half. He thought they should be content to express their

dissatisfaction at the result of the negotiations but not go witch-hunting.

Dr. J. A. IRELAND (Shropshire) said that this was a motion of no confidence in the Committee. As to the employment of an experienced advocate, that proposal had already been before the Conference and the Representative Body and had been thrown out by both. He reminded practitioners that they had joined the Service voluntarily, not knowing what certain terms and conditions were, and that the Committee had been elected by them. At the present moment, when things were moving slightly in their favour, to pass a vote of no confidence would be absurd. He had seen something of the negotiations which the Committee had undertaken with the Government, and, while he had had a critical mind, he was full of admiration for Dr. Wand and his colleagues, whose procedure in these negotiations had appeared to him wholly admirable.

Dr. A. G. MANLEY (Surrey) spoke in favour of the Swansea motion, which, he said, was not a condemnation of the Committee but only an expression of disapproval at the way they had handled the case.

Dr. H. H. GOODMAN (Newcastle-upon-Tyne) said that he had hoped that the proposers of this motion would have brought forward some constructive criticism as to how they would have conducted the negotiations to better advantage. Such suggestions were singularly absent. They could not find a better advocate than Dr. Wand.

The CHAIRMAN OF COUNCIL (Dr. E. A. Gregg) said that that was not a new resolution. It had been considered and turned down before. He had had the privilege of being associated with negotiations since the days of Brackenbury, and he had heard how their case was presented in those days. He had lived through the stalwart days of Dain, when their case was thoroughly presented. He had lived through some later days [during his own chairmanship of the Committee] when he hoped the case was not inadequately presented, and he had reached the days of Wand. What was wanted in such negotiations was a plain unvarnished statement of the case, backed up with adequate evidence. What they did not want was an attempt by a skilled advocate by rhetoric to try to obtain some result which could not be obtained by plain statement. He begged them not to be led astray into thinking that there was some marvellous power in having a legal advocate. They were not dealing here with twelve jurymen at the Old Bailey; they were dealing with people who had a knowledge of the Service and who, point by point, would be able to stump a skilled advocate as well as they could stump anybody else. What was wanted in these negotiations was a man with a knowledge of practice, able to bring out facts from his own experience and that of his colleagues.

Dr. C. H. DAVIES, in reply, said that the only people who appeared to be satisfied with the Committee were the members of the Committee themselves.

The Swansea motion was lost by an overwhelming majority.

Prolonged Delays

Dr. WAND proceeded to move the first of six recommendations of the Committee:

That the Conference is seriously disturbed at the repeated hold-ups and prolonged delays in the negotiations on general-practitioner remuneration.

An amendment was proposed by Newcastle-upon-Tyne to add the following words to the recommendation: "and calls upon the Minister of Health to state immediately what global sum should be in the central pool to implement the recommendations in the Spens report."

Dr. H. H. GOODMAN, in moving, said that two years after the beginning of the Service it was time the Minister told them what the sum should be. He believed that the Government was "stalling" until after the next General Election. What practitioners asked for was elementary and was not denied to any class of worker in the country. It should be remembered that many new doctors had entered the Service since July, 1948, and the crowded state of the consulting service had led to an increase of those choosing general practice. Some of these would take out the basic £300, and this would diminish the pool and also the number of people on their lists. Unless moneys came into the central pool practitioners would suffer cuts—insidious cuts, not open cuts like those of the dentists. They wanted the central pool to be fixed so that the necessary adjustments could be made in accordance with external changes.

Dr. FRANK GRAY (Committee) said that the meeting would be in sympathy with the spirit of the Newcastle amendment. He would suggest one slight alteration. As it stood at present it was inviting the Minister to take unilateral action and determine what the figure should be. He thought that it should read, "what global sum should in his opinion be in the central pool."

This alteration was accepted by Newcastle, and in that form the Newcastle amendment was carried.

The first recommendation of the Committee was then carried in the following form:

That the Conference is seriously disturbed at the repeated hold-ups and prolonged delays in the negotiations on general practitioners' remuneration and calls upon the Minister of Health to state immediately what global sum should in his opinion be in the central pool to implement the recommendations in the Spens report.

The second recommendation of the Committee was formally moved by Dr. Wand and carried without discussion:

That the Conference deplores the failure of the Minister of Health to give an unqualified assurance that negotiations on general-practitioner remuneration will always be conducted through Whitley machinery.

Preparations for Withdrawal

The recommendation was as follows:

That the Conference instructs the General Medical Services Committee to make preparations for the withdrawal of general medical practitioners from the National Health Service in the event of the Minister failing to give the necessary assurance, sought in the previous resolution, or in the event of the investigations now under consideration not leading to a satisfactory settlement of general-practitioner remuneration.

Dr. WAND, in moving this recommendation, said that the amendments which were down on the agenda following this recommendation suggested a number of different courses of action. In his last reply the Minister had said that normally discussions on disputes on remuneration would be conducted through Whitley machinery. There were a number of alternative actions which might be taken. The Conference might decide to await the results of the inquiry. It might decide that there should be no inquiry and that withdrawal should take place immediately. It might decide to make preparations immediately for withdrawal and fix a date, or to make preparations immediately to withdraw under certain circumstances, such as unilateral action by the Minister, or unreasonable delay in carrying out the inquiry, or dissatisfaction with its results. If these alternatives were adopted power could be given to the Committee to take the necessary action at the appropriate time or another Conference could be called to make the final decision. If they did decide on withdrawal should certain things happen in the future, they must determine both the strategy and the timing. They would bear in mind certain important points. They must be aware of the feeling of their constituents and the necessity for certain preparation, including the giving of three months' notice. They would bear in mind that if they declined to take part in this inquiry there was a risk that the Government might use that as a point against them and make a great deal of capital out of it. But if they decided that withdrawal—or he preferred the words "termination of contract"—in certain circumstances was their policy they had to prepare themselves through their actions at the periphery to march forward united and determined, in good spirit, knowing that any action they took now was a fight for good general practice in the future. This was not a fight for money only; in recent months the question of status had come more and more to the fore.

The "Necessary Steps"

Among several amendments on the paper it was decided to take one by Lancashire:

That this Conference deplores the inadequacy of the remuneration of general practitioners, and considers that a final settlement of such remuneration is overdue. The Conference instructs the General Medical Services Committee to take all necessary steps to prepare for the withdrawal of general practitioners from the Service if the question of remuneration is not settled satisfactorily forthwith.

Dr. A. OWEN, in moving the above, said that they had gone round the "periphery" in Lancashire and had asked some 1,600 members their opinions, and so far 72% had declared their willingness to terminate their contracts.

Dr. C. M. CRAIG (Westmoreland) opposed the Committee's recommendation. He suggested that on this occasion they should concentrate on the question of remuneration and not mix it up with a threatened withdrawal of service.

Dr. A. H. WESTON (Middlesex) considered that the Lancashire amendment was rather woolly. A later amendment in the name of his own area instructed the Committee to make preparations forthwith for the termination of contracts, and that immediate action be taken in the event of the Minister failing to give the necessary assurance without undue delay or in the event of the investigations not leading to a satisfactory settlement. So far the Committee had failed to produce results. It was by results that in future they would be judged. The introduction of the word "forthwith" into the Middlesex amendment meant that preparations should be started now. These preparations included good staff work and a state of readiness at a moment's notice to take action.

Dr. W. H. HAYES (Bristol) said that his committee did not think there was any point in having further negotiations. The only thing left now was the weapon of resignation. He believed that the public had never been more sympathetic than now to the doctors' case. As to the financial state of the country, that was an argument which was always being brought up, but the Government had now told them that the financial prospects were improved, and the T.U.C. was claiming that wages should be unfrozen.

Dr. R. W. MCCONNEL (Buckinghamshire) felt that another Conference should be called to consider the preparations. They must await the results of the inquiry.

Dr. WAND said that in view of the number of amendments and their slight differences in wording he hoped the Chairman would give the meeting an opportunity of deciding the straight question on withdrawal as a clear-cut issue.

The CHAIRMAN said that he was prepared to accept a motion to give the Conference the opportunity of voting clearly on whether there should be immediate withdrawal. It was understood that withdrawal meant three months' notice.

Dr. W. H. HAYES (Bristol) was strongly in favour of withdrawal (three months' notice) now. Any other action would be taken as weakness on their part. Dr. W. D. ANDERSON (Glasgow) said that a resolution that practitioners should place their resignations in the hands of the Committee, to be used unless the Minister was willing fully to implement Spens, with retrospective effect to July, 1948, was carried at a meeting at Glasgow at which 85 practitioners were present, the number in favour of the resolution being 72. Dr. F. E. GOULD (Birmingham) believed that preparations for withdrawal should be made forthwith, but the preparation must include very careful explanation to those practitioners who did not attend meetings of the profession. Dr. H. D. SUTHERLAND (London) said that time must be given for staff work; the next three months would be insufficient.

The CHAIRMAN then put it to the meeting whether notices should be handed in immediately or not, and there was an overwhelming "No." The Lancashire motion already moved was disposed of by a vote to proceed to the next business. The "next business" was part of a motion by Middlesex:

That the Conference instructs the General Medical Services Committee to make preparations forthwith for the withdrawal of general medical practitioners from the National Health Service.

This was moved by Dr. A. H. WESTON (Middlesex), who said that it was a simple direct instruction, attaching no conditions whatever to the preparations for withdrawal.

Dr. O. C. CARTER (Committee) said that, although he was one of the few people present who were not personally affected by the decision, these matters were of such vital importance to the whole profession that the view of every type of practitioner should be put before the Conference. He was not sure that it was to the credit of the profession as a whole that two years after the Act came into force they should be called together to consider such matters as were on the agenda that day. They were as far as ever from getting satisfaction. There were some of them who, after the second plebiscite, did their utmost to persuade practitioners not to accept service, but they were unsuccessful. The result was that practitioners had been split into two unequal groups, a small group outside the Service and a big group inside. Many of those inside the Service had suffered financial hardship, and all had found their status deteriorating. This must be put right at the earliest possible moment. On this matter he was as much a die-hard as ever. The Spens Report, the charter of the general practitioner, had not been implemented. He hoped the Conference would decide on withdrawal from the Service at the proper time.

Preparations "Forthwith"

The Middlesex motion was reworded as follows:

That the Conference instructs the General Medical Services Committee to make preparations forthwith for the termination of contracts by general medical practitioners in the National Health Service.

There voted:

In favour	141
Against	17

The Conference then turned to consider as a single issue the time at which withdrawal should become operative.

Dr. WAND said that fixing the date was always an embarrassment, for one could never anticipate events. He reviewed again the various possible instructions which the Conference might give to the Committee. Dr. A. G. MANLEY (Surrey) asked if they were serious about this question of determining contracts. If they were there was no reason why they should not give a date. Dr. R. HUTCHISON (Lanark) spoke of the feeling of frustration north of the Border. He thought they should put a definite date to their withdrawal. Dr. A. V. RUSSELL (Wolverhampton) said that discontent all over the country had increased very much. He hoped that the Committee, in following their instructions to organize termination of contracts, would also organize an alternative service which they could offer to their patients. Dr. A. MCARTHUR (Oldham) said that if they terminated their contracts they would become again free and independent practitioners, and they would have with their freedom the power of negotiation which they lost in 1948. Dr. S. NOY SCOTT (Devon) spoke against the fixing of a date; a large number of them had no mandate to fix a date. They must await events and have another Conference before doing anything further.

After some further debate it was suggested that the following form of words should follow the part of the Middlesex motion already passed:

and that, if and when it becomes evident that there is no prospect of a satisfactory settlement of the claim, a Conference be called to name a date at which general practitioners shall be advised to end their contracts with executive councils, and that in any case a Conference be called to consider the position in December, 1950, if a satisfactory settlement has not been reached by that time.

These words satisfied Middlesex and Surrey, which had motions on the subject. They were put to the Conference and carried by a full vote.

The Effective Percentage

Dr. J. C. ARTHUR (Gateshead) moved that when resignation of practitioners was called for an 85% adhesion should be specified as necessary before resignations became effective. He believed that if a high figure was specified it would be attained. Dr. BARBARA WOODHOUSE (Middlesex) objected to one area laying down the law for the whole country in this respect. Dr. ARTHUR said that his was a representative area. His committee was simply suggesting a figure which would be likely to encourage the waverers.

The motion was referred to the Committee.

Dr. J. C. MCMASTER (Somerset) moved that preparations for termination of contract should be put in hand at once and

planned in full practical detail, with adequate attention to the public relations aspect. Dr. FRANK GRAY said that the Committee could not make all these preparations; the bigger responsibility rested on the members of the Conference and of local medical committees. It was only at the periphery that any weaknesses could be overcome.

This motion was accepted by the Committee and carried.

A further motion by Gateshead concerning preparations and calling for a clear statement on the availability of the accumulated defence funds and the procedure to be followed by practitioners in the acceptance of patients for treatment in the circumstances then arising was carried. The SECRETARY informed the meeting that the decision of the Conference that day would lead to the operation of the Guild machinery for the first time.

A Middlesex motion instructing the Committee to obtain assurances of support from other branches of the profession was accepted by Dr. WAND in principle as a reference to the Committee.

Dr. W. P. HEDGCOCK (Cambridgeshire) moved that practitioners should be prepared to co-operate with the Minister to ensure economies in the Service if he would undertake to apply the sums saved to the implementation of the Spens Committee's proposals for remuneration of all grades of general practitioners. It was evident that a vast amount of money was being wasted. Dr. WAND pointed out that this was contrary to constitutional procedure regarding expenditure of moneys.

It was agreed to pass to the next business.

The Investigation into Income and Expenses

Dr. WAND then moved the third recommendation of the Committee:

That the Conference, recognizing that an equitable settlement of the remuneration issue may be influenced by early and accurate information on general-practitioner income from National Health Service sources and practice expenses, is willing to participate in the proposed inquiry.

He said the intention was that the two sides together should agree on a method of getting the information and the factors to be determined.

Dr. H. P. SUMNER (Salford) said that the Minister should already have a good idea of what practice expenses were. Dr. B. HALFPENNY (Kent) said that before agreeing to these further investigations an assurance should be sought from the Minister that any disputes on remuneration would be settled through the recognized machinery or referred to arbitration. Dr. R. W. MCCONNEL (Buckinghamshire) felt that any participation in such an investigation should not be conditional on the question of negotiation through Whitley machinery. Dr. H. H. D. SUTHERLAND (London) hoped that the inquiry would not mean another large document which would take much time to study and discuss.

Dr. WAND said he could give an assurance that matters would not be allowed to be unduly protracted.

The recommendation was carried with one dissentient.

Status of the General Practitioner

Dr. J. BAIRD FORRESTER (Glasgow) moved:

That the fundamental requirement to secure a satisfactory status for the general practitioner and to improve the Service is a reduction in the maximum number of patients permitted with an appropriate increase in the capitation fee.

He said that many of the services which the general practitioner was able and qualified to perform had now to be done at the hospital, because the practitioner had not time to cope with them, owing to the trivial matters which of necessity occupied him. In order to enable him to carry out these services the maximum number of patients on the list might be reduced below 4,000, but this should be conditional on the implementation of Spens.

Dr. R. W. MCCONNEL (Buckinghamshire) said they did not want to tie an able man down to a lower standard.

Dr. J. C. ARTHUR (Gateshead) asked by what right Glasgow, because it could not manage 4,000 patients as a maximum, had to say that they could not manage them in Gateshead.

Dr. J. T. MCCUTCHEON (Glasgow) said that what Glasgow wanted was to secure that the work was done under better conditions and with more time for its performance. The motion brought forward by Dr. Forrester had been passed practically unanimously at their meeting. There were many practitioners who could manage a list of 4,000, though they felt on the whole that the average practitioner could not manage that number to the best advantage.

Dr. FRANK GRAY (London) supported Dr. Arthur. It was not a question of the "average doctor." Most of the doctors with a list of 4,000 were better able to manage their practices and give a good service than a large number of those with smaller lists.

Dr. WAND said that the purpose of the Conference was to seek a method of trying to obtain proper remuneration for general practitioners. To pass a resolution of this kind now might be most dangerous. The first thing to do was to get more remuneration. Having done so, the question of distribution would come in. But if they started cutting down the maximum, first by one step and then by another, they would arrive at an equalization of practices and a full-time service.

Dr. FORRESTER said, in reply, that he personally had a list of 4,000, but if it was not for a very efficient assistant he certainly would not be able to cope with it. How could one deal with 100 people in the surgery and give them proper attention?

The Glasgow motion was heavily defeated.

The Increased Burden of Work

Dr. A. B. DAVIES moved a resolution calling upon the Conference once again to stress the greatly increased burden of work experienced by the profession as a result of the introduction of the Act.

The motion was carried.

Dr. WAND at this point moved the fifth recommendation of the Committee:

That, in the opinion of the Conference, one of the greatest dangers confronting general practitioners, and so their patients, is the lowering of the status of the general practitioner since the introduction of the National Health Service.

The motion was carried unanimously.

Dr. H. SOUTHWORTH (Lancashire) moved:

That this Conference regrets to record the lowering of the status of the general practitioner under the National Health Service, and instructs the General Medical Services Committee immediately to take whatever action may be necessary to secure the restoration of the general practitioner to the high and honoured position he held immediately before the introduction of the present Medical Service.

He said that practitioners must have time for study, not only in refresher courses and in the reading of technical books and journals, but time for study of what was going on around them, how they could advise their patients properly about their ailments and learn something about their environment. One patient who came into his surgery told him that that was the first time he had ever sat down in a doctor's surgery. In all his previous visits he had remained standing and had received his certificate or prescription or whatever it might be. They wanted time to see their patients in hospital. If they were to obtain the best results for their patients they must be their friends, and to be anyone's friend took time.

Dr. D. F. HUTCHINSON (Middlesex) said that this motion by Lancashire instructed the Committee to do something they could not possibly do.

Dr. SOUTHWORTH replied that in his view this was the most important motion of the Conference. The other motions were merely administrative instructions.

The motion was carried.

General Practitioners and Hospitals

The last of the Committee's recommendations was as follows:

That the Conference deplores the changing relationship of the general practitioner to the hospital, with particular reference to the insufficiency of general-practitioner beds; to the exclusion of general practitioners from the membership of hospital management committees; to the difficulty of access to special departments; and generally to the position of general practitioners in the administration of hospitals.

Dr. WAND moved this recommendation formally.

Dr. R. W. MCCONNEL (Buckinghamshire) moved as an amendment that it be suggested to local medical committees that they should form joint committees in the area of a regional hospital board, such committees to seek liaison with the board. In his area a co-ordinating committee had made a considerable difference in the attitude of the board to general practice. He strongly recommended other local medical committees to follow the same course of action.

Dr. W. F. HUDSON (Oxfordshire) said that the previous week the Minister had addressed the Association of Hospital Management Committees. At the close of the address he (the present speaker) asked Mr. Bevan whether it was not a fact that there were several regional boards and hospital management committees on which there was no general practitioner, and whether there were not several hospital management committees which attempted to manage their affairs without the assistance of a medical advisory committee. Mr. Bevan's reply, which was somewhat unenlightening, was, "Too many doctors are serving on committees, possibly at the expense of their clinical work." At the same time Mr. Bevan said that it was right that every hospital management committee should have a medical advisory committee. But whenever the Minister was asked to ensure that medical advisory committees were set up he had stubbornly refused to make such committees statutory. In Oxfordshire his attitude was much deprecated.

Dr. F. M. ROSE (Preston) said that if they were going to allow themselves to be ousted from hospitals their status was going to drop, and, in addition, they were likely to lose their clinical skill.

Dr. J. A. IRELAND (Shropshire) said that one aspect of this matter had not been referred to. The present set-up tended to close the avenue of approach for the general practitioner to consultant and specialist status. In the past many general practitioners had qualified as consultants and specialists owing to their attachment to various hospitals.

Dr. WAND said that he approved personally of the Buckinghamshire recommendation. They had taken steps to bring home to the Ministry the position of the general practitioner in relation to the regional hospital boards and hospital management committees, and he believed they had made some progress and that the offending circular might be modified very considerably before the next elections took place. His little doubt about this recommendation went back to the resolution which the Conference had already passed asking the Committee to try to obtain the co-operation of other sections of the profession. These committees would have a relationship with the consultants of the area. There had been set up a Joint Liaison Committee between the General Medical Services and the Consultants and Specialists Committees and he wondered whether this motion should not be referred to that Committee in order that the matter might be taken up there.

Dr. TALBOT ROGERS (Kent) said that it was a very difficult job to be a general practitioner on a regional hospital board, for there were very few people to back up one's point of view. He welcomed the Buckinghamshire suggestion and hoped that it would be carried. He wanted to see every region follow the example of Oxfordshire.

It was agreed to refer the Buckinghamshire motion to the General Medical Services Committee.

Dr. HOWIE WOOD (Isle of Wight) moved an amendment to the Committee's recommendation introducing two fresh clauses. The recommendation with these clauses would read:

That the Conference deplores the changing relationship of the hospital to the general practitioner, with particular reference to the insufficiency of general-practitioner beds, *both general and maternity*; to the exclusion of general practitioners from the membership of hospital management committees; to the difficulty of access to special departments; *to the exclusion of general practitioners from those departments in which they have special experience*; and generally to the position of general practitioners in the administration of hospitals.

The recommendation would thus stress the need for some steps to be taken to secure the admission of the general-practitioner obstetrician to maternity hospitals where he might look after his own cases if he so wished.

This amended form was accepted by Dr. Wand and agreed to by the Conference.

Increase in Hospital Personnel

Dr. A. G. CHAMBERLAIN (Dorset) moved, "That this Conference views with concern the rapid increase in personnel (both medical and lay) in the hospital services and in the resultant cost of such services."

He said that this additional personnel was not replacement but new appointments, and although a certain number of them would be bound to be made in a new Service this state of things was going on too rapidly. In a hospital known to him the medical staff was now two-and-a-half times as great as it used to be, and yet very little more work was done. Every consultant in every hospital he went to seemed now to have one or more young men of registrar status. In addition, there was a perfect army of lay officials, multitudes of technicians—he knew that some of them were needed, but they were not all needed—as well as clerks and other people.

Dr. J. A. PRIDHAM (Committee) hoped the Conference would pass this motion unanimously. The Service was getting out of balance. It was started with the idea of prevention, but all the resources appeared to be applied to the hospital services, which really came in where the preventive services broke down.

Dr. WAND said he was not happy about this resolution at all. Leaving aside the point about the lay personnel, take the reference to medical staffing. The profession were asking that general practitioners should be associated with the hospitals. They were disturbed by the fact that the ranks of general practice might be swollen by registrars who could not find staff appointments. They were concerned with the position of the S.H.M.O.s and their gradings. In his city of Birmingham they had to wait three weeks for an appointment with a physician, and his patients had to wait two years before their children's tonsils and adenoids could be removed. He wondered whether it was their business at that time to make comment on such a matter as was brought forward by the Dorset motion. It would be better discussed at the Representative Meeting, where both parties were concerned.

It was proposed from the body of the Conference, and agreed, to pass to the next business.

Superannuation

Dr. A. G. HOLMAN (Norfolk) moved:

That this Conference considers that the 8% contribution by the Exchequer towards superannuation payments should be payable to general practitioners or their dependants in the case of death or retirement before the required ten years' service has been completed, or, alternatively, that the recent concession by which hospital medical officers are allowed to count their previous service towards the necessary ten years to qualify for pension should be extended to general practitioners from the time when they started National Health Insurance work.

Dr. WAND said that when they discussed superannuation regulations previously to the appointed day the points which were made in the Norfolk resolution were pressed upon the Ministry very strongly, but the Ministry refused to consider them. The Ministry's statement was that the scheme had an actuarial balance, and the actuary whom the profession employed to advise them on that point confirmed that actuarially the scheme was a good one. Therefore if increases were to be made for any particular group it would mean that there would have to be larger payments than the 6 or 8%. They would, of course, take up the point again if the Conference so desired, but he was not very hopeful of success. He suggested that the motion be remitted to the Superannuation and Compensation Committee of the British Medical Association.

It was agreed that this should be done.

Fees for Specialist Services

Dr. C. F. WRIGHT (Reading) moved to instruct the Committee to make representations to the Ministry that general practitioners with acknowledged specialist abilities, who performed

services for patients on their own lists, such services being agreed to be outside the scope of general practice, should be permitted to charge fees for such services.

Dr. WAND said that for two solid years the Committee had been hammering at this question. The regulation was that a doctor could not charge, and that was that. But they had in the meanwhile approached this from another angle. They had a subcommittee which had produced a report on the association of the general practitioner with the hospital, and it was in this approach that he thought they might achieve the object of Reading.

The motion was put to the Conference and lost.

A motion from Brighton asked that the agenda of future Conferences might be published in the *British Medical Journal* for the week immediately preceding the date of the Conference.

Dr. WAND explained that the amendments were necessarily received late, and the democratic machine by which they worked made timing difficult. But they would do their best.

The Conference ended after passing a cordial vote of thanks to the Chairman.

PRESCRIBING IN THE HEALTH SERVICE

NO ABSOLUTE RESTRICTION

In its Second Interim Report the Joint Committee on Prescribing states: "From the outset we were agreed that wherever our discussions might lead us there should be no absolute restriction on the prescribing by a general practitioner of any drug which in his opinion was necessary for the treatment of his patients."

The committee was appointed in 1949 by the Central and Scottish Health Services Councils

"to consider and report from time to time whether it is desirable and practicable to restrict or discourage the prescribing by practitioners giving general medical services under the National Health Service Acts of 1946 and 1947 of (1) drugs and medicines of doubtful value or of unethical character; (2) unnecessarily expensive brands of standard drugs."

The members of the committee are:

Sir Henry Cohen (chairman); Dr. Janet Aitken; Professor Stanley Alstead, Dr. J. A. Brown; Professor E. C. Dodds, F.R.S.; Professor D. M. Dunlop; Dr. F. Gray; Dr. P. Hamill; Mr. J. C. Hanbury, F.R.I.C.; Dr. G. MacFeat; Professor Chassar Moir; Dr. A. Smith Pool; Mr. J. H. Ramsay, Ph.C.; Dr. W. D. D. Small; Sir Henry Souttar; Mr. D. E. Sparshott, M.P.S.; Dr. J. G. Thwaites; Alderman W. J. Tristram, M.P.S.; with, as joint secretaries, Mr. D. Emery and Mr. W. G. Honnor.

Amplifying its statement that there should be no absolute restriction on prescribing, the report states that if the committee were to recommend that certain drugs should not be prescribed by a practitioner he would still be at liberty to prescribe them; or if a list of "approved" drugs were drawn up the practitioner could still prescribe drugs not on this list. But in either case he might have to justify his action to the local medical committee.

The Health Departments provided the committee with a list of several hundred proprietary preparations. Most of them did not differ materially, states the report, from the drugs and preparations included in the *B.P.*, the *B.P.C.*, or the *National Formulary*. "Such proprietary preparations are usually more expensive—often very much more expensive—than standard drugs or preparations of reputed analogous therapeutic effect. There is no medical advantage in prescribing an expensive proprietary brand of a standard drug or preparation, but equally no objection to such prescriptions can be taken on purely medical grounds."

The committee was not unanimous on the desirability of drawing up at this stage lists of proprietary preparations and other drugs which a doctor could or could not prescribe without risk of having to justify his action. A minority thought a list would be resented and that any form of restriction would foster a belief in the public that some drugs, however essential for treatment, could not be obtained in the Health Service. But the majority thought that practitioners would welcome a list, for then they would know what they could prescribe in reasonable quantity without risk of having to justify their action, and they would be in a stronger position to resist the requests of unreasonable patients.

The committee recommended that before imposing any restrictions a letter should be sent to all practitioners stating the committee's views. It is being sent to hospital practitioners as well as general practitioners, and is summarized below.

Though deciding that no attempt should be made to impose restrictions until the effect of the letter had been determined, the committee decided by a majority that the preparation of a list of drugs should start at once. A practicable method would be to compile a list of "approved" drugs which a practitioner would know he could prescribe in reasonable quantity without question.

The committee (with one dissentient) regards it as undesirable that medicinal preparations advertised direct to the public should be prescribable on Form E.C.10. All drugs and preparations described in the *B.P.*, the *B.P.C.*, and the *National Formulary* should be freely prescribable, except those classified as food, toilet preparations, or not drugs for National Health Service purposes by the Definition of Drugs Joint Subcommittee.

Classification of Drugs

The committee decided that proprietary preparations could be conveniently arranged under the following six categories:

(1) New drugs of proved value not yet standard.
(2) Proprietary brands of standard drugs, singly or in combination.
(3) Standard preparations, and new remedies of proved value, in elegant form or vehicle.
(4) Qualitative and/or quantitative modifications in the composition or combination of standard preparations, or new remedies of proved value, which are not accepted as therapeutically superior to preparations included either alone or in combination in the *B.P.*, the *B.P.C.*, or the *National Formulary*.
(5) Preparations not in the *B.P.*, *B.P.C.*, or *National Formulary* which in the committee's view have not been proved of therapeutic value.
(6) Preparations which are a combination of (4) and (5).

Apart from preparations in categories (5) and (6) of the previous paragraph (which consist of, or contain, drugs of doubtful value) the committee has no reason for suggesting on medical grounds that these proprietary preparations should not be freely prescribable in the National Health Service, except when advertised direct to the public. The objection to many of them is that a standard drug of reputed analogous therapeutic effect can be prescribed at less cost, but the committee does not feel that it is a competent body to advise on this question of cost.

The committee recommends that proprietary preparations in category (1) should be freely prescribable, and that preparations in categories (2), (3), and (4), which it regards as not therapeutically superior to standard preparations, should be prescribable subject to (i) their not being designated as foods, toilet preparations, or not drugs for N.H.S. purposes by the Definition of Drugs Joint Subcommittee, (ii) their not being advertised direct to the public (recommended, with one dissentient), and (iii) satisfactory arrangements for price being made between the Health Departments and the manufacturers.

The committee is prepared, if the councils so wish, to continue classifying proprietary preparations referred to it into these six categories. This will be a long process because there are many thousands of such preparations and a therapeutic assessment involves the collection of all relevant information and a study of each preparation individually.

LETTER TO DOCTORS

The letter which the Chief Medical Officer of the Ministry of Health is sending to doctors about the prescribing of expensive proprietary preparations begins by asking for co-operation, since "it is by co-operation, rather than by orders and regulations, that the best results are achieved." After saying that there is no intention of placing any absolute restriction on the prescribing by a general practitioner of any drug which in his opinion is necessary for the treatment of his patients, the letter continues:

"You are probably aware of the fact that rather more than 30% of the cost of medicines supplied to public patients is for proprietary preparations. Of course, it would be wrong to condemn proprietary preparations as a whole; indeed, some of them are of great value in the treatment of patients and have no standard equivalent. There can be no question of asking practitioners not to prescribe proprietary preparations known to be of proved value and for which there is no equivalent substitute.

"There are, however, some proprietary preparations for which there are standard equivalents in the *Pharmacopoeia*, *B.P.C.*, or the *National Formulary* and which are more expensive than the standard preparation. It is in this field that substantial economies could be made without affecting in any way the efficacy of treatment. None of us want the Health Service to cost more than is necessary, and there is reason to believe that a substantial saving could be effected if practitioners would prescribe the standard preparation, wherever it is equivalent to the proprietary.

"The formal suggestion I want to make is that, save in any exceptional case where there is an overriding medical consideration, doctors will seriously consider before ordering one of these proprietary preparations whether the alternative standard drug could not be ordered without detriment to the patient's condition. It will be appreciated that, in many cases, preparations in this group are advertised direct to the public.

"The departments would greatly value the help of the medical profession, while preserving their right to do what they believe to be best in the interests of the patient, in prescribing a standard preparation, where there is such a preparation, and so avoiding unnecessarily expensive prescribing."

Correspondence

Status of General Practice

SIR,—The passing of a second year of National Health Service finds our profession increasingly concerned with its financial and moral status. When Mr. Bevan was induced to accept the Spens standard of remuneration of doctors it seemed that we had finally settled and assured our financial status for at least a decade. At that time our N.H.I. capitation fees were so long overdue for revision that there was little difficulty in obtaining either a united threat of resignation or, within a matter of days, the appropriate response from Mr. Bevan. The present investigations are unlikely to show that our position is as far below accepted standards as in those days. Therein lies our weakness: not only because our case will be harder to make out, but because there will be relatively fewer doctors who are personally interested in taking measures on this occasion which would stand a reasonable chance of proving effective. It looks, therefore, as if questions of our financial status are increasingly going to be left to the discretion of the Minister of Health, just because he has chosen to challenge our right to independent machinery at a time when many of us are too well off to care about either future consequences or a present minority who are already hard hit.

What I have referred to as our "moral" status is in the opinion of many doctors on a steep decline, and to many of them this is causing as much concern as material considerations. There can be little doubt that the status of doctors in the eyes of the public is declining, and in my view this is intimately connected with the fact that our public contacts are so frequently under circumstances that find us collectively or individually interested primarily in securing the shekels. Mr. Bevan is largely responsible for our prolonged fight for our financial rights as a profession, but I doubt if even this is diverting public opinion from the most worthy objects of our calling as much as the increasing revelation by individual doctors of a cash outlook that had hitherto been unsuspected by their patients.

In the past, half the population, and probably the more intelligent and discerning half, used to receive regular medical accounts, which were paid and receipted without any other recognition between doctor and patient that they existed at all. This attitude was not inconsistent on the doctors' part with their rather disinterested appeals for public support in the fight against Mr. Bevan's introduction of the N.H.S. Act. Everyone knew the doctor had to be paid for his work, but his profession had built up for itself a reputation for a sort of service that sought inspiration primarily in the particular nature of his calling.

It has come as a considerable shock to great numbers of people, many of whom are themselves engaged in vocational work, to find that their doctors' service to them was so intimately related to the money they paid him. The butcher and baker called regularly once a week and often were most kind and obliging, but they never were regarded in the same light as the doctor. His was a kindly courteous action which called for quite a different sort of response than was usually afforded tradesmen, however considerate, skilful, or necessary to life they might have been. Now all is suddenly changed. Dear Dr. X no longer looks in for his nice little talk that was such an event each week; and even when emergency arises he does not seem as attentive and concerned as of old. To make matters worse he has said and done a great deal to give the impression that the old Dr. X is still about if you tip him heavily in addition to the already heavy burden of taxation that you thought did at least eliminate doctors' bills.

Personally I have resolutely refused to accept "private" patients and done everything possible (in a practice that was less than half "panel") to make my old private patients realize that our former relationship was not after all a cloak for a cash-and-carry business. I took what I thought was an opportunity to enhance my status, and I am not so far disappointed in the result, even from the financial aspect I neglected. A few really money-minded people are still suspicious, but on the whole I think patients find less cause to question the motives which actuate my personal attention and in many cases cultivate a greater respect for them than hitherto. My previous attitude to general practice has undoubtedly facilitated the change-over in my case, but I think most doctors could do as I have done, and they and their patients would derive immense satisfaction therefrom.

In my opinion this private-patient "racket" is an enormous blunder and is even of doubtful money value. I should like to see someone like Lord Horder collect a body of doctors who would pledge themselves to do all they can to abolish it and lead the profession to a position of even greater respect than it has ever commanded. We are not getting away with the general attempt to blame the patient's sudden change of status on Mr. Bevan. A lot of patients realize already that this change is at least as much due to their doctor's reaction to the N.H.S. as it is to anything in the Act itself.

Finally, if money *were* our ultimate inspiration, the success of our financial negotiations in the long run might well depend on keeping the public in ignorance of the fact. We cannot look for much support from a public who regard our negotiations with Mr. Bevan as merely a mass edition of the doctors' general scramble for more money wherever it can be obtained. The Act has come to stay and private practice almost certainly has not. Let us fight for our rights in the proper place, but at the same time order our personal relationships with patients to take advantage of the Act rather than in such a way as will soon reduce the whole profession to a status considerably below that of Civil Servants.—I am, etc.,

Eye, Suffolk. J. SHACKLETON BAILEY.

SIR,—Why the continuous smearing of the G.P.s? One is frequently reading in and out of the medical journals such sentences as "the *deterioration* that has taken place in standards of general practice since the N.H.S.," and "so-and-so would do a lot to ameliorate the *downward trend* of medicine in general practice that is now taking place." Add to this the suggestions or plans to make the G.P. attend courses yearly or occasionally, presumably in order to fit him for general practice; talks of altering the pregraduate and postgraduate curricula, etc. All these sorts of things put together can only leave the public with the impression that whatever is wrong with the N.H.S. is at the door of the G.P., not forgetting "lack of proper accommodation" for his patients. Now this is all eyewash and there is something very sinister behind it all.

The truth is that the modern G.P. and the older ones with years of experience behind them were never so competent to deal with the ill-health of the nation as they are to-day; and all—and I mean all—the evils of the totalitarian N.H.S. are due to the overloading of the Service with politics and lay administrators. There must be more committees and boards and

councils running the Service than there are doctors, who are actually coping with the situation extraordinarily well, and but for the overwork put in by the G.P.s the Service would have gone phut long ago.

Here I will ask this pertinent question: What body of men in this country or any other would do the amount of overwork that the G.P.s have done and are doing for pre-war rates of pay?—and doing it with little or no hope of getting a post-war rate, most having been robbed of their capital asset. It is about time that the doctors' representatives and the medical journals set about impressing the public that the failures, evils, and frustrations of the N.H.S. have nothing whatever to do with the G.P.s (underpaid) or hospital staff. The semi-breakdown is due to too much laity and to the fact that there were not and are not enough doctors, hospitals, nurses, or domestics to run a total service, and there will not be for many, many years.

Just imagine what would happen if the State said that for a compulsory weekly contribution we could use the transport system when and where to we liked. I wonder if the railway workers would work as well as we have, and as long as we have, for pre-war wages, and I wonder if their representatives would suggest to them courses on how to run railways or suggest that they keep better and brighter stations and waiting-rooms, cleaner buses, etc. You can take it from me the public would be reduced to walking.

What exactly is the matter with the B.M.A.? I can't make out whether it is in love with the Ministry of Health or the Ministry of Health in love with it. Both have been behaving queerly for a long time, and neither committees, nor resolutions, nor curses, nor chaos seem to have the slightest effect. All end in forms, and more committees, and investigations, and pools.—I am, etc.,

St. Osyth, Essex. R. E. CLARKE.

Medical Patenting

SIR,—The position in regard to medical patents is that open publication of the idea is sufficient, unless profit is required. This automatically precludes a valid patent being granted.

In regard to improvements relating to methods of manufacture and initial discoveries, the larger manufacturing chemists have the advantage of experienced research departments. These improvements and ideas are patented with a view to profit. Handing over patents to the National Research Development Corporation only invites competition between the firms and the corporation. The medical inventor may also have to bear the cost of obtaining the initial patent.

The holding by the corporation of the patent may place them in a better position for bargaining over royalties, but little else. The corporation should be of use in developing ideas which are ignored or suppressed by the normal producers and research departments.—I am, etc.,

London, S.W.1. STANLEY HANS.

Training of Nurses

SIR,—The paragraph on "Lectures to Nurses" (*Supplement*, June 10, p. 279) states: "Student nurses are trained chiefly by members of hospital medical staffs." I submit, Sir, that this is not so. Nurses receive their practical instruction, which even medical men must admit is the most important part of their training in the wards, from the ward sisters, some help being given in the class-room by the sister tutor.

The medical staffs certainly give courses of lectures in specialties—e.g., medicine, surgery, etc.—and many medical staff appointed to give lectures to nurses do discuss the work with the tutor and as a result of that discussion give a course of lectures, which, taken with the tutor's nursing lectures in the same subject, make a complete and satisfactory whole. A very great number, however, think it unnecessary to discuss the work with her, and one is forced to listen to medical staff telling nurses how to open an abdomen to perform an appendicectomy, how to do surgery of the palmar surface of the hand, or, at the other extreme, describing simple nursing treatments.

The nurses would fare very badly if their training were left chiefly to the medical staffs of hospitals, who are no more qualified to train nurses than nurses are to train doctors, medicine and nursing being two entirely different arts complementary to each other and, when allied, making a whole.—I am, etc.,

Northwood, Middlesex. G. EVE COLLINGWOOD, Senior Tutor to Mount Vernon School of Nursing.

Co-operation between Health Services

SIR,—The status of the general practitioner is hardly likely to be raised by the inadequate representation given on the very important committee set up by the Central Health Services Council to study co-operation between the services. The smooth running of the scheme depends almost entirely on this co-operation between hospitals, local authorities, and general practitioners. Can this be attained without more advice from workers in the field, who should be on this committee?—I am, etc.,

Stoke, Plymouth. O. LL. LANDER.

Disciplinary Powers of B.M.A.

SIR,—Many members of the B.M.A. will, and all of them should, be grateful to Dr. S. Wray (*Supplement*, June 17, p. 291) for pointing out the implications and possible result of the new Article 11 of the Articles of Association, if it is passed into being. The theoretical position at least will be intolerable.

Although a member for 32 years, I shall resign from the B.M.A. immediately if the new Article 11 comes into operation. Whatever is the B.M.A. thinking of, and who is behind all this?—I am, etc.,

Colchester, Essex. M. C. BREESE.

SIR,—I regard Recommendation C as one of the most obnoxious, authoritarian, and malevolent resolutions that has ever come before the A.R.M. I hope it will be turned down flatly. I shall not continue to be a member if it is passed. I am sure that the Council would act wisely in rejecting it.—I am, etc.,

London, W.9. S. CROWN.

Association Notices

Diary of Central Meetings

JULY

12	Wed.	Welsh Committee (at Southport), 8.30 p.m.
13	Thurs.	**Annual Representative Meeting** (at Southport), 10 a.m.
14	Fri.	**Annual Representative Meeting** (at Southport), 9.30 a.m.
15	Sat.	**Council** (at Southport), 9 a.m.
15	Sat.	**Annual Representative Meeting** (at Southport), 10 a.m.
17	Mon.	**Annual Representative Meeting** (at Southport), 9.30 a.m.
17	Mon.	**Council** (at Southport), at conclusion of A.R.M.
17	Mon.	**Annual General Meeting** (at Southport), 12.30 p.m.
18	Tues.	**Adjourned Annual General Meeting and President's Address** (at Liverpool), 8.30 p.m.
27	Thurs.	General Medical Services Committee, 11 a.m.
27	Thurs.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
28	Fri.	Drafting Subcommittee, 10.45 a.m.
28	Fri.	Venereologists Group, 2.30 p.m.

Branch and Division Meetings to be Held

ROCHDALE DIVISION.—At Rochdale Infirmary, Monday, July 10, 8.30 p.m., meeting. Agenda includes consideration of agenda for Annual Representative Meeting, Southport, July 13.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JULY 15 1950

GOLD MEDAL OF THE ASSOCIATION

PRESENTATION TO DR. JAMIESON

At a meeting arranged by the New Zealand Branch in Auckland University College on the evening of June 5, the Chairman of Council, Dr. E. A. Gregg, presented to James Peter Speid Jamieson, M.D., F.R.A.C.S., the Gold Medal of the Association. This was awarded to him by the Council in recognition of his great services to the Association and to the profession. Mr. E. H. Luke, President of the Branch, was in the chair, and those accompanying him on the platform included the Mayor of Auckland, Sir John Allum, Dr. J. O. Mercer, who is Chairman of the Branch Council, Mr. D. S. Wylie, Mr. F. R. Smale, Chairman of the Auckland Division, and Mr. L. K. Munro, Editor of the *New Zealand Herald*.

After the Mayor had spoken briefly in praise of the profession and of Dr. Jamieson's services to it and to the community, Dr. Gregg addressed the meeting and conveyed to the Branch the warm good wishes of the Association at home. Referring to the National Health Service in Britain, he stressed the importance of a sense of vocation in medical practice and the need for maintaining the professional independence for which Dr. Jamieson had fought so doggedly.

At the conclusion of his speech, before decorating Dr. Jamieson with the medal, Dr. Gregg read the words of the accompanying illuminated testimonial. Dr. Jamieson expressed his thanks in a memorable speech.

"You will readily understand," Dr. Jamieson said, "that it is difficult for one at a moment which, as it were, places a crown on the efforts of a lifetime to fully express his emotion. You will forgive me, then, if I seek thoughts from someone eminent to help me. I recall an impromptu address by the late Sir William Osler to a gathering of recently qualified graduates in the winter of 1906–7. In that he rapidly sketched the geographical line of advance of scientific medicine from its beginning to his own time. He traced it from the island of Cos, through Greece, Sicily, and Asia Minor, to the Arabs. Thence, through them, into Moorish Spain, and from there to Italy. Then from Padua to Leiden and the Low Countries, and into Britain, which still held leadership. He asked a question, 'Where will it be next—West, East, or the Antipodes?' He answered the question himself, thus: 'It is hard to say; but of one thing we may be certain. Athene places her shrine only where there is freedom; and where there is most freedom, there will be made the future developments in scientific medicine.' This saying of this master in medicine has remained with me ever since, and it is to that more than anything that the reference to freedom, in the address with which you have honoured me, is due.

"On the same occasion Osler imparted to us certain precepts for guidance. From those I should like to record this, every word of which he emphasized with the motion of his hand: 'Never allow yourself, on any account whatever, to quarrel with a colleague.' Those things came to me from Osler's lips. Freedom is essential for progress, and harmony is essential in the profession.

"There are in this room many men with whom I have had the honour to work, as of one mind. It was their work that won me this award. There are also here perhaps some whose ways of thought lay differently. It is the greatest pleasure to see them all, whether we agreed or differed, for it marks two things. First, that here we are not compelled to think alike. Unlike some other countries, we still have freedom to think as we believe right. Secondly, that, however we may differ on points, we are completely united in the desire to develop the best medical service for the benefit of everyone.

"It is with much pride, then, tempered by a sense of humility for my own part, that I receive this address and the medal with which you have decorated me, not in the narrow sense of a personal distinction, but as a recognition by the parent body of the spirit of freedom and responsibility in this Branch, which the Association has striven always to foster. I thank you, Dr. Gregg; will you accept through me the filial homage of this Branch to the parent body in Britain?"

Dr. Jamieson, a native of Shetland and a brother of Dr. E. B. Jamieson, the distinguished Edinburgh anatomist, has practised in Nelson for many years. He was chairman of the National Health Insurance Committee of the New Zealand Branch and the acknowledged leader of the profession in the Dominion in the long and difficult but successful struggle to preserve unlimited clinical responsibility for the practitioner. He is a Past-President of the Branch.

After Dr. Jamieson's speech the meeting concluded with a stimulating address, from the point of view of the "consumer," by Mr. L. K. Munro.

TO BRISBANE AND BACK

BY

ANGUS MACRAE, M.A., M.B., Ch.B.
Deputy Secretary

With three Canadian companions and myself, the Chairman of Council had already made sixteen landings before crossing the Equator on the way to Honolulu at 06.30 hours on Tuesday, June 6. There were still ten landings to be made before we would see Heath Row again. The Chairman had visited Brisbane as the Council's delegate to the second British Commonwealth Medical Conference and the seventh Australasian Medical Congress (B.M.A.). He had called at Auckland to present the Gold Medal of the Association to Dr. J. P. S. Jamieson. An account of the Auckland ceremony appears above, so here I shall say only that the speech delivered with controlled emotion by Dr. Jamieson will remain one of the chief memories of a remarkable journey.

A full report of the Commonwealth Conference will be published later. A number of delegates spoke of the spiritual value of this series of meetings. These are high-sounding words, but to witness the spirit of fellowship that pervaded both the formal discussions and the casual conversations was certainly an inspiring experience. Outstanding among the papers read were a fascinating account of the history and work of the Flying Doctor Service and an outline by Sir Earle Page, Australian Commonwealth Minister of Health, of his new conception of a national health scheme, based on a combination of Government aid with nation-wide voluntary insurance.

The Minister proposes to avoid costly Governmental administration by making the financial benefits, which will include Government subsidies, payable through the Friendly Societies. These benefits will constitute a grant-in-aid (up to 90%) towards payment for services received, the doctor being paid on a fee-for-service basis and the patient providing, in addition to his insurance contribution, a small part of the fee.

It was refreshing to find the Minister, without a single accompanying official, making a long journey to Queensland

to expound his proposals and to answer questions about them in an atmosphere of great good will at a meeting of the B.M.A. Federal Council, which decided to accept the scheme in principle.

Cairo and Points East

On the way to Brisbane we called at Cairo, Karachi, Delhi, Bombay, Calcutta, and Singapore. At each of these places, as well as in Australia and New Zealand, we received a welcome of a cordiality that had to be experienced to be believed. In India, Pakistan, and Singapore we visited many impressive hospitals, laboratories, and research institutions. We heard of a proposed new health insurance scheme for industrial workers in India, but both there and in Pakistan the provision of satisfactory medical services in the rural areas seems to be an extraordinarily difficult problem.

Everywhere the hospitality we received was overwhelming, and many delightful social functions were fitted into our crowded days. Here are a few—but only a few—of the things I shall not forget: the wonderful affection and loyalty that bind Australia and New Zealand to the mother country, and the B.M.A. in these Dominions to what they like to call "the parent body"; the Taj Mahal at Agra; the brilliance of the silver crescent moon as we drove through the night from Delhi to Agra; the fortitude of the Chairman of Council, who kept moving throughout ten days in the really hot countries; the comradeship of our fellow-travellers from Canada, Dr. Harris McPhedran, and Dr. and Mrs. T. C. Routley; the towering personality of the Premier of Western Bengal, the Hon. B. C. Roy, F.R.C.S.; the dexterity of the intrepid snake-man who showed us the method of extracting venom from a dangerous reptile; and the treasures in the Egyptian Museum from the tomb of the boy-king, Tutankhamen.

I remember particularly experiments with chopsticks at a marvellous Chinese dinner in Singapore; the blarney of the Chairman of Council when negotiating with a Calcutta vendor of grave demeanour the appropriate deduction to be made from the price of a small ivory elephant by reason of a fractured tusk; the grace and skill of the Indian dancers who demonstrated their art for our delight; the view from Picnic Point, Toowoomba, a beautiful city 2,000 feet above the level of the sea; and the engaging frankness of the handsome Ukrainian head-waitress in Canada, who explained that she had left England because there were "too many other good-looking women" in that country as competitors in the labour market. I recall, too, the uncomplaining resignation of the Chairman of Council when he accepted my suggestion (dictated by extreme shortage of dollars) of a 10-cent ride in a tram during our one-day rest-pause at Honolulu; the splendour of the snow-clad Canadian Rockies; and the loveliness of the more modest hills of home as we flew in over Lamlash to the happiest of landings at Prestwick on a perfect June morning.

One thing more I might add. My most lasting impressions will be of the reality of the British Commonwealth of Nations as a potent force for amity and peace in the world, and of kindness, of very great kindness, at the hands of hospitable people too numerous to be mentioned by name.

ANNUAL MEETING

AMENDED PROGRAMME FOR SECTION OF ANAESTHETICS

Meeting-place: Lecture Theatre, Physics Building.

Tuesday, July 18.—10 a.m., *Paper:* Applied Pharmacology in Anaesthesia for Abdominal Operations, by Dr. STUART C. CULLEN (U.S.A.). 11.30 a.m., *Paper:* Resuscitation of the Newborn, by Dr. G. ORGANE (London), followed by Dr. R. J. MINNITT (Liverpool).

Wednesday, July 19.—10 a.m., *Papers:* Anaesthesia in the Newborn, by Dr. T. N. P. WILTON (Bristol), followed by Dr. G. JACKSON REES (Liverpool). 2.30 p.m., *Papers:* (1) Some Therapeutic Applications of Nerve Blocks, by Dr. G. C. STEEL (London); (2) Analgesia in Anaesthesia, by Dr. L. RENDELL-BAKER (Cardiff); (3) Sudden Death During Operation due to Undetected Paraganglioma, by Dr. S. B. DARBISHIRE (Ulverston).

AN EXPERIMENT IN GROUP PRACTICE

BY

B. ROSEFIELD, L.R.C.P.&S.I.

Several months before July 5, 1948, a meeting was called to discuss the formation of a non-partnership group practice. A number of neighbouring general practitioners were invited. Eight practitioners attended, and they unanimously agreed to establish a roster system for off-duty hours to include week nights, week-ends, Bank holidays, and annual vacations, as well as absence from practice due to illness. There are now twelve doctors (including three assistants) working in harmony together. The scheme has worked so well that at least two other groups of doctors in the same Metropolitan borough have organized themselves similarly, and other groups are being formed in adjacent boroughs.

Duties

The members of our particular group all live in close proximity to one another in an urban area. The average size of our N.H.S. lists is about 3,250. Three of the members have assistants. All members practise from their own residences, though two have branch surgeries in addition. We meet once a quarter to discuss all matters affecting the group and to draw up the dates for duties for the next twelve weeks.

In a period of twelve weeks each doctor is on duty for five week nights (at average intervals of one night in twelve) and for one week-end. Some prefer to split up the week-end duty in winter, doing Saturday night to Sunday afternoon in one week, and Sunday afternoon to Monday morning another week. Others do the week-end as a whole, and so are free from further week-end duties during that period. Permission was received from the executive council to close Saturday evening surgeries from the beginning of May to the end of September. The duty doctor for that evening is available to deal with all calls.

Each member is supplied with three or four copies of the duty roster. A boldly printed card is hung on the front door each evening at 7 p.m., informing patients where to apply for treatment from the doctor on duty. The card is in a frame with a detachable back, allowing the card to be changed as required. Similar cards are displayed at week-ends. For annual holidays there is a framed printed notice displayed, giving the list of doctors' names, addresses, and consulting hours, and informing patients that they may attend any of the doctors listed while their own practitioner is on vacation. In the evening this card is replaced by the usual card giving the name of the doctor on duty that night.

Constitution

As a result of our experiences in the first year's working of the group practice we drew up a constitution, which all members agreed to support. The rules of the constitution are as follows:

1. *Objects.*—To work in close harmony and co-operation for the mutual benefit of all members of the group.

2. *Membership.*—Open to all doctors approved by the present members of the group.

3. *Chairman.*—Shall be elected annually in rotation from the members.

4. *Tours of Duty.*—Week nights: 7 p.m. to 8 a.m. Week-ends: Summer months, 1 p.m. Saturday to 8 a.m. Monday; winter months, 7 p.m. Saturday to 3 p.m. Sunday, 3 p.m. Sunday to 8 a.m. Monday. Bank holidays: As for winter week-ends.

5. *Requests for Visits.*—The doctor on duty must ensure that someone is available at his premises to receive all messages during his tour of duty.

6. *Fees.*—All fees received may be retained by the duty doctor, unless other arrangements have been made between individual members of the roster.

7. *Transfer of Patients.*—A duty doctor who meets patients of other members for the first time while on duty roster must *not* accept any transfers to his list of such patients.

8. *Illness of Members.*—In the event of sudden illness of any members, the remainder of the group should be prepared to look after the sick members' patients for a period not exceeding one month.

9. *Half-holidays.*—If possible, arrangements should be made between individual members of the group for acceptance of calls up to 7 p.m. If necessary, the duty doctor for that night should be willing to do urgent calls before 7 p.m. A too rigid adherence to hours of duty is not in the spirit of this group.

10. *Annual Vacation.*—Should be taken if possible in summer months, and so avoid excessive strain on group members. It is suggested that, if possible, only two members be away at a time. Members on vacation in winter months should have a locumtenent or assistant to carry on their work.

11. *Continuity of Treatment for Patients.*—Except in an emergency, treatment of patients of absentee doctor should not be handed over from one member to another. Original doctor called in to attend should continue the treatment of the patient as required until return of absentee doctor.

12. *Roster Meetings.*—Shall be called as deemed necessary by the chairman. Two-thirds attendance of members shall constitute a quorum. Decisions taken at roster meetings shall be binding on all members, whether present or absent. The chairman shall have a casting vote.

13. *Assistants.*—Full-time assistants of members, living in the district, should become members of the roster.

14. *Complaints.*—Complaints between members should be referred to the chairman for decision. If the complaint is sufficiently serious, the chairman may call an emergency meeting of the group to decide on all points at issue.

15. *Expenses.*—All expenses incurred in the organization of the group shall be shared equally between the members.

16. *Expulsion from the Group.*—A member may be expelled from the group forthwith if a majority of members decide that he is not contributing adequately to the principles of the group, as laid down in the preceding rules.

Calls

The amount of work to be done has been remarkably light. Week-day evening visits (before midnight) do not average more than four an evening over the year. Night calls (after midnight) are very few. We find that a large number of patients prefer to wait for their own doctor in the morning rather than call in the duty doctor. Week-end work varies considerably. Some doctors have had from fourteen to twenty-four calls to do in one day; others have had six or less. Generally speaking, we never fail to be amazed at the comparatively few calls we have had to do.

Midwifery does not come within the scope of duties in the group.

Benefits of Group Practice

There is little extra work entailed for those working in a group practice. Patients have accepted the scheme without any objections and appreciate the fact that there is always a doctor available for them to call when necessary. The ideal minimum number for a roster would be six doctors. This would allow for a week night and a week-end on duty, in rotation, for each.

The benefits to be gained from a group practice are manifold. The general practitioner has definite hours of leisure and rest, and can go out, when off duty, without fear of recall. The difficulty and expense of obtaining locums for holidays and illness is eliminated. There is a spirit of friendliness and co-operation between colleagues which was noticeably absent before the inception of the N.H.S. Despite the increased work occasioned by the Health Service, we have never had so much time for relaxation.

We cannot speak for rural practitioners, but as a result of our experiences we would urge all urban doctors to endeavour to organize a similar scheme in their own districts. It would be to their own advantage and to that of their patients.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

PAY IN THE ARMED FORCES

DEPUTATION TO MINISTERS

On July 6 a deputation from the B.M.A. was received at the House of Commons by the Minister of Defence (Mr. E. Shinwell), the First Lord of the Admiralty (Viscount Hall), the Secretary of State for War (Mr. John Strachey), and the Secretary of State for Air (Mr. Arthur Henderson). The members of the deputation were Dr. E. A. Gregg (Chairman of Council), Air Vice-Marshal D'Arcy Power (Acting Chairman of the Armed Forces Committee), Surgeon Captain A. Robinson Thomas, R.N.V.R., and Colonel E. C. Linton, accompanied by the Secretary of the Association and other members of the Secretariat.

The deputation expressed concern at the low level of voluntary recruitment to the medical branches of the armed Forces. It drew attention also to the dwindling yield from conscription, due to the fact that a growing proportion of doctors who will qualify in the next five years will have already performed their National Service before starting their medical training. The main reason for the present low rate of voluntary recruitment was stated to be the fact that the terms offered by the armed Forces compared unfavourably with prospects in the National Health Service.

The deputation then referred to the Association's proposals for improvement of pay, which were first laid before the Ministry of Defence in March, 1949 (*Supplement*, April 2, 1949, p. 204), and to the subsequent fruitless discussions, an account of which appeared this year in the *Supplement* of May 20 (p. 223).

In reply, Mr. Shinwell stated that the Ministers were sympathetic with the Association's case. They were as concerned as the deputation at the growing shortage of medical officers. They were not convinced, however, that improvement of pay was necessarily the only answer to this problem. Mr. Shinwell reminded the deputation of the Government's present policy of restraint on personal incomes.

The Minister chided the deputation on the Association's refusal to publish War Office advertisements for civilian specialists at preferential rates of pay. The deputation replied that it was a combination of three things—underpayment in the Service, the ban on retirement, and the importation of civilians at considerably higher rates of pay—which the Association felt could not be tolerated, and asked whether the ban on retirement from the R.A.M.C. was likely to be lifted. Mr. Shinwell stated that it would be difficult to lift the ban under present circumstances.

The Ministers paid a tribute to the work of the medical officers in the three armed Forces and concluded by saying that they would consider the points made by the deputation as quickly as possible.

SERVICE COMMITTEE REGULATIONS

DEPUTIES AND ASSISTANTS

The Minister of Health has made some alterations in the Service Committees and Tribunal Regulations.

The N.H.S. (Service Committees and Tribunal) Amendment Regulations, 1950, provide that a deputy or assistant to a general practitioner in the Health Service shall on application be treated as if he were a party to any service committee proceedings which concern his conduct. The Ministry of Health states that, if the deputy or assistant elects to be treated as if he were a party to the proceedings, the executive council cannot make any recommendation for action against him (including, for example, reprimand). The council's decision under Regulation 6 of the principal regulations can relate only to action against the responsible practitioner. It follows from this that the deputy or assistant will not have a right of appeal.

When the conduct of a deputy or assistant is called in question, this will normally be apparent from the complaint. In such cases a copy of the complaint should be sent to the deputy

or assistant at the same time as it is sent to the principal (or as soon afterwards as the facts become clear), and he should then be asked whether he wishes to be treated as if he were a party to the proceedings. If the deputy or assistant does not become a party, he will still be entitled to be present as a witness on behalf of the respondent.

The new regulations also enable an executive council to establish with the consent of the Minister two or more medical service committees, dental service committees, or pharmaceutical service committees.

CENTRAL HEALTH SERVICES COUNCIL

The Minister has made the following appointments to the Central Health Services Council and Standing Advisory Committees:

Central Health Services Council.—Medical Practitioners: Dr. Janet Aitken; Professor R. Cruickshank; Sir Stewart Duke-Elder; Dr. W. V. Howells; Dr. C. W. Walker. Persons with experience in hospital management: Hon. A. J. P. Howard; Mr. F. S. Stancliffe. Persons with experience in local government: Alderman A. F. Bradbeer; Mrs. Dorothy Thurtle. Dental practitioners: Mr. J. Lauer; Professor R. V. Bradlaw. Registered nurse: Miss C. H. Alexander.

Standing Medical Advisory Committee.—Dr. Janet Aitken; Professor R. Cruickshank; Sir Stewart Duke-Elder; Dr. W. V. Howells; Dr. C. W. Walker.

Standing Dental Advisory Committee.—Mr. C. V. Armitage; Mr. Joseph Lauer.

Standing Ophthalmic Advisory Committee.—Dr. Janet Aitken; Sir Stewart Duke-Elder.

Standing Nursing Advisory Committee.—Miss C. H. Alexander; Dr. Horace Joules; Hon. A. J. P. Howard; Professor R. M. F. Picken; Mr. F. S. Stancliffe.

Standing Maternity and Midwifery Advisory Committee.—Dr. Janet Aitken; Mr. A. W. Bourne; Dr. W. V. Howells; Mrs. Dorothy Thurtle; Dr. C. W. Walker; Councillor W. Onions, J.P.

Standing Mental Health Advisory Committee.—Dr. Denis J. Williams.

Standing Cancer and Radiotherapy Advisory Committee.—Dr. W. V. Howells.

The period of office of these members is until March 31, 1953, except for the following:

Professor R. V. Bradlaw, Mr. C. V. Armitage, and Dr. Horace Joules serve until March 31, 1951, and Dr. Denis Williams until March 31, 1952.

ANAESTHETICS GIVEN BY TRAINEE ASSISTANTS

A circular from the Ministry of Health states that, after consultation with the General Medical Services Committee of the B.M.A., the Minister has decided that it would not be appropriate for an anaesthetic fee to be claimed in respect of the administration of an anaesthetic by a trainee assistant at an operation performed by his principal (or performed by a partner or ordinary assistant of the principal).

The Minister also considers that it would be inappropriate for an anaesthetic fee to be claimed where a trainee assistant acts as an anaesthetist for his principal (or for the partner or ordinary assistant of his principal) in connexion with the provision of maternity medical services.

PATIENTS AND ASSISTANTS

A circular from the Ministry of Health gives guidance to executive councils on the additional number of patients allowed to a doctor in respect of assistants. In respect of a permanent assistant the regulations provide for an increase of up to 2,400 patients. "Permanent assistant" is not defined, but the Minister, after consultation with the General Medical Services Committee of the B.M.A., suggests that, while the facts of each case must be considered on their merits, in general it would be reasonable to regard as a permanent assistant not only a full-time assistant but also an assistant regularly employed part-time for at least one-half of the time that a full-time assistant would normally serve the practice; that in the case of such a part-time assistant it would be reasonable for an executive council to agree that the principal's list might be increased by a proportion of 2,400 approximately equal to the proportion of the time given by the assistant; but that, where the assistant is employed for less than half-time, no increase in his principal's list should be permitted.

When permission is given in future to a doctor to have an increased list in respect of an assistant, the Minister suggests that the permission should be made subject to the doctor's informing the council of any change in the period of service given by that (or any subsequent) assistant, and to review by the council in the event of any such change.

CENTRAL HEALTH SERVICES COUNCIL
FIRST REPORT

Under the National Health Service Act the Central Health Services Council was appointed to advise the Minister of Health on general matters, and in its first report[1] it considers the first 18 months of the Health Service up to December 31, 1949. The report covers only England and Wales, since there is a separate council for Scotland.

Health Centres.—As a result of a recommendation by this committee the council has advised the Minister that the Act should be amended so that doctors in practice at a health centre may, if they wish, treat private patients at the centre. The council has also advised the Minister that, if a new health centre is opened, the appropriate authority should be able to prohibit doctors from opening a surgery in a prescribed area round the centre for a limited period, exceptions being made for death or retirement.

Hospital Administration.—A special committee has been considering the relation between (*a*) the Minister and regional hospital boards; (*b*) regional boards and hospital management committees; and (*c*) management committees and hospitals in their groups; with special reference to the control of finance and staff establishments. The council has advised the Minister to invite the King Edward's Hospital Fund and the Nuffield Trust to undertake a complete unit costing of a small number of representative London and provincial hospitals. An agreed system should be used, and the results subject to a joint report by the two bodies.

Prescribing.—A Joint Subcommittee was set up and included Scottish representatives to give guidance on various aspects of prescribing. The first report—on the distinction between foods and drugs—was summarized in the *Supplement* of May 27 (p. 231), and a second report—on whether there should be any restriction on what could be prescribed under the Health Service—was summarized in the *Supplement* of July 8 (p. 24). The Joint Subcommittee is now considering toilet preparations, disinfectants, and antiseptics. The Minister had been advised that drugs in the experimental stage or in short supply should be treated in three stages:

(*a*) An initial period of investigation during which the value of the drug is being ascertained—e.g., by the Medical Research Council—and no prescribing should take place.

(*b*) A period during which a drug of proved value is in short supply. During this time the drug should be available at designated centres to which patients should be referred or from which supplies could be obtained on application in cases approved by the director of the centre.

(*c*) A period of unlimited supply when any further control is necessary only in the interests of the patient. There should then be complete liberty of prescribing, but it may often be desirable to issue advice on prescribing a drug to general practitioners either through the medical press or by circular letter based, where necessary, on the authority of the Medical Research Council.

Hospital Services

The Pressure on Hospitals.—The council has made the following recommendations to the Minister:

Acute Emergency Cases.—(i) Regional boards, in consultation with the boards of governors, should set up an emergency bed bureau for each appropriate area which would be responsible for the admission of emergency cases from that area. (ii) With each bed bureau there should be associated a senior medical officer, who would have authority to order any hospital within the area to admit emergencies. (iii) No patient reported to the bed bureau as an emergency case should be refused admission to hospital unless the patient had been seen, either at home or at the hospital, by the medical officer concerned or by a responsible officer acting on his behalf. (iv) Records should be kept not only of cases admitted but also of those refused admission.

[1] Report of the Central Health Services Council for the period ending December 31, 1949. H.M.S.O. 1s.

Early Malignant Cases.—Similar action should be taken for early malignant cases where even a short delay in providing treatment would reduce the prospect of recovery.

Non-urgent Cases.—(i) Facilities for minor operations in out-patient departments should be improved. (ii) More patients should be treated in their homes by means of domiciliary visits. (iii) The discharge of post-operative cases to convalescent homes and other places—e.g., vacant wards in hospitals—where they could recuperate should be facilitated. This would allow of a dilution of skilled nursing staff. (iv) Beds should be redistributed among specialties in the light of the review made by regional boards. (v) Some larger urban isolation hospitals should be used for non-infectious cases, especially post-operative recovery and chronic sick; this too would allow of a dilution of skilled nursing staff. (vi) There should be closer liaison on this matter between regional boards and boards of governors, and teaching hospitals should accept a reasonable number of chronic sick patients. (vii) The need for admission to hospital of infectious cases who could often be nursed at home should be reassessed. (viii) The average length of stay of patients could often be shortened by increasing the frequency of specialist visits and by providing more pathological and radiological facilities; patients sometimes occupied beds for several days waiting for their investigation or treatment to be started or their discharge to be authorized. (ix) Improvements in standards of hospital accommodation and of the ratio of nurses to patients should not be made by reducing the numbers of available beds. (x) Advantage should be taken of the services of district nurses and home helps to nurse patients in their homes when possible.

Co-operation Between the Services.—The council has asked the committees concerned not to submit any advice to the Minister for the present, for it proposes to consider during this year what advice should be formulated on this subject.

Work of Standing Advisory Committees

Medical Advisory Committee.—This committee carried out much of the work referred to above. The committee is obtaining information on whether certain methods of contraception are injurious to health and whether doctors should be better informed on methods of contraception.

Ophthalmic Advisory Committee.—The committee has given the following advice to the Minister:

(*a*) That as an interim measure a patient who had been referred to the hospital eye service and found by a hospital ophthalmologist not to need ophthalmic treatment, but only to need glasses which could be supplied through the supplementary ophthalmic services, might be returned to the supplementary ophthalmic services for the supply of those glasses, at the discretion of the hospital ophthalmologist who examined him.

(*b*) That in all other cases where a patient had been referred to the hospital eye service from the supplementary ophthalmic services, the patient should remain within the hospital eye service for any treatment, glasses, or observation necessary.

Nursing Advisory Committee.—The committee was asked by the Minister what would be the most effective procedure for obtaining and collating information regarding approved nursing techniques and for making this information available to hospitals and nurses throughout the National Health Service. It was also asked what techniques ought to be recommended. The committee has given considerable thought to this question and will submit a report this year.

Large-scale recruitment of student nurses by teaching hospitals is said to have had an adverse effect on the recruitment of nurses to hospitals under regional hospital boards. The committee is studying this problem. Costs and methods of dividing general wards into cubicles by means of curtains are also being studied.

Maternity and Midwifery Advisory Committee.—The committee thought it desirable that the attention of medical students should be drawn to the fact that a resident appointment in a maternity unit would normally qualify them for admission to obstetric practices under Part 4 of the Act.

Mental Health Advisory Committee.—The committee is considering the problem of the organization of preventive psychiatry and of the aftercare service by local authorities. An experimental scheme would be welcomed for the boarding out of suitable mental patients, and the committee hopes to report on this later.

Tuberculosis Advisory Committee.—The advice of the medical committee has been sought on a proposal that a proportion of beds in suitable general hospitals should be reserved for cases of tuberculosis. The committee advised the Minister that there should be no general ban on placing infectious tuberculous persons in ordinary employment subject to medical decision in each case and the suitability of the employment. It has also advised him that it would be unwise to train tuberculous persons in making woolly toys or to supply them with materials for such toys.

Cancer and Radiotherapy Advisory Committee.—The committee has recommended to the Minister that the existing facilities for educating general practitioners about the symptoms of cancer should be encouraged and expanded wherever possible, but that it was undesirable at present for any cancer publicity to be carried out directly to the general public, though the latter advice is to be considered further.

C.M.S. SALARIES IN EAST AND CENTRAL AFRICA

The Association's negotiations on Colonial Medical Service salaries with the Colonial Office are beginning to bear fruit. Increased salaries as set forth below have been introduced in Kenya, Tanganyika, and Nyasaland.

Kenya	
Director of Medical Services	£2,050
Deputy Director of Medical Services	£1,800
Assistant Director of Medical Services Assistant Director of Laboratory Services	£1,700
Senior Medical Officer	£1,650
Medical Officer	£865: £865: £935 by £35 to £1,005 (E.B.) by £45 to £1,140 (P.B.) by £45 to £1,320 (E.B.) by £45 to £1,590
Tanganyika	
Director of Medical Services	£2,000
Deputy Director of Medical Services	£1,800
Assistant Director of Medical Services	£1,700
Senior Medical Officer	£1,650
Medical Officer	£865: £865: £935 by £35 to £1,005 (E.B.) by £45 to £1,140 (P.B.) by £45 to £1,320 (E.B.) by £45 to £1,590
Nyasaland	
Director of Medical Services	£1,800
Deputy Director of Medical Services	£1,700
Assistant Director (Health)	£1,675
Senior Medical Officer	£1,650
Medical Officer	£865: £865: £935 by £35 to £1,005 (E.B.) by £45 to £1,140 (P.B.) by £45 to £1,320 (E.B.) by £45 to £1,590

(E.B. = Efficiency Bar; P.B. = Promotion Bar)

Increases on similar lines are under consideration by the Governments of Uganda, Zanzibar, and Northern Rhodesia.

Negotiations in regard to specialists are still in progress.

Correspondence

The J.H.M.O. Grade

SIR,—The time has come for a thorough investigation into the J.H.M.O. grade; enough has been said on behalf of, and in defence of, other grades. There appears to be no specific method by which one is assessed for this inferior grade, and one is left in little doubt as to its being either a "dead end," a "back-water," or a source of cheap labour and exploitation.

The J.H.M.O. is not catered for in relation to clinics, classes, or any form of prescribed training. He has merely to "be," and is looked upon as being nothing more than a medically qualified errand-boy suffering from profound lethargy and mental constipation—the mental defective of medicine. No person or group of persons is interested in his defence, his promotion, his future, or his well-being.

The only action he is allowed to perform, it appears, is to lazily wallow in the quagmire of his own ignorance. He is not supposed to take any responsibility (although it may be thrust upon him), and yet paradoxically in at least one hospital there is a J.H.M.O. at present who is taking over the full duties of a consultant when on holiday.

How is this possible? The J.H.M.O. concerned is of mature age, has been qualified for some years, is keen and progressive, has had plenty of all-round experience, held a senior appointment in one of the Services, and was recently on a short-list of two for a senior-registrar appointment, and has had complete charge of a hospital. So, gentle reader, do not sneer at the J.H.M.O. He may be much better qualified for his job than you: tread warily.

The scheme of grading as it stands stinks and should be scrapped. May I suggest that if we are to be graded it should be as follows: consultants, specialists, and A.M.O.s. We are becoming too class-conscious, and that is bad. Nowadays when doctors meet they immediately inquire as to each other's grading; the salary is quickly assessed (jealousy often occurs in one, or both); then a further inquiry as to any extra qualifications: which brings me to the fact that, if one does not possess the necessary diploma(s) with which British medicine is flooded, then it must follow that one is a dullard and a dolt. We are none the better for having these diplomas, as the individual would still strive to give of his best irrespective of the prize other than having the patient recover quickly, which is the greatest of all rewards. A patient asks to be cured; he doesn't ask about diplomas.

When in Canada recently I was not asked once what my qualifications were, and I was accepted as having at least the same knowledge as themselves. What matters in the North American continent is, Can you work hard? Can you get the results? and it is on these that one obtains the proper rewards, which to me at least is a very sensible attitude.

However, one must have the prescribed diplomas in this country, otherwise one is brainless: what a rotten psychology! We all know of those among us, who for some reason or other are not the possessors of any extra qualifications, whose work and diligence are of the highest order. Are such people to be rewarded with a J.H.M.O. grade, or are they to be graded according to results?

We must all stand firm as the dentists and pharmacists and insist to the last on our rights. We must fight against a system which is out to oppress and suppress us. We must deal properly and expeditiously with such a system whose "brains" has no "association" and in which there are too many "clots."—I am, etc.,

Shotts, Lanarkshire. A. M. BUCHANAN.

SIR,—Dr. J. McGhee (*Supplement*, June 17, p. 292) is surely and rightly pointing out a grievance which has hitherto had very little attention. This grade should combine to get their case adequately represented. Age, experience, and years of service have indeed been ignored. One J.H.M.O. of my acquaintance is over 60 years of age but still a "junior." The B.M.A. when approached on this subject promised to take up our case in the second half of next year together with a number of other inappropriately graded senior practitioners.

I strongly feel that the matter should not rest there. The post of J.H.M.O. is *de facto* a *cul-de-sac* from which there is no escape except by very slender chance, since the possibilities of promotion from this grade are so extremely limited. I therefore suggest that the J.H.M.O.s unite to secure, primarily, regrading, and, pending such regrading, fair and just remuneration as stressed by Dr. McGhee.

To apply the term "junior" to men grey with long and mature experience is not merely inappropriate but detracts from the prestige and dignity of our profession.—I am, etc.,

Birmingham. R. S. HOLZER.

Whitley Machinery

SIR,—Since July, 1948, whenever the mass of frustration and irritation over negotiations threatened to depress the G.P. he always sought comfort in the fact that we had established the right to take our problems to a Whitley Council. He felt that here his case would receive impartial consideration, and if his case could be established as right and just it would be binding on the Government to act accordingly.

The consultants have now had their first meeting of a Whitley Council to consider their problems. May we be told just what happened at that meeting, and did it turn out to be the impartial tribunal which it is supposed to be?

I am one of the profound cynics that believe that in winning the right to take our problems to a Whitley Council we have won but a barren victory, as I do not believe that it will advance our cause, however just. I am prepared to be convinced that I am wrong, but only if we can be told how the first meeting was conducted. I believe we have a right to know.—I am, etc.,

Upminster, Essex. E. ANTHONY.

POINTS FROM LETTERS

One Profession

Mr. A. W. D. COVENTON (Leafield, Oxford) writes: . . . General practice was a fine life for a man, a liberal education, a test of character. What is it now? Something to be avoided, a grind, an imprisonment of the spirit? The elements of specialism lie in general practice. It provides unlimited opportunity for observation, for follow-up, for studying men, women, and children in health and sickness in their own homes, not served up on a plate in hospitals. Away with this dichotomy. Open the gates; make the medical profession one and indivisible. Teach the specialist that he is the assistant of the general practitioner and is privileged in serving. Give the general practitioner opportunity to follow his bent, a ready welcome in any hospital, library, or laboratory in the land which can stimulate and enlarge his knowledge till he too may become a specialist. And warn the patient—that guinea-pig whose guineas are extracted before treatment—that he is in danger of becoming a number in a cage.

Association Notices

Diary of Central Meetings

JULY

17	Mon.	**Annual Representative Meeting** (at Southport), 9.30 a.m.
17	Mon.	**Council** (at Southport), at conclusion of A.R.M.
17	Mon.	**Annual General Meeting** (at Southport), 12.30 p.m.
18	Tues.	**Adjourned Annual General Meeting and President's Address** (at *Liverpool*), 8.30 *p.m.*
24	Mon.	Staff Side, Committee "C," 11.30 a.m.
24	Mon.	Full meeting, Committee "C" (at Ministry of Health), 2 p.m.
27	Thurs.	General Medical Services Committee, 11 a.m.
27	Thurs.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
28	Fri.	Drafting Subcommittee, 10.45 a.m.
28	Fri.	Venereologists Group, 2.30 p.m.

Branch and Division Meetings to be Held

SOUTHAMPTON DIVISION.—At Royal South Hants and Southampton Hospital, Wednesday, July 19, 8.30 p.m., special general meeting.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY JULY 22 1950

British Medical Association

ANNUAL REPRESENTATIVE MEETING, SOUTHPORT, 1950

The Annual Representative Meeting opened in the Floral Hall, Southport, on Thursday, July 13, and was continued on the following Friday, Saturday, and Monday. The chair was taken by Dr. J. A. Brown (Birmingham), who was supported by the President (Dr. C. W. Curtis Bain), the President-Elect (Sir Henry Cohen), the Chairman of Council (Dr. E. A. Gregg), and the Treasurer (Mr. A. M. A. Moore). The main agenda contained some 267 motions and amendments, almost all of which related to matters contained in or arising from the Annual and Supplementary Reports of Council, published in the *Supplement* of April 22 and 29 and June 10, respectively.

THURSDAY, JULY 13
PRELIMINARY BUSINESS

The meeting opened at 10 a.m.

Mr. J. Ewart Purves (Bromley) moved that each copy of the Minutes of the Representative Meeting should contain a verbatim report, as in *Hansard*, and that this copy be available at Headquarters.

The Chairman of Council said that as there was no reference to the printing of the report he was prepared to accept the proposal on the understanding that the record need not include the more trivial parts of the discussions.

Some discussion took place on the arrangement of the agenda. It was agreed that the Agenda Committee should group motions or amendments which covered substantially the same ground and should have powers to select and mark with an asterisk in the agenda of the meeting one motion or amendment in the group on which discussion should take place.

A time limit for speeches was also considered, and it was agreed on a motion by Burton-on-Trent that a representative should be allowed to speak for seven minutes in moving any resolution, subsequent speakers to be allowed five minutes. Chairmen of committees in introducing reports were allowed 15 minutes.

On the motion of the Chairman of Council the part of the report under "Preliminary," with the exception of paragraph 2, which was postponed for consideration by the Council, was approved.

Dr. J. B. Miller, Vice-President

The Chairman of Council moved that Dr. J. B. Miller, of Bishopbriggs, Lanarkshire, a former chairman of the Representative Body, be elected a Vice-president of the Association. He said that he made this proposal with the very greatest pleasure and referred to the outstanding services which Dr. Miller had rendered to the Association.

Dr. Miller was at this point called to the platform, representatives rising and applauding, and the motion was carried unanimously.

The Chairman of Council further said that there was no honour which could be done to Dr. Miller which he did not completely and heartily deserve.

Dr. Miller said that when he was elected Chairman of the Representative Body he stated that it was the greatest honour to which any general practitioner could look forward. He still thought so, but it was also a very great honour to be made a vice-president of this great Association. For the last 30 years he had been trained to learn a little about the work of the Association, which indeed had been the principal interest in his life. Now he felt that he could take a back seat. He thanked them not only for their kind reception but for the way in which the representatives had enabled him to carry through those trying and tempestuous years when he was Chairman. (Applause.)

THE AUTONOMOUS BODIES

The Chairman of Council moved approval of the report of Council under "Relationship of Autonomous Bodies to the Association."

Dr. J. C. Wishart (Bromley) moved to confirm the composition and status of the two autonomous committees as defined in the Supplementary Report in respect of the year 1950–1, but to declare that the autonomous powers of these committees, in so far as they derived from the Representative Body, required to be specifically renewed by successive Annual Representative Meetings. In doing so he said that they had always looked to the Representative Body as the parliament of the Association. They believed that the decisions taken by the Representative Body were those that mattered. His Division had learnt with dismay of the powers handed over to the autonomous bodies which were not responsible either to the Council or to the Representative Meeting. This caused many discussions in the Divisions and also in the Representative Body itself, and they were told by the chairman of one of the autonomous bodies that all their discussions were useless and that the function of that particular meeting of the Representative Body was only to impress the rubber stamp of approval. This was a serious position. The Representative Body was jealous of its powers. It was quite obvious from the report that the Council were not entirely happy about the position. His committee was prepared to accept the report on the constitution and functions of the autonomous committees, but it felt that the Council should retain some control, and accordingly it asked for the autonomy of these committees to be specifically reviewed at each annual meeting.

The Chairman of Council said that this was a subject that naturally caused a good deal of vague anxiety. He gave the meeting credit for having read the report. There were all sorts of possibilities, difficulties, and dangers which might be conjured up in their minds, but he put it to the meeting that it would be an extremely unwise thing at this stage to take precipitate action. The Council was keeping an eye on the problem, and he took no exception to the Bromley phrase "in so far as they derived from the Representative Body." But it was just as well not to pass this motion, because they did not want to limit themselves as to the action they had to take. He thought therefore that they might usefully pass to the next business. ("No.") By passing such a motion they might easily do more harm than good. The position in regard to this matter was under closest possible observation all the time.

Dr. J. A. Gorsky (Council) said that while he appreciated the arguments just put forward by the Chairman he still viewed the situation with some anxiety. They were at the moment employees, whether they liked to be or not, of a rather troublesome individual at the Ministry of Health whose power enabled him to by-pass the Council. While he approved of the report issued by the committee of which he is a member he still felt that this matter must be under the supervision of the Representative Body. Neither the Representative Body nor the Council were ever consulted about the payment of the staff side of the Whitley Council. For this and other reasons he felt that the Bromley motion should be passed. There was nothing in it which was objectionable.

Mr. H. H. Langston (Winchester) said that autonomy might become autocracy. It might lead to division and dissension within the profession. The Minister had shown more than once that he was aware of the old maxim "Divide and Rule." In the consultants and specialists field he thought the exercise of autonomy did give rise to grave disquiet. On the Joint Committee the Central Consultants and Specialists Committee had only six representatives and that Joint Committee was now a constituent part of the staff side of the Whitley Council. He wondered whether the Representative Body had envisaged that a body over which it had so little control should be the negotiating authority for consultants and specialists.

Autonomy had these dangers, and freedom of action might be abused. This Representative Body must guard its mandate jealously. The only safeguard was that the question of autonomy be re-examined freely.

Dr. R. W. McConnel (Buckinghamshire) expressed the opinion that the Council had acted wisely in asking that the matter should be deferred. The members had asked for evolution in the case of the National Health Service, and he would suggest that the matter under discussion now should be allowed to evolve. The General Medical Services Committee had become a partly autonomous body; the Representative Body knew that last year and gave the Committee power to act on its own. There might be a danger of the Committee becoming a stronger body than the Council, but the matter could be discussed again in three years' time.

CIVIC WELCOME

At this point the Mayor of Southport (Lieutenant-Colonel R. Fleetwood Hesketh) attended to convey a welcome to the Association. He said that he regarded it as a great privilege to welcome the Association, not only because it was one of the most distinguished bodies in the country but also because it was very largely due to the medical profession that Southport existed at all. It was owing to the recommendations of doctors in the latter part of the eighteenth century, when for the first time they took the view that the sea was a cure for all ills, that people were induced to visit this part of the coast of England.

He wished to extend a special welcome to those who had come from overseas, and he hoped that their visit to this country would be both interesting and enjoyable.

He hoped that the Association's meeting in Southport would be a success and that those who were there would repeat their visit in the near future.

The Chairman, in thanking the Mayor for his cordial welcome, said that he knew that the Mayor and his council had taken very considerable pains to make the Association's visit to Southport a great success, and he was quite sure, judging by the arrangements which the members had already seen, that that object would be achieved.

The Mayor then withdrew.

THE AUTONOMOUS BODIES

(Discussion continued)

Dr. W. D. Anderson (Glasgow), in speaking in support of the Council's motion, said that his Branch approved of the position of autonomy which the General Medical Services Committee held, in which the Committee reported to the Council of the British Medical Association and any decision that was not in accordance with the policy of the Association could be referred back by the Council to the General Medical Services Committee.

Before the inception of the new Service, the specialists in Glasgow had an inter-hospital committee which represented all specialists in the area, and when it was suggested that regional consultants and specialists committees should be formed this inter-hospital committee wished to form a committee independent of the British Medical Association, but it was persuaded not to do that because its representatives were informed, at a Branch Council meeting to which they were invited, about the autonomy possessed by the General Medical Services Committee and were told that the specialists and consultants could have the same autonomy. At first they did not wish to have any general practitioners on their committee, but now they had been persuaded to have two.

Dr. Frank Gray (Council) suggested that the representatives should ask themselves whether the amendment was wise and whether it was necessary. There was no doubt that the Representative Body had the power in question and could exercise it, and it had shown that it was not unwilling to exercise it. To state that it had that power would imply, he submitted, a doubt of its possession of it.

As to whether the amendment was wise, he would point out that the situation was new in one respect and old in another. The Insurance Acts Committee had had autonomy for years and no one questioned it, but on the consultants' side the situation was a new one. That might be an illogical development, but he did not need to remind the representatives of the troubles which might have arisen had it not been for the wholly illogical act of statesmanship, the appointment of the Joint Committee.

He would suggest that, now there was an arrangement in existence which had prevented troubles arising, the Representative Body should be content to let that arrangement continue, knowing that it could review the position in a year's time if it wished to do so. He felt sure that in three years' time the Representative Body would be satisfied that it had an arrangement which preserved all its power but did not clog it with unnecessary detail.

He submitted that the amendment was unnecessary and that the Representative Body would be wise to pass to the next business.

Dr. R. Hale-White (Marylebone) thought that the issue before the meeting was simply whether the existing arrangement should be reviewed by the Representative Body annually or whether it should be left to the discretion of the Representative Body to say whether it should be reviewed annually or not. The present was a time of extremely rapid change, and he felt that the situation must be reviewed by the Representative Body every year if the Representative Body was to continue to mean anything at all. He entirely agreed with what Dr. Gorsky and Mr. Langston had said.

Dr. K. C. Bailey (West Somerset), in supporting the amendment, said that there were so many cross-sections in the profession that if they were all going to be split into their own groups and put their own cause first the profession would be divided much more than it had been in the past. He felt it was necessary that the Representative Body should have the final word and that the Council should be able, if any contentious matter arose, to advise the various committees on the possible harm that might be done.

He would point out that the amendment only asked that the Representative Body should have the power to review the situation at the end of each year. It was better to have a specific time laid down for the review, and he thought that three years was too long an interval.

Dr. D. F. Hutchinson (Council) asked the Representative Body to reject the amendment. He knew from experience, he said, that both Committees were working extremely well, and he thought it was wrong to upset anything which was working so well, especially as the matter could be reviewed by the Representative Body at any time.

Dr. Wishart, in replying to the discussion on the amendment, drew attention to the very careful wording of the amendment and said that the operative part was "the autonomous powers of these committees, in so far as they derive from the

Representative Body." It had been suggested that because things were working well they should be left as they were and evolution allowed to take place, but he wanted the Representative Body to control the evolution.

The Bromley amendment was carried, and the report of Council under this heading, as amended by Bromley, was carried.

THE WAR MEMORIAL

Dr. H. Guy Dain (chairman of the War Memorial Committee), in moving approval of that part of the report, said that the Council, acting on the instructions given by the Representative Body at its last meeting, had proceeded with the preparation of the war memorial and had taken expert artistic advice on the subject. The Representative Body had decided that the memorial should take the form of a fountain in the forecourt at Headquarters, and a design for this had been prepared and could be seen by the representatives at the present meeting. The opinion had been expressed by some members that the memorial should take a form that would be of use to the living, and it was proposed to meet that point of view by founding scholarships for the dependants of those who had given their lives in the war. Substantial subscriptions had already been received for the memorial, some of them being earmarked for one or other part of the memorial; the Committee preferred that the subscriptions should not be earmarked, but subscribers could earmark them if they wished.

The design of the permanent memorial was by Mr. James Woodford, R.A., and had been selected after very careful consideration by experts in the artistic world. There was a central fountain which represented resurgence after the war, and there were figures symbolizing service and sacrifice. He thought it was a very worthy memorial to the members of the Association who had made the supreme sacrifice in the war.

It was also proposed to have a roll of honour on which the names of the members who gave their lives would be inscribed and which would be kept in a case in a room at Headquarters, the pages being turned day by day. It was proposed to add the names of medical sons of members of the Association who had not joined the Association at the time of their death and the names of other medical men who were not members of the Association, these names being put into a separate list from that of the Association members.

With a membership of some 60,000, the contributions to the memorial ought to be sufficient to provide not only the fountain which he had described but also a considerable sum of money to be spent on the living, as had been suggested.

Dr. T. F. Tierney (Marylebone) thought that some indication should be given to members of the Association of the amount that they should subscribe for the memorial. He would suggest that it should be two guineas.

Dr. E. C. Warner (Marylebone) deprecated the proposal to have two separate lists in the roll of honour, and said that he thought the making of a distinction between those who were and those who were not members of the Association would be unworthy of the Association.

Mr. G. J. Alexander (Edinburgh City) moved that the dedicatory inscription be so worded as to include not only members of the Association but all other British medical men and women who lost their lives in the recent war. In putting forward this motion, he said, the Edinburgh Division had in mind a number of young doctors who very shortly after graduation joined the Forces and had not become members of the Association. Many of these young men were the sons of doctors who were members of the Association, and he thought it might be assumed that they would have become members of the Association. It was felt that to exclude their names from the inscription on the memorial would cause dissatisfaction and distress. As the British Medical Association was the only representative of the medical profession as a whole, his Division thought that the inscription on the memorial should be so worded as to include all British medical men and women who lost their lives in the war.

Dr. W. Radcliffe (North-East Essex) thought that the design of the memorial should be considered very carefully, and it should be remembered that anatomy was the foundation of good sculpture. The design which was chosen should not be one which in fifty or a hundred years' time would be regretted. He suggested that the design which had been chosen by the Committee should not be accepted by the Representative Body but should be referred back to the Council.

Dr. G. O. Barber (Mid-Essex) said that the figures in the proposed design did not appeal to a number of the members who had seen them, and he thought that many who had not yet seen them would be horrified by the way in which the human form had been distorted. The artistic appreciation of the human form was a fashion, and a fashion which changed quite rapidly, but the human form itself did not change.

Dr. Dain, referring to the Edinburgh motion, said he hoped that it would not be proceeded with in its present form, because it was not proposed to put on the memorial the names of the doctors who lost their lives in the war; they would be inscribed in the roll of honour, which would be in the form of a memorial book.

Mr. Alexander said that, in view of what Dr. Dain had said, his Division would not press for its motion to be carried in the present wording. The object which the members of the Division had in mind was to avoid any distinction between members and non-members of the Association on the memorial.

The Edinburgh motion was carried.

Dr. Dain said it was possible to enter in the roll of honour the names of all doctors who made the supreme sacrifice during the war, without any distinction between members and non-members of the Association. (Applause.)

He would welcome the help of any member of the Association in deciding on the most appropriate inscription to be placed on the memorial itself. It should not be long, but it should indicate the object of the memorial.

He hoped the Representative Body would not delay the matter but would allow it to go forward now. The design was an artistic one and was suitable for the site on which the memorial was to be placed, and, as the sculptor proceeded with the figures in stone, there would be an opportunity of inspecting them to see that they were anatomically correct.

Dr. J. A. Ireland (Shropshire and Mid-Wales) said that in the opinion of a great many people, including the late President of the Royal Academy, modern art was a passing phase. He hoped that the design of the figures would be referred back to the Council to be reconsidered.

Dr. H. B. Muir (Fife) said that the figures on the memorial represented nothing which appealed to him, and he found them repellent. He was one of those who strongly objected to the form of the memorial that had been decided upon, and if the design of the memorial was unsatisfactory he felt that its whole object was defeated.

Dr. Dain said he hoped that the design would not be referred back to the Council unless the Council was given authority to proceed with it after it had been re-examined, as otherwise it would mean a delay until the next meeting of the Representative Body. He would remind the members that the form of the figures could be modified whilst the sculptor was working on them.

Dr. D. L. S. Johnston (Halifax (with Todmorden)) moved that the Representative Body should defer a decision on the matter until Saturday morning, so that all the representatives would have time to see them before a decision was taken.

This was agreed.

MEDICAL FILMS

Dr. R. P. Liston, chairman of the Film Committee, moved approval of the report under "Medical Films." He said that it was obvious that increasing interest was being shown in medical films, judging by the applications they were receiving. The B.M.A. film "Infections of the Hand" had been well received by those who had seen it already. It would have its first public showing next week in Liverpool. It was being shown also at the International Film Congress at Lausanne in August.

The Association had accepted an invitation to send a delegate to the International Medical Conference (Film Section) at

Verona at the end of the present month. This would do something more to enhance the standing of the Association overseas.

The report was adopted.

NATIONAL HEALTH SERVICE ACTS

Dr. R. Hale-White (Marylebone) moved:

That this meeting reaffirms its readiness to co-operate with the authorities in building up an efficient and smooth-working National Health Service, but deeply regrets that all efforts in this direction during the past three years have been frustrated by the cavalier treatment accorded to its representatives in their conversations and negotiations with the Minister.

He said that the public might have got the impression that the profession was against any kind of National Health Service, but that was not so, and they felt in Marylebone that it should be put on record that the profession continued its willingness to build up an efficient and smooth-working Service. But he was none the less critical. He recalled some remarks by Mr. Bevan in the issue of the *British Medical Journal* on July 3, 1948, and he asked that the Minister's assurances then given should be viewed in the light of after events. In the two years since those words were written they might well feel that the Minister had "plumbed the depths of insincerity" and they might also feel that they had the right to expect something better of a Minister of the Crown. For his own part he did not believe that the Minister had ever the slightest intention of co-operation once he got the doctors in the "bag." In fact he did not believe that the Minister knew how to co-operate; it was not in his make-up. The method of dictation by the Minister and subservience by the profession had been tried for two years—two years too long—and in fact it had failed, as they all knew it would. Among doctors, especially general practitioners, it had produced distrust and cynicism.

The Marylebone motion was carried by an overwhelming vote, apparently unanimously.

Mr. H. H. Langston (Winchester) moved:

That this meeting considers the time long overdue when the Association should formulate a detailed programme of reforms the profession desires to be adopted in relation to the National Health Service and instructs the Council to draw up such a list forthwith for submission to and discussion by Branches and Divisions.

He said that the accusation was not infrequently levelled at the profession that it did not know its own mind nor what it wanted and that one section wanted one thing and another section something different. Even more strongly did some members of the profession accuse the Association of not knowing its own mind. Much of that criticism was purely destructive and made by those who seldom took the trouble to help formulate the policy. But there was much of it also which deserved very serious consideration. It should clearly be stated that to whatever degree the National Health Service had or had not been a success, and whatever benefit it might have brought to the public, the Service was being undertaken by a medical profession which was frustrated, overworked, tired, and disillusioned. There was great dissatisfaction in all branches in various degrees, but perhaps this was greatest among general practitioners.

He thought also that it should be stressed that this dissatisfaction did not arise purely from financial causes. Before anything else it arose from a sense of frustration. Their administrators did not seem able to understand or appreciate that a man, if he was to do his proper work, must have a certain clinical freedom and access to diagnostic facilities. What sort of men were they going to get in 10 or 20 years' time if the present situation continued? Yet this Association had not yet published any detailed programme of reform which they could present to the Government or the public with the whole weight of the profession behind it. He was aware that the Council did set up an Amending Acts Committee—a body which never properly functioned. They in the Winchester Division felt it was necessary for the Council to get down to the formulation of a detailed programme with the full support of the autonomous bodies and their co-operation. These suggestions should then be sent down to the Divisions for discussion and after being considered by the Council brought before the Representative Body. He thought this was a matter of urgency and one of the most important functions the Council had now before it.

Dr. R. Kelson Ford (Chelsea and Fulham) said that about two years ago the Minister of Health stated at a meeting that he expected that the new Service would have growing pains. They as medical men knew something of the significance of growing pains. They knew that these were evidence of one of the most crippling diseases of the organism. Some of its symptoms were exhibited now in the National Health Service. If these symptoms continued and the underlying disease was allowed to develop it might very well be irremediable. He spoke in particular of the situation in hospitals and of the frustration to which general practitioners were subject, also of the added expenses of practice, and the difficulties which arose in the public health field. He doubted whether the nation could afford a really efficient Service on the lines on which it was at present run. The Winchester motion ought to be implemented by calling for a scheme of rehabilitation in the National Health Service.

Dr. A. V. Russell (Council) said that it was essential that they should formulate their ideas as to how this deplorable scheme could be saved from utter disaster. He would like to take the meeting back to May, 1948, when they were induced, very much against their will, to enter this Service on the understanding that once they entered it they would be able to shape it to their own desires and make it into a Service of which they could be proud. The late Chairman of Council (Dr. Dain) told them that they were assured of amending legislation to meet their complaints and to put right anomalies, and largely on that understanding they agreed to come in. The Amending Acts Committee was formed. They did not know what its activities were, but they did know that at the time the Council were discussing the situation the Amending Act, which they were assured would not be tabled without prior consultation, was actually tabled in the House of Commons without any consultation with them at all. The Amending Act certainly included measures to prevent full-time salaried State services, and it embodied some minor amendments which did not alter the main position at all. It was more than time that they should put forward their suggestions as to how this intolerable situation could be put right.

By and large it was they who were working the Service who knew best how it should be worked. One of the things which might be considered forthwith was the curtailment of the overriding powers of the Minister. (The time limit prevented the speaker from concluding his argument.)

Dr. T. W. Morgan (Kingston-on-Thames) said that he came to them as a general practitioner and asked them to give their unqualified support to this Winchester motion. They were asked during their visits and in their surgeries what constructive proposals they as an Association had put forward, and they had to reply that there was no specific policy yet laid down. They had waited for two years. A number of points should be considered. One of these was the opportunity for general practitioners to partake in the ancillary services. The general trend at the moment was to send up their patients to hospitals for investigation, whereas if the practitioner could be given pathological and *x*-ray reports it would add greatly to the usefulness and interest of his practice.

From the point of view of the administration of the Service there should be a greater representation of general practitioners on both advisory and executive bodies. They had to face a sense of frustration which general practitioners experienced as a result of this policy. He urged that a really constructive programme be placed before the Branches and Divisions. Everybody should have some say in the formulation of constructive criticism.

Dr. J. C. Arthur (Council) said that he did not think they were any more satisfied with the consultant service than with the general-practitioner service, or that the public was satisfied. On the hospital side his patients were seriously concerned over the fact that they had to pay two and a half times as much for private beds as they paid before.

Perhaps they did not realize the enormous burden of bureaucracy with which the Service was being saddled. He gave some instances of the extravagance of lay administration. He begged for a clear statement—one which should be not merely bits and pieces—of what they thought was wrong in the whole set-up from top to bottom.

Several other speakers intimated their desire to address the meeting, but a motion was proposed and carried that the question be now put.

Mr. Langston, in reply, emphasized one point that what was required was that the Association should hammer out through its machinery a policy of reform endorsed by the whole profession and supported by sound arguments, and thought that such a policy should be given the widest publicity.

The Winchester motion was carried, amid applause, without a dissentient.

The Amending Acts Committee

Dr. H. Barbara Woodhouse (Harrow) moved that an Amending Acts Committee be constituted as a standing committee of the Association. She said that the National Health Service "child" was born on "the wrong side of the blanket." They need not perhaps be surprised that it was not altogether a normal infant. Such a child must call for the attention of the best "specialists" that could be employed. In order that the health services might be got into a healthy condition it would be necessary to correct one by one the abnormalities, and for this purpose she suggested that an Amending Acts Committee be constituted.

Dr. R. Cove-Smith (Marylebone) thought it was a pity that the Amending Acts Committee was ever allowed to sink into oblivion. He hoped this motion would be supported. There was a great tendency at present, when they were being almost snowed under by delegated legislation, for material to slip through unobserved. The new Committee would hold a watching brief.

Dr. H. Alexander (Wandsworth) also supported the motion. It was imperative that the Amending Acts Committee should be revived. There had been one Amending Act which had contained certain concessions, but there were many more points to be considered. The Government machine had increased tremendously and had now become overriding and top-heavy, with the result that legislation flowed from the various Ministries at a rate with which the overworked House of Commons could not keep pace. It was of paramount importance that every one of the regulations which were laid on the table of the House and eventually became law should be scrutinized. That would be one of the most important functions of the new Committee.

Dr. H. H. D. Sutherland (Kensington and Hammersmith) imagined that the meeting would have no objection to this being made a standing committee and carrying full responsibilities. It would have important duties in consultation with the Council and the Representative Body and the autonomous bodies.

Dr. R. M. S. McConaghey (Torquay) considered they had too many committees already and that this motion was covered by the Winchester motion already passed.

Dr. E. C. Warner (Marylebone) supported the motion. He asked the meeting to bear in mind the overwhelming powers of the Ministry. The Minister himself had said, when discussing the question of anaesthesia in childbirth, that there was nothing that he himself could not do by exercising his dictatorial powers. The enormous powers possessed by regional hospital boards and hospital management committees must also be remembered.

He believed that there was a great deal of support for some change in the Act from Labour Members of Parliament. A Labour Member had said to him that he thought the present Act could be put right only by another Act altogether.

Dr. J. A. Gorsky (Council) supported the motion. The Act, he said, was top-heavy and in fact unworkable, and it would be necessary very soon to have a complete Amending Act altogether. There was a precedent for it in Parliament. In 1923 the Law of Property Act was passed, which the lawyers found was unworkable. In the following year it was amended and still proved to be unworkable. Later still another Act was passed.

The Chairman of Council said that they were all in sympathy with the object of this motion. The previous committee of this kind had to gather together various points for presentation when the Amending Bill was introduced. It was not true to say that it had died from neglect. It was not a policy-forming committee; policy would be shaped by various committees concerned with different parts of the Act. A standing committee was different from other committees and some such action as suggested would in all probability be the action adopted by the Council. The meeting itself had already passed the Winchester motion, and he thought it would be better if the idea behind this Harrow resolution were referred to the Council so that at the moment when the result of the Winchester motion would be available the appropriate action might be taken.

Dr. Woodhouse, in reply, said that it had been objected that the Winchester motion had been carried and covered the same ground. But the first work of the proposed Amending Acts Committee would be to implement the Winchester motion. It was most important that this work should be started at once and carried through to the end. The ground could not be covered in one Amending Act.

The Harrow motion to reconstitute the Amending Acts Committee as a standing committee was carried, and it was further agreed that membership should include, in addition to the principal officers of the Association *ex officio*, the chairmen of the General Medical Services, Central Consultants and Specialists, and Public Health Committees, four members elected by the Representative Body, and four by the Council.

GENERAL MEDICAL SERVICES

The Position of General Practitioners

Dr. S. Wand, chairman of the General Medical Services Committee, presented the report of Council under this heading. In doing so he repeated in great part the statement he made at the recent Conference of Local Medical Committees, reported in the *Supplement* of July 8 (p. 18), and he drew attention to the resolutions passed by that Conference which he hoped the Representative Meeting would endorse. He emphasized certain special points which had arisen in the discussions with the Minister. What practitioners were asking for was not extra money but a determination of their remuneration as it should have been on the appointed day. The Minister had made it clear at their last interview that he did not regard Spens as necessarily a continuing factor. They had always been aware of the possibility of unilateral action on the part of the Minister, having in mind such action by him in the case of pharmacists, dentists, and ophthalmic practitioners. The betterment factor, or cost-of-living bonus, which they had requested should be 70%, was at present only about 40%, but 70% was now too low, and it should be nearer 100%. On the question of the downgrading of the general practitioner the Minister had expressed a good deal of sympathy; the trouble at the moment was with the Treasury and the Chancellor.

What was the financial position of general practitioners to-day? According to the Doctor's Remuneration Tables prepared by the Government, at the lower end of the scale 36.4% were earning under £1,000 a year net. The time it took to qualify as a doctor, the cost of education, and the fact that he did not earn money until he was 23 or 24 years of age must all be taken into account. At the upper end of the scale the general practitioner compared badly with the specialist. The whole general-practitioner group was lower than the specialist group. One Sunday paper worked out that the Service cost £9 5s. 6d. a year for each person. But the general practitioner's share was about 2½d. a week—equal to a little more than one cigarette, or one cigarette and a match! In these days of attractive specialisms it was more than ever necessary that there should be a first-class general-practitioner service, but, as it was, frustrated men were filling the ranks of general practice, and the number was likely to be increased by registrars who wanted to get into consultant practice and for whom there were no places. This being the case, the effect on the Service would be very serious.

Doctors nevertheless were trying loyally to carry out their fullest responsibilities whatever the demands might be, but, should it become evident that there was no prospect of a satisfactory settlement of the claim, steps would be taken to organize termination of contracts. (Applause.) He wanted to make it clear that withdrawal of service did not mean that they stopped giving advice and treatment to their patients. It meant only that they ended their contracts with the Minister, which might mean compulsory arbitration. The Conference was to meet in December, or it would meet earlier if in the meantime unilateral action was taken by the Minister.

"We have tried our best to act fairly to get justice. We have no design to make political capital. Our purpose is to get a fair deal for general practitioners. But now the time seems to have come when we must have a showdown. We cannot allow things to go on in this indeterminate manner. We are, after all, a unique body of people. We are doing a unique job of work, and that work includes hardships and difficulties and responsibilities for us and our families such as are shared by no other section of the community. It is time that that was properly recognized and rewarded. If we have to come to a fight I want to emphasize the need for unity. Let it be remembered that without a satisfied general-practitioner service there are bound to be reactions, and it is the patients who will suffer. I ask this meeting to endorse and fortify the resolutions of the Special Conference, and to that end I propose the following resolution:

"That this Representative Meeting endorses the resolutions (on remuneration and on status of the general practitioner) of the Special Conference of Local Medical Committees held on June 29, 1950, and pledges its support."

There was prolonged applause at the end of Dr. Wand's speech.

The Proposed Inquiry

Dr. C. P. Wallace (Guildford) said that he would like to support Dr. Wand's proposal, which included the suggestion of withdrawing in certain circumstances. He was well aware that, to use Dr. Wand's own words in the *Supplement* of July 8 (p. 18), withdrawal was the most serious step that could be taken, and it was a step which, if decided upon, must be decided upon deliberately and with a full knowledge of its implications. He thought it would help the meeting if the Chairman of Council could give a general assurance that during the past year such arrangements had been made as would enable doctors to withdraw at very short notice.

Commenting on Dr. Wand's statement, he thought it was reasonable for the Minister to ask for an inquiry with regard to the expenses of general practitioners, but it was also a fact that it was most unreasonable for him to ask for that inquiry at the present juncture. The Minister had had two years in which to discover what those expenses were. The subject of general practitioners' expenses had been investigated by the Spens Committee, and in the intervening years those expenses had increased very considerably. For instance, the cost of domestic help had increased by 225%, the capital value of the doctor's motor-car had increased by 200% or 250%, and the expense of obtaining and maintaining a house had increased by about 220%. He did not agree that adequate remuneration for doctors could be provided only by effecting economies in the Service.

Dr. W. N. Leak (Mid-Cheshire) suggested that the Representative Body's appreciation of the work which had been done by Dr. Wand and his colleagues should be entered in the Minutes. (Applause.)

Some doctors felt that there was a certain amount of indignity in pressing for an increase in remuneration at the present time, but he would point out that the Minister had given a definite promise to the Association about matters which could be proved statistically, such as the cost of living, and if he could not be held to his promise about matters which could be proved statistically it would be hopeless for the Association to expect to hold him to his promise about status or anything of that kind which concerned the profession.

Dr. A. V. Russell (Council) pointed out that what was being asked for was not an increase in remuneration. The remuneration of general practitioners had never been agreed. They were receiving at the moment an inadequate interim payment, and they were asking for the Spens Report to be implemented. They were asking for their rights and not for a rise.

The resolution "That this Representative Meeting endorses the following resolutions of the Conference of Local Medical Committees and pledges its support" was carried with one dissentient. These resolutions, on remuneration and status, were published in the *Supplement* of July 8.

Whitley Machinery and Compulsory Arbitration

Dr. J. M. Marshall (Tunbridge Wells) moved that participation in the investigation into general-practitioner income from N.H.S. sources and practice expenses should be made conditional upon a satisfactory assurance that remuneration would always be a matter for negotiation through Whitley machinery and that, in the event of disagreement, either party should have the right to refer the matter to arbitration.

Dr. A. C. E. Breach (Bromley) thought that it was important to clarify the position about Whitley machinery and compulsory arbitration. He himself believed Whitley machinery to be basically machinery for discussion and, if possible, agreement between employer and employee, and he did not think that a Whitley Council had power to enforce a settlement upon either party. If there was to be such a power new machinery would have to be set up with authority to enforce its decisions on both parties. As to the practicability of that, he thought that the public would consider it quite reasonable for the medical profession to claim the right to refer disputes between themselves and their employers to arbitration. As Dr. Wand had pointed out, the medical profession was unique in that it had voluntarily set aside the right to form a trade union and to use the principal weapon of the trade union, and in return it asked the Government for the right to refer disputes to arbitration.

The Secretary (Dr. Charles Hill) said he would try to make clear the position with regard to arbitration. As Dr. Breach had said, Whitley machinery was purely voluntary, and at the present time it did not include any provision for arbitration. There was, however, an arbitration agreement which was under discussion. Section 13 of the Amending Act laid down a form of inquiry or arbitration, the essence of which was that the Minister's consent was necessary before a matter went to arbitration, though there was the possibility that the Minister of Labour would refer a dispute to a court of inquiry and not arbitration in certain circumstances.

There was, however, a provision which was in no way affected by the Amending Act or by any Whitley agreement —namely, the provision in the Conditions of Employment Order of 1940 dealing with the National Arbitration Tribunal, and for practical purposes that was the only form of arbitration for medical practitioners at the present time. It would exist in law from the moment that the general practitioners as a whole gave notice of withdrawal or termination of contract, and it meant that when a dispute existed—i.e., at the moment of resignation—the matter must be referred to the Minister of Labour, and within the next 21 days the Minister would decide what action to take. He might decide, in the absence of voluntary machinery, to refer the matter to compulsory arbitration. If he did general practitioners would be required to accept compulsory arbitration and not to proceed with the withdrawal of service until that arbitration was completed, and they would be bound to accept the result. If, on the other hand, at the end of 21 days the Minister had not acted, general practitioners would be free in law to proceed to withdraw and to take such action as they chose. Therefore their position was, in relation to the motions which the Representative Body had endorsed, that from the moment of the mass resignation they might find that the Minister of Labour had referred the matter to compulsory arbitration. They could not proceed to withdraw without giving notice to the Minister of Labour and giving him the opportunity, if he chose (and personally he thought the Minister would so choose), to proceed to compulsory arbitration.

Dr. J. A. Gorsky (Council) called attention to a resolution which had been carried unanimously at the last Annual Representative Meeting, to the effect that, as the Minister of Health had withdrawn the assurances and undertakings repeatedly given to the profession on the question of arbitration in the event of a dispute, the Representative Body demanded that effective action should be taken forthwith to insist that arbitration machinery should be set up and that the demand for arbitration by the profession should not be subject to the Minister's veto. He would add to that to-day "not even the Government's veto of prerogative."

Dr. Marshall suggested that the motion by Tunbridge Wells should be referred to the Council to be put before the appropriate committee, and this was agreed.

An Independent Court of Arbitration

Dr. C. P. Wallace (Guildford) moved that the meeting should press the Minister of Health to agree to the appointment of an independent Court of Arbitration to which appeal could be made in the event of disagreement concerning the remuneration of practitioners, and that such Court should be established without delay.

Since the coming into force of the National Health Service Act, he said, the whole position of the profession had changed. Previous to July 5, 1948, only a small percentage of the profession were employed directly or indirectly by the State, whereas now about 90% were employed by the State and were dependent on the State for their daily bread, and he could not see how they could escape from a position of serfdom unless they secured independent arbitration. He thought that the meeting should assert in no uncertain way its demand for an independent court of arbitration, and the public should know that the reason why the profession was threatening withdrawal was that it had been denied independent arbitration between the Minister and the profession.

Dr. Wand, in opposing the motion, said that, in the light of what he had pointed out to the meeting, he could not envisage an independent court of inquiry or arbitration being set up at the moment. Such a motion would embarrass those who were carrying out negotiations for general practitioners, because it would tie them down to the exact way in which they were to proceed. They were fully determined to obtain fair and honest arbitration in its fullest sense, with no overriding influence. He hoped that the motion would be withdrawn or, failing that, rejected.

Dr. Breach said he could not understand why Dr. Wand did not wish this vital issue to be discussed by the meeting. The members were concerned to obtain proper terms of service, which to many of them resolved itself into a question of payment. How could they possibly decide on a certain drastic course of action, such as the withdrawal of service, in support of any particular figure, when the value of money was changing from week to week? Surely the sensible thing to do was to set up a court of arbitration which would have power to enforce an impartial decision on both parties. Dr. Hill had not dealt with the question of the setting up by Parliament of a court specifically designed to resolve disputes between doctors and the Minister to which either party could appeal. Such a court, by virtue of its being set up by Parliament, must have power to enforce its decisions, and it was this kind of court that was required.

Dr. Gorsky (Council) endorsed the remarks made by Dr. Breach and said he hoped that the meeting would support the motion by Guildford. In a leading article on arbitration in the *Manchester Guardian* of July 8 last year it was stated that there was a good deal of substance in the doctors' contention and that it did not apply only to themselves; with the spread of public services there was a strong case for reconsidering the method of settling differences in which the Minister was a party to the dispute as well as the judge.

The medical profession wanted an independent court of arbitration, and he believed that if they asked for it they would obtain it.

Dr. J. C. Arthur (Gateshead) said he had had a good deal of experience of negotiation, and he believed there was only one thing which the Ministry understood—namely, the big stick. He would rather go to the Ministry with the resignations of 90% of practitioners in his pocket than go to any arbitration tribunal. The Spens Committee was the arbitration tribunal which fixed the position of the doctor, not necessarily by any given figure but by a position in the social scale in this country. Doctors were considered by many other professions to be not badly paid, and if they put their case before an independent arbitration tribunal on which there were, for instance, school masters, those members of the tribunal might not be very sympathetic towards even the implementing of the Spens award. If the medical profession tied itself to compulsory arbitration it would be putting itself into a dangerous position and might lose all that it had gained by the Spens report. What the medical profession should do was to see that the Spens report was fully implemented.

Dr. A. Beauchamp (Birmingham) hoped that the meeting would reject the motion, because the operative word was "independent." Some of the representatives might remember the result of the last independent court of arbitration, with which none of them were satisfied.

Dr. W. Jope (Council), speaking as one of those who from time to time accompanied Dr. Wand to the Ministry to discuss terms and conditions of service, expressed the hope that the Representative Body would not tie their hands.

Dr. H. H. D. Sutherland (Kensington and Hammersmith), in opposing the motion, said that so far as he knew there was no independent compulsory court of arbitration available and none that would cover the position of the doctors. They were not envisaging a dispute that would result in a strike in the usual sense of the word, as it was understood by the present Government and the people of this country, and he therefore hoped that the Representative Body would not do anything which might act as a boomerang and come back on them when, under the present arrangements, their negotiators were able to see the opening of the door.

The meeting agreed that the question be now put.

Dr. Wallace, in replying to the debate on the Guildford motion, said he could not understand why the Association's negotiators should object to the suggestion that the profession would be prepared to accept an independent court of arbitration. The meeting, in passing the motion, would not be in any way tying their hands in their negotiations, nor would it be in any way expressing disappointment at or disapproval of the results of the negotiations up to date. The members might well do so, but they were conscious of the fact that Dr. Wand and his team had been doing their best. His Division felt that, in view of the suggestion of withdrawal of service, it was absolutely necessary that the Representative Body should put on record its willingness to accept an independent arbitration court.

Dr. F. E. Gould (Birmingham) asked whether, if the members agreed to an independent court of arbitration being appointed, they would lose their right to give notice to terminate their contracts.

The Chairman said he thought that would be so.

The motion by Guildford to press the Minister for an independent court of arbitration was lost by a large majority.

Compensation

A motion by Tunbridge Wells was on the agenda relating to the prolonged delays in the negotiations on compensation for general practitioners. The mover said that it was put forward with a view to eliciting a statement on the compensation question.

Dr. Wand said that the Compensation Committee had been busy during the whole year, and had nearly completed its part of the job. There had been a number of appeals, two of which had been taken to the courts for adjudication, and the decision was in favour of the Compensation Committee's point of view in both cases. It was hoped that all these matters would be dealt with by the end of the year. The cases that now came forward were more difficult than formerly. At the last committee meeting over an hour was spent on one case.

The Tunbridge Wells motion was withdrawn.

Petrol and the Mileage Fund

Dr. J. T. McGlasson (Dumfries and Galloway) moved:

That in view of the increased expense to the doctor due to the rise in the price of petrol there should be an increase in remuneration.

This motion was the result of a unanimous decision of a meeting of his Branch—a Branch in which the great majority of the doctors were rural or semi-rural, and practically all were dependent on mileage payments to supplement their incomes. They felt that the additional mileage grant was now quite insufficient. There had been a considerable increase in the amount of work, in the cost of cars, and, since last May, an increase in the cost of petrol. The extra cost of petrol to the practitioners in his district was roughly £70 a year—equivalent to 100 capitation fees.

Dr. Wand said that the day after the Budget they made representations to the Ministry on this subject, and they had been to the Treasury and the Ministry back and forth rather like a shuttlecock. The pool had been diminished by the amount of this tax to the extent of getting on for half a million a year. It was particularly hard on the rural practitioner who had to cover a large mileage for a small number of patients. The Minister was being asked to receive a deputation to consider ways of putting back the money which had been lost to the pool. It was very important to watch the terms of the forthcoming inquiry so that this addition to practice expenses might be fully taken into account.

The resolution was carried unanimously.

Mr. J. C. McMaster (West Somerset) moved, and it was agreed, that in view of the considerable advances in the price of petrol the sum of £2m. for mileage was inadequate and should be increased.

Dr. H. L. Taylor (Newcastle-upon-Tyne) said that his Division felt that there was great inequality in the proportion of mileage allowance for various districts, and he urged that before there was any alteration in the distribution of mileage money there should be a comprehensive survey of the country as a whole.

Dr. Frank Gray (Council) said that although not a rural practitioner he was a member of the Rural Practitioners Subcommittee. The old system of distribution of mileage as between the different counties was thoroughly inequitable. The Conference had asked for that distribution to be revised, and there was an interim scheme which would in his judgment give a much fairer distribution. The complete survey for which Newcastle was asking was a long process which would take 18 months or more. But in the interim if mileage was to be distributed differently money must be taken from areas which had had more than their fair share and passed to areas which had had too little. He hoped the Newcastle motion would be turned down, and the existing scheme be allowed to take its course, particularly as those who would benefit would be those who had had the roughest deal in the past.

Dr. J. A. Ireland (Shropshire and Mid-Wales) said that executive councils should have power to distribute as and how they considered equitable among practitioners entitled to mileage. The allocation as given to-day was vastly more equitable than the old system. He did not want anyone to go away with the idea that they had "lost money." If they had less money it meant that they had been receiving more than they were entitled to in the past.

Dr. Wand said that this redistribution involved £91,000 out of £2m.—that is, 5% of the total pool. The new distribution would remedy present inequalities. These inequalities had gone on for long enough.

The Newcastle motion was withdrawn.

Dr. Enid A. Hughes (West Denbigh and Flint) moved that the mileage grant should take into account the increased cost of travelling in a mountainous as compared with a flat area.

It was agreed to refer this to the Council.

Dr. N. G. Lindsay (Harrogate) was of opinion that the sum allocated for mileage to rural practitioners was inadequate and took insufficient cognizance of the time spent on travelling. He pressed for an early statement on the effect on individual rural practitioners of the proposed re-allocation of the global sum.

Dr. Wand said that it was an interesting fact that out of the Doctors' Remuneration Tables there emerged the very definite point that the net annual remuneration of doctors in receipt of mileage payments exceeded that of doctors who were not in receipt of such payments. Doctors in rural areas should remember that even urban practitioners spent a certain amount of time in travelling. He hoped that before passing any such resolution as Harrogate had in mind they would await the results of the fact-finding inquiry of the Mileage Commission. Another point which rural practitioners should bear in mind was that their town colleagues were more subject to the impeding effect of fogs and traffic blocks.

A Harrogate motion on the subject was withdrawn.

Dr. R. B. Allen (Consett (with Hexham)) urged that mileage payments in maternity cases should be paid from the same source as maternity fees, and should not be a first or any other charge on the central mileage fund. The mileage fund should not be raided for this purpose.

Dr. Wand pointed out that this would include mileage for maternity cases, and they must not go back on their bargain.

The motion in favour of the course indicated by Dr. Allen was lost.

Dr. L. N. Jackson (Exeter) asked the meeting to express the opinion that rural mileage in maternity cases was entirely inadequate. A maternity case seven miles away might involve a dozen visits, for which the total mileage payment was 12s., or 1s. a visit.

Dr. D. M. Hughes (South-West Wales) and Dr. H. B. Muir (Fife) continued the discussion. Dr. W. Jope (Council) said that in Scotland it was agreed to allocate this money to executive councils to use at their discretion.

Dr. Wand said that they had had discussions in the Rural Practitioners Subcommittee and their opinion was that the mileage should be paid at the figure at present indicated. He hoped that in view of the discussions which had taken place Exeter and other Divisions with similar motions would all agree to have them referred to the Council, which would look at the matter again.

Exeter, however, asked that its motion that rural mileage in maternity cases was entirely inadequate might be put to the meeting, and on a show of hands it was lost.

The meeting adjourned at 5.30 p.m.

FRIDAY, JULY 14

The Annual Representative Meeting resumed at 9.30 a.m.

GENERAL MEDICAL SERVICES

Rural Mileage

Dr. Enid A. Hughes (West Denbigh and Flint) moved that mileage for maternity cases should be calculated from the distance between a practitioner's residence and the place where the patient was confined, instead of the place where the patient resided.

This was agreed to, as was a further motion by Shropshire drawing attention to the injustice towards a rural practitioner who could not claim maternity benefit mileage for a patient confined at a cottage hospital or nursing home in a "closed" area at some distance from the patient's or the doctor's residence.

Dental Anaesthetic Fees

Dr. R. M. S. McConaghey (Torquay) moved that the Minister be informed that the recent cut of 10% in the fee for dental anaesthetics had been made without previous consultation with the medical profession and that it was unacceptable to the profession and that the Minister be asked to restore it forthwith. He said that this cut in remuneration was made by a Minister who was said to be "sympathetic" to the profession; he wondered what would happen with a Minister who was not sympathetic. It seemed to him that this was a shadow of things to come.

Dr. H. F. Hiscocks (South-east Essex) said that some members of the profession had been asked whether the Minister recognized that doctors gave anaesthetics for dentists. Of course he did; doctors were specifically referred to in the schedule of fees, and on the prescribed form there was a place for the doctor's name to be filled in if the fee was over a certain amount. They were not concerned with the rights and wrongs of the dentists' "cut," though they might all have their views on its justification. But the fact that this involved doctors' anaesthetic fees at the same time seemed to have been ignored. The doctor got his full fee in the majority of cases from the dentist simply because the dentist was kind enough to pay him. It was a humiliating position for the doctor and one which was quite wrong in principle. He hoped the General Medical Services Committee would take up this case with the Ministry forthwith.

Dr. Wand said that this matter had already been taken up with the Ministry, and the line the Committee had taken was that this was a fee for medical work and should be paid as such and that there should be an *ad hoc* payment for each administration irrespective of the number of teeth extracted. They were now awaiting a reply from the Ministry; he was not too optimistic about that reply, but the matter would be pursued vigorously.

The Torquay motion was carried.

Classification of Areas

Dr. J. C. Arthur (Gateshead) moved that in view of the completely unrealistic standards adopted by the Medical Practices Committee in classifying certain areas as under-doctored the meeting strongly supported the General Medical Services Committee in its protest to the Ministry. This matter as to what constituted an under-doctored area should be considered very carefully by the Committee.

The motion was carried.

Medical Service Subcommittees

Dr. A. M. Maiden (Lincoln) moved to press the Ministry of Health to amend the regulations so that a doctor was notified in every case immediately a patient laid a complaint against him, and not, as now, as soon as reasonable after the Chairman of the Medical Service Subcommittee ruled that there was a prima facie case. There was some ambiguity about the regulations, resulting in a certain amount of hardship to the doctor. The doctor in many cases did not hear about a complaint until three months had elapsed. One complaint within his knowledge was made on March 25. The first notice the doctor had of it was on June 14, and he was notified later that an inquiry would take place on July 27. The doctor should be notified immediately of any complaint, frivolous or otherwise; or, alternatively, a directive might be sent by the Ministry whereby this ambiguity in the regulations would be cleared up.

Dr. Wand said that they had made representations to the Ministry for a number of changes in the regulations under the Medical Service Committee procedure. The time-lag had caused a great deal of dissatisfaction. The point had been raised with the Ministry and legal advice had been taken. The Ministry were unwilling to alter the regulations, but they had put up a draft handbook for consideration with a view to helping the chairmen of these committees. This handbook his committee had not considered completely. On the general subject of these regulations—they were put out in 1948, and the profession had now some right to say that after they had been working for two years it was desirable to look into the matter and show where changes could be made in the light of experience.

Dr. A. C. E. Breach (Bromley) moved that there be substituted for the principal part of the Lincoln resolution the following words: "that the Ministry of Health be pressed to amend the regulations in consultation with the Council of the B.M.A. and that the Council be requested to undertake at once a full investigation of the status, composition, procedure, and functioning of the Tribunal and Medical Service Committees, to hear evidence, to ask legal advice, and to publish a report before the end of the year."

Dr. Breach said that up to ten years ago the common people of this country were confident in their birthright of freedom, and rightly so, for they knew that there stood between them and the whims of the political executive a bench of judges who were no respecters of persons. The judges were still there, but during the past ten years Parliament had devised means of short-circuiting the administration of the law. Over a wide field it had set up a system of tribunals endowed with powers comparable to those previously resting with the courts alone. It was their duty as citizens to view these changes critically when they tended to threaten the liberties of the subject.

These tribunals, which had become a popular expedient with the politicians, constituted a danger to the freedom of justice. As compared with a court of law, the medical tribunal was in the extraordinary position of hearing only one type of case, a complaint from the "consumer" against the "supplier." The process could never be reversed. The defendant, always a professional man, stood to lose everything if he was held to be at fault. If he was exonerated he did not even recover costs. The appellant, however unjustifiable his complaint, might not even be rebuked. The composition of the tribunal was also significant. The members were not salaried like judges. They were remunerated by fees for their services and had no security of tenure. If a medical member did not interpret the official wish satisfactorily it would be competent for the Minister to select other members of the medical panel to serve in future. Another factor which might well prejudice the independence of the members was that they received circulars from the Ministry explaining the official view of the law. Finally, when one realized that from such tribunals the only appeal was to the Ministry it was apparent how far we had wandered in these few short years from the well-beaten paths of British justice.

If these tribunals were to be tolerated certain drastic reforms must be sought. Rules of evidence must be carefully laid down by the court and strictly followed. Appeals to a superior court must be allowed on questions of law. The decision of the tribunal must be unanimous. The tribunal should give a reasoned decision. Medical members to the tribunal should be appointed by the profession and should be given security of tenure with a retainer. The law should be laid down by the superior court, not by the Government department concerned. The tribunal should be empowered to censure the plaintiff and impose substantial costs as a deterrent from frivolous and malicious mischief-making. As it was with the tribunals, so it was at an even more amateurish level with the Medical Service Committees.

Such was the position in which as a profession they had let themselves be placed. The need to find a remedy was urgent indeed and deserved close attention. It might be that informed opinion would conclude that these committees were so potentially mischievous that the only remedy was to abolish them entirely. If that was indeed the solution then it was up to the profession to see that by united action they obtained the necessary amendment of the present law.

Dr. Robert Forbes (Council), in supporting the amendment by Bromley, said that the Representative Body would remember that last year it had devoted a considerable amount of time to the subject with which the amendment dealt, and since then Dr. Dain and a committee associated with him had examined the problem and made certain proposals which they intended to put before the Ministry with a view to the revision of the procedure of Medical Service Committees. Those committees were of growing importance and of growing significance to every individual practitioner engaged in the Service. There was a considerable amount of concern about their procedure and their powers, and there was ample room for improvement to protect the respondent practitioner. All the committees did not observe the regulations, and there were occasions when the practitioner was placed at a serious disadvantage. It was therefore felt that a further examination of the situation would be justified, and the Bromley amendment would enable further, fuller, and even more constructive submissions to be made for the improvement of the Medical Service Committee and its procedure.

Dr. J. A. Gorsky (Council) said the danger was that the tribunals were administrative and therefore were not bound by law to give reasons for their decisions. They did not publish their decisions, so it was not possible to know when there was a miscarriage of justice, and no case was stated by an administrative tribunal before the High Court of Justice. The matter was now in the hands of the legislature, because a

Bill dealing with it had been introduced into the House of Lords by Lord Samuel. The matter was an important one not only for doctors but for all professional men and women, and if the members of the Representative Body wished to strike a blow for the liberty of the subject they should support the Bromley amendment.

Dr. J. C. Arthur (Gateshead), in supporting the amendment, said that in the report of the General Medical Services Committee a time limit was fixed for lodging complaints and a time limit was fixed for the report of the appropriate committee to the Executive Council, but nothing was said about any time limit for the appropriate committee holding its inquiry on the complaint. It was the time which elapsed between the lodging of the complaint and the holding of the inquiry which was so particularly trying to the doctor concerned, and that time was sometimes as long as five or even six months. There could be no adequate reason for such a delay in any circumstances, and this was a matter which should be rectified as soon as possible. The whole matter was receiving very full consideration by the General Medical Services Committee, which he was told would shortly report upon it to the Council of the Association. He thought that the most expeditious and efficient way of dealing with the whole matter might be to refer the Gateshead motion and the other motions on the subject to the General Medical Services Committee.

Dr. Breach, in replying to the discussion on the Bromley amendment, said that in view of the authoritative support which the amendment had received he was confident that the importance of the subject with which it dealt was fully realized.

The Bromley amendment was carried with one dissentient and was also carried as the substantive motion.

Change of Doctor

Dr. Wand, in moving the paragraphs of the report concerning change of doctor (paras. 32 and 193), said that the Ministry had accepted the proposal that a patient must give notice to the executive council in order to change his doctor and that such notice would become effective at the end of two weeks. The notice would be valid for one month only. Change by consent would continue.

Dr. C. W. Walker (Cambridge and Huntingdon) moved:

That this meeting is of opinion (*a*) that the present arrangements whereby a patient may change his doctor without notice is satisfactory, and (*b*) that a return to the practice under the National Health Insurance Act is not desirable.

He said that the members in Cambridge had found that the new arrangement whereby a patient could change at any time was more satisfactory than the old N.H.I. regulation that the patient had to obtain the signature of his old doctor—a procedure which was considered by the patient to be an obstacle to change. The choice of doctor should not only be free but should be seen to be free, and that cut the ground from under most complaints. Moreover, the members in Cambridge very much disliked the idea of treating a patient who would prefer to be treated by someone else but had not the courage to say so.

Dr. D. L. Gullick (East Herts), in supporting the amendment, said that the relationship between doctor and patient was essentially one of confidence, and if confidence was lost on either side it was better that the relationship should be broken. It therefore followed that no obstacle should be placed in the way of severance. Under the old system, if a patient asked his doctor to sign his card for transfer there would be very few occasions on which the doctor would be disinclined to do so, so that to revert to the old system would simply mean another form for doctors to sign.

Dr. A. M. Maiden (Lincoln), in opposing the amendment, said that it had been found in eight local medical committee areas in the East Midlands that a certain abuse crept in when patients knew that they had a right to change their doctor at any time. For instance, a patient might ask her doctor for cod-liver oil for her baby, and, if the doctor thought the baby did not require it and, being a man of integrity, refused it, the patient would go to a neighbouring surgery and ask the doctor there to put her name on his list, and he might give her the cod-liver oil. There was a certain drift of patients to the lists of doctors who gave way to patients, and it was felt in his Division that this abuse could be prevented only by the giving of notice before a change was made.

Dr. A. G. Chamberlain (Dorset) said he did not think the abuse to which Dr. Maiden had referred was very prevalent. There would always be some disgruntled patients. The members in Dorset did not want to have a patient on their lists for even a day after the patient wanted to make a change, and they preferred the system under which patients could change whenever they wished to do so, without notice. He therefore supported the amendment.

Dr. S. Smith (Tower Hamlets), in speaking against the amendment, said that there was a small minority of patients who abused their rights, and the new regulations were framed with a view to putting an obstacle in the way of those patients. He had had one patient who came to him from another doctor and who, he subsequently discovered, had changed her doctor three times in the course of a year and had made unreasonable requests to all of them.

Dr. H. H. D. Sutherland (Kensington and Hammersmith) hoped that the meeting would reject the amendment and support the proposal that 14 days' notice of change should be given, as he thought that was the best compromise that could be achieved.

Dr. Doris Odlum (Bournemouth) expressed the opinion that the matter of status was at issue. Patients nowadays had the idea that doctors were at their beck and call and could be pushed around as they chose, and the fact that they could change their doctor so easily strengthened their idea that doctors were people of no importance. That was a very sound reason, she thought, for making it rather more difficult for patients to change their doctor. She agreed that doctors did not want to have on their lists anyone who was unwilling to be there, but that was not quite the point; the point was that the easy change lowered the doctors' status. She therefore supported the proposal that 14 days' notice of change should be given.

The Chairman of Council said that the representatives should not lose sight of the fact that the ease with which a patient could transfer from one doctor to another provided a way of escape from a complaint against the doctor which might otherwise be made. It was better that a dissatisfied patient should be able to change his doctor easily than that he should adopt the expedient of becoming troublesome and making a frivolous complaint against his doctor, thereby causing the doctor a great deal of trouble. He remained a firm believer in free choice at any moment, even though there were many troubles associated with it.

Dr. J. Bleakley (Belfast), in opposing the amendment, said that the new proposal did not in any way interfere with free choice of doctor; it merely introduced a little sand into the works to make it difficult for busybodies to go round collecting cards and giving them to a doctor who had been over-generous to them. In Northern Ireland 14 days' notice was not specified, but a patient who wished to change his doctor had to send a form to the board, which was the equivalent of the executive council in this country, to obtain permission to transfer. That did not delay change very much, but it made it a little more difficult. The members in Northern Ireland felt that this was only a small beginning, leading to the larger issue of the reintroduction of penal and disciplinary measures against patients, which they felt to be absolutely necessary.

Dr. J. A. Pridham (Dorset) said that doctors were always protesting about regulations and wanting their freedom and to go back to private practice, one of the characteristics of which was that a patient could change his doctor at any time; but now doctors wanted to put an obstacle in the way of that. It seemed to him that they were speaking with two voices. He wished to emphasize strongly what the Chairman of Council had so wisely said.

The representatives should realize that by putting sand in the machinery they were favouring the older practitioners, as against the young men who were trying to build up practices or who had just come out of the Forces. The more difficult it was made for a patient to change his doctor the more the man in an established practice would be assisted.

The new regulation would be inviting patients to put pen to paper and make a complaint, and he thought it would therefore be distinctly unwise.

Dr. R. B. Allen (Consett (with Hexham)) said there were black sheep among patients, and there were also black sheep in the medical profession. He deprecated doctors tying themselves up once again in red tape. They should be careful in accepting a transfer from another doctor and find out the reason for the change. He strongly supported the amendment.

Dr. F. E. Gould (Birmingham) pointed out that one of the conditions which the Association had managed to establish at the inception of the new Service was free choice of patient by doctor and free choice of doctor by patient; as the regulations stood at the present moment the patient had the right to change his doctor at any time, but the doctor had not the same right to get rid of a patient; he had to give at least one week's notice. He thought there was a great deal to be said in favour of the old system, under which the doctor could sign part "C" of the medical card and request his patient to find another doctor immediately.

Dr. Frank Gray (Council) submitted that the proposed change of procedure was in the interests of the patients themselves and the community. If a patient really wished to change his doctor he could either ask the doctor for his consent, which was not likely to be refused, or write to the executive council. It was much better for the patient to have to take time to think again than for him to be able to rush off to another doctor whenever he liked. He would never find a perfect doctor, and second thoughts were often best. The proposed change of procedure would not involve any real interference with the patient's freedom of choice.

Dr. J. G. Thwaites (Brighton) thought it was quite clear that all the representatives wished to maintain the patient's freedom to change his doctor whenever he wished to do so. Reference had been made to the state of affairs in private practice, but he would submit that there were certain courtesies which had to be observed then, and surely an effort should be made to preserve those courtesies under the new Health Service. There was no harm whatever in having a slight delay which would remind the patient that there were these courtesies to be observed. Moreover, the delay would give a doctor time to get into touch with the doctor to whom his patient was transferring and to give him some information, good or bad, about the patient if he wished to do so. He hoped that the amendment would be rejected.

Dr. J. C. Arthur (Gateshead) also opposed the amendment. The new procedure, he said, was one of the most helpful things that the medical profession had obtained from the Minister since the National Health Service Act had come into force. The Minister had refused it at first, saying that the patient under the Service must be as free as a private patient, but he had lost sight of the fact that the private patient had to pay both doctors. Under the present arrangement a patient could go to four doctors in a day and get expensive drugs from all of them, and pour them all down the sink if he did not like the taste of them.

Dr. Wand said he thought that most of the representatives who had spoken in favour of the new proposals were urban practitioners, whilst those who had spoken against them were chiefly doctors engaged in rural or semi-rural practice. There was a difference in the conditions of practice in the two types of area. There was a more floating population in the urban areas, and he thought that was a factor which influenced the opinion of the speakers. (Cries of dissent.) Abuses were taking place, and the number of changes to-day were several hundred per cent. more than those in pre-1948 days. The small alteration effected in the new procedure would have a salutary effect in the case of many of the abuses, and it was a very simple compromise between the two extremes. He hoped the meeting would reject the amendment.

Dr. Walker, in replying to the discussion on the amendment, said that his own practice was an urban one. Abuses of the system by the doctor would not be avoided by injuring the patient, and there were other ways of improving the integrity of doctors. Abuse by the patient sometimes occurred, but there was a very simple method of restraining that abuse, quite apart from regulations. If a doctor, before accepting the patient of another doctor, used the telephone he would easily find out whether that patient was a desirable person or not. He could not too strongly emphasize the fact that all regulations were bad because they were sure to be unfair to someone. Regulations were necessary, but they must be reduced to the minimum. The regulation that 14 days' notice of change of doctor must be given must avoid a certain amount of abuse, but someone would suffer unfairly through it. That raised the question of principle, and he was one of those who believed that if doctors could maintain their principles their status would look after itself.

The Cambridge and Huntingdon amendment, declaring the present arrangements for change of doctor satisfactory, was lost by a considerable majority.

Frivolous and Unjustified Emergency Calls

An amendment by Plymouth, requesting the Council to add the words "trades unions" to the organizations to be embraced in a publicity campaign (para. 33 of Annual Report), was accepted.

Dr. J. W. McCarthy (Hendon) moved to urge the Council to take further steps to have the regulations amended to provide the practitioner with a right in appropriate cases to lodge a complaint against a patient on his list who made frivolous or vexatious demands upon his services.

He thought it might be said that a doctor should take such a patient off his list, but the capitation fee was too low to permit a doctor to lose many of his patients. It was only in a few cases that a doctor would complain of patients, but it would be a deterrent to patients being unreasonable in their demands if it was stated on the card that the doctor had the right to make complaints.

Dr. Frank Gray (Council) said that in every walk of life the great majority of people acted reasonably, but in almost every walk of life there had to be disciplinary machinery to deal with the small minority. There was no such machinery in the case of the patients of doctors in the National Health Service, and the Minister by his persistent refusal to establish this machinery was encouraging them to behave in an unruly manner. He hoped that the meeting would pass the motion by Hendon, which asked for the same powers to be used against the troublesome patient as against the troublesome doctor.

Dr. D. M. Hughes (South-west Wales), in opposing the motion, said he thought it would result in doctors suffering a further loss of status. They could deal with the problem themselves by "telling off" patients when necessary. Some patients made frivolous calls, but it must be borne in mind that there were frivolous mentalities in the medical profession, and if such doctors were allowed to make silly complaints against patients the result would be a grand slanging match, in which the doctors would be the losers in the long run and which would result in a further drop in the status of doctors.

Dr. Robert Forbes (Council) pointed out that the proposal put forward in the motion had already been made to the Ministry by the General Medical Services Committee and that the Ministry had not received it favourably. He thought that the Representative Body should give some expression of opinion which would fortify the Committee in the views which it had already expressed, so that it might be more likely to get something done to deter patients from making frivolous and vexatious demands on doctors. It was not contemplated that practitioners would often make complaints against patients, but it was contemplated that they would feel much happier if they had the power to do so. He therefore hoped that the Hendon motion would be carried.

Dr. H. H. Goodman (Newcastle-upon-Tyne) strongly supported the motion. It was wrong to allow a patient to complain against a doctor and to deny the doctor an equal right.

Mr. A. Dickson Wright (Marylebone) thought that some deterrent for this class of patient should be thought out. He wanted something more subtle and clever than was suggested in the Hendon motion.

Dr. E. G. Smallbone (South Essex) spoke against the motion.

The Hendon motion, urging the Council to take further steps to have the regulations amended to provide the practitioner with the right to lodge a complaint against a patient for frivolous or vexatious demands, was carried.

The Question of Penalty

Dr. A. M. Maiden (Lincoln) moved to ask the Association to take all steps to persuade the Minister to institute some machinery whereby a doctor could lay a complaint against a patient, and to impose some penalty on the patient if his conduct was deemed unreasonable. He said that this differed from the Hendon motion only in calling for some penalty. He gave a number of examples of inconsiderateness on the part of patients.

Dr. H. Barbara Woodhouse (Harrow) gave other examples of inconsiderateness. She suggested that patients be required to pay a small mileage fee for each unjustified call.

Dr. G. D. Bolsover (Oxford) said that all of them who were in practice could give a wealth of instances of vexatious calls. Nevertheless, he was opposed to this motion because he felt it would be impracticable. What penalties could be imposed? He doubted whether any body before which a patient could be brought would be in a position to assess or impose a fine. All this would be of no benefit to the doctor, and his relations with his patient would be destroyed.

A representative suggested, amid laughter, that a patient's medical card might be endorsed in the same way as a car-driving licence.

Dr. A. Barker (East Kent) asked the meeting to reject this idea of a penalty. They could very well impose their own penalties. If a patient called them out to some distance and then the case was found to be entirely frivolous, why should they not say, "I am sorry, Mrs. Jones, but you will have to come to my surgery for the medicine and I am afraid I cannot take you back"?

Dr. J. A. Ireland (Shropshire and Mid-Wales) said that having passed the Hendon motion it would be ridiculous not to call for any penalty at all.

The Lincoln motion was declared carried.

General Practitioners and Hospital Committees

Dr. W. N. Leak (Mid-Cheshire), on behalf of Preston, moved:

That this meeting views with the gravest concern recent action taken by regional hospital boards to exclude general practitioners from membership of hospital management committees. It instructs Council to take appropriate action to maintain and improve general-practitioner representation on hospital boards and management committees.

Dr. Leak said that he brought forward this proposal because it was in his area of Cheshire that the case referred to occurred. He gave an outline of the case, which had been the subject of correspondence in the *Manchester Guardian* and elsewhere. It concerned the action of the Liverpool Hospital Board. As a result of correspondence with the Ministry he thought that some advantage had now been gained, thanks to the publicity which this case had received.

Dr. T. Rowland Hill (Marylebone) moved that the phrase should run, ". . . general practitioners *and consultants*." He said that there was too much separation between the consultant and the general practitioner. This could do only harm to both of them. He saw no reason why the General Medical Services Committee should not make some reference to consultants as well as general practitioners. In this matter of representation on hospital boards they had everything to lose by separating the two branches of the profession and everything to gain by marching together. The consultants would be enthusiastically behind the general practitioners in asking for a general increase in the representation on regional hospital boards. But it was important they should leave no suspicion of a division between them.

Mr. A. Dickson Wright (Marylebone) supported the amendment. The consultants were in a minority in that meeting, but it was always a fair meeting and prepared to listen to the point of view of other people. In the case of his own hospital he had been on practically every committee before the Act, and now he was not on any committee at all. They had been frustrated and opposed on all sides. He felt that this motion as originally worded and confined to general practitioners might lead to division, and to add the phrase "and consultants" was surely not asking for too much.

Dr. F. M. Rose (Preston) said that it was a little unfortunate that the position should be obscured by the reference to consultants. They had wanted in this motion to bring forward the principal issue. The circular from the Ministry of Health issued last November of which they complained was directed not against consultants but against general practitioners. He thought that every hospital management committee and every regional board should have one general practitioner. Of course it was agreed that the consultants also should have adequate representation, but he did not think the present motion should be watered down.

Dr. Rowland Hill (Marylebone) said that he did not want to leave a suspicion that there was any disunity in this matter as between general practitioners and consultants.

Dr. R. W. Rae (North Staffordshire) urged that the resolution be passed in the form originally proposed and that the reference to consultants be the subject of a later resolution.

Dr. Frank Gray (Council) said that as the Amending Bill was going through the House of Commons Mr. Bevan was told that he had got his Health Service in three separate sections and was asked what measures he proposed for co-ordinating them. He then said that it was the users of the Service—that is to say, the doctors—who would co-ordinate them. The three sections tended to develop separately without such co-ordination, and the proposal now made was to ensure that that did not go further. He hoped it was appreciated that they were not asking for this as a privilege but as a duty. General practitioners were heavily burdened already, and this was going to add to their burden; but they accepted it because they were convinced that it was essential that there should be one health service and not three health services.

Dr. H. N. Gregg (Coventry) urged that general practitioners and consultants must stand together on this question. He spoke as a general practitioner who was on a hospital management committee.

Dr. S. Wand (Chairman of the General Medical Services Committee) said that strong representations had been made to the Ministry on these lines and it had been made clear that general-practitioner representation must not be at the expense of the consultant. They had been promised a circular letter, and he believed that much of the ill effect would be eliminated when that circular letter was issued.

After some further discussion the motion by Preston was put to the meeting in the following form:

That this meeting views with the gravest concern recent action taken by regional hospital boards to exclude general practitioners and other doctors from membership of the hospital management committees.

This was carried by a unanimous vote.

Medical Advisory Committees

Mr. J. H. Mayer (Tunbridge Wells) moved:

That this meeting considers that adequate representation of both specialists and general practitioners on all regional hospital boards and hospital management committees is essential for the good of the hospital service, and deplores both the present inadequate representation and the tendency further to diminish this representation.

He said that the debate on the previous motion made it necessary to say very little, but this motion emphasized the need for combined action by all branches of the profession in the administration of the hospitals.

Mr. A. Lawrence Abel (Marylebone) said that nothing had been forthcoming on the question of how the general-practitioner representation should be chosen. It was very important to watch these elections to the various committees. He moved to insert the words "by election or nomination by the profession"; also he would like all types of hospital included.

Dr. Rowland Hill pointed out that the Ministry had substituted the word "consultants" for the word "specialists," and technically there were no specialists.

Mr. R. L. Newell (Chairman of the Central Consultants and Specialists Committee) said that this motion raised very serious issues and he strongly supported Mr. Abel's amendment. Suggestions had been made in certain quarters that doctors should be excluded from management committees. Nothing could be more disastrous to the Service than to exclude them from some part of the management of the hospitals. He referred to a report in the *Daily Telegraph* on June 21 of the meeting of the Association of Hospital and Welfare Administrators at Southend in which it was stated that chief administrative officers wanted Mr. Bevan to withdraw from doctors and dentists the right to be members of hospital committees. There was an attempt to exclude medical men from regional boards, but how could this Service be run unless the boards had advice from all sections of the medical profession?

Mr. J. T. Rice Edwards (Monmouthshire) spoke of the importance of having elected—not appointed—members of these boards.

Dr. W. N. Leak (Mid-Cheshire) said that it was quite time that the Minister acted reasonably in this matter and accepted the nominations put forward.

Dr. F. M. Rose (Preston) said that he would have liked a firm statement from the consultants that each regional board and management committee should have one general practitioner. In his view those nominated by local authorities, whether doctors or not, should be regarded as lay people and general-practitioner representation should be separate.

Miss Gladys M. Sandes (Marylebone) considered that there was a great drive to put hospital and medical staffs entirely under lay administrative control.

Dr. J. M. Gibson (Public Health Service) proposed a further amendment to bring in the words "all sections of the medical profession." This was a matter which concerned also medical officers of health.

Dr. C. Metcalfe Brown (Council) urged that they should do nothing as an Association which would convey the slightest suggestion that there was any lack of unity. He supported most heartily the representation on these bodies of the general practitioner and consultant, but there was undoubtedly a place also for the public health officer.

The Chairman of Council said that to use the expression "all sections of the medical profession" would leave opportunity for a very wide interpretation, bringing in orthopaedists, ophthalmic surgeons, and others. All the sections into which the profession was divided might claim representation. Whatever might be the appeal of the National Health Service, he thought they should get some other expression rather than "all sections of the medical profession."

Dr. J. Stanley Thomas (Stratford) referred to the case of teaching hospitals, where there were consultants in very large numbers. The election of a general practitioner was surely of importance and should be urged.

Mr. Lawrence Abel said that he was in sympathy with the request of the public health officers and was ready to agree to the modification of the resolution to include the phrase "and, where applicable, medical officers of health."

The resolution was then put to the meeting and carried in the following form: "That this meeting considers that adequate representation, by election or nomination by the profession, of consultants, general practitioners, and, where applicable, medical officers of health on all regional hospital boards and hospital management committees is essential for the good of the hospital service, and deplores both the present inadequate representation and the tendency further to diminish this representation."

Dr. G. H. Barendt (Southampton) moved:

That it is of the utmost importance that general practitioners be represented on every regional hospital board and that at least one be elected to the medical advisory committee of every hospital management committee.

They as general practitioners should work in the closest possible harmony with consultants, who were in effect their partners.

Certain amendments to this motion were put forward, and after some brief discussion, the hour for luncheon adjournment having arrived, the Chairman adjourned the meeting in order that in the interval the motion might be straightened out.

When the discussion on the motion was resumed there were more amendments.

Dr. W. Smith (Greenwich and Deptford) moved that the motion read as follows: "That it is of the utmost importance that each hospital medical staff advisory committee be approached to secure representation of general practitioners." He said that general practitioners on such committees could and did serve many useful purposes. They made for a proper co-ordination of the work of the hospital. Medical advisory committees were among the most important committees on which they as medical men could sit.

Dr. C. F. Mayne (Plymouth) said that a certain amount of misapprehension existed concerning these committees. In his own clinical area they had made a definite liaison between the clinical medical advisory committee and the local executive council through the local medical committee. The local medical committee had nominated a general practitioner to serve on the advisory committee, and in its turn the advisory committee appointed a member representative of hospital medical staffs to serve on the local medical committee. The arrangement worked well, and the same thing could be done in all areas. He believed that machinery already existed for the purpose.

Mr. C. Hope Carlton (Westminster and Holborn) said that during the last two years he had spent much time sitting on three group medical advisory committees. The medical advisory committee was such a keystone in the building up of the hospital service that it must not be disregarded. Hospitals were suffering now from a diminution of *esprit de corps*. The reason for this was the policy of the Government, which was to exalt the group at the expense of the individual hospital.

In practice two types of committee functioned in London. One was elected by the consultants of the group of hospitals, who might come from 20 different institutions of the most different types. The other was the advisory committee, which was regarded by the hospital management committee as a sub-committee of that body, with a member of the management committee as its chairman. He thought the motion now before the meeting was tinkering with the subject. The Minister should be called upon to lay down the status, procedure, and powers of these bodies.

Mr. J. C. McMaster (West Somerset) said that he was by no means clear what was meant by the medical advisory committee. In the South-western Region hospitals had medical staff committees, not medical advisory committees. A region was divided into clinical areas and each clinical area had a clinical advisory committee. This was not statutory but it had the blessing of the regional board, and it seemed to him that that was the one on which the general practitioner should be represented.

More amendments were proposed, but Dr. H. Guy Dain, who was temporarily filling the chair for the meeting, suggested that all the amendments meant much the same thing and that the form of words now before the meeting might very well be adopted.

The motion in the following form—

That it is of the utmost importance that each hospital medical staff advisory committee be approached to secure representation of general practitioners.

—was carried and passed on to the General Medical Services Committee for its information and action.

On the motion of Dr. Rowland Hill (Marylebone) a recommendation was carried that the Minister should instruct hospital medical committees to recognize and employ local medical committees as advisory bodies in relation to general practitioners and their work.

Dr. Dain said that the meeting would wish to congratulate Sir Henry Cohen, President-Elect of the Association, Dr. Gregg, the Chairman of Council, and Dr. C. O. Stallybrass, chairman of the Liverpool Local Executive Committee, on the honorary

degrees which had been recently conferred upon them by the University of Liverpool. (Applause.)

Refresher Courses

Dr. W. Woolley (Bristol) moved to urge the Minister of Health to amend the regulations governing grants for refresher courses in order that full-time assistants might be eligible for grants. He said that the Minister had been approached by the directors of postgraduate study asking him to change his regulations in order to allow assistants to have grants. They in Bristol felt that the more people who tackled the Minister on any problem the more likely they would be to obtain a result. It might be said that assistants were normally men who had been qualified for only a short time and therefore were not in need of refresher courses. But there were quite a number of men who had been qualified for several years and still remained assistants. Why should there be that differentiation between principal and assistant? If he himself as a principal could obtain a grant, why not his assistant?

Dr. S. Wand indicated his readiness to accept this motion.

Dr. H. S. Howie Wood (Isle of Wight) moved that week-end refresher courses organized by London teaching hospitals should also rank for grant to the practitioner. They should be recognized in exactly the same way as those organized by the Ministry of Health.

It was agreed that this resolution be referred to Council.

Vaccination and Immunization

Dr. O. B. Lean (Northamptonshire) moved that the agreement reached on the fees for vaccination and immunization was not satisfactory in that no fee had been agreed for reports on re-vaccinations which were unsuccessful. His Division felt that this agreement was yet another example of "too little and too late." The general practitioner had always been written down. It would have been better to revise the terms of the agreement with some improvement. He hoped there would be an end of general practitioners waiting for crumbs from the rich man's table.

Dr. Wand said that this re-vaccination problem was rather new. It came forward particularly in the recent epidemic of smallpox at Glasgow. When the terms were agreed by the committee they had in mind a re-vaccination of infants. Now they had the case of the adult who had been vaccinated in infancy and was re-vaccinated and it did not "take." He thought most of them would feel that in the majority of such cases re-vaccination was unnecessary. On that issue they would take it back to the Ministry, point out the anomaly, and see what could be done about it.

The Minister's Undertakings

Dr. R. Cove-Smith (Marylebone) moved that the meeting call upon the Minister to make good his undertaking to adjust the remuneration of urban and rural practitioners in accordance with the recommendations of the Spens Committee, to provide suitable health centres, and to organize adequate clerical assistance for practitioners. This motion was a reminder of how many things still required fulfilment. The figures for practitioners' remuneration had not yet been agreed by the Minister. What other profession would go on working for two years continuously without having their salary properly adjusted? On the question of health centres it was realized that this was a difficult problem at the moment, but there was a possibility of the adaptation of present buildings to this end. The greatest need was for diagnostic centres. These would increase the confidence and morale of the practitioner and would be of great benefit to the patient by giving him the possibility of a more rapid diagnosis, and it would ease the strain on out-patient departments. As to organized clerical assistance, at present doctors' wives were co-opted as "full-time receptionists" on behalf of Mr. Bevan. The Minister should be reminded again and again of his unfulfilled promises.

Dr. G. O. Barber (Mid-Essex) moved to add the words "and press local authorities to provide accommodation for group practices." All over the country there were groups of general practitioners who had taken the bull by the horns and had acquired or rented existing premises and had altered them so as to provide good consulting-rooms, and had arranged rosters for night duty and week-ends. There were other doctors who wished to do the same, but were afraid of the initial capital outlay. This amendment would place the obligation on local authorities to provide such premises in which four or six doctors could be in one consulting block.

Dr. Cove-Smith accepted this addition to his motion.

The Chairman of Council said that he was completely in sympathy with the object behind this resolution, but he had a certain overhanging anxiety on this mode of presenting the issue. In certain large towns there were people connected with the public life of the town who were anxious to press for the hurried setting up of centres which they described as health centres, and who would almost advocate taking over any place they could get. It would be a thousand pities if as a result of pressure brought to bear upon local authorities a number of pseudo-health centres were set up under the guise of helping group practice. Having ventilated the subject it might be wise to allow the Council to deal with the matter and to see that it was presented in such a way that the unfavourable results he had suggested did not arise.

Dr. G. Priestman (Bradford) thought the starting-point of diagnostic centres was a good one, and he hoped the matter would be referred to Council for consideration. Dr. A. C. E. Breach (Bromley) was a little chary of the words which Mid-Essex proposed should be added.

The motion as amended was carried.

On the report under "General Medical Services" as a whole, Dr. E. B. Smith (Nottingham), referring to the paragraph relating to the medical examination of claimants to unemployment benefit, said that he noticed that for the additional work or responsibility entailed there was no reference to fees. It was time that the tendency of Government departments to accept the services of general practitioners without fee should cease.

Dr. Wand said that the paragraph to which attention was called was just an intimation of the fact that the Minister had given a more definite instruction that this consultation with the general practitioner should take place. The doctor had not got to fill in a form or afford any information he did not think necessary.

The Chairman of Council said it was only fair and right that the meeting should realize that with regard to these examinations, which were conducted by examining officers on behalf of the Ministry of Labour, when the form was sent to the doctor giving him the opportunity, if he so wished, to make some communication on it to be laid before the examining officer, he was entitled, if he asked for it, to a copy of the examining officer's report.

Dr. W. A. Hyslop (Leeds) raised the question of the dispensing capitation fee, and Dr. Wand said that the Rural Practitioners Subcommittee was at present making an investigation on this and cognate matters.

Dr. Wand also stated that an addition had been made to the pensions and insurance scheme. It had been possible to negotiate a scheme of pensions for their employees such as their dispensers and secretaries. It was possible to provide for them at a very reasonable annual payment. It had been embarrassing, being eligible for superannuation themselves, to find that there was no scheme for their employees.

The General Practitioner's Burdens

Mr. A. Lawrence Abel (Marylebone) moved:

That this meeting believes that the future of medicine is being placed in jeopardy by the fact that many general practitioners are suffering from overstrain and financial worry and are deprived of any cause for pride and satisfaction in their work.

General practitioners, he said, had inadequate time for the proper examination of patients. He had lately asked many doctors who had brought cases, "How often do you have time to examine a patient?" Some of them replied, "You don't know how we have to run our practices." One of them said that he saw 80, and another 120, patients in a couple of hours. Many doctors told him they thought they were becoming sorting agents for sending cases to hospital, and the patients came back from hospital as cases rather than as patients.

Dr. Wand said that they had expressed many sentiments regarding the quality of their work, and the danger to that quality, because of the burden and frustration placed upon them. He had been struck by the fact during that Representative Meeting that every speaker who had suggested some improvement had been applauded. Every doctor in the country was concerned with only one thing regarding his profession, and that was to do better and better doctoring, and to be given more opportunities to that end. He could not see how a resolution of the kind that Marylebone had proposed would help, and he thought it might be best to proceed to the next business.

Dr. D. M. Hughes (South-west Wales) said that it was not true that the vast majority of doctors did not examine their patients. He supposed that the trend to-day was to examine them less than used to be done, but this deterioration in the standard of general practice did not take place when the National Health Service came into being; it had begun to occur long before that. He thought that general practitioners should make a point of carrying out what examinations they thought fit and doing essential treatment. If the surgery lasted for a couple of hours longer the patients would realize that the doctor was concerned with the genuine need of his patients, and those who had come to the surgery frivolously would become tired of waiting and would leave.

The meeting agreed to proceed to the next business.

Dr. W. M. Knox (Glasgow) moved:

That a fundamental requirement to secure a satisfactory status for the general practitioner, and thus to improve the Service, is a reduction in the maximum number of patients permitted with a corresponding increase, if necessary, in the capitation fee to implement Spens.

There was no doubt, he said, that there was a vast amount of overwork on the part of the general practitioner, and the motion was designed to put forward a remedy for that. The motion had been debated recently at the Special Conference of Local Medical Committees and had then been rejected, chiefly on the ground that, as the conference had been called to deal very largely with the question of increased remuneration, the motion was not strictly relevant, but he did not think that was a true reading of the situation.

As a member of the Spens Committee he could assure the Representative Body that it was never envisaged by any member of that committee that the basis of remuneration of the general practitioner should necessitate gross overwork. One of the important paragraphs of the Spens report was, in his opinion, a short one which stated that when the new Service was introduced the general practitioner must have time for reading, study, and recreation. At the moment, if a doctor was to earn a reasonable income he had no time for any of those things. His remuneration, so far as the Minister was concerned, was obviously based on the maximum amount of work that could be done under the Act and not on a reasonable amount of work. The solution of the problem lay in a curtailment of the maximum number of patients which a practitioner was allowed to take, together with an increase in the capitation fee, in order to implement the findings of the Spens Committee and to bring about the spread that was envisaged by that committee. In that way there would be a redistribution of the work, an improvement of conditions for the junior members of the profession, and an easement for the senior members, who were now overworked.

He was fully in agreement with the view that the general practitioner should have access to hospitals and should take part in the management of hospitals and in the work of the regional hospital boards; but how was it possible for a doctor who was working at full pressure all day to carry out such duties? The general practitioner should have to do only a reasonable amount of work to make a reasonable income and should have time for study and recreation; in his opinion the only way in which that state of affairs could be brought about was by a reduction in the number of his patients.

Dr. W. Fulton (Glasgow), in supporting the motion, said he thought that the only way in which general practitioners could regain their status and standing in the eyes of their specialist colleagues and the public was to do their work better, and they could do it better if they had more time to devote to it. One point which might appeal to the Minister was that if the general practitioner did better work there would be fewer patients sent to hospital, so that hospital costs would be reduced. Some specialists said that patients were being sent to hospital who could have been quite easily diagnosed in another five minutes by the general practitioner. The improvement of the Service was a matter which was very dear to the heart of the Minister, and from that point of view the proposal might appeal to him.

Dr. Wand said he hoped that the question of a reduction in the maximum number of patients would be left over for the present. If persisted in, it might eventually mean such a levelling out that the profession would be forced into the position of a salaried service, with all the disadvantages that would bring to the patient. He hoped that the Representative Meeting would concentrate upon the remuneration issue as put forward on the previous day and not deal with anything else until that matter was satisfactorily settled. He hoped therefore that the meeting would not force the hands of the Committee in a way which might react disadvantageously on the main issue.

The meeting agreed to pass to the next business by 200 votes to 100 (the bare two-thirds majority required).

Provision of Diagnostic Facilities

Dr. F. M. Rose (Preston) moved that the Representative Body reiterate its demand for the provision of *x*-ray and laboratory facilities directly available to the general practitioner, either in hospital or elsewhere. This proposal, he said, was not a new one. It had been the policy of the Association for several years, yet regional hospital boards had circularized hospital management committees in their areas stating that the policy of the boards was that these departments in hospitals should be kept closed. Some of the hospital management committees had been more enlightened than their boards and had maintained open departments. The closing of the departments was in fact ineffective, because the cases which would have been referred direct were sent in a circuitous way through consultative clinics and reached the department some 10 weeks later.

It had been stated that in many areas the departments could not stand the strain if they were open to the general practitioner, but if the work that went through an *x*-ray department was analysed it would be found that the general-practitioner work was probably not more than 10% of the total work done, and in the case of the laboratories the proportion was probably only about 8%.

It was felt that if the general practitioner was to continue to maintain his present high standards he should have the services in question directly at his disposal, so that he could investigate a case thoroughly before deciding what he should do with it. He was the man in charge of the case, and he should not be forced into an unwanted consultation just because he could not get pathological or *x*-ray facilities otherwise. It was in the interests of consultants that there should be in their area general practitioners who took an interest in the clinical problems which were presented to them and who could examine a case and offer a reasonable opinion about the diagnosis. They could do a large amount of the work which was at present burdening the out-patient departments.

Dr. Ff. Roberts (Cambridge and Huntingdon), speaking as the senior radiologist of a hospital, said that last October the Local Medical Committee applied for *x*-ray and laboratory facilities to the medical committee of the hospital, and that committee, without consulting him, said that the diagnostic *x*-ray department was not large enough for general practitioners to send their patients there as a general rule but that the matter might be considered when the department was enlarged. He protested against that decision being made without his having been consulted, but his protest was completely ignored. Although he went to see the chairman of the medical committee on the subject the committee refused to alter its decision. He then wrote to the Minister of Health, who put him into touch with Sir John Charles, but in spite of repeated assurances that steps would be taken in the matter nothing had yet been done. Apparently the answer to the question

whether the Minister wanted patients to have treatment promptly was that he did not care about the patients; he only cared about whether the Service appeared to his supporters to be working satisfactorily. Dr. Roberts amused the meeting greatly with his account of the prolonged correspondence on the case.

The Preston motion was carried unanimously.

Dr. H. H. D. Sutherland (Kensington and Hammersmith) moved:

That where facilities are not already available, and as a temporary measure, this meeting is of opinion that for a satisfactory medical service it is essential that centres should be established to provide the general practitioner with such ancillary aids to diagnosis and treatment as pathological laboratories, *x*-ray facilities, and a physiotherapeutic department.

General practitioners, he said, could not go on waiting from six to nine months for these facilities, which were required for ordinary cases such as the tuberculous patient, the pregnant woman, the man who sustained an apparently simple injury at work, and so forth. There were a number of places where this work could be done for general practitioners. For instance, a retired pathologist who still had his own laboratory could do it, and in the larger towns there were various places other than hospitals where it could be carried out.

Dr. T. F. Tierney (Marylebone) said that he was a radiologist on the staff of four hospitals, and if he wished to take patients from general practitioners nobody could prevent him doing so. At the largest of the four hospitals, which was a teaching hospital, he did not accept cases from general practitioners unless they were referred to him personally, because the department could not cope with any more work than it was at present doing. He was sure he was speaking for the majority of hospital radiologists when he said that they were anxious to take cases direct from general practitioners, and he did not think that the hospital authorities would stand in their way; but they did not possess the facilities for dealing with the cases.

Dr. H. Barbara Woodhouse (Harrow) said that a general practitioner in Harrow, who for many years had had his own *x*-ray plant and had done radiological work, had written to various authorities, six months before the inception of the National Health Service, to find out how his equipment could be used under the Service. Although he was told that the equipment was good and adequate, he was also told that a place could not be found for him in the Service. It therefore did not appear to be a fact that there were not enough radiologists or equipment for the work to be done.

Dr. S. Smith (Tower Hamlets) said that in his Division a series of clinical meetings had been held, one of which had taken place at the local hospital, and during the course of that meeting the general practitioners and pathologists discussed the question of facilities, as a result of which both the laboratory and the *x*-ray department were thrown open to general practitioners, who were given direct access to them. It seemed to him that a good deal could be done by friendly chats between the local divisional secretary or the local medical committee and the hospitals concerned.

Dr. W. Smith (Greenwich and Deptford), speaking as a pathologist, said he would welcome general practitioners having access to pathological laboratories, but at the present time there were many hospitals which had not adequate pathological facilities even for their in-patients, who, he would suggest, must be given priority. Last year the Representative Body had agreed that the use of such facilities should be extended as they became available, and additional facilities were becoming available every month.

Dr. D. M. Hughes (South-west Wales) said that in 1940 the Ministry of Health established a laboratory in a county town nine miles away from where he lived, and it had been of so much help and interest to the general practitioners in the district and had helped them to raise their standards of practice so much that he thought such facilities should be extended. He strongly supported the suggestion that wherever these were available general practitioners should be encouraged to make use of them.

Dr. Sutherland said that although the Ministry had set up its laboratories they were not sufficiently on the spot to cope with all the work, and there were facilities elsewhere—e.g., men who had their own *x*-ray plant—which were not used. This proposal of Kensington and Hammersmith was designed to bring out the "little ships" when the "big ships" were very fully burdened.

The motion was carried.

A motion by Trowbridge asking that until there was a great improvement in facilities the proposed elaborate routine examinations of hospital nursing and domestic staff should not be carried out was negatived.

Anaesthetics in Midwifery

Dr. P. A. McCallum (Torquay) asked the Council to press for an alteration in the Ministry ruling that one anaesthetic fee should be payable for one confinement. The Ministry rule was an example of the Civil Service mind. The judgment of the doctor in these cases should surely be trusted.

The motion was carried.

Obstetric Beds

Dr. Watney Roe (Chelsea and Fulham) moved that the Ministry be asked to instruct hospital boards to arrange for obstetric beds in maternity homes and hospital wings to be placed at the disposal of general practitioners where none were now available. If Manchester could do this, why not London? The beds he was asking for were general-practitioner beds, entirely separate from those under the gynaecologist or obstetric specialist. General practitioners were asking only for the return of patients who had been taken from them.

The motion was supported by Dr. I. G. Innes (East Yorkshire), who related some experiences in the East Riding, and Dr. A. C. E. Breach (Bromley), who proposed the addition of the words "in adequate number," which was accepted.

Dr. H. S. Howie Wood (Isle of Wight) called attention to the fall in incomes of general practitioners brought about by the increasing number of expectant mothers who entered hospitals where they would not be attended by doctors of their own choice. One of the questions to which great importance was to be attached was the status of the general-practitioner obstetrician. Surely such a man should be recognized as able to conduct confinements in approved nursing-homes or maternity blocks in a hospital. In his area it was proposed to start a training school for midwives, and apparently one of the conditions was that all the births in the Isle of Wight attended by these women should be conducted in maternity blocks of hospitals. Practitioners who were to be excluded from having their cases in these beds were naturally perturbed.

The motion was carried.

Superannuation Contributions

Dr. A. G. Holman (East Norfolk) asked the meeting to express the opinion that the 8% contribution by the Ministry towards superannuation payments should be payable to general practitioners or their dependants in the case of retirement or death before the requisite 10 years' service had been completed, and that the recent concession whereby hospital medical officers were allowed to count their previous service towards the necessary 10 years to qualify for pension should be extended to general practitioners from the time when they started National Health Insurance work. A similar motion was brought before the recent Conference of Local Medical Committees, and Dr. Wand had said that the scheme was actuarially sound. It was certainly actuarially profitable for the Government.

Dr. Wand said that actuarial advice had been taken throughout the whole of the negotiations on superannuation, and they were assured that the scheme was actuarially sound. Certain improvements in the scheme had been obtained since it was first put forward. At the Special Conference he had given an undertaking that he would look into the matter even further to see if yet other improvements could not be made. Dr. Holman was well aware that he had given that assurance, and when he gave such an assurance he meant what he said.

Dr. E. C. Warner (Marylebone) said that a certain concession had been given to consultants in this respect, and it seemed only fair that a similar concession should be given to those in general practice.

Dr. Holman said that the fact that he brought forward this motion again at the present meeting did not in any way mean that he doubted Dr. Wand's undertaking.

The motion was carried.

Medical Benevolence

In moving approval of the portion of the Council's report under this heading Dr. Janet K. Aitken (Council) said that the details of the moneys received were given in the report. It was 25 years since the B.M.A. Charities Trust Fund was established. In its first year it allocated £45; last year the amount was £4,250.

This part of the report was approved.

Elections

During the day it was announced that Dr. J. A. Brown had been elected Chairman of the Representative Body without a contest, and that after a contest Dr. S. Wand had been elected Deputy Chairman.

The meeting adjourned at 5.30 p.m.

SATURDAY, JULY 15

The Representative Meeting opened at 10 a.m., a meeting of Council having been held at 9 a.m.

The War Memorial

The debate on the Association's war memorial, adjourned from Thursday, was resumed.

Dr. W. Radcliffe (North-east Essex), in moving that the design of the memorial be referred back to the Council, said that until the representatives saw the model on Thursday few people had seen the design which had been approved by the Council. The Representative Meeting last year had given the Council permission to hold a competition for the design, to appoint assessors, and to initiate an appeal. Why had there been no illustration of the design in the *British Medical Journal*? It should be remembered that the widows, mothers, and children of the men to be commemorated would make pilgrimages to the memorial for many years to come and that the design was one which they would consider worthy. He thought that the memorial would be greatly improved by some flowers, which would introduce colour into the courtyard.

Dr. H. S. Howie Wood (Isle of Wight), in supporting reference back, said he was sure the representatives would agree that it was essential that the design of the memorial should be non-controversial.

Dr. W. E. Dornan (Sheffield), in opposing the motion, said that anatomy might not change but fashions in the human form certainly did. He thought that the general effect of the proposed design, as viewed through the gates, was most pleasing.

Dr. J. B. W. Rowe (Harrow) said that he liked the lay-out of the design but he did not like the figures, and he supported reference back as far as the figures were concerned.

So far as the inscription was concerned, for which Dr. Dain had invited suggestions, he noticed that there was room for only 68 letters, so the inscription would have to be very short, and he would like to suggest that it should be taken from the writings of some medical poet, such as the late Poet Laureate, Dr. Robert Bridges.

Dr. J. R. M. Sangster (Lewisham), in opposing reference back, said that so far the Association had a clean record in artistic matters. The Epstein figures on the Association's old building in the Strand were no disgrace to the Association and were still examined with interest by serious students. All art was modern art in its time, and all serious art was modern art. Mr. Woodford had done his best to interpret the Association's wishes and should, he suggested, be asked to proceed with the work.

Dr. Dain, in replying to the discussion, reminded the Representative Body that at its meeting last year it had decided that the memorial should take the form of a fountain and had given the Council authority to engage experts as assessors. The Council had done so, and, on the advice of those experts, had selected three sculptors of repute to send in designs. After carefully considering the three designs, the assessors had unanimously recommended that the design by Mr. Woodford should be accepted, and the Committee had accepted the assessors' report and presented it to the Council, which had approved it. Mr. Woodford was quite ready to receive suggestions with regard to the figures, and some such suggestions had already been made to him. Some criticisms had been made about the anatomical accuracy of the figures, but he had been assured by some experts on the subject that there were no anatomical distortions in the figures as presented. He might mention, in conclusion, that the appeal for funds for the memorial had been issued only a week ago and that £3,000 had been received by last Wednesday.

The reference back was lost by a large majority and the report was approved.

GENERAL MEDICAL SERVICES (RESUMED)

National Formulary

Dr. W. Radcliffe (North-east Essex) moved that the approximate cost of each prescription in the *National Formulary* should be printed in future editions or in a supplement to the present edition. The object of this, he said, was to try to effect an economy in the cost of the drug bill by teaching the young men leaving hospital and, more important still, those still in hospital, and reminding other members of the profession, of the cost of the various prescriptions and drugs in the *National Formulary*.

Dr. A. B. Davies (Walsall and Lichfield) said that there had undoubtedly been a vast increase in the number of prescriptions under the National Health Service Act, and he suggested that at least some of the responsibility for this rested on the Minister, who at the inception of the new Service had promised the public that the sky should be the limit. The three main causes of excessive cost in prescribing were to be found in the quantities prescribed, the frequency of prescribing, and the use of proprietaries. At the last meeting of the Representative Body there had been much criticism of the new *Formulary*, and it had been said that because of its inadequacies there was a necessary call for the prescribing of proprietaries. The Formulary Committee was now endeavouring to reduce the cost of prescribing by introducing a complete range of pleasant flavourings, colourings, and blendings, and it was hoped that when the new *Formulary* was issued in May, 1951, doctors would make greater use of it.

There was already material—the green book which was issued by the Ministry from time to time, the *Formulary* itself, and a list of drugs which had been issued—which practitioners could use in scrutinizing their cost of prescribing. He would suggest that the motion should be referred to the General Medical Services Committee, so that that Committee could in turn delegate the matter to a new subcommittee which was to be set up to examine prescribing.

Dr. S. Wand said that he would accept the motion as a reference to Council. It was a new and interesting suggestion and therefore needed careful consideration.

Dr. Radcliffe agreed that the motion should be referred to the Council.

Provision of Medicine for Private Patients

Dr. H. H. Goodman (Newcastle-upon-Tyne) moved:

That, in the opinion of this meeting, private patients are entitled to free medicines and appliances.

His Division, he said, considered that this matter was so important for the survival and resuscitation of private practice that it should continue to be pressed upon the Minister. It was surely wrong to deprive a certain section of the community of something for which they had paid, and private patients paid just as much as anyone else by way of contribu-

tions and more than others by way of taxation. The real reason why private patients were not allowed free medicines and appliances was that the Government was afraid to allow private practice to compete on equal terms with the National Health Service.

An amendment by Bournemouth to add the following words to the motion, "and this meeting instructs the Council to continue its efforts to get this principle accepted and implemented by the Government," was accepted by Newcastle, and the motion, as amended, was carried.

Certificates from Other than Medical Practitioners

Dr. J. A. Gorsky (Westminster and Holborn) asked the meeting to express its disquiet at the absolute power possessed by the determining authority under Section 43 (3) of the National Insurance Act, 1946, and Clause 2 (1) of S.I. 1948, No. 1175, to accept certificates or other evidence of incapacity for work for sickness benefit claims from persons other than registered medical practitioners. He declared that such procedure did not allow for safeguards against abuse, lowered the status of medical practitioners, and was inconsistent with Section 37 of the Medical Act, 1858.

It would, he said, be a tragedy not only for the profession but also for the nation which it served if the public were left with the impression that, once the matter of remuneration was settled, all would be well with the National Health Service. The medical profession was threatened with encroachments on the ethical and professional freedom of its members and could not tolerate any further degradation of medicine into a State monopoly.

Unqualified persons were permitted to sign certificates entitling people to sickness pay out of National Insurance funds. If this was permitted and allowed to continue, it would be impossible to tell where the process would end. There would seem to be nothing to prevent anyone putting up a brass plate and calling himself an osteopath, a chiropractor, or a Christian Science practitioner and selling certificates to any insured person who wanted to enjoy a period of paid idleness. He had in his possession a card issued by an institute which set out a list of conditions "successfully treated at the institute," including rheumatism, fibrositis, sciatica, obesity, migraine, and high and low blood pressure, and which stated: "Certificates under the Health Service are obtainable for sick benefit."

General practitioners had lost their liberty because they had relaxed their vigilance, and it was vital now that they should strengthen their vigilance if they wished to retain what they had left and to recover what they had lost of their professional liberty.

Section 37 of the Medical Act, 1858, stated that no certificate required by any Act from any physician, surgeon, licentiate in medicine and surgery, or other medical practitioner, is valid unless the person signing the certificate is a registered medical practitioner. That section had not been repealed in the Ninth Schedule of the National Insurance Act, 1946, and therefore any certificate for the purpose of claiming sickness benefit must be given by a registered medical practitioner. Section 2 (1) of S.I. 1948, No. 1175, said that every person claiming sickness benefit must furnish evidence of incapacity in respect of the days for which the claim was made, by means of a certificate given by a registered medical practitioner "or by such other means as the determining authority may accept as sufficient in the circumstances of any particular case or class of cases." The Minister had given power to the officials who constituted "the determining authority" to accept evidence from persons other than registered medical practitioners for the purpose of obtaining sickness benefits, and, as that was repugnant to the wording of Section 37 of the Medical Act of 1858, the Minister was acting *ultra vires*.

Medical registration conferred on doctors a status with which were associated privileges and rights, but those rights imposed a correlative duty or obligation. A breach of those duties or obligations might bring them before the General Medical Council or the Medical Services Committee. It was of paramount importance to those who did the routine work of the medical profession to demand that their status should be safeguarded and not lowered to the standards of unorthodox practice. They could not tolerate with complacency a seemingly trivial unfairness or allow it to go unredressed, for the greatest tyranny had the smallest beginnings.

Did a registered medical practitioner lose his or her medical registration on becoming a Minister of the Crown? If not, was the Minister of National Insurance covering unregistered medical practitioners?

Dr. J. T. Baldwin (Lothians) said that complaints might be lodged against medical practitioners by various persons, including the Minister of National Insurance, in respect of irregular certification, and he believed that those complaints could be lodged only against medical practitioners whose names were on the lists of the local medical committees. It would appear, therefore, that an unregistered practitioner could not have a complaint lodged against him and was not subject to the procedure of the Medical Services Committee, and if he was unqualified he was not subject to the jurisdiction of the General Medical Council. Therefore it would seem that an unregistered practitioner, and particularly an unqualified practitioner, could continue to issue certificates without the possibility of any penalty being imposed upon him. That was an intolerable situation, and the meeting should therefore support the motion by Westminster and Holborn.

Dr. Wand reminded the representatives that the present position had existed since the beginning of National Health Insurance. (Cries of "Shame.") It had always been the right of patients to provide any evidence of incapacity that they chose and for the authority paying out the money—formerly the approved societies and now the Minister—to satisfy itself that the evidence was sufficient. Patients might choose to obtain medical advice from properly qualified medical practitioners or they might choose to obtain it elsewhere. The Ministry of National Insurance could accept the evidence received, it could refer a case to the regional medical officer, or it could decide to accept evidence from other quarters. He asked the representatives to consider the implications carefully before voting on the motion.

Dr. Gorsky, in reply, said he would like to point out that the money in question was public money and that before 1948 the Ministry of Health controlled all insurance, but now there was another Minister for it. Dr. Summerskill had said in the House: "I have no authority to issue directions to these determining authorities." The determining authorities had absolute power to accept the certificates. The only person who could refer a case to the regional medical officer under Section 43 was the determining authority, not the Minister of National Insurance. He did not object to complete freedom, but he objected to the freedom which enabled an unqualified practitioner to advertise for patients and to sell certificates.

The Westminster and Holborn motion was carried by a large majority.

THE ASSOCIATION OVERSEAS

Mr. J. L. Gilks (Zanzibar) moved the report under "Overseas." He referred to the work of the Association in securing new salary scales for colonial medical officers. He said also that the Council had continued to take an active interest in the affairs of the overseas Branches. Early in the year one of the Assistant Secretaries (Dr. Grey Turner) paid a very successful visit to the West Indian Branches, and an immediate result had been that the Council had called a meeting of all the Caribbean Branches to take place next year, and was sending one of its elder statesmen, Dr. Dain, to preside over it. He was being accompanied by Dr. H. B. Morgan, a member of Council for the Caribbean Branches.

A number of representatives from Overseas Branches then briefly addressed the meeting.

Dr. Douglas J. Thomas (Victoria) said that he spoke for all the States in the Commonwealth of Australia. Last December the Association fought and won an action in the High Court of Australia which prevented the then Government from enforcing their "free medicine" scheme, because that scheme contained some element of civil conscription.

Dr. J. E. O'N. Gillespie brought the greetings of the Cyprus Branch. They were very grateful for the improvements that the Colonial Medical Service effected as a result of the Association's work.

Dr. A. G. Davies (Tanganyika) said that their problems in East Africa were really the same as those in this country. "The conditions which you get in England and the standards you build up become ultimately our conditions and standards."

Dr. M. A. Gabriel-Jayamaha, a past president of the Malayan Branch of the B.M.A., brought the greetings of his Branch.

Dr. J. R. Gregory (Kenya), in a humorous speech, gave his impressions of the Representative Meeting as it struck a looker-on. There appeared to be a great deal of muddled thinking, which resulted in muddled publicity. Many speakers had been at great pains to explain that their only point of view was that of the patient, but their subsequent words seemed to belie that. They certainly succeeded in creating a wrong impression to judge by the headlines in some papers. That day's heading in one paper was "Frivolous Calls." Speaking as a private practitioner he could say that frivolous calls were in no way a monopoly of State medicine. He thought that they were talking too much about the falling status of the general practitioner. Never in the history of mankind had a people been better looked after by more highly educated men. The public read only the headlines and got the wrong impression. (Applause.)

Dr. O. A. Diethelm (New South Wales) spoke gratefully of the reception he had had in this country. One thing which impressed him was the almost complete unanimity of the profession. There was almost complete unanimity in the profession in Australia against an Act of the Government—the proposed National Insurance Act which was brought forward by the last Australian Ministry.

Mr. V. G. Griffiths (Malta) and Dr. A. C. Fisher (Northern Rhodesia) conveyed the greetings of their constituencies. Dr. Fisher said how much the *British Medical Journal* was appreciated in Northern Rhodesia. They looked forward with every mail to its coming.

Mr. A. Eisdell Moore, President of the New Zealand Branch, expressed his sense of gratitude to the parent body for the help it had afforded in that distant Dominion. He also expressed appreciation of the conferment of the Gold Medal on Dr. J. P. S. Jamieson, who had been a leader in New Zealand in the protest they had put up against the introduction of socialized medicine.

Mr. R. T. S. Goodchild brought the greetings of the Uganda Branch. They considered themselves an integral part of the British Medical Association, and they had recently had a visit from a very good ambassador of the parent body, Dr. Grey Turner, an Assistant Secretary.

The last of the overseas delegates to speak was Dr. P. T. O'Farrell, of Eire, who said how deeply the close association of the Irish Medical Association and the B.M.A. was appreciated.

The report under "Overseas" was adopted.

GENERAL MEDICAL SERVICES (RESUMED)

Distribution of Moneys in the Service

Dr. J. L. McCallum (Westminster and Holborn) moved to express the dissatisfaction of the meeting with the present distribution of moneys voted by Parliament for the National Health Service as between hospital and general-practitioner services, and to urge that as a matter of policy for the promotion of the better health of the nation the Minister should devote a greater proportion to the front-line services and less to the services at the base. He said that this was not an attack on their colleagues in hospitals. It was, however, an attack on a Minister who prided himself on his administrative ability. They knew in the Association that what was wrong with the Service was its division into three parts, each competing for the money available. General practitioners were called by the Minister one pressure group within the whole structure of the Health Service. Of the total money expended on the Service the general practitioner received not more than 10%—a quite inadequate proportion in view of the work he did.

Dr. H. G. Dowler (Gloucestershire) said that the long-term requirement was to induce a better attitude towards general practice among medical students and their younger colleagues. The short-term requirement was surely an economic one. If more money was spent on general-practitioner services there should be shorter lists, more doctors in practice, and better work done. Unless something was done soon to improve the general-practitioner part of the Service it would be too late.

Dr. H. F. Moffit (North Glamorgan and Brecknock) supported the motion, which he thought went to the root of the matter. The National Health Service was out of balance. They wanted to get the balance put right. The Minister did not realize the quiet and efficient work of the general practitioner. He had a bias towards the more spectacular work of the hospitals.

Dr. Wand said that the Representative Body would realize that this was a very difficult problem, and he hoped that a final decision would not be reached without the fullest consideration in committee. He asked that the motion be referred to the Council. While it came under "General Medical Services" in the agenda the consultants and specialists ought to have something to say about it.

The motion to refer the Westminster and Holborn resolution to Council was lost and the motion was carried.

Negotiations with the Ministry

Dr. R. B. Allen (Consett (with Hexham)) moved that some attempt should be made to do away with the veil of secrecy which was habitually drawn over the negotiations with the Ministry of Health. Divisions wanted to have some information from Headquarters. He thought that Dr. Wand might consider making a confidential periodical statement for the information of their secretaries or members.

Dr. A. Barker (East Kent) opposed the Hexham motion, which he said suggested a lack of confidence in the General Medical Services Committee. They did not want to prejudice negotiations by premature disclosures.

Dr. Wand claimed that his committee had taken the profession into its confidence at every possible stage. The profession had been informed of all that had been done in negotiation. The effect of such a motion would be to make negotiations with a Government body absolutely impossible.

Dr. T. Rowland Hill (Marylebone), speaking as a member of the Joint Committee, did not feel really hostile to this motion. The Joint Committee at its last meeting had resolved to make public as frequently as possible a full report of the work it was undertaking.

Dr. S. Noy Scott (Plymouth) said that this complaint about secrecy came from members who never attended their Division meetings. It was impossible and often unwise to put everything in print.

Dr. Allen offered to withdraw the Consett (with Hexham) motion, but the meeting would not permit him to do so, and on a show of hands it was heavily lost.

A Question of Names

Dr. P. W. F. McIlvenna (Reading) moved that the title of the Committee be altered to the "General Practitioners' Committee," and that the Conference of Local Medical Committees be called the "Conference of General Practitioners." He held that this would make for more cohesion and would identify the general practitioner more closely with its work.

Dr. Wand pointed out that the committee did not represent all general practitioners, some of whom were outside the N.H.S., and their interests were looked after by the Private Practices Committee. The reason for the title "General Medical Services" was because that was the heading of the appropriate section in the Act.

After a brief discussion both motions were lost by a very large majority.

Dr. R. M. S. McConaghey (Torquay) moved:

That the Conference of Local Medical Committees be called the Conference of General Practitioners, and that, in view of the important part now played by such committees in moulding the future of general medical practice, every endeavour be made both centrally and locally to stimulate interest in, and to secure the election of suitable candidates to, local medical committees.

He said that in some areas practitioners had been given no opportunity of discussing Local Medical Committee work. The utmost information was necessary if there was to be a united profession.

This was carried as a recommendation to Council.

CONSULTANTS AND SPECIALISTS

Mr. R. L. Newell (chairman of the Central Consultants and Specialists Committee) introduced the report of Council under this heading.

He said that when he presented this report last year at Harrogate the terms and conditions for consultants had not been approved. There were many difficult outstanding items. The Joint Committee had entered into lengthy discussions with the Ministry and eventually decided that the necessary safeguards had been obtained. They advised that consultants on hospital staffs should sign permanent contracts. The reasons why they came to this conclusion were fully set out in this part of the Annual Report. He thought it was a wise decision of the Joint Committee, but they were still considering and discussing outstanding points with the Ministry. During the year they had appointed an executive committee which had done some extremely good work under the chairmanship of Dr. Rowland Hill. If the formation of the Central Consultants Committee had had only one effect, that of making the consultants attend the Annual Representative Meeting, it had proved its usefulness. Mr. Lawrence Abel had said at the representatives' dinner the other night that the autonomous bodies should act with the B.M.A. in all questions of major policy, and with that he was in full agreement. He regarded the relationship of the autonomous bodies to the B.M.A. in the light of a "Commonwealth of the British Medical Association."

Grading of Hospital Medical Staff

Dr. J. C. Wishart (Bromley) moved:

That this meeting is not satisfied with the composition of the former Grading Committees. Too many mistakes have been made. It recommends that another body, including general practitioners, be set up forthwith to re-hear appeals with a view to rectifying existing anomalies.

He gave instances of anomalies of grading, but said it was not in order to air grievances that this motion had been brought forward. Bromley hoped that the committee would use its influence to set up future grading committees on a better basis. They should press for the setting up of an independent body to hear appeals.

Dr. T. Rowland Hill (Marylebone) moved to add certain words:

"and urges the Central Consultants and Specialists Committee to take all possible steps to ensure that the promised review of grading is carried out in agreement with it upon methods and personnel."

He gave one example of mis-grading—that of a surgeon who had been for many years in general practice in a big South Coast town. The fact that he had been in general practice was the one thing that weighed against him. A very large proportion of the surgery of this country had been done by men in general practice. This particular man had been surgeon on the staff of his local hospital for 30 years and senior surgeon for five years. But he was still graded as "S.H.M.O." Yet he had referred to him by so-called consultants cases that the consultants themselves could not deal with. When the speaker tackled a member of the Grading Committee on this subject the answer was, "Oh, but he is a general practitioner and gets a lot as a general practitioner, so he does not need the money."

The amendment was further supported by Dr. L. A. Gibbons (Reigate), who said that a pathologist in his group was a specialist of 20 years' standing but was graded as "S.H.M.O." and his appeal was not allowed.

The Chairman suggested that it would be wise to leave out any reference to individual cases of mis-grading; they did not really help the matter at all.

Mr. J. C. McMaster (West Somerset) referred to the way in which some grading committees had discharged the duties entrusted to them. He thought that it constituted one of the most discreditable episodes in the history of their profession. A number of the original injustices were corrected on appeal, but many more were not, and many appeals were dismissed in a very arbitrary manner. Not only that, but a requested personal interview was often not accorded to the appellant. There was no evidence of any change of heart in recent months.

Dr. H. S. Howie Wood (Isle of Wight) said that the general-practitioner specialist in many instances had been let down. He realized this, because he had felt the bump. When the original applications were asked for he was invited to submit instances from his colleagues and he did so, but these were disregarded. The personal interview in many cases was asked for and not granted, and the appeals were turned down. He held strongly that they should ask for a review of all cases from the very beginning, even if the persons concerned were graded, not "S.H.M.O.," but were part-time specialists who had been graded "J.H.M.O." or "G.P."

The Chairman said that he was informed by the mover that the motion was intended to cover all grading.

Dr. J. B. Tilley (Newcastle-upon-Tyne) said that, with all deference to the Chairman, he would like to quote one individual case. In his Division there was a doctor who was working in the teaching hospital for the board of governors in the capacity of consultant. That same doctor worked in the hospitals of the regional hospital board in a similar capacity. Yet he had been graded "S.H.M.O."

Mr. A. Dickson Wright (Marylebone) said that this grading had been done regionally, and therefore there was a great lack of uniformity. Appeals had also been heard regionally with discordant results. When they approached the Minister in 1951 they should take a wide view on this subject and try to increase the number of specialist jobs so that there would be more vacancies for this vast army of men who were looking for work.

The Bromley motion was carried in the following form:

That this meeting is not satisfied with the composition of the former grading committees. Too many mistakes have been made. It recommends that another body, including general practitioners, be set up forthwith to re-hear appeals with a view to rectifying existing anomalies, and urges the Central Consultants and Specialists Committee to take all possible steps to ensure that the promised review of gradings is carried out in agreement with it upon the methods and personnel.

A rider by Worcester and Bromsgrove was carried in order to place beyond all shadow of doubt the fact that both general practitioners and specialists would be included in the review of grading.

S.H.M.O. Grading

Dr. K. C. Bailey (West Somerset) moved that the whole grade of S.H.M.O. should be discontinued at once and all advertisements in the *Journal* for posts in this grade should cease. He said that people had been graded not according to their personal merits but according to the convenience of the Service. This meeting was in the Floral Hall, but he could offer no bouquets to Mr. Newell or the Council for their dealings over the S.H.M.O.s.

Dr. M. Westwood (Gloucestershire) opposed the motion to abolish the grade. It had been a very useful grade and a link between the specialist and the general practitioner. He did not deny that some people had been put in the grade improperly, but on the other hand many of those who had been working in small hospitals in the past had been put in this grade and had been able to carry on very useful work.

Mr. Newell asked the mover to withdraw this motion. They were cognizant of the difficulties of the grading, about which they had been in constant consultation with the Ministry. They had almost reached conclusions following which there would be a great diminution in this class of position, and he hoped that when the report was published it would meet with general agreement.

Dr. Bailey could not agree to withdraw the resolution. He had in mind their colleagues who had been disgracefully treated.

The motion received little support and was negatived.

A motion in the name of Worcester and Bromsgrove drew attention to the electorate of regional committees. The electorate proposed consists of members of hospital medical staffs graded as consultants and S.H.M.O.s. Worcester wished to add the words "and general practitioners working in hospitals according to the terms of service." Dr. T. Rowland Hill opposed the addition of these words on the grounds of constitutional correctness, but promised that the Consultants and Specialists Committee would give consideration to this group. The motion was referred to Council.

Prospects for Specialists

Mr. Weldon Watts (Newcastle-upon-Tyne) asked the Council to consider urgently the future position of trainee specialists in view of the few specialist appointments available. Registrars of all grades were necessary in hospitals, especially in teaching hospitals, and if the registrar understood that there was no possibility of becoming a specialist it would bring about a rapid drop in numbers, and it would be difficult for hospitals to replace the registrars they lost. One expedient would be to create posts of the nature of hospital medical officers which surplus trainee specialists might take. Another possibility would be in the use of general-practitioner specialists. Registrars should know what their prospects were.

Mr. R. L. Newell said that the problem was partly due to the use of the term "trainee specialist." The whole Service became flooded with a very large number of registrars, who thought they had got on the first rung of the ladder. In this country a short time ago there were 5,000 registrars, with, possibly, 200 posts falling vacant each year. They might with advantage revert to the older terms of "R.S.O." and "R.M.O.," which would not necessarily imply a specialist appointment.

Dr. C. F. Mayne (Plymouth), in supporting the motion, referred to the hopeless position of many of the senior registrars in non-teaching hospitals.

The Newcastle motion on the subject was carried.

A further motion by West Somerset drew attention to the plight of many qualified senior registrars and instructed the Council to approach the Minister on their behalf.

Dr. T. F. Tierney (Marylebone) said that such a motion was too general in its terms. It should be worded in such a way as to discriminate between trainee radiologists and pathologists on the one hand and supernumerary registrars on the other. There were no supernumerary registrars in radiology.

Dr. J. M. C. Gill (Aberdeen and Kincardine Counties (with Orkney and Shetland)) said that in his area there were 75 specialists with 65 trainee specialists, and 300 general practitioners with only 10 general-practitioner trainees.

Mr. Newell said that he would willingly take this motion to his committee, but there were no data at the moment on which to work. It would be tragic to see these senior registrars turned off their hospitals without any alternative form of employment. Many of them were men of 30 or 40 with families.

The motion was referred to Council.

Dr. G. J. Meikle (Worcester and Bromsgrove) suggested that for a proportion of their period of office—say six months—senior registrars should be seconded to a peripheral hospital. At the peripheral hospital they would have a chance of showing the stuff of which they were made.

Dr. R. Cove-Smith (Marylebone) understood that the Minister had stated that he would be favourable to such interchange.

Mr. Newell said that his committee had already proposed such interchange between the hospitals in the region, but he would not care to tie the proposal down to a period of six months.

This motion also was referred to Council.

A motion by Worcester and Bromsgrove was agreed to urging that the arrangement concerning the apportionment of superannuation of general-practitioner specialists in partnership (para. 65 (*b*) of Annual Report) should be retrospective to July 5, 1948. Another motion from the same Division which was accepted was that medical records of hospital patients should be made available only to the Ministry of National Insurance with the knowledge of the consultant in charge of the case.

Medical Superintendents

Dr. E. C. Dawson (Derby, with West Derbyshire) moved that, if the agreed scale of remuneration for medical superintendents was not implemented in view of economy measures, alternative suggestions be prepared by the Council to make such an agreement operative in accordance with the accepted policy of the Association prior to acceptance of terms of service by consultants and specialists.

The Derby Division was concerned, he said, with a group of medical superintendents who did not come under the heading of consultants and specialists and had no opportunity to obtain consultant status. They were chiefly medical superintendents of the smaller hospitals, who had had to undertake a variety of work, and there were some in the larger general hospitals whose work had been mainly administrative. At the meeting of the Representative Body last year a motion had been passed to the effect that there should be a definite scale of remuneration for medical superintendents and that it should be £1,500 to £2,500 per annum, and that range had later been accepted by the Consultants and Specialists Committee; but when later on the terms of service of consultants and specialists were discussed with the Ministry it had been decided that the rate of remuneration for superintendents of general hospitals could be settled later. Then the economy cut had been introduced, and there had been a notice from the Ministry that no further increase of remuneration could be considered. His Division now considered that ways and means should be found of implementing the scale which had been agreed.

Mr. Newell, in supporting the motion, said that the Consultants and Specialists Committee had strongly represented the position of the medical superintendent to the Ministry. The question of their remuneration had now been referred, as were all questions of remuneration, to the Whitley Council. The proposals on the subject were now being considered by a subcommittee of Committee D, on which there would be direct representatives of medical superintendents.

Dr. F. Lishman (Bishop Auckland (with Durham)), in supporting the motion, said that the status of the medical superintendent had been definitely lowered by his being paid at the same rate as a secretary or assistant secretary for that part of the time when he administered the hospital. Good medical administrators were in short supply, and they should be paid rather more than those who were carrying out clinical duties.

The motion was carried.

Dr. R. B. Allen (Consett (with Hexham)), to cries of "Agreed," moved "That this meeting reaffirms its belief in the superiority of medical over lay administrators of hospitals." It was, he said, the long-term policy of the Ministry to take all administrative power and authority from the medical staffs of hospitals, and the Ministry was rapidly tending to achieve this by the appointment of lay administrators and by freezing out medical superintendents by underpaying them. A parallel case was to be found in the public health service, where town clerks and clerks of councils had been doing all they could to undermine the administrative authority of the medical officer of health. A medical superintendent was the only person who was capable of running a hospital in a proper way and the only person who was able to co-ordinate and fuse the requirements of the various departments. Moreover, he was the only person who, when it came to cutting down expenses, knew what was necessary and what could be dispensed with. The staffs of hospitals and the professional members of hospital management committees should see that medical superintendents were replaced when vacancies occurred. The loss of professional status involved in the continued advance of the Ministry's policy must be fought strenuously for the sake of the profession as a whole and particularly for the sake of those whose work lay within the hospital service.

Dr. T. Rowland Hill (Marylebone), in moving that the words "and that the influence of clinicians upon hospital administration shall be preserved" be added to the motion, said that the issue was a much wider one than that of the lay administrative officer *versus* the medical administrative officer. It was the issue of lay dominance *versus* medical dominance in hospitals. The greatest hospitals in the past had always been guided in their administrative policy by the advice of their clinicians, and that should continue. There was a danger now of its being submerged and the clinician's having no voice at all in medical administration or medical policy.

Dr. Allen agreed to the proposed words being added to the Hexham motion.

Dr. N. Strang (South Shields) thought that most of the representatives must have seen the effect on hospital administration of the medical superintendent being pushed out. The internal disruption of harmony which was seen in some hospitals was admitted by the various sections of the staff to be entirely due to the lay administration which had taken the place of the previous medical administration.

The motion as amended was carried.

Domiciliary Consultation Arrangements

Dr. S. J. Firth (Brighton) moved "That the quota system of domiciliary visits for consultants be abolished, on the ground that it operates against free choice of consultant by both patient and general practitioner."

The present quota system, he said, was bad for the patient, for the general practitioner, and for the consultant. Before the National Health Service came into operation general practitioners could have the services of any consultant they liked as often as they liked. Under the present system, long before the end of a quota period, the best consultants had used up their quota, and the general practitioner had either to get somebody in whom he had less confidence or ask the consultant of his choice to pay a domiciliary visit free. General practitioners did not like to ask consultants to do that, and he was sure that if the quota system was abolished they would get better service for their patients.

Dr. K. C. Bailey (West Somerset) moved as an amendment that the words "on the ground that it operates against free choice of consultant by both patient and general practitioner" be omitted and the following words substituted: "and that whole-time consultants continue to be readily available, as otherwise the free choice of consultants by both patient and general practitioner is impeded."

This amendment, he said, was intended to clarify the position of whole-time consultants. The consultants and specialists felt that the whole-time consultant should be called in only in the absence of any part-time consultant, and that was a disadvantage to the clinician who was interested in his work and wished to see his cases from the onset.

Dr. Doris Odlum (Bournemouth), in supporting the amendment, said she had never approved of the suggestion that the whole-time consultant should be put at the bottom of the list of consultants sent to general practitioners and that the general practitioner should not call in a whole-time consultant so long as a part-time consultant was available. That might mean that the best consultant for a case was not called in. She was in favour of the abolition of the quota system, but she was also in favour of equality of opportunity and calling in the best man for a case.

Dr. H. Barbara Woodhouse (Harrow) also supported the amendment. The medical practitioners in her area had not yet received a list with instructions as to whom they should call in and whom they should not call in, but they felt a certain amount of restriction owing to the fact that whole-time salaried consultants received no payment for the extra work entailed by domiciliary visits.

Mr. A. Lawrence Abel (Marylebone), in opposing the amendment, said it had been pointed out to consultants that they would be much better off financially from the income-tax point of view if they elected to do 9½/11 sessions instead of 11/11, as the Ministry had now given them permission to do. The amendment, he thought, meant something quite different from the Brighton motion. The consultants who were employed whole-time had already got their whole time filled up and had no time for doing domiciliary work in any event. The amendment was, he considered, a red herring drawn across the track of the motion, and it would lead to a full-time State salaried service in the lifetime of the present generation.

Mr. J. C. McMaster (West Somerset) said that Mr. Abel had not explained what was to happen to the whole-time consultant who had applied to become part-time on 9½ sessions and had been refused. What was he to do? If the Association did not approve of whole-time appointments, why did it countenance the reception of advertisements for whole-time appointments?

Mr. Newell said the Ministry had agreed that wherever practicable a whole-time consultant could apply for a part-time position, and in the area of his own regional board three people had so applied, and their applications had been granted.

The West Somerset amendment was lost, and the Brighton motion was carried.

Additional Whole-time Posts

Mr. H. H. Langston (Winchester) moved the following amendment to para. 69 of the Annual Report: "and that this meeting strongly disapproves of the practice of certain boards in refusing to grant consultants who were in whole-time employment before the appointed day the right to transfer to part-time appointments, and considers this contrary to the Ministry's assurance that it was not its intention to place difficulties in the way of private practice."

This amendment, he said, was a vitally important one. In spite of the Ministry's assurance the regional boards were in fact refusing the applications of whole-time consultants to transfer to part-time work. At the last meeting of one regional board part-time consultants were criticized, and the remark was made that "this pseudo-part-time employment, where a man is getting the best of both worlds, is one of the greatest sources of increasing expense in the National Health Service." The chairman of the board stated that the board's medical advisory committee had recommended that consultants should be allowed to change from whole-time to part-time status, but that the board was reconsidering the granting of that permission.

He submitted that consultants had the right to choose whether they would be whole-time or part-time.

Mr. Newell accepted the amendment, and it was carried.

Hospital Advisory Committees

Dr. T. Rowland Hill (Marylebone) moved:

That this meeting recommends that the traditional practice of the hospital boards being advised in all medical matters by an advisory committee composed of members of their own hospital staff should be perpetuated.

This matter, he said, was a very important one to the consultants. The system to which reference was made in the motion had produced a good spirit in the hospitals and was responsible for much of the vital growth of British medicine, and out of it had grown the conception of the consultant. The Minister and his officials had not shown hostility towards this practice, but they had displayed a complete ignorance of it; and in the negotiations with the Ministry it had not been possible to obtain more than a partial recognition of the system.

An amendment that the advisory committee should be strengthened by some general practitioners and public health medical officers in appropriate cases was accepted, and with this addition the motion was carried.

Hospital Out-patient Departments

Dr. A. Brown (Cambridge and Huntingdon) moved:

That this meeting considers that every effort should be made to restrict hospital out-patient departments to consultant work. The patients should be returned to the general practitioner at the earliest opportunity, except where he is unable to provide essential treatment.

It would be agreed, he said, that the general practitioner was primarily responsible for the patient, and when he sent the patient to hospital he did so for one of two reasons—to obtain a second opinion or to have some special investigation carried out. The time lag which took place in getting appointments for these patients increased the work of the general practitioner, because while the patient was waiting he had to be seen many times by the general practitioner. If patients were returned to the general practitioner at the earliest opportunity the new patients could be seen much earlier, and he thought that this should be done in all cases where the general practitioner could give the patient the necessary treatment.

Dr. R. M. S. McConaghey (Torquay), in opposing the motion, said it would mean that, if a general practitioner referred a case of whitlow to the hospital for opening, the patient would be returned to the general practitioner as soon as the whitlow had been opened, and he would do the dressings. He thought that when a general practitioner referred a patient to the consultant at a hospital he should say whether he wanted an opinion only or whether he wanted an opinion and treatment.

Dr. W. N. Leak (Mid-Cheshire) said that the authorities of the Merseyside Hospital Scheme had informed all their people within the last few months that they had now increased the benefits so that every patient who was attending an out-patient department and was off work would get an extra payment. That was an inducement to people to attend the out-patient department instead of seeing their own doctor, and he thought the Association should do its utmost to stop this kind of thing.

Dr. H. H. D. Sutherland (Kensington and Hammersmith) said that forms were issued by the Association to cover the case in which a doctor sent his patient to a hospital and asked for a special investigation, and the patient was returned to him except when in-patient or special out-patient treatment was needed. Those forms were still available.

Dr. Brown, in replying to the discussion, said that general practitioners in Cambridgeshire treated cases of whitlow themselves and did not send them to hospital. They sent patients to hospital only for a second opinion or for investigation or treatment which they could not carry out in their surgeries.

The motion was carried.

Private Patients in Hospital

Dr. P. J. Gibbons (Liverpool), in moving "That this meeting draws the attention of the Ministry to the excessive charges for private patients in hospitals and considers that steps should be taken to review these charges in accordance with the promise of the Minister," said that when medical practitioners entered the National Health Service two years ago they did so in the belief that private practice would form an integral part of the Service, but that position had been gradually undermined by the policy of the Ministry. The cost of beds for private patients in hospital had been increased to such an extent that it was almost impossible for any except the most wealthy people to have private treatment in hospital. A definite charge should be fixed, to apply to all private beds in hospitals, and that charge should be a moderate one.

Dr. H. W. Harvey (Marylebone), in supporting the motion, said that many patients who would formerly have had private beds in hospitals now had to go into the public wards. He had twice had to take them out of the public ward, not because they objected to being there but because they could not sleep without being given more opiates than was good for them.

The motion was carried.

Payment by Patients for Hospital Maintenance

Dr. H. Barbara Woodhouse (Harrow) moved to instruct the Council to make strong representations to the Minister through their negotiating body, with a view to instituting payments by hospital patients for their board up to £1 per week.

The course suggested in the motion, she said, would effect a very substantial economy in the National Health Service. In her own area there were very few people who could not pay £1 a week for their board in their own homes, and if patients in hospital were asked to pay only 10s. a week for their board it would mean a saving of £500 a week, or £26,000 a year, in a hospital with 1,000 beds. The National Health Service was widely advertised as a free health service, but it had never been advertised as a free hotel service. The present system created gross anomalies. It had been argued that if a bread-winner had to go into hospital and drew only his insurance pay it would create great hardship if he had to pay for his board in hospital, but if he had an attack of tonsillitis and was nursed at home he had to pay for his board there.

Mr. Newell said that the concern of the medical profession was with the medical running of hospitals, and he did not think that the proposal made in the motion was one which concerned the Representative Body.

The meeting agreed to pass to the next business.

Mileage Fees to Specialists

Mr. Weldon Watts (Newcastle-upon-Tyne) moved to urge the Central Consultants and Specialists Committee to press for an increase in the mileage fees paid to specialists in the National Health Service. He pointed out that if a specialist did less than 3,000 to 4,000 miles in a year he got 7½d. a mile, and if he did more than that he got about £1 a week plus 3½d. a mile. If a specialist did a big mileage, as many of them did, perhaps 11,000 or 12,000 miles, the £50 a year worked out at only 3,000 miles, and they were getting about 4d. a mile for the whole of their consultant work. This was very inadequate, and, moreover, the question of income tax entered into the matter, as the income tax authorities said that the consultant was being paid for his car expenses. If a consultant worked under the Ministry of Pensions and not in the National Health Service he got 1s. a mile.

Mr. Newell accepted the motion, and it was carried.

The Trainee Specialist

Dr. J. O. McDonagh (Perth) moved:

That this meeting considers that the trainee-specialist should undertake at least one year in general practice (*a*) to make him more fitted to train future general practitioners and (*b*) to give him a wider outlook on his own specialty and on medicine in general.

The representatives, he said, would have noticed that in the report on the training of tuberculosis specialists in the *British Medical Journal* it was suggested that a year in general practice should be part of the training. General practice was now becoming almost a specialty itself. It was often said that the general practitioners were the front line of medicine, and it was felt that these men in the front line were being trained by people who had no idea of the conditions in the front line. The trainee-specialist, although he would like to do a little general practice, dare not do so, because he was afraid of losing contact and being passed over. He thought that a certain number of trainee-specialists, after they had sampled general practice, would choose to remain in it.

The subject dealt with in the motion was a rather big one for the Representative Body to discuss now, and he would be quite content if it was referred to the Council for consideration by the appropriate committee.

Dr. J. W. Taylor (Aberdeen and Kincardine Counties (with Orkney and Shetland)), in supporting the motion, said that a knowledge of the problems of the general practitioner would enable the trainee-specialist better to assess what could be done and what could not be done in the patient's own home. It had been his own intention to become a specialist, but war service had intervened and for one reason and another he had gone into general practice, and now he would not change. There were many benefits in general practice, and he thought that if all graduates who intended to become specialists had a year in general practice many would remain in it. Those who did not do so would gain, from their year in general practice, a much wider outlook on medicine in general and the patient in particular.

It was agreed that the motion should be referred to the Council.

General Practitioner Staffs of Cottage Hospitals

Dr. H. S. Howie Wood (Isle of Wight) moved: "That this meeting is of opinion that where a certain proportion of beds

in a cottage hospital are allocated to the charge of consultants no corresponding decrease in the £25 per occupied bed payments should occur."

He said that in the case of a cottage hospital in his area the general practitioners had been asked to hand over some of their beds to the care of the consultants and they had agreed to do this, but a little later on they had been informed that the £25 per bed annual payment would not apply in future to those beds over which the consultants had control. He did not know whether that was general throughout the country or was only a local ruling. It certainly would not improve the relationship between general practitioners and consultants.

Mr. Newell pointed out that the staff fund of £25 per average occupied bed had been created to remunerate the general practitioner for attendance at the cottage hospital on patients other than his own. The general practitioners had no duties or responsibilities towards the patients in the beds which were reserved for the use of consultants, and it would therefore be very difficult to argue that those beds should be taken into account in the assessing of the staff fund.

Dr. G. Catherine Evans (East Kent), in supporting the motion, said that in the case of the beds reserved for the use of consultants it was the general practitioner who attended the patient in the middle of the night when necessary and who went to see the patient day after day and on Sundays, whilst the consultant visited the patient only once a week or once a fortnight. Surely the general practitioner should be paid for that work.

Dr. Howie Wood said that, although Mr. Newell was technically correct in saying that the payment of £25 was intended to remunerate the general practitioner for attendance on patients other than his own, he did not think anyone could seriously contend that the services which the general practitioner rendered to his own patients in a cottage hospital did not form part of the ground for the payment of the £25. At one cottage hospital in his area the general practitioners had resolutely refused to give up their beds until they had received an assurance that no difference would be made to the £25 per bed payment. It was only fair to state that the regional hospital board liaison officer had hinted that it might be possible, by the proposing of additional duties and something along the lines of non-resident house-surgeon posts, for some additional money to come to the staff at some future date, which would go far to make up for the 50% cut in their bed fund. On the question of principle, it seemed entirely wrong that the general practitioners, who were in fact doing an honorary house-surgeon's work and dealing with all emergencies in the absence of the consultant, should be deprived of their remuneration simply through a change in the control of the beds.

The motion was carried.

Worcester and Bromsgrove proposed an annual conference of group medical committees. Mr. Newell said that his committee was considering this question. The calling of large meetings was not to be undertaken without consideration. The proposal was referred to Council.

Attention to Maternity Cases at Hospital

Dr. Alice E. N. Gilby (Westminster and Holborn) moved:

That this meeting deplores the lack of attention and the failure to accept responsibility by some hospitals in the treatment of early complications and mishaps arising in cases that they have accepted for confinement including antenatal care. This lack of attention is manifested in particular by the tendency to refer these cases back to the general practitioner for treatment.

These patients had booked their confinements at hospital, but if there was anything wrong in the earlier stages they were frequently referred back to their own doctor for treatment. This puzzled the patients. The hospitals booked confinements, and yet refused admission to the patients for the mishaps of pregnancy.

Dr. C. Warner (Liverpool), as a general-practitioner member of the Liverpool Obstetric Advisory Committee, said that it has been his job to try to retain maternity work in the hands of general practitioners, and therefore he asked that this motion be thrown out. They had already passed a motion asking that patients should be returned from out-patient departments to general practitioners as soon as possible. If they were going to detach themselves from all responsibility for their patients from the moment they were sent to hospital they were wasting their time in talking about status. The fact that he sent his patient to hospital did not, as he saw it, absolve him from responsibility for that patient.

Dr. Marguerite G. Sheldon (Birmingham) also opposed the motion, which was lost.

"Sub-consultants"

Dr. G. Catherine Evans (East Kent) moved that a new committee be formed parallel to the Central Consultants and Specialists Committee to represent the interests of "sub-consultants"—that is to say, S.H.M.O.s and those medical superintendents not classified as consultants. She pointed out that the chances of a sub-consultant getting on to the regional or central consultants committee were negligible. True, he or she might be co-opted on to the regional body, but no co-opted member could gain access to the central body. She also pointed out how numerous the sub-consultants were; the previous week two-thirds of the advertisements in the *British Medical Journal* related to sub-consultants. Adequate provision should be made for their representation.

Dr. A. Smith (Lanarkshire) said that this proposal for a new committee was one of the quaintest that had ever come before the Representative Body. He was certain that the people concerned would get representation through the Central Consultants and Specialists Committee far better than through splinter bodies. The very word "sub-consultant" was wrong. How would a doctor like to be described as a "sub-practitioner"?

Mr. Newell said that in his committee they had done their best to represent this section, which they hoped would be a diminishing section. They had given representation to registrars, also to medical superintendents. He deprecated the further formation of committees, and hoped the representation of this as of other groups would be left in the hands of his committee.

The motion was lost by a large majority, but the proposer was loudly applauded for her sprightly advocacy.

Plans Relating to Hospitals

Dr. W. Smith (Greenwich and Deptford) had a motion deploring the regional hospital board plans by which few general hospitals are to remain complete entities. The new plan of the regional board envisaged the cutting up of what were complete hospitals into bits and pieces, so that at one place there would be all the gynaecological patients, at another the surgical and dental, and at another, perhaps a few miles away, the medical cases. What was going to be the position if they had a medical case which required surgical treatment and then possibly became a gynaecological emergency? Such cases would have to be moved from place to place instead of being treated throughout in the same building. They were told that the reason for this policy was that small groups of beds for any specialty were uneconomic, and that unless there were a reasonable number of beds for a unit it was an impracticable position in present circumstances, also that the training of registrars became an impossibility. In Greenwich and Deptford they did not believe this to be true, and they were alarmed that this sort of arrangement should have been forced upon them. It became a question of patients *versus* planning. Were they to go in for an organization which was neat from an administrative point of view or to be able to treat their patients under one roof, thus ensuring a better and perhaps swifter result? Recently in his area a case of haematemesis occurred in a medical bed in a 500-bed hospital, and no surgeon was available because there were in that hospital no surgical beds.

The motion was carried.

THE GENERAL PRACTITIONER AND THE HOSPITAL

The interim report of Council under the heading "The General Practitioner and Hospital Work" was received, and the recommendation was moved calling for the retention of the smaller general-practitioner and cottage hospital for general practitioners, with the setting aside of certain wards in district hospitals, the setting up of clinical assistantships and of part-time registrar type appointments, with other proposals. The full text of the recommendation was set out in the *Supplement* of April 22, p. 145. In moving, Mr. A. Staveley Gough, Chairman of the Committee on the General Practitioner and Hospital Work, said that it was a fact that a large number of hospitals in this country were first bujlt by the energies of general practitioners, sometimes with their own money, and often through the help of their grateful patients. They were in fact general-practitioner hospitals. It was true that these hospitals had become upgraded and were no longer general-practitioner hospitals, in some instances rightly so. But this proved that the general-practitioner hospital was necessary. It was necessary to prevent among doctors a feeling of frustration. In many cases the general practitioner was able to continue the treatment of his patient in a serious illness, and would get much professional comfort thereby, but the reason he could not do so was the housing problem. He mentioned the case of a simple ulcer. The general practitioner, with the diagnostic facilities which should be available to him, was able to make a diagnosis and to set in motion treatment without referring such cases to special departments, but he was unable commonly to ensure for that patient the essential rest, freedom from domestic worries, and the certain amount of supervision required in order that the patient might learn the routine in his own home. When one considered young students to-day coming out of hospital, with their modern training, depending almost as much, if not more, upon ancillary methods of diagnosis than upon their clinical acumen, it was evident that many of them within five years of entering general practice would be frustrated and would be saying to themselves, "I am only here to act as a sorter." Older men, of course, had learned to compensate.

They were asking for the restitution to general practitioners of the hospitals of which they had been dispossessed, but more important still they were asking for additional accommodation in district hospitals in the larger towns. In the smaller towns, on the whole, they found a better average of general practice, but as soon as they got into the industrial areas surrounding the general hospitals the question of general practice was apt to become subordinated to certification and hospital sorting, to the detriment of general practice itself, without any reproach to the practitioners concerned.

The second part of the report was a question of how the general practitioner could be integrated into hospital practice more widely than in a general-practitioner hospital. They had to watch most closely lest a man with great ability, but facing financial difficulty, when he left hospital practice and entered general practice found the door of special practice completely closed to him. For that reason the Committee was proposing clinical assistantships. Many general practitioners would welcome a chance of taking a special appointment in hospital. These jobs would be held in rotation and would provide post-graduate education of the finest type for quite a number of general practitioners.

In the third part of the motion they had another problem. This recognized the difficulty of the supernumerary registrar grade. There was a growing call for appointments of this type or kind. Then it was recognized among the registrars that to-day there would be many who could not be absorbed in full-time consultant work. It would be wrong to suggest that all of them should go into general practice. It could be said that there were plenty of regions where part-time consultants having the necessary experience would fulfil the need for hospitals in many areas which depended in the main on registrar service, backed up by the occasional help of consultants. Finally they asked that all hospitals should welcome the attendance of general practitioners for the purpose of consultations, ward rounds, clinical and scientific meetings, and inclusion in hospital teams. (Applause.)

Dr. Frank Gray (Council) moved an amendment to the part of the recommendation which read "Whenever possible clinical assistantships should be set up. . . ." His amendment was that instead of "whenever possible" the words "for educational purposes" should be used. The verbal alteration was slight, but the principle behind it was of fundamental importance. The meeting had been concerned a great deal with the question of status. General practice was itself a specialty of no less status than any other branch of medicine. For educational purposes the general practitioner might wish to do one of two things: he might wish to exchange his specialty, in whole or in part, for another branch of the profession, and in rural areas, as had been indicated, this might indeed be a very desirable thing, or he might wish to have the best form of postgraduate instruction in one particular specialty for his own purposes as a general practitioner. These objects were quite appropriate, but in no circumstances must it be allowed to go forth that the general practitioner was of a status equivalent to that of clinical assistant or any comparable grade in hospitals. Nothing could be more disastrous than to say that every form of hospital practice was higher than general practice. That position must never be accepted. He would add that the best men were required for general practice, and it was not to be regarded as "promotion" if the general practitioner went into another branch of medicine. While they welcomed these clinical assistantships they were for a specific purpose and must not be allowed to prejudice the status of the general practitioner.

Mr. Gough said that while he believed that there was no derogation of the general practitioner in the original recommendation he was prepared to accept this amendment, having in mind that this was an interim report and still subject to final conclusions. He agreed to the words which indicated that the proposed clinical facilities were an educational facility, which was what in fact they were.

The recommendation as finally adopted was as follows:

A. That the smaller general-practitioner and cottage hospital should be retained by the general practitioner and, in addition, that certain wards in the district hospitals should be set aside for the treatment of patients by general practitioners.

B. That, for educational purposes, clinical assistantships should be set up (1) allowing for periods of approximately two years at least in any particular specialty; (2) allowing for short periods in two or three specialist departments.

C. That part-time appointments should be established and held by general practitioners.

D. That in rural areas the appointment of part-time general-practitioner specialists should be retained and encouraged. Such appointments will both benefit the Service and absorb practitioners who, having had specialist training, are reluctant or unable to obtain consultant appointments. General practice in these localities should be no bar to the holding of a specialist appointment.

E. That the attendance of general practitioners at hospitals should be welcomed for the purposes of consultation, ward rounds, clinical and scientific meetings, and inclusion in the hospital teams.

ELECTIONS TO COUNCIL

During the course of the day the results of elections to Council were announced as follows:

Ten members of Council elected by the Representative Body as a whole: Mr. Lawrence Abel, Dr. O. C. Carter, Dr. H. G. Dain, Dr. R. Forbes, Dr. J. A. Gorsky, Lord Horder, Dr. J. A. L. Vaughan Jones, Mr. H. H. Langston, Dr. J. A. Pridham, Sir Lionel Whitby.

Two members elected by representatives of Scottish constituencies: Dr. I. D. Grant, Dr. G. W. Ireland.

One member elected by representatives of constituencies in Wales (including Monmouthshire): Dr. H. R. Frederick.

Surgeon Vice-Admiral Sir Sheldon Dudley was elected as representative of the Medical Branch of the Royal Navy on the Council to fill the vacancy caused by the resignation of Surgeon Rear-Admiral C. H. M. Gimlette for the remaining period of the latter's term of office, 1949–50.

Air Vice-Marshal D'Arcy Power was elected as the representative of the Medical Branch of the Royal Air Force for the period 1950–1.

The Chairman, before closing the meeting, reminded the members of the vast amount of business remaining—108 motions and amendments on the agenda—for the last day of the meeting.

The meeting adjourned at 5 p.m.

MONDAY, JULY 17

The Representative Body reassembled at 9.30 a.m.

THE 1951 MEETING IN SOUTH AFRICA

Government Policy of Racial Discrimination

A private session of the Representative Body was held to consider as a matter of urgency a recommendation from the Council concerning the arrangements for the proposed joint meeting with the Medical Association of South Africa, to be held at Johannesburg in July, 1951. This recommendation was in the following terms:

That the following message be sent to the Medical Association of South Africa:

That the British Medical Association fully recognizes and appreciates that the Medical Association of South Africa imposes no colour bar whatever. Nevertheless, finding itself faced with the possibility that—as a result of local social customs and legislative policy on racial questions—some of its members may be deprived of their rights and privileges while visiting South Africa, the British Medical Association feels compelled to withdraw its acceptance of the invitation to meet jointly with the Medical Association of South Africa in Johannesburg in 1951.

In regretfully reaching this conclusion the Association has no desire whatever to interfere in the domestic affairs of South Africa.

Still hoping that a joint meeting—to which it has looked forward for so long—will be possible, the Association invites the Medical Association of South Africa to consider the possibility of such a joint meeting being held in London in 1951 or subsequently.

After a long discussion, in which the debate reached a very high level, the Representative Body by a very considerable majority rejected the Council's recommendation and decided to adhere to the decision to hold a joint meeting with the South African Medical Association in Johannesburg in 1951.

The Secretary's Request

Dr. Gregg and Dr. Hill made statements on the staffing arrangements consequent upon the election of the Secretary to Parliament. Dr. Hill explained that his Parliamentary work made it difficult for him, even though on leave of absence for Parliamentary work, to continue in the post of Secretary, and he had asked the Chairman of Council that he should be released from the duties of Secretary at the earliest convenient moment.

To the motion by Oxford regarding the position of the Secretary in Parliament was moved and carried an amendment by Torquay welcoming Dr. Hill's election to Parliament. A motion by Bromley on the subject of the Secretariat and political candidatures was withdrawn.

ORDER OF BUSINESS

Attention was called at this point to the eleven pages of agenda still remaining, and the necessity of completing certain business in time to permit of the necessary resolution altering the articles being submitted to the Extraordinary General Meeting of the Association to be held at 12.30 p.m.

It was decided accordingly to take this business under "Organization," and Dr. R. Forbes (Council) moved and Dr. T. W. Morgan (Kingston-on-Thames) seconded that the remaining business be remitted to a Special Representative Meeting to be held in London in the autumn. This was agreed to.

ORGANIZATION

Election of Central Council

Dr. J. A. Pridham, Chairman of the Organization Committee, having moved the reception of the report of Council under that heading, Dr. J. E. Morrison (Stirling) moved that in view of the fact that Group 27 comprises 1,757 members, the representation of the Group on the Council be increased from one to two. Group 27 comprises Glasgow West of Scotland Branch (County Divisions), Stirling Branch, and Border Counties Branch. He said that for every group with over 1,600 members there were two members of Council. Why, then, select out Group 27 for special treatment? In considering the Scottish figures, his motion, if carried, would give one Scottish member on the Council for every 800 members. England was represented on the Council by one seat for every 782 members.

Dr. H. B. Muir (Fife) said that there was no doubt that if the Stirling motion were carried Scotland would gain a certain advantage, but it should be generally agreed that Scotland, in view of the difficult geography of its regions, could not be represented properly by fewer than seven members.

Dr. I. D. Grant (Glasgow) said that he was not speaking as a perfervid nationalist. He was asking only that Group 27 be treated in the same way as other groups which had more than 1,600 members.

Dr. Pridham accepted the Stirling motion, but pointed out that it had been amended by the mover, and as now put forward it did not mean that Scotland got an extra total number; it meant merely a rearrangement of the present representation.

The Stirling motion was carried. Dr. Grant said that he was very unhappy if, as the Chairman of the Committee had suggested, it meant that as a *quid pro quo* Scotland had to sacrifice one of its members elected by representatives of Scottish constituencies.

The Chairman said that the Scottish situation must be unravelled later. The timetable did not permit of any more discussions or of any further motions to be taken. The remainder of the business would be taken at an Adjourned Representative Meeting to be held in London probably in October.

The meeting accorded a vote of thanks to those who had facilitated the work of the representatives at Southport—namely, the Mayor and Corporation, the publicity manager, the assistant manager of the Floral Hall, the chief constable, and the chairman and members of the Southport Annual Meeting Executive Committee, of the Ladies Committee, and of the Southport Division.

The meeting stood adjourned at 12.30 p.m.

THE REPRESENTATIVES' DINNER

At the close of the first day of the Representative Meeting the representatives dined together at the Prince of Wales Hotel, Southport, with their Chairman, Dr. J. A. Brown, presiding. After paying the usual compliment to the Chairman, the company joined the ladies at the Palace Hotel for dancing.

Mr. Lawrence Abel, in proposing the health of Dr. Brown, delivered an amusing speech, serious and gay, but mostly gay, and seasoned with transatlantic stories and classical quotations. By the strict rules of the Representative Body, he said, this was the only occasion during the meeting that a representative was permitted to address his fellow representatives—a reference to the fact that some speakers during the day had unwittingly transgressed the rules by addressing "Ladies and gentlemen" instead of "Mr. Chairman." Mr. Abel went on to speak of the individualism of doctors, and the threat to such individualism entailed by "National Health Servitude." The Representative Meeting was one of the sanctuaries remaining where such individualism had full play. He also referred breezily to the financial position—"We are owed 17½ million—16½ million for general practitioners, plus one million for merit awards for consultants." For two years general practitioners had been waiting, and still there was not a cloud of promise in the sky as big as a man's hand.

After these various entertaining excursions, Mr. Abel turned to the subject of his toast, speaking "as a mere consultant concerning our leading general practitioner." He congratulated the Representative Body on being so clever as to elect J. Alexander Brown to its chairmanship. Dr. Brown had been for 15 years a representative; for 10 years he had served on the Insurance Acts Committee, and after that on the General Medical Services Committee; he had been for eight years on the B.M.A. Council, and was now a direct representative on the General Medical Council. He was a busy and popular general practitioner, who had never been known to fail a colleague or a patient who called upon him for help. He was a man who talked—but not too much—and a kind and respected physician. The chairmanship of the Representative Body was a very important position, both from the public and the Association point of view, and so long as a succession of men like those who had occupied the chair continued to lead the Association there need be no fear for the future of the profession in this country.

Dr. Brown, who was given musical honours, confined himself to thanking Mr. Abel for the kind things he had said. His predecessor, Dr. J. B. Miller, had said earlier in the day that when he was elected chairman of the Representative Body it was the proudest moment of his life, and he himself had the same feeling. The Representative Body was noted for its kindness to its chairmen and the indulgence which it accorded to their occasional, but inevitable, mistakes.

ANNUAL GENERAL MEETING

The 118th Annual General Meeting of the British Medical Association was held at the Floral Hall, Southport, on Monday, July 17. The retiring President, Dr. C. W. Curtis Bain, was in the chair.

Induction of President, 1950–1

The minutes of the last Annual Meeting held at Harrogate on June 27, 1949, were confirmed. The President then inducted into the chair Professor Sir Henry Cohen as President of the Association, 1950–1, and invested him with the presidential badge of office. He mentioned that at 24 Sir Henry Cohen was the youngest man ever to be elected to the staff of the Liverpool Royal Infirmary. At 34 he was the youngest professor of medicine the university had ever had. Whether or not he was the youngest President in the history of the Association he did not know, but it must be a very long time since three successive Presidents were all physicians and all in their early fifties. It was a good answer to those who held that the Association was controlled by old men.

Sir Henry Cohen, on taking the presidential chair, said he could assure them that he was not unaware of his deficiencies, but that did not prevent him from feeling the deepest pleasure and satisfaction at the high compliment and the great honour they were doing him in accepting him as President for the ensuing year. He stood in succession to a line of predecessors with whom he did not venture to challenge comparison except in two respects: his admiration for the Association, which had grown immeasurably during the last few years, and his appreciation of the place in which the Association stood in relation to the profession.

Balance Sheet and Appointment of Auditors

On the motion of the President the balance sheet and income and expenditure account for the year 1949 was submitted and approved.

The motion that Messrs. Price, Waterhouse and Co. be reappointed auditors of the Association until the next Annual General Meeting at a fee of 450 guineas was moved by Dr. I. G. Innes, seconded by Dr. O. C. Carter, and adopted.

President, 1951–2

The President announced that the Representative Body had elected Dr. Alan William Stuart Sichel, of Capetown, as President of the Association, 1951–2.

Vote of Thanks to Past President

The Chairman of Council (Dr. Gregg) moved:

That the hearty thanks of the Annual General Meeting of the Association be given to the retiring President, Dr. C. W. Curtis Bain, for his services as President, 1949–50.

He said that in the pleasure and satisfaction of successive Annual Meetings not the least important factor was the personality of the President. Dr. Bain had certainly lived up to the presidential tradition. It was a gratifying thing, at a time when their relations with the Royal College of Physicians were so close, that they should have had three successive Presidents who were distinguished Fellows of that College. In their expression of thanks to him as President they associated the name of Mrs. Bain, their very gracious hostess at Harrogate.

The vote of thanks was duly accorded, and the meeting adjourned until the evening of the following day at Liverpool for the President's Address.

PROCEEDINGS OF COUNCIL

Saturday, July 15, 1950

A meeting of the outgoing Council was held in the Town Hall, Southport, on Saturday morning, July 15, an hour before the assembly of the Representative Body. Dr. E. A. Gregg was in the chair.

A letter of sympathy was sent to Dr. L. A. Parry, a former member of Council, in his serious illness.

The congratulations of the Council were tendered to the members of the Association on whom honours had recently been conferred by the King.

A report from the Central Consultants and Specialists Committee was presented by Mr. R. L. Newell. It contained two recommendations, both of which were adopted. One of these concerned the constitution of the Radiologists' Group Committee, and the other, put forward on behalf of the Tuberculosis and Diseases of the Chest Group Committee, concerned the fee for examination of employees or prospective employees. It was agreed that the fee for a consultant opinion given by a chest physician upon an employee or prospective employee, at the request of the employer, should be not less than 2½ guineas, with an additional half-guinea if the use of *x*-ray apparatus was involved.

A report from the General Medical Services Committee, presented by Dr. Wand, contained a recommendation, which was agreed to, that the Association be appointed a trustee of the superannuation and death benefit scheme approved by the Medical Insurance Agency. At the Committee's suggestion, the Medical Insurance Agency has drafted proposals for superannuation and death benefit schemes for employees of doctors, such as secretaries and dispensers. The scheme covers pension on retirement at 65 for men and 60 for women, based on salary and length of service, death benefit (for women), and return of contributions on withdrawal from the scheme before death or retirement.

The Council received with pleasure a letter from the president of the Medical Women's Federation stating that at the recent meeting of the council of that body much satisfaction was expressed at the conclusion of the joint negotiations, over a long period, regarding the status of women doctors serving in the armed Forces of the Crown. The letter continued: "We know how important the support of the British Medical Association has been, and I would like, as president, to send you a note of sincere thanks for the B.M.A.'s understanding response to our approach to this thorny question. . . . Of course we would have liked to gain our further point concerning conscription of women doctors. We still feel strongly about this, for we ask for equality of sacrifice as well as equality of opportunity."

A report by the Chairman of Council on his recent visit to Australia to attend the recent British Commonwealth Medical Conference at Brisbane was laid before the Council. The Chairman said that it had been a journey well worth while, and within the possibilities of a short visit it did accomplish some useful results. He expressed his warm thanks to Dr. Macrae, joint deputy secretary, who had accompanied him and had been most helpful. The Council unanimously accorded its grateful thanks to Dr. Gregg for undertaking the journey.

One important matter remained on the agenda, and a special meeting of Council was arranged for the following (Sunday) evening.

HEARD AT THE FLORAL HALL

"Sunny Southport" hardly came up to its adjective so far as the weather was concerned, but lack of sunshine and blue skies was offset as usual by hospitality and friendliness. The management of the Floral Hall, an immense auditorium where the Representative Meeting was held, did everything possible for their guests. Perhaps the opportunities for stealing out for tea or coffee during the duller part of the debates were too abundant and compelling. The staff of the Association, especially the "back-room boys" who remain late at night doing work of which the representatives are scarcely aware, have seldom been better accommodated. They could look out of their rooms from the gallery upon a forum of debate during the day which was transformed in the evening to a hall of gaudy entertainment. The most brilliant scene was on the Friday evening when the Mayor of Southport (Colonel Fleetwood Hesketh) gave a civic reception in honour of the meeting, and dancing and vocal and instrumental entertainment continued until a late hour.

The first words uttered at any Representative Meeting are invariably "Can you hear me?" The microphone is a continual source of frustration—to use a word which figured very largely in the discussions in another connexion. In some parts of the hall one could hear perfectly, but there were pockets of inaudibility, where an isolated sentence would come through crystal clear, quite startling in its apparent irrelevance, preceded and followed by bursts of indistinct rumbling. Some of the older representatives who recalled the meetings of years ago—such as the last time the meeting was held in Lancashire, in 1929—hankered after the days when there were no such "contraptions," and speakers had to exercise their natural powers to make themselves heard, instead of shouting down a sort of telephone. The natural human voice is infinitely preferable to the voice as mechanized and distorted by amplifiers. The omnipresence of the microphone spells death not only to ornamental oratory but to effective debate. Even the eloquence of Demosthenes and of that Cicero whom Mr. Lawrence Abel so effectively quoted at the Representatives' Dinner would have gone down before it.

The number of new members of the Representative Body was unusually large, and many of them made maiden speeches. When it was known that a maiden speech was being made the reception of the speaker was as cordial as it is traditionally in the House of Commons. Speakers showed considerable restraint. Hardly one disregarded the red light warning, and most of them when they finished were still on the green. One laxity which would have been heavily frowned upon in days gone by was the practice of addressing "ladies and gentlemen" instead of the chair.

Humour at Southport was not very much forthcoming. Dr. Ff. Roberts, of Cambridge, amused the assembly by his account of long-drawn-out Government correspondence and lost letters. Some of the two dozen women representatives contributed their share to the humour of the proceedings. One of them described the dinosaur at the Smithsonian Institution, Washington, which is said to have had two brains, one in the head and the other in the tail, and so became extinct because it could not make head or tail of it. Then there was the lady who declared that to be able to come to the microphone and tell her troubles to all of them was her idea of perfect heaven. It was she who introduced the much derided phrase "sub-consultant" and the barely pronounceable word "Shmose" to describe senior hospital medical officers.

One story told at Southport concerned a doctor who was called from his club late at night to examine a man who had been brought to the police station on the suspicion of being drunk in charge of a car. The examining doctor proceeded with the examination, drawing a "straight" chalk line on the floor. The accused man looked at it and said, "Well, if that is a straight line, then I am drunk." One of a little bunch of stories told by the Chairman at the Representative Dinner concerned a nurse at a hospital in Birmingham who was asked at an examination, "What are rose hips?" and replied, "Rose hips are very frequently the commencing sign of a bed sore."

ARMED WITH IRON BAR

In a case that came before a medical service committee a man was said to have gone to a doctor's house armed with an iron bar.

According to the report of the committee the father of a child telephoned the doctor (Dr. A) asking him to visit the child, who had been sick, since he thought the child would choke. The child was on Dr. A's Health Service list. The doctor declined to visit: he was suffering from a severe attack of eczema at the time, and was heavily bandaged. He was being assisted by another doctor (Dr. B) who lived three or four miles away, but thought it unnecessary to ask Dr. B. to carry out the visit if it were no more than a case of the child having brought up its feed.

The father, armed with an iron bar, then went to Dr. A's house and saw the doctor's wife, to whom he was extremely abusive. The doctor's wife arranged for an immediate visit by the district nurse, and promised a visit by Dr. B if the nurse thought it necessary. After examining the child and watching the next feed the nurse did not think it necessary, and notified Dr. A that there seemed to be nothing wrong with the child. After a telephone call from the father to Dr. A the next morning, Dr. B visited the child and found it perfectly well.

Findings of Committee

The committee's opinion was that Dr. A in no way failed to comply with his terms of service. It placed on record its dismay at the action of the father, which he freely admitted, of approaching the doctor's house armed with an iron bar, and of his subsequent rudeness to the doctor's wife. The committee felt that his complaint against the doctor was actuated by malice, and recommended that he be reprimanded.

Questions Answered

Assisting at Operations

Q.—*In a cottage hospital with no resident medical officer assistance at surgical operations performed by the visiting surgeons is given by the general practitioner of the patient concerned. Is remuneration for such work covered by the annual capitation fee?*

A.—Remuneration for assistance at surgical operations is considered to be covered by the capitation fee if the patient operated on is on the list of the doctor assisting. If the patient is not on the doctor's list remuneration is effected through the hospital staff fund (£25 per average occupied bed).

Cost of Periodicals

Q.—*Can I, as a whole-time salaried medical officer, claim an income-tax allowance in respect of periodicals?*

A.—The operative rule under Schedule E forbids the deduction of expenses not "incurred wholly, exclusively, and necessarily in the performance of the duties." Expenses which are incurred to fit the individual to perform the duties are regarded by the courts as not incurred "in" the performance of the duties, and for that reason the cost of professional literature is not allowable in the case of salaried employment.

Advice on Contraception

Q.—*Is advice on contraception included in the terms of our contract under the N.H.S.?*

A.—A practitioner is required under his terms of service to give all necessary advice and treatment to patients on his medical list. While no hard-and-fast ruling is possible, it might be assumed that a practitioner would give contraceptive advice to a patient on medical grounds, and it would be left to his discretion whether it was given on other grounds. Certainly a practitioner would not be committing a breach of his terms of service if he declined to give such advice. A fee for such advice may not be charged to a patient on his medical list.

X-RAY EXAMINATION OF EMIGRANTS

The Australian and New Zealand Governments have now agreed that the fee for the *x*-ray examination of prospective Government-sponsored emigrants should be £2 2s., with a reduction to £1 11s. 6d. in respect of additional members of the same family examined at the same time. This is the fee which has been agreed between radiologists and the Dominions for a full examination, including screening. Radiologists undertaking this work are asked to submit their claim direct to the Dominion representatives concerned and not to the emigrant.

Prospective emigrants to Canada and South Africa are required to meet the expense themselves, and it is suggested that the above fee be regarded as a maximum in these cases.

COMPENSATION FOR GOODWILL

Under the National Health Service Act, 1946, and Medical Practices Compensation Regulations, 1948, compensation for loss of right to sell the goodwill of a medical practice is to be calculated "by reference to the last two accounting years immediately preceding the appointed day." The question was recently raised in the Divisional Court[1] whether such accounts can be made up *ad hoc* for the two years ending on the appointed day. The court answered that they could not, and that the words mean the last two annual periods before the appointed day for which the accounts were normally made up for income-tax purposes.

[1] *R. v. Minister of Health; ex parte Dingle*: 1950, 1, All England Reports 875 (quoted *Law Notes*, June, p. 134).

Correspondence

Merit Awards

SIR,—In the South Somerset Clinical Area consultants have recently met to discuss Merit Awards, and I have recently received my ballot paper to vote for names. On it are the names of 21 consultants in the area, and I am asked to put an X against the nine most deserving.

I have examined the list and found that, excluding myself, no less than eleven consultants are unknown to me even by sight; further, in eleven cases I do not know their specialty. No doubt this ignorance is my own fault and due to my work being at a hospital some 30 miles away from the town where the majority of these consultants work.

I cannot believe that this is a fair way of choosing names for what amounts to a very considerable increase in salary for the favoured few. Taking names out of a hat would be almost as fair.

As regards co-operation with the Ministry in the selection of names, a meeting of consultants was held a short while previously. It was said that the Ministry had £1½ m. which it was most anxious to distribute, and it was further believed that unless the money was accepted now the offer might be withdrawn. The meeting was informed that it was unlikely that anyone under 45 would receive a Merit Award, and that the idea of them was to make up for the loss of private practice.

There was a strong feeling that, while the medical profession was engaged in a long struggle to improve conditions of service and pay in the National Health Service, it was undesirable to co-operate at all about Merit Awards until the profession had gained some satisfaction about much more important matters. A vote was taken as to co-operation; six votes were cast in favour and five against, so the discussion continued and the ballot method of selecting names was decided upon.

I feel very strongly that whatever the rights and wrongs of Merit Awards the present is not the moment for the profession to occupy itself with them. There are large numbers of S.H.M.O.s doing consultant work who are not even eligible for Merit Awards.

If the Ministry is anxious to distribute money, it should be spread widely through the profession to make up for the lamentable fall in income of many doctors, and so help to recover their lost professional status. If the Merit Awards really are to make up for the fall in income due to loss of private practice, they should be divided among all doctors and not given to those whose income has in many cases fallen less than others.

I hope I have made myself clear: in my view specialists should at present adopt a policy of non-cooperation. I intend to write across my ballot paper to this effect, so that it is invalid. I believe that this type of action will show the Ministry that the profession means business, and that it is not merely "throwing a spanner in the works" for no useful purpose.—I am, etc.,

Yeovil, Somerset. R. J. BUXTON.

Grading

SIR,—Some of your readers will be weary of the plaintive cries of S.H.M.O.s, not least among them the erstwhile paid members of professional assessment committees. Others will feel, as I do, that the nadir in the history of medical ethics should not be allowed to be forgotten. The foreign infection which invaded a number of British minds and thus enabled them to judge their fellows *in absentia* will, it is hoped, be rooted out by the only antidote left to us—namely, a renewed and firmer faith in our sense of justice.

I may have overlooked one or two copies of the *B.M.J.*, but so far as I am aware no member of a professional assessment committee has had face enough to announce publicly either his motive or his justification for receiving money as payment for acting as judge and jury in a case where the defendant was not permitted to speak nor even be present either at his trial or appeal. These eminent gentlemen will naturally prefer anonymity, for nemesis is overtaking them. We, the downgraded, have no redress but the satisfaction of knowing that they are now the accused and the entire profession is jury. It has, I think, reached its verdict. The penalty is the condemnation and censure of their more noble-minded colleagues, coupled possibly with the pangs of conscience.

The Minister of Health is not entirely to blame. After all, he is not a doctor and doesn't allow his keen sense of oppression and injustice to interfere with his duty to the State purse. He has from time to time the unfortunate duty of taking Ministerial evasive action. His assertion (*Journal*, July 1, p. 54) that "some posts graded for consultants were inevitably held by individuals who had been graded only as senior hospital medical officers" (note the word "inevitably") will not satisfy the most simple-minded of his critics. When I was graded S.H.M.O. in Liverpool I was invited to undertake fresh duties with greater responsibilities. I suggested that, as I was not graded as a consultant, the regional hospital board might grade the new post as for a consultant. I was told that in that event the post would have to be advertised, and that if I was not the successful applicant I would find myself left as S.H.M.O. with approximately half my original eleven sessions.

Having promptly been placed on a short-list of three for the advisory post to another regional hospital board and lecturer to a university, and, being unsuccessful there, having subsequently achieved consultant status elsewhere, I find my own case forcibly strengthened by the fact that the post I vacated in Liverpool was advertised as a consultant post. It has been filled by a former colleague who ought to have had consultant status allotted to him last year. A third colleague has packed his traps, shaken the Merseyside dust off his feet, and booked his passage to Canada. Yet a fourth colleague must surely achieve consultant status when the review committees sit in 1951, thus making the required apprenticeship a mere matter of about eighteen years.

Mr. Bevan seeks to offset this Gilbertian state of affairs by suggesting the hardship would be worse if a S.H.M.O. "could never have a chance of being regarded as a consultant." I would that he footed our bills for solicitors' fees, stamp duties, and removal costs necessitated by the resultant domestic upheaval, to say nothing of finding new school outfits for the children and pacifying our bank managers.

Is it too much to hope that the review committees will be entirely reappointed (why not elected ?) and that they will reconsider the original gradings ? The unforgivable miscarriage of justice in 1949 and the subsequent failure of other appointment committees to implement not only the Spens recommendations but the instructions of the N.H.S. Act terms and conditions of service have cost us dear. In my own case the loss is approximately £1,250 gross to date. If all else fails, perhaps some librettist and composer will seize on what is obviously the subject of a new comic opera.—I am, etc.,

Worcester. ARTHUR S. WIGFIELD.

Pharmacy More Remunerative

SIR,—In the *Chemist and Druggist Supplement* of July 1 there is an advertisement:

"Medical practitioner (retired) wishes to undertake retail dispensing work in London during next three months."

The present salaries being paid to pharmacists are completely out of relation to those paid to doctors, comparing them from their pre-war standpoint, and it is possible that a doctor might find more remunerative employment in pharmacy than in his own profession. Indeed, I believe this is the case in the official scales for hospitals in respect of the newly qualified. Comment is superfluous.—I am, etc.,

Newcastle-upon-Tyne. A. FORSTER.

Vaccination

SIR,—In the *Supplement* of July 1 (p. 11) the Secretary of the B.M.A. writes a footnote to a letter on vaccination. He states that the Ministry maintains that vaccination forms part of a practitioner's service for which he is already remunerated by capitation fee.

Are not the B.M.A. advisers to the medical profession being a little slow in the uptake on these argumentative subjects ? If what the B.M.A. Secretary writes is true, then the whole basis for assessing the total sum paid as a capitation fee falls to the ground. We have repeatedly been informed that we only see a certain percentage of our patients, therefore the capitation fee is so much. If we are now forced to see every infant whose mother can be persuaded to co-operate for two (sometimes four) attendances for vaccination and two for inoculation in the first year of its life, then it is obvious that the whole new population will have visits or attendances to their credit from the very first year of their lives. In other words every G.P. who does his job *must* see every infant at least on four occasions, and more probably on six, for the first capitation of 16s.

Now this state of affairs was never meant to be, and I consider it a very important item in the argument for a higher rate of pay. We had 16s. paid for being at risk to everyone, and not 16s. with the promise that every newborn member of the Health Service should receive half a dozen items of attendance at 2s. 8d. a time.—I am, etc.,

Christchurch, Hants. EDWARD F. HUNT.

Four Days Lost

SIR,—My appointment as E.N.T. surgeon under the new Health Service having recently been terminated by that authority, the fees due to me up to date of termination of my appointment were paid less four days for the period July 1–4, 1948, as the new Service started on July 5, 1948—surely an extraordinary method of accountancy. Presumably this will apply to all employed in this Gilbertian form of service, though it is obvious that in many cases the four-days deduction will be made in the dim and distant future—whenever particular appointments are terminated.

Incidentally, on being absorbed into this Service, my fees, hitherto paid by the local authority monthly, were automatically reduced by about 33⅓%, in spite of the fact that a responsible Cabinet Minister stated in the House of Commons that H.M. Government gave an assurance that wherever an industry is nationalized employees so taken over would suffer no financial loss. Presumably the medical profession does not share in this assurance.—I am, etc.,

Exeter. CHARLES H. CARROLL.

Payment in the Health Service

SIR,—During the first complete year of the Service I felt that with the novelty of "free" treatment and drugs, and the calls made on us by Form O.S.C.1, figures of work done for the amount paid would be unreliable. With the second year now at an end I am able to provide details of a London practice in a year of little general sickness and no epidemic, and it is of interest that in fact more work was done in the second year than in the first.

The number of items of service per head was just over 4½, and the payment per item, taking the reduction for superannuation into account, was 3s. 9d. gross, less expenses, now 40%, or 2s. 3d. net.

On January 1, 1946, the capitation fee was 15s. 6d., and it is now 17s., not, as many think, 18s., since the Ministry does not pay for the 5% it estimates as not using the Service, though these have to pay for its cost, and we are at risk for them. This shows an increase in the capitation fee of 10% only.

I note that in the year 1946–7 the number of items of service per head was 3.6, and the payment for each, 4s. 7d. gross, less expenses (then at 32%), or 3s. 1d. net. In other words, there has been a drop of 28% in the fee per service rendered. —I am, etc.,

London, S.W.1. A. HARBOUR.

The B.M.A. War Memorial

SIR,—We have had welcome evidence in recent years of our national recovery from the sculptural epidemic of the nineteenth century. It is regrettable that our Council should suffer a relapse, and it will be tragic if those they represent cannot cure them.

A return to peace and plenty may some time make it reasonable to patronize the Arts, but while the world, the British Empire, our country, and our profession are all struggling to keep above the bread line we of all people should not spend £10,000 to enhance the beauty of our house. Our dead brothers merit more than that.

Let the Council reverse the order of their objects. Let us establish a fund of £50,000 for the children of the fallen, with 50,000s. for an illuminated roll of honour—one guinea from each doctor—and anything given in excess of these totals could be expended on statuary.—I am, etc.,

Grimsby, Lincs. E. J. THOMSON.

POINTS FROM LETTERS

Numbers on Lists

Dr. ROBERT WIGODER (*London, S.E.6*) writes: In the *Daily Telegraph* dated June 6 it was reported that the commanding officer of the British Military Hospital in Singapore complained that he was short of staff, as he only had four general practitioners instead of 13 to 406 patients. Mr. Bevan says one doctor should be able to look after 4,000 civilians of all ages from birth to 90. I think no further comment is necessary.

Return to Private Practice

Dr. BASIL S. GRANT (East Horsley, Surrey) writes: It is refreshing to read Dr. C. L. Carter's letter (*Supplement*, June 24, p. 301) after so many others have moaned and groaned about the size of the central pool and the capitation fee. . . . The remedy lies with us—mass resignation to regain our freedom and our status. After which the Minister can use some of the millions which he is at present squandering on a third-rate health service to build houses for the homeless and to finance a provident scheme, grant-in-aid, or some other form of financial help towards the cost of illness. All this can only be obtained by a return to private practice.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Captains R. P. Hickey, P. M. Bretland, and W. G. Miln have retired, receiving a gratuity, and have been granted the honorary rank of Major.

Short Service Commissions.—Majors J. C. Scott and H. A. Kreiser have retired, receiving a gratuity. Captains K. D. Foggitt, D. Dexter, and T. D. S. Oswald have retired, receiving a gratuity, and have been granted the honorary rank of Major.

Captain P. J. C. Burton to be Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Colonel R. C. Clarke, O.B.E., T.D., has relinquished his appointment as Honorary Colonel of a T.A. Unit, tenure expired.

Captain J. C. Knox, C.B.E., to be Honorary Colonel of a T.A. Unit, in succession to Brigadier W. Anderson, O.B.E. (deceased).

Major (Acting Colonel) C. K. D. Edwards has relinquished the acting rank of Colonel.

Major D. P. Holmes to be acting Colonel.

Majors M. W. Gonin, D.S.O., T.D., and J. S. H. Wade to be acting Lieutenant-Colonels.

Majors (Honorary Lieutenant-Colonels) H. B. Lee and R. G. Evans, M.B.E., from T.A.R.O., to be Majors.

Major D. W. E. Lloyd, M.C., from T.A.R.O., to be Major, and has been granted the acting rank of Lieutenant-Colonel.

Captain (Honorary Major) A. MacOuiston, from T.A.R.O., to be Major.

Captains A. Chambers and H. R. Shields, from T.A.R.O., to be Majors.

Captains J. R. McBoyle and B. W. Wells to be Majors.

Captain (acting Major) D. W. L. Leslie has relinquished the acting rank of Major.

Lieutenants S. H. Madden and W. G. Daynes to be Captains, and have been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel T. T. P. Murphy, O.B.E., T.D., from Active List, to be Lieutenant-Colonel.

Majors H. Gass, O.B.E., and H. B. Porteous, M.B.E., from Active List, to be Majors, and have been granted the honorary rank of Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) E. G. Mackie, having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Major E. N. Owen, from Active List, to be Major.

Major R. M. Pearce, having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Captains J. K. H. McCullough and M. J. G. Lynch, from Active List, to be Captains, and have been granted the honorary rank of Major.

Captains (Honorary Majors) D. E. O'Connor-Cuffey, S. A. R. Chadwick, J. T. Dunkerley, and C. H. Bulcock, M.C., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.

ROYAL AIR FORCE

Air Commodore (Acting Air Vice-Marshal) W. E. Barnes to be Air Vice-Marshal.

Group Captain (Acting Air Commodore) R. H. Stanbridge, O.B.E., to be Air Commodore.

Squadron Leaders, G. R. Gunn, O.B.E., A. L. Knipe, J. W. Reade, and E. B. Bright, A.F.C., to be Wing Commanders.

Flight Lieutenant M. S. Hughes has relinquished his temporary commission, retaining the rank of Squadron Leader.

Flight Lieutenants R. J. Young and S. M. Rigg to be Squadron Leaders.

ROYAL AIR FORCE VOLUNTEER RESERVE

Flight Lieutenant C. H. Levick to be Squadron Leader.

INDIAN MEDICAL SERVICE

Lieutenant-Colonel H. S. Waters has retired.

Majors D. K. L. Lindsay, O.B.E., T. E. Palmer, O.B.E., and G. F. Harris have retired, and have been granted the honorary rank of Colonel.

Majors T. M. Williams, M. D. Black, W. W. Laughland, L. S. F. Woodhead, M.B.E., W. McN. Niblock, S. W. Allinson, and R. D. MacRae have retired, and have been granted the honorary rank of Lieutenant-Colonel.

Majors W. S. Morgan, A. A. Pullar, O.B.E., H. B. Wright, W. J. Virgin, E. H. Wallace, G. B. Thomas, O.B.E., W. D. Goodall, and J. D. Murdoch, O.B.E., have retired.

Captain J. Lightbody has retired, and has been granted the honorary rank of Lieutenant-Colonel.

Captain P. J. Wormald has retired, and has been granted the honorary rank of Major.

Association Notices

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and childbearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing to the Secretary by November 1, 1950, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prize due regard will be given to evidence of personal observation. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or

part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary not later than November 1, 1950. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary.

Diary of Central Meetings

JULY

24 Mon. Staff Side, Committee "C," 11.30 a.m.
24 Mon. Full Meeting, Committee "C" (at Ministry of Health), 2 p.m.
27 Thurs. General Medical Services Committee, 11 a.m.
27 Thurs. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
28 Fri. Drafting Subcommittee, 10.45 a.m.
28 Fri. Venereologists Group, 2.30 p.m.

AUGUST

3 Thurs. Committee on Psychiatry and the Law, 2 p.m.
30 Wed. General Practice Review Committee, 2 p.m.

Branch and Division Meetings to be Held

NORFOLK BRANCH.—At Guildhall, King's Lynn, Thursday, July 27, 3.30 p.m., annual meeting. Address by Dr. Charles Hill, M.P.

NORTH OF ENGLAND BRANCH.—At Bamburgh Castle Golf Club, Thursday, July 27, 12.30 p.m., annual meeting.

Meetings of Branches and Divisions

WINCHESTER DIVISION

The Division held its annual meeting at Winchester on May 20, the chief guest being Mr. Reginald Vick, consulting surgeon to St. Bartholomew's Hospital. Over seventy members and their guests attended.

After the guests had been welcomed by the chairman, Dr. Margaret Savory, of Andover, Mr. Vick gave an address on "Who Would be a Doctor?" He said that he hoped the title did not suggest that he had come down to Winchester to decry the profession or the new and trying circumstances under which it now worked; on the contrary, he had come to praise it. The backbone and most important member of the profession was still the general practitioner, and he hoped that the Health Service would eventually settle down and leave undisturbed the family doctor in his happy relationship with his patient. But he feared the very real danger of over-specialization, which was the trend at present. He had a sympathetic word to say about the doctor's wife, and then discussed all sections of the profession.

After tea the members from outside Winchester were entertained by Winchester doctors until the second part of the meeting. Mr. H. H. Langston was elected chairman for the ensuing year, and Dr. G. G. M. Edelsten, of Sutton Scotney, vice-chairman. The following resolution, among others, was unanimously adopted for the Representative Meeting to be held in July:

"That Council be instructed to form a committee to investigate in all its aspects the case for and against a whole-time salaried medical service, and to report thereon; this report to be published as soon as possible so that the medical profession and the general public as a whole may be adequately prepared for, realize the implications of, and be in the strongest possible position to counter (if thought desirable) any attempt by a future Government to introduce a whole-time salaried medical service."

The Division was congratulated on the success of its campaign to reorganize the B.M.A. The members then adjourned to the Chairman's Sherry Party and the Annual Dinner. Dr. W. S. Larcombe, of Alton, in proposing a toast to the retiring chairman, said that she had, as the first lady chairman of the Division, carried out her duties during a very arduous year in a manner well meriting the appreciation and gratitude of the Division. Mr. Vick, replying to the toast to the guests, caused much amusement in his references to examiners and examinees he had known during his career.

NORTH OF ENGLAND BRANCH

The first meeting of the spring course of scientific meetings was held on February 16. Dr. H. G. Miller and Miss Morley gave a demonstration of speech defects in childhood. The aetiology was discussed and a method of classification offered. The results to be obtained in the various types were demonstrated, and the audience was greatly impressed.

Professor C. H. Stuart Harris then gave an address on "The Practitioner and the Influenza Problem." He emphasized the need for laboratory control of diagnosis for research purposes, and said that with the aid of the laboratory influenza could be broken down into at least four classes: (1) influenza due to virus A and B; (2) febrile catarrh; (3) atypical pneumonia with its aetiological factors; (4) common cold, which is usually afebrile. He described the recent trends of influenza epidemics and how the disease spread through communities and from country to country. At present, deaths from influenza occurred chiefly in the aged, and death was usually from pneumonia, often staphylococcal, or from heart failure. He drew attention to the role of familial infections in influenza. It was apparent that viruses could change their behaviour and virulence. Thus poliomyelitis was increasing in this country, and no one could predict at present whether an influenza pandemic would occur.

He described attempts to control influenza, and mentioned the difficulties that were involved. The general practitioner could help in three ways. In remote country districts he could assist by collecting evidence of the mode of spread and incubation period. He could collect data from the careful observation of families with one or more influenzal members. He could assist in attempts to prevent influenza.

Dr. S. V. Tinsley was in the chair, and Dr. D. Court proposed the vote of thanks. There were 120 members present.

The second meeting was held on March 30. The Nuffield Department of Industrial Health arranged a series of demonstrations of work in progress. These included investigations into erosion of teeth in factory workers who were handling organic acids, and experiments designed to obtain fundamental information about the relationship between man and machine. Other demonstrations emphasized the importance of occupational history and social history in the diagnosis and management of various diseases in industrial workers. Professor R. C. Browne spoke briefly about the work of the department and showed a film on nystagmus in miners.

Dr. F. H. Beards read a paper on the work of an industrial medical officer, illustrating the lecture by reference to the conditions at a large chemical works covering a variety of processes.

Professor R. C. Browne was in the chair, and Dr. H. H. Goodman proposed the vote of thanks.

The third meeting, held on April 20, was devoted to radiology. A fascinating display of radiographs revealed all the common x-ray changes in the various commoner diseases. The display was extensive and carefully documented, and was the work of Dr. D. Ramage, Dr. B. Houston, and Dr. F. Warwick.

Dr. S. Whately Davidson then reviewed the place of radiology in modern diagnosis. He traced the development of x rays, and mentioned the growth of the x-ray department of the Royal Victoria Infirmary, which last year dealt with over 54,000 new patients. He mentioned the newer techniques and then gave a comprehensive review of the radiology of the chest. There were 95 members present, and the meeting was greatly appreciated.

B.M.A. FILM LIBRARY

The following films have been presented to the Film Library.

The Taking of Blood. Sound, monochrome, 1 reel, 22 mins. Author: Bayer Products, Ltd.

Signs and Stages of Anaesthesia. Sound, monochrome, 1 reel, 23 mins. Author: Imperial Chemical Industries, Ltd.

Open Drop Ether. Sound, monochrome, 1 reel, 31 mins. Author: Imperial Chemical Industries, Ltd.

Nitrous Oxide-Oxygen-Ether Anaesthesia. Sound, monochrome, 1 reel, 26 mins. Author: Imperial Chemical Industries, Ltd.

Endotracheal Anaesthesia. Sound, monochrome, 1 reel, 26 mins. Author: Imperial Chemical Industries, Ltd.

Intravenous Anaesthesia. Sound, monochrome, 2 reels, 25 mins. Author: Imperial Chemical Industries, Ltd.

Spinal Anaesthesia. Sound, monochrome, 2 reels, 35 mins. Author: Imperial Chemical Industries, Ltd.

Respiratory and Cardiac Arrest. Sound, monochrome, 1 reel, 15 mins. Author: Imperial Chemical Industries, Ltd.

Operative Shock. Sound, monochrome, 1 reel, 16 mins. Author: Imperial Chemical Industries, Ltd.

Handling and Care of Patients. Sound, monochrome, 1 reel, 26 mins. Author: Imperial Chemical Industries, Ltd.

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 5 1950

SURVEY OF GENERAL PRACTICE

The Medical Practices Committee has completed its survey as at January 1, 1950, of the number of general practitioners practising in the various parts of England and Wales. The executive council areas or parts of them are listed in four schedules as in the previous survey (*Supplement*, August 6, 1949, p. 70). The areas have been listed in the schedules as follows:

SCHEDULE I

Open areas with high average lists compared with the rest of the country. Any application to practise in these will be granted forthwith.

England: Counties

Cheshire.—District of Runcorn (with the exception of Frodsham and Helsby). Crewe (Crewe and Nantwich District). Haslington (Crewe and Nantwich District).

Derbyshire.—Borough of Ilkeston. Urban Districts of Alfreton, Clay Cross, Heanor, Long Eaton, Ripley, Swadlincote. Rural Districts of Blackwell and Chesterfield.

Durham.—Borough of Hartlepool. Borough of Jarrow and the Urban Districts of Blaydon, Felling, Hebburn, Ryton, Whickham. Urban Districts of Bishop Auckland, Crook and Willington, Shildon, Spennymoor, Tow Law. Urban Districts of Bolden, Hetton, Houghton-le-Spring, Seaham and the Rural Districts of Easington, Sunderland.

Essex.—Boroughs of Barking, Chelmsford, Dagenham, Romford. Urban Districts of Billericay, Canvey Island, Hornchurch, Rayleigh.

Gloucester County and City.—Kingswood and Warmley.

Hampshire.—Borough of Eastleigh.

Kent and Canterbury.—Boroughs of Bexley, Chatham, Dartford (and Rural District of Dartford), Erith, Gravesend. Urban District of Crayford.

Lancashire.—Boroughs of Leigh, Middleton. Urban Districts of Abram, Aspull, Audenshaw, Denton, Droylsden, Golborne, Haydock, Hindley, Newton-le-Willows, Standish-with-Langtree, Tyldesley, Westhoughton, Worsley (including Astley and Little Hulton). Haigh (Wigan Rural District). Maghull (West Lancashire Rural District). Poulton-with-Fearnhead (Warrington Rural District). Southworth-with-Croft (Warrington Rural District).

Leicestershire and Rutland.—Hinckley. Melton Mowbray (with the exception of Somerby).

Middlesex.—Boroughs of Edmonton, Tottenham and Wood Green, Heston and Isleworth, Southall. Urban Districts of Hayes and Harlington, Staines, Yiewsley and West Drayton.

Northumberland.—Borough of Wallsend. Urban Districts of Ashington, Bedlingtonshire.

Nottingham County and City.—Arnold, Beeston, Carlton and Netherfield, Carlton-in-Lindrick, Eastwood, Edwinstowe and Ollerton, Kimberley, Warsop.

Staffordshire.—Boroughs of Newcastle-under-Lyme, Rowley Regis, Tipton, Wednesbury. Urban Districts of Brierley Hill, Brownhills, Darlaston, Sedgley, Wednesfield, Willenhall.

Suffolk East.—Borough of Beccles. Rural District of Wainford.

Warwickshire.—Urban District of Bedworth. Rural District of Atherstone.

Worcestershire.—District of Halesowen.

Yorkshire (East Riding).—District of Haltemprice.

Yorkshire (West Riding).—Borough of Ossett, Urban District of Horbury and Rural District of Wakefield. Urban Districts of Adwick-le-Street and Bentley-with-Arksey; Conisborough, Dearnie and Mexborough; Cudworth, Darton and Royston; Darfield, Dodsworth, Wombwell and Worsborough. Urban District of Tickhill, and the Rural District of Doncaster.

England: County Boroughs

Dudley, East Ham, Gateshead, Great Yarmouth, Kingston-upon-Hull, Rotherham, Smethwick, South Shields, Stoke-on-Trent, Walsall, Warrington, West Bromwich, West Hartlepool.

Wales: Counties

Denbighshire and Flintshire.—Borough of Denbigh.

Glamorgan.—Urban District of Pontypridd.

Monmouthshire and Newport.—Urban District of Cwmbran.

SCHEDULE II

Other open areas where applications would be automatically granted.

England: Counties

Bedfordshire.—Boroughs of Bedford, Dunstable, Luton. Urban Districts of Biggleswade, Leighton Buzzard, Sandy. Rural Districts of Ampthill (including Ampthill, Cranfield, Toddington, and Woburn). Bedford (with the exception of Harrold, Riseley, Sharnbrook, and Turvey). Biggleswade (including Arlesey and Shefford). Luton (including Barton and Shillington).

Berkshire.—Urban and Rural Districts of Abingdon, Wallingford, Wantage (with the exception of Brightwalton), Wokingham. Urban District of Maidenhead. Rural Districts of Bradfield, Easthampstead, Faringdon.

Buckinghamshire.—Districts of Aylesbury (with the exception of Brill, Haddenham, Long Crendon), Buckingham, Bletchley, Chesham, High Wycombe (with the exception of Hambleden, Horsley Green, Prestwood, Stokenchurch), Slough.

Cambridgeshire.—Borough of Cambridge. Rural Districts of Chesterton, Newmarket, South Cambridgeshire.

Cheshire.—Districts of Bredbury and Romiley, Cheadle and Gatley, Congleton, Crewe and Nantwich (with the exception of Crewe and Haslington), Hyde, Dukinfield and Stalybridge (with the exception of Hollingworth and Mottram), Macclesfield (with the exception of Bollington), Sale (with the exception of Carrington), Wirral. Districts surrounding the County Borough of Chester (including the Urban Districts of Ellesmere Port and Hoole and the Rural District of Chester). District of Mid-Cheshire (including the Urban Districts of Middlewich, Northwich and Weaverham and Winsford). Frodsham (Runcorn District). Lymm (Knutsford and Wilmslow District).

Cornwall.—Albaston and Calstock, Bodmin, Bugle and St. Dennis, Callington, Camborne, Camelford, Carn Brea, Chacewater, Delabole, Grampound, Helston, Launceston, Looe, Newquay, Penryn, Penzance, Perranporth, Polperro, Porthleven, Port Isaac, Probus, Redruth, St. Austell, St. Blazey, St. Columb, St. Just, Saltash, Torpoint, Truro.

Cumberland.—Aspatria, Brampton, Cleator Moor and Whitehaven, Cockermouth, Distington and Harrington, Egremont, Longtown, Maryport, Penrith, Wetherall, Wigton, Workington.

Derbyshire.—Boroughs of Chesterfield, Glossop. Urban and Rural Districts of Ashbourne, Bakewell, Belper. Urban Districts of Bolsover, Dronfield, Matlock, New Mills, Staveley, Wirksworth. Rural Districts of Chapel-en-le-Frith, Clowne, Repton, Shardlow.

Devon and Exeter.—Axminster, Dartmouth, Exeter and Ide, Ilfracombe, Ivybridge, Kingsbridge, Kingsteignton and Newton Abbot, Plympton, Plymstock and Elburton, Silverton, South Molton, Tavistock, Tiverton, Topsham, Torquay.

Dorsetshire.—Beaminster, Blandford, Branksome, Poole, Parkstone, Canford Cliffs, Sandbanks, Bridport, Portland, Shaftesbury and District, Sherborne, Weymouth and District, Wimborne and District.

Durham.—Durham City, the Urban District of Brandon and Byshottles and the Rural Districts of Durham, Lanchester. Urban and Rural Districts of Barnard Castle (with the exception of Middleton-in-Teesdale, Gainford, and the Rural District of Darlington). Urban and Rural Districts of Chester-le-Street and the Urban

Districts of Consett, Stanley, Washington. Urban and Rural Districts of Stockton, the Urban District of Billingham, and the Rural District of Sedgefield (with the exception of Sedgefield Village and Stillington).

Essex.—Boroughs of Chingford, Colchester, Harwich, Ilford, Leyton, Maldon, Saffron Walden, Walthamstow. Urban Districts of Benfleet, Braintree and Bocking, Brentwood, Burnham-on-Crouch, Chigwell, Clacton-on-Sea, Epping, Halstead, Thurrock, Waltham Holy Cross, Witham, Wivenhoe. Rural Districts of Braintree, Chelmsford, Dunmow, Epping, Halstead, Lexden and Winstree, Maldon, Ongar, Rochford, Saffron Walden, Tendring (with the exception of Great Bentley, St. Osyth and Thorpe-le-Soken).

Gloucester County and City.—Almondsbury, Berkeley, Bitton, Chipping Sodbury, Cinderford, Blakeney, Drybrook, Newnham and Westbury-on-Severn, Cirencester and Rendcomb, Dursley, Uley and Wotton-under-Edge, Filton, Gloucester, Hambrook, Hanham, Hucclecote and Churchdown, Lydbrook, Lydney, Bream, Coleford and Parkend, Mangotsfield, Mitcheldean, Northleach, Stroud, Cainscross, Chalford, Eastcomb, Painswick, Pitchcombe and Stonehouse, Tewkesbury, Tidenham, Winchcombe and Bishops Cleeve.

Hampshire.—Boroughs of Aldershot, Andover, Basingstoke, Gosport, Romsey, Winchester. Urban Districts of Alton, Fareham, Farnborough, Havant and Waterloo, Petersfield. Rural Districts of Andover, Basingstoke, Droxford, New Forest, Petersfield, Ringwood and Fordingbridge, Romsey and Stockbridge, Winchester.

Herefordshire.—Bromyard and district, Hereford and district, Leominster and district, Ross-on-Wye and district (with the exception of Whitchurch), Vowchurch.

Hertfordshire.—Boroughs of Hemel Hempstead, Hertford, St. Albans, Watford (with the exception of the Garston district). Urban Districts of Baldock, Berkhamsted, Bishop's Stortford, Bushey, Cheshunt (including Waltham Cross), Chorley Wood and Rickmansworth, Harpenden, Hitchin, Hoddesdon, Letchworth, Royston, Sawbridgeworth, Tring, Ware, Welwyn Garden City. Rural Districts of Berkhamsted, Braughing, Hatfield, Hemel Hempstead, Hitchin, St. Albans, Ware, Watford, Welwyn.

Huntingdonshire.—Huntingdon, Kimbolton, Ramsey, St. Ives, St. Neots, Somersham, Warboys, Yaxley.

Isle of Ely.—Chatteris with Doddington, Ely, Haddenham with Sutton March, Parson Drove, Thorney, Whittlesey, Wisbech.

Isle of Wight.—Cowes, Newport.

Kent and Canterbury.—Boroughs of Bromley, Canterbury, Deal, Dover, Faversham, Gillingham, Maidstone, Margate, Ramsgate, Rochester. Urban Districts of Ashford, Chislehurst and Sidcup (except St. Paul's Cray and St. Mary's Cray), Northfleet, Orpington, Penge, Sittingbourne and Milton, Swanscombe, Tonbridge, Whitstable. Rural Districts of Bridge Blean, Eastry, Elham, Maidstone, Malling, Strood. Isle of Sheppey.

Lancashire.—Boroughs of Accrington, Ashton-under-Lyne, Bacup, Chorley, Clitheroe, Colne, Crosby, Darwen, Eccles, Farnworth, Fleetwood, Haslingden, Heywood, Lancaster, Morecambe and Heysham, Nelson, Prestwich, Radcliffe, Rawtenstall, Stretford, Swinton and Pendlebury, Widnes. Urban Districts of Adlington, Ashton-in-Makerfield, Atherton, Barrowford, Billinge and Winstanley, Blackrod, Brierfield, Chadderton, Church, Clayton-le-Moors, Crompton, Dalton-in-Furness, Failsworth, Formby, Fulwood, Great Harwood, Horwich, Huyton with Roby, Ince-in-Makerfield, Irlam, Kearsley, Kirkham, Lees, Leyland, Litherland, Littleborough, Little Lever, Longridge, Milnrow, Ormskirk, Orrell, Oswaldtwistle, Padiham, Poulton-le-Fylde, Prescot, Rainford, Ramsbottom, Rishton, Royton, Skelmersdale, Thornton Cleveleys, Tottington, Trawden, Turton, Ulverston, Upholland, Urmston, Walton-le-Dale, Wardle, Whitefield, Whitworth, Withnell. Rural Districts of Blackburn, Burnley, Chorley, Clitheroe, Fylde (except Freckleton), Garstang (with the exception of Bleasdale, Pilling and Stalmine-with-Staynall), Lancaster, Limehurst, Lunesdale, Preston, Ulverston (except Broughton West, Coniston, Hawkshead, Kirkby Ireleth, Lower Allithwaite and Lowick), Warrington (except Poulton-with-Fearnhead and Southworth-with-Croft), West Lancashire (except Maghull), Whiston, Wigan (except Haigh).

Leicestershire and Rutland.—Borough of Loughborough (and surrounding rural areas), Ashby de la Zouch, Coalville, Lutterworth (excluding Peatling Magna), Market Harborough (excluding Hallaton), Rutland (excluding Uppingham and Market Overton). Surrounding districts of Leicester (villages of Anstey, Billesdon, Birstall, Blaby, Countesthorpe, Glenfield, Kirby Muxloe, Narborough, Oadby, Syston, Thurmaston, Wigston, South Wigston).

Lincolnshire (Holland).—Borough and Rural District of Boston. Urban and Rural Districts of Spalding. Rural District of East Elloe (with the exception of Gedney Hill).

Lincolnshire (Kesteven).—Ancaster, Bourne, Caythorpe, Grantham, Heckington, Market Deeping, Navenby, North Hykeham, Stamford.

Lincolnshire (Lindsey).—Boroughs of Cleethorpes, Louth, Scunthorpe. Urban Districts of Alford, Barton-upon-Humber, Brigg, Gainsborough, Horncastle, Skegness. Rural Districts of Caistor (with the exception of Keelby), Gainsborough (with the exception of Newton-on-Trent), Glanford Brigg, Grimsby (with the exception of Immingham), Horncastle (with the exception of Revesby and Tetford), Isle of Axholme, Louth (with the exception of Thoresby North), Spilsby (with the exception of Burgh-le-Marsh, Hogsthorpe and Wainfleet), Welton (with the exception of Bardney and Dunholme).

London.—Boroughs of Battersea, Bermondsey, Bethnal Green, Camberwell, City and Shoreditch, Deptford, Finsbury, Fulham, Greenwich, Hackney, Hammersmith, Islington, Lambeth, Lewisham, Poplar, St. Pancras, Southwark, Stepney, Stoke Newington, Wandsworth, Woolwich.

Middlesex.—Boroughs of Acton, Brentford and Chiswick, Ealing, Hornsey, Southgate, Twickenham, Wembley, Willesden. Urban Districts of Enfield, Feltham, Friern Barnet, Harrow, Potter's Bar, Ruislip and Northwood, Sunbury-on-Thames, Uxbridge.

Norfolk.—Borough of King's Lynn. Urban and Rural Districts of Swaffham. Urban Districts of Downham Market, North Walsham, Wymondham. Urban District of East Dereham and Rural District of Mitford and Launditch. Rural Districts of Blofield and Flegg, Depwade, Docking, Downham, Erpington, Forehoe and Henstead, Loddon, Marshland, St. Faith's and Aylsham, Smallburgh, Walsingham, Wayland.

Northamptonshire.—Brackley, Burton Latimer and Finedon, Corby, Daventry, Desborough and Rothwell, Irthlingborough, Kettering (Borough), Kingscliffe, Northampton (Rural District), Oundle, Paulerspury, Rushden and Higham Ferrers, Thrapston, Towcester, Wellingborough.

Northumberland.—Borough of Blyth. Urban Districts of Gosforth, Longbenton, Newburn, Prudhoe, Seaton Valley, Whitley Bay. Rural Districts of Bellingham, Castle Ward, Glendale, Haltwhistle, Morpeth.

Nottingham County and City.—City of Nottingham. Bingham, Blidworth and Rainworth, Costock and Ruddington, Gringley-on-the-Hill, Harworth, Hucknall, Kirkby-in-Ashfield, Mansfield Borough, Mansfield Woodhouse District, Misterton, Newark Borough, North Clifton, Retford, Selston, Southwell, Stapleford, Sutton Bonington, Sutton-in-Ashfield, West Bridgford, Worksop.

Oxford County and City.—Banbury and District, Bicester, Charlbury and District, Clifton Hampden, and Dorchester-on-Thames, Eynsham and District, Islip, Kidlington and Woodstock, Oxford, Watlington, Wheatley, Witney.

Salop.—Bridgnorth, Cleobury Mortimer, Ellesmere, Ludlow, Market Drayton, Newport, Oswestry, Shifnal, Shrewsbury, Wellington, Wenlock, Whitchurch.

Soke of Peterborough.—Whole of County.

Somerset.—Bridgwater, Frome and adjacent districts, Taunton, Wells and adjacent districts (with the exception of Castle Cary, Milborne Port, Queen Camel), Yeovil.

Staffordshire.—Boroughs of Bilston, Lichfield, Stafford, Tamworth. Urban Districts of Aldridge, Amblecote, Cannock, Coseley, Kidsgrove and Biddulph, Leek, Rugeley, Stone, Tetterhall, Uttoxeter. Rural Districts of Cannock, Cheadle, Leek, Newcastle-under-Lyme, Lichfield, Seisdon, Stafford, Stone, Tutbury.

Suffolk East.—Boroughs of Eye, Lowestoft. Urban Districts of Bungay, Halesworth, Leiston, Stowmarket, Woodbridge. Rural Districts of Blyth (except Earl Soham, Peasenhall and Yoxford), Deben (except Orford and Otley), Gipping, Hartismere (except Stradbroke and Fressingfield), Lothingland (except Wanford and Wrentham), Samford.

Suffolk West.—Boroughs of Bury St. Edmunds, Sudbury. Urban Districts of Hadleigh, Haverhill, Newmarket. Rural Districts of Mildenhall, Thedwastre, Thingoe.

Surrey.—Boroughs of Beddington and Wallington, Godalming, Kingston-upon-Thames, Malden and Coombe, Mitcham, Surbiton, Sutton and Cheam. Urban Districts of Carshalton, Chertsey, Egham, Merton and Morden, Walton and Weybridge.

Sussex East.—Urban Districts of Burgess Hill, Newhaven. Crawley Development Area (Rural District of Cuckfield).

Sussex West.—Arundel, Billingshurst, Chichester, Cowfold, Crawley Development Area, Horsham, Lancing, Littlehampton, Petworth, Pulborough, Shoreham and Southwick, West Wittering.

Warwickshire.—Urban Districts of Kenilworth, Leamington Spa, Nuneaton, Rugby, Solihull, Stratford-on-Avon, Sutton Coldfield, Warwick. Rural Districts of Alcester, Meriden (with the exception of Hampton in Arden), Rugby, Tamworth, Warwick, Southam (Southam Rural District).

Westmorland.—Borough of Appleby.

Wiltshire.—Amesbury, Box, Calne, Castle Combe, Chippenham, Corsham, Cricklade, Devizes and Bourton, Downton, Highworth, Ludgershall, Malmesbury, Melksham, Purton, Ramsbury, Salisbury, Stratton St. Margaret, Swindon, Trowbridge, Upavon, Warminster, Westbury, Wilton, Wootton Bassett, Wroughton.

Worcestershire.—Districts of Bromsgrove, Droitwich, Evesham, Kidderminster, Knightwick, Oldbury, Pershore, Redditch, Stourbridge, Stourport-on-Severn, Tenbury, Upton-on-Severn, Worcester (Rural).

Yorkshire (East Riding).—Borough of Hedon and District. Borough and Rural Districts of Beverley, Bridlington. Urban and Rural Districts of Driffield. Rural District of Pocklington. South Holderness district, North and South Cave district, Market Weighton, Newport.

Yorkshire (North Riding).—Boroughs of Redcar, Scarborough, Thornaby-on-Tees. Borough and Rural District of Richmond (with the exception of Aldbrough St. John and Newsham). Urban and Rural Districts of Malton (except Hovingham and Welburn). Urban Districts of Eston, Guisborough, Loftus, Saltburn and Marske, Skelton and Brotton. Urban District of Scalen and Rural District of Scarborough. Rural Districts of Flaxton, Stokesley (except Hutton Rudby, Stokesley and Great Ayton).

Yorkshire (West Riding).—Borough of Batley and Urban District of Heckmondwike Brighouse and Urban Districts of Elland, Queensbury and Shelf. Borough and Rural District of Goole and Urban and Rural Districts of Selby. Borough of Pontefract, Urban Districts of Featherstone, Knottingley and Rural District of Osgoldgross. Borough of Pudsey, Urban Districts of Aireborough, Horsforth. Borough of Todmorden, Urban Districts of Hebden Royd, Ripponden, Sowerby Bridge, and Rural District of Hepton. Borough of Keighley. Borough of Morley. Urban and Rural Districts of Hemsworth; Penistone; Urban Districts of Hoyland Nether, Stocksbridge and Rural District of Wortley. Skipton and Urban Districts of Barnoldswick, Earby, Silsden. Urban Districts of Baildon, Bingley, Denholme, Shipley, Castleford, Normanton, Colne Valley, Denby Dale, Holmfirth, Kirkburton, Meltham, Garforth, Rothwell, Stanley, Mirfield, Spendborough, Rawmarsh, Swinton, Wath-upon-Dearne, Saddleworth, Maltby and Rural Districts of Kiveton Park Rotherham. Rural Districts of Bowland, Sedbergh, Settle, Nidderdale, Ripon and Pateley Bridge (with the exception of Kirkby Malzeard), Tadcaster, Wetherby, Thorne, Wharfedale.

England: County Boroughs

Barnsley, Barrow-in-Furness, Bath, Birkenhead, Birmingham, Blackburn, Bolton, Bootle, Bradford, Brighton (excluding Postal District No. 6), Bristol, Burnley, Burton-upon-Trent, Bury, Carlisle, Coventry, Croydon, Darlington, Derby, Dewsbury, Doncaster, Grimsby, Halifax, Huddersfield, Ipswich, Leeds, Leicester, Lincoln, Liverpool, Manchester, Middlesbrough, Newcastle-upon-Tyne, Northampton, Norwich, Oldham, Plymouth, Portsmouth, Preston, Reading, Rochdale, St. Helens, Salford, Sheffield, Southampton, Southend-on-Sea, Stockport, Sunderland, Tynemouth, Wakefield, Wallasey, West Ham, Wigan, Wolverhampton, Worcester, York.

Wales: Counties

Anglesey.—Urban Districts of Amlwch, Holyhead and Holyhead Island. Rural District of Twrcelyn (with the exception of Llanerchymedd). Rhosneigr (Valley Rural District).

Breconshire.—Brecon and district, Brynmawr and district, Cefn Coed and district, Crickhowell and district, Ystradgynlais with Abercrave, Cwmtwrch, and Pontneathvaughan.

Caernarvonshire.—Boroughs of Bangor, Pwllheli. Urban Districts of Llandudno, Llanfairfechan. Rural District of Gwyrfai (with the exception of Waenfawr).

Cardiganshire.—Tregaron.

Carmarthenshire.—Ammanford and Llandebie, Brynamman, Burry Port and Kidwelly, Cross Hands and Penygroes, Garnant and Glanamman, Llandilo, Llanelly, St. Clears.

Denbighshire and Flintshire.—Buckley Urban District, Caergwrle district, Chirk district, Connah's Quay Urban District, Flint Borough, Hawarden Rural District, Holywell Rural District (except Ffynnongroew), Mold Urban District, Overton Rural District (except Hanmer), Rhyl Urban District, Ruthin Rural District, St. Asaph Rural District (except Dyserth), Wrexham Urban and Rural Districts (except Holt) including Brynbo, Cefn Mawr, Coedpoeth, Garth, Gresford, Llay, Rhosllanerchrugog, Rossett, Ruabon, Summerhill, Trevor.

Glamorgan.—Boroughs of Barry, Port Talbot. Borough and Rural District of Neath. Urban Districts of Aberdare, Bridgend, Caerphilly, Gelligaer, Glyncorrwg, Llwchwr, Maesteg, Mountain Ash, Ogmore and Garw, Rhondda. Rural Districts of Llantrisant and Llantwit Fardre, Penybont, Pontardawe. Bishopston, Reynoldston (Gower Rural District), Rhiwbina, Whitchurch (Cardiff Rural District), Llanharan (Cowbridge Rural District).

Merionethshire.—Dolgelley, Blaenau Festiniog, Festiniog.

Monmouthshire and Newport.—County Borough of Newport. Urban and Rural Districts of Abergavenny, Monmouth (with the exception of Raglan), Pontypool. Urban Districts of Abercarn, Abertillery, Bedwas and Machen, Bedwellty, Blaenavon, Ebbw Vale, Mynyddislwyn, Nantyglo and Blaina, Rhymney, Risca, Tredegar. Rural District of Magor and St. Mellons.

Montgomeryshire.—Montgomery.

Pembrokeshire.—Fishguard and Goodwick, Haverfordwest, Milford Haven, Newcastle Emlyn (parts of the Pembrokeshire Executive Council's area adjacent to this district), Neyland, Pembroke, Pembroke Dock.

Wales: County Boroughs

Cardiff, Merthyr Tydfil, Swansea.

SCHEDULE III

Doubtful areas where additional doctors are not specifically needed and where each application must be carefully considered in the light of the position at the time.

England: Counties

Berkshire.—Urban and Rural Districts of Newbury, Windsor. Rural Districts of Cookham, Hungerford (with the exception of Lambourn).

Buckinghamshire.—Amersham, Haddenham.

Cheshire.—District of Altrincham.

Cornwall.—Bude, Falmouth, Liskeard, Lostwithiel, Padstow, St. Ives and Carbis Bay.

Cumberland.—Kirkbride, Silloth.

Devon and Exeter.—Appledore, Bideford and Northam, Barnstaple, Crediton, Cullompton, Okehampton.

Dorsetshire.—Bere Regis, Charmouth and Lyme Regis, Dorchester, Verwood, Wareham, Winfrith and Wool.

Durham.—Rural District of Weardale.

Essex.—Borough of Wanstead and Woodford.

Gloucester County and City.—Cheltenham, Charlton Kings, Cleeve Hill, and Prestbury. Marshfield, Newent and Corse, Stow-in-the Wold and Bourton-on-the-Water, Thornbury.

Hampshire.—Borough of Christchurch. Urban District of Fleet. Rural Districts of Alton, Hartley Wintney, Kingsclere and Whitchurch.

Herefordshire.—Cradley, Ledbury.

Hertfordshire.—Urban Districts of Barnet and East Barnet, Stevenage. Rural District of Hertford.

Isle of Ely.—Littleport.

Isle of Wight.—Ryde (with the exception of Seaview), Sandown, Shanklin and Brading, Ventnor.

Kent and Canterbury.—Boroughs of Beckenham, Folkestone, Hythe. Urban District of Southborough. Rural Districts of Hollingbourne, Swale, Tonbridge.

Lancashire.—Borough of Mossley.

Lincolnshire (Kesteven).—Sleaford.

London.—Boroughs of Chelsea, Hampstead, Holborn, Kensington, Paddington, St. Marylebone, Westminster.

Middlesex.—Borough of Hendon.

Norfolk.—Urban Districts of Cromer, Sheringham.

Northumberland.—Borough of Berwick-on-Tweed. Urban and Rural Districts of Alnwick. Rural Districts of Belford, Hexham.

Nottingham County and City.—Lowdham and district.

Oxford County and City.—Chipping Norton and district, Deddington and district, Goring-on-Thames, Henley-on-Thames.

Salop.—Chirbury.

Somerset.—Adjacent districts of Bridgwater (with the exception of Dunster, Minehead, Porlock, Stogumber, Williton). Adjacent districts of Taunton (with the exception of Dulverton). Weston-super-Mare and adjacent districts (with the exception of Nailsea, Wedmore, Yatton). Adjacent districts of Yeovil (with the exception of Churchinford, Ilchester, Ilminster, Curry Rivel, Langport, Long Sutton, Keinton Mandeville, Somerton).

Suffolk East.—Urban District of Felixstowe. Otley (Deben Rural District).

Suffolk West.—Rural Districts of Clare, Cosford.

Surrey.—Boroughs of Barnes, Epsom and Ewell, Guildford, Reigate, Richmond, Wimbledon. Urban Districts of Caterham and Warlingham, Coulsdon and Purley, Dorking, Esher, Farnham, Frimley and Camberley, Woking. Rural Districts of Bagshot, Dorking and Horley, Godstone, Guildford, Hambledon.

Sussex East.—Boroughs of Hove, Lewes. Urban Districts of East Grinstead, Portslade, Seaford. Rural Districts of Chailey, Hailsham, Uckfield.

Sussex West.—Bognor Regis, Harting and Rogate, Haslemere (area adjoining Surrey border), Henfield, Midhurst, Steyning.

Warwickshire.—Rural District of Shipston-on-Stour.

Westmorland.—Borough of Kendal. Urban District of Windermere (including Bowness-on-Windermere).

Wiltshire.—Marlborough.

Yorkshire (East Riding).—Urban District of Filey. Urban and Rural Districts of Norton. Beeford, Sherburn, Wetwang, Yedingham.

Yorkshire (North Riding).—Urban and Rural Districts of Northallerton, Pickering, Whitby (except Danby and Grosmont). Rural District of Startforth.

Yorkshire (West Riding).—City of Ripon. Borough of Harrogate and Urban District of Knaresborough. Urban Districts of Ilkley, Otley.

England: County Boroughs

Blackpool, Brighton (Postal District No. 6 only), Chester, Eastbourne, Hastings, Southport.

Wales

Anglesey.—Brynsiencyn.

Breconshire.—Builth and Llanwrtyd and district, Hay-on-Wye and Talgarth and district, Sennybridge and district.

Caernarvonshire.—Borough of Caernarvonshire, Conway and Llandudno Junction. Urban District of Bethesda.

Cardiganshire.—Aberystwyth, Llangeitho.

Carmarthenshire.—Carmarthen, Newcastle Emlyn, Pontyberem, Whitland.

Denbighshire and Flintshire.—Abergele Urban District, Conway Bay Borough, Dyserth (St. Asaph Rural District), and Prestatyn Urban District, Ffynnongroew (Holywell Rural District), Holt (Wrexham Rural District), Llanrwst Urban District.

Glamorgan.—Urban Districts of Penarth, Porthcawl.

Merionethshire.—Penrhyndeudraeth.

Monmouthshire and Newport.—Urban and Rural District of Chepstow (with the exception of Tintern). Urban District of Usk.

Montgomeryshire.—Caersws and Llanidloes, Cemmaes Road, Machynlleth and Aberilefenni, Llanfair Caereinion, Llanfyllin, Llansantffraid and Penybontfawr, Newtown, Welshpool.

Pembrokeshire.—Narberth, Saundersfoot, Tenby.

SCHEDULE IV

Closed areas where the number of doctors is considered to be adequate.

England: Counties

Bedfordshire.—Bedford Rural District: Harrold, Riseley, Sharnbrook, Turvey.

Berkshire.—Brightwalton (Wantage Rural District), Lambourn (Hungerford Rural District).

Buckinghamshire.—Brill, Long Crendon, Chalfont St. Giles, Chalfont St. Peter, Gerrard's Cross, Seer Green, Great Missenden, Prestwood, Hambleden, Horsley Green, Stokenchurch, Beaconsfield.

Cheshire.—Districts of Hoylake and West Kirby, Knutsford and Wilmslow (with the exception of Lymm), Bollington (Macclesfield district), Carrington (Sale district), Helsby (Runcorn district), Hollingworth (Dukinfield, Hyde, and Stalybridge district), Mottram (Dukinfield, Hyde, and Stalybridge district).

Cornwall.—Boscastle, Cawsand, Constantine, Constantine Bay, Downderry, Fowey, Hayle, The Lizard, Marazion, Mevagissey, Millbrook, Mullion, Pensilva, Perranarworthal, Polyphant, Rock, Ruanhighlanes, St. Agnes, St. Germans, St. Keverne, St. Mawes, St. Stephens, Tintagel, Townshend, Tywardreath, Upton Cross, Wadebridge, Widemouth Bay.

Cumberland.—Aiston, Bootle, Caldbeck, Dalston, Gosforth and Ravenglass, High Hesket, Keswick, Kirkoswald, Millom, Rowrah.

Derbyshire.—Borough of Buxton. Urban District of Whaley Bridge.

Devon and Exeter.—Ashburton, Bampton, Beer, Bere Alston, Bishopsteignton, Black Torrington, Bovey Tracey and Lustleigh, Bow, Bradninch, Bradworthy, Braunton (including Croyde Bay), Brixham, Broadclyst, Buckfastleigh, Budleigh Salterton, Chagford, Cheriton Fitzpaine, Chillington, Chudleigh, Chulmleigh, Clayhidon, Colyton and Seaton, Combe Martin, Culmstock, Dawlish, Dunsford, Exmouth, Halberton, Hartland, Hatherleigh, Hemyock, Hittisleigh and Cheriton Bishop, Holsworthy, Honiton, Hope Cove, Kingskerswell and Ipplepen, Lifton and Lewdown, Lympstone, Lynton and Lynmouth, Modbury, Morchard Bishop, Moretonhampstead, Newton Ferrers and Yealmpton, North Tawton, Ottery St. Mary, Paignton, Pinhoe, Roborough, Salcombe, Sampford Peverell, Seaton, Shaldon, Shebbear and Beaworthy, Sidmouth and Sidbury, South Brent, Starcross, Tamerton Foliot, Teignmouth, Tipton St. John, Torrington, Totnes, Uffculme, Umberleigh and Winkleigh, Whimple, Witheridge, Woodbury, Yelverton.

Dorsetshire.—Abbotsbury, Bourton and Gillingham, Broadstone, Buckland Newton and Cerne Abbas, Child Okeford, Corfe Castle, Cranborne, Evershot, Ferndown and West Moors, Handley and district, Maiden Newton, Marnhull and district, Milton Abbas and Winterborne Stickland, Puddletown, Stalbridge, Sturminster Newton, Swanage, Yetminster.

Durham.—Barnard Castle Rural District: Gainford, Middleton-in-Teesdale. Sedgefield Village and Stillington (Sedgefield Rural District).

Essex.—Urban Districts of Brightlingsea, Frinton and Walton, West Mersea. Great Bentley, St. Osyth, Thorpe-le-Soken (Tendring Rural District).

Gloucester County and City.—Blockley, Chipping Campden, Mickleton and Moreton-in-Marsh, Frampton-on-Severn, Lechlade and Fairford, Minchinhampton, Brimscombe and Nailsworth, Pilning, Ruardean, St. Briavels, Tetbury.

Hampshire.—Borough of Lymington.

Herefordshire.—Eardisley, Kington and district, Leintwardine, Pembridge, Weobley, Whitchurch.

Hertfordshire.—Rural District of Elstree (including Boreham Wood). Garston district (Borough of Watford).

Huntingdonshire.—Alconbury Weston, Buckden.

Isle of Ely.—Manea.

Isle of Wight.—Bembridge, Freshwater, Totland and Yarmouth, Niton, Seaview, Shorwell.

Isles of Scilly.—Isles of Scilly.

Kent and Canterbury.—Boroughs of Lydd, Sandwich, Tenterden (with the Rural Districts of Cranbrook and Tenterden), Tunbridge Wells. Urban Districts of Broadstairs and St. Peters, Herne Bay, Sevenoaks. Rural Districts of Ashford (East), Ashford (West), Dover, Romney Marsh and Borough of New Romney, Sevenoaks. St. Paul's Cray, St. Mary's Cray.

Lancashire.—Borough of Lytham St. Annes. Urban Districts of Carnforth, Grange-over-Sands, Preeshall. Bleasdale (Garstang Rural District), Broughton West (Ulverston Rural District), Coniston (Ulverston Rural District), Freckleton (Fylde Rural District), Hawkshead (Ulverston Rural District), Kirkby Ireleth (Ulverston Rural District), Lower Allithwaite (Ulverston Rural District), Lowick (Ulverston Rural District), Pilling (Garstang Rural District), Stalmine-with-Staynall (Garstang Rural District).

Leicestershire and Rutland.—Hallaton, Market Overton, Peatling Magna, Somerby, Uppingham.

Lincolnshire (Holland).—Gedney Hill (East Elloe Rural District).

Lincolnshire (Kesteven).—Bassingham, Billinghay, Castle Bytham, Colsterworth, Corby, Dunston, Folkingham, Heighington, Horbling, Long Bennington, Martin, Metheringham, Rippingale, Ropsley, Ruskington, Woolsthorpe.

Lincolnshire (Lindsey).—Urban Districts of Mablethorpe and Sutton-on-Sea, Market Rasen, Woodhall Spa. Bardney (Welton Rural District), Burgh-le-Marsh (Spilsby Rural District), Dunholme (Welton Rural District), Hogsthorpe (Spilsby Rural District), Immingham (Grimsby Rural District), Keelby (Caistor Rural District), Newton-on-Trent (Gainsborough Rural District), Revesby (Horncastle Rural District), Tetford (Horncastle Rural District), Thoresby North (Louth Rural District), Wainfleet (Spilsby Rural District).

Middlesex.—Borough of Finchley.

Norfolk.—Borough of Thetford. Urban Districts of Diss, Hunstanton (New), Wells-on-Sea. Rural District of Freebridge Lynn.

Northamptonshire.—Blisworth and Roade, Brixworth, Bugbrooke and Kislingbury, Byfield and Woodford Halse, Cold Ashby, Crick and West Haddon, Earls Barton, Flore, Guilsborough, Islip, Long Buckby, Moulton, Raunds, Weedon, Welford, Yardley Hastings.

Northumberland.—Rural District of Rothbury.

Nottingham County and City.—Carlton-on-Trent, Colston Bassett, North Collingham, North Leverton, Tuxford.

Oxford County and City.—Bampton and district, Burford and district, Chinnor, Little Milton and Thame, Shipton-under-Wychwood.

Salop.—Clun.

Somerset.—Castle Cary, Churchinford, Curry Revil, Dulverton, Dunster, Keinton Mandeville, Ilchester, Ilminster, Langport, Long Sutton, Milborne Port, Minehead, Nailsea, Porlock, Queen Camel, Somerton, Stogumber, Wedmore, Williton, Yatton.

Staffordshire.—Rural District of Uttoxeter.

Suffolk East.—Boroughs of Aldeburgh, Southwold. Urban District of Saxmundham. Earl Soham, Peasen Hall, Yoxford (Blyth Rural District), Orford (Deben Rural District), Stradbroke and Pressingfield (Hartismere Rural District), Wangford and Wrentham (Lothingland Rural District).

Suffolk West.—Rural District of Melford.

Surrey.—Urban Districts of Banstead, Haslemere, Leatherhead.

Sussex East.—Borough of Bexhill. Urban and Rural Districts of Cuckfield (including Haywards Heath but with the exception of the Crawley Development Area). Urban District of Rye. Rural District of Battle.

Sussex West.—Angmering, Rustington and East Preston, Barnham, Eastergate and Yapton, Loxwood, Rudgwick and Slinfold, Selsey, Storrington, Worthing.

Warwickshire.—Rural Districts of Southam (except Southam), Stratford-on-Avon. Hampton-in-Arden (Meriden Rural District).

Westmorland.—Ambleside, Arnside, Brough, Glenridding, Grasmere, Kirkby Lonsdale, Kirkby Stephen, Milnthorpe, Orton, Shap, Staveley, Temple Sowerby.

Wiltshire.—Aldbourne, Bradford-on-Avon, Broadchalke, Burbage, Codford St. Mary, Fovant, Great Bedwyn, Hindon, Lacock, Market Lavington and Littleton Panell, Mere, Pewsey, Sherston, Shrewton, Sutton Benger, Tisbury, Whiteparish.

Worcestershire.—Districts of Hundred House, Malvern.

Yorkshire (East Riding).—Rural District of Howden. Urban District of Hornsea. Bubwith, Elvington, Escrick, Holme-on-Spalding-Moor, Leven, Middleton-on-the-Wolds, Rillington, Roos, Stamford Bridge.

Yorkshire (North Riding).—Rural Districts of Aysgarth, Bedale, Easingwold, Helmsley, Kirby Moorside, Leyburn, Masham, Reeth, Thirsk, Wath. Aldbrough St. John and Newsham, Danby and Grosmont, Great Ayton, Hutton Rudby and Stokesley, Hovingham and Welburn.

Yorkshire (West Riding).—Kirkby Malzeard (Ripon and Pateley Bridge Rural District).

England: County Borough

Bournemouth.

Wales: Counties

Anglesey.—Borough of Beaumaris. Urban Districts of Llangefni, Menai Bridge. Rural Districts of Aethwy with the exception of Brynsiencyn), Valley (with the exception of Holyhead Island and Rhosneigr). Llanerchymedd.

Caernarvonshire.—Urban Districts of Bettwys-y-Coed, Criccieth, Penmaenmawr, Portmadoc. Rural Districts of Lleyn, Nant Conway, Waenfawr (Gwyrfai Rural District).

Cardiganshire.—Aberayron, Borth, Cardigan, Crosswood, Henllan, Lampeter, Llandyssul, New Quay, Pontrhydygroes.

Carmarthenshire.—Caio, Conwil Elvet with Abernant and Newchurch, Drefach and Tumble, Ferryside, Llandovery, Llangadock, Llanybyther, Nantgaredig, Pontyates, Trimsaran. Areas immediately adjacent to Henllan and Lampeter in the Cardiganshire Executive Council's area.

Denbighshire and Flintshire.—Cerrigydruidion, Glynceiriog, Hanmer (Overton Rural District), Llanfairtalhaiarn, Llangollen Urban District, Llanrhaiadr-ym-Mochant.

Glamorgan.—Borough and Rural District of Cowbridge (with the exception of Llanharan). Rural District of Cardiff (with the exception of Whitchurch and Rhiwbina). Glamorgan Rural District: Llanmorlais, Penclawdd.

Merionethshire.—Aberdovey, Bala, Barmouth, Corris, Corwen, Harlech, Towyn.

Monmouthshire and Newport.—Urban District of Caerleon. Raglan (Monmouth Rural District), Tintern (Chepstow Rural District).

Pembrokeshire.—Boncath, Maenclochog, Newport, St. Davids, Solva, Trecwn.

Radnorshire.—Whole of County.

GENERAL MEDICAL SERVICES COMMITTEE

THE INQUIRY INTO REMUNERATION

An all-day meeting of the General Medical Services Committee was held on July 27. The Committee extended its congratulations to its chairman, Dr. Wand, on his election as deputy chairman of the Representative Body, and expressed its appreciation of the way in which he had presented the Committee's work to the Annual Representative Meeting.

Dr. Hutchinson drew attention to a film, "The Birth of a Baby," which was being sponsored by the Ministry of Health and in which, it was stated, there was a bias against the participation of the general practitioner in maternity work. The Committee resolved to approach the Chief Medical Officer of the Ministry on the subject and also to protest to a newspaper concerning a statement in its columns.

The chairman reported that representations had been made to the Ministry concerning the incidence of the petrol tax, but no satisfaction had been obtained except that it had been promised that in the inquiry into practice expenses allowance would be made for any material increases in the items making up expenses.

The Committee considered the resolutions of the recent Special Conference concerning remuneration, especially the instruction to make preparation for the termination of contracts to take effect should there be no prospect of a satisfactory settlement of the practitioners' claim. The many aspects of this matter, including the percentage of resignations which was to be judged effective, were considered. It was agreed that the British Medical Guild should be the central machinery, working through local Medical Guild committees, which would be expected for the purpose of this dispute to be adequately representative of the membership of the local medical committees. Three additional members were appointed from the General Medical Services Committee to the Guild Executive.

The Problem of Inflation

A letter from the Ministry was reported stating that, like the profession, it was anxious to deal with the problem of inflation and to arrive at the true number of people on doctors' lists. The Ministry was by no means satisfied that this amounted to as much as 95% of the population. The representative of Northern Ireland on the Committee produced figures from his area, where there was no possibility of overlapping, showing that doctors' lists comprised 97.5% of the population. He believed that for a large proportion of the remaining 2.5% the doctors were also at risk. The chairman said that this authenticated figure from Northern Ireland was most valuable. His own impression was that in many areas up to 99% were on the lists. The Leeds representative said that in his city 496,997 out of a population of 503,500 (about 98.7%) were on the lists.

The Committee had before it the Ministry's "first thoughts" on the scope of the inquiries into remuneration and practice expenses. Dr. Wand said that the immediate reaction of the representatives of the Committee when the Ministry's plan was divulged to them was that the year 1949, the figures for which it was proposed to take as the basis of the calculations, was one with a large background of private practice receipts, as well as certain other extra receipts, including a settling-up cheque for National Health Insurance. As the purpose of the inquiry was to determine the net remuneration for, say, 1951, it was important that no item should be included which would not in fact come into remuneration for that year.

On the other aspect of the inquiry, concerning practice expenses, again, a number of points arose. The first was petrol tax and perhaps other impositions which would be an extra expense in 1951 but would not be shown in the 1949 figures. He mentioned also house repairs and other considerations. Care must be taken that this inquiry, which might determine remuneration for some time to come, was not loaded against the doctor from the beginning. The need for all reasonable speed in arriving at the results of the inquiry had also been impressed on the Ministry.

It was pointed out in the Committee that all that was really necessary was to bring the Spens figures up to date. If the Ministry wanted to include any factor over and above what was taken into consideration in arriving at the Spens figure it was for the Ministry to prove the necessity for it.

The Committee appointed six of its members, headed by Dr. Wand, to go into immediate consultation with the actuary and income-tax assessor acting on their behalf, and also to ask Professor Bradford Hill for his comments, as it was upon his computations that the Spens figures were established, the same body to meet the officials of the Ministry early in the following week.

Health Centres

An interim report from the Health Centres Subcommittee was brought forward. This subcommittee was appointed to consider the position of doctors in areas where a health centre was contemplated. It had held seven meetings at which detailed consideration had been given to a number of important points, including the method of selection and mode of entry to practise in a health centre, co-operation between the practising doctors, and existing practice liabilities.

In discussion in the full Committee questions were raised concerning rents of premises, and the principle was put forward that a doctor going into a health centre should not be called

upon to pay a rent, but, on the other hand, he should not be subsidized in this respect as compared with his colleagues outside. The interim report was accepted for reference to Council, the Committee giving authority, pending Council's approval, for the document to be used as a basis for any advice or action which might be necessary.

The question of change of doctor was the subject of correspondence which appeared on the agenda. The Ministry had drafted certain documents dealing, among other matters, with the introduction of a waiting period before change of doctor could take place. One point to which the Committee took exception was in a draft E.C.N. for issue to doctors which stated that "the procedure for immediate transfer of persons to the successor of a doctor who has died or retired, subject to the person's right to choose another doctor at any time, remains unchanged in all cases." The words "at any time" were replaced by "within one month," and with this modification the documents were approved.

Attention was drawn to the appearance of advertisements offering positions of trainee assistant at salaries in excess of the amount allowed by the Government to a principal for employing a trainee assistant. The Assistants Subcommittee was of opinion that such augmented salaries were undesirable, and that practitioners should be required to adhere to the allowance made by the Government for this purpose. After a brief discussion the Committee argeed to recommend to the Council that advertisements of the kind to which objection was taken on this ground should not be accepted by the *British Medical Journal*.

The Committee considered a memorandum, referred to it by the Central Consultants and Specialists Committee, on the appointment of registrars. The dangers of inbreeding, whereby registrars had difficulty in getting appointments outside their own hospital area, were regarded by the General Medical Services Committee as a matter for concern.

In its long session the Committee considered, among a multitude of other matters, ways and means of effecting economy in prescribing, basic salaries, maternity medical services, the protection of practices in a national emergency (the committee originally appointed on this subject being asked to look at it again in the light of the new international situation), the arrangements for the remuneration of doctors when assisting dentists, and the "mileage" question as affecting doctors called to lighthouses. It is proposed to divide lighthouses into those easily accessible (for which £2 per visit should be paid) and others (£5 per visit), but no payment beyond ordinary mileage would be made in the case of lighthouses which are in a centre of habitation.

IRISH MEDICAL ASSOCIATION

PRESIDENTIAL ADDRESS

Dr. P. T. O'Farrell was elected president of the Irish Medical Association on July 5, and delivered the presidential address. After paying tribute to the work of the previous president, Dr. Patrick Moran, and to his predecessors, Dr. O'Farrell said that they realized social medicine played an important part in the betterment of the people's health and that as individuals they could not always give an efficient service without some form of State aid, particularly in the province of preventive medicine. "But," he said, "we do resent State interference in professional matters until we have been properly consulted as an association." While this promise had been given to them, it had not always been honoured to their satisfaction. They deprecated a form of controlled medicine which believed in exerting authority before acquiescence. In particular they feared a general extension of State medicine which would make them Civil Servants subservient to a soulless and oppressive bureaucracy.

Modern Governments seemed to have little regard for the niceties of moral obligations, and by a form of insidious propaganda and political clamour were able to make the people subservient to what Lord Horder called "a doctrinaire Socialistic adventure." If freedom was threatened, they must be prepared to show the people that State-controlled medicine might be not only bad but sometimes pernicious. To disrupt the doctor-patient relationship could not commend itself to anyone who gave reasonable thought to the subject. The best of medicine should be made available to all citizens, but this did not imply that everyone should be treated free. On both practical and moral grounds they must reject the concept of an exclusive State responsibility for the health and well-being of their people.

Modern medicine was an expensive business not easily borne by a large section of the population, and for that particular group they welcomed some limited form of State aid, provided liberty of action was allowed in the practice of their profession. In pursuance of this policy, they reaffirmed their willingness to work in close collaboration with Government Departments. Their Association had submitted a carefully considered scheme for an improved health service, but it seemed to have been pigeonholed. Acceptance of help should not necessarily entail unquestioned acceptance of authority. When there were differences of opinion between State Departments and the profession, hasty tempers should not be aroused, for peaceful solutions were often better than the enforcement of policies not freely acceptable.

General Practice

The keystone of any form of medical service depended in the first instance on the general practitioner, whom Osler had rightly called the "flower of the profession." The general practitioner should be encouraged in every way, and there was no reason why private practice should not be continued side by side with health services organized by the State.

The association did not approve of the principle of a free medical service for those who could afford to pay. If they accepted it, then private practice would to a great extent disappear. There was, however, a public demand for an extension of the present State health service which they would not wish to oppose. Accordingly they must be prepared to arrive at some kind of reasonable understanding. But they could not agree to a complete State control of the profession. No State medical service could ever be satisfactory or work efficiently without the co-operation and good will of the profession. To get this co-operation some fundamental principles must be conceded—namely, free choice of doctor whenever possible, professional secrecy at all times, and adequate remuneration for services rendered. They must also guard against the dangers of overwork.

On the surface the relations of the association with the Ministry of Health might appear to be somewhat strained, but they assured the Minister of their willingness to co-operate in every way they could, for they respected the good work that he had already done. It should be possible by friendly negotiation to smooth out various differences to achieve the common aim of bringing to the people the best of medicine.

In conclusion he touched on affairs of a more domestic nature. Their relations with the B.M.A., he said, were of a most cordial kind, and they had received much guidance and assistance from B.M.A. Headquarters. At the same time the B.M.A. fully acknowledged the complete independence of the Irish Medical Association, the new name which had recently been agreed upon.

Corrections

In our report of the Annual Representative Meeting (*Supplement*, July 22) under "General Medical Services (Resumed)" at p. 51, we mistakenly reported Dr. H. F. Moffit as having made a speech which was in fact made by Dr. J. A. Pridham.

Under "Elections to Council," in the report of the Meeting, the term of office for which Surgeon Vice-Admiral Sir Sheldon Dudley was elected should have been recorded as 1949–52, not 1949–50.

HOSPITAL COST ACCOUNTING

The Ministry of Health has sent to hospital boards and committees a circular describing an interim scheme of accounting. It is intended for use as from April 1 this year, the main object being to provide reliable information for the purpose of estimates and financial control. While all hospitals must use the system outlined, they are left free to undertake further cost analyses as may be practicable within the present limitations on the appointment of additional staff.

PROBLEMS OF ASSISTANTS

A special subcommittee appointed to consider the various problems of assistantships in general practice under the National Health Service has recently completed its task and reported to the General Medical Services Committee. The subcommittee included a number of practitioners who are engaged as assistants in the N.H.S., and many suggestions and comments sent in by assistants were carefully considered. A report will be discussed by the Annual Conference of Local Medical Committees in October.

Since there has been little opportunity for assistants to make their views known on the various committees of the Association, it has been decided that, in order that the various problems affecting assistants can be brought to light and examined, the subcommittee should form part of the permanent structure of the G.M.S. Committee. It will of course be necessary to change the assistant members of the subcommittee from time to time.

TOILET PREPARATIONS

RECOMMENDATIONS OF COMMITTEE

The Definition of Drugs Joint Subcommittee (chairman, Sir Henry Cohen) of the Central and Scottish Health Services Councils has now issued its report on the classification of toilet preparations. The Committee states that, as in the case of foods, decisions on classification must to some extent be arbitrary, but it lays down the following general principles:

It is unethical for a doctor to order a preparation of undisclosed composition. Attention may also be directed to Section 11 of the Pharmacy and Medicines Act, 1941, which requires that the composition of any articles sold "recommended as a medicine" shall be clearly stated on the label. Preparations of undisclosed composition should therefore not be ordered on Form E.C.10.

Preparations normally used for toilet purposes should not be ordered on Form E.C.10 even though their composition is disclosed and even though they are included in the *British Pharmacopoeia* or *British Pharmaceutical Codex*.

(i) The following are to be regarded as being covered by the phrase "preparations normally used for toilet purposes": astringent lotions, bath salts, cold creams, face powders, hair tonics, hand creams, shampoos, shaving creams, shaving soaps, shaving styptics, skin lotions, soaps, toothpastes, tooth powders, talcum powders, vanishing creams, and similar preparations.

(ii) The following are examples of preparations coming within this category which are included in the *British Pharmaceutical Codex*: Cologne spirit, ointment of rose water, paste of stearic acid, paste of hamamelis.

Certain proprietary preparations for which prophylactic or therapeutic claims are made should not normally be ordered on Form E.C.10 if they may be used for routine toilet purposes. A doctor who prescribes such preparations may be required to justify his action to the local medical committee if he is to avoid being surcharged with the cost of the preparation. The following proprietary preparations are in this category: toilet preparations of alleged prophylactic value, such as anti-midge and barrier creams; toilet preparations which are vehicles for some form of medicament, such as medicated soaps; toilet preparations for use by persons susceptible to allergic or trophic skin reactions.

Correspondence

Doctors and Hospital Management Committees

SIR,—Whilst all must agree with the firm stand taken at the A.R.M. about the action which the Ministry is taking to reduce the medical membership of management committees, seeing that such membership is part of the agreement made with the profession, it seems to me that it is time for us to pause and think whether the presence of doctors on these committees is really an advantage or a source of strength to the profession. A wholly lay management committee now, in the same way as the lay boards of governors in the past, could hardly afford to neglect the advice sent to it by a medical committee. It might ask for modification or further discussion but could never entirely ignore it, and we know that this method of hospital government has stood the test of time and was most satisfactory to both sides, administration and medical. However, have only one medical man on the management committee and the whole complexion of things is altered. Recommendations from medical committees can then be discussed by the lay members, who can bring their medical colleague into the discussion, and it would be a most unusual person who, in this position, would never give an opinion as a doctor but would always weigh the evidence impartially and as a layman. And if he is not so disposed he can obviously wield more power than his professional brethren who do not happen to be present. And a lay committee so fortified may, and often will, feel in a strong enough position to refuse a request or recommendation which has been made after careful consideration by a medical advisory or staff committee. It is certain that doctors will never be granted such a number of seats on these committees that their voting-power would be a justification for the retention of the right of membership, and it seems unlikely that the principles of democracy will ever be put into practice so that the medical members could be elected by the vote of their colleagues. Moreover, it is rapidly becoming the custom for the local M.O.H. to be elected to membership by nomination of the local authority, so that the present small medical membership is often further weakened by one who has the mind of an administrator and loyalty only to those whom he represents.

It would be a pity if, in order to retain what are our undoubted rights, which are admittedly in danger of being whittled away, we sought to perpetuate an arrangement which is not to our advantage, places those doctors who are elected to, or are placed on, management committees in a difficult position, and, finally, weakens the power of the medical advisory and staff committees. Rather, I feel that our power and the salvation of the hospital services rest in the reinstatement of the old order of lay management committee and medical advisory committee. I would go further and say that the latter committee should be composed of the senior hospital staff committee-members plus a sufficient number of general practitioners and other doctors (e.g., public health M.O.s, etc.), to give the latter adequate voting power.

Abolition of medical membership on management committees is a loss which the profession can well afford to cut.—I am, etc.,

Swindon. GUY ROWORTH.

Status of General Practice

SIR,—Permit me to express my entire concurrence with the views expressed in Dr. R. E. Clarke's letter (*Supplement*, July 8, p. 25). Might we please hear rather less about the alleged shortcomings and incompetence of the modern general practitioner? It is nauseating to note the Pharisaical smugness with which suggestions for refresher courses, additional postgraduate study, and what not are advocated for the G.P. with such readiness and assurance by anyone not engaged in general practice.

To me it would appear that the present policy of the B.M.A. is to lend colour to the prevalent suggestions that the G.P. of to-day is an ignorant, inefficient, and antiquated individual from whom the darling public must be protected at all costs, and our interests are not best served at the present time by appointing a special committee to inquire into our future training and education, etc.

I sincerely wish that the same zeal would be displayed in appointing a special committee to inquire into and to make practical suggestions for the immediate remedy of the innumerable injustices and often intolerable working conditions under which the G.P. labours, including among other things a long overdue and sane revision of the hours which he is expected to work in relation to his miserable remuneration. What about a special committee to re-educate the public in these matters first?

Furthermore I am appalled at the proposed extension of disciplinary powers of the B.M.A. to include publication in the *British Medical Journal* of expulsion together with relevant facts in the matter of a doctor who in future shall fall from grace. Whatever the merits of the case, the B.M.A. exists primarily to protect the doctor's interests, and if it appears to have an indifferent record in this respect it will at least be expected to refrain from kicking a man who is down.

Article 11 might possibly serve a useful purpose yet if only it arouses practitioners from their apathy and brings them to a full realization of the position into which they are drifting. I, for one, will certainly resign without regrets from membership of the B.M.A. on the same day that it comes into operation.—I am, etc.,

Skelmersdale, Lancs. J. A. BELL.

A.R.M. Correction

SIR,—I was surprised when reading the *Supplement* of July 22 to find you report on p. 52 that "Dr. T. Rowland Hill (Marylebone) moved to add certain words. . . ." This, Sir, was moved by Mr. Lawrence Abel, not Dr. Rowland Hill.

I am therefore not surprised to find that your reporter completely missed the point when I addressed the Representative Meeting. I did say that a group of well-known but Socialist-minded people in the South-west Metropolitan Hospital Regional Board had verbally threatened to bring in a whole-time Service within two years. I also mentioned that G.P. specialists would be limited in the number of their sessions by the number on their executive lists irrespective of partnerships, etc.

Whereas I do appreciate that you cannot possibly report on each individual speech, nevertheless important parts should be mentioned instead of the smallest. If you get the names of important men mixed up, how can we take any of it as being a true and reliable report of the meeting?—I am, etc.,

LESLIE GIBBONS,
Hon. Sec., Reigate Division.

*** We regret the mistake which our correspondent refers to, which was due to the great speed with which the reports have to be prepared on these occasions. The words were moved by Mr. Lawrence Abel and seconded by Dr. T. Rowland Hill.—ED., *B.M.J.*

The G.P.'s Job

SIR,—So Lord Quibell thinks that we must do a better job of work before becoming entitled to an increase in pay. He quite obviously has no idea of the amount of work we are doing. If he takes the trouble to read the statistics of disease, infant and maternal mortality, etc., perhaps he could tell us just where we are lacking.

He says that the work of hospital out-patient departments "has increased out of all reason." Of course it has. Our patients are always demanding to be sent to hospital, and we have not the time for a full and complete investigation ourselves.

Could he let us have a list of those "trifling" cases that we are supposed to send to hospital "automatically"? At the same time he could list those doctors who are "not doing the work they are paid to do."

Has he made this statement with the knowledge and approval of the Minister, in which case he is hardly likely to obtain very much co-operation from us? Or are we faced with another case of the tail wagging the dog?

Would Lord Quibell be willing to tell us what his employment was prior to his elevation to the House of Lords, what his remuneration was, and also his hours of work? If we knew this we could perhaps assess the true value of his lordship's opinion and statements.—I am, etc.,

Coventry. JOHN HALE POWER.

Independent Court of Arbitration

SIR,—In the leading article in the *Journal* of July 29 (p. 256) you draw attention to the fact that the A.R.M. at Southport turned down a motion which called for an *independent* court of arbitration. Your readers may well ask why. They may seek the answer in the accurate report of the debate in the *Supplement* of July 22. I think they will find the answer very inadequate. Dr. Breach, supporting the motion, thought that the public would consider it quite reasonable for the profession to claim the right to refer disputes to arbitration. Dr. Gorsky, also supporting the motion, said that, with the spread of public services, there was a strong case for reconsidering the method of settling differences in which the Minister was a party to the dispute as well as the judge.

Dr. Wand opposed the Guildford motion because he maintained that it would embarrass those who were carrying on negotiations for general practitioners. Dr. Wand (who for the moment held the meeting in the hollow of his hand) succeeded in having this important motion rejected. Now that the heat of debate has passed, perhaps Dr. Wand will tell your readers in more detail why he took the grave responsibility of opposing a demand for independent arbitration, especially in view of the imminence of compulsory arbitration stated so clearly by Dr. Charles Hill. I trust that general practitioners will never agree to compulsory arbitration.

The object of the Guildford motion was to suggest arbitration with the consent of both parties, consent with regard to the constitution of the court and the terms of reference. Should we offer to accept such independent arbitration instead of withdrawal, resignation, termination of contracts, instead of a "strike," we should be offering to accept what is spoken of in international relations as "the rule of law." America and Britain, with other powers, are defending that principle at this very hour.—I am, etc.,

West Clandon, Surrey. C. P. WALLACE.

Association Notices

ADJOURNED A.R.M., 1950

The Adjourned Annual Representative Meeting, 1950, will be held at B.M.A. House, London, W.C.1, on Thursday, September 28. The Meeting will begin at 9.30 a.m., and it is expected that the business will be completed in one day.

A.R.M., 1951

On behalf of the Council, the Chairman of Council, in consultation with the Chairman of the Representative Body, has decided to convene the Annual Representative Meeting, 1951, in the week immediately preceding the departure for South Africa of those travelling by sea to attend the Joint Meeting with the Medical Association of South Africa in Johannesburg. The decision has been taken now because of the expected difficulty of obtaining hotel accommodation in London at short notice during the Festival of Britain next year.

The A.R.M., 1951, will be held at B.M.A. House, London, W.C.1, and will begin on the morning of Wednesday, June 13, and continue until Saturday, June 16.

CHARLES HILL,
Secretary.

Diary of Central Meetings

30 Wed. General Practice Review Committee, 2 p.m.

H.M. Forces Appointments

COLONIAL MEDICAL SERVICE

The following appointments have been announced: J. Taylor, M.B., D.T.M.&H., D.P.H., Senior Medical Officer, Seychelles; H. T. Laycock, M.B., F.R.C.S., A. McD. Allan, M.B., C. G. I. Gordon, M.D., and T. K. Sweeney, M.B., Medical Officers, Tanganyika; I. E. Dawson, M.B., Medical Officer, Kenya; W. Dering, M.D., Medical Officer, Somaliland Protectorate.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY AUGUST 12 1950

THE WAY DIVIDES*

BY

FRANK GRAY, M.B., B.Chir.

There is abundant evidence both that something is wrong and is felt to be wrong by a very large number of general practitioners. For many months past it has been impossible to open the *Journal* without finding articles or letters of complaint. Other publications have also provided evidence—not always so reliable. Apart from the question of finance, which is receiving the fullest consideration elsewhere, the chief trouble appears to have been accentuated and displayed, but not originated, by the National Health Service Acts. It is the question of status. It also seems, at any rate at first sight, that there is a remarkable degree of unanimity on the remedy—the association of general practitioners with hospitals.

It is always a wise rule in our profession to take nothing for granted, and I am going to ask you to look at this question more closely. Perhaps you will agree that we should take this problem of medicine as a medical problem. What is the complaint? It appears to be fivefold: the general practitioner complains of (1) inadequate time to do his work properly; (2) excessive clerical work; (3) the demands of his patients—unnecessary and unreasonable; (4) being a signpost; (5) the nature of his clinical work—the trivial cases.

No prolonged examination is required here. All will probably agree on the facts, though perhaps some are already beginning to wonder just how the "hospital remedy" is going to meet this situation. On the actual complaints I think we shall also agree:

(1) That the general practitioner must have more time, though precisely how he uses that time is another matter.

(2) That unnecessary clerical work must be cut out, though there is a certain irreducible minimum which the general practitioner must do himself.

(3) That the general practitioner must have some protection against the unreasonable patient, though he must also do something to protect himself. It is plain, from the experience of many, that to pay Danegeld by giving the patient everything she asks for has one inevitable result—to bring her back asking for more.

(4) A signpost may not be an object of beauty, but it has an essential function to perform. Moreover, in our profession skilled guidance is very necessary: witness the unfortunate results to some who have strayed to Harley Street without it.

(5) That the bulk of the general practitioner's cases are trivial ones. Here we come to the crux of the problem. Most have known this for years, but it has recently been discovered by a Committee of the B.M.A. to the astonishment of their consultant members. Yet this Committee—on "General Practice and the Training of the General Practitioner"—having made this discovery, can only go on to suggest the usual remedy—more association with hospitals. So we must turn to study this remedy, bearing in mind that the majority of the general practitioner's cases are trivial, and also two other platitudes—for it is platitudes that are most often overlooked—(*a*) There are only twenty-four hours in the day, and (*b*) The general practitioner has no financial interest in the ill-health of his patients (in the vast majority of cases).

Characteristics of Hospital Medicine

What are the chief characteristics of hospital medicine? Though there are always exceptions—in individual hospitals and consultants, and to some extent in certain branches of medicine—the general characteristics would appear to be as follows:

(1) The answers we get depend on the questions we ask, and the question asked at hospitals is, What is wrong with this patient?—the answer almost invariably being expressed in physical terms. Sometimes the further question is asked, How did the patient get this illness? but never, Why has this patient got ill at all? Always what, sometimes how, never why. In this lack of inquiry and limited outlook hospital medicine shows itself to be unscientific.

(2) In confining itself to physical phenomena it is based on a system of philosophy long since discarded by all other educated sections of the community—that is, it is materialistic.

(3) It deals almost exclusively with serious and advanced cases. Now a large object is easier to see than a small one, and a large deviation from health than a small one. In other words, it is elementary.

(4) Ever-increasing reliance is being placed on instrumental aids in diagnosis. Once they were an adjunct to intelligence; now they are becoming a substitute for it. It is a pathetic sight to see the functional case being "signposted" to one mechanical test after another by the registrar (the consultant of the future). In Manchester they have invented a mechanical brain which perhaps may one day do the job: at present a registrar is not only cheaper to produce but occupies much less space.

(5) When the treatment is finished the patient is unlikely to see the hospital again. It is the general practitioner who will have to live with the results, and in not a few cases to endeavour to explain

> The fault, dear patient, is not in our scars,
> But in ourselves, that we are invalids.

The hospital is irresponsible.

(6) A prison, a monastery, and a hospital have this in common: they are cut off from the outside world. Hospital medicine, in dealing with patients cut off from their natural surroundings, is unreal.

(7) It follows from these facts that only curative work can be done in the hospital, or "salvage department" as it has so aptly been named. It is quite incapable of preventive medicine.

The position may be summarized by saying that, while the hospital is a suitable place to teach students the elements of medicine, it is quite incapable of supplying the advanced training required for general practice. But if, in spite of this, general practitioners were to return to hospital, what would be the effect on the greater part of their work—the trivial case? Can we doubt that there is only one possible answer—increased neglect?

If this is the value of the conventional remedy, how has it come to be so universally prescribed? As medical students we were all trained by consultants and specialists, and in our formative years we had them as exemplars before us. Theirs was the position to which we looked up, and to which we might perhaps hope to attain. The cases which they treated were obviously the ones that mattered, the cases they disdained equally of no importance. Moreover, we were aware that they not only attained the highest honours but also attracted the highest fees; they had the double advantage of both kudos and cash. When this attitude, quite natural in the student, persists in the mind of an established general practitioner, it is of course an example of our old friend the inferiority complex. But is it true? Is it justified? "Always down the breeze comes the siren song of the specialist; anything you do I can do better." I do not need to give you the source of this dictum; it could have appeared only in the editorial columns of the *Lancet*. But is it true? Can you see a specialist doing your morning surgery? The truth is, of course, that in its aerial passage from Harley Street to Charing Cross the siren song has been

*Presidential Address delivered to the Metropolitan Counties Branch on July 4.

sadly mutilated; the actual words are, "Anything that I allow to think is worth doing I can do better than you can." In its corrected form the song is not only accurate, it is positively intelligible. The specialist does not allow that the trivial case is worth "doing," because he himself is quite incapable of "doing" it.

The Challenge of the Trivial Case

So we come back once more, as we always must, to the main part of the general practitioner's work—the trivial case. What is the real objection which so many general practitioners have to these cases? The usual reply is that they are not interesting. But why? What is "interesting" work? The answer is that interesting work is work in which we take an interest—just that, no more and no less. Then why do so many doctors take no interest in these cases? Partly because, under the conditions of private practice, they were not called to give them much attention, but mainly because, having been trained by consultants who naturally did not see such cases, they were themselves not capable of dealing with them. In other words, the general practitioner who bemoans the trivial case does so from a mixture of ignorance, incompetence, and inferiority complex.

Suppose we face the problem, what do we find? The "trivial" case includes the earliest stages of nearly all serious complaints, and not only early but therefore also curable; the really slight cases which can be put right quickly and thoroughly by anyone who has the "know-how"; and a variety of "functional" cases, with most of which nobody else is in a position to deal.

Now what are the functions of the general practitioner? The B.M.A. Committee to which I referred has classified them thus: (1) continuous care of patients; (2) the treatment of the patient as an individual; (3) health education and preventive medicine; (4) a mixed bag, which may be lumped together as co-operation with other people in treatment.

How does this link up with the trivial case? The continuous care, and the knowledge of the individual, enable the general practitioner to assess the complaint when he hears it. Have we not all had the neurotic, continually crying wolf, and yet one day coming with a slightly different attitude—if anything less anxious? "Hullo," we say, "here's something different"—and nearly always there is. On the other hand, would we not agree that the usual order of events is stress, strain, or worry first, illness after? And have we not felt, from our knowledge of the individual and his intimate family circumstances, that a little chat to us on these worries has not only eased his feelings but also improved his health? In fact we may have prevented some further illness. This brings us to another special function of the general practitioner—preventive medicine and health education.

When is John Bull really interested in keeping well? Not when he is well—unless he has reached that state of anxiety neurosis to which it is apparently the chief object of the advertising world to bring him (and then he would not really be well). No, when he is well he does not care two hoots about health education. On the other hand, when he is suffering from pneumonia, or is under a surgical anaesthetic, he is not capable of profiting from the best advice. So the only time when he is both able and willing to attend to preventive measures is when he has a trivial complaint. Again, when the disease is advanced it is too late for prevention. It is only in the really early stages—that important section of the "trivial" complaints—that preventive advice is of any use. Moreover, not only is the general practitioner the only person who sees the patient at this stage, but he alone has another advantage—he knows the patient's background and his individual make-up. Both are essential—not merely to understand the real causes of the trouble, but also to make sure that the advice given is put across and accepted. The best advice is useless when it is not taken.

It is often assumed that preventive medicine is a specialty to which the general practitioner will seldom attain—though the youngest member of the public health service seems to achieve it automatically, even before acquiring the D.P.H. In fact, the main qualification for preventive work is not so much special experience as an attitude of mind—an attitude of the keenest scientific inquiry into all possible causes of trouble, coupled with a willingness to give detailed attention to the remedy. While paying a well-deserved tribute to the pioneer work of our public health colleagues in this field, we must remember that they can labour only under a severe handicap; not only do they lack the personal knowledge of the patient, but also they are dealing with "diseases." We all speak, for convenience, of the prevention of disease, but "disease" is a philosophic concept. The doctor's job is to keep people well. If the cure of one disease can be pronounced only when the patient has died of something else it is small consolation to the relatives; and if the death rate from one disease goes down, while that from another goes up, it is no real credit to preventive medicine. So the real job can be properly done only in general practice—with human beings.

If the general practitioner's job is to keep his patient well, when should he begin? Obviously as early as possible—in the patient's infancy. It is difficult to understand why infant welfare, which is surely the general practitioner's own natural field, and which many of us so much enjoyed before the war, should be handed over to immature young women to titillate their maternal instincts. A successful start in early life not only benefits the patient but gives the general practitioner less work later.

Raising Status of General Practice

If, as I have tried to prove, general practice is a specialized branch of medicine, whose chief material is trivial complaints and whose chief object is to keep people well, what is needed to raise its status? In the first place the general practitioner must have more time for his work. There are too few doctors with really intelligent employers, but I am sure that both of us would agree that our most valuable possession is time to think. The general practitioner must have this too; he must also have time to take a careful history of every patient, and in appropriate cases to make a thorough physical examination.

Some would say that he should make a thorough physical examination of every patient who comes to see him. No single measure could have a worse effect on the health of the community. Enough neurotics have been created or made worse by this very procedure at hospitals. The general practitioner has the duty, as well as the responsibility, of not making an examination where it is not necessary—and, incidentally, not helpful. On the other hand a detailed and careful history is always helpful, whatever the complaint.

In the second place the general practitioner needs special training in the handling of these most difficult of all cases—the trivial complaints. From whom is he to get this training? Not from consultants or any other branch of his profession: they know nothing about it. The answer is that he must get it from his colleagues. General practitioners must pool their experiences and help to educate each other. They must also educate themselves; in other words, they must have time to do some research in their own specialty. The highest standards can be maintained only by continuous research.

The next question is, Who is to act? The G.M.C.? This body is concerned with undergraduate education, and is composed (and will continue to be composed) chiefly of academic representatives. The Ministry of Health? This is a question which requires intelligent study. Who looks for intelligence in a Government Department? The aim of both politicians and Civil Servants is to make things look well (the difference between them being that, to achieve this desirable object, the politician is convinced that he must do something, the Civil Servant that he must do nothing). Moreover, the Treasury would have to be asked for additional money, and the Treasury would rather provide £60m. to cure disease than £6m. to prevent it. In fact, to adapt a famous saying, it appears that in the Civil Service "the other departments use the Treasury as their lunatic asylum."

There is only one solution: the general practitioners must do it themselves. Is that possible? Can we raise ourselves by our own bootlaces? Yes, and it is being done at this moment by another section of our own profession. Not so many years ago I can remember the *Journal* containing article after article by the leading obstetricians of the day, who, having discovered the anatomical proximity of the rectum to the vulva, proceeded to deduce from this somewhat elementary knowledge that puerperal sepsis was due to the dirty general practitioner conveying germs from one orifice to the other. It was to prevent this sort of rubbish from being put out that the obstetricians and gynaecologists founded their college, and, though we may think that at times they still show traces of their barbarous ancestry, yet we must admit that they have done a great deal to raise the standards of their branch of the profession. What the obstetricians have done the general practitioners can do.

I have been considering general practitioners as specialists, but of course there must be the fullest co-operation between them and their colleagues in other branches of the profession—on equal terms. By all means let us continue to have lectures to general practitioners by consultants; let us also have lectures by general practitioners to consultants, who need them just as much. And after the necessary preliminary period let it be laid down that no one shall be qualified to deliver these lectures unless he himself has attended a course in, or has had personal experience of, the practice of his audience. It is just as well that we should all know what we are talking about.

To-day there are two alternatives before the general practitioner; he may crawl into hospital, to eat humbly of the crumbs that fall from the consultant's table and day-dream of the position to which he will never attain, or he may stand outside, devoting himself to his own self-chosen task, a specialist in his own right. The choice lies before him, and must soon be made. The way divides.

GENERAL PRACTICE REVIEW COMMITTEE

Concern has recently been expressed at the conditions obtaining in general practice and the reported loss of prestige of general practitioners. The Council of the B.M.A. therefore appointed a committee to inquire into the matter. The following are the terms of reference:

To review the present position in general practice, its difficulties and its trends, both generally and with reference to the two years' experience of the National Health Service Acts, and to the B.M.A. Report on "General Practice and the Training of the General Practitioner," and to make recommendations.

In addition to the *ex officio* members the committee is composed mainly of general practitioners. Its chairman is Dr. C. W. Walker, a general practitioner in Cambridge. The committee members are representative of various types of general practice—urban, rural, private, and N.H.S. In order that general practice can be studied in all its facets consultants, public health medical officers, and industrial and administration medical officers are included in the membership. The committee held its first meeting in July, when the views of general practitioners on present-day troubles were received and discussed.

At its next meeting on August 30 the committee will decide on what further evidence is required and how it is to be obtained in order that a comprehensive statement may be prepared setting forth the nature of the difficulties and anxieties of the general practitioner of to-day and the faults in general practice from the point of view of both the patient and the doctor. Thereafter the committee will consider what should be done in the future.

HEALTH SERVICE GLASSES

The Ministry of Health states that bifocal and lenticular lenses will now be included in the range of glasses of a special type obtainable under the Health Service towards the cost of which the patient makes a payment. No contribution from public funds will be paid towards the cost of replacing scratched lenses, except where it can be shown that the damage has been caused by something outside the patient's control, such as a street accident. The patient will receive a leaflet on the care of plastic lenses, since they are liable to be scratched easily.

EXAMINATION OF MIGRANTS

Following negotiations with the Canadian and Australian immigration authorities, agreement has been reached that, as from July 1, 1950, the recommended fees for the examination of adults and unaccompanied children going to Canada or Australia will be £1 1s., and that for the examination of accompanied children under 16 years of age the fee will be 7s. 6d. These fees are payable by the migrants. Previously the recommended fees were 10s. 6d. and 5s. respectively.

The New Zealand Government has recently decided to accept certain categories of family groups under its immigration scheme. As formerly, fees for the medical examinations required will be paid by the New Zealand authorities. It has been agreed that, for the examination of adults and unaccompanied children, a fee of £1 1s. will be payable. In the case of accompanied children under 16 years of age proceeding to New Zealand, the authorities concerned ask for a more detailed report than that required for similar classes going to Australia or Canada. For these reports, therefore, the agreed fee is 10s. 6d.

PUBLIC HEALTH DISPUTE

AGREED TERMS OF REFERENCE

As reported last week (*Journal*, August 5, p. 336), the dispute on public health salaries is to be taken to the industrial court. The two sides of the Whitley Council have agreed on the terms of reference in which the dispute will be submitted. They are as follows:

"To determine a difference between the management and staff sides of Committee C of the Medical Council of the Whitley Councils for the Health Services (Great Britain) arising out of the staff side's proposals for revised salary scales and conditions of service for medical officers employed by local authorities."

PREPARATIONS FOR WITHDRAWAL

ROLE OF BRITISH MEDICAL GUILD

Among the resolutions passed by the Special Conference of Local Medical Committees on June 29 was one instructing the General Medical Services Committee to make preparations forthwith for the termination of contracts by general practitioners in the Health Service.

There are certain legal limitations on what the B.M.A. and its autonomous bodies may do in this respect. The G.M.S. Committee and local medical committees are constitutionally precluded from undertaking the task. Therefore preparations for withdrawal, and if necessary their implementation, must be effected through the British Medical Guild. The Guild is at once to be made ready for action, and honorary secretaries of B.M.A. Divisions and of local medical committees have been sent guidance from Headquarters on the action to take now.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

B.M.A. FILM LIBRARY

The following films have been purchased for inclusion in the Film Library.

A Case of Kernicterus Chorea. Silent, colour, 1 reel, 8 mins. Author: Guy's Hospital Medical School.

Blood Streams in the Basilar Artery. Silent, colour, 1 reel, 8 mins. Author: Wellcome Film Unit.

S.M.A. GENERAL MEETING

At its Annual General Meeting in May this year the Socialist Medical Association called on the Government and the Ministry of Health to make modern treatment available to a larger number of acute cases of tuberculosis by arranging for early cases to be treated in general hospitals. Night sanatoria and hospitals should be provided for patients who are infectious but do not need more than general care and attention. Existing hospitals and chest clinics should be modernized and readapted. New hospitals and clinics should be built, including hostels which can provide a sanatorium regime for those patients who do not require much skilled nursing. More domestic and other staff should be enrolled, and the salaries of nurses and others increased. The meeting called for an industrial health service to be integrated with the National Health Service, and deplored financial discrimination against health workers in the public health and preventive services. The meeting expressed its grave concern about the continued failure of the Government to provide health centres.

Greater economy in the hospital services is necessary and possible, the meeting considered, and savings could be made without detriment by (*a*) appointing full-time instead of part-time specialists where possible, and (*b*) reducing or abolishing the merit awards. The meeting urged that improvements of the standards of general practice be given priority. The maximum number on a doctor's list should be 3,000, and the entry of doctors into general practice facilitated. A higher standard of general practice would greatly reduce the pressure on hospitals, and thus lead to economies. The meeting asked the S.M.A. to press for the adoption of a 40-hour week for all health workers.

The meeting resolved that the drug industry should be nationalized and that the S.M.A. should press the necessity for a commission to work out the use of proprietary medicines in general and specialist practice.

Questions Answered

Travelling Expenses for Attending Course

Q.—*Am I entitled to claim against income tax any relief for travelling expenses incurred when attending courses for the Final Fellowship examination? I was living at home in Surrey, the course being at a hospital in London.*

A.—Costs incurred when studying for and obtaining further qualifications, degrees, etc., are regarded as capital outlay and cannot be treated as expenses necessarily incurred in the performance of professional duty.

Epileptics under Health and Insurance Schemes

Q.—*What is the position of epileptics under the National Health Service? As they are "unemployable," are they entitled to sickness benefit, and, if so, for how long?*

A.—Unemployment and sickness (cash) benefits under the National Insurance Act are dependent on a prescribed number of contributions having been made over a certain period. "Unemployable" persons who have not made the requisite contributions would not be eligible for such benefits. The medical, institutional, and other benefits of the National Health Service, however, are available to all and are not dependent on an insurance qualification.

Subsistence Allowance

Q.—*I visit two consulting-rooms each week. What can I claim for "subsistence" as an expense of my practice?*

A.—According to the regulations the amount to be claimed is the excess of the sums expended over the cost of the food, etc., at home. The amount to be set off in that way would presumably be small. No allowance is due for the cost of food, etc., consumed at home.

Correspondence

Registrars

SIR,—Registrars are divided into junior registrars, registrars, and senior registrars.

Junior Registrars.—It would appear that these are not true "trainee" appointments but are in reality senior house-officers from whom selection should be made to registrar posts. The title and status of junior registrars is now under consideration.

Registrars.—These are trainee posts, but many from this grade may be expected to enter general practice if senior registrar posts are not available or higher qualifications are not obtained. The number of registrar posts should be in proper proportion to the number of senior-registrar posts.

Senior Registrars.—Those so graded may be regarded as the consultants of the future. Wastage at this level should be small. In future a higher qualification will be a *sine qua non* for this grade, in which the number should bear a proper relationship to the number of consultants in each faculty.

All three grades exist in both teaching and non-teaching hospitals. In the interest of the Service registrars and senior registrars of the highest calibre are just as important in major non-teaching as in teaching hospitals.

There is, apparently, a tendency for consultant appointment committees to give undue preference to candidates from teaching hospitals, and perhaps to overestimate the value of research and publications, opportunities for which are greater in the teaching hospital. Such a trend would, if persisted in, lead candidates for registrar posts to avoid the major non-teaching hospitals as dead-end jobs. This would be to the detriment of the service of these hospitals and ignore the opportunities for practical training which they can provide.

Senior registrars in non-teaching hospitals should have the same opportunity of advancement as those in teaching hospitals. It could be fairly stated that the former obtain a greater practical experience than the latter but less academic advantage, whereas the latter have a greater academic opportunity but on the whole may lack extensive practical training and experience. Further, in professorial units they may be side-tracked for long periods on special research.

It should be clearly realized that the major non-teaching hospitals do more than three-quarters of the work of the country. It would indeed be a retrograde step if registrars of such hospitals are going to find themselves frustrated by undue preferment of teaching-school candidates. The result of such preferment is obvious; the larger non-teaching hospitals will be down-graded or, at least, their up-grading sadly retarded. The value of high-calibre registrar service to such hospitals is immeasurable, both in the total service to the community and in the training of house staff as future general practitioners.

Some scheme whereby registrars can be transferred from teaching schools to non-teaching hospitals and vice versa should be devised if justice is to be done in the future. By this means all senior registrars would have the undoubted advantages of a teaching hospital background together with the wider clinical experience which the regional non-teaching hospital affords. For the present it must be hoped that appointment committees will give consideration to practical experience at least equal to that given to academic attainment, volume of published work, or research, frequently of doubtful value.—We are, etc.,

CHARLES E. KINDERSLEY,
Chairman,
H. J. GIBSON,
Secretary,
South-western Regional Consultants and Specialists Committee.

The Ship Surgeon's Life

SIR,—At present there is a scarcity of doctors willing to act as ship surgeons. The pay is less than that of a locumtenent, but the work is lighter and the living conditions are better. If a doctor wants work as a ship surgeon he need not pay fees to an agent, but can get work by calling personally at the shipping office.

When I applied at the shipping office for work, pleasantly spoken clerks gave verbal promises which I foolishly did not get confirmed in writing. I was given the false impression that I had as assistants a fully trained nurse and an Indian surgery-boy who spoke both English and Hindustani, and also that my cabin was air-conditioned.

Just before a ship sails from the U.K. to a foreign port the crew sign "deep-sea articles" which bind them for perhaps two years. It is advisable to study these articles carefully, but in the rush and bustle of the day prior to departure this is usually impossible. When ships unload cargo at their destination abroad they then receive orders and new cargo, and there is no certainty that the ship will immediately return to the U.K.

The Ministry of Transport regulations for payment of crew and for deduction of income tax should also be studied. Doctors owning a banking account may not find it convenient to receive wages paid in cash. The agents of the shipping company provide local currency at foreign ports at more favourable rates of exchange than are available to private individuals. I found the cost of buying uniform for my first voyage about equal to two months' wages. The cost of tropical kit at such a port as Aden is less than in the U.K.

It is common now for shipping companies to employ aeroplane services in filling vacancies in their ship's crew in foreign ports. In such cases it is possible to travel light and then buy tropical kit and other necessities on landing. To wear shorts and open-neck shirt in the Tropics is comfortable, but shorts are not comely for the elderly with stout or lean figures.

The crew was kind to me and did not ask for my services unreasonably. The passengers needed little attention, and only in rare instances is a ship surgeon entitled to private fees.

Ministry of Transport regulations about drugs carried on board ship should be revised and brought up to date. Many of these drugs are useless, and some new drugs in common use are not on the list. It is difficult for men in the Mercantile Marine to get dental and optical treatment in the U.K., as they are seldom at home for more than two or three weeks.

The standard of medical services in India is below that in the U.K. Inefficiency, obstruction, with irritating delays, and poor-quality work are common. By contrast, in American hospitals it is usual to have elaborate laboratory tests as a routine. A lascar in a famous American hospital for treatment of digestive upset had a lumbar puncture done for no very obvious reason.

There is always uncertainty about the date of return to the U.K., which makes it difficult to plan civil employment a few months ahead.

The cargo ship on which I have happily served for seven months started her first voyage early in January, 1949, and has accommodation for twelve passengers. I have visited several similar ships and have not seen better accommodation.

A useful hint before starting a voyage is for a ship surgeon to make a careful list of kit required and money needed, and then take half the amount of kit and twice the amount of money.—I am, etc.,

Edinburgh. A. V. DILL.

Report of the A.R.M.

SIR,—Dr. Leslie Gibbons complains (*Supplement*, August 5, p. 84) that his remarks in the Representative Meeting were not more fully reported. This was because Dr. Gibbons, like several other speakers, was heard only with great difficulty at the microphone. He spoke into it instead of towards it—a common fault—with the result that, at all events in the front of the hall, including the Press table, only isolated phrases were audible. The page of my notebook which is devoted to Dr. Gibbons's speech is an exercise in frustration. A few words are heard and recorded, and the rest is lost in the confused roar which is set up when the microphone is misused. My Press colleague who sat beside me was equally embarrassed.

Would it not be possible for those who make maiden speeches in the Representative Body to have a little previous instruction in handling—or rather in not handling—this exasperating instrument so that they can be heard all over the hall?

It is unfortunate that the name of Dr. Rowland Hill was substituted for that of Mr. Lawrence Abel as the proposer of the motion, but in fact—what Dr. Gibbons does not state—Dr. Rowland Hill seconded it. It was a Marylebone motion sponsored by both gentlemen.—I am, etc.,

YOUR REPORTER.

The War Memorial

SIR,—As the originator in the Council of the suggestion that the proposed war memorial should provide for the education of the children of doctors who fell in the late war, and as the proposer of the Harrow amendment at the Harrogate A.R.M. last year which sought to reverse the Council's decision to erect a fountain, I write not only to support the letters of Drs. P. M. Vicary, I. H. Jones, and R. Blowers (*Supplement*, July 29, pp. 74–75) but to plead for the larger view. I feel that we are letting slip the opportunity to do something really big for the Association and to create something which will endure and live and flourish in a way that a stone memorial cannot possibly do.

Scattered about our beautiful countryside are many stately mansions which are deteriorating rapidly because their present owners, crippled by high taxation, cannot afford to maintain them. One such mansion, in Nottinghamshire, I had the opportunity of looking at on my way back from the Southport-Liverpool meeting. It would make a magnificent memorial school to which the orphaned children could go and at which other children of doctors, particularly doctors serving overseas, could receive their education. No doubt there are other and perhaps even more suitable mansions.

The principal initial difficulty, apart from inertia, in the foundation of such a school would be the provision of capital. Well, we are over 60,000 strong in the Association, and £1 added to our yearly subscription for the next two years will produce £120,000 in a magnificent cause.

There are precedents for the foundation of such a school as I have outlined. In 1843 Marlborough College was established for the sons of the clergy. Surely in 1950 doctors can provide similarly for the children of their fallen brethren and, incidentally, for their own in the years to come.—I am, etc.,

Harrow, Middlesex. J. B. WRATHALL ROWE.

"Removal or Transfer"

SIR,—The point that Dr. W. Davan Neill mentions (*Supplement*, July 29, p. 75) was raised in Cornwall some time ago, and the clerk of the executive council now makes an entry in the last column of the form requesting return of medical record cards—"local" if the transfer is to a neighbouring doctor, and in other cases the name of the town to which the patient has moved. This is a courtesy that is much appreciated.—I am, etc.,

St. Ives, Cornwall. P. C. MATTHEW.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Short Service Commissions.—War Substantive Lieutenant-Colonel L. E. C. Davies, M.B.E., has retired and has been granted the honorary rank of Colonel. Major R. H. Simon has retired and has been granted the honorary rank of Lieutenant-Colonel. Major J. D. Condon has retired. War Substantive Major P. L. O'Neill has retired and has been granted the honorary rank of Lieutenant-Colonel. Captain (War Substantive Major) I. M. Davies has retired and has been granted the honorary rank of Lieutenant-Colonel. Captains (War Substantive Majors) R. J. K. Tallack and R. Waddell, M.C., have retired and have been granted the honorary rank of Majors. Captains A. T. Rogers, N. J. Y. Simpson, W. H. Whyment, T. R. Wilson, M.C., J. W. Taylor, M.C., R. H. C. Manifold, J. W. R. Battram, M.C., G. J. L. Davies, C. L. Johnston, and J. F. N. C. Ward-McQuaid have retired and have been granted the honorary rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. W. Hirst, O.B.E., T.D., to be acting Colonel.
Majors B. C. Jennings and A. McQuiston to be acting Lieutenant-Colonels.

Association Notices

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prize *due regard will be given to evidence of personal observation.* No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and a sum of money slightly less than the amount of the Sir Charles Hastings Clinical Prize, will be awarded for the second best essay submitted.
3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.
4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.
5. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950.
6. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for an award of either of the prizes in any subsequent year.
7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.
8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.
9. Each essay must be typewritten or printed and must be accompanied by a sealed envelope, enclosing the candidate's name and address, firmly affixed to the essay.
10. The writer of an essay to whom a prize is awarded may be requested to prepare a paper on the subject for publication in the *British Medical Journal* or for presentation to the appropriate Section of the Annual Meeting of the Association.
11. Inquiries relative to the prizes should be addressed to the Secretary.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary not later than November 1, 1950. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary.

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and childbearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing to the Secretary by November 1, 1950, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

Diary of Central Meetings

AUGUST

30 Wed. General Practice Review Committee, 2 p.m.

SEPTEMBER

14 Thurs. A.R.M. Agenda Committee, 11.30 a.m.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY AUGUST 19 1950

ADVISORY APPOINTMENTS COMMITTEES

New regulations (National Health Service (Appointment of Specialists) Regulations, 1950) define the grades for which the advisory appointments committee machinery is to be used (for consultants and S.H.M.O.s), and to meet practical difficulties encountered under the old regulations.

The following are the principal changes made.

These categories of specialists are taken outside the scope of the advisory appointments committee machinery, though they will still be appointed by regional hospital boards and boards of governors:

(i) Professors, readers, and other members of professorial units at universities, medical schools, or postgraduate institutes, who will receive no remuneration from the hospital boards for their hospital appointments.

(ii) Consultants past normal retiring age appointed in an honorary unpaid capacity.

(iii) Clinical teachers who continue to hold existing posts at teaching hospitals and are appointed to the staff of a non-teaching hospital primarily in order to enable them to give clinical teaching to students at that hospital also.

(iv) Persons primarily engaged in research which necessitates appointment to a hospital staff, so long as the hospital appointment is unpaid.

(v) Persons appointed to posts whose tenure is, with the prior approval of the Minister, expressly limited (e.g., an eminent clinician from overseas who has come to work for a short time in a British hospital).

Regulation 8 prevents an advisory appointments committee which has not found among the applicants anyone of sufficient merit to fill a consultant vacancy from recommending that one of the applicants could be appointed to the post as an S.H.M.O.

APPOINTMENT OF REGISTRARS

The Minister of Health has decided that the appointment and dismissal of senior registrars and registrars in non-teaching hospitals should be the responsibility of regional hospital boards, though hospital management committees will still play an important part in their selection. This change has been made because it is considered essential that the universities, the medical schools, and postgraduate institutes should be closely concerned with the selection of men in these grades. It may also be necessary, in enlarging a man's experience, for him to move more freely between hospitals than may be possible if he is closely attached to one management committee group. (National Health Service (Functions of Regional Hospital Boards, etc.) (Amendment) Regulations, 1950.)

Machinery of Appointment

A circular from the Ministry of Health states that the machinery set up under the National Health Service (Appointment of Specialists) Regulations does not apply to the appointment of senior registrars and registrars, and it is not proposed to lay down precise machinery for the appointment of these grades by regulation. But hospital boards should follow the principles set out below.

(i) Posts should normally be advertised.

(ii) When a registrar holding a particular post divides his time between several hospitals, arrangements ought to be worked out between the boards concerned for the progress from hospital to hospital.

(iii) Because senior registrars and registrars are training grades, the university, medical school, or institute must be closely concerned in the selection for appointment.

(iv) In the case of an appointment to a non-teaching hospital the hospital management committee, and in all hospitals the medical staff of the hospital concerned, should also be represented on any selection committee.

(v) To secure common standards, the selection for both teaching and non-teaching hospitals in each region should so far as possible be made by committees with a common standing membership enlarged so as to reflect the local interests. (This is modified below for the London area owing to special difficulties.)

(vi) Committees of this kind may be advantageous not only to advise on a new appointment, but also to review holders of posts annually to decide whether they should be allowed to continue their training for a further year in the same grade or have their appointment terminated.

Composition of Selection Committees

The committees should consist of two elements: a standing nucleus, and additional members appointed *ad hoc* to suit the post or posts to be filled.

Outside the four metropolitan regions the minimum requirements for any such committee of selection should be:

A standing nucleus consisting of one medical and one lay member appointed by the regional hospital board, one lay member appointed by the board of governors, and two medical members appointed by the university; these five will all take part in the work, but only two of the medical or dental members and one of the lay members need sit at any one time when the committee is meeting; one of these five to be appointed chairman by the regional board or the board of governors, whichever is the appointing authority for the hospital concerned.

At non-teaching hospitals there should be three additional members, one lay and one medical or dental, appointed by the hospital management committee concerned, the medical or dental member being normally the person under whom the registrar would work; and one medical or dental member of the specialty concerned appointed by the regional board.

At teaching hospitals there should be two or three additional members, one lay (optional) and one medical or dental, appointed by the board of governors, the medical or dental member being normally the person under whom the registrar would work; and one medical or dental member of the specialty concerned appointed by the university.

All three elements should sit together to consider combined teaching and non-teaching hospital appointments.

In the four metropolitan regions the minimum requirements for any such committee should be as follows:

At non-teaching hospitals: (*a*) A standing nucleus consisting of one medical member and two lay members (of the latter of whom only one need take part at any one time when the committee meets) appointed by the regional board, and two medical members (of the latter of whom only one need take part at any one time when the committee meets) appointed by the regional postgraduate education committee, one of these five being appointed chairman by the regional board. (*b*) Three additional members, one lay and one medical or dental, appointed by the hospital management committee concerned, the medical or dental member being normally the person under whom the registrar would work; and one medical or dental member of the specialty concerned appointed by the regional board.

At teaching hospitals: (*a*) A standing nucleus consisting of one lay and one medical or dental member appointed by the board of governors, and two medical or dental members (of whom only one need take part at any one time when the committee meets) appointed by the medical or dental school or postgraduate institute, one of these four being appointed chairman by the board of governors. (*b*) Two additional members consisting of an additional medical or dental member, being normally the consultant under whom the registrar would work, appointed by the board of governors, and a medical or dental member of the specialty concerned appointed by the school or institute. In addition, the advice of the regional postgraduate education committee should be sought, whether by membership of the committee or otherwise.

Where a combined teaching and non-teaching hospital post is to be filled the standing elements in each committee should join with an agreed additional element on the above lines.

THE AMBULANCE SERVICES

REPORT OF SELECT COMMITTEE ON ESTIMATES

The Select Committee on Estimates has examined the ambulance services in England and Wales and in Scotland, and made a number of recommendations in its report (H.M.S.O., 4s.). The estimated cost of the ambulance services to the nation for the year 1950–1 is £7,986,000.

Discussing the improper use of ambulances and of permission being given for journeys obviously outside the scope of the Health Service, the committee found that there had been abuse, though relatively rarely, and that it could be dealt with by local health authorities. The committee recommends that consideration should be given to laying down a wide range of cases for which a medical certificate ought to be required before an ambulance can be called on. In some areas ambulance drivers are instructed to carry no one who has not a medical certificate, except in an emergency. But many had not such a rule. The committee believes that such a certificate would not cause too much administrative work. In general, ambulances should be ordered through the hospital rather than through the doctor, as is the rule of the London County Council.

Evidence given before the committee showed that some patients had chosen to receive treatment at hospitals far from their homes. Since they are entitled to free ambulance transport, considerable cost has fallen on the public. The committee recommends that, before admitting a patient from a distant place, hospitals should insist on a certificate stating that the necessary diagnosis or treatment cannot reasonably be obtained at a nearer hospital. It recommends also that the Ministry should emphasize by circular the economies to be obtained by using rail as opposed to road transport for long journeys. The need to carry out-patients to and from hospital requires examination, the committee thought, for it seemed that some out-patients had continued to be conveyed by ambulances and hospital cars after they had become fit to travel by ordinary means. The committee recommends that all local health authorities should keep a check on this.

In Scotland the ambulance service is borne by the Exchequer, whereas in England and Wales one-half is borne by the ratepayers. The Scottish ambulance service is therefore mainly paid for by the taxpayers of England and Wales. The committee recommends that the Departments concerned should consider how this anomaly might be removed.

The committee found wide variation in the ambulance services run by different local health authorities. Though opposed to greater centralization, it considers that the Ministry of Health should examine the situation and perhaps compare the running expenses of different authorities.

PAYMENT OF SCOTTISH CHEMISTS

Amending regulations have been made giving the Secretary of State power to alter the rates of payment to chemists in Scotland after consulting an organization which is in his opinion representative of the general body of chemists. The Court of Session recently upheld the chemists' argument that the regulations then existing did not give the Secretary of State this power.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

Correspondence

Independent Court of Arbitration

SIR,—The letter of Dr. C. P. Wallace in the *Supplement* of August 5 (p. 84) on "Independent Court of Arbitration" is timely. He draws attention to the report of the debate on the subject in the *Supplement* of July 22 and to Dr. Hill's statement on "Whitley Machinery and Compulsory Arbitration" at p. 38 in the same issue. It is quite clear to me that a salutary clearance of verbal rubble is necessary if the profession is to understand the difficulties of the problem and the dangerous situation that confronts it. Terminology must be precise. Industrial arbitration has been defined as "the settlement by one or more presumably impartial persons of an issue on which the parties have failed to agree." This was the definition of the Royal Commission on Labour in its final report in May, 1894, which was followed by the Conciliation Act, 1896. Any difference or dispute arising with respect to our remuneration or conditions of service under the National Health Service Acts is deemed to be, by Section 13 of the National Health Service (Amendment) Act, 1949, a difference or dispute to which the Conciliation Act, 1896, applies. This latter Act was formerly administered by the Board of Trade and is now transferred to the Ministry of Labour.

As I intend to show that Dr. Hill was wrong in his statement to the R.B. as reported in the *Supplement* of July 22 (p. 38) it is first essential to state the powers of the Minister of Labour under the Conciliation Act, 1896, and the Industrial Courts Act, 1919, referred to in Clause 13 of the National Health Service (Amendment) Act, 1949, and his powers assumed by him under the Conditions of Employment and National Arbitration Order, 1940, made by virtue of the powers conferred on him by Regulations 58AA of the Defence (General) Regulations, 1939. I need hardly remind Dr. Hill that this latter Order was a wartime emergency creation, due to the vital necessity in time of war of reducing stoppages of work to a minimum. It provides that any "lock-out" or "strike" is illegal unless the dispute has been reported to the Minister of Labour and the Minister has not, during the ensuing 21 days, referred the dispute for settlement either to collective joint machinery suitable for settling the dispute or, failing that, to the tribunal.

Does Dr. Hill consider that mass resignation from the Service constitutes a "strike"? If he does not, then his statement to the R.B. is inaccurate. If he does consider mass withdrawal a "strike," then the legal opinions which we obtained when we were considering the constitutional position of the Association were not a correct evaluation of the position. That was my opinion 18 months ago when I had the temerity to express it in Council and in a letter to the *Supplement* of April 16, 1949 (p. 235). What is now interesting is that Dr. Hill agrees, and has so informed the R.B., that doctors are workmen employed in "trade or industry," that we have an employer, the Minister of Health, and that a dispute concerning our remuneration and terms of service is a "trade dispute" within the meaning of the Industrial Courts Act, the Conditions of Employment Order, 1940, and probably within the meaning of the Trade Disputes Act, 1906. It may still be necessary to reconsider the constitutional status of the Association in the light of Dr. Hill's remarks.

The Minister of Labour, under the Conciliation Act, 1896, where a difference exists or is apprehended between an employer and workmen, may, if he thinks fit, exercise all or any of the following powers—namely:

(*a*) inquire into the causes and circumstances of the difference;

(*b*) take such steps as may seem expedient to him for the purpose of enabling the parties to the difference to meet together, by themselves or their representatives, under a presidency of a chairman mutually agreed upon or nominated by the Minister of Labour, with a view to the amicable settlement of the difference;

(*c*) on the application of either parties interested appoint a board of conciliation;

(*d*) on the application of both parties to the difference appoint an arbitrator.

The Industrial Courts Act referred to in Section 13 of the Amending Act gives the Minister of Labour power to refer the matter for settlement to the industrial court or to an arbitrator or arbitrators appointed by him or to a board of arbitrators consisting of an equal number of nominees of the employees and employer concerned and an independent chairman nominated by the Minister of Labour. This can only be done with the consent of both parties. The Act also gives the Minister power to refer the dispute to a court of inquiry even without the parties' consent, but such a court can only issue recommendations and not an award. The court of inquiry has power to summon witnesses, take evidence on oath, and call for documents. Its report must be laid before both Houses of Parliament.

The Conditions of Employment Order lays down quite clearly that, if in the opinion of the Minister of Labour suitable means for settling the dispute already exist, then he must refer the matter for settlement in accordance with the provisions laid down; this would mean by virtue of the provisions of Section 13 of the Amending Act. Until that is done the Conditions of Employment and National Arbitration Order cannot apply. That is where Dr. Hill went wrong in his statement to the R.B.

I now come to the Guildford resolution and Dr. Wallace's letter. Until the advent of the National Health Service, when the State in the person of the Minister of Health became our employer, the disputes referred to in the Acts and Order mentioned above were between employees and an employer who was not a Minister of the Crown. Therefore it would appear right and proper for the Minister of Labour, as a Cabinet Minister, and as a presumably impartial umpire, to exercise his powers under the above-mentioned Acts and Order to settle a dispute in the interests of the State. But we are now confronted with a new constitutional situation where the State, in the person of one of its Cabinet Ministers, the Minister of Health, is the employer and a party to the dispute. Can the Conciliation Act, the Industrial Courts Act, and the Conditions of Employment Order operate? Is Clause 13 of the National Health Service (Amendment) Act valid? The House of Lords in *National Association of Local Government Officers* v. *Bolton Corporation* has shown quite clearly that it is a necessary consequence of compulsory arbitration that the parties thereto must sacrifice their power to exercise their own discretion in the matters referred. That means that the State, through its Cabinet Ministers, as employer of the doctors must subordinate its power to exercise its own discretion in the matters in dispute. This means a subordination of prerogative if the Cabinet is to remain an instrument of democracy. It is difficult to see how the Minister of Labour can exercise his powers on behalf of a colleague in the Cabinet where that Minister is directly or indirectly a party to the dispute as well as a judge. If the doctrine of Cabinet collective responsibility is to remain as part of democratic government, then there is a clear case for reconsidering the method of settling differences when the State is the employer.

Guildford and Dr. Wallace are right in demanding an independent court of arbitration. The judiciary is still independent and its integrity beyond dispute. I quote the late Professor Laski: "It is difficult to overestimate the significance of the judiciary in the modern State. The work of the executive has become so vast, the powers delegated to it by the legislature are so wide, that the judges are, perhaps more than at any previous time, the real safeguard of personal liberty." An independent court is the only answer to the Minister's and Cabinet's veto.—I am, etc.,

London, W.8. J. ARTHUR GORSKY.

*** The Secretary of the B.M.A. writes: When the Association is in need of legal advice it obtains it from its legal advisers and, where necessary, from the most eminent counsel in the branch of law concerned. This procedure was followed recently when the General Medical Services Committee desired an interpretation of Clause 13 of the National Health Service (Amendment) Act, 1949, and the Conditions of Employment and National Arbitration Order, 1940. The statement made by Dr. Hill to the Representative Body was based on the opinion of distinguished counsel. Dr. Gorsky can accept or reject this legal opinion as he pleases. When he says Dr. Hill is wrong in this and that, he is challenging the legal opinion upon which Dr. Hill's factual statement was based. This footnote is based on this and other legal opinions obtained by the Association.

Dr. Gorsky's letter confuses the issue by contrasting the legal advice given to the Association on the "trade union" issue in 1949 with the legal advice given a few weeks ago on the question of arbitration. The 1949 controversy related to the powers of a medical trade union. The present issue concerns the power of the Minister to invoke compulsory arbitration under the Conditions of Employment and National Arbitration Order, 1940. These are different problems, just as the definitions of the term "trade dispute" are different in the Trade Disputes Act, 1906, and the 1940 Order.

On the first point the substance of the legal advice given to the Association in 1949 was that there was substantial doubt whether the Trade Disputes Act of 1906 applied to a medical trade union.

On the second point the crux of our present position in relation to what has come to be described as "compulsory arbitration" is provided by the answer to the question: "Do medical practitioners engaged in the provision of personal medical services under the N.H.S. come under the Conditions of Employment and National Arbitration Order, 1940?" Under this Order either party to a dispute which cannot be settled by existing machinery can report it to the Minister of Labour, and if a prompt settlement cannot be reached by other means the Minister is bound to refer the dispute for settlement to the National Arbitration Tribunal. Strikes and lock-outs are prohibited by the Order unless the dispute has been so reported to the Minister and unless within 21 days he has not referred the dispute to the tribunal.

There is "existing machinery" for determining disputes affecting medical practitioners employed in the N.H.S.—namely, the Whitley Councils for the Health Services (Great Britain). That machinery does not at present include any provision for arbitration, although an arbitration agreement is under discussion. Under the two Acts mentioned in Section 13 of the N.H.S. Amendment Act—i.e., the Conciliation Act, 1896, and the Industrial Courts Act, 1919—the consent of both parties to the dispute is necessary before reference to the forms of arbitration provided by these Acts. A fortnight before the Annual Representative Meeting at Southport leading counsel expressed the view that there were three points to be considered in determining whether the 1940 Order applied to practitioners providing general medical services under the N.H.S.:

(1) Whether doctors in that position are employed by the Crown.

(2) If so, whether the Crown is bound by the 1940 Order.

(3) Do the words of the Order include persons in the position of doctors?

On question (1) counsel expresses the opinion that the duty is placed on executive councils to make arrangements with medical practitioners for the provision of general medical services and that an executive council is a separate public corporation distinct from the Crown. In other words, if doctors are "employed," they are employed by executive councils and not by the Crown.

On question (2) counsel's view is that article 4 of the 1940 Order, which prohibits strikes and lock-outs except after the fulfilment of certain conditions, does not apply to the Crown and that the Crown cannot be made to go to any form of compulsory arbitration.

On question (3) counsel's view is—this point gave him considerable trouble—that doctors providing general medical services are within the purview of the 1940 Order. Counsel adds that the effect of this will be that if such doctors wish to withdraw their services, thus coming within the definition of "strike," which means "the cessation of work by a body of persons employed acting in combination or a concerted refusal or a refusal under a common understanding of any number of persons employed to continue to work for an employer in consequence of a dispute," they must give 21 days' notice required by article 4 of the 1940 Order. They must also give this notice to the Ministry of Labour before they give their own three months' notice to terminate their employment.

The Minister of Labour, of course, during those 21 days would be free, if he chose, to proceed to compulsory arbitration.

The second point to which Dr. Gorsky refers is that a necessary consequence of compulsory arbitration is that the parties thereto sacrifice their power to exercise their own discretion in the matters referred. This, Dr. Gorsky adds, means a subordination of prerogative if the Cabinet is to remain an instrument of democracy. Leading counsel was asked to advise the Association on the following two points:

(1) If the National Arbitration Tribunal has the power to lay down as a matter of law binding on executive councils, as well as the doctors in contract with them, that the remuneration of the doctors shall be a certain figure, is Parliament bound to give the Minister such a vote as will enable him to meet this order?

(2) If the National Arbitration Tribunal's order is for remuneration greater than that laid down by the Minister in some statutory regulations hereafter made, does the order override the regulations?

His answers to these questions, shorn of legal arguments which need not be detailed here, are as follows:

(1) Parliament is not bound to give the Minister money sufficient to cover the remuneration awarded to the doctors, but it can be assumed that it would in fact do so unless some national emergency made it necessary to impose cuts.

(2) A conflict between a statutory regulation and an award of the National Arbitration Tribunal could not in law occur. Alternatively, if it were possible in law, it would not in practice be allowed to arise, or, if it did by inadvertence arise, it would be solved by legislative action. Whether the legislative solution would be in the sense of the tribunal's award or of the Minister's legislation would depend upon the circumstances prevailing at the time: the probability is that the tribunal's award would be followed.

The Industrial Medical Officer

SIR,—Statements expressed at the Annual Meeting convince me more than ever of the folly of generalizing on the work of the industrial medical officer.

I recently left the service of a well-known firm with several factories here and overseas. At Factory A, near Chester, the shortage of labour compelled the labour officer to accept reluctantly all sorts of persons, some over 65 years of age. The function of the preliminary medical examination was to assist in placing applicants—so as to make the best use of available man-power—and to determine each individual's limitations. It must be realized that the foremen were very loath to accept persons who were obviously elderly or below par unless the doctor explained precisely what the worker could or could not reasonably be expected to do.

On the other hand, at Factory B, only 25 miles away, there was such an abundance of unskilled unemployed that the labour officer usually weeded out all except the brightest, smartest, most promising young men. In theory medical examination was unnecessary after such thorough selection, but in practice some of these men, despite outward appearances, were totally unfit, or fit only for restricted duties. Several had deliberately failed to [illegible]tion disabilities (such as herniae) which we, for our own reasons, considered extremely important. The "liberty of the subject" is irrelevant. If a labour officer can interfere with the "liberty of the subject" by rejecting perhaps 90% of the applicants, the doctor is surely justified in rejecting an occasional one.

What then were our criteria for judging fitness? It all hinged on the fact that my chief loyalty was to the existing workers in the factory. At Factory B many men were remaining in unsuitable jobs to their health's detriment because they preferred that to the dole. Their names were on our waiting-list, and they hoped, in the course of time, to be transferred to light or permanent day work. This state of affairs was very distressing. When examining applicants for employment the doctor was acutely conscious of that waiting-list, and he rejected any who were likely to congest it still further within a few years. This leads to a great principle—namely, that if one is going to make conditions of service as easy and pleasant as possible for the existing workers one has to be strict with the entrants. (The same principle explains the need for medically examining bank clerks, who enjoy the benefits of pension and sickness schemes.)

Preliminary medical examination also eliminates applicants who would otherwise spoil the harmony of the workshop. Verminous men, for instance, soon cause unrest. Men who would fail to pull their weight, through frequent sickness absence, are eliminated because they would tend to reduce the output—and the bonus—of their team, and be most unpopular.

From the managerial point of view, at Factory B the aim was to try to fit the square pegs into the square holes right from the beginning instead of by a process of trial and error. It took an average of six months for a worker to attain proficiency, so if he resigned, or requested a transfer, the loss and inconvenience were great. All successful applicants were expected to remain in their jobs for many years. The doctor therefore had to be thoroughly familiar with the prognosis of various disabilities, with the sequence of promotion in the departments, with environmental conditions, and with the peculiarities of the individual foremen.

In other words, let each industrial medical officer work out the aims and methods most suited to his own factories.—I am, etc.,

Matlock Bath, Derbyshire. RALPH N. WILSON.

The G.P.'s Job

SIR,—I quite agree with Lord Quibell that we G.P.s tend to send to hospital many cases which we would ourselves deal with in a private practice. I am, however, very surprised that the very man who was chastised by the Government for introducing bonus payments to his bricklayers should be so blind to the cause of our sins of omission. If his lordship can explain how we are to supply two clean and sterile towels, sterile instruments, and sterile or antiseptic dressings for each incision of a septic finger, plus the anaesthetic, out of a payment of 2s. 6d. per hundred patients, my wife and I will be very thankful; or how to find the time to do an E.S.R. and full blood count on each case of the rheumatoid type which presents itself, and repeat them regularly, when it is economically essential to have at least 3,000 patients, every one of whom was expressly told by Mr. Bevan to use the Service to the full, and many of whom do their best to obey.

Though there will always be slackers, the truth has to be recognized that most of us would much rather do these things ourselves and feel that we were at least pretending to be proper doctors, but cannot afford to do them. The Government put the cart before the horse in 1948, and, as do individuals, must have a period of extra expense during the changeover which will occur as soon as it is economically possible for us to do these jobs ourselves.—I am, etc.,

Cromer, Norfolk. A. H. GREGSON.

POINTS FROM LETTERS

The War Memorial

Dr. H. V. DEAKIN (London, N.W.3) writes: I welcome Dr. E. J. Thomson's letter (*Supplement*, July 22, p. 62) in reference to the B.M.A. War Memorial and shall be happy to contribute generously towards his admirable proposal—a fund of £50,000 for the children of the fallen. On receiving the appeal I wrote a letter of protest to the Chairman of the Council, for it appeared that the descendants were a minor consideration. I refuse to subscribe a penny towards enhancing the appearance of B.M.A. House, when a simple shrine and roll of honour should meet everyone's point of view. The children of our dead brothers should be our foremost and chief consideration. . . .

Association Notices

Branch and Division Meetings to be Held

MANCHESTER DIVISION.—At Christie Hospital and Holt Radium Institute, Wilmslow Road, Withington, Manchester, Friday, August 18, 2.30 p.m. Demonstration of methods of treating malignant disease by means of radiation, including radium, *x* rays, and radioactive isotopes.

Diary of Central Meetings

AUGUST

30 Wed. General Practice Review Committee, 2 p.m.

SEPTEMBER

14 Thurs. A.R.M. Agenda Committee, 11.30 a.m.
15 Fri. Staff Side, Committee "C," 2 p.m.

OCTOBER

3 Tues. Committee on Psychiatry and the Law, 2 p.m

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY AUGUST 26 1950

NEW APPEAL MACHINERY

PROCEDURE FOR SETTLING INDIVIDUAL DISPUTES

Special machinery for hearing appeals by individual members of staff, including medical practitioners, engaged in the National Health Service concerning disputes affecting terms and conditions of employment, *other than dismissal or disciplinary action*, is now being set up. It is provided for under a General Whitley Council agreement.

Fourteen regional appeals committees will be appointed. They will consist of equal numbers of the management side and staff side of the Whitley Council. Management side members will be selected from a panel representing the Ministry of Health, regional hospital boards, boards of governors of teaching hospitals, executive councils, joint pricing committees, Dental Estimates Board, and the county councils and county borough councils in each regional area. Staff side members will be selected from representatives of the professional organizations and trade unions represented on the Whitley Councils for the Health Services and having members employed by the authorities concerned.

The four main steps in the procedure are:

(1) An appeal may be made by the employee to his employing authority.

(2) An appeal from the decision of the employing authority may be made by the employee's recognized professional organization or trade union to the regional appeals committee.

(3) If the regional appeals committee fails to reach a decision, the appeal may be referred by either party (staff organization or employing authority) to the appropriate Whitley Council.

(4) If the Whitley Council fails to reach a decision, either party to the dispute may take steps to have the matter referred to arbitration.

The Minister of Health is anxious to bring the new arrangements into operation as quickly as possible, and has asked for the early nomination of representatives to serve on the appeal panels.

HEALTH SERVICES FINANCE

The Committee of Public Accounts has some criticism to make of the finances of the National Health Service in its Fourth Report (H.M.S.O., 9d.). The committee recognizes the difficulties of accurately forecasting the effect of the Health Service on the remuneration and expenses of the people participating in it, but regrets that the initial rates were not made provisional until the relevant facts had been ascertained. But it adds that such an arrangement could probably not have been negotiated with the professional bodies concerned. Full information on earnings and expenses of doctors has not yet been obtained, though the available evidence suggests, says the report, that "the earnings of the general practitioners as a whole may have somewhat exceeded the Spens ranges."

The Ministry of Health stated to the committee that dentists had been able to work "unbelievably long hours." The Ministry thinks that it is possible for dentists to work considerably more than 1,500 chairside hours a year (on which the Spens recommendations were made) without detriment to their efficiency.

The number of prescriptions dispensed by chemists in 1949–50 was about 200 million instead of the 140 million expected. Cuts have been made in their remuneration, but the Departments do not know the total payments made to individual chemists, and they have little information on the effect of the Health Service on their earnings from private work.

Considering the finance of the hospital services, the committee endorsed the Government's view "that in the long run a reasonable degree of freedom to the hospital bodies to exercise their responsibilities without excessively detailed control should produce the best service." But it hopes that some system will be evolved to ensure that the money is administered wisely and with due regard to economy.

The committee was informed that large arrears of capital expenditure were accumulating and that many desirable schemes for improving the hospital services cannot be carried out. The Ministry of Health was aware that postponement of capital expenditure might sometimes be a false economy.

SUPPLEMENTARY OPHTHALMIC SERVICES

Amending regulations have been made enabling people whose glasses were prescribed more than two years previously to have them replaced or repaired without a further sight test, though for a person under 16 the previous prescription must have been issued within 12 months.

Another regulation deals with the case where a person loses or damages his glasses through carelessness but where full payment for the cost of replacement would cause undue hardship. In these circumstances, after appropriate investigation, ophthalmic services committees are given power to reduce or waive payment. This and some other changes are made in the National Health Service (Supplementary Ophthalmic Services) Amendment Regulations, 1950.

Some special ranges of hard-wearing spectacle frames suitable for children are now available under the Supplementary Ophthalmic Services.

MATERNITY MEDICAL SERVICES

New arrangements for paying for maternity medical services provided by two doctors to the same woman are described in a circular from the Ministry of Health. They have been made after consultation with the General Medical Services Committee of the B.M.A. The equivalent of a single inclusive fee is payable. Since it is difficult for the doctors to settle how the fee should be split, executive councils are asked to accept responsibility for the decision in consultation with the local medical committee. Executive councils "should normally reach a preliminary decision on the basis of the claims submitted by the doctors, inform the doctors what is proposed, and then reach a final decision after considering any representations made by the doctors."

GENERAL PRACTICE IN NORTHERN IRELAND

The Northern Ireland Committee of the Nuffield Provincial Hospitals Trust has decided to make an independent survey of the conditions of general practice in Northern Ireland. The main objects are to improve the status of the general practitioner and to find, if possible, how he can obtain reasonable time for leisure, contact with his colleagues, and postgraduate study. The assumption is that any improvement which can be made on these lines will be reflected in improved service to the patient.

Dr. J. A. Fisher, formerly of the Nuffield Department of Clinical Medicine, Oxford, has been appointed to make the survey, which will be based on sample surveys, questionaries, and direct interviews with practitioners. Although the Nuffield survey is independent, it is being made with the approval and encouragement of the Northern Ireland Ministry of Health, the Health Services Board, and other interested authorities there

PHYSIOTHERAPY IN THE N.H.S.

The General Medical Services Committee has continued to contest the Ministry's view that, because specialist facilities are available through the hospital service, a general practitioner cannot receive payment for specialist services to patients on his list unless he holds a hospital appointment. For some time the Ministry has been urged to find some way of giving general practitioners with the necessary experience the right to take part in the physiotherapy service, possibly as clinical assistants. The committee has felt such an innovation to be particularly necessary in rural areas where it is difficult for patients to attend hospitals for treatment.

While stating that it is looking into the position of a mobile physiotherapy service to cover the needs of patients who cannot reasonably be expected to attend at hospitals, the department has agreed that in certain circumstances it might be possible for regional hospital boards, in view of the limitations of hospital physiotherapy departments in isolated country districts, to make arrangements for general practitioners to undertake the work.

The Ministry feels this to be entirely a matter for the regional hospital board, but envisages that in the following circumstances general practitioners could participate in the physiotherapy service:

(1) when the patients concerned are not within easy reach of a hospital providing physiotherapy services;

(2) when the doctor holds a temporary clinical assistantship from the hospital management committee and is under the supervision of the director of the hospital department of physical medicine;

(3) when a substantial number of patients in the district are likely to require such services; the doctor could not thereby limit the services to his own patients.

STATUTORY LEVY FOR LOCAL MEDICAL COMMITTEES

Some executive councils have been making a statutory levy for local medical committees from the remuneration of general practitioners by deducting the sums from, and in proportion to, the amounts paid in respect of general medical services proper, maternity medical services, and pharmaceutical services. In view of representations by the profession these deductions will in future be made in proportion only to the capitation payments, and, where appropriate, basic salary.

FACULTY OF OPHTHALMOLOGISTS

At a meeting of the council held on June 30 a letter was received from the British Medical Association stating that the Ophthalmic Group Committee supported the Faculty's representations that orthoptists should not be included within the scope of the deliberations of the Inter-departmental Committee on the Statutory Registration of Opticians, but should be regarded as medical auxiliaries.

The Faculty's attention has been drawn to the fact that the Ministry of Health has given directions to regional hospital boards that school clinics held at hospitals should be run by ophthalmic opticians, who should refer cases which they thought fit to an ophthalmic surgeon, who would be nominally in charge. The Faculty's views have been asked for on this point before such a clinic is formed in the London County Council area. The council considers that the Ministry's direction is undesirable, and the honorary secretary was asked to write to the Chief Medical Officer of the London County Council drawing his attention to a memorandum on "An Ideal School Ophthalmic Service" prepared by the Ophthalmic Group Committee of the British Medical Association in May, 1948.

It has been agreed to contribute £30 towards the cost of the lectures in ophthalmology at the Royal College of Surgeons.

Correction.—Under the heading "Health Service Glasses" in the *Supplement* of August 12 (p. 87) we should have stated that bifocal and lenticular *plastic* lenses will now be included in the range of glasses of a special type obtainable under the Health Service towards the cost of which the patient makes a payment.

Heard at Headquarters

Priorities

A doctor, describing the following letter in the melancholy phrase "Commonplace in general practice these days," tells us that he received it recently from one of his patients: "Dear Dr. X, Would you please give Mary her priority for milk and eggs. Penicillin eye ointment for Mr. N., also certificate for Elizabeth for her broken nose, and slimming tablets for me. I have to give insurance man certificate for Elizabeth saying she has had a broken nose and has had operation on same. Thanking you.—Mrs. N. P.S. Also headache tablets for Mary."

Questions Answered

International Health Certificate

Q.—*Am I entitled to charge for the International Health Certificate of successful vaccination—that is, not for the vaccination but for the certificate?*

A.—Yes.

Employment of "Mother's Help"

Q.—*I am doing public health work—maternity and child-welfare sessions. In order to do this, I employ a "mother's help" to look after my child, aged 9 months, in my absence. Am I entitled to income-tax relief in respect of her wages? Unless I employ someone for the child, I cannot do the clinic work.*

A.—There is a judicial decision, now nearly 60 years old but still valid, against such a claim. The case was that of a man and wife acting as master and mistress of a school, and the claim was for a deduction of £30 in respect of the cost of a servant employed to free the wife for her school duties. The judge held that it was not an expense incurred in the performance of their duties as school teachers (*Law Reports* (1891), 1 Q.B. 560).

Deductions When on Holiday

Q.—*Each month a sum is deducted from my salary in respect of board, lodging, etc. On returning from a month's holiday I found that that amount was deducted for the period I was away. Is any rebate allowed for absence on holiday?*

A.—Hitherto hospital authorities have adopted different policies in this matter: some have continued to make the deduction for board and lodging while the officer was on holiday, while others have not. The point was not covered in the Terms of Service issued in June, 1949, but the Ministry has recently instructed in Circular R.H.B. 50/44 (H.M.C. 50/43) that—so far as house officers are concerned—the standard charge of £100 per annum should *not* be abated on account of absence on annual leave or normal periods of sick leave.

Where in cases of prolonged sick leave this gives rise to hardship, the hospital management committee has discretion to relax the charge. Singularly enough, the deductions for board and lodging are not made in the case of nursing staff on holiday.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

Correspondence

Independent Court of Arbitration

SIR,—Despite the rebuke which Dr. Hill attempts to administer to me in his reply to my letter in the *Supplement* of August 19 (p. 92) I am unrepentant. I do not confuse the issue, because the matter raised in 1949 and the interpretation of Clause 13 of the National Health Service (Amendment) Act, 1949, are both part of the same problem. It is a difficult problem, I freely admit, but the issues cannot be dissociated. It is bound up with the right that every man must be permitted to withhold his labour if he wills, provided he breaks no contract and provided there is not in existence such a state of emergency as calls for the suppression of normal freedom. It was this state of emergency in 1940 that compelled the Minister of Labour and National Service to make the Conditions of Employment and National Arbitration Order. That emergency no longer exists, and what is allowed to a single person should be allowed to a number of persons acting in concert. The order has been temporarily continued in force, but it is not yet part of our permanent legislation. I feel certain that if any attempt is made to make it permanent it will be resisted by the trade unions. What is much more important is the fact that, although it is a criminal offence under this Order to strike without giving notice to the Minister of Labour, in practice no attempt has been made to enforce this Order.

Industrial arbitration has been defined as "the settlement by one or more, presumably impartial, persons of an issue on which the parties have failed to agree." Who are the parties under the National Health Service Act, 1946, and the Amendment Act, 1949? On the one hand there are the persons rendering varying services under the Acts and on the other hand there is the Minister of Health, who is bound "to provide or secure the effective provision of services in accordance with the following provisions of the Act" (Clause I (1)—Duty of Minister). It does not matter whether he does it directly or not; the Minister is the employer of all those giving services under the Act.

The definition of industrial arbitration mentioned above was contained in the final report in May, 1894, of the Royal Commission on Labour. As a result of this report the Conciliation Act, 1896, was enacted. This Act was formerly administered by the Board of Trade and substituted by the Minister of Labour in 1916. The Industrial Courts Act, 1919, re-enacts the substance of the Conciliation Act, 1896, and if Dr. Hill had read my letter carefully and the provisions of both these Acts in full he would, I am sure, have been more tolerant of my right to express my opinion. I again repeat that his interpretation of both these Acts in his reply is wrong.

Both Acts are now of importance to the profession, particularly the Conciliation Act, because any difference or dispute arising with respect to our remuneration or conditions of service under the National Health Service Acts is deemed to be by Section 13 of the National Health Service (Amendment) Act, 1949, a difference or dispute to which the Conciliation Act applies. The Minister of Health has clearly subordinated his power under Clause 47 of the original Act to decide disputes for himself, and in my opinion is now by Clause 13 of the Amendment Act a party to the dispute and not the sole arbiter. I am quite well aware that by the Fifth Schedule of the National Health Service Act each executive council is a body corporate, but I do not agree that the 163 executive councils in the British Isles are distinct from the Crown. Without going into detail on this matter I would submit that they are so constituted and bear so immediate a relation to the Crown that they must be regarded as branches of the executive Government of the realm, and—as defined in Salmond on Torts—they are incorporated servants of the Crown. They possess no legal personality or capacity otherwise than as agents of the Crown.

With great respect to the eminent leading counsel referred to by Dr. Hill, whose name I do not know, I submit that his interpretation of the 1940 Order is not accurate. He expresses his opinion on Clause 4, Part II, of the Order headed "Lock-outs and Strikes," and omits reference to Part I entitled "National Arbitration." Clause 2 (2) clearly states that, provided the dispute is referred to the Minister of Labour, the Minister must refer the matter to any collective machinery suitable for settling the dispute. He must therefore deal with it under all the provisions of Clause 13 of the Amendment Act, which means *all* the machinery of the Conciliation Act and the Industrial Courts Act. If he failed to do what is obligatory under Clause 2 and proceeded as Dr. Hill and learned counsel suggest under Clause 4 at once we should be entitled to ask the Courts to restrain him from so doing. In any case Clause 4 cannot apply unless the Minister of Labour declares that our withdrawal by giving proper notice under the Law of Contract is a "strike." If he does declare it a "strike" then the constitutional position of the Association will have to be reconsidered.

The proceedings before the industrial court are voluntary and are privileged. The decisions are not enforceable under the Arbitration Act of 1889, as that Act does not apply to any reference to the industrial court or to any reference under the Conciliation Act or Industrial Courts Act. Nor is there any penal provision enforceable against any person refusing to observe the terms of a decision. Where, however, a decision is accepted or acted upon it forms a condition or term of the contract of employment. If we do not like the terms, either as individuals or collectively, then we resign our contracts. There is nothing to stop us. Slavery was abolished years ago. Although few in number, decisions have been rejected. So why be fearful?

I have not had the advantage, as a member of the Council of the B.M.A. or as a duly elected member of the Representative Body of the Association, of seeing the full report of counsel's opinion. But the answers to the two questions submitted to counsel, on page 94 of the *Supplement* of August 19, are very curious. The answer to the first is a presumption, and I would be glad to see the full legal arguments on which he bases his assumption. His answer to the second question shorn of legal arguments and as presented by Dr. Hill means just nothing to me. It is a mass of "ifs and ors" and ends in the guesswork of probability. There are at least four contingencies. With great respect I do not consider that the answer to Question 2 will assist the General Medical Services Committee in their deliberations.

I would again repeat and stress my opinion expressed in my previous letter that we are confronted, and have been since July 5, 1948, with a new constitutional situation, where the Minister of Health is an employer and a party to a "trade dispute" as enacted in Clause 13 of the Amendment Act. Under Whitley machinery, which is voluntary, he can exercise the Crown's prerogative. Under Clause 47 of the National Health Service Act the Crown's prerogative could be exercised by the Minister of Health as sole arbiter of disputes. Parliament, however, has abrogated the prerogative by statute in Clause 13 of the Amendment Act and the Minister has become a party to the dispute. Parliament is supreme, and, if it has thought fit to regulate a subject-matter in a manner which clearly seems to exclude the use of prerogative power, then effect must be given to its legislative mandate in Clause 13 of the Amendment Act. It has been clearly defined judicially that a statutory provision can extinguish or curtail the Crown's prerogative (*Min. of Health* v. *R. ex parte Yaffe*, 1931, and *Att.-General* v. *De Keyser's Hotel*, 1920).

May I finally register a protest, which will doubtless be supported by many members of Council? Some weeks after the Southport meeting we are informed, as the result of a letter of mine, that a fortnight before the A.R.M. the opinion of leading counsel was obtained at the request of the General Medical Services Committee. I appreciate the fact that the G.M.S. Committee possesses autonomy, which has already been referred to as illogical. Nevertheless, it is still a Standing Committee of the Association. Was the matter so secret and so confidential that it was withheld from members of the Council of the Association? The issues are of vital importance to the profession. It was on the agenda of the A.R.M. Dr. Wand, as chairman of the General Medical Services Committee, must have been aware of counsel's opinion when he made his

impassioned speech on withdrawal of service. Why did he not inform the Representative Body of the fact? Dr. Hill was cognizant of this fact when he made his *ex cathedra* statement to the Representative Body at Southport. Why was the Council and the R.B. ignored? It calls for an explanation.—I am, etc.,

London, W.8. J. ARTHUR GORSKY.

Resignation and Arbitration

SIR,—The first question to be answered in this very complex controversy is, Are we "employed" and, if so, by whom? Legal opinion quoted in the Secretary's answer to the letter from Dr. J. A. Gorsky (*Supplement*, August 19, p. 92) makes it quite clear that if general practitioners are employed they are employed by the executive councils and not by the Crown.

I believe that we are *not* employed. When we signed E.C.16 we agreed to provide general medical services under the provisions of the N.H.S. Act, 1946, no more and no less. Section 21 of the Act specifically forbids the L.H.A. to employ general medical practitioners in health centres, and nowhere in Part IV of the Act is any mention made of the executive councils' employing general practitioners. It would indeed be an odd constitutional situation if we as doctors were members of an executive council which is our own employer. Our position in relation to the executive councils is so vastly different from that of the public health medical officer and the local health authority by whom he is employed.

The second question is, If we collectively terminate our contracts with executive councils, is it a "strike"? Let us take the legal definition of a strike. A strike means "the cessation of work by a body of persons employed acting in combination or a concerted refusal or a refusal under a common understanding of any number of persons employed to continue to work for an employer in consequence of a dispute." This would apply to a group of public health doctors employed by the L.H.A., but it cannot apply to general practitioners. If we collectively terminate our contracts with executive councils we do not cease work. In fact we continue to provide general medical services for the public, including, I hope, certificates of incapacity. All we have done in effect is to change our methods of remuneration and collect our fees from the patient direct instead of through the agency of the Government.

It will be seen at once that the 1940 Order cannot apply to general practitioners, since we are not employed and we do not strike.

All the points in relation to Section 13 of the Amendment Act have already been covered by Dr. Gorsky's letter and the Secretary's reply thereto, except this—that the Amendment Act was passed after most of our contracts were signed and is therefore retroactive legislation and as such is incompatible with my sense of justice and fair dealing.

Whatever else we do we should not lose the right to collectively terminate our contracts. This affects consultants as much as general practitioners.—I am, etc.,

Solihull, Warwickshire. ARTHUR BEAUCHAMP.

The War Memorial

SIR,—I have followed this correspondence with a good deal of concern. It has seemed to indicate that there is not the unanimous welcome response that I had thought would follow any proposal made by the Council after due consideration and supported by high artistic authority. Whatever the proposal had been, I should have sent in my modest contribution so long as it included a memorial which could be *seen*. I never enter our courtyard without an affectionate glance at the gates which we dedicated to the 1914–18 fallen, and I have not met anyone who did not admire the taste and judgment of those responsible for that memorial.

I was therefore perturbed when some of the critics of the present proposal seemed to suggest that it would not be in keeping with the Lutyens façade or was likely to mar the beauty of the courtyard. I was glad when I was offered the privilege of visiting the studio of the artist and examining the model with the help of his explanations. I came away feeling that the whole conception is worthy of the position it is designed to hold, of the artist, and above all of those whose sacrifice we desire to commemorate. I believe it will add a new glory to the House of which we are so proud.

A word about the suggestion that we should not use the money for a visible memorial but, so to speak, put it into something "useful." Personally I should object to this, remembering the many memorial schemes which have left nothing to quicken the imagination, and I should hate the idea of the B.M.A. using it to compete with that great foundation, Epsom. I remember a strong movement at one time in favour of establishing an independent B.M.A. charity fund. This was heavily defeated, and for some years now the ability of the Association to raise money in a good cause has been used to co-operate with the R.M.B.F. to the satisfaction of all concerned. I would therefore suggest that any money left after the Memorial is paid for should be offered to Epsom in the form of B.M.A. scholarships and pensions. That body with its vast experience would know, in consultation with the Association, how best to use such funds.—I am, etc.,

ALFRED COX.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Captain (War Substantive Major) J. J. Voller, *from Short Service* (Specialist) Commission, to be Captain.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Colonel) J. W. Bowden, *formerly* I.M.S., to be Major, retaining the honorary rank of Colonel.

Lieutenant (War Substantive Captain) G. J. Cleland, M.B.E., *from* Emergency Commission, to be Captain, and has been granted the honorary rank of *Major*.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel W. W. Crawford, T.D., to be acting Colonel.

Captain (acting Major) I. W. Buirski to be acting Lieutenant-Colonel.

Captains A. H. Bulleid and J. Gregory to be Majors.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel G. A. Kane, O.B.E., T.D., from Active List, to be Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) A. Pain, O.B.E., T.D., having exceeded the age limit for liability to recall, has ceased to belong to the T.A.R.O.

Captain (Honorary Major) J. M. G. Wilson has relinquished his commission.

ROYAL AIR FORCE

Squadron Leader E. F. Mason, M.B.E., has resigned his commission, retaining his rank.

ROYAL AIR FORCE VOLUNTEER RESERVE

Flight Lieutenant T. L. Adamson has relinquished his commission on appointment to the reconstituted R.A.A.F., retaining the rank of Squadron Leader.

INDIAN MEDICAL SERVICE

Major D. P. Dewe has retired.

Association Notices

Diary of Central Meetings

SEPTEMBER

14	Thurs.	A.R.M. Agenda Committee, 11.30 a.m.
15	Fri.	Staff Side, Committee "C," 2 p.m.
21	Thurs.	General Medical Services Committee, 11 a.m.
28	Thurs.	**Adjourned Annual Representative Meeting**, 9.30 a.m. **Council** (after conclusion of adjourned A.R.M.).

OCTOBER

3	Tues.	Committee on Psychiatry and the Law, 2 p.m.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY SEPTEMBER 2 1950

British Medical Association

REPORT OF GENERAL MEDICAL SERVICES COMMITTEE, 1949

Preliminary

Personnel of General Medical Services Committee, 1949–50

Ex-officio: Dr. C. W. C. Bain, F.R.C.P., Harrogate (President); Dr. J. A. Brown, Birmingham (Acting Chairman of Representative Body); Dr. E. A. Gregg, J.P., London (Chairman of Council); Mr. A. M. A. Moore, F.R.C.S., Upminster, Essex (Treasurer); Dr. W. Jope, Blantyre, Lanarkshire (Chairman of Conferences of Local Medical Committees).

Elected by A.R.M. of B.M.A. (1949): England and Wales: Dr. H. Guy Dain, LL.D., Birmingham; Dr. H. H. Goodman, Newcastle-upon-Tyne; Dr. F. Gray, London; Dr. S. Wand, Birmingham; *Scotland:* Dr. W. M. Knox, Glasgow; *Northern Ireland:* Dr. J. Bleakley, Belfast.

Direct Representatives of Local Medical Committees: Dr. J. T. Baldwin, Penicuik, Midlothian (Group "A.1"); Dr. A. C. Hendry, Bucksburn, Aberdeenshire (Group "A.2"); Dr. J. T. McCutcheon, Glasgow (Group "A.3"); Dr. R. C. Hamilton, Kilmarnock (Group "A.4"); Dr. P. V. Anderson, Shildon, Co. Durham (Group "B"); Dr. H. F. Hollis, Leeds, and Dr. R. H. Sunderland, Bradford (Group "C"); Dr. C. Baxter, Liverpool, Dr. A. Campbell, Accrington, and Dr. S. A. Winstanley, Urmston (Group "D"); Dr. D. B. Evans, Wrexham, and Dr. A. E. Jenkins, Pontypridd (Group "E"); Dr. J. B. Bennett, Hyde, Cheshire (Group "F"); Dr. A. B. Davies, Walsall (Group "G"); *Dr. G. Waring Taylor, Leicester, and Dr. A. S. Wilson, Gosberton, Lincs (Group "H"); †Dr. W. D. Steel, Worcester, and Dr. F. A. Smorfitt, Southam, Warwickshire (Group "I"); Dr. W. Woolley, Bristol (Group "J"); Dr. I. C. Pearce, Diss, Norfolk (Group "K"); Dr. C. F. R. Killick, Williton, Somerset (Group "L"); Dr. H. S. Howie Wood, Isle of Wight (Group "M"); Dr. D. F. Whitaker, Guildford, and Dr. A. T. Rogers, Bromley (Group "N"); Dr. J. L. McKenzie Brown, Walthamstow, and Dr. D. F. Hutchinson, Acton (Group "O"); Dr. J. F. Murphy, London, S.W.8, and Dr. H. H. D. Sutherland, London, W.10 (Group "P"); Dr. J. B. Young, Belfast, Northern Ireland (Group "Q").

Elected by Annual Conference of Local Medical Committees, 1949: Dr. A. Beauchamp, Birmingham; Dr. S. A. Forbes, South Croydon; Dr. I. G. Innes, Hull; Dr. J. A. Ireland, Shrewsbury; Dr. F. M. Rose, Preston; Dr. J. A. Pridham, Weymouth.

Nominees of Other Bodies: Mr. R. L. Newell, F.R.C.S., Cheadle, and Mr. T. Rowland Hill, F.R.C.P., London (*Central Consultants and Specialists Committee*); Dr. Catherine Harrower, O.B.E., Glasgow (Medical Women's Federation); Dr. J. A. Struthers, London (Society of Medical Officers of Health).

Co-opted Member: Dr. O. C. Carter, Bournemouth.

Observer from the British Dental Association: Mr. J. W. Gilbert, L.D.S. R.C.S., London, E.7.

*Resigned June, 1950. †Resigned January, 1950.

Chairman

1. Dr. S. Wand was appointed Chairman for the session 1949–50.

Obituary

2. The Committee regrets to record the deaths of: Dr. D. G. Greenfield (Rushden, Northants), a Past-Chairman of the Conference of L.M.C.s, and for many years a member of the Insurance Acts Committee and Chairman of its Rural Practitioners' Subcommittee. Dr. C. M. Stevenson (Cambridge), a member of the Insurance Acts Committee in 1938–9, and a representative at Conferences for many years. Dr. C. G. Martin (London), a member and representative of the London Local Medical Committee for many years, and a member of the wartime Medical Planning Commission. Dr. Ernest Martin (Manchester), Honorary Secretary of the Oldham L.M. and Panel Committee before joining the Ministry of Health Divisional Medical Staff. Dr. J. W. Little (Newmains, Lanarkshire), a member of the Insurance Acts Scottish Subcommittee for many years, and Secretary of the Lanarkshire Panel Committee. Dr. A. W. Holthusen (Southend), a representative at Conferences for many years, and a member of the Southend Insurance Committee.

Work of the Committee

3. The Committee's efforts to secure an improvement in the capitation fee were set out in M.28 and reported to the Special Conference of Local Medical Committees on June 29. In addition a review has been undertaken of many of the Regulations affecting general practitioners in the Service. These activities, together with an increasing volume of routine business, have inevitably increased the Committee's activities, and with the exception of February it has been found necessary to hold monthly meetings since the last Annual Conference. Each meeting has occupied the attention of the Committee for at least six hours and on several occasions the Agendas have contained more than fifty items as well as reports from subcommittees. In addition to meetings of the full Committee there have been numerous subcommittee meetings, deputations to the Ministry of Health, and informal discussions with representatives of other bodies associated with the National Health Service.

4. A list of attendances at various meetings is given in Appendix "A." This does not include attendances of members at Whitley Council meetings or other Association Committees upon which they serve as representatives of the G.M.S. Committee.

Election of Direct Representatives on the Committee

5. The regrouping of Local Medical Committees for the purpose of electing direct representatives on the G.M.S. Committee, as approved at the last Annual Conference, comes into operation at the forthcoming election. A separate communication on the subject is being sent to Secretaries of Local Medical Committees.

Representation on B.M.A. Committees

6. The G.M.S. Committee is represented on the following B.M.A. Committees: Private Practice (Dr. S. Wand); Central Consultants and Specialists (Drs. A. T. Rogers and D. F. Hutchinson); Ophthalmic Group (Dr. W. Woolley); Occupational Health (Dr. H. F. Hollis); Public Relations (Drs. S. Wand, D. F. Hutchinson, F. M. Rose, C. Baxter, H. H. D. Sutherland, and W. Woolley); Health Centre (Dr. D. F. Hutchinson); Compensation and Superannuation (Drs. S. Wand, W. Jope, and A. Campbell); Committee *re* Association of G.P.s with Hospital Work (Drs. S. Wand, D. F. Hutchinson, and C. F. R. Killick); Joint Committee of B.M.A. and Pharmaceutical Society (Drs. S. Wand, F. Gray, and W. Jope); Joint Subcommittee on Report of Working Party on Midwives (Drs. A. T. Rogers, H. H. D. Sutherland, and J. G. Thwaites); Joint Formulary Committee of B.M.A. and Pharmaceutical Society (Drs. A. B. Davies, S. A. Forbes, A. Smith Pool, and D. F. Whitaker); Joint Subcommittee of Central Consultants and Specialists and General Medical Services Committees (Drs. D. F. Hutchinson, A. T. Rogers, and H. S. Howie Wood).

Nominees on the Ministry of Health Distribution Committees

7. The following nominees were accepted by the Ministry for appointment to the Central Distribution Committees for 1949–50:

International Distribution Committee: Dr. F. Gray (London), Dr. W. M. Knox (Glasgow), Dr. J. D. Wells (Billericay, Essex), and Dr. E. J. Rees (Pontypridd).

Distribution Committee for England and Wales: Dr. F. Gray (London), Dr. W. Woolley (Bristol), Dr. E. J. Rees (Pontypridd), and Dr. D. P. Stevenson (Deputy Secretary of the B.M.A.); together with Dr. J. C. Pearce (Diss, Norfolk), Dr. J. D. Wells (Billericay, Essex), and Dr. C. F. R. Killick (Williton, Somerset) when questions concerning mileage are under consideration.

8. This representation has enabled the Committee to present its views direct to Ministry Committees which are concerned with the distribution of the Central Pool. In this way the Committee has been able to press for an interdepartmental committee to re-examine the distribution of the Mileage Fund and the desirability of setting up machinery to check the inflation of doctors' lists.

Medical Practices Committee

9. Dr. W. E. Dornan has been reappointed Chairman of the Medical Practices Committee for a further period.

10. A number of informal meetings have been held between representatives of the General Medical Services Committee and the medical members of the Medical Practices Committee, at which matters of mutual interest have been discussed.

11. The Committee would like to record its appreciation of the ready way in which the medical members of the Medical Practices Committee have co-operated in these discussions, and on one occasion a joint approach has been made to the Ministry on an important problem affecting the filling of vacant practices.

Representation on the Joint Pricing Committee for England

12. The Committee's nominee, Dr. Joel Green (London, N.W.6), has been reappointed to the Joint Pricing Committee for England.

Liaison with the Dentists

13. The British Dental Association has agreed to an exchange of observers. Dr. F. Gray (London) represents the G.M.S. Committee on the appropriate committee of the B.D.A., and Mr. J. W. Gilbert, L.D.S. R.C.S. (London), represents the B.D.A. on the G.M.S. Committee.

Liaison with Consultants and Specialists

14. The Committee has accepted an invitation from the Central Consultants and Specialists Committee to form a joint subcommittee to consider matters of major importance affecting the interests of both general practitioners and consultants and specialists.

15. The General Medical Services Committee will be represented by Drs. S. Wand, A. Campbell, H. S. Howie Wood, D. F. Hutchinson, C. F. R. Killick, W. Jope, and A. T. Rogers.

Remuneration

16. Local Medical Committees will remember that the Special Conference on June 29, 1950, passed the following resolutions:

(1) That the Conference places on record the fact that at no time, either before or since the appointed day, has the remuneration of general practitioners been agreed.

(2) That the Conference is seriously disturbed at the repeated hold-ups and prolonged delays in the negotiations on general-practitioner remuneration, and calls upon the Minister of Health to state immediately what the global sum should, in his opinion, be in the Central Pool to implement the recommendations in the Spens Report.

(3) That the Conference deplores the failure of the Minister of Health to give an unqualified assurance that negotiations on general-practitioner remuneration will always be conducted through Whitley machinery.

(4) That the Conference, recognizing that an equitable settlement of the remuneration issue may be influenced by early and accurate information on general-practitioner income from National Health Service sources and practice expenses, is willing to participate in the proposed inquiry.

(5) That the Conference instructs the General Medical Services Committee to make preparations forthwith for the termination of contracts by general medical practitioners in the National Health Service.

(6) That if and when it becomes evident that there is no prospect of a satisfactory settlement of the claim, a Conference be called to name a date on which general practitioners are advised to end their contracts with local executive councils; and that in any case a Conference be called to consider the position in December, 1950, if a settlement has not been reached by that time.

17. These resolutions were forwarded to the Ministry of Health on June 30, 1950, and a reply was received to the effect that a memorandum setting out the Ministry's proposals for the inquiries into general practice income and expenses would be available at an early date. The letter went on to say that, in view of the delay in arriving at the necessary settlement to enable the inquiries to proceed, there was some doubt as to whether it would be possible to complete the inquiries by November 1.

18. The Committee has since received the memorandum referred to above and has discussed it in detail with officers of the Ministry. During the discussions the Committee's representatives were accompanied by an eminent actuary and an accountant with experience of doctors' accounts and income-tax problems. Sufficient agreement has been reached with the Ministry on the general lines upon which the inquiries are to be conducted to enable the collection of the factual information to be proceeded with forthwith.

19. The Committee has also considered the necessary steps to be taken to give effect to the instruction of the Special Conference to prepare forthwith for the termination of general practitioners' contracts with Executive Councils. It will be remembered that the British Medical Guild was set up specifically for the purpose of dealing with disputes arising between the Government and any section of the profession, and, bearing in mind that for constitutional reasons the G.M.S. Committee is unable to organize mass withdrawal from the Service, it is inevitable that the Guild should make the necessary preparations. Local Medical Committees will by now have received Memorandum I issued by the Executive Committee of the Guild, and a further memorandum will shortly be issued dealing with the more detailed arrangements to be made by the Local Guild Committees as soon as they have been set up in every area.

Mileage

20. It will be remembered that, following a comprehensive survey of mileage payments throughout the country, the Committee concluded that the global sum of £2 million was adequate for Great Britain as a whole, but that the figures revealed discrepancies in some areas which indicated that the distribution of the Fund was urgently in need of revision. Concurrently with the Committee's survey the Ministry collected data for use as the basis of future distribution of the Central Fund between Executive Councils. Every Executive Council concerned with the payment of mileage was asked to submit returns of units claimed on a standard basis of one unit for each mile or part of a mile over two miles from the doctor's residence to the patient's address. By a process of dividing the total number of persons on the doctor's list by the total number of mileage units credited to him, the practices were then classified into (*a*) rural, (*b*) semi-rural, and (*c*) urban, and the units in the rural and semi-rural practices weighted by 100% and 50% respectively.

21. Subsequently the Ministry submitted statements showing the effect of applying the new proposals, and, whilst the Committee was not surprised to see that a substantial redistribution would be effected by the adoption of the new criteria, the absence of any reference to "walking" units resulted in an incomplete picture of the mileage position generally.

22. Further discussions and examinations of the problem have shown that many of the inequalities are due to the lack of any up-to-date basis for the allocation of the Reserve portion of the Fund. The original grants from the Reserve portion were determined by a Ministry of Health Committee after a comprehensive survey some 25 years ago, and, with subsequent increases in the Mileage Fund, the present size and distribution of the Reserve portion bears little relation to the difficulties of access actually involved.

23. Additionally, although the new proposals vary the weightings which are applied to the different categories of practice, the actual method by which the practices are classified for the purpose of compiling returns which govern the distribution of the Ordinary portion of the Fund is also some 25 years old and therefore cannot wholly account for changing conditions in various areas. It is clear, therefore, that the factors on which the Committee's proposals were based would not necessarily lead to a permanently equitable distribution of the Fund.

24. The Committee concluded that the only remedy lay in the appointment of a Government Committee to review the whole mileage problem afresh. The Ministry has agreed to take this course, but, as some time will elapse before any new scheme can be evolved, it has been decided as an interim measure to vary the "weightings" from April 1, 1950, in accordance with the proposals which the Committee had made. It is felt that this step will reduce some of the more obvious inequalities in distribution pending the completion of the work of the Government Committee.

25. The Committee has also undertaken an examination of the specially difficult areas with a view to helping the practitioners in these areas, either from the Special Inducement Fund or by making special payments as a first charge on the Central Mileage Fund in cases of difficulty where payments from the Special Inducement Fund would not be considered appropriate. In view of the appointment of a Government Committee to investigate the mileage question in detail, however, it is considered that this question could more satisfactorily be resolved in the course of that Committee's investigations, and no further action is being taken for the time being. It is hoped that the interim scheme will go some way towards alleviating some of the more extreme cases of special difficulty.

26. Consideration has been given to the question of mileage payments for doctors attending patients at lighthouses. The doctor's liability in terms of time spent is considerable and might well involve absence from his practice for a long period during bad weather. Pending further consideration of the subject by the Government Committee mentioned above it has been decided that mileage payments should be based on the following factors:

(1) cost of boat hire where necessary and on each occasion when it is necessary;

(2) mileage based on the distance from the doctor's home to the point of embarkation less two miles;

(3) payment for loss of remunerative time based on a classification of lighthouses into two grades: (*a*) easily accessible, £2 per visit; (*b*) others, £5 per visit.

27. Where the lighthouse is on the mainland and within reasonable distance of the centre of an area of habitation it will not be included in these special arrangements.

Basic Salary

28. The 1949 Annual Representative Meeting of the B.M.A. recorded its objection to the Minister of Health allowing an appeal against the refusal of a Local Medical Committee and Executive Council to grant basic salary. It was suggested to the Ministry that appeals of this nature should be referred to the Medical Practices Committee, or at any rate that that Committee should be consulted before the Minister announced his decision on appeal. The Ministry's view is that the result of an appeal is a quasi-judicial ruling which should be given by the Minister, who is alone responsible.

29. The Minister has subsequently, on a number of occasions, allowed appeals by general practitioners against decisions of Executive Councils that basic salary should not be granted. The reason given by the Minister was that the doctor was building up a practice. In one particular case the doctor in question had limited his list to children under 16 years of age, and the Local Medical Committee pointed out that this was not only contrary to the spirit of the N.H.S. Act, but was against the view expressed by the Minister in the House of Commons on July 19, 1948, when he described as reprehensible the idea of a doctor taking younger members of a family on his list and refusing the older members. Apart from this, if the doctor in question had not restricted his practice to children, it is reasonable to suppose that he would have acquired a list of sufficient size to make it unnecessary to consider granting him basic salary. The G.M.S. Committee has registered a strong protest against the Minister's action in allowing the second appeal.

30. The Ministry, after representations had been made by the Committee, has advised Executive Councils that they should not grant basic salary to a doctor who is also on the list of an adjoining area without consultation with the other Executive Council concerned. In the event of disagreement it is suggested that the decision should rest with the Executive Council in whose area the doctor has the largest list.

Central Practitioners' Fund—Basis of Calculation

31. In 1948 it was agreed that the population factor in the calculation of the Central Practitioners' Fund—95% of the population in Great Britain—should hold good for two years. Discussions are taking place with the Ministry of Health in order to determine what modifications are necessary in the light of changed conditions, and it will be necessary to obtain further exact information before any decisions are taken. A major point of disagreement between the Committee and the Ministry is the degree of inflation of doctors' lists.

Special Inducement Fund

Partnerships

32. The question was taken up with the Ministry of reductions made when granting inducement payments of partnerships where the practitioners concerned are related. Whilst the Committee considers that it is reasonable to reduce grants when two doctors are sharing a house, a reduction of £500 was regarded as excessive, and the Department was informed of the Committee's view that the primary consideration should be the needs of the applicant and not the medical man-power needs of the area. The Ministry agreed that, whilst the existing criterion for an inducement payment—namely, an income of less than £1,000 net—was unchanged, a difference of £500 in the case of related partners would be excessive.

Scope of the Fund

33. The Committee's attention was drawn to instances where inducement payments had been applied for on the grounds of a reduction in income as a result of the introduction of the National Health Service, but refused by the Ministry because the doctors concerned practised in an area where inducement payments would not be appropriate. The Ministry agreed in principle that the balance of the Inducement Fund should be

immediately available to assist practitioners in cases of hardship irrespective of whether the area in which they practised is regarded as an "Inducement area," and details of the scheme were issued to general practitioners through Executive Councils in March. The circumstances of all such cases will be reviewed annually, and, though it is recognized that payments will have to be made in certain cases over a number of years while the doctors adjust themselves to the new circumstances, it is contemplated that such payments will be on a descending scale. Payments may be made retrospective to July 5, 1948.

Superannuation—Annual Statement

34. The 1949 Annual Conference (Minute 78) asked that as soon as practicable after April 5 each year a single statement be made available to every general practitioner in the Service showing the total amount deducted in respect of superannuation contributions from all sources. When making representations to the Ministry on the subject the Committee pointed out that some doctors were on more than one Executive Council list and were also employed by hospitals, and a comprehensive statement of their superannuation position would be appreciated.

35. The Ministry's reply is that the Superannuation Division maintains a file for each doctor which contains a form completed by each body (Executive Council, Regional Hospital Board, etc.) with which he is in contract, but not a running record of contributions. Pensions are based on earnings, not on contributions, and the Ministry is only concerned with the amount of contributions in the case of those doctors who leave the Service and are entitled to a refund; the amount can then be obtained direct from the Executive Council and other authorities concerned.

36. It would require a substantial increase in staff, for a limited purpose, to put the Ministry in a position of giving every doctor a statement of the amount of his contributions, but the Ministry is prepared to consider getting this information in any exceptional case where absence of figures could be shown to result in hardship.

Whitley Council Machinery

37. The following have been appointed to represent the interests of general medical practitioners on the Staff Side of the Medical Functional Council: Dr. S. Wand (Birmingham), Dr. E. A. Gregg (London), Dr. W. Jope (Blantyre, Lanarks), Dr. W. M. Knox (Glasgow), Dr. Charles Hill, M.P., Dr. A. E. Jenkins (Pontypridd), Dr. C. F. R. Killick (Williton, Somerset). These representatives, together with the following, form the Staff Side of the Committee of the Council dealing with general medical services: Dr. J. A. Brown (Birmingham), Dr. I. G. Innes (Hull).

Petrol Tax

38. Immediately following the announcement that the Chancellor of the Exchequer proposed to increase the tax on petrol by ninepence a gallon representations were made to the Ministry of Health, on the ground that the increased tax constituted a net reduction of general-practitioner remuneration, falling heaviest on those who travel the greatest number of miles. Subsequently the Ministry stated that this was a matter for the Treasury to deal with, and a request was made to the Chancellor to receive a small deputation. The reply on behalf of the Chancellor was a reference to questions and answers in Parliament to the effect (*a*) that it was impracticable to relieve doctors of the increase in petrol duty, and (*b*) that the imposition of a new tax could not be regarded as constituting grounds for an addition to remuneration. In the circumstances the Chancellor felt that no useful purpose would be served by his receiving a deputation.

39. The Committee was not satisfied with the position and asked the Minister of Health to receive a deputation. This request was granted and at the interview the Minister stated that the petrol tax was essentially a Treasury matter affecting many classes of persons. Whilst doctors might be in a slightly worse position than other sections of the community the Minister held that they could not expect an upward revision of their remuneration merely on the ground that the cost of petrol had been increased. So far as it affected the net remuneration of doctors from a fixed central pool, the Minister felt that he could not act until the proposed inquiries into income and practice expenses were completed and it could be seen whether the Spens Committee's recommendations were being implemented. He agreed, however, that as the figures relating to practice expenses would cover a period anterior to the imposition of the additional tax on petrol, an adjustment would have to be made in respect of these or other factors which had changed materially in the meantime.

Temporary Residents

40. By agreement between the Committee and the Ministry, Form E.C.19 has been amended so as to require the doctor to certify that he has actually given treatment to the patient in respect of whom he is claiming a temporary resident fee.

Maternity Medical Services

41. In consequence of a number of anomalies which have arisen in regard to maternity medical services, the Ministry, after consultation with the Committee, issued a circular letter to Executive Councils which it is hoped will clarify the position.

42. Several questions have been under discussion, notably the position of a woman who, during her pregnancy, frequently travels from one area to another, and that of a woman discharged from hospital within a few days after the confinement.

43. The Ministry has agreed that early discharge from hospital after confinement is undesirable except in special home circumstances and has undertaken to discuss with the Senior Administrative Officers of Regional Hospital Boards how far unnecessarily early discharge can be prevented in the future. The Committee is anxious to have information of cases in which this has been done.

44. The Committee also raised the question of women who are receiving antenatal care at a hospital or antenatal clinic but who require treatment in their own homes, and a list of the following conditions, which in the Committee's view arise solely from pregnancy, has been sent to the Department:

(1) Toxaemia of pregnancy.
(2) Antepartum haemorrhage.
(3) Any pelvic or vulval abnormality arising out of pregnancy.
(4) Genito-urinary infections.
(5) Hyperemesis gravidarum.

45. The Ministry proposed that doctors who, although providing treatment for these conditions, are not responsible for the antenatal care should receive a fee of 10s. 6d. (7s. 6d. if the doctor is not a general-practitioner obstetrician) for each attendance or visit, subject to an overriding maximum of the Part I fee. In cases of doubt as to whether a particular condition does arise from pregnancy, it has been agreed that the Local Obstetric Committee should adjudicate.

46. A number of difficulties have arisen as to what can be construed as a "reasonable effort" to obtain a patient's attendance for a post-natal examination and thus enable the doctor to claim a Part II fee. The Committee has expressed the view that two serious attempts should be sufficient for this purpose and, in view of the uncertainty which exists, the Ministry has been asked to issue some guidance on the subject.

Anaesthetics

47. The Central Consultants and Specialists Committee has been asked to consider, with a view to appropriate representations to the Ministry of Health, a proposal that a general practitioner should be able to call upon the services of a consultant anaesthetist in connexion with a maternity service rendered in a nursing-home, without the necessity for calling in a consultant obstetrician.

Forms E.C.24 and 24A

48. Arising from a circular letter (E.C.L. 16/50) to Executive Councils, referred to in paragraph 41, the notes on the inside back cover of pads of Forms E.C.24 and 24A are being revised and will, it is hoped, clarify a number of points upon which practitioners have been in difficulty in the past in completing the forms. Provision is to be made in the forms for practitioners to claim mileage in appropriate cases.

49. Following a suggestion made by the Executive Councils' Association, the Ministry was asked to arrange for pads of Forms E.C.24 and 24A to be numbered in serial order with a numerical index for the patients' names. It is considered that this proposal will be of assistance to doctors.

50. The Ministry states, however, that the cost of this proposal would be out of proportion to the advantages gained. Instead, there will be printed on the front page of each pad of forms a number of lines which the doctor can use as an index.

Access of General Practitioners to Maternity Hospitals

51. The Committee has expressed its agreement with the suggestion made by the Ministry in its circular letter R.H.B. (49) 132 that, where a general practitioner has access to beds in maternity units, a selected general-practitioner obstetrician should have the general oversight of the unit.

Range of Treatment

52. The Committee has raised the question of payment for circumcision in cases where the doctor is called in by a midwife within fourteen days after the confinement. The Ministry is unwilling to prescribe a specific fee for circumcision carried out in these circumstances, because in the light of current medical thought it does not wish to encourage an increase in the number of such operations. It therefore appears that the only source from which payment for circumcision can be claimed is the scale of fees for medical practitioners called in by midwives whereby a practitioner can claim 12s. 6d. for the first visit and 10s. 6d. for each subsequent visit to the mother or child. These fees however are only appropriate where the doctor is called in under the "Medical Aid" arrangements.

53. The Medical Practitioners (Fees) (No. 2) Regulations, 1948, provide for a fee in respect of an attendance at an abortion, miscarriage, etc., after the 28th week. Now that the Ministry has agreed to pay a Part I fee in cases where a practitioner is called to attend a miscarriage occurring after the eighth week, the Committee has asked for these Regulations to be amended and thus bring the Medical Aid arrangements into line with the agreement which has been reached. The Ministry has undertaken to consider amending the Regulations when a convenient opportunity occurs.

Drugs and Dressings for Maternity Patients

54. The Committee has suggested a number of additions to the present maternity pack, and detailed suggestions have been sent to the Department. It is understood, however, that the contents of these outfits are at present under consideration by the Obstetrical and Gynaecological Group of the Medical Supplies Working Party, and the Department has undertaken to consider the Committee's proposals in the light of the advice given by the Working Party.

55. The Ministry has agreed that, in the case of drugs and dressings supplied by a dispensing doctor providing maternity medical services for patients on another doctor's dispensing list, the cost can be recovered by prescribing the drugs and dressings on Form E.C.10, which should be passed to the Executive Council. Still under consideration is the question of allowing the cost of minor and inexpensive dressings supplied to a maternity patient on the doctor's own list.

Mileage in Maternity Cases

56. Agreement has been reached with the Ministry on the payment, as a first charge on the Central Mileage Fund, of mileage in maternity cases, the basis being a "per case" payment per mile for each outward mile in excess of two miles from the doctor's residence to the patient's address. Maternity mileage is payable only when the patient resides in an area in which mileage is normally paid. The payment per mile would be 3s. when the full maternity service is given and 1s. 6d. when only a Part I or Part II service is given. In cases where any lesser maternity fee is claimed maternity mileage is not payable.

Obstetric Emergencies

57. The Committee has taken no exception to the Ministry's proposal that midwives under certain circumstances should be empowered to call upon the services of an Obstetric "Flying Squad" where such arrangements are made by local authorities, although it has emphasized that before doing so midwives should make every effort to secure the services of the patient's doctor or, failing him, another doctor.

Review of General Practitioners on Obstetric List

58. The Ministry has agreed that Executive Councils, when reviewing names of doctors included in the local Obstetric List, should look at those practitioners concerning whose suitability for retention in the list there might be some doubt, rather than carry out a general review of all the doctors on the list.

Employment of Assistants in Maternity Work

59. With a view to assisting young doctors to obtain obstetric experience, consideration is being given to the possibility of extending a scheme which is in operation in Middlesex, which provides facilities for young doctors to attend obstetric clinics as clinical assistants.

Change of Doctors

60. Arising from resolutions passed by the 1949 Annual Representative Meeting and the Annual Conference, discussions have taken place with the Ministry on the desirability of reverting to the practice under the N.H.I. Act whereby, except with the consent of the two doctors concerned, a patient could change his doctor only at the end of a specified period.

61. As a result of these discussions the Ministry submitted a proposal that, as in the case of a patient who withdraws from a doctor's list, a patient who wishes to transfer to another doctor should be required to give a fortnight's notice of his intention to the Executive Council. This requirement would be operative only if the patient did not change his address. In the event of removal, either within or outside the Executive Council area, no notification would be necessary.

62. The Committee has accepted this proposal as satisfactory for a trial period, on condition that provision should also be made for an immediate change of doctor with the consent of the two doctors concerned. The Ministry has agreed to this arrangement and it is hoped to introduce the new scheme at an early date.

Filling of Vacancies

63. Arising from a resolution passed at the 1949 Annual Conference, agreement has been reached with the Medical Practices Committee that, when that Committee is considering an application for an appointment to a practice vacancy, provision should be made for the attendance of a nominee of the Executive Council concerned (such nominee to be a member of the Local Medical Committee) either at the request of the Executive Council or of the Medical Practices Committee. The Executive Council's nominee would attend for the purpose of giving supplementary information relating to candidates whose applications were under consideration, but would not be present at the interview with the candidates, nor when the final selection is made.

64. In consequence of a further resolution of the Annual Conference, an investigation has been made of the machinery for hearing appeals by unsuccessful applicants with a view to eliminating delay which might endanger both the successor to the practice and the continuity of general medical services. After careful consideration, however, the Committee felt that much of the delay could be obviated by the establishment of a joint subcommittee of the Executive Council and the Local Medical Committee for the purpose of considering applications for vacancies in the first instance.

65. The Committee shares the Ministry's anxiety about the position of a doctor appointed to fill a vacancy but who finds that another doctor has secured the only available accommodation. The question has been discussed both with officials of the Ministry and with representatives of the Medical Practices

Committee, and consideration is being given to the possibility of overcoming the present unsatisfactory situation. Among the proposals under discussion are the closing of a small area around the practice premises and an amendment of the Terms of Service prohibiting a doctor, other than the one selected to fill the vacancy, from providing general medical services from the premises used by the outgoing doctor for a period except with the consent of the Medical Practices Committee.

Classification of "Open" Areas

66. Concurrently with the publication of the First Report of the Medical Practices Committee listing areas which were inadequately doctored or where more doctors were stated to be required, a circular letter was issued by the Ministry urging Executive Councils, in co-operation with Local Medical Committees, in areas where the need for more doctors was considered to be a matter of priority, to take effective action to increase the number of practitioners. It was suggested that steps should be taken to advertise the need for a specified number of doctors.

67. The Ministry's action gave rise to resentment by Local Medical Committees in some of the areas listed as being under-doctored, and, after consultation with the Medical Practices Committee on the subject, a strong protest was sent to the Ministry that in spite of previous assurances it did not see fit to consult the profession's representatives before issuing its letter to Executive Councils.

68. The Committee recognizes that, in some areas where the average number of patients on doctors' lists in an Executive Council area exceeds 3,000, a *prima facie* case exists for an immediate investigation by the Local Medical Committees in those areas, although this should not exclude the possibility of an investigation at the other end of the scale in areas which are over-doctored. It does not, however, agree to the steps outlined in the Ministry's letter, and Local Medical Committees were asked not to give effect to the Ministry's suggestion pending a more satisfactory statement from the Department.

69. The Committee now understands that the Department does not propose to press Executive Councils to take any further action until the results of the Medical Practices Committee's second survey are known. An undertaking has been received that the profession's representatives will be consulted before any action is taken on the Committee's Second Report.

Exchange of Practices

70. Difficulties have been experienced by doctors wishing to exchange practices, particularly in cases where Executive Councils would not co-operate in consenting to exchanges. The question has been discussed with the Medical Practices Committee, and that Committee has suggested to Executive Councils that applications received from doctors to exchange practices should receive favourable consideration. The Medical Practices Committee has undertaken to take up on behalf of the doctor concerned any case in which the Executive Council is not willing to co-operate.

Health Centres

71. A resolution passed by the 1949 Annual Conference, expressing the need for protecting the practices of doctors who consent to practise from Health Centres, has been sent to the Department.

72. The special subcommittee appointed to consider the problem of Health Centres generally has prepared an Interim Report which has been adopted by the Committee and is set out in Appendix "B."

Constitution and Procedure of Medical Service Committees

73. The Committee has carried out a complete review of the constitution and procedure of Medical Service Committees, with the object of recommending changes where it is considered that the existing machinery is defective or is not working smoothly. Local Medical Committees were given an opportunity of making suggestions in the light of experience gained during the first 18 months of the new Service.

74. Among the proposals which have been discussed with the Ministry of Health are:

(*a*) limitation of the scope of complaints to those made by the patient, or someone on his behalf when he is unable himself to make a complaint;

(*b*) the reduction, from six to four weeks, of the period within which a complaint must be lodged;

(*c*) a specific requirement that the report of the Medical Service Committee shall be considered by the Executive Council not later than one month after the inquiry:

(*d*) that in formulating its recommendation the Medical Services Committee should confine itself strictly to the facts of the case under consideration, and should not make any recommendation intended to have a wider implication;

(*e*) the introduction of machinery similar to that in operation under the N.H.I. Act, enabling a complaint to be made against a patient;

(*f*) the preparation of a handbook of procedure for the consideration of complaints under the N.H.S. Act for the use of Local Medical Committees and Executive Councils.

75. The Ministry's view is that, whilst the framework of the procedure must be set out in Regulations, the Department's policy is, generally speaking, to refrain from making additional Regulations except where the need for them is clearly established. The intention is to communicate the Department's views to Executive Councils on matters of detail in a manner which gives them a reasonable measure of discretion. This object will be achieved, it is believed, by the issue of a handbook, a draft of which the G.M.S. Committee is now discussing with officers of the Ministry.

76. The question of legal representation at hearings of Medical Service Committees has also been carefully considered. In 1949 the A.R.M. by a narrow majority—125 to 123—asked the Council to seek an amendment of the Regulation to bring it into line with that in Northern Ireland, whereby a defendant doctor can, if he so desires, have the services of a solicitor or paid advocate. After careful consideration of all aspects of the problem, the Committee is satisfied that the present position holds greater advantages for the defendant doctor than the change suggested by the A.R.M. In view, however, of certain new aspects of this problem which have recently come to light, the Committee is giving further consideration to the whole question of representation at Medical Service Committee hearings.

Medical Membership of Tribunal Under Section 42 of the N.H.S. Act

77. The Tribunal for the purpose of inquiring into representations that the continued inclusion of a person on any Executive Council list would be prejudicial to the efficiency of the Service originally provided for the appointment of only one "practitioner member" of each of the professions concerned. Under the 1949 Amending Act each profession will have a panel from which the "practitioner member" will be selected. The following have been nominated for the medical panel: Dr. H. Guy Dain (Birmingham), Dr. S. A. Winstanley (Urmston, Lancs), Dr. A. E. Jenkins (Pontypridd), Dr. A. T. Rogers (Bromley, Kent), Dr. C. F. R. Killick (Williton, Somerset), Dr. Graham P. Williams (Holyhead), Dr. A. S. Wilson (Gosberton, Lincs), Dr. D. T. McDonald (Northumberland).

Disciplinary Machinery—Medical Advisory Committee

78. When the Minister of Health has decided to withhold a sum of money from a medical practitioner's remuneration in respect of an alleged breach of the terms of service he is required, in certain circumstances, to set up a Medical Advisory Committee consisting of the Chief Medical Officer of Health or his deputy and two other medical practitioners in the service of the Ministry, together with three medical practitioners selected from a panel nominated by a body representative of those engaged in the provision of general medical services. All the members of the G.M.S. Committee who are actively engaged in general medical services under the Act have been nominated to form the panel for this purpose.

Publicity for Disciplinary Cases

79. The Committee has objected to publicity being given to the names of parties to disciplinary proceedings, especially when the decision of the Tribunal was that the doctor's name should not be removed from the medical list. The official reply is that it is the Minister's duty under Section 42 (7) (*c*) of the Act and Regulation 43 of the Service Committee and Tribunal Regulations to publish the decisions of Tribunals, and that it is appropriate in publishing the decision to include a summary of the more important points of the case.

Vaccination and Immunization

80. Clearly it cannot be disputed that vaccination and immunization are services within the competence of a general practitioner. The Ministry, however, go further and hold to the view that these services form part of a general practitioner's terms of service for which he is already remunerated by the Local Executive Council. Nevertheless, the Committee claimed that, when these services are performed in conjunction with a Local Authority's scheme in which general practitioners are invited to participate, they are no longer services which are entirely within a general practitioner's contract under the N.H.S. Act. It was finally agreed that a doctor's participation in a Local Authority's scheme under Section 26 of the Act involves an element of advocacy of vaccination and immunization and the submission of records; and that as these factors go beyond the practitioner's ordinary Part IV obligations they fall to be taken into account in determining the scale of fees to be paid by the local Health Authority on receipt of the record.

81. In December last agreement was reached on the fees for notified vaccination and immunization. The Local Authorities' Associations undertook to recommend their constituent bodies to pay a fee of 5s. for each record received from a general practitioner. The fee will be paid for evidence of a successful vaccination on the first attempt or where a second attempt has been made after an unsuccessful first attempt. A third attempt will be regarded as a fresh vaccination and an additional fee of 5s. will be paid for it.

82. For immunization a fee of 5s. will be paid in respect of the complete process, normally involving two injections. A fee of 5s. will also be paid for a "boost."

83. It should be borne in mind that the offer of a fee of 5s. for each record received had to be considered (*a*) in the light of the discussions with the Ministry of Health and the Local Authorities' Associations; (*b*) in the knowledge that the proposal represented an increase of 100% over the original offer; (*c*) on the information that the Treasury would not agree to a higher fee, having regard to the national economic situation, and (*d*) on the realization that the rejection of the offer might mean that alternative arrangements might be made, possibly by the establishment of Local Authority clinics, for vaccination and immunization.

84. The terms outlined above were accepted on the understanding that they would apply retrospective in all cases where records had been returned since July 5, 1948, and without prejudice to the reopening of the question of the fee in the light of changed circumstances. Subsequently, however, reports received from various parts of the country showed that some Local Authorities were paying medical practitioners the agreed fee of 5s. only in respect of patients on their N.H.S. lists. There appears to be no justification for this discrimination, which is not in accordance with the official view. Appropriate and successful action has been taken in all cases brought to the notice of the Committee.

85. Information was also received that some local authorities were refusing to pay the notification fee for an incomplete case when the doctor was prevented by circumstances outside his control from successfully completing the vaccination or immunization. The Ministry's view is that the local authority would be justified in paying a fee when it is satisfied that failure to complete the procedure was not the doctor's fault. Local authorities seeking a ruling from the Ministry have been informed in this sense.

86. With a view to standardizing and simplifying the reports to be used in connexion with vaccination and immunization, revised forms have been approved for recommendation to Local Authorities. The Ministry is not in a position to do more than recommend the adoption of the suggested models. Local Medical Committees may feel that inquiries should be made in the appropriate quarter as to what action is being taken locally in this matter.

87. The Committee has discussed with the Ministry the question of payment for combined whooping-cough and diphtheria inoculations involving three items of service instead of two. The point was made that these injections carried an added liability, in so far as the increased number of injections made it more difficult to contact the patient, and it was suggested that whooping-cough immunization should form the subject of a separate notification with an appropriate fee. The Ministry's reply was that they could not depart from the principle that the inoculation was included in a general practitioner's ordinary obligations to patients for whom he is providing general medical services, and that the element of propaganda and the submission of a report were not more onerous in the case of combined reports. It was stated, also, that the number of Local Health Authorities making use of a combined antigen was not large and would probably diminish.

88. Local Authorities making inquiries on the point have been advised by the Ministry that, where a separate record of inoculation against whooping-cough is required, a separate fee should be paid, and it is thought that similar arrangements would probably be applicable if an Authority had in an emergency a draft scheme in operation for reports of inoculation against typhoid fever.

89. The Ministry has ruled that a doctor taking part in the National Health Service is not entitled to charge a fee for inoculating any of his own N.H.S. patients before they go abroad, but he can charge a fee for the International Certificate, if required.

Vaccination and Inoculation of Merchant Seamen

90. When a merchant seaman is required to be vaccinated or inoculated, the doctor (frequently a part-time medical officer of the Shipping Federation) giving the service, under present arrangements, is entitled to take the man on his list and receive a temporary resident fee of 15s. from the "pool," in addition to the fees for notification (5s.) and International Certificate (3s.). This is felt to be a payment out of proportion to the service rendered and may prove to be a substantial liability to the "pool." It has been agreed, therefore, that the Shipping Federation shall be paid from the "pool" a fixed sum of £1,000 a year to cover all vaccinations and inoculations carried out by their part-time medical officers. The fee to be paid by the Federation to its medical officers will be negotiated between the Federation and the B.M.A. The arrangement is to be reviewed in two years.

Range of Service

Physiotherapy

91. Following prolonged representations by the Committee to the Ministry of Health, Regional Hospital Boards have been given power to arrange for a general practitioner with experience in physiotherapy to become associated with the Hospital Service in an isolated country district. The conditions will be on the following lines:

(i) that the patients concerned are not within easy reach of a hospital providing physiotherapy services;

(ii) that the doctor holds a temporary clinical assistantship from the hospital management committee and is under the supervision of the director of the hospital department of physical medicine;

(iii) that a substantial number of patients in the district are likely to require such services. (There can be no question of limiting the service to his own patients because the patients receiving physiotherapy would in effect be out-patients of the hospital.)

Liability to Attend Accidents Occurring In or About a Mine

92. At the request of the Private Practice Committee Counsel's opinion has been obtained on the liability of medical

practitioners to visit patients below ground in a mine. Briefly the opinion expressed was as follows:

(1) A private practitioner, whether specialist or general practitioner, would not be liable to descend a mine, unless he was treating a patient for a recurrent condition which suddenly flared up while the patient was below earth and further medical attention was necessary before he could be brought to the surface.

(2) A general practitioner under the National Health Service Act has a liability to visit and treat a person below ground whose condition so requires.

(3) A practitioner who enters into a special contract with the National Coal Board might also according to his contract be liable to be called to see a patient below ground.

93. In all these instances it is the opinion of Counsel that the doctor must expose himself to danger unless the probability is that by giving the treatment the doctor would himself be injured and the patient thus not assisted, i.e., he must take all reasonable, but not unreasonable, risks.

Medical Treatment

94. General approval has been given to the following definition of "medical treatment" prepared by the Ministry of Health:

"Medical treatment consists in the employment of the professional skill of the medical profession to alleviate suffering, to restore normal functions, to maintain health, and to prevent disease or other conditions harmful to health.

"The word 'health' here refers to the mental as well as to the physical state."

Emergency Treatment

95. The Private Practice Committee of the Association has been asked to consider whether the present fee of 12s. 6d. payable under the Road Traffic Act for emergency treatment is adequate in the light of present-day conditions.

Representation of General Practitioners on Regional Hospital Boards and Hospital Management Committees

96. The appointment of members of Regional Hospital Boards is in the hands of the Minister, who is obliged to consult "such organizations as he may recognize as representative of the profession in the area or generally." In practice, the Minister has invited the Association (centrally) to make nominations, and, since the establishment of the Central Consultants and Specialists Committee with its regional organization, the matter has been dealt with through that Committee. Regional consultant and specialist committees have been advised to consult Local Medical Committees in the region before submitting names. This procedure, as a result of the difficulties involved, has in practice not had the desired effect so far as general practitioners are concerned. At the same time, it is noticeable that there has been a continuing tendency to reduce the medical representatives on Regional Hospital Boards, and the appointments made by the Minister in March last show that in eight cases medical members have been replaced by laymen. It has been agreed with the Ministry that, in future, the Association will submit separate lists of consultants and specialists and general practitioners.

97. Some concern was felt at the limitation placed by the Ministry on the sources from which names for vacancies for medical members of Hospital Management Committees may come. In the Ministry's circular R.H.B. (49) 143 it is stated that "medical and dental members should normally be derived, as implied by the Act, from names proposed by the hospital staffs and not from other sources." No such inference as that indicated can be drawn from the Act, and it was pointed out to the Ministry that this limitation for practical purposes prevents general practitioners from finding their way to Hospital Management Committees. The Ministry has agreed to issue a clarifying circular before the next annual elections to Hospital Management Committees take place, in the light of the Committee's recommendation.

98. When the B.M.A. is invited to nominate for appointment to Regional Hospital Boards, the Secretary will communicate with (*a*) Secretaries of Regional Consultants and Specialists Committees and (*b*) representatives of grouped Local Medical Committees for the purpose of securing names and informing those bodies of the number of vacancies available.

Relationship of General Practitioners to Hospitals

99. The attention of Local Medical Committees is drawn to the following minute of a Special Conference of Representatives of Local Medical Committees held on June 29, 1950:

"15. That the following motion be referred to the General Medical Services Commitee:

"That it be suggested to Local Medical Committees that they should voluntarily form Joint Committees with the other Local Medical Committees in the area of a Regional Hospital Board, and that the Committees thus formed should seek liaison with the Boards."

100. A Joint Committee on the lines indicated has proved useful in one or two areas where it has been formed.

General Practitioners and Special Departments of Hospitals

101. The 1949 Annual Conference (Minute 69) asked that general practitioners be given direct access to *x*-ray and physiotherapy departments of hospitals and to pathological laboratories. When this resolution was discussed with the Ministry, it was pointed out that where facilities were available general practitioners had direct access to pathological laboratories, and that Senior Administrative Medical Officers and regional advisers in pathology had been asked to encourage this wherever possible. Lewisham, Portsmouth, and Southampton were quoted as examples of areas where these facilities were available.

102. So far as radiological facilities were concerned, where they were available they were open to general practitioners. In general there was a shortage of plant and staff, and it would be necessary to retain the out-patient departments as a screen for some time to come. The ultimate aim, when circumstances permit, will be to give general practitioners direct access to the radiological department.

Remuneration of General Practitioners on the Staffs of Cottage Hospitals

103. Local Medical Committees have been asked for their views on the basis and adequacy of the present payment at the rate of £25 per occupied bed and the method of distributing the Staff Fund to doctors of the hospital medical staff. A special subcommittee has been appointed to consider the problem, but after an examination of the replies received from Local Medical Committees it was decided to institute a more detailed inquiry designed to reveal the nature and extent of the duties which fell upon general practitioners in cottage hospitals, with particular reference to the time factor. The Committee has in mind a detailed catalogue of the various hospital activities and the amount of time devoted to them.

104. The results of the original inquiry indicate that in a number of cottage hospitals general practitioners are performing duties which were not envisaged when the Staff Fund method of payment was originated, and at this stage it is felt that the problem of inadequate remuneration which has been stressed by the staffs of many hospitals might be overcome by the grading of a larger number of practitioners who render services outside the scope of a general practitioner's terms of service as part-time Medical Officers under paragraph 10 (*b*) of the Terms and Conditions of Service for Hospital, Medical, and Dental Staff (England and Wales). Before the possibilities of this proposal are explored to any degree, however, it is considered that more precise information must be obtained as to the conditions which exist in a number of representative cottage hospitals throughout the country, and with this end in view a survey of the work involved over the period September to November, 1950, will be undertaken.

105. Discussions are to take place with officials of the Ministry on the financial implications of beds in general-practitioner hospitals being taken over by consultants and specialists.

106. In a number of areas beds in charge of consultants are not counted in the number of beds on which the Staff Fund is assessed, although a considerable amount of work devolves upon the general practitioner in the absence of the consultant.

Contracts for Doctors Undertaking General-practitioner Services at Cottage Hospitals

107. As a result of complaints from one or two areas consideration has been given to the form of contract for use between Hospital Management Committees and doctors giving general-practitioner services at cottage hospitals. With a view to establishing the general principles to be incorporated in these contracts and issuing some guidance on the subject, the Committee has asked Local Medical Committees to supply information as to the nature of any contracts which have been offered to practitioners. When this data has been collected the question will be considered in more detail.

Certification

108. The report of the Interdepartmental Committee on Certification was published towards the end of 1949. Generally speaking, it showed much sympathy with the views expressed in the Association's evidence to the Committee. It endorsed the Association's view that certification should not take precedence over the doctor's clinical work, and drew attention to the inroads which unnecessary certification can make on a doctor's opportunities for study and leisure.

109. Another point upon which the Interdepartmental Committee and the Association are in agreement, and which has already been implemented, is the list in the Regulations of those certificates which a doctor is required to give as part of his terms of service. Amending Regulations were issued in December last which prescribed the certificates to be given without charge. The Committee was consulted before the list of certificates was finally determined, and five forms which do not appear in the list were withdrawn at the Committee's request.

110. Further certificates cannot be added without prior consultation with a Joint Subcommittee set up for the purpose upon which the General Medical Services Committee will be represented. The Joint Subcommittee will consist of 11 members —a Departmental Committee Administrator (in the Chair), a representative of the Organization and Methods Branch of the Ministry, a representative of the corresponding Branch of the Treasury, a Ministry of Health Medical Officer, a Ministry legal adviser, a representative of the Department of Health for Scotland, and five general practitioners nominated by the B.M.A. The General Medical Services Committee has nominated Drs. S. Wand (Birmingham), W. Jope (Blantyre, Lanarks), J. A. Arthur (Gateshead), W. Woolley (Bristol), and R. C. Hamilton (Kilmarnock) (representing Scotland).

111. Proposals for a simplified omnibus certificate for National Insurance purposes have been discussed with representatives of the Ministry of National Insurance. There are certain administrative difficulties associated with a single form for all purposes, and the Ministry is submitting counter-proposals the effect of which would be to reduce to two the number of books of certificates which a practitioner would require to have in use.

112. The Ministry of National Insurance has been asked to agree to amend the Certification Rules so that a doctor attending a pregnant woman who is incapable of work and is claiming sickness benefit (not being entitled to maternity allowance) can issue a certificate covering six weeks before and four weeks after the confinement.

Notification of Infectious Diseases

113. At the Committee's request the Public Health Committee of the Association is taking action with a view to the introduction of a single form of certificate, for use throughout the country, to cover the present form for common infectious diseases, the form for notification of puerperal pyrexia, and the form for the notification of measles and whooping-cough.

Maximum Numbers on Doctors' Lists

114. In November, 1948, the Ministry decreed that doctors should no longer be allowed to exceed the normal prescribed maximum number of persons on their lists. Those who had more than the maximum number were asked not to accept more persons until their lists fell below the limit. A year later, after consultation with the Committee Executive, Councils were instructed to take steps to bring lists below the limit (plus an allowance of 5% for possible inflation). The General Medical Services Committee took no exception to these measures.

Limited Lists

115. Under the National Assistance Act a Local Authority is required to provide residential accommodation for aged and infirm persons for whose care and attention provision cannot otherwise be made. The normal arrangement for general medical services for these persons is by a doctor on the Executive Council's list who may be a whole- or part-time employee of the Local Authority. The Committee's view is that where an institution providing accommodation of this character is under the direction of a Local Authority, there should ordinarily be free choice of doctor, and that only in exceptional circumstances should a medical officer of the Authority be responsible for general medical services; in these exceptional circumstances the capitation fees in respect of inmates should be reduced. The Ministry is in general agreement with this view.

Patients in Mental Hospitals

116. Despite the Committee's opposition, the Ministry has decided to remove from doctors' lists mental patients who have been more than two years in hospital. The Ministry's view is that the retention of these patients on doctors' lists is a growing source of inflation.

Prescribing and Dispensing

Doctors Paid on a Prescription Basis

117. The Ministry has agreed that doctors paid on a prescription basis should, on convenient occasions and with the patients' consent, be allowed to issue prescriptions to be dispensed by a chemist. The necessary amendment of the Regulations will be made at the earliest opportunity.

Prescribing for Residential Schools and Institutions

118. The Ministry has accepted the Committee's proposals for bulk prescribing for residential schools and institutions, and has issued instructions incorporating these arrangements. Subsequently, it was found necessary by reason of the provisions of the Dangerous Drugs Act to exclude dangerous drugs and Fourth Schedule poisons from these arrangements. The Ministry has recently claimed that the scheme should apply only to preparations set out in the *National Formulary* and not to drugs which are individually mentioned but appear as ingredients of preparations in the *Formulary*. The Committee disputes this contention and the matter is still under consideration.

Prescribing of Preparations which are not Drugs or Medicines

119. The Ministry has issued to Executive Councils the First and Second Reports of the Joint Subcommittee of the Standing Medical, Pharmaceutical, and General Practitioner Advisory Committees, which has been reviewing a number of borderline preparations held by the Department not to be drugs. The Ministry was asked, in sending these reports to Executive Councils, to stress that they had no statutory force and were issued only for advisory purposes.

Specially Expensive Drugs

120. Following representations by the Committee, the Ministry has agreed to the inclusion of the following in the list of specially expensive drugs and appliances for the supply of which dispensing doctors paid by capitation fee receive payment over and above such fee:

(*a*) All sulphonamide drugs costing over 5s. per 100 tablets.

(*b*) Plaster-of-Paris and other medicated bandages.

(c) The therapeutic equivalents of:
Ergotamine tartrate
Amylobarbitone and amylobarbitone sodium
Cyclobarbitone
Diphenan
Isoprenaline sulphate
Compound spray of adrenaline and atropine, *B.P.C.*

121. The Committee is also seeking the addition of the following to the specially expensive list:

All antibiotic drugs;
Vitamin B_{12}.

Medicines and Appliances for Doctors' Surgeries

122. Discussions have taken place between representatives of the General Medical Services Committee and of the chemists on a suggestion that doctors should be allowed to order on official prescription forms stocks of medicines and dressings for emergency use in their surgeries. This procedure would take the place of the present somewhat unsatisfactory arrangement under which doctors are paid a very small sum (2s. 6d. a 100 patients per annum) to cover the drugs and dressings they are required to keep in stock for an emergency or before a supply can be obtained in the ordinary way from a chemist.

123. General agreement with the chemists has been reached on the list of medicines and dressings which may be ordered in this way, including the quantities which may be ordered at any one time, and the list has been sent to the Ministry on behalf of the organized bodies of doctors and chemists.

Unofficial Prescription Forms

124. The Committee has given its approval to a circular letter, since issued to Executive Councils and general practitioners by the Ministry, prohibiting the use of unofficial prescription forms and stressing the necessity for the use of Form E.C.10 in all cases. As from February 1, 1950, Pricing Offices have been instructed not to accept any prescription not given on an E.C.10.

Use of Form E.C.10 for Private Patients

125. As a protection against the unauthorized use of Form E.C.10, the Ministry proposes to reintroduce, in a modified form, the old N.H.I. arrangements for scrutinizing a proportion of prescriptions after they have been priced. Any apparent irregularities which this scrutiny might bring to light will be investigated in accordance with the machinery laid down in the Regulations.

Dispensing Doctors Paid on the Basis of the Drug Tariff

126. Representations have been made to the Ministry against its decision to apply the reduction of the "on cost" allowance on drugs from 33% to 16% from May 1, 1950, to doctors who elect to be paid for their dispensing on the same basis as chemists. At the same time that the reduction was imposed negotiations were still being carried on through the Chemists' Whitley machinery, and the Minister has undertaken that if the percentage "on cost" finally agreed on the Whitley Council (or awarded by an arbitrator) differs from the 16% which will apply from May 1, the different percentage will apply retrospectively from the same date. This is a cut in doctors' remuneration which cannot be recovered.

Standard Dressings

127. The Committee suggested to the Ministry of Health that the specification of the existing standard dressings is both uneconomical and obsolete. Agreement has been reached with the Department on the revision of the component parts of the standard dressing laid down in the Drug Tariff. It has been decided that the new standard dressings would consist of three 2-in. bandages, 1 sq. yd. of white gauze, and 1 oz. of cotton-wool.

Discount on Drugs

128. Discussions have been held with the association of the British Pharmaceutical Industry with a view to securing a higher rate of discount for dispensing doctors who obtain their drugs from wholesale houses.

129. Investigations have shown that, at present, doctors are usually supplied by the majority of manufacturing chemists with non-proprietary drugs at wholesale prices (i.e., after allowing for the usual discount), and that it is only on a number of proprietary preparations (approximately 18% of preparations ordered by doctors from manufacturers) that no discount, or at the most 10%, is allowed to doctors. The higher discount allowed to chemists is intended to reimburse them for the large stocks they are obliged to carry. In the circumstances the Committee decided not to press for any further discount on these proprietary preparations.

Pricing of Dispensing Doctors' Prescriptions

130. The Committee has approved the Ministry's instruction to Executive Councils that dispensing doctors who are paid on the basis of the Drug Tariff should sort their prescriptions for pricing purposes. Several complaints have been received against this requirement, but the Committee felt that in view of the alternative method of payment which exists it could take no exception to the Ministry's proposal.

Drugs Administered by a Doctor in Person

131. Some doubt has arisen as to the interpretation of paragraph 7 (9) (ii) of the Terms of Service, which states that a practitioner "may supply any other drug which is administered by him in person."

132. The Ministry, after taking legal advice, expressed the opinion that the wording implies the actual application of the drug to the patient's body, but the Committee, although not denying that that may be the intention of the regulation, is unable to accept this explanation as a fair interpretation of the wording. Having regard to the various interpretations which can be placed upon the context of this particular paragraph, it should be amended in order that the intention of the regulation shall no longer be in doubt.

List of Appliances

133. The Ministry has agreed in principle to include the following in the list of appliances which general practitioners may prescribe for their patients, and is now in the process of amending the list:

Clinitest apparatus;
Male and female portable urinals;
Sponge rubber.

134. The Committee has also asked the Ministry to agree to the inclusion of adhesive sponge rubber, elastonet, and elasto-crepe bandages.

135. The Department still has under consideration the suggestion that the words "dressings (any specification)" should be substituted for the list of dressings in the Third Schedule to the Regulations.

Circulation of Lists of Pharmacists to General Practitioners

136. Following a question in the House of Commons on the cost of circulating lists of pharmacists to general practitioners, the Ministry of Health asked for the Committee's views on the continuation of this practice. The Committee has informed the Ministry that a satisfactory arrangement would be the circulation to each general practitioner once a year of a cyclostyled list of pharmacists in the area covered by his practice.

Economy in Prescribing

137. Arising from a resolution of the 1949 Annual Conference, the Committee sought the advice of the Science Committee of the Association on the question of the nomenclature of drugs and the standardization of bulk in packages, with a view to eliminating waste and extravagant prescribing. The Committee welcomed a suggestion from the Science Committee that an *ad hoc* committee should be established to examine this problem.

Supplies of Oxygen

138. The revised arrangements for the supply of oxygen and oxygen-tents (through the Hospital Service) have been under consideration. Whilst welcoming the suggestion that oxygen cylinders and tents should be available, the Committee informed the Ministry that it takes strong exception to the decision that oxygen-tents should be available only on the authority of a specialist. The Ministry has undertaken to make arangements to ensure the speedy supply of a tent without a consultant authority in special cases—e.g., premature babies and carbon monoxide poisoning.

Testing of Drugs and Appliances

139. There have been protests against the requirement in the terms of service that, when requested, doctors must provide prescriptions for the purpose of testing drugs and appliances supplied by chemists.

140. The Committee, appreciating the need for maintaining a high standard of dispensing, is satisfied that a drug-testing scheme is desirable and necessary. In view, however, of complaints received about the present scheme, the Committee intends to discuss with the Ministry of Health the possibility of an alternative arrangement after consultation with the Pharmaceutical Society.

Partners and Assistants

141. The Medical Practices Committee expressed some anxiety at the position which had arisen in a number of cases which had come to that Committee's notice whereby, although two practitioners claimed to be in partnership for the purpose of increasing the combined list to 8,000 patients, the relationship which did exist was, in point of fact, that of principal and assistant, in which case the maximum combined list permitted would be 6,400 patients.

142. After consultation with the Medical Practices Committee and officials of the Ministry, the Committee advised that unless a practitioner is in the position of a principal in connexion with the practice with a share in the partnership of not less than one-third of that held by the partner with the maximum share, he should be regarded as a salaried partner and that the combined lists of a principal and a salaried partner should not exceed the maximum for a principal and one assistant, namely, 6,400.

143. The Ministry is implementing these principles in a circular to Executive Councils.

144. A special subcommittee, under the Chairmanship of Dr. J. T. McCutcheon (Glasgow), was appointed to consider the general position of assistants in general practice under the National Health Service. Two aspects of the problem have been considered—(1) the position of the permanent assistant, and (2) the position of the assistant "with a view." So far as the permanent assistant is concerned, the conclusion reached is that there is little positive action which can be taken to improve the position of a doctor who prefers to remain permanently as an assistant. His relationship with his principal and his conditions of service are purely matters of private arrangement which it is not possible to regulate.

145. The assistant who wishes, eventually, to practise as a principal in his own right is in a different category. It is disturbing to find that a number of appointments advertised as "with a view" prove eventually to have no real prospects of partnership. It is considered to be undesirable to limit by regulation the time within which a principal taking an assistant with a view to partnership must inform the assistant of his decision. Indeed, it is felt to be undesirable to govern by regulation the relationship between assistant and principal. It is in the interests of both parties that there should be an assistantship agreement, prepared by a solicitor with experience in the legal pitfalls of medical practice, and in this connexion the new *Medical Practitioners' Handbook* published by the Association will contain a section dealing with the conditions which should be incorporated in such an agreement.

146. The G.M.S. Committee has decided to make the appointment of an Assistants' Subcommittee a permanent feature of its work.

147. After a careful examination of the problem the Committee has decided that it is not in favour of any departure from the present position that the Medical Practices Committee has no power to intervene in the matter of the engagement of assistants. Having regard however to that Committee's responsibility for limiting the number of doctors in each area, the Committee has expressed the opinion that consent to the employment of a third or subsequent assistant should be given only by the Medical Practices Committee.

Definition of a Permanent Assistant

148. With the object of issuing some guidance to Executive Councils on the subject, the Ministry sought the Committee's advice upon what might be construed as a "permanent assistantship" for the purpose of calculating the permitted maximum number of patients on a doctor's list. The Committee has agreed that while the facts of each case must be looked at on their merits, in general it would be reasonable to regard as a permanent assistant for this purpose not only a full-time assistant, but also an assistant regularly employed part-time for at least one-half of the time that a full-time assistant would serve. In the case of such a part-time assistant any increase in the principal's list would be limited to a proportion of 2,400 approximately equal to the proportion of the time given by the part-time assistant in relation to a full-time assistant.

149. The Committee is of the opinion that no increase should be allowed in respect of any assistant who is employed for less than half the time which an ordinary assistant would give to the practice.

Superannuation and Assistants

150. A concession of some importance has been made by the Treasury. As from April 1, 1950, a principal will be relieved of the responsibility of paying the employer's contribution towards an assistant's superannuation. This responsibility will be assumed by the Treasury.

Trainee Assistants

151. Discussions have taken place with the Medical Practices Committee on the provision made in the amending regulation for a right of appeal to the Medical Practices Committee against the refusal of an Executive Council to agree to the employment of an assistant. It has been agreed that this right of appeal should not apply to trainee assistants.

152. A county Local Medical Committee has, under legal guidance, drawn up a draft form of contract for use by its members employing trainee assistants. A copy of this draft together with the comments of the Association's solicitors thereon can be obtained from the Secretary of the General Medical Services Committee.

153. It is apparent from advertisements appearing in the medical press that in some cases trainee assistants are being offered salaries in excess of the amount allowed by the Government to a principal who undertakes the training of an assistant. This practice is considered to be undesirable, and the Council of the B.M.A. is being recommended to refuse advertisements offered to the *B.M.J.* where the salary exceeds the Government grant.

Form E.C.1

154. Following discussions with the Ministry, the Department has redrafted Form E.C.1 (application for inclusion in a doctor's list) with the object of revealing whether or not the person completing the form is already on a doctor's list. It was felt that the readiness with which Form E.C.1 was available and could be used even when a medical card was available and should be used was a large contributory factor in inflating the numbers on doctors' lists. The revised form contains a declaration that the applicant is not already on the list of a doctor in any area, and it is available only through Executive Councils and individual doctors.

155. Subsequently the Ministry's attention was drawn to the fact that the new Form E.C.1 (Rev.) does not require the patient's signature when the patient wishes to transfer to another doctor and the medical card is missing, although when the patient has a medical card and wishes to change his doctor he is required to sign the appropriate part of the card.

156. It has also been pointed out that a signature to the declaration on the card, as to the accuracy of the information given, is necessary in the case of a first application but not when the patient loses his medical card and wishes to change his doctor.

157. The necessary amendments to the wording of Form E.C.1 are being made by the Department, who will at the same time take advantage of the opportunity to make one or two

further amendments consequent upon the new procedure for change of doctor.

Fees for Anaesthetics

158. The Ministry of Health is preparing a memorandum dealing with circumstances in which fees may or may not be charged for the administration of anaesthetics.

Fees for Dental Anaesthetics

159. The recent decision of the Minister to impose an overall reduction of 10% in dental fees means that doctors who are asked to give anaesthetics for dental operations may receive a corresponding reduction in the fees due to them. The Committee felt that the time had arrived when the position of the doctor in relation to dental anaesthetics should be reviewed, and representations have been made to the Ministry of Health:

(i) for recognition of the principle that a doctor who is called upon to administer an anaesthetic in connexion with a dental operation is entitled to be paid for the time spent and responsibility involved;

(ii) that the fee to be paid to a doctor for this service should be 30s. per administration, irrespective of the number of teeth to be extracted;

(iii) that whilst it is desirable that fees for anaesthetics administered in connexion with dental operations should be paid direct to the doctor, no objection is raised to the continuance of the present method of paying the fees, namely, through the dentist performing the operation.

160. The Ministry's reply was that responsibility for providing an anaesthetist in connexion with a dental operation rests with the dentist, and the fee to be paid to a doctor giving an anaesthetic is a matter to be settled between the two practitioners. The Ministry cannot hold out any hope of increasing dental fees (including fees for dental anaesthetics).

Emergency Treatment Following Dental Operations

161. It is hoped that provision may soon be made for a doctor to be paid a fee when he is called in to an emergency following a dental operation, the dentist not being available. The proposal is under discussion with the Ministry, the difficulties being mainly of a legal nature.

Administration of Anaesthetics by Trainee Assistants

162. Agreement has been reached with the Ministry that it would not be appropriate for a fee to be claimed by a trainee assistant for the administration of an anaesthetic where the operation is performed by the principal. The necessary instructions have been issued to Executive Councils.

Frivolous and Unjustified Emergency Calls

163. The Ministry of Health was asked to reintroduce the rules for the conduct of patients which were printed on the medical card under the N.H.I. Act. It was felt that this would have the effect of relieving doctors of many frivolous and unjustified calls. The Ministry's view, however, is that a better understanding of doctors' difficulties would be secured by propaganda rather than by direction. A publicity campaign embracing the Press, radio, and women's organizations is being planned with this object in view; the Committee has not to date, however, seen much indication of the Ministry's efforts in this direction.

164. The 1949 Annual Conference (Minute 58) asked that there should be provision for a doctor to make a complaint against a patient, as was the case under the N.H.I. Act. This is one of the matters upon which representations have been made to the Ministry in connexion with the Service Committee and Tribunal Regulations.

Definition of "Night Visit"

165. Following representations by the Committee, the Ministry agreed to recommend to Executive Councils that in the scale of fees for emergency treatment a night visit should be defined as a "visit made between the hours of 8 p.m. and 9 a.m. in response to a call received between those hours."

Treatment of Seamen

166. Whole-time medical officers of the Shipping Federation are frequently called upon to give general medical services to seamen, and it has been agreed that in respect of those services a limited sum shall be made available from the Central Practitioners' Fund.

167. It has also been agreed that boys accommodated in Shipping Federation Training Schools should be regarded as temporary residents, the attending doctor being paid a quarter of the ordinary capitation fee for each one, and that remuneration for a routine examination will be regarded as a separate matter which is outside the terms of service of general practitioners under the National Health Service.

168. The Committee has not succeeded in securing an augmentation of the "pool" to cover the treatment of foreign seamen. The Ministry's argument is that the liability is very small and that foreign seamen, along with the other visitors to this country, are counterbalanced by British nationals going abroad for short periods and certain classes of persons (lunatics, people in hospital, etc.) for whom payments are made into the "pool" without any liability for medical treatment by general practitioners.

169. In cases where a seaman is on the list of a doctor in a port it appears that unless the doctor limits the area of his practice he can be called upon to treat the seaman even when he is aboard a ship off-shore or lying in the roads without being able to claim any additional payment, and the Ministry was informed that unless these arrangements were modified it might be necessary to advise doctors to exclude the immediate port area from the area in which they undertake to visit N.H.S. patients.

170. The Ministry agreed that there is no reason why a port vicinity should not be excluded from a doctor's area of practice under the N.H.S. Act, but it is thought the position should be covered by a previous arrangement with the Shipping Federation by which the latter reimburses its part-time medical officers for visits to ships in midstream, over and above the temporary resident fee which the medical officer receives from N.H.S. funds.

Reinstatement of Demobilized Service Personnel in Doctors' Lists

171. The 1949 Annual Conference (Minute 93) asked that steps be taken to ensure that the names of Service patients are restored to the lists of doctors in which they were included before enlistment. The point was taken up with the Ministry, but could not be pressed in face of the statement that it would involve the employment of a substantial number of additional clerks.

Temporary Release from the Forces

172. Prior to 1950 persons temporarily released from the Forces for short periods of less than three months were handed a form (E.C.13) with a leaflet advising them to apply for inclusion in a doctor's list under the National Health Service. Now, where the temporary release is for a period of not more than three months, the Service concerned will not follow this procedure. If treatment is required, the member of the Forces will become a temporary resident. Where, however, the temporary release is for more than three months, the Service concerned will issue E.C.13 (overstamped "Temporary Release from the Forces") with the appropriate leaflet, and will collect the medical card when he returns to duty.

173. The number of temporary releases is very small, but the procedure outlined above will, it is believed, avoid inflation of lists from this source, and the Committee is assured that the number released temporarily from the Forces will be added to the population upon which the Central Practitioners' Fund is based.

Reports to Regional Medical Officers

174. Two days is considered to be insufficient time within which to expect general practitioners to complete and return reports on patients referred to Regional Medical Officers. The Ministry was asked to instruct Regional Offices to allow not less than four days for this purpose, but is unable to do more than agree that in exceptional circumstances the time limit of two days will be extended. The Ministry of National Insurance points out that it has a duty to guard against improper expenditure on sickness benefit and is unwilling to agree to a general prolongation of the time allowed for returning reports on patients.

Telephone Charges

175. Following reports of increased expenditure on telephone calls since the inception of the National Health Service, the Committee has carried out an inquiry with the object of assessing the actual increase which has taken place.

176. The results show that, after offsetting the general increase which has been imposed by the G.P.O. since 1948, no case exists for any action being taken for the time being. The Committee will, however, keep the subject under review.

Refresher Courses

177. Government-sponsored courses of postgraduate study for general practitioners have been supplemented by a new type of course which consists of three half-day sessions at the week-end or during the week. The conditions of grant and procedure are similar to those applicable to the longer courses.

"Covering" an Unqualified Practitioner

178. The question was raised as to the position of the general practitioner who discovers that his patient is receiving treatment from an unqualified practitioner, with particular reference to the issue of certificates. A comparison was made between the new and old Regulations, and legal advice was sought on the point. The result has been the promulgation of an Amending Regulation providing that a practitioner "shall not be required to issue a certificate where the patient is receiving medical treatment otherwise than from, or under the supervision of, a medical practitioner."

Medical Examination of Nurses

179. The Committee has under discussion with the Hospital Division of the Ministry the requirement by some hospitals that a candidate for a nursing post shall produce a pre-employment certificate of fitness, for which there is no provision for a fee payable by the hospital. The service does not come within a general practitioner's contract under the Act, and it is considered that the hospital authorities should pay an appropriate fee for the examination direct to the practitioner.

Registration of Babies

180. Following representations by the Committee, Form H.S.L., which is issued to all persons registering the birth of a baby, has been amended so that the general phraseology of the form is now in the nature of advice rather than an instruction. It has not been found possible, however, to persuade the Ministry to draw attention, on this form, to the fact that opportunity still exists for treatment as a private patient.

New Acceptances—Medical Record Cards

181. It was suggested to the Ministry that Form E.C.15 (on which a doctor is notified that patients have been put on his list) is too flimsy to be filed conveniently in doctors' record cabinets, and that in its place a continuation medical record card, which could be linked up with the medical record envelope later on, should be sent.

182. The Ministry has no objection to this procedure, and has suggested to Executive Councils where it is not already in operation that they should consider, in consultation with their Local Medical Committees, whether they now wish to adopt it.

Medical Examination of Claimants to Unemployment Benefit Where Capability for Work is in Doubt

183. It is a condition of payment of Unemployment Benefit that a claimant should be capable of work. Where doubt arises as to a claimant's capability to work or as to his medical fitness for a particular kind of work offered to him, he is referred to an Examining Medical Officer for a report. These cases are usually referred to doctors who act as medical referees for the Ministry of Labour and National Service, the fee for each case (12s. 6d.) having been agreed between the Association and the Ministry of Labour. Experience has shown that an Examining Medical Officer does not comply with the suggestion in the official form sent to him to consult the patient's own doctor "*in appropriate cases.*" This leads to conflicting medical views between the E.M.O. and the patient's own doctor and often between these authorities and the R.M.O. on the health side. A paragraph is to be added to the form making it necessary for the E.M.O. to contact the patient's own doctor in every case, and not only when he considers it appropriate to do so.

Appointment of Medical Practitioners to National Service Medical Boards and Disablement Advisory Committees

184. The Ministry of Labour will make an announcement annually in the medical journals towards the end of April or the beginning of May to the effect that appointments to National Service Medical Boards throughout the country are about to be reviewed and that any doctor who would like to be considered should inform his Local Medical Committee or the Ministry of Labour and National Service.

185. It has also been decided that an announcement regarding membership of Disablement Advisory Committees and their panels should be included in the advertisements, although in these instances only casual vacancies will be involved. The Committee has expressed satisfaction with the proposal to review National Service Medical Boards and Disablement Advisory Committees on a national basis in future.

186. The desirability of extending this procedure to Ministry of Pensions and Ministry of National Insurance Boards is under consideration.

Health Education

187. The Central Council for Health Education contemplates calling a Conference on health education in schools in the near future, and the Committee has appointed two representatives (Drs. Gray and Sutherland) to attend such a conference. The subject is of some importance to general practitioners in that ignorance of the simplest rules of health is likely to increase the volume of work they are called upon to do.

The School Health Service and the General Practitioner

188. The 1949 A.R.M. passed the following resolution:

"77. **Resolved:** That a School Medical Officer should send any child he considers to need hospital treatment to the family doctor; he should not, except in case of urgency, send the child to any particular hospital or to any particular consultant, the choice of which is the proper province of the family doctor in conjunction with the parents."

189. This resolution was considered jointly by the B.M.A. and the Society of Medical Officers of Health, and both bodies have agreed that the following procedure should be followed when a School Medical Officer considers that a child needs special investigation or treatment:

(1) Where in the opinion of a medical officer employed by a Local Authority a child needs special investigation (other than an ophthalmic examination) or treatment, he should send the child to a specialist only after prior consultation with the child's own doctor, upon whom rests the responsibility for general medical care.

(2) In consulting the general practitioner, the medical officer should give him the opportunity to make the arrangements for the consultation or to agree—by replying or in the absence of a reply—that the arrangements should be made by the medical officer.

(3) A copy of any special report on the child received by the medical officer should be sent to the child's own doctor.

Aftercare

190. Section 28 of the N.H.S. Act empowers a Local Authority to make arrangements "for the purpose of the prevention of illness, the care of persons suffering from illness or mental defectiveness, or the aftercare of such persons. . . ." The G.M.S. Committee had an opportunity of commenting on a proposal by the Medical Officer of Health of a large county to introduce a scheme for aftercare. Part of the scheme was that a Health Visitor should be seconded to work in a hospital to provide information concerning the background and home conditions of patients for the use of the hospital medical staff. The Committee's comment was that there appeared to be insufficient liaison between the Health Visitor and the patient's

own doctor, and that difficulties were likely to arise if the proposal was allowed to develop without proper regional control.

Spa Treatment in Great Britain

191. The Committee has appointed two of its members (Drs. F. A. Smorfitt and D. F. Whitaker) to represent it on the Spa Practitioners' Group Committee, which is preparing a report on spa treatment in Great Britain. The report will take the form of a guide for the use of the medical profession.

Election of Chairmen of Executive Councils

192. The 1949 Amending Act gives an Executive Council authority to appoint its own Chairman at a special meeting convened for the purpose. Under the original Act the Chairman was appointed by the Minister.

General Practitioners Attending Training Camps

193. General practitioners attending training camps with the Supplementary Reserve or the Territorial Army incur expenses in the provision of locums which, it is felt, should be a charge on public funds. The Ministry's view is that it is taken into account, as a practice expense, in fixing the remuneration of general medical practitioners. The Committee is not satisfied with the position and is making representations on the subject to the Service Departments.

Pension and Insurance Schemes for Doctors and Their Employees

194. The Pension and Insurance Scheme which was available to insurance practitioners and other members of the B.M.A. until December, 1948, has been revised by agreement with the insurance companies concerned. Like its predecessor, the revised scheme provides for pension, for family provision, and for disability. A supplementary scheme has also been evolved which is likely to be of particular interest to practitioners in the National Health Service who are anxious to make adequate provision for their dependants, as well as possibly to augment their pension at retirement.

195. A further scheme has been prepared providing for superannuation and death benefits for employees of doctors. The scheme covers:

(*a*) A pension on retirement at 65 and 60 for a woman, based on salary and length of service with (for men) the option of a "survivor" pension for widows,

(*b*) death benefits (for women), and

(*c*) return of contributions on withdrawal from the scheme before death or retirement.

The Defence Trusts

196. As set out in the last report to the Conference, there are now two Defence Trusts—the National Insurance Defence Trust and the General Medical Services Defence Trust. The creation of the G.M.S. Defence Trust was necessary on legal grounds, but this step does not involve any modification of the objects for which money already subscribed will be used. All contributions from Local Medical Committees now go to the G.M.S. Defence Trust and all payments within the objects of the two funds (which are identical) will be made from the N.I.D.T. until such time as the moneys at its disposal are exhausted. In any emergency the funds of both Trusts will, if necessary, be used for identical purposes, namely, the protection of the interests of general practitioners. The trustees of both funds are the members of the General Medical Services Committee of the B.M.A.

197. The balance sheet and statement of expenditure and income of the N.I.D.T. for the year ending December 31, 1949, are being sent to every Local Medical Committee. The amount at present standing to the credit of the G.M.S. Defence Trust is over £15,000.

198. It has been decided that the target for the combined funds shall remain unchanged at £1,000,000. This decision was reached after a review of the extent to which areas have already subscribed in terms of their quotas to a £1,000,000 fund. A statement showing the contributions so far received from each area is being circulated to Local Medical Committees.

199. An appeal was made to Local Medical Committees in November last to revive their voluntary levies for Defence Trust purposes as soon as arrangements could be made to do so. The response to this appeal so far has not been as good as was anticipated. The need for a strong defence fund cannot be overemphasized, and current events in the field of general medical practice indicate the advisability of strengthening the funds without delay. Local Medical Committees which have not already done so are urged to take this matter in hand immediately.

S. WAND,
Chairman, General Medical Services Committee.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

Chairman and Deputy Chairman

200. Dr. W. M. Knox and Dr. W. Iope were appointed Chairman and Deputy Chairman respectively for the session 1949–50.

Subcommittees

201. The Subcommittee appointed the following subcommittees: Chairman's, Rural Practitioners', Colliery Practitioners, Dispensing Capitation Fee, Allocation of Partnership Shares, and a Joint Subcommittee with the Consultants and Specialists Committee (Scotland) on Relation of General Practitioners to Hospitals.

Representation

202. Representatives of the subcommittee have been appointed to other Committees as follows: Maternity Services Subcommittee and Public Health Subcommittee of the Scottish Committee, International Advisory Distribution Committee, Scottish Advisory Distribution Committee, and the Tribunal established under Section 43 of the Scottish Act.

Meetings with Department of Health

203. Arrangements have been made for regular meetings at three-monthly intervals between representatives of the Department of Health and of the Subcommittee for the purpose of discussion of general medical service matters.

Part-time Services Rendered to Local Authorities

204. Discussions have been proceeding with representatives of the Scottish Local Authorities' Association on the question of fees payable by Local Authorities for part-time services rendered by general medical practitioners. Substantial agreement has been reached on the various items, including the fee for the report on vaccination and immunization. The terms of this agreement, though not identical with the agreement reached with the Local Authorities' Association in England and Wales, are no less satisfactory so far as Scotland is concerned. The question of mileage is reserved for further discussion. The agreement in respect of the fee for the report on vaccination and immunization will be promulgated shortly and will be retrospective to July 5, 1948. The agreement in respect of other items of service has still to be confirmed by the respective bodies, and when this has been done the date of implementation must await a separate and later decision in the light of Government policy with regard to increases of personal incomes.

Inducement Fund

205. The question of the method of application for and extension of the scope of grants from the Inducement Fund has been discussed with the Department of Health. The Department received favourably a proposal that applications for the grants from the Fund should be made centrally and not to the local Executive Council, though it is agreed that there must at the appropriate stage be some consultation of a non-financial nature with the Executive Council, advised by the Local Medical Committee. It has been agreed that the scope of the Fund should be extended to cover assistance to general practitioners who have suffered loss of income, attributable to the operation of the National Health Service. A suggestion by the Department that the Fund should be used to promote the introduction of practitioners into under-doctored areas is being examined.

Vacancies in Medical Practices

206. Amendments of the General Medical and Pharmaceutical Services (Scotland) Regulations in respect of procedure for the filling of vacancies in general practice have been agreed with the Scottish G.M.S. Subcommittee and issued by the Department of Health to Executive Councils for circulation to general practitioners. The object of these amendments is to speed up the procedure, and they provide that the selection of applicants for practice vacancies should be a matter for Executive Councils, after consultation with the Local Medical Committees, subject to a right of appeal to the Scottish Medical Practices Committee.

Draft Allocation Scheme and Limitation of Numbers on Practitioners' Lists

207. After consultation with the Scottish G.M.S. Subcommittee a model Allocation Scheme has been prepared by the Department of Health and is being issued to Executive Councils in Scotland. In this connexion the steps to be taken to bring practitioners' lists within the permissible limits have been discussed with the Department of Health. As a result of these discussions, practitioners in Scotland will be notified through the Executive Councils that as from September 30, 1950, payment for patients on a doctor's list will be made only to the prescribed maximum of 4,000 for a doctor in single-handed practice without an assistant.

Partnership Arrangements under the National Health Service

208. Present indications are to the effect that joining an established senior or seniors in partnership is likely to become the commonest form of entry into general practice under the N.H.S. Consequently it is a matter of concern to the profession and in its best interests that partnerships should be entered into under equitable and satisfactory agreements. The principal matters and contingencies which require to be provided for in an agreement dealing with a partnership under the National Health Service are accordingly under consideration. In arriving at conclusions special attention will be paid to preserving freedom of action to the partners in the matter of partnership arrangements, the provision of adequate opportunities for improvement in the position of the junior partner, and to discouraging the employment of salaried partners.

Dispensing Capitation Fee

209. The question of the dispensing capitation fee in Scotland (5s. as compared with 6s. 6d. in England and Wales) has been further considered. As indicated in the report to the 1949 Annual Conference, the Department of Health agreed to review the matter if evidence could be shown after one year's working of the Act that the fee was inadequate. Information regarding particulars of costs and expenses has been sought from dispensing practitioners in Scotland and this information is now the subject of consideration by a special subcommittee.

Change of Doctor

210. Steps have been taken in Scotland, after consultation with the General Medical Services Subcommittee, to bring the procedure in respect of change of doctor by a patient into line with that which is now being adopted in England and Wales.

Medical Certificates

211. General agreement has been reached with the Department of Health on the certificates to be prescribed under Regulations as certificates which the doctor is required to issue free of charge to his patients or their representatives under Section 34 (2) (*d*) of the 1947 Act. Objection was taken on behalf of the profession in Scotland to the inclusion of jury exemption certificates in the list, but after discussion with the Department the objection has been waived, on the understanding that the certificates are not required to be given on "soul and conscience."

Constitution and Procedure of Medical Service Committees

212. Discussions for amendmen of the Service Committees and Tribunal Regulations (1948) (on lines similar to those which have taken place with the Ministry of Health in respect of the English Regulations) have been held with the Department of Health for Scotland. Substantial agreement with the Department has been reached, subject, where necessary, to discussion between the Department of Health and the Scottish Association of Executive Councils.

Joint Subcommittee on Relation of General Practitioners to the Hospital and Specialist Services

213. The Secretary of State has invited the Scottish Health Services Council to consider and advise him on the relationship between the general practitioner and the hospital and specialist service. The question has accordingly been referred to a special Joint Subcommittee of three of the Standing Advisory Committees of that council. A Joint Subcommittee of the General Medical Services Subcommittee (Scotland) and the Central Consultants and Specialists Committee (Scotland) has presented, on behalf of the Association, an interim report on the relationship of general practitioners and hospital and specialist services under the National Health Service, and this report has been supported by verbal evidence. The Subcommittee is now preparing its final report.

Representation on Regional Hospital Boards and Hospital Boards of Management

214. There is dissatisfaction in Scotland with the position in respect of medical representation on Regional Hospital Boards and on Hospital Boards of Management. Particulars of the actual representation at the present time have been obtained, and the question will be considered further in the light of this information and any necessary action taken.

Mileage

215. The method of distribution of the Mileage Fund, adopted for a trial period of twelve months in England and Wales, has been rejected as not suitable to Scotland. The question of the best method of distribution of Scotland's share of the fund is accordingly under active consideration.

Examination of Patients on the Instruction of R.M.O.s of the Ministry of National Insurance

216. Representations having been made that patients of practitioners who were claimants for Industrial Disablement Benefit were being medically examined on the instruction of the Regional Medical Officer of the Ministry of National Insurance, without any notification to the practitioner either of the fact that the patient was to be examined or of the result of the examination, the whole position has been discussed by the Subcommittee with the R.M.O. The Subcommittee's suggestion was that the practitioner should be notified both that the claimant was about to be boarded and of the findings of the board. Any arrangement which might be made for such notification would have to be made on a U.K. basis, and the R.M.O. has undertaken to discuss this suggestion with the appropriate officials of the Ministry of National Insurance. The matter will be further considered when the report of this discussion is available.

Maternity Record Form

217. The question of the adoption of a standard maternity record form for Scotland is at the present time under discussion with the Department of Health.

Prescribing of Expensive Medicines and Appliances

218. Following consultation with the Subcommittee, the Chief Medical Officer of the Department of Health has issued, through Executive Councils in Scotland to general practitioners, under cover of an explanatory letter, the second Interim Report of the Joint Committee on Prescribing.

Fees for Services Rendered to Mineworkers in Scotland

219. Discussions are proceeding with representatives of the Coal Board and the Mineworkers' Union in Scotland on questions relating to emergency calls to mine accidents, death and disablement benefits, fees for services rendered to mineworkers, and notification of practitioners in pneumoconiosis post-mortem cases.

Treatment of Venereal Disease

220. Discussions have been proceeding with the Department of Health on the question of the domiciliary treatment of venereal diseases, particularly in the rural areas, which the Subcommittee contends cannot be regarded as coming within the contract of the general practitioner under the National Health Service and should carry with it a special fee. Consequent upon these discussions, it is proposed to refer the matter

for consideration to the Standing Medical Advisory Committee of the Scottish Health Services Council.

Executive Council for the Outer Isles

221. Attempts to secure the establishment of a separate Executive Council for the Outer Isles, in accordance with the wishes of the profession in the Islands, have been unsuccessful. The Department of Health has, however, intimated that the profession's views will be borne in mind, and the matter has been noted for further action at the appropriate time.

Medical Treatment of Aged and Chronic Invalids in Institutions

222. The Subcommittee and the Department are agreed that residents in Local Authority institutions should have the right of free choice of doctor, and the Department has undertaken to investigate any complaints on this score.

W. M. KNOX,
Chairman, General Medical Services Subcommittee (Scotland).

APPENDIX "A"

Attendances at Meetings of General Medical Services Committee and its Subcommittees

Name	General Medical Services Committee		Sub-committees, Deputations, etc.	
	Actual	Possible	Actual	Possible
Anderson, Dr. P. V.	5	8	—	—
Bain, Dr. C. W. Curtis (*President*)	—	8	—	—
Baldwin, Dr. J. T.	7	8	—	—
Baxter, Dr. C.	5	8	—	—
Beauchamp, Dr. A.	6	8	4	8
Bennett. Dr. J. B.	7	8	—	—
Bleakley, Dr. J.	6	8	—	—
Brown, Dr. J. A. (*Chairman of R.B.*)	3	8	1	4
Brown, Dr. J. L. McKenzie	4	8	1	1
Campbell, Dr. A.	5	8	—	1
Carter, Dr. *O.* C.	4	8	—	—
Dain, Dr. H. Guy, LL.D.	8	8	9	9
Davies, Dr. A. B.	8	8	6	6
Evans, Dr. D. B.	5	8	2	3
Forbes, Dr. S. A.	7	8	3	4
Gilbert, Mr. J. W.	5	8	3	4
Goodman, Dr. H. H.	8	8	4	4
Gray, Dr. F.	8	8	23	24
Gregg, Dr. E. A., J.P. (*Chairman of Council*)	1	8	2	5
Hamilton, Dr. R. C.	8	8	—	—
Harrower, Dr. Catherine	7	8	4	4
Hendry, Dr. A. C.	5	8	—	—
Hill, Dr. T. Rowland	1	8	—	—
Hollis, Dr. H. F.	8	8	1	2
Hutchinson, Dr. D. F.	8	8	19	20
Innes, Dr. I. G.	7	8	2	3
Ireland, Dr. J. A.	6	8	3	5
Jenkins, Dr. A. E.	8	8	3	3
Jope, Dr. W. (*Chairman of Conference of L.M.C.s*)	7	8	11	11
Killick, Dr. C. F. R.	8	8	8	10
Knox, Dr. W. M.	7	8	8	11
McCutcheon, Dr. J. T.	7	8	5	5
Moore, Mr. A. M. A., F.R.C.S. (*Treasurer*)	—	8	—	—
Murphy, Dr. J. F.	3	8	3	11
Newell, Mr. R. L., F.R.C.S.	—	8	—	—
Pearce, Dr. J. S.	7	8	4	5
Pridham, Dr. J. A.	7	8	3	5
Rogers, Dr. A. T.	7	8	6	10
Rose, Dr. F. M.	8	8	2	2
Smorfitt, Dr. F. A.	5	5	3	3
Steel, Dr. W. D.	3	3	1	2
Struthers, Dr. J. A.	7	8	—	—
Sunderland, Dr. R. H.	8	8	—	—
Sutherland, Dr. H. H. D.	8	8	1	1
Taylor, Dr. G. Waring	5	6	3	3
Wand, Dr. S. (*Chairman*)	8	8	42	42
Whitaker, Dr. D. F.	8	8	3	3
Wilson, Dr. A. S.	1	1	3	3
Winstanley, Dr. S. A.	4	8	1	5
Wood, Dr. H. S. Howie	6	8	—	4
Woolley, Dr. W.	8	8	3	3
Young, Dr. J. B.	3	8	—	—
Arthur, Dr. J. C.	—	—	1	1
Byrd, Dr. C. B.	—	—	3	3
Elliott, Dr. J. E.	—	—	4	4
Figgis, Dr. M. M.	—	—	3	3
Gardner, Dr. A. W.	—	—	1	1
Gemmell, Dr. J.	—	—	4	4
Haslam, Dr. R. K.	—	—	1	1
McDonald, Dr. D. T.	—	—	2	3
Marshall, Dr. J. B.	—	—	3	3
Riddolls, Dr. A. W.	—	—	2	3
Scott, Dr. J. A.	—	—	1	4
Sloan, Dr. O.	—	—	2	3
Stoker, Dr. A. D.	—	—	3	3
Wells, Dr. J. D.	—	—	2	3

Scottish G.M.S. Subcommittee

Name	G.M.S. Sub-committee (Scotland)		Subcom-mittees and Deputations	
	Actual	Possible	Actual	Possible
Anderson, Dr. J. R.	3	4	3	4
Anderson, Dr. W. D.	4	4	—	—
Anderson, Dr. W.	—	—	2	3
Baldwin, Dr. J. T.	4	4	8	9
Blair, Dr. A. C.	4	4	9	11
Cable, Dr. J. Ewen	3	4	1	4
Campbell, Dr. J. M.	—	—	2	2
Climie, Dr. A.	2	4	—	—
Gardner, Dr. W. S.	4	4	—	—
Gibson, Dr. W.	4	4	—	—
Girvan, Dr. A. M.	—	—	2	3
Grant, Dr. I. D.	1	4	4	7
Hamilton, Dr. R. C.	1	4	3	3
Harrower, Dr. Kate	3	4	1	1
Henderson, Dr. S. J.	—	—	1	3
Hendry, Dr. A. C.	3	4	—	—
Horne, Dr. J. L.	1	4	—	—
Hutcheon, Dr. H.	3	4	—	—
Hutchison, Dr. B.	4	4	1	1
Ireland, Dr. G. W.	—	—	2	2
Jamieson, Dr. G.	—	—	3	3
Jope, Dr. W.	3	4	7	9
Kelman, Dr. J.	—	4	—	—
Knox, Dr. W. M.	4	4	12	16
Langmuir, Dr. J. R.	2	4	—	—
Logan, Dr. D. Dale	3	4	2	3
Macarthur, Dr. J. C.	3	4	—	—
McCallum, Dr. J. D.	2	4	—	—
Macaulay, Dr. J. L.	2	4	—	—
McCutcheon, Dr. J. T.	3	4	1	1
McDonald, Dr. C.	1	4	—	—
Macdonald, Dr. A. C.	1	4	—	—
MacFarl, Dr. G.	—	—	1	2
Macleod, Dr. I. M.	3	4	—	—
Mathers, Dr. R. P.	3	4	—	—
Millar, Dr. A. F. Wilkie	3	4	6	8
Murdoch, Dr. J. A.	—	—	2	2
Nelson, Dr. N.	4	4	6	6
Philip, Dr. P. W.	4	4	3	3
Smith Pool, Dr. A.	4	4	3	3
Ross, Dr. W. B.	—	4	3	3
Rutherford, Dr. R. N.	3	4	—	—
Sandeman, Dr. C. S.	4	4	2	2
Sandison, Dr. A. E.	4	—	—	—
Scott, Dr. A.	1	4	—	—
Shand, Dr. P. K.	—	4	—	—
Sibbald, Dr. D. A.	2	4	—	—
Simpson, Dr. A.	2	4	6	6
Sinclair, Dr. F. McEwen	1	4	2	3
Stewart, Dr. N. B.	4	4	—	—
Swanson, Dr. C. J.	4	4	6	6
Thomson, Dr. R. M.	3	3	—	—

APPENDIX "B"

INTERIM REPORT OF HEALTH CENTRES SUBCOMMITTEE

General Considerations

1. The Subcommittee was appointed to consider the position of doctors in an area where the establishment of a Health Centre is contemplated and whether such doctors should be afforded some measure of protection during the period immediately before and after the transition from present conditions of practice at the doctor's residence to Health Centre practice. It has held seven meetings at which detailed consideration has been given to a number of important points. In view of the complexity of the subject, however, the Subcommittee has decided to issue an interim report on the questions which have so far been examined. Several matters remain unresolved, notably the preliminary association which may be formed by doctors likely to enter a Health Centre, and their relationship with Local Health Authorities. Similarly, an examination must be made of the possibilities which might arise from a Health Centre comprising more than one building. The Subcommittee will express its views on these and other matters in a later report.

2. There are indications that pressure may be brought to bear in favour of the erection of a large number of Health Centres throughout the country at the earliest possible date. The general economic situation and the restriction of capital development will undoubtedly retard the Health Centre programme, but in view of this pressure the Subcommittee feels that every opportunity should be taken to reinforce the view expressed by the Council of the B.M.A. in its Report on Health Centres that widespread development of Health Centres cannot, and should not, be commenced without experimental trial in different types of Health Centres in varying areas. Centres are already under construction and the need is urgent.

Local Consultation

3. The first essential to the establishment of a Health Centre is that it should be properly sited. It is during this stage of preliminary discussion and before the site is chosen that the Local Health Authority through the machinery of the Local Medical Committee should consult the local doctors, whose knowledge of local conditions would be invaluable.

4. Encouragement should be given to doctors through the Local Medical Committee to initiate proposals for the establishment of a Health Centre in areas where practitioners desire the introduction of such Centres.

5. It may often happen that certain existing buildings, suitably adapted, could usefully be converted to or associated with the Health Centre, and early consultation would be essential on this point before plans were too far developed.

6. As soon as possible all questions of major policy should be determined nationally. The local application of these principles should be agreed locally and made available to practitioners as long as possible before contracts are exchanged.

Protection from Encroachment

7. The successful establishment of a Health Centre is largely dependent upon the adequacy and ability of the professional staff, and the Subcommittee is convinced not only of the need for a full complement of doctors at the Centre but also that it must be attractive to the best general practitioners in the area. Every general practitioner in the area should have an opportunity of applying for admission to the staff, and a doctor contemplating transferring his practice to a Health Centre should be influenced by his ability to adapt himself to the new form of practice and not by the fear of other doctors coming into the area and taking advantage of his action. This fear is very real, since the National Health Service Act by abolition of the sale and purchase of practices has materially altered the position of the new entrant, and these factors, combined with the provision of basic salary, encourage more doctors to commence practice on their own by squatting. Any transition from present-day practice to Health Centre practice provides obvious openings for such doctors. Ordinarily, the establishment of a practice in this way is fraught with hardship, but the conditions inherent in the establishment of a Health Centre would make the area an obvious choice for these practitioners. A newcomer might well attract patients who prefer to be attended in the vicinity of the old surgery premises rather than go to a Health Centre.

8. As an example, in the early part of 1949 there was a movement afoot by the London County Council to establish a Health Centre at Poplar. This project is now in abeyance, but when the doctors in the area to be served by the Health Centre were approached they indicated their willingness to staff the Centre on condition that their existing practices were safeguarded by the district being declared a "closed" area for a defined period.

9. Those who enter Health Centres will be virtually in the position of engaging, on behalf of the profession and the community, in an experimental form of practice, and it does not seem to the Subcommittee to be unreasonable that they should be given a measure of protection against any possible encroachment on their means of livelihood; indeed, such a measure of protection will continue to be necessary until practice from Health Centres becomes the usual method of providing general medical services. Unless some measure of protection is afforded it is felt that there will not be the same incentive to doctors already well established in practice in the area to take part in the work of the Centre. It is recognized that the medical profession collectively has, in the past, favoured absolute freedom of practice, but it is submitted that the circumstances associated with the establishment of a Health Centre call for a modification of this policy. On this point the following resolution has, on the recommendation of the General Medical Services Committee, been passed by the Annual Conference of Local Medical Committees:

"That it be regarded as an essential preliminary during the experimental period that, in every area in which a Health Centre is to be opened, no doctor (other than one of the principals in the Health Centre, or a doctor who, at the commencement of the period specified below, had premises in the area from which he practised and was at that time on the Executive Council List) should be allowed to open a surgery (including a surgery at his residence) within an agreed area around the Health Centre for a specified period before and after the opening of such Centre."

10. The Subcommittee is also of the opinion that an exchange of contracts between the Local Executive Council and the general practitioners whom it is agreed shall work from the Health Centre should take place before the commencement of building, and that the area surrounding the Centre should be closed to newcomers from the signing of contracts or the commencement of building, whichever is the earlier, until one year after it is functioning as a Health Centre.

Method of Selection and Mode of Entry to Practise in a Health Centre

11. The provision of general medical services at a Health Centre, as elsewhere, is the duty of the Executive Council. It is therefore assumed that these questions will be resolved in conjunction with the Local Medical Committee, preferably through a small joint committee.

12. In the Subcommittee's opinion the following principles should apply in connexion with the staffing of the Centre:

(1) When it has been decided to open a Health Centre the Executive Council should approach all the doctors in the area (to be delimited *ad hoc* in each case) and invite them to apply for admission.

(2) If the number of applicants does not exceed the number who can work together in the Centre, then subject to 4 (*a*) they should all be admitted.

(3) If the number of applicants is less than the number of doctors who the Executive Council considers should work together in the Centre, then the Council might, if they think fit, extend the invitation to include doctors practising in a larger area around the Centre. The Executive Council should not invite any additional doctors from outside the area unless, and subject to paragraph (4) (*a*):

(*a*) there is a vacancy in the area at the time, or

(*b*) the combined lists of the accepting doctors, including assistants, exceed the permitted maximum.

(4) If the number of applicants from the delimited area is greater than the number of doctors who can work in the Health Centre, then the Executive Council should proceed to select those who are to go in. In so doing:

(*a*) Only those doctors who have mutually agreed to work together shall be selected.

(*b*) Regard should be had to any preferences expressed by those whom it is proposed to select as to their colleagues.

(5) If a vacancy occurs at a Health Centre or if the practitioners wish to add to their number, the remaining doctors should select another practitioner. A proposed addition would be subject to the consent of the Executive Council, such consent not to be unreasonably withheld, having regard to the accommodation available. If it is proposed not to fill a vacancy the consent of the Medical Practices Committee should be obtained.

13. Whilst the Subcommittee wishes to emphasize the necessity for preserving the right of a practitioner to choose his own partner and to work in co-operation with those outside the Centre, it is opposed to any steps being taken which might lead to the overstaffing of a Health Centre.

Co-operation Between Doctors Practising from a Health Centre

14. Those in partnership when the Health Centre is functioning will probably wish to continue with current arrangements. In other cases, although it should not be an obligation, it is felt to be eminently desirable that there should be some form of co-operative arrangement between practitioners from the clinical, administrative, and financial standpoints. The allocation of moneys received for services rendered at the Health Centre is, of course, a matter of private arrangement between the doctors concerned, and the Subcommittee does not think it would be desirable to make any suggestions on this aspect of Health Centre practice.

Procedure for Terminating the Contract of a Doctor Working at a Health Centre

15. A doctor wishing to retire from a Health Centre should give the usual three months' notice to the Executive Council and should either:

(1) Withdraw from the area and give up his list of patients, or

(2) Subject to the terms of any partnership or similar agreement

(*a*) continue in N.H.S. practice in the area, or

(*b*) give up his list of patients and continue in private practice in the area.

16. In the circumstances set out in (1) and (2) (*b*) above the Subcommittee holds the view that a vacancy would exist, whilst the continuance in N.H.S. practice in the area would not create a vacancy.

Terms of Service at Health Centres

17. It is contemplated that the terms of service at a Health Centre will be governed by the terms and conditions of service for general practitioners now in force. There should be no differentiation between the terms of service for those practising in a Health Centre and those practising outside the Centre.

Existing Practice Liabilities

18. In cases where a doctor owns his surgery premises it is not anticipated that any difficulties will arise so far as continuing liabilities are concerned. In the event of his moving into other premises, however, it is desirable that he should restrict the future use of his existing surgery premises to prevent another doctor from using the property for surgery purposes. Such a safeguard could be easily effected by including a restrictive covenant to this effect in the conveyance.

19. Many doctors entering Health Centre practice will, however, be faced with the problem of continued liability under the leases of their existing surgery premises. The Subcommittee feels that these practitioners should not be influenced against Health Centre work by the possibility of financial loss, and due regard must be given to the means whereby the doctor can terminate his liability without being penalized in any way. Here, again, the future use of the premises must be restricted to prevent another doctor from using the property for surgery purposes within a reasonable period of time.

20. There are at present three ways in which a tenant can be wholly or partially released from the obligations of his lease: the lease can be terminated by agreement with the landlord; the remaining term of the lease can be assigned; or the premises can be sublet. In the last two cases the tenant remains liable to his landlord but can have recourse to his assignee or subtenant. The adoption of the first of these alternatives would probably involve a cash payment by way of compensation to the landlord, whilst subletting or assigning is only possible if the lease permits it.

21. In view of the Ministry's desire to see doctors participating in Health Centre practice, the Subcommittee feels that it is not unreasonable to ask that such practitioners should be safeguarded against the possible consequences of agreeing to enter a Health Centre. Such a safeguard would require the introduction of legislation to provide that the lease should have written into it, at the option of the landlord, either that the doctor has the right to surrender the lease without incurring a penalty, or that he has the absolute right to assign or sublet. Either provision would be invoked only at the wish of the tenant. It should also be a condition of the surrender of the lease that the landlord should not let or otherwise dispose of the premises to another doctor for a specified term.

22. Consideration has also been given to the position of doctors who for various reasons may not immediately wish to terminate their leases and vacate their surgeries. These practitioners would be faced with the alternatives of (*a*) leaving the surgery vacant although retaining possession; (*b*) keeping the premises furnished and holding periodical surgeries; or (*c*) installing a caretaker.

23. Although in the case of (*a*) there is a distinct danger of requisitioning, and also in the case of a whole house which is partly used for surgery purposes and partly as a flat for the caretaker it might be held by the Local Authority that the actual surgery part of the building was not required for occupation and could be subject to requisitioning, the Subcommittee feels that the Ministry of Health, which controls housing policy, could overcome this difficulty by issuing a directive that Local Authorities should not requisition premises so vacated for a given period.

24. In the event of a caretaker being installed, several difficulties may arise to prevent the doctor recovering possession of the premises. Without the benefit of a service tenancy agreement specifically stating that the caretaker occupies the premises solely as a condition of his employment by the doctor, it appears that a caretaker could normally claim the protection of a statutory tenancy and the doctor would be faced with considerable difficulty in obtaining vacant possession in the event of the caretaker refusing to quit at the termination of the arrangement. If a service agreement is completed the doctor should normally have no difficulty in obtaining possession if he requires the premises for use by another employee, although should he himself wish to reoccupy the premises he must first offer the service tenant suitable alternative accommodation. Even if suitable alternative accommodation is offered a Court would only make an order for possession in certain cases if the doctor acquired his interest in the premises before September 1, 1939 (or in some cases December 6, 1937), and if the Court is satisfied that the hardship to the landlord in not granting the order is greater than the hardship to the tenant of doing so. The acceptance of rent for one rent period between the time that the doctor ceases to use the premises as a surgery and the time that notice is given to the caretaker might well invalidate any service tenancy agreement by turning what started as a service tenancy into an ordinary tenancy fully protected by the Rent Restrictions Acts.

25. To overcome these difficulties, if caretakers are to be taken as the best solution of the doctor's problem, the doctor must be provided with some means whereby he can:

(1) obtain immediate possession of any premises in which he has installed a caretaker for the time being;

(2) prevent the requisitioning of any vacant part of his premises.

26. (1) above can be secured by legislation amending the Rent Restrictions Acts or by the doctor himself ensuring that the rent paid by the caretaker does not exceed two-thirds of the rateable value of the property let to the caretaker, thus removing the caretaker's tenancy from the scope of the Rent Restrictions Acts. The safeguard required in (2) would require the introduction of amending legislation to guarantee the doctor against requisitioning for a specific period, which it is suggested should be for two years. The only alternative is for the doctor to secure an undertaking from the requisitioning authority that the premises would be handed back should he require them, but this arrangement would not be altogether satisfactory, as the doctor's obligations under his lease would not necessarily be covered by the requisition rental paid and repairing obligations accepted by the requisitioning authority.

27. It is felt that apart from other considerations it is necessary for the doctor to be able to leave the Health Centre and revert to practice outside if it is desirable for him to do so. The full implications of Health Centre practice are not known, and in the interest of all parties it should be possible for the doctor to leave the Centre if either he desires to do so for personal or professional reasons or if his continued attendance at the Centre would in any way disrupt the harmony or efficient working of the Centre. Similarly, by prohibiting the use of any vacated premises by another doctor some measure of protection would be afforded against encroachment, a step which is considered highly desirable if practitioners are to be encouraged to enter Health Centre practice.

Development Charges under the Town and Country Planning Act, 1947

28. The question also arises as to the liability of a doctor for a development charge under the Town and Country Planning Act if on assigning or subletting his surgery premises the new tenant carries out any alterations or effects any material change of user which would attract a development charge. Generally speaking, any development charge is paid by the "developer," but in some circumstances it is possible that the doctor will be called upon to pay this charge. It therefore seems desirable that a doctor should be protected against incurring such a payment in consequence of his entering Health Centre practice, and of necessity subletting or assigning his existing surgery premises. Here again it seems that amending legislation is the only certain way of overcoming the difficulty.

29. Normally a development charge would not be attracted if a doctor who owned his premises merely ceased to use them for surgery purposes and used them purely for his residence; if, however, he put the surgery premises to some other use—e.g., for office accommodation or for letting as a separate flat—he would normally have to pay a development charge. If, however, on entering health centre practice he no longer required the premises at all and sold them, while a development charge might be incurred if there was any material change in the use of the premises it would fall to the purchaser for payment. In so far as this factor would have a bearing upon the purchase price of the house, it is considered that the doctor should be indemnified against any possible loss.

Model Contract

30. Detailed consideration has been given to the matters which it is thought desirable to incorporate in the contract to be entered into by a doctor who agrees to practise from a Health Centre. A model contract drawn up by the solicitors in the light of the Subcommittee's deliberations is shown in Appendix I. Although it is suggested that this contract should be used by those who join a newly formed Health Centre, some modifications will undoubtedly be necessary in the light of experience.

31. The Subcommittee is of the opinion that so far as possible doctors agreeing to practise from Health Centres should be governed by the same terms and conditions of service as exist at present, and is of the opinion that the introduction of additional regulations or restrictions should be avoided. To this end the contract should be with the Executive Council, thus placing the doctor in the position of subtenant, the Executive Council being the main tenant of the Local Health Authority.

32. In examining the matters for which it is thought provision should be made in the contract, the Subcommittee had reason to examine a number of related questions which, although in all cases are not capable of detailed incorporation in a model contract, should be agreed between the parties concerned.

The views of the Subcommittee on these matters and an amplification of some of the terms of the model contract are set out below:

Services Available at the Health Centre

33. The contract sets out the majority of the services which the Executive Council would undertake to provide at the Health Centre, but the Subcommittee wishes to stress that full provision must be made for the doctor to have such professional, technical, and clerical assistance as he may reasonably require, and the importance of ensuring that facilities are provided for the reception of telephone and other messages during the twenty-four hours. It is considered desirable that any arrangements for the running of the Centre shall include the services of a caretaker upon whom the practitioner can call to perform small maintenance tasks in the building, etc.

Payment for Accommodation at a Health Centre

34. The Subcommittee has carried out a detailed examination of the method of computing the rent which practitioners are to be charged for the accommodation and services which are provided at a Health Centre, and is in agreement with the following basis, which has been determined by the Ministry of Health and communicated to Local Health Authorities: "The rent to be charged should be a reasonable computation of what it would cost the doctors to provide facilities for practice from their own surgeries in the neighbourhood of the Centre."

35. The payment for accommodation and services should not exceed the cost of obtaining private surgery accommodation and comparable services in the district on the basis of an assessment by the district valuer, and in no circumstances should it exceed the cost to the Local Health Authority or the Local Executive Council. The total rent should be related only to the accommodation and services in use.

36. In some circumstances it is envisaged that it will be necessary for the doctor to join the staffs of two Health Centres or, where the nature of the countryside demands it, to maintain a branch surgery in addition to his Health Centre practice. To permit him to undertake Health Centre practice without financial hardship the rent might have to be adjusted in order that it bears a relation to the actual user of the accommodation and services.

Administrative Arrangements

37. As circumstances will necessarily differ from area to area the Subcommittee is of the opinion that it is inadvisable to incorporate these arrangements in any detail in the contract. The general administrative arrangements should be determined locally between the Local Health Authority, the Executive Council, and the Local Medical Committee.

38. The doctors on the staff of a Health Centre should form themselves into a Medical Staff Committee and include in the membership of the Committee the Medical Officer of Health of the Local Health Authority or his medical representative. Such a committee should receive official recognition and should appoint an accredited representative who would represent them in matters affecting the day-to-day management of the Centre.

39. It may ultimately prove desirable in the light of experience to establish Joint Medical Staff Committees of Health Centres.

40. The matters which should be agreed locally should include, *inter alia*, the following items:

(a) Lay assistance in the administration of the Centre

At each Health Centre some person should be given the necessary authority and deputed to deal with administrative details arising from the day-to-day running of the Centre. Such an individual would keep in the closest touch and co-operate with the doctors in the Centre.

(b) Management

The doctor's share in the management of the Centre should be exercised through the committee formed by the doctors in the Health Centre.

(c) Disputes

Disputes between two doctors should be placed before the Medical Staff Committee, and, failing agreement, thereafter the Local Medical Committee.

Any complaint made by a patient against a practitioner in the Health Centre must, as in the case of a doctor outside the Centre, be made to the Executive Council and dealt with in the usual manner by the Council.

(d) Services for patients

Agreement should be reached between the Executive Council, the Local Professional Committees, and any other interested bodies as to the services which will be available at the Health Centre (e.g., dental, ophthalmic, and pharmaceutical services), and the practitioners concerned fully informed.

(e) Facilities for doctor

Similarly, the doctor should be advised of any agreement reached between these bodies as to the right which he has to utilize any arrangements in force at the Health Centre for filing records, supplying drugs, pathological examinations, etc.

The Doctor–Staff Relationship

41. The necessity for the provision of such ancillary staff as are reasonably necessary to meet the doctor's requirements has already been stressed and a clause to this effect is included in the model contract. The Subcommittee, however, considers that the doctors at the Centre should be free to arrange between themselves how the services of the secretarial, dispensing, and

clerical staff should be shared. Presumably, any such staff will be employed by the Local Health Authority and their hours and general conditions of service will be governed by those applicable to Local Authority staffs. Consequently the doctor will not have the right to dismiss a member of the staff, but it is felt that he should have the right to take immediate disciplinary action which shall be reported to the Local Health Authority, who shall be responsible for deciding what further steps are necessary.

42. Many doctors going into Health Centres will probably wish to take their existing secretaries with them, and the contract provides that the appointing authority shall, so far as possible, afford the doctor the opportunity of taking his own secretary, clerk, and/or dispenser.

43. In connexion with the provision of lay staff at a Health Centre, the Subcommittee wishes to emphasize the advantages and economies which it is considered would be effected by the installation of labour- and time-saving devices such as dictaphones.

Surgery Arrangements

44. The model contract contains a clause which would set out the doctor's rights in regard to waiting-room accommodation. On this question the Subcommittee is of the opinion that it is generally desirable that there should be one waiting-room for every consulting-room, but the construction of the building should be such that it is capable of being adapted so that there could be one waiting-room for more than one consulting-room.

45. The internal arrangements of this nature should be such as would satisfy the Local Medical Committee, and particular emphasis is laid upon the need for safeguarding the security and privacy of patients' records.

46. No reference is made to specific surgery hours, as, in the opinion of the Subcommittee, these would be determined as at present.

Security of Tenure

47. Provision has been made in the model contract to specify what security of tenure a doctor has in his surgery, and that normally the Executive Council has no right to evict him. The Subcommittee is of the opinion that, ordinarily, a doctor should have the right to remain in the Health Centre for so long as his name appears on the Medical List. It is, however, of the opinion that some machinery should be established whereby in very exceptional circumstances a practitioner's tenancy could be terminated or allow his immediate resignation from the Centre. Any such machinery should include a full and proper right of appeal. Similarly, if the continuance of a doctor's Health Centre practice would result in any breach of a restrictive covenant in a partnership agreement (e.g., that the doctor would not practise in the area) and the agreement was upheld in the Courts, then the doctor should, in those circumstances, be required to leave the Centre.

Summary of Main Recommendations

48. In its Report the Subcommittee has given its views on a number of detailed points relating to the establishment, staffing, and administration of a Health Centre. Many of the recommendations cannot be implemented until plans for the establishment of Health Centres are more advanced or can be applied under local arrangements. It is, however, considered necessary that early consideration should be given to the adoption of some of the major proposals which will require either amending regulations or legislation and which are set out below:

(1) That it be regarded as an essential preliminary during the experimental period that, in every area in which a Health Centre is to be opened, no doctor (other than one of the principals in the Health Centre, or a doctor who, at the commencement of the period specified below, had premises in the area from which he practised and was at that time on the Executive Council List) should be allowed to open a surgery (including a surgery at his residence) within an agreed area around the Health Centre for a specified period before and after the opening of such Centre.

(This recommendation has been approved by the Annual Conference of Local Medical Committees.)

(2) That legislation should be introduced to provide that, if a practitioner who enters a Health Centre wishes to be wholly or partially released from his obligations under the lease of his existing surgery premises, the lease shall have written into it, at the option of the landlord, either that the doctor has the right to surrender the lease without incurring a penalty or that he has the absolute right to assign or sublet.

(3) That to safeguard the position of practitioners who do not immediately wish to terminate their leases and/or vacate their surgeries, amending legislation should be introduced:

"(*a*) to amend the Rent Restrictions Acts so that a doctor may obtain immediate possession of any premises or part of premises in which he has installed a caretaker or other person for the time being, and

(*b*) to guarantee the doctor against the requisitioning of any vacant part of his premises for a specific period, which it is suggested should be for two years.

(4) That doctors be protected against incurring a development charge in consequence of entering Health Centre practice, and, of necessity, subletting, assigning, or selling their existing surgery premises.

(5) That Local Health Authorities and Local Executive Councils should be required to adhere to the principle laid down that the rent to be charged to doctors for accommodation and services should be a reasonable computation of what it would cost the doctors to provide facilities for practice from their own surgeries in the neighbourhood of the Centre.

(6) That Local Health Authorities and Local Executive Councils should be advised to give official recognition to the Medical Staff Committee formed by the doctors of the Health Centre.

APPENDIX I TO THE REPORT OF THE HEALTH CENTRES SUBCOMMITTEE

Model Contract

THIS AGREEMENT is made the day of 19 BETWEEN THE EXECUTIVE COUNCIL FOR THE COUNTY [BOROUGH] OF (hereinafter called "the Council") of the one part and of in the County of Registered Medical Practitioner (hereinafter called "the Practitioner") of the other part.

WHEREAS:

(1) Pursuant to the powers in that behalf contained in the National Health Service Act, 1946, there has been established a Health Centre at the premises (hereinafter called "the premises").

(2) The Practitioner carries on medical practice in or about aforesaid under contract with the Council under Part IV of the said Act and is desirous of carrying on such practice from the said premises.

(3) The Council have agreed to grant to the Practitioner a licence to use the said premises upon the terms hereinafter appearing.

NOW in pursuance of the said agreement and for the consideration hereinafter appearing THIS AGREEMENT WITNESSETH as follows:

1. THE Council hereby grant the Practitioner and/or any partner or assistant designated by him licence and authority to have as from the day of 19 :

(*a*) the sole and exclusive right for himself or themselves or his or their patients and visitors to use the room(s) designated on the floor of the premises as [a] consulting room(s) for the purposes of his or their said practice

(*b*) the right for himself or themselves or his or their patients and visitors to use [in common with [ ] other practitioners and their patients and visitors] the room(s) designated on the floor of the premises as [a] waiting room(s) for the purpose of his or their said practice

(*c*) the sole and exclusive right to use the space(s) designated in the [garage] [parking place] annexed to the premises for the accommodation of his or their motor car(s)

(*d*) the right for himself or themselves or his or their patients and visitors in common with all others entitled thereto to use all entrance doors halls stairways lifts passages roadways and other means of egress and regress necessary or convenient for the purpose of obtaining access to the before mentioned rooms or [garage] [parking space] or any of them

(*e*) the right for himself or themselves or his or their patients and visitors in common with all others entitled thereto to use the lavatory and sanitary accommodation in and about the premises

2. THE Practitioner shall pay to the Council for such licence a sum at the rate of £ per annum payable quarterly in arrear on the in every year the first payment (being in respect of the period from the until the) being made on the day of 19 .

3. THE Council shall:

(*a*) furnish the said rooms with all necessary and proper furniture fittings and equipment and in the case of [each of] the said consulting room(s) the said furniture fittings and equipment shall include the items set out in the First Schedule hereto and the Council shall replace from time to time as occasion shall require such of the said furniture fittings and equipment as may require replacement PROVIDED ALWAYS

(i) that the Practitioner may at any time notify the Council in writing that he does not require [in any specified room] any item or items or furniture fittings or equipment set out in such Schedule and upon the receipt of such notice the Council shall remove the same

(ii) that the Practitioner shall be at liberty at any time and from time to time to bring into [any of] the said consulting room(s) such of his own furniture fittings and equipment as he may decide

(*b*) at all time maintain the premises and in particular the rooms hereinbefore referred to in good and substantial repair and condition both internally and externally and keep the said furniture fittings and equipment in good repair and condition

(*c*) once in every [ ] years paint in a good and workmanlike manner the interior of the said rooms usually painted and paper wash stop distemper grain varnish and whiten all parts usually papered washed stopped distempered grained varnished and whitened. The colour of the decorations to the said consulting room(s) shall be chosen by the Practitioner and the colour of the decorations to the said waiting room shall be chosen by the Practitioner jointly with the other practitioners using the same or on failure to agree by the Council

(*d*) supply a telephone to [each of] the said consulting room(s) and pay all charges and expenses in connexion therewith other than such as are not attributable to the use of the premises for the purposes of the practice carried on by the Practitioner which shall be borne and paid by him

(*e*) pay all rates taxes and other outgoings whatsoever in respect of the premises and indemnify the Practitioner against all liability in respect thereof

(*f*) at all times keep the said rooms and all such parts of the premises as are used by the Practitioner or any such partner or assistant or his or their patients and visitors in common with other persons properly cleaned and lighted and warmed to such extent as may be reasonably necessary from time to time

(*g*) provide to the satisfaction of the Health Centre Medical Staff Committee hereinafter referred to the services referred to in the first part of the Second Schedule hereto

(*h*) provide to the satisfaction of the Local Medical Committee for the County [Borough] of the services referred to in the Third Schedule hereto and permit to the Practitioner and any such partner or assistant the full enjoyment thereof

(*i*) indemnify the Practitioner and any such partner or assistant against all liability howsoever arising in respect of:

(i) any accident sustained by or any injury to any person coming in or upon the premises not being an accident or injury arising directly out of or in consequence of professional treatment given by the Practitioner or any such partner or assistant

(ii) any failure (not being attributable to the personal act or default of the Practitioner or any such partner or assistant) to ensure that all records papers and other documents relating to patients of the Practitioner or any such partner or assistant are preserved from disclosure save to the Practitioner or any such partner or assistant or to the patients to whom they respectively relate or to any other person having power lawfully to require such disclosure

(iii) any negligence or wrongful act or default on the part of any person in or about the premises other than the Practitioner or any such partner or assistant

(iv) any accident sustained by or any injury to any person employed in and about the premises (not being attributable to the personal act or default of the Practitioner or any such partner or assistant)

4. THIS Licence shall be determinable:

(*a*) By the Practitioner at any time on giving to the Council three months' notice in writing to terminate the same

(*b*) By the Council on giving to the Practitioner two months' previous notice in writing to terminate the same on the happening of one of the following events:

(i) if the Practitioner's name shall for any reason be removed from the Medical List of the Council

(ii) if the sum payable under Clause 2 hereof shall be in arrear and unpaid for 21 days after the same shall have been legally demanded in writing

(iii) if the Practitioner shall be guilty of such conduct as shall in the opinion of the National Health Service Tribunal on a reference by the Council after considering a report of their Medical Service Committee justify the termination of this Agreement (subject to appeal to the Minister of Health as provided by the said Act)

5. (*a*) THERE shall be constituted a Committee to be known as the [ ] Health Centre Medical Staff Committee which shall be composed of all the medical practitioners carrying on practice at the premises as Principals and being under contract with the Council under Part IV of the said Act together with the Medical Officer of Health for the County [Borough] of [ ]

(*b*) The said Medical Staff Committee shall be empowered to make regulations governing the nomination of a Chairman and the conduct of business by the Committee

(*c*) The said Medical Staff Committee shall have power:

(i) to determine on behalf of the Practitioner all matters arising out of the liability of the Council under Clause 3 (*g*) hereof

(ii) to consider and make recommendations (after such inquiry as they may think proper) for the settlement of all matters of dispute between the Practitioner or any such partner or assistant and any other medical practitioner (not being a partner or assistant of the Practitioner) practising at the premises (subject to appeal to the Local Medical Committee of the County [Borough] of)

(iii) to consider and make recommendations (after such inquiry as they may think proper) for the settlement of all complaints made by the Council against the Practitioner or any such partner or assistant in connexion with his use and enjoyment of the rights hereby granted subject to the right of either party to require the matter to be referred by the Council to their Medical Service Committee

(iv) to make regulations which shall be binding on the Practitioner and any such partner or assistant with regard to the matters set out in the Second Part of the Second Schedule hereto

(v) to nominate on behalf of the Practitioner and any such partner or assistant a representative or representatives to a Committee which shall manage and control the Health Centre on behalf of the Council and all other interested parties.

6. THE right of the Practitioner and any such partner or assistant to carry on his or their practice from the premises shall not be restricted to practise under the National Health Service Act but shall extend to all medical practice carried on by him from time to time.

7. THE Practitioner shall:

(*a*) refund to the Council the cost of all telephone calls made by him or any such partner or assistant from the premises otherwise than in the bona fide conduct of his or her practice

(*b*) refund to the Council the cost of all work carried out by it under Clause 3 (*b*) hereof in respect of the said consulting room(s) which is necessary for reasons other than fair wear and tear in the conduct of his practice

(*c*) conform and ensure that any such partner or assistant shall conform to the satisfaction of the said Medical Staff Committee with all regulations properly made by them under Clause 5 (c) (iv) hereof.

8. IF at any time the premises are destroyed or so damaged by fire storm tempest or any other cause as to deprive the Practitioner of his rights hereunder or any material part thereof the Council shall forthwith make suitable alternative provision therefor and shall take all reasonable and proper steps to restore to the Practitioner as soon as possible the rights so lost.

AS WITNESS etc.

THE FIRST SCHEDULE

List of basic furniture fittings and equipment for consulting rooms to be provided by Executive Council

THE SECOND SCHEDULE

PART I

Services to be provided by the Council to the satisfaction of the Medical Staff Committee

1. The Health Centre shall be open and fully staffed during all hours approved by the Council as the surgery hours of the Practitioners practising therefrom and for [one hour] before the commencement of the earliest and [one hour] after the end of the latest of such surgery hours.

2. For the purpose of the last preceding paragraph the full staff of the Health Centre shall include persons suitable and trained to carry out:

(i) Such duties (including secretarial duties) in connexion with the attendance on patients as the practitioner or the said Medical Staff Committee may reasonably require

(ii) the duties of the Council under paragraph 2 of the Third Schedule hereto relating to medical records and other documents

(iii) to ensure that all calls and messages handed in or sent to the Health Centre for the Practitioner or any partner or assistant designated by him in his absence shall be immediately and accurately transmitted to him or his nominated deputy

3. At all times when the Health Centre is not open and fully staffed the Council shall maintain on the premises such staff as may be required:

(i) to enable the Practitioner and any partner or assistant designated by him to gain access to and use his consulting room and [garage] [parking space] for all reasonable and proper purposes

(ii) to enable the Practitioner and any partner or assistant designated by him to obtain ready access to the records of any of his patients

(iii) to enable all calls and messages handed in or sent to the Health Centre for the Practitioner or any partner or assistant designated by him to be immediately and accurately transmitted to such practitioner or his nominated deputy

4. The Council shall provide at all times a reasonably sufficient supply of hot water to all hot water taps within the premises.

5. The Council shall at all times nominate a person or persons to have (*inter alia*) the following responsibilities and to be available at all reasonable times to the Practitioner and any partner or assistant designated by him:

(i) the general control and direction of the lay staff of the Health Centre and the carrying out of the obligations of the Council in accordance with this Agreement

(ii) the carrying out at the request of the Practitioner or any partner or assistant designated by him such minor repairs and decorative measures as are reasonably required and are the responsibility of the Council hereunder.

THE SECOND SCHEDULE

PART II

Matters on which the Medical Staff Committee may make Regulations

1. The conduct of the practitioners practising in the Health Centre towards each other and the rights of each individual practitioner in relation to the others in connexion with all services and facilities at the Health Centre enjoyed by all the practitioners in common.

2. The conduct of such practitioners towards the lay staff employed by the Council, the rights of the individual practitioners to give orders to such staff and to receive attention personally from them to the exclusion of other matters and all matters in connexion therewith PROVIDED ALWAYS that such Regulations shall so far as reasonably practicable:

(*a*) give to the practitioner who on commencing practice in the Health Centre arranges with the Council to employ at the Health Centre any secretary or other person previously employed by him all reasonable preference in the services of that person

(*b*) empower the practitioner nominated by the said Committee as the representative of such Committee under Clause 5 (c) (v) hereof (or his deputy in his absence) to take immediate disciplinary action with regard to any member of the lay staff of the Health Centre whom he has reason to believe guilty of serious misconduct pending action on the part of the Local Health Authority.

THE THIRD SCHEDULE

Services to be provided by the Council to the satisfaction of the Local Medical Committee for the County [Borough] of [ ]

1. The Council will provide within the Health Centre the following facilities:

[Here will follow a list of other services at the Centre—e.g., dental, ophthalmic, and pharmaceutical services.]

2. The Council will make arrangements for the proper filing and safe custody of all medical records reports correspondence and other documents belonging to practitioners practising from the Health Centre or held by them for the purposes of their practices and shall take all steps reasonably necessary for ensuring the privacy thereof.

FAILURE TO TREAT ROAD ACCIDENT

£50 PENALTY RECOMMENDED

In a case that came before the Birmingham Medical Service Committee recently a member of the public, Mr. A, alleged that a general practitioner, Dr. X, failed to give emergency treatment to a person who, on June 10, was involved in a road accident from which he subsequently died.

The case was initiated by a letter from Mr. A, which stated that a milkman was knocked down by his bolting horse, that he was severely injured, and had since died. At the time of the accident, wrote Mr. A, he asked Dr. X, who was in his surgery less than 100 yards away, to go along to see if he could do anything for the injured man. The doctor refused, and Mr. A was told to telephone 999 for an ambulance. Mr. A added that the doctor could have offered to telephone for the ambulance, but another man had to wait several minutes to get through in a public phone box.

The clerk of the executive council asked for the observations of Dr. X on the matter, and Dr. X replied in a letter that, without vouchsafing for the veracity of Mr. A's statement, it was correct in basic facts. The letter continued:

"At the time, I was busy in my surgery and had about 30-40 patients waiting, and I believe my secretary told the person who rushed in to say that I should come out at once to see a man injured, lying in the road, and was informed by her to send for the police. She was obeying my instructions to her. As a rule I do not go out to attend accidents on the King's Highway, for I find that there are too many accidents on the ———, and it interferes in my routine; though if a patient applied to me for treatment at my surgery or a request to visit at his home, it is immediately attended to. I am not aware that it is obligatory on me to attend road accidents, if so the Minister should issue a directive to that effect; if not, no notice should have been taken of such a letter as that of Mr. A's. He is probably one of those people who write letters to the Ministers or daily Press for the love of it or for self-righteousness. It is unfortunate that the telephone booth was occupied. I suggest that the Postmaster-General be approached with a view to have a few more installed on the ———."

Hearing Before Committee

When the case was heard on July 19 by the medical service committee, Mr. A said he had been an eye-witness of the accident, and in view of the serious injuries sustained by the milkman had personally sought the doctor's assistance. He had told the doctor's receptionist what had happened, and asked her to tell the doctor and ask him to attend. The receptionist had informed Mr. A that a lady had already reported the accident and had been told to dial 999. He (Mr. A) had not been permitted to see the doctor.

Dr. X stated that he had given implicit instructions to his receptionist that he was not to be interrupted during surgery hours, except for maternity cases and for patients who had

sustained accidents and were brought to his surgery. On no other account would he leave his surgery routine. His receptionist reported any summons to the scenes of accidents at the end of surgery times only. His evidence, according to the report of the medical service committee, included the statement, "I have been summoned to many accidents, but I have not been to any."

Dr. X was shown a paragraph of the executive council's allocation scheme (which forms part of the terms of service). He stated that he had not read it, though he possessed a copy of the scheme. The paragraph is as follows:

"If neither the practitioner responsible for a person's treatment nor his deputy is available for giving the person any treatment immediately required owing to an accident or other emergency, it shall be the duty of any practitioner who may be summoned, and is available, to give any necessary treatment."

After considering the evidence, the medical service committee concluded that Dr. X's name had been on the executive council's medical list since July 5, 1948; that he had been summoned to give emergency treatment immediately following an accident; and that he had not attended to give emergency treatment although he was available when summoned. The committee found that Dr. X had contravened his terms of service, and deprecated his giving standing instructions to his receptionist that he was not to be interrupted during his surgery in respect of road accidents. The committee's unanimous opinion was that Dr. X's failure to attend this case amounted to negligence or neglect of his professional duty.

The committee recommended that Dr. X be severely reprimanded and that representations be made to the Minister of Health that the sum of £250 be withheld from Dr. X's remuneration. It also recommended that the relevant regulations should be sent to Dr. X, and that he be required to adhere more closely to them in future.

Executive Council Reduces Penalty

When the executive council met on August 4 it adopted these recommendations with one exception—namely, that the Minister of Health should be recommended to withhold £50 from the remuneration due to Dr. X, and not £250.

MEDICAL PRACTICES COMMITTEE

SECOND REPORT

The Medical Practices Committee for England and Wales has prepared a report covering the second year of operation of the Health Service. The committee's recent classification of areas, according to the number of general practitioners in them, was published in the *Supplement* of August 5, p. 77. The report is presented in shortened form below.

Distribution of General Practitioners

The report states that the total number of principals among general practitioners admitted to the medical lists during the year was 1,242 as against 912 withdrawals. The apparent increase during the year is probably less than the true figure, for some practitioners delayed their impending retirement from general practice until such time after the appointed day as would enable them to secure in reasonable time the capital sums due as compensation. Prompt repayment of even a portion was not possible in the early months of the operation of the Act.

Last year the committee hazarded the opinion that there was already discernible a desirable adjustment in the location of general practitioners more suited to the needs of the public. To-day it is clear that this movement is well established. In areas where the patient–doctor ratio was high the number of resident practitioners on the lists of the executive councils concerned has increased by 168 from 3,627 to 3,795, a general increase of 4.7%. Where the converse was the case there has been a decrease of resident practitioners on the lists of 44, from 597 to 553—namely, 7.4% of those formerly in practice. This decrease has resulted from doctors retiring altogether from general practice and to a lesser degree from movement out of "over-doctored" areas to practices in other areas without replacement by fresh admissions to the list in either group. It is expected that this trend will continue until a state of equilibrium is more nearly reached.

The committee included in Schedule I [open areas with high average lists] only areas where on the facts and figures supplied to it the patient–principal ratio exceeds 3,000–1, but for various reasons not all such areas were included. Criticism has been levelled at the committee during the year on the basis of its assessment of such areas. It has been claimed that since the maximum for a principal to have on his list was 4,000 registered patients the committee had no cause to suggest that additional practitioners were required in areas where the average did not exceed 4,000. It was unable to accept this view.

On the basis of the number of doctors at present available as general practitioners, the average figure would be 2,000–3,000. These limits are elastic enough to cover the situation in most parts of the country. It may well be that in the more sparsely populated rural districts even this lower figure is too high.

The committee takes into account the part played by assistants. It considers that the value of assistants as part of the medical man-power of an area should be assessed as half that of a principal, because of the statutory limitation of 2,400 additional registrations allowed and other factors such as their impermanence and inexperience. The optimum average of registrations in respect of assistants should be, therefore, between 1,000 and 1,500, though this figure underestimates the value of many assistants.

The list of areas in Schedule I is shorter than it was last year because of (1) the increase in principals on the lists of the executive councils concerned during the year; (2) correction of inflation caused by duplicate registration of patients; (3) the taking account of assistants, though this has not made as much difference as might have been expected.

The implications to be drawn from the inclusion of an area in Schedule I are that such an area is worth special consideration by doctors who wish to start new practices and that there is a prima facie case for consideration by the executive council whether or not additional doctors ought to be specifically invited or possibly even induced to practise. Many executive councils have recognized that additional doctors were required in their area and have published advertisements accordingly or encouraged doctors with the larger practices to take new partners or assistants. During the year 374 new practitioners have entered into partnership with doctors already in practice. On the other hand some executive councils have considered, and in many cases convinced the Ministry and the committee, that there was no need to take active steps but that the normal increase of doctors could be awaited.

But there are parts of the country in the areas of county executive councils which do not appear in Schedule I and yet where the general-practitioner services may not be adequate. In such areas doctors have lists well above the average together with large mileage commitments and are often obliged to dispense medicines for their patients. In addition some of the doctors are in contract with the regional hospital board or a hospital management committee for a varying number of weekly sessions. The overall work of these practitioners may exceed that of many doctors with full lists in urban areas and additional practitioners be more urgently required than in most industrial areas. There is also the factor of the varying level of demand for medical care in different areas. The problem of arriving at a simple formula which would focus attention upon such areas is still under consideration by the committee.

Shortage of Accommodation

Doctors who wish to commence new practices and executive councils who are anxious to attract such doctors repeatedly have been balked in their efforts by the difficulty and sometimes impossibility of obtaining any suitable premises from which a practice might be conducted. This is equally the case in built-up and in new development areas, though in the latter

instance some local authorities are prepared to co-operate with the executive councils and the committee. But the committee states that the general-practitioner services should generally be expanded as the new population moves in and not be provided for as an afterthought when the people are already settled and accepted on the lists of those local doctors who were in the neighbourhood before the development was contemplated and who may be overburdened by the new patients.

It has often proved more satisfactory for new entrants into practice to start as partners of existing practitioners. The existing surgery accommodation can frequently be made adequate for the new partner to work from. The new doctor is of immediate benefit to the people of the area, providing services for the patients on his partner's list. The doctor himself is occupied from the time of settling into practice and avoids the anxious period of almost complete lack of work and remuneration which is the usual experience of a doctor who seeks to start an entirely new practice, even though he may attract a basic salary. Generally, the new partner is more acceptable to the other practitioners in the district than the doctor commencing a new practice.

Admissions to the List

Applications to Start Practices

During the year there have been 256 applications made by doctors to commence new practices; 250 were granted and six refused, these latter on the grounds that the number of doctors in the area was already adequate. There have been two appeals against the decision of the committee in this respect, the committee's decision being upheld in both these cases. Of doctors who have started new practices since the National Health Service began some have quite early attracted to themselves a number of patients, which suggests that their venture is on the way to success. Others, however, particularly in the more popular districts, would appear to have little prospect of ever achieving a competence in their present location. London, for instance, presents a peculiarly difficult problem, and the committee has again suggested to the London Executive Council and local medical committee that parts of the areas should be "closed" to new entrants. It is awaiting advice before arriving at a decision on this point.

Assistants

The 1949 Amendment Act and regulations have had the effect that as from February 1, 1950, no application by an assistant as such to be placed on the medical list could be made. This does not preclude assistants' being admitted to the list for purposes other than their assistantship or doctors already on the medical list from acting as assistants. Prior to the above date, 625 assistants were admitted to the medical list since July 1, 1949. Since under the Amendment Act and regulations assistants are no longer admitted to medical lists, any principal who fails to obtain the permission of an executive council to employ an assistant is entitled to appeal to the Medical Practices Committee. The committee has so far considered that it would not be proper to declare that the number of doctors practising in an area was adequate and so close the area to the entry of new principals on the score of assistants employed by the existing practitioners.

Last year the committee emphasized the importance of a period of service as an assistant in general practice before becoming a principal. In a recent report a committee under the chairmanship of Sir Henry Cohen also emphasized this point. The special value of such a period to assistants contemplating general practice as their objective is confirmed by the fact that, as compared with a total of 690 vacancies which were otherwise filled, 178 assistants succeeded or became partners of their former principals during the year. There were approximately 1,700 assistants employed by principals on the list on January 1, 1950. In addition a considerable number of assistants were appointed as principals to other vacancies.

Vacancies

Last year the committee drew attention to the problem of selection of practitioners to succeed to vacancies in established practices. Since that time the position has been clarified by the Amendment Act and regulations. The effect of these will be to render the machinery of appointment more effective. In England and Wales rather more than half of the general practitioners work in partnership. When a partner leaves the Service it is left entirely with the remaining partners to decide whether they wish to assimilate such of their late partner's patients who may care to continue with them; they may do this by themselves, or with assistance, or by the choice of a new partner, subject only to such conditions as the executive council in accordance with its allocation scheme may require to be fulfilled. Here, therefore, is implementation of the Minister's promise to the profession that the wishes of the local doctors should be closely considered when the appointment of successors to practices is made in those cases where it is most pertinent that they should be considered. The admission of any new partner chosen by remaining partners to the medical list is automatic.

In other cases a doctor who has been an assistant or a deputy in a practice for some time, or a relation of the doctor who goes off the list, is regarded as the "logical" successor. Where that step is recommended by an executive council in consultation with the local medical committee, the M.P.C. is ready to endorse their view.

When the executive council advertises a vacancy it usually prepares a short list of the most likely candidates and after interviewing these makes recommendation to the M.P.C. Save in exceptional circumstances the M.P.C. has been able without hesitation to accept the advice tendered and select accordingly. Rarely has it felt it was necessary to ask for further information before accepting this advice and only in one or two cases to take steps to reinterview the candidates before making a selection. Some executive councils prefer to leave the interviewing of candidates to the M.P.C.

The machinery for such appointments has been criticized as being cumbersome. The committee has been critical of the delay which occurred in one phase or another of the process, particularly in the early days. In recent months it has been possible for a successor to take over before the date of a retiring doctor's resignation became effective. In cases of withdrawals from the list caused by death, or at short notice by reason of ill-health, the vacancies are usually filled without a long period of delay, and it has been possible to provide satisfactory interim arrangements for the care of the patients pending the appointment of a successor.

The committee is pleased to observe that the time occupied by the Ministry to inquire into the circumstances of any appeal against a selected candidate and by the Minister to decide such appeals has been reduced to a minimum during the year. In no case has delay from such a cause been of any appreciable hardship to patients, successful applicants, or appellants.

The purport of Section 34 (9) of the National Health Service Act, 1946, is that, in the selection of an applicant to go on the list, regard shall be had by the committee, and by the Minister on appeal, to mutual desires of the applicant and a doctor or doctors already on the list to enter into partnership. Where there is a relationship between the parties concerned the committee, and the Minister on appeal, are enjoined to have special regard to this. The qualification means that in neither instance is there a direction to the committee to grant these applications. Nevertheless, where such applications are for the purpose of going on the list in respect of an existing practice and within that practice only, the committee regards this section of the Act as virtually mandatory. It is difficult to envisage circumstances which might cause any application of this kind to be refused.

On the other hand the problem is different when an applicant for a previously independent practice proposes a partnership with a doctor or doctors who are already on the list. In cases where the merit of applicants is equal or nearly equal it may be proper that an applicant contemplating partnership should succeed. Indeed, the very arrangements for conducting the practice proposed by the new partnership may well make this applicant the most suitable.

Whenever an application affected by this section of the Act comes before the committee it gives it the fullest consideration. Should it appear that the executive council has not appreciated the force of such an application, or that the information submitted is incomplete, the committee has advised it of the position and awaited further comment before proceeding. The matter having been exhaustively considered, the M.P.C. has on occasion in the face of such proposals selected a candidate who desired to practise independently, as superiority in other respects cannot be disregarded. The committee is convinced that its carefully considered decision has been right in these cases, and notes that when an appeal against the decision of the committee has been made the decision of the Minister has been in accord with its own.

Practice Exchanges

Early this year the committee noted with some concern that since July 5, 1948, only two practice exchanges had been effected and gave consideration to this matter. Discussion with representatives of the profession and consultation with the Ministry led to the issue of a circular. Since that date two further practice exchanges have been completed. Several preliminary advertisements have recently appeared in the medical press. These would appear to justify the committee in its belief that there is, as before July 5, 1948, a desire for such arrangements, and that where agreement between the doctors concerned can be reached the necessary administrative steps should and would afford no difficult obstacle.

Practice Premises

The committee calls attention to the difficulties caused by the shortage of houses, in particular of premises with suitable accommodation for consulting-rooms. Many doctors have made application to go on the list in areas where their services are needed, only to find that they have been unable to obtain any building from which they can conduct a practice. A further and more serious cause for anxiety has been occasioned in finding premises to conduct existing practices, often where the number of patients attached to the practice was substantial. In some cases the retiring doctor or his family continued to live at the practice house and were unwilling or unable to find other accommodation, and equally diffident about providing, even temporarily, surgery accommodation for the use of a successor. Some retiring doctors or their legal successors who were owners of the property have co-operated with executive councils at considerable inconvenience to themselves.

More difficult, however, is the circumstance in which the available premises are disposed of to a doctor other than the successful applicant for the practice vacancy. This is calculated to set at naught the machinery of appointment to practices under the Acts and regulations, the purchaser being already on, or applying to come on, the medical list. Many such situations have occurred and have given rise to grave anxiety and a sense of frustration to doctors who have been appointed to vacancies, to executive councils, local medical committees, and to the M.P.C. The frequency is increasing as its effect becomes more widely known. The profession was well aware of this possibility before the Act became law, and the Ministry was advised accordingly. Recently there have been renewed discussions on the problem between officials of the Ministry, the representatives of the profession, and the M.P.C., and the committee believes that a satisfactory solution will not be long delayed.

Appeals

There have been a number of appeals to the Minister during the year against the decisions of the committee. Most have been made by unsuccessful candidates for a practice vacancy. In some instances there have been two or more appellants. All appeals save one have been decided on written evidence, and no appellant has been successful during the year.

Sale of Property

Applications for certificates that proposed transactions do not involve the sale of goodwill have been dealt with in somewhat increased numbers. In some of these cases the committee has been forced to refuse a certificate purely on the technical grounds that the transactions outlined in the application were no longer in the state of being proposals, but had been completed. Where refusal was on such grounds only and where the committee would, had application been made at a time when the transaction was yet a proposal, have granted the required certificate, the parties concerned have been so informed. Where the reverse has been the case, the applicants have been told of this and sometimes have submitted fresh proposals modifying the transaction, and the committee has issued a certificate in respect of such fresh proposals.

Partnership Agreements

Several applications during the year for certificates in respect of partnership agreements have been refused on the grounds that the proposed share of the junior partner bore no proper relation to the work he might reasonably be expected to do, or that he was in effect in the position of a salaried assistant. Under the regulations governing the old National Health Insurance scheme no partnership was recognizable as such by an insurance committee if the share of one partner was less than one-third of the share of any other partner. No similar regulation has been made under the present Act. In law it appears that a partnership exists, and the parties assume the responsibilities and privileges of partnership by merely holding themselves out to be partners. Therefore as matters stand executive councils are bound to recognize all partnerships notified to them as being fully effective, and in particular for the purpose of numbers of patients on their lists to recognize all partners in contract with them as principals.

There would appear to be a small but material percentage of partnerships which fall outside the definition of the old N.H.I. regulations. This may well prejudice an estimate of the true medical man-power in an area and undermine the proper working of the allocation scheme. In other obvious respects such arrangements may be undesirable. The committee has drawn the attention of the representative professional body and the Ministry to these matters, and understands that the proposal has been made to issue instructions on the lines of the N.H.I. regulations. Thus, where it is not established that a partner receives at least one-third of the share of any other partner, the partners would be treated, for the purpose of numbers on their lists, as a principal and assistant.

Inducement Payments

The Ministry has continued to consult the committee about payments made from the Inducement Fund, and in some cases the committee's advice has been incorporated by the Minister in his final decision.

As a clearer picture of the likely demands on this limited fund has become available, it has been possible to arrive at a more permanent basis of assessment of inducement payments. Consideration of claims made on the grounds of hardship caused to some practitioners by the establishment of the National Health Service is now possible, and a formula has been agreed under which recognition can be made of the unfortunate situation in which these practitioners are placed. An experimental plan has been produced with the co-operation of the Ministry, the B.M.A., the executive council concerned, and the M.P.C. to utilize some of the money in this fund to induce doctors to practise in the less attractive and more heavily populated parts of the area of one large county executive council. The working of this plan will be wholly a matter for the executive council, subject to Ministerial approval. The committee hopes that the results may make the scheme worth repeating in other similar areas.

Friendly Liaison

Close and friendly liaison has been continued with the General Medical Services Committee of the B.M.A. The committees have never failed to reach an understanding after consultations on any point at issue.

Inevitable difference of viewpoint arises on occasion between executive councils, local medical committees, and the M.P.C. This has been relatively rare, which is a tribute to the sound advice that has usually been received from the executive

councils. Any differences are largely explained by virtue of the scope of the M.P.C.'s operations, for it must take a wider view than is always possible for the local bodies.

The following Table shows the numbers of appointments to and withdrawals from medical lists, made by or reported to the committee:

Principals—Resident Areas

	General Practice	Limited List	Total
Total number on medical lists at July 1, 1949	16,651	889	17,540
Admissions to medical list	967	275	1,242
Total	17,618	1,164	18,782
Withdrawals—deaths and resignations ..	715	197	912
Total number of principals on medical lists at July 1, 1950	16,903	967	17,870
Refusals (other than for vacancies) ..			6

Correspondence

Arrangements at Representative Meetings

SIR,—It is time that a strong protest was made about the arrangements for Annual Representative Meetings. It is fair to say that the proceedings at Harrogate, when there was insufficient time even to permit of chairmen of many committees saying a few words about their reports when presenting them, were disgraceful although unavoidable.

One would have expected that those who arrange the time-table would have learned from his experience that three and a half days is insufficient time to set aside for an A.R.M. The recent meeting at Southport, however, shows this not to have been so. Even had the lengthy discussion about the visit to South Africa not taken place there would have been still too little time to complete the agenda, and it is never possible to be certain that no such serious matter will be raised and so upset the time-table.

After these two experiences it is astonishing to learn that the 1951 A.R.M. has already been arranged to take place on *four* days next June, the last of the four being the Saturday before some members depart for South Africa and therefore presumably precluding any extension of the meeting should it prove necessary.

Is an attempt being made systematically to curtail the time available to the Representative Body for debate, or what is the motive? It should surely be obvious that in the early years of a new National Health Service there would be much to discuss, and it is perhaps desirable to draw attention, as has often been done before, to the fact that most of the items on the agenda represent the devoting of much time and thought on the part of many members of Divisions and Branches. Surely time should therefore be allowed for their adequate consideration.

This is not a request for the meetings to be made any longer than is absolutely necessary, but only for some elasticity to be provided for in future arrangements—e.g., starting the 1951 meeting on the Tuesday and ending on the Friday or the Saturday as may prove necessary.—I am, etc.,

Churchdown, Glos. H. G. DOWLER.

Independent Court of Arbitration

SIR,—This is the most important matter we have had to discuss since the profession became employees of the State in July, 1948. The profession should be grateful to Dr. J. A. Gorsky (*Supplement*, August 19, p. 92) and Dr. C. P. Wallace (*Supplement*, August 5, p. 84) for their determined pursuance of the subject in face of substantial opposition. The attitude adopted by Dr. Hill and Dr. Wand at the Southport meeting will cause uneasiness in many minds.

The position of the Government as employer and arbitrator is untenable. There is a clear case for reconsidering the method of settling differences between employees and employers when the State is the employer: should legislation be necessary to cover new constitutional situations then we must demand it. If this subject is pursued with determination and courage we shall be rendering a great service not only to the medical profession but to the community as a whole. Indeed, it is our duty as democratic citizens in an age of nationalization if we are to avoid the totalitarian State.

It was unfortunate that Dr. Hill, when making his much-publicized statement upon the legal aspect of arbitration and withdrawal from the N.H.S., failed to inform the R.B. that he was acting upon eminent counsel's opinion. His eagerness to correct this error in the *Supplement* of August 19 is to be welcomed. Nevertheless, Dr. Wand, though fully cognizant of counsel's opinion, made a rousing speech on the same day urging the profession to withdraw from the Health Service. Are we to assume that he was not in agreement with Dr. Hill? Surely we are entitled to some explanation of these contradictory statements by leading members of the Association.

Clearly, this all-important issue should be the subject of a thorough and impartial investigation.—I am, etc.,

Guildford, Surrey. J. O. M. REES.

*** The Secretary of the B.M.A. writes: The General Medical Services Committee decided to seek counsel's opinion as to whether medical practitioners engaged in the provision of personal medical services come under the Conditions of Employment and National Arbitration Order, 1940. Counsel's opinion to the effect that doctors are within this Order was reported to the Special Conference of Local Medical Committees at its meeting on June 29. Dr. Wand, in his opening speech at Southport, made the following statement (*Supplement*, July 22, p. 38): "He wanted to make it clear that withdrawal of services did not mean that they stopped giving advice and treatment to their patients. It meant only that they ended their contracts with the Minister, *which might mean compulsory arbitration*."

Association Notices

PROPOSED ENFIELD AND POTTERS BAR DIVISION

Notice is hereby given by the Council of a proposal to form an Enfield and Potters Bar Division of the Metropolitan Counties Branch; the area of the new Division to comprise the postal and Urban Districts of Enfield and the Urban District of Potters Bar.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association not later than September 30, 1950.

CHARLES HILL,
Secretary.

Diary of Central Meetings

SEPTEMBER

14 Thurs. A.R.M. Agenda Committee, 11.30 a.m.
15 Fri. Staff Side, Committee "C," 2 p.m.
21 Thurs. General Medical Services Committee, 11 a.m.
28 Thurs. **Adjourned Annual Representative Meeting**, 9.30 a.m. **Council** (after conclusion of adjourned A.R.M.).

OCTOBER

3 Tues. Committee on Psychiatry and the Law, 2 p.m.

Branch and Division Meetings to be Held

SOUTH MIDDLESEX DIVISION.—At Public Health Department, Bath Road, Hounslow, Sunday, September 3, 7.30 p.m. Meeting to explain functions of British Medical Guild and to elect members of local Guild committee. All medical practitioners in South Middlesex are invited to attend.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY SEPTEMBER 9 1950

HEALTH SERVICE IN AUSTRALIA
FREE MEDICINE SCHEME

A scheme for providing free medicine in Australia, devised by Sir Earle Page, started on September 4 (*The Times*, September 5). There are 135 drugs that may be prescribed free, including the sulphonamides, penicillin, insulin, and vitamin B_{12}. Chemists, friendly societies, and hospitals will be reimbursed by the Government. According to *The Times*, members of the B.M.A. are co-operating unreservedly in the new scheme. Nearly all the doctors in Australia had refused to work the previous plan devised by Mr. Chiffley's Government.

PUBLIC HEALTH DISPUTE
DATE FIXED FOR HEARING

The dispute over remuneration in the public health service will be heard for arbitration by the industrial court in London on Monday, October 9.

INCREASES OF PAY IN ARMED FORCES

The recently announced increases in pay for officers in the armed Forces do not apply to medical officers. The Government White Paper on Service Emoluments (Cmd. 8027) included the following note:

"Separate consideration is being given to the position of the Medical, Dental, Veterinary, and Chaplains Services, of Quartermasters, and of officers employed in certain legal, educational, and other special duties."

The B.M.A. remains in close touch with the Ministry of Defence about the remuneration of medical officers in the armed Forces, and it is hoped to be able to publish a detailed announcement in the near future.

SCOTTISH CHEMISTS TO LEAVE HEALTH SERVICE

Over 1,300 chemists in Scotland have given three months' notice of their intention to withdraw from the National Health Service. This decision is a result of their dispute with the Secretary of State for Scotland over the 8% cut recently imposed on their pay.

RECIPROCITY WITH CHANNEL ISLANDS

A reciprocal health service agreement has been concluded between the Ministry of Health and the Department of Health for Scotland on the one hand and the States of Jersey and Guernsey on the other. Channel Islanders visiting Great Britain are entitled to use all the facilities of the National Health Service (other than those relating to mental health and mental deficiency). In particular they are permitted to come to Great Britain for the specific purpose of being admitted as patients to National Health Service hospitals (other than mental health and mental deficiency hospitals) where adequate hospital facilities do not exist in Jersey and Guernsey.

The States of Jersey will provide free in-patient treatment and out-patient treatment so far as it is available in Jersey hospitals for all visitors from Great Britain, but no family-doctor service.

The States of Guernsey (including Alderney) will provide free in-patient treatment so far as it is available in the Guernsey hospital for all visitors from Great Britain and a family-doctor service for these visitors. The family-doctor service for this purpose consists of the services of a general medical practitioner and a supply of drugs. This service will be free of charge. The arrangements do not cover the provision of dental or ophthalmic treatment to the visitors by the States of either Island.

The facilities provided by the States are for visitors from Great Britain only, and not for those who become resident in the Islands. If treatment is obtained privately in the Channel Islands, responsibility for payment remains as before a matter for settlement between patient and practitioner; the Minister has no power to reimburse the cost in such a case.

Northern Ireland is shortly to be made a party to the agreement with the States of Jersey and Guernsey.

Questions Answered

Professional Secrecy in the Forces

Q.—*To what extent can a medical officer serving in one of H.M. Forces maintain the normal ethical standards of professional secrecy? As a regimental medical officer I am frequently approached by my senior officers for detailed information regarding illnesses of the men under their command. Should I obtain the patient's consent before giving such information? As it is, whether or not my patients do give their consent, I am required to write the diagnosis after their names on a "morning sick report." This Army form is not considered to be confidential, so that within a regiment a diagnosis is common knowledge.*

A.—The requirements of the regulations to which all Service personnel are subject by law must be deemed in the special circumstances prevailing to absolve the Service doctor from obeying in its strictest sense the rule of professional secrecy. The health of a member of the Forces has a close bearing not only on his efficiency as a fighting man but also on the well-being of the unit with which he is serving. These considerations are of primary importance to the commanding officer, and the Service authorities have recognized this by ensuring that he is provided with adequate information about the health of those under his command. King's Regulations and Admiralty Instructions require (Articles 1407–8) that the medical officer shall submit a daily sick book and a weekly return of sick to his captain. Articles 1410–11 lay down in addition the rules for the submission of quarterly journals. Similar instructions appear in King's Regulations and Air Council Instructions for the Royal Air Force (para. 1480), and in Regulations for the Medical Services of the Army (para. 169). The duties of medical officers may in theory be enforced as a matter of discipline, but there is no reason to suppose that this is ever necessary in practice, since the position seems to be generally understood and accepted in the Forces.

A soldier is normally aware that the nature of his complaint is entered on the sick report, and in ordinary circumstances it is reasonable to assume that consent for disclosure to his commanding officer is implied. All Service medical documents are regarded as confidential—i.e., not to be disclosed to anyone whose official duty does not require him to have knowledge of their contents. If, however, the medical officer has serious doubts in a particular case regarding the propriety of entering the diagnosis on the sick report, he should omit it and either communicate it orally to the commanding officer or enclose it in a sealed envelope.

SIR CHARLES HASTINGS FESTIVAL

The Council of the B.M.A. has decided to hold a Sir Charles Hastings Festival in Worcester on May 30, 1951, and it is hoped that as many members as possible will be able to attend. The Mayor and Corporation of the City have kindly intimated their willingness to place the Guildhall at the disposal of the Association for the occasion, and the Bishop of Worcester hopes to be able to take part in the festival. There will be an address on Sir Charles Hastings by Dr. W. H. McMenemey. Full particulars will be announced later.

Correspondence

General Practitioner Maternity Services

SIR,—This memorandum has been drafted by the Bristol Local Medical Committee in conjunction with groups of doctors practising in Bristol, and constitutes an attempt to formulate a policy for the future of the Bristol maternity services as they affect general practitioners.

It is realized that paragraph 9(A) (i) as it stands is in conflict with paragraph 2 (*a*) of the Ministry of Health E.C.L.16/50, which circular lays down that where arrangements are made for confinement in hospital the hospital would normally be expected to undertake full antenatal and post-natal facilities subject to certain exceptions. The committee considered, however, that the present arrangements as laid down by regulation are open to the criticism that often the patient is seen by one doctor at the antenatal clinic, delivered by a second in hospital, and post-natally examined by a third: not one of them is the doctor whom she has chosen to look after her under the National Health Service.

It is felt that the document is of more than local interest, and the Bristol Local Medical Committee would be glad to receive, either through the *Journal* or direct, the comments of local medical committees and others who are interested in large urban areas where such a scheme might be useful. The Bristol committee would value copies of similar schemes in operation in other cities.

If sufficient support is forthcoming the General Medical Services Committee will be asked to seek amendment, where necessary, of the regulations.—I am, etc.,

WALTER WOOLLEY,
Hon. Secretary,
Bristol Local Medical Committee.

SUGGESTIONS FOR GENERAL PRACTITIONER MATERNITY SERVICES IN A LARGE URBAN AREA

Preamble

1. Midwifery should be regarded as a normal province of the G.P., and the present tendency to divorce the G.P. from the practice of midwifery is deplorable, as it removes from the scene the one individual who is likely to be most informed on the past history of the patient and most closely acquainted with her health, temperament, and domestic circumstances.

2. It is absurd to pay lip-service to the extreme importance of the family doctor and then deprive him of the opportunity of attending his patient at a time when the value of his association with the patient and her family is at its highest to them. It is also directly contrary to the Minister's policy as set out in R.H.B. (49) 132 and to his promise that under the National Health Service every expectant mother can have the doctor of her choice.

3. In the past it has sometimes not been possible for the working-class mother to have the services of both a doctor and a midwife on account of the financial strain involved, but with the provision of a comprehensive National Health Service an attempt should be made to get back to the ideal arrangement of family doctor as well as midwife in all midwifery.

4. The present-day distinction between a "midwife" and a "maternity nurse" is purely artificial and is largely responsible for the feeling of disquiet and sense of "indignity" that is felt by the midwives' profession. The two terms are interchangeable and identical and the fact that a "midwife" is acting in co-operation with a doctor in no way lessens the skill, responsibility, and dignity that is required of her in the practice of her profession. Therefore, the designation "maternity nurse" should be abolished. The functions of doctor and midwife are complementary and not antagonistic.

5. As the maternity services as at present constituted leave much to be desired, the following suggestions are put forward in an endeavour to remove the more outstanding difficulties.

Suggestions for the Improvement of the Service

6. Every expectant mother should consult her own doctor at an early stage of pregnancy. The present position in which the doctor responsible for the health of the patient may remain in ignorance of her pregnancy is ludicrous. If the woman attends at a clinic in the first instance she should be instructed to consult her doctor.

7. Ideally, no patient should be seen at an antenatal clinic unless referred with a letter from her doctor, as is the normal procedure in other departments of medicine.

8. If her own doctor does *not* practise midwifery, he will refer her to a colleague who does so and who will accept her by signing Form E.C.24 or E.C.24a.

9. Having accepted the patient, the doctor will determine if she is likely to require delivery in a maternity centre or unit.

(A) *Maternity Centre Cases.*—(i) If it is considered necessary on *obstetric grounds* for the patient to have her confinement in a maternity centre, she will be referred to an obstetric consultant, who, if he agrees, will arrange the necessary bed and then refer the patient back to her doctor, who will then be responsible for her antenatal care in collaboration with the consultant. (ii) On discharge from hospital the patient will be referred back to her own doctor, who should have a prior report on her hospital treatment. (iii) The post-natal examination will normally be carried out by the general practitioner who referred the case.

(B) *Maternity Units.*—(i) It must be stressed that there is an urgent need for general-practitioner beds to which patients can be admitted whom, for domestic or other reasons, it is impossible or inadvisable to confine at home. It is hoped, therefore, that the proposal for the development of maternity units, as set out in the Report of the Maternity Services Subcommittee to the South-western Regional Hospital Board, will be expedited with the minimum delay, and that, if possible, one or more of these units may be sited at a maternity centre.

(C) *Domiciliary Cases.*—(i) If the patient is to be confined at home it is desirable that there should be the closest liaison between the doctor and the midwife, each realizing that co-operation as a team is necessary throughout the pregnancy, confinement, and puerperium; and this should be such that the patient will derive from each their own particular skill. (ii) At the first consultation the doctor should advise the patient how to obtain the services of a midwife. If a midwives clinic exists in the district the patient should be encouraged to avail herself of the facilities which it affords. The doctor should also arrange with the midwife the supervision of the antenatal care and confinement. (iii) Ideally it is desirable that the doctor and the midwife should see the patient together at one prenatal examination, preferably between the 35th and 38th weeks. (iv) It is suggested that expectant mothers should attend at times set aside for them where adequate time can be given to the examination and the long wait in a crowded surgery could be avoided.

10. It is emphasized that the present number of compulsory examinations by a doctor as laid down in the regulations under the Act is intended as a minimum only, and every doctor realizes that more examinations are desirable in the interests of the patient in every case.

11. It is recognized that the doctor must be at pains to maintain his efficiency in obstetrics and must therefore have adequate facilities for postgraduate education. It is strongly recommended that doctors shall be encouraged to attend maternity centres as honorary registrars or clinical assistants to the obstetric department.

12. A standardized form for antenatal notes and full details of the pregnancy and puerperium should be issued. This form should be of a size suitable for inclusion in the medical record envelope.

War Service

SIR,—In view of the present unsettled state of world affairs and the possibility of large numbers of medical officers being again required for the armed Forces, one wonders what has been done by way of preparing for this in advance. It would appear that no time should be lost in preparing a scheme which could be put into operation at short notice, and the following points seem worthy of consideration:

(1) Though it worked in practice, the arrangements made and operated in the 1939-45 war gave rise to dissatisfaction, particularly among those called up for the armed Forces. Many of these men and women felt and still feel that they had the worst of it as compared with their colleagues who remained in civil practice. In spite of statements that "doctors in the Forces were lucky to be enjoying the sun in Italy while their fellows at home were killing themselves with overwork," the majority would gladly have changed places with those at home. Separation from families was the most important single factor in the minds of most.

(2) In the event of mobilization at the present time, those who served longest and through the real war years would be the first to go again.

(3) The protection of practices, though admirable in theory, was far from all it should have been in many instances.

(4) Since modern war involves everyone, medical mobilization should apply to all in active medical practice. It should imply the immediate institution of a State medical service embracing every doctor in the country. Some would be earmarked for the fighting services, others for duties at home.

(5) Pay for all should be standardized on one scale linked to age and experience. Over and above basic pay there should be a heavy financial reward attached to service with the armed Forces and an even heavier reward for overseas service. The basic home (civil) salary would naturally be comparatively small to offset the Forces and overseas weighting.

(6) There should be no question of physical fitness—anyone able to carry out his professional duties at home is fit for comparable duties overseas in appropriate conditions.

(7) Service with the armed Forces in the 1939-45 war should be taken into account in earmarking practitioners for the armed Forces in the future, those with no such service or with the least being called up first, those with the most last. Naturally this last consideration would not apply to those voluntarily accepting advance commitments such as Territorials, etc., and naturally a high age limit for overseas service would have to be accepted.

No doubt there are many more considerations, but I would emphasize the following points: the first should be last; the all-embracing form of service; the principle indicated for payment; and the urgency of preparatory work.—I am, etc.,

Stockton-on-Tees. ERIC H. TRAVERS.

Protection of Practices

SIR,—In view of the present political situation it would seem both sensible and fair to establish the necessary conditions for the protection of the practices of those practitioners who may shortly be absent on war service. It is generally agreed that the protection-of-practices scheme in the recent war did not work very well. Many doctors returned to find themselves facing virtual ruin. This should not be allowed to happen again, and now that most of us receive the majority of our remuneration from the N.H.S. its prevention should be much easier.

What is required is protection both of practices and incomes of doctors absent on war service. I have put forward as a tentative policy, for which the B.M.A. should press, the following:

(1) All doctors absent on war service to be paid, as a minimum, the fees they would have received for the number of patients on their N.H.S. list (or the salary they would have received from a hospital or specialist appointment) at the outbreak of hostilities—this to continue for the duration of the war and six months beyond.

(2) Where necessary for the protection of his practice (e.g., when the absent practitioner has been or is becoming incapable of providing at his own expense a suitable locumtenent) the Minister of Health shall be responsible for providing one at the absent practitioner's expense. This should not be a local practitioner normally practising in the neighbourhood, save under special circumstances and with special safeguards, as well as the absent practitioner's consent.

(3) Both the above clauses to be cancelled in exceptional circumstances—e.g., the death of the absent practitioner, and on the advice of the local executive council.

I would like to add for the benefit of those who may think that these proposals go too far that the salaries of most State employees were made up to their civilian level during the recent war and their jobs guaranteed to them at its termination. In Switzerland this is done by the State for all persons, State-employed or not, called up for military service, as many Swiss were for long periods during the recent war.

I have put these proposals to the B.M.A. through our local representative, and the Secretary has promised to consider them in the future. The local executive council have discussed the matter, and have been content to await instructions from the Ministry of Health. Without pretending to be a political prophet, may I suggest that the matter may well be urgent, and it is only just to get fair conditions established as soon as possible, so that those of us who, like myself, will again join the armed Forces may do so with the knowledge that their practices and families are, so far as possible, provided for.—I am, etc.,

Theale, Berks. H. S. SAMUEL.

*** The Secretary of the B.M.A. writes: The G.M.S. Committee is giving urgent consideration to this problem.

Status of General Practice

SIR,—Dr. Shackleton Bailey (*Supplement*, July 8, p. 25) tries to make a good case for "nice little talks" and to insinuate that we are now less "attentive and concerned" than when paid by our patients. I wonder if it ever dawns on Dr. Bailey that at least one could then charge for being a mug? May I give him three examples, which incidentally occurred on three consecutive days recently?

(1) A National Health Service patient is to see the E.N.T. specialist. *She* decides to see him privately, and *they* decide that she will go into the nursing-home. I receive a letter from the specialist, the final paragraph of which suggests that I might arrange to notify her of the arrangements for her admission in two days' time. Am I supposed to act as errand boy, run round and tell her? I didn't, but did see the message arrived in time, at the cost of a telephone call.

(2) An N.H.S. patient *wants* to see a specialist but can't wait the three weeks required to see him even privately, so the specialist has to come and see her—cost to me about 1s. in telephone calls. Good thing for the specialist financially, but not for me, and one and a half hours of my time used.

(3) An N.H.S. patient rings up between 11 a.m. and 12.45 p.m. for a visit to his wife. Message taken by my wife's help, who suggests that it will now be afternoon. Comes the reply that the patient will be out, could Doctor come to-morrow morning, and if he wants any more information he can ring up. *This message was treated with the contempt which I think it deserves.*

Apparently we used to dispense "kindly courteous actions" when we were paid for them. This has now ceased, according to Dr. Bailey. A lot of it has, and a jolly good job too. Those who are ill still receive "kindly courteous actions," but those who aren't should not expect to be pampered by an underpaid profession or by anybody else.

It is my contention that examples like the above are the chief cause of an infuriated profession, and also that we, on average, are the one body playing the game to the full in the N.H.S. (a long way beyond the Act as written), and, again on average, the patients are a bad last, along with Mr. Bevan. If we continue to be the mug, even in the guise of "kindly courteous actions," then we never shall regain our status.—I am, etc.,

Baildon, Yorks. G. H. COOPER.

Pharmacy and Medicine

SIR,—I feel, with reference to Dr. A. Forster's comments (*Supplement*, July 22, p. 62) concerning the salaries paid to pharmacists, that his conclusions are arrived at rather hastily and without due consideration of the facts. That a retired doctor should wish to do dispensing does not necessarily mean that financial gain is the sole objective, as one is seldom called out at night, and in addition the post is static.

I myself would welcome a better training in the medical curriculum as regards pharmacy, as many newly qualified doctors are quite unable to write a proper prescription, let alone dispense, and practically none have any idea of the cost of the items ordered. In my opinion it is high time that the proper status of pharmacy be recognized in England as it is in France, and that the pharmacist be regarded as a professional man and not merely a vendor of toilet preparations and general bottle-washer.

The standard of examinations has been considerably raised of recent years in pharmaceutical training, and if Dr. Forster thinks that the way to pharmacy is an easy and lucrative one I would suggest that he consult the syllabuses for the M.P.S., Ph.C., and B.Ph., and consider doing a two- or three-years apprenticeship in addition.

To compare the lower-paid grades of medicine with those of pharmacy is only half the story, for I am quite certain that there is a very considerable difference between the salaries of the

higher grades. One good point at least about the new National Health Service is that it has tended to make the pharmacist rely more on his professional ability than on the sale of druggists' sundries to earn his living.

I make these observations with a reasonable knowledge of the facts, as I am both a practising consultant as well as a qualified pharmacist who has spent a three-years apprenticeship with a past-president and examiner of the Pharmaceutical Society, and who has had practical experience of both retail and hospital pharmacy.—I am, etc.,

Lowestoft, Suffolk. J. F. PERREDES.

Answer Charges

SIR,—Surely Dr. A. P. Hardman (*Supplement*, July 29, p. 73) is wrong. In his letter "Are G.P.s Working?" he states that "it would be both irrelevant and a little too serious-minded to reply to the allegations in detail." It is this attitude that in my opinion is causing the complete lack of understanding throughout the country of the G.P.'s difficulties, both financial and professional.

Daily we read various frivolous statements made about G.P.s by Ministers, editors of newspapers, and "Pro Bono Publico." Usually the various charges are left unanswered, and our silence is taken as the various readers would wish. The profession—I am referring to G.P.s—is passing through a most critical phase and cannot escape criticism, but we should not let false accusations go unanswered, and in my opinion a committee of our more likeable colleagues should be established with the sole object of dealing with such problems.

If extravagant statements are followed by a detailed reply by an official body we will soon fall from this unhappy limelight.—I am, etc.,

Shipley, Yorks. J. A. FRAIS.

Eye Examinations of Recruits

SIR,—By the stroke of a pen, the Ministry of Labour, in a frantic attempt to save money, has dispensed with the services of ophthalmic medical practitioners. These doctors have been giving continuous valuable help in assisting chairmen of National Service medical boards in the proper grading of recruits—a national service that has been given promptly since 1939.

From August 1 all these recruits are referred to the out-patient department of the hospital nearest to their home. Hospitals are being asked to give preference to recruits at the expense of ordinary patients, and the result will be added congestion to our out-patient departments. In the abrupt "sacking" of these men with such haste the Ministry has omitted the courtesy of "Thank you" for a job well done.—I am, etc.,

London, S.E.13. M. L. HUDSON EVANS.

Nurses' Salaries

SIR,—In view of the pressing national need for nurses, I think these salary figures are worth consideration in that they reveal one of the many curious anomalies in the profession.

Assistant nurse	£285–£385
Staff nurse S.R.N.	£315–£415
Ward sister	£375–£500
Staff midwife	£335–£435
Midwifery sister	£395–£520
Health visitor	£335–£435

A young woman contemplating nursing as a career may thus enrol as an assistant nurse, dispense with examinations, and earn after eight years £385. She may decide to train. After three years she takes her State nurse's qualification and may then earn up to £415.

In some hospitals it is possible to become a ward sister without further training, but most now insist on the midwifery qualification involving 1–2 years' further work, and then a possible salary of £500 (after eight years as ward sister).

If she now decides to take her health visitor's training she finds that, after two more years of study and examinations, not only is her starting salary less than the one she earned as a ward sister or even as a staff nurse, but it is actually less than the salary earned by her friend who entered nursing at the same time but who decided to dispense with the grind of continued study and to become an assistant nurse.

I cannot imagine that doctors would take kindly to a salary scale for themselves which had a starting level at less than that earned by their receptionists. It takes seven years to train a health visitor, and a little less to train a doctor, and in each case the years of study are arduous and expensive. I submit that these salary relationships are quite ludicrous.—I am, etc.,

Newcastle-upon-Tyne. MARGARET C. WATKINSON.

Reform of N.H.S.

SIR,—In 1914–18 and again in 1939–45 the elasticity of the organization of our profession was such that it was able to overcome the strains placed on its resources by war and meet them successfully. Our planners' orgy has now placed such a strait-jacket upon us that I do not think our previous success could be repeated. Indeed, even near-war might now lead to a breakdown of the medical services of the country.

These considerations alone appear to me as sufficient to require reform of the National Health Service, and I suggest that this, urgent as it is on many other grounds, is on this ground alone a No. 1 priority.—I am, etc.,

Wolverhampton. R. S. V. MARSHALL.

The War Memorial

SIR,—Your correspondent Dr. Alfred Cox has completely missed the point in his letter on the war memorial (*Supplement*, August 26, p. 98). We have protested because we are justly and primarily concerned with the families of those who died, and not with the beauty and glory of B.M.A. House. Some of us who can remember the years 1911 and 1948 are a little critical of this glory.

The suggestion which he makes of competition with Epsom is ridiculous, for we are only concerned with the help we can give the children of those who died, and those alone. You can certainly devote any surplus to Epsom, where it will be more usefully employed than on bricks and dignified rest-rooms. A simple shrine and roll of honour can be *seen*, and should satisfy Dr. Cox and those who put visible memorials before helping the descendants of the fallen.—I am, etc.,

London, N.W.3. H. V. DEAKIN.

SIR,—There is hardly a question on which opinions are more diverse than that concerning the form which a war memorial should take, and my only reason for taking part in this correspondence is that since 1946, for certain reasons, I have studied the question, having listened to debates and broadcasts, perused correspondence, and questioned many people, listening sometimes in patient amazement to what some of them had to tell me.

In 1946 I listened to a debate in which nearly all the speakers urged a "utilitarian scheme" as a memorial. The last speaker, after criticizing severely the previous ones, ended his remarks thus: "If you want a memorial erect a visible memorial; if you want a project by all means carry it out, but, for pity's sake, do not call it a war memorial, for its memorial value is *nil*." About the same time I received a circular from my old school appealing for funds for a memorial. Among other things there was proposed a scholarship open to the sons of old boys who had fallen in the war, and a fund to help in the education of others whose families were in straitened financial circumstances, the appeal ending somewhat as follows: "If thought advisable, a certain limited sum will be set aside for the erection of a visible memorial in the school grounds, which shall itself be an object of beauty, which shall beautify the part of the grounds where it is placed, and will be so placed that it will be passed at least once daily by all the residents proceeding to and from their daily work." These, it would seem, are the three essentials of a visible memorial.

As I write, I have before me in Winston Churchill's *Great War* a panorama of the war cemetery "Tyne Cot" near Ypres, the description stating that there lie the remains of 11,851 British and Empire soldiers who fell in action in the salient.

If one could visualize a thousand less graves it would represent a week's ration in killed of the early days of the battle of the Somme. As one scans this picture certain thoughts naturally arise: first, that these men should have had before them another forty years of useful life, or thereabouts, and, secondly, that their sacrifice was in vain; they were let down, and the whole ghastly business, this time carrying with it the lives of hundreds of thousands of civilians, had to be gone through again. If all these men were alive again, whether they were medical or no, one is almost certain that they would say, "No memorial for us, please; spend the money on some scheme which will do people some good." At the same time, before they died they passed through considerable tribulation, and I think they would wish for two things: first, that they should be remembered personally, and should not be forgotten, and, secondly, that it should be remembered that they made the supreme sacrifice in order that never again should those whom they left behind have to lie awake through another black night of war. Both these things are brought vividly to mind as one scans even the simplest visible memorial in the open, but they are emphatically not so brought to mind by any project or utilitarian scheme, however beneficent.

So far then I think that the actual proposal for the B.M.A. memorial is correct. As to the proposed form, however, I disagree entirely, and here I join issue with Drs. P. M. Vicary, I. H. Jones, and R. Blowers (*Supplement*, July 29, pp. 74–75). In the first place the illuminated Roll of Honour, in which a fresh page is turned daily, is itself a visible memorial of considerable beauty, and, in the second place, a certain limited sum only need be set aside for such a memorial; and if more than the Roll is desired I should think that a tenth or less of the sum proposed would be sufficient for a column, simple but dignified, entirely devoid of symbolic figures, and bearing a simple inscription—in English, of course, for the sake of those of us in whose cerebra the Latin-perceiving portions have become atrophic. I think that this is what Dr. E. J. Thomson means (*Supplement*, July 22, p. 62), though his approach is different. As he indicated, this should leave a considerable sum for the carrying out of the beneficent schemes which have been proposed.—I am, etc.,

Rustington, Sussex. W. E. WALLER.

Doctors and Hospital Management Committees

SIR,—In the interests of the efficient management of our hospitals I cannot agree with Dr. Guy Roworth's contention (*Supplement*, August 15, p. 83) that medical men should not serve on hospital management committees. To begin with, the basis of the argument is false. He says, "A wholly lay management committee now, in the same way as the lay boards of governors in the past . . ." It will probably be a surprise to the majority of the specialists to learn that in the past the boards of governors in the hospitals were entirely lay. It was one of the strengths of these committees that there were always two or three medical men to guide the deliberations of the lay members. In the same way the municipal hospitals health committees were attended by medical officers of health, and the medical superintendents of the hospitals were often present. These facts at once refute his argument that the lay committee was immune from the advice of individual members of the profession as distinct from advice tendered by the medical advisory committee.

Nor is there any weight in Dr. Roworth's contention that "it would be a most unusual person who . . . would never give an opinion as a doctor but would always weigh the evidence impartially and as a layman" (I will omit any elaboration of the insult in the remark). The medical members of management committees have two functions, distinct yet complementary. The first is to convey the considered views of their colleagues—*even though contrary to their own personal opinions.* Perhaps Dr. Roworth has been unfortunate in his experience of this aspect of our work. But he is not "weighing the evidence impartially" if he thinks this is a common experience. There are many medical men with legal experience. If not, why are there medical coroners or medical members of Parliament? The second is to give technical advice.

The value of this advice is that it is not a matter of personal or other opinion, but that it is technical advice, and that it is advice that can be given only by a medical man. It will be a sad day for the Health Service if the management committees cease to contain a leavening of medical men. As well expect a board of directors of an engineering concern to run it without an engineer as a member, or the officers of the *Queen Mary* to consist of surgeon, engineer, radio operator, social secretary, and the like, but no trained sailors.

Hospitals are places where medical and surgical work is done. Medical men must serve on the management committees to guide them in a complicated task.—I am, etc.,

Manchester. W. SAYLE-CREER.

B.M.A. LIBRARY

The following books have been added to the Library:

Abse, D. W.: Diagnosis of Hysteria. 1950.
American Men of Science: a biographical directory. Edited by Jaques Cattell. Eighth edition. 1949.
Bacon, H. E.: Anus, Rectum, Sigmoid Colon: diagnosis and treatment. Third edition. Two volumes. 1949.
Banszky, L.: Modern Treatment of Asthma: with special reference to gold therapy. 1950.
Barrass, P.: Fifty Years in Midwifery: the story of Annie McCall. 1950.
Bates, M.: Natural History of Mosquitoes. 1949.
Bockus, H. L. (Editor): Postgraduate Gastroenterology. 1950.
Boyce, F. F.: Acute Appendicitis and its Complications. 1949.
Boyd, M. F. (Editor): Malariology. Two volumes. 1949.
Brown, J. B., and McDowell, F.: Skin Grafting. Second edition. 1949.
Cheney, G.: Medical Management of Gastrointestinal Disorders. 1950.
Collins, D. H.: Pathology of Articular and Spinal Diseases. 1949.
Cozen, L.: Office Orthopedics. 1950.
Curran, S. C., and Craggs, J. D.: Counting Tubes: theory and applications. 1949.
D'Amour, F. E., and Blood, F. R.: Manual for Laboratory Work in Mammalian Physiology. 1948.
De Rudder, B.: Kinderärztliche Notfallfibel. 1949.
Desmond, S.: How You Live, When You Die (a guide to the next world). 1950.
Dodson, A. I.: Urological Surgery. 1950.
Dunton, W. R., jun., and Licht, S. (Editors): Occupational Therapy. 1950.
Eddy, W. H.: Vitaminology. 1949.
Gesell, A., Ilg, F. L., and Bullis, G. E.: Vision: its development in infant and child. 1949.
Gigante, D.: Studi e Ricerche sulla Manna e Mannite Naturale. 1948.
Giordano, A.: Avviamento alla patologia genetica dell' uomo. 1949.
Glaister, J.: Medical Jurisprudence and Toxicology. Ninth edition. 1950.
Goepp, R. M., and Flippin, H. F.: Medical State Board: Questions and Answers. Eighth edition. 1950.
Grundy, F.: The New Public Health. 1949.
Harant, H., and Duc, N.: Pathologie Exotique. 1948.
Hauser, E. D. W.: Diseases of the Foot. Second edition. 1950.
Henderson, Sir D., and Gillespie, R. D.: Textbook of Psychiatry. Seventh edition. 1950.
Henrici, A. T., and Ordal, E. J.: Biology of Bacteria. Third edition. 1948.
Hewitt, L. F.: Oxidation-Reduction Potentials in Bacteriology and Biochemistry. Sixth edition. 1950.
Hill, A. B.: Principles of Medical Statistics. Fifth edition. 1950.
Holt, L. B.: Developments in Diphtheria Prophylaxis. 1950.
Hormann, H.: Serologische Reaktionen und Immunität bei Malaria. 1948.
Hottinger, A., *et al.*: Hungerkrankheit, Hungerödem, Hungertuberkulose. 1948.
Huber, P.: Schattenseiten der Ulkuschirurgie. 1949.
Jha, P.: Ayurved-Vigyan-Mimansa (scientific investigation and exposition of Ayurved). 1949.
Josselyn, I. M.: Psychosocial Development of Children. 1948.
Keith, Sir A.: An Autobiography. 1950.
Kersley, G. D.: The Rheumatic Diseases. Third edition. 1950.
Kirchhoff, H.: Das Lange Becken. 1949.
Kneucker, A. W: Richtlinien einer Philosophie der Medizin. 1949.
Kolle, K.: Psychiatrie. Dritte Auflage. 1949.
Kottmaier, J.: Taschenbuch der praktischen Medizin. 1949.
Krayenbühl, H., and Noto, G. G.: Das intrakranielle subdurale Hämaton. 1949.
Kubanyi, E.: Transplantation von Mensch auf Mensch aus dem Lebenden und aus der Leiche. 1948.
Lachnit, V.: Nierenfunktionsproben und ihre praktische Bedeutung bei hämatogenen Nierenkrankheiten. 1949.
Lacroix, P.: L'Organisation des Os. 1949.
Lampert, H.: Uberwärmung als Heilmittel. 1948.
Lamy, M., Lamotte, M., and Lamotte-Barrillon, S.: La Dénutrition. 1948.

Lenggenhager, K.: Weitere Fortschritte in der Blutgerinnungslehre. 1949.
Mellanby, Sir E.: Story of Nutritional Research. 1950.
Merrill, V.: Atlas of Roentgenographic Positions. Two volumes. 1949.
Mettler, F. A. (Editor): Selective Partial Ablation of the Frontal Cortex. 1949.
Newburgh, L. H. (Editor): Physiology of Heat Regulation and the Science of Clothing. 1949.
Pack, G. T. (Editor): Cancer of the Esophagus and Gastric Cardia. 1949.
Pratt, J. H.: A Year with Osler 1896-1897: notes taken at his Clinics in the Johns Hopkins Hospital. 1949.
Pratt, R., and Dufrenoy, J.: Antibiotics. 1949.
Reich, N. E.: Diseases of the Aorta. 1949.
Reik, T.: Inner Experience of a Psychoanalyst. 1949.
Roberts, G. O.: Road to Love. 1950.
Robson, J. M., and Keele, C. A.: Recent Advances in Pharmacology. 1950.
Saltzman, M.: Clinical Audiology. 1949.
Saner, F. D. (Editor): The Breast. 1950.
Spearman, C., and Jones, L. W.: Human Ability. 1950.
Spurling, R. G.: Practical Neurological Diagnosis. Fourth edition. 1950.
Whitby, Sir L. E. H., and Britton, C. J. C.: Disorders of the Blood. Sixth edition. 1950.
Wyburn-Mason, R.: Trophic Nerves. 1950.

Association Notices

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing to the Secretary by November 1, 1950, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary not later than November 1, 1950. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prizes *due regard will be given to evidence of personal observation.* No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Diary of Central Meetings

SEPTEMBER

14	Thurs.	A.R.M. Agenda Committee, 11.30 a.m.
15	Fri.	Staff Side, Committee "C," 2 p.m.
19	Tues.	Organization Committee, 11.30 a.m.
21	Thurs.	General Medical Services Committee, 11 a.m.
28	Thurs.	**Adjourned Annual Representative Meeting,** 9.30 a.m. **Council** (after conclusion of adjourned A.R.M.).

OCTOBER

3	Tues.	Committee on Psychiatry and the Law, 2 p.m.

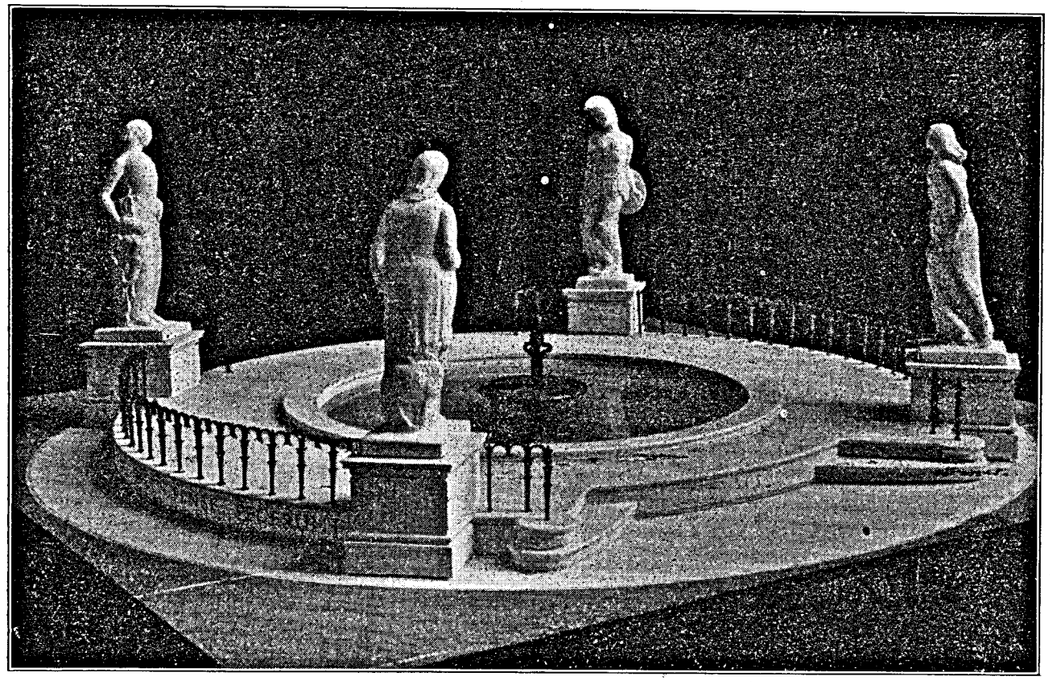
Branch and Division Meetings to be Held

EAST HERTS DIVISION.—At County Hospital, Hertford, Wednesday, September 13, at 8.30 p.m. Dr. E. Grey Turner (Assistant Secretary, B.M.A.): "The Purpose and Objects of the British Medical Guild." All medical practitioners in East Herts are invited to attend.

Faculty of Ophthalmologists: Correction

There was a mis-statement in the report from the Faculty of Ophthalmologists which appeared in the *Supplement* of August 26 (p. 96). It was not intended to make a statement that the Ministry of Health had given directions to regional hospital boards that school clinics held at hospitals should be run by ophthalmic opticians, and no such direction has in fact emanated from the Ministry, which has not yet expressed its final policy on this matter. Further, the policy of the Ministry in connexion with the arrangements to be made in ophthalmic clinics in hospitals was expressed long ago and is unchanged.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY SEPTEMBER 16 1950



THE WAR MEMORIAL

Herewith we print a photograph of the model for the B.M.A. war memorial, which has been designed by Mr. James Woodford, R.A. It is to consist of a bronze fountain surrounded by four symbolic figures carved in classic style in Portland stone and by a low wrought-iron railing, and is to be placed in the forecourt of the Association's building in Tavistock Square. The figures are:

Sacrifice.—Machaon, the soldier-surgeon son of Aesculapius, was killed in the Trojan War. He was the first recorded medical war casualty and also distinguished himself in battle. He was wounded by Paris but was carried from the field by Nestor. He was said to be one of those heroes concealed in the wooden horse. He is depicted with his sponge for the staunching of blood and a vase of soothing ointments to be applied to wounds.

Cure.—A figure representative of the ancient post-Greek phase of medicine, linked with early instruments and the process of "cupping."

Prevention.—A figure, of about the period of 1770, with accessories symbolic of the introduction of antiseptics and the early researches into inoculation.

Aspiration.—Towards greater achievement, represented by a mother leading forward a child into the future—a more idealized figure than the others.

It is proposed to place the new fountain in the centre of the existing island, the present road-kerb being used but the four stone blocks removed. An area of grass surrounding the new work is also proposed.

It has been thought wise, in fact essential, to keep the main axis of the Court open as at present, rather than to close it by the erection of any sort of mass set on the centre of the existing island. It is for this reason that the memorial has been designed to take the form shown in the model: a low central water-basin with a small centre feature in the form of the classical "serpent-and-staff" symbol, and a slightly raised platform on the perimeter of which four pedestals are placed on the diagonals of the Court. On each of the stone pedestals a stone figure will be placed. Inscriptions, to be subsequently selected, are proposed on the two vertical, external faces of the platform, with a date on the front face.

The model was chosen as the best in a special limited competition by two assessors from the Royal Society of British Sculptors and Mr. C. H. James, R.A., F.R.I.B.A.

MOTION-STUDY INVESTIGATION INTO THE CLERICAL WORK OF A DOCTOR'S SURGERY

BY

E. D. WILLIS, F.R.C.S.Ed.

AND

ANNE G. SHAW, M.A.

The National Health Service with its increase of compulsory record-keeping has thrown into relief the problem of the already considerable amount of clerical work involved in a doctor's practice. The practice in question, before the beginning of the National Health Service in July, 1948, was largely private, with a small panel of about 500 patients. On the introduction of the scheme a number of the patients registered.

In an attempt to find some solution to this problem a motion-study investigation was carried out. The technique used was that employed by modern industry to simplify working methods and to increase individual output. Motion study has been defined as the scientific investigation of the movements involved in the performance of any piece of work and the development of methods which eliminate unnecessary movement and conserve energy, time, and materials.

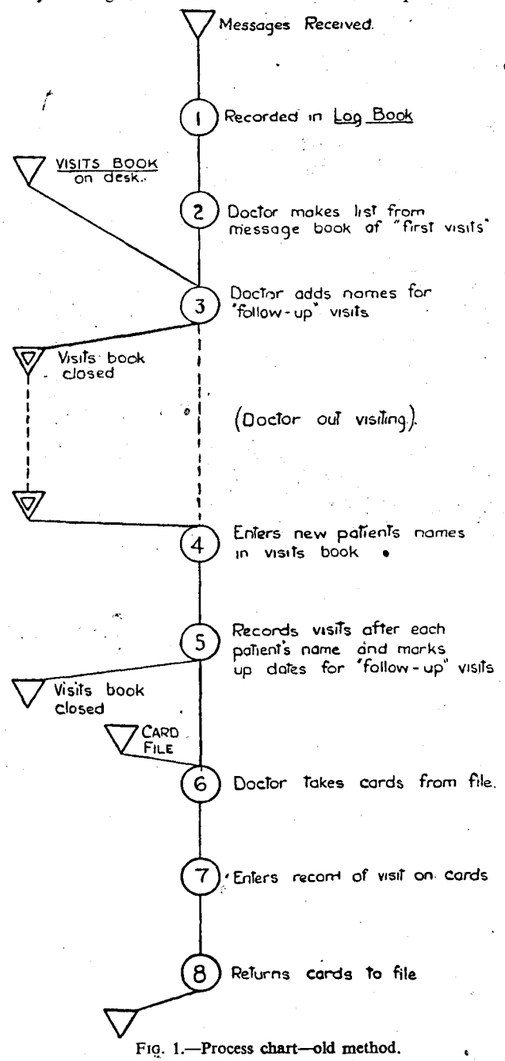


FIG. 1.—Process chart—old method.

In making a motion-study investigation, before any suggestions for improvement are considered all details of existing practice must be fully recorded and analysed. There are both simple and more elaborate techniques available for this purpose, and the investigator chooses the technique that is suitable for a particular investigation. In this case it was necessary to use only the simplest—the process chart. The value of this technique lies in its presentation of a series of facts in such a way that they can be both visualized as a whole and also examined in detail. In making an analysis of a process chart each detail is questioned: Is it necessary? Is its place in the sequence right? Can it be combined with any other detail? Can it be simplified (by some alteration in equipment, etc.)?

Clerical Work

This investigation was confined in the first place to a study of the clerical work involved in the daily round of visits and to a consideration of the layout of the surgery.

The investigator began by observing and charting the activities of the doctor and her secretary in planning a day's round and keeping the normal records of visits. The situation as seen by the investigator was as follows:

Personnel.—There were two doctors who shared an office and a secretary. Since one acted as the other's assistant, both to some extent dealt with the same group of patients.

Records.—(1) A log-book. This was kept beside the telephone, and in it was entered against the time received all messages (telephoned, verbal, or written) regarding visits, prescriptions, certificates, or appointments. (2) Patients' record "cards." These were National Health Service envelopes; the private patients were card-indexed on individual white cards of about the same size. (3) A "visits" book. This was ruled off into columns for the name, address, and each day of the month. Names and addresses were entered as the first visit was made and were therefore not in alphabetical order, and a mark in the appropriate column indicated the date on which the next visit was due. This mark was crossed when the visit had been made. At the end of each month those not signed off were transferred to a fresh page to start the next month's list. This meant for the doctor about two hours' work, which could not be delegated, and it was essential that it was done on the last day of the month.

Procedure.—When either of the doctors was preparing to go out visiting she needed to know (1) what new messages had come in asking for visits ("new visits"), and (2) which of the patients known to be ill required follow-up visits and which chronic patients were due for a visit ("follow-up visits"). She therefore consulted the log-book for "new visits" and the visits book for "follow-up visits." If she needed further information about the patients she also referred to their cards in the file and then made out her list. On returning from the round new names were recorded in the visits book and the day's visits were marked off against them and against the names already in the book, with a further mark under the day on which the next visit was due. The identical information was then entered on the patients' cards with case notes.

Analysis of Existing Practice and Resulting Improvements

A chart (Fig. 1) was made to contain this information, which was analysed in the following way.

Necessity.—The only record that could possibly be eliminated was the visits book. The message book was inevitable in some form, and the keeping of the cards was a statutory obligation on the doctor. The visits book was traditional, but an examination of its use showed that much of its function had departed with the introduction of the new Health Act. It had been the chief source of information for monthly accounts. Few of these were now necessary, and its remaining function was as a reminder for follow-up visits. If this could be managed in some other way the visits book would be virtually obsolete.

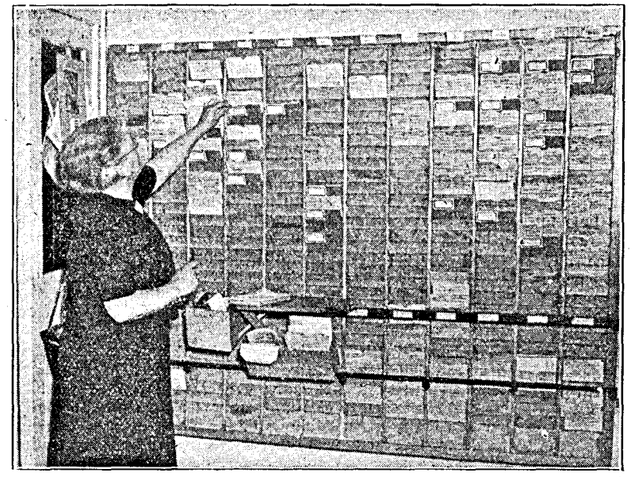


FIG. 2.—The card rack in operation.

Sequence and Combination.—An examination of the sequence of events suggested that more use would be made of the record cards if they were taken out of the file at an earlier stage and by the secretary at her convenience rather than by the doctor, who was nearly always in a hurry after completing her round. They would be useful to the doctor when making up her list. This led on to the idea that by keeping the cards of current patients in a separate place they might be used to remind the doctor about future visits in place of the visits book.

Simplification.—It was obvious that the cards could be used in this way only if some arrangement could be made to keep them safely in a special file of some sort. Here the investigator's experience of factory production methods provided a suggestion. In some modern factories slotted racks are used to hold cards representing work in hand and available for different types of machines. An adaptation of this rack was therefore suggested and made (Fig. 2). The columns were laid out on the lines of the visits book, but instead of using 31 columns, one for each day of the month, the seven days of the week headed the first seven columns, followed by "week 2," "week 3," and "week 4." The eleventh column was headed with the name of the next month, and the twelfth with the name of the following month. In this rack were kept the cards of all current patients, and cards were moved from column to column as they were visited and as further visits were necessary.

The rack was designed to screw on to the wall, and a bar was fitted across it to carry a sliding table. Below this table were boxes for the cards that were ready to be returned to the permanent file as no longer requiring visits. At the side was another small box for prescription pads and certificate books and the *National Formulary*, since the desk is used for writing the prescriptions and certificates arising from the visits. The doctor moved the table along each day until it was under the cards for that day, and entered information on to the cards on the spot so that there was no danger of any being mislaid. The rack was used for private patients' cards as well as for National Health Service cards, and accounts were made out directly from the information on the private cards, on which the doctor recorded the fee as the visit was entered.

The assistant doctor had a similar board containing her own patients' cards and any others temporarily put there for her attention by the other doctor. By this interchange of cards both doctors benefit from each other's case notes. This is particularly useful where there is a trainee.

To find space to put the racks, shelves and a cupboard previously used in a dispensing practice were removed, retaining a small cupboard for emergency drugs only. Removal of the shelves and cupboard also provided space near the secretary's desk and the telephone for the new National Health Service card-filing cabinets—a necessity if the scheme was to work successfully. Fig. 3 shows the new method.

Comment

The main part of this solution was based on the discovery, very common in the experience of a motion-study investigator, that present practice is often dictated by past conditions and that closer examination will often disclose parts of it that are obsolete.

The visits book had served its purpose in the past but had lost much of its usefulness under the new conditions. The surgery was now mainly an office and served as a dispensary only in a very minor way. Record-keeping and form-filling had largely replaced the dispensing of drugs and the sending out of accounts. It was therefore time to reorganize the system of work and to modify the records and the lay-out of the room. By eliminating the obsolete, and by rearranging the operations that remained and designing equipment to simplify them, much redundant work was cut out, and the new arrangements made it possible not only to get through the essential clerical work but to do it more efficiently and completely.

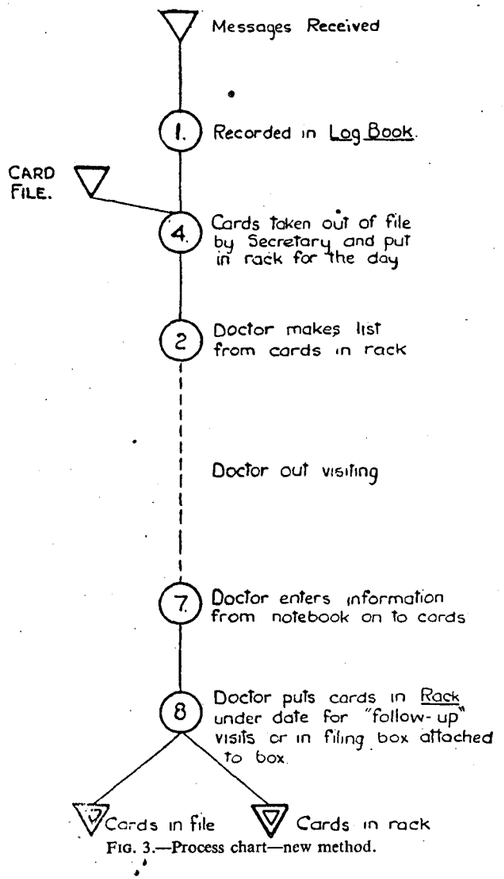


FIG. 3.—Process chart—new method.

During the six months that the system has been in operation it has amply fulfilled the functions for which it was instituted. It has also had certain subsidiary good effects. Records are now always up to date when cards are called in by the executive councils, and from the cards in the rack it is possible to find the doctor when out on rounds. Telephone numbers, if available, have been added to the cards to make this easier, and even a casual helper has been able to trace the doctor for an emergency call.

A further use has been made of the rack to hold temporarily any specialists' reports or other letters received in the morning's mail and referring to the day's visits, before there is time to examine them and transfer them to the permanent records.

An adaptation made to the lowest quarter of the rack accommodates the year's midwifery engagements under monthly headings. These cards are left in the rack, and act as a permanent reminder until the final examination has been made.

Cases seen on behalf of another doctor are recorded on insert cards and left in the board until the date of the doctor's return. They are then sent to him, without writing a further report, for filing in the patient's National Health Service envelope.

It should of course be emphasized that this system is only the solution to one doctor's problem. It would need adaptation to suit a practice staffed in a different way. All motion-study improvements are made to suit individual circumstances, and each problem must be studied without prejudice.

APPLICATIONS FOR FOREIGN CURRENCY

All applications made to the Bank of England for foreign currency for visits abroad by hospital medical and dental staff are submitted by the Bank to the Ministry of Health for approval before they can be granted. Since foreign exchange for short-term visits to many countries now costs more than hitherto, the Department is under the necessity of taking a stricter line before approving applications for currency for visits abroad, especially to North America. Such approvals cannot be given simply because positive advantages can be urged in favour of a visit, but only where serious disadvantages would seem likely to result if the visit were not made.

SCOTTISH CHEMISTS AND THE HEALTH SERVICE

The Secretary of State for Scotland has issued a Press statement on the three months' notice of withdrawal from the National Health Service which has been given by the majority of chemists in Scotland (over 1,300 out of 1,750). He explains that the 8% cut recently imposed on their pay is provisional, pending a decision by the Whitley Committee, or by a neutral arbiter, on what their rate of payment should be. If there were no provisional cut, but the negotiated decision later imposes one, it would be impossible for the Ministry to make it retrospective and to recover the money overpaid to the chemists, and the taxpayer would thereby suffer. But if the negotiations go in the chemists' favour the 8% will be refunded to them.

As regards the Pricing Bureau it is true that the operation of pricing individually each item in every one of the million and a half prescriptions dispensed each month is not promptly undertaken, and indeed for most months is not undertaken at all. The advance payment a chemist receives monthly is calculated by an approximate method, intended to give him something like 90% of the exact sum due, but this percentage varies considerably. For those months when full pricing is not done, the final settlement—at present about a year in arrears—is based on an averaging system giving much more accurate results than the simple formula used for the advance payment. Extra payments can be made, and are made, for exceptional reasons such as hardship.

VACCINATION AND INOCULATION OF MERCHANT SEAMEN

On October 1 new arrangements start for paying doctors employed by the Shipping Federation for the vaccination or inoculation of merchant seamen on shore or in a ship lying within a port area. They have been made by the Minister of Health after consultation with the Shipping Federation and the General Medical Services Committee of the B.M.A. These doctors will receive payment for vaccination or inoculation from the Federation, which will be paid quarterly a sum from the Central Practitioners' Pool.

The Federation has obtained an undertaking from the doctors concerned that from October 1 they will not claim temporary-resident fees from the executive council in respect of merchant seamen to whom they give no treatment other than vaccination or inoculation (or what follows these services—e.g., inspection). If a doctor gives treatment other than vaccination or inoculation to a merchant seaman not on his National Health Service list he may claim a temporary-resident fee from the executive council.

Vaccine lymph will be obtainable free of charge from the Public Health Laboratory Service.

The Shipping Federation will continue to be responsible for paying the part-time doctors concerned for each International Certificate of vaccination or inoculation given. If the doctors are taking part in the local health authority arrangements under Section 26 of the National Health Service Act, 1946, the usual fee for the submission of any records of vaccination required by the authority in accordance with those arrangements would be payable by the authority.

JUNIOR MEDICAL POSTS IN HOSPITALS

According to a Ministry of Health circular, the Central Medical War Committee has agreed that after September 30, 1950, the classification of posts as A, B2, or B1 shall no longer be used, and the N.H.S. titles will suffice.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.
Non-County Borough Councils.—Dartford.
Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

Questions Answered

Scholarships and Income Tax

Q.—*Is income tax payable on a scholarship?*

A.—The position with regard to scholarships is governed by Section 28 of the Finance Act, 1920. It provides that "income arising from a scholarship held by a person receiving full-time instruction at a university, college, school, or other educational establishment shall be exempt from income tax." Scholarships which do not carry full-time instruction are not within the exemption.

Correspondence

School Health Service and the General Practitioner

SIR,—The procedure recommended jointly by the B.M.A. and the Society of Medical Officers of Health (see *Supplement*, September 2, p. 111) has one important omission, namely, failure to mention the parent. If a school medical officer discovers a defect requiring special investigation, then the parent should be asked whether she, or he, would prefer the matter to be dealt with through the family doctor service or through the school medical service. If the former is chosen, then the school doctor can write a note for the parent to take to the child's family doctor, leaving the initiative with him; if the latter is chosen, then it seems fair that the school doctor should take the initiative by reporting to the family doctor direct in writing, and then proceeding with the arrangements for further investigations, unless an objection is raised by the family doctor within a specified period. I consider that a school medical inspection is of little or no value without the presence of parents, and if they take the trouble to come then they should not be made to feel that the discovery of a defect is of more importance to the family doctor than to them. Furthermore, the school medical service will not survive if it is made subservient to the family doctor.—I am, etc.,

Withyham, Sussex. P. DUPRÉ.

National Service Medical Officers

SIR,—With the increase in the length of National Service from 18 months to two years I feel the time has come to bring to the fore the plight of serving medical officers. My own case is typical of many others, and therefore I will deal with it alone.

On qualifying I took two house appointments, and then felt that the time had arrived to carry out my period of National Service. By this time I had decided to attempt a higher qualification in surgery, and was delighted on entering the R.A.F. to be told that every consideration would be given to my aims. After nine months of duty as a station medical officer, performing practical work that could be done by a junior medical student, the desire to learn a little of one's preferred specialty becomes urgent. On inquiry one is told that the only way to obtain hospital work is to take a short-service commission or sign on as a regular. One is thus left with the prospect of two years spent performing work of a trivial nature and a return to a house appointment, after one's release, at a very small salary. The remedy is surely obvious. An appointment of nine months to a year as a station medical officer would be of value if it were followed by a year doing the work of one's choice in an R.A.F. hospital.

We are told that eighteen months is too short a period to teach a pilot all he should know, but it should be remembered that a doctor can forget in eighteen months a great deal that he did know.—I am, etc.,

R.A.F. MEDICAL OFFICER.

Withdrawal from N.H.S.

SIR,—We are told that steps are now being taken to put in hand the preparations for a general withdrawal from service. We cannot deny that there is a marked reluctance on the part of established practitioners to commit themselves to such a step without knowing what such withdrawals really entail.

So far we have had no authoritative statement from the British Medical Association or the British Medical Guild outlining the likely course of events when mass resignations are handed in to the executive councils. Your columns contain long letters of controversy regarding the status of the G.P.—Is he a "workman," or is he "self-employed"? Is the British Medical Guild a legally constituted body or otherwise? Do we resort to Whitley machinery or to compulsory arbitration? Are local medical committees and B.M.A. Divisions precluded from helping to organize such withdrawals or not? All these are of minor interest compared to the more pressing question of what will happen if and when we do withdraw.

The G.P. who has built up his practice and who has heavy family responsibilities is entitled to know exactly what he incurs by sending his *undated* letter of resignation to the British Medical Guild. It is very like handing over a blank cheque, and blank cheques have an unpleasant habit of proving very troublesome to both giver and receiver.

Some of the points which are troubling G.P.s were raised in a recent issue of a contemporary medical journal.

(1) If resignations are sent in to executive councils, are patients officially informed that, as their doctor is no longer in the N.H.S., they should transfer to a practitioner who is still in the Service?
(2) What happens to compensation and superannuation? Is the former paid and the latter withheld?
(3) If we decide to re-enter the Service, do we have to make a fresh application for permission to practise in the same area, and will such permission be granted automatically?
(4) Do we forfeit our previous years of service for superannuation purposes?
(5) If the fight with the Ministry is prolonged are there sufficient funds in the British Medical Guild to meet our commitments?

These are but some of the questions occupying our minds at the moment, and answers to them will help us to decide whether or not to support the British Medical Guild.—I am, etc.,

London, W.6. B. ROSEFIELD.

The War Memorial

SIR,—Dr. Alfred Cox's letter (*Supplement*, August 26, p. 98) about the war memorial calls for some reply, as it epitomizes the difference in outlook between those who will enjoy seeing the new memorial and those who will seldom have the opportunity of doing so, and the latter are surely the majority of our members. It is for this reason that the decision of the Council in such a matter probably does not truly represent the wishes of the members, many of whom feel that their contributions are to be spent more for the gratification of those who frequently visit the House than for the cause of the fallen or the benefit of their heirs. The unfortunate result of this is that those who feel that their money will not be spent as they would wish either withhold their contributions or give less than they would otherwise have done.

Many of us think that the provision of scholarships at Epsom or contributions to the Benevolent Fund would more fittingly commemorate the sacrifice of our colleagues and accord with their wishes than a visible memorial however magnificent. It would seem that the fairest way to decide this important issue would be by postal vote of all members, or by a statement accompanying each contribution to indicate the preference of the donor, those who have already subscribed also having the opportunity to make their choice.—I am, etc.,

St. Day, Cornwall. CHRISTOPHER HEATH.

*** A photograph of the model of the memorial appears on the first page of the *Supplement*.—ED., *B.M.J.*

Obligation to Emergency Cases

SIR,—I have read with concern in the *Supplement* of September 2 (p 120) the report under the heading "Failure to Treat Road Accident: £50 Penalty Recommended." This raises the questions: (1) When is a doctor available? (2) Can a doctor attend two patients at the same time in different places, and, if not, who should decide which case he should attend?

It seems to me that the answer to these questions is self-evident. A doctor is not available to treat a patient when he is treating another patient, for it is quite impossible for even a doctor to be in two places at the same time, and the only person who can decide which case to attend must be the doctor.

According to the report the facts are that the doctor in question was in his surgery attending a patient, with 30 or 40 patients in his waiting-room, when he received a call to a street accident, and it would seem to me that the doctor's decision to continue to treat patients with whom he has a direct contract at the time and place which he had contracted to treat them under the terms of service, rather than dash out to an emergency street accident where the best he could do would be to render first-aid and hang about until the ambulance came, was the correct one.

The medical services committee's conclusion in this case that the doctor was available would seem to me to be a most peculiar

one, cutting right across the old National Health Insurance Committee ruling that a doctor should be available and should be in his surgery attending his patients at surgery hours, at the same time leaving the practitioner in a quandary about the best course of action to adopt under these circumstances. If two or more patients make a demand upon the same doctor at the same time, surely the doctor's first obligation is to the patients who are on his own list.—I am, etc.,

JAMES G. McDOWELL.

Southampton.

SIR,—With no wish to enter into the rights and wrongs of the refusal of Dr. X to attend the victim of a road accident (*Supplement*, September 2, p. 120), I should like to ask for some informed comment on the application of the paragraph of the Terms of Service which you quote: "If neither the practitioner responsible for a person's treatment nor his deputy is available . . . it shall be the duty of any practitioner who may be summoned, etc."

In the absence of any evidence that the services of the practitioner responsible or his deputy were sought by anyone, was the paragraph operative in the case of Dr. X?

People are prone to lose their heads in cases of accident and very frequently fail to ask the simple question, "Who is your doctor?" with the result that Dr. A may be dragged away from a busy surgery while Dr. B, who is in fact responsible, is sitting at home scanning the pages of the *Journal* or some lighter periodical.—I am, etc.,

DONALD M. O'CONNOR.

Launceston, Cornwall.

B.M.A. LIBRARY

The following books have been added to the Library:

Aggeler, P. M., and Lucia, S. P.: Haemorrhagic Disorders: a guide to diagnosis and treatment. 1949.
Ainsworth-Davis, J. C.: Essentials of Urology. 1950.
Almeyda, J.: Major Symptoms in Clinical Medicine Volume 1. 1950.
Altschule, M. D.: Physiology in Diseases of the Heart and Lungs. 1949.
Ayer, A. A.: The Anatomy of Semnopithecus Entellus. 1948.
Benninghoff, A.: Lehrbuch der Anatomie des Menschen. Dritte Band: Nervensystem, Haut und Sinnesorgane. Dritte Auflage. 1950.
British Encyclopaedia of Medical Practice. Under the general editorship of the Rt. Hon. Lord Horder. Second edition. Volume 1. 1950.
Cleckley, H.: The Mask of Sanity. Second edition. 1950.
Friedberg, C. K.: Diseases of the Heart. 1950.
Gamlin, R.: Modern School Hygiene. Fourteenth edition. 1950.
Gates, O., and Warren, S.: Handbook for the Diagnosis of Cancer of the Uterus by the Use of Vaginal Smears. Third edition. 1950.
Ginzberg, E.: A Pattern for Hospital Care. 1949.
Gohar, N.: Mycoses and Practical Mycology. 1948.
Gold, H.: Quinidine in Disorders of the Heart. 1950.
Gordon, H. L.: The Maggid of Caro. 1949.
Hadfield, J. A.: Psychology and Mental Health. 1950.
Hebb, D. O.: The Organization of Behavior. 1949.
Hume, E. H.: Doctors Courageous. 1950.
Jones, K. C.: The Practice of Chiropody. 1948.
Kalkman, M. E.: Introduction to Psychiatric Nursing. 1950.
Kessler, H. H.: Principles and Practice of Rehabilitation. 1950.
Luchsinger, R., and Arnold, G. E.: Lehrbuch der Stimm- und Sprachheilkunde. 1949.
McCurdy, R. N. C.: The Rhesus Danger: its medical, moral, and legal aspects. 1950.
Mann, I.: The Development of the Human Eye. Second edition. 1949.
Mannheimer, E. (Editor): Morbus Caeruleus: an analysis of 114 cases of congenital heart disease with cyanosis. 1949.
Maranon, G., and Fernandez Noguera, J.: La Enfermedad de Addison. (Estudio de 400 casos.) 1949.
Neumeyer, M. H., and Neumeyer, E. S.: Leisure and Recreation. Revised edition. 1949.
Nonidez, J. F., and Windle, W. F.: Textbook of Histology. 1949.
Peck, T. W., and Wilkinson, K. D.: William Withering of Birmingham. 1950.
Peel, J. H.: Textbook of Gynaecology. Third edition. 1950.

In view of increasing activities and expansion of business the Medical Insurance Agency is opening a branch at the British Medical Association Regional Office, 234, St. Vincent Street, Glasgow, C.2, on October 1, 1950, for the convenience of members of the medical profession resident in the West of Scotland. Mr. B. Nivison-Brown has been appointed manager, and will welcome inquiries. The telephone number is Central 5597, and the telegraphic address "Associate, Glasgow, C.2."

Association Notices

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and a sum of money slightly less than the amount of the Sir Charles Hastings Clinical Prize, will be awarded for the second best essay submitted.
3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.
4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.
5. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950.
6. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for an award of either of the prizes in any subsequent year.
7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.
8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.
9. Each essay must be typewritten or printed and must be accompanied by a sealed envelope, enclosing the candidate's name and address, firmly affixed to the essay.
10. Inquiries relative to the prizes should be addressed to the Secretary.

Diary of Central Meetings

SEPTEMBER

19	Tues.	Organization Committee, 11.30 a.m.
21	Thurs.	General Medical Services Committee, 11 a.m.
21	Thurs.	Tuberculosis and Diseases of the Chest Group Committee, 12 noon.
28	Thurs.	**Adjourned Annual Representative Meeting**, 9.30 a.m. **Council** (after conclusion of adjourned A.R.M.).
28	Thurs.	Board of Trustees of British Medical Guild (at conclusion of Council).
29	Fri.	Venereologists Group Committee, 2.30 p.m.

Branch and Division Meetings to be Held

ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Friday, September 22, (1) 8.30 p.m., meeting of all medical practitioners in the area of the Division for formation of local branch of British Medical Guild; (2) 9 p.m., film by Mr. A. Dickson Wright: "Total Sympathectomy for a Case of Hypertension." Mr. Dickson Wright will attend to speak on his film.

SOUTH MIDDLESEX DIVISION.—At St. John's Hospital, Twickenham, Thursday, September 21, 8.45 p.m., Dr. Marjorie Warren: "Geriatrics and the General Practitioner."

SWINDON DIVISION.—At Victoria Hospital, Swindon, Wednesday, September 20, 8.30 p.m., local formation of British Medical Guild. All medical practitioners in the area of the Division are invited.

TUNBRIDGE WELLS DIVISION.—At Royal Mount Ephraim Hotel, Tunbridge Wells, Sunday, September 24, 3 p.m., meeting of all medical practitioners in Tunbridge Wells, Tonbridge, and Sevenoaks areas for election of a local committee of British Medical Guild.

WEST MIDDLESEX DIVISION.—At Nelson Room, Town Hall, Ealing, W., Friday, September 22, 9 p.m. Meeting of British Medical Guild. Dr. Angus Weston: "Remuneration." All medical practitioners in the area of the Division are invited.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY SEPTEMBER 23 1950

INTERCHANGE BETWEEN NATIONAL HEALTH SERVICE AND COLONIAL MEDICAL SERVICE

A scheme has been introduced by which doctors in the National Health Service may transfer for a limited period to the Colonial Medical Service without loss of superannuation rights. The scheme was prepared by the Colonial Office in consultation with the Ministry of Health. The authors of the scheme expressed the opinion that the Colonial Medical Service offered special opportunities for experience not obtainable at home, and that such experience should count very much in favour of the doctor on his return to this country, whether as a candidate for a practice or for a hospital appointment.

A doctor entering the scheme will be required to serve in a participating colony for one, two, or three tours of service, not exceeding six years in all. He will continue to participate in the National Health Service superannuation scheme, and the Colonial Government concerned will pay the employer's contributions (8% of the doctor's colonial salary, excluding cost-of-living allowance, if any).

The doctor will be permitted at any time, provided that the Colonial Government desires to retain his services, to elect to transfer permanently to the Colonial Medical Service. On transfer, payment of contributions under the National Health Service (Superannuation) Regulations will cease and he will at once commence to earn a colonial pension in accordance with colonial pension laws. His service under the National Health Service (Superannuation) Regulations will count towards the minimum of 10 years necessary to qualify for a colonial pension, but will not count in the computation of such pension. His pension rights under the National Health Service superannuation scheme will, on application to the Ministry of Health under Regulation 55 (5), be placed in cold storage.

If the doctor elects to revert to the National Health Service at the expiration of his period of service in the Colonial Medical Service, his service in the National Health Service superannuation scheme will be continuous and he will, subject to satisfactory service, also be granted a gratuity of 20% of the aggregate of his salary earned during his period in the Colonial Medical Service. The purpose of this gratuity is twofold—namely, to assist the doctor to meet the expenses of resettlement in the United Kingdom, and to provide a supplement to his National Health Service superannuation in respect of service in a tropical climate.

The arrangements will apply to medical officers who are appointed to the service of participating Colonial Governments within 12 months of ceasing to be employed by a regional hospital board, board of governors, hospital management committee, or local executive council, or within six months of ending National Service, if contributions have been paid during that service. Any doctor wishing to take advantage of the scheme must elect to do so within three months of commencing colonial service. Provided that a doctor participating in the scheme re-enters the National Health Service within 12 months of the termination of his engagement in the Colonial Medical Service, his superannuation rights will be treated as continuous. The scheme does not apply to doctors employed by local authorities.

Although doctors appointed under the scheme will be short-term officers, the backbone of the Colonial Medical Service is made up of those who are prepared to make their careers in the Colonies, and the Colonial Office is naturally concerned to continue to recruit doctors for the Colonial Medical Service on a permanent basis. It is hoped that a proportion of those recruited under the scheme will then become permanent members of the Colonial Medical Service.

Full details of the scheme, which is merely outlined above, may be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

PAY OF PERMANENT ASSISTANTS IN GENERAL PRACTICE

According to a recent Press report the Bradford Health Executive Council has agreed to a recommendation of their medical service committee that no permanent full-time assistant in a practice should receive less than £700 a year, the salary of trainee assistants under N.H.S. This recommendation has been passed to the Ministry of Health and the B.M.A. It arose out of discussion of a case in which a doctor with about 6,000 patients on his list was employing as his assistant a foreigner over 65 years old and unable to drive a car, and was paying him an annual salary of £420. It was said that when the medical service committee commented on this to the doctor concerned he offered to give his assistant a rise of £60, which the committee felt was inadequate.

CHANGE OF DOCTOR—NEW ARRANGEMENTS

After consulting with the G.M.S. Committee of the B.M.A. and with the Executive Councils' Association, the Minister of Health has decided to place some restrictions on the right of patients to transfer from one N.H.S. practitioner to another. The new regulations come into force on October 1, 1950, and provide that a person who has not changed his address from that shown on his medical card may change to another doctor only in one of two ways. Either his doctor agrees, in which case page 3 of the medical card is annotated at the top, "I consent to transfer," with date and signature; or the patient sends his medical card to the executive council with a letter requesting transfer. In this case he gets his card back with a special slip affixed, permitting him one calendar month in which to find a new doctor, and this valid period only begins a fortnight after receipt of his request by the council. This limits the frequency of transfer. Full details are to be circulated to all practitioners involved.

Correspondence

Professional Secrecy and Accidents

SIR,—After an accident or an assault hospitals and doctors are pestered by the popular press with long-distance telephone calls asking for information about the injuries and condition of the patients. This I always refuse to give, considering that to do so would be a breach of professional secrecy, even though a matter of public interest. Judging from newspaper reports not every doctor thinks the same. What is your view ?—I am, etc.,

St. Ives. T. E. BARWELL.

B.M.A. LIBRARY

The following books have been added to the Library:

Pyke, M.: Industrial Nutrition. 1950.
Ricci, J. V.: The Development of Gynaecological Surgery and Instruments. 1949.
Ritvo, M.: Roentgen Diagnosis of Diseases of the Skull. 1949.
Saunders, H. St. G.: The Middlesex Hospital, 1745-1948. 1949.
Segal, C. S.: Backward Children in the Making. 1949.
Shanks, S. C., and Kerley, P. (Editors): A Textbook of *X*-ray Diagnosis. By British authors. Second edition. Volume 4. 1950.
Shellshear, J. L., and Macintosh, N. W. G.: Surveys of Anatomical Fields. 1949.
Singer, J. J.: Differential Diagnosis of Chest Diseases. 1949.
Siri, W. E.: Isotopic Tracers and Nuclear Radiations: with applications to biology and medicine. 1949.
Stallard, H. B.: Eye Surgery. Second edition. 1950.
Stauffer, K.: Homöotherapie. Vierte Auflage. 1950.
Stern's Applied Dietetics. Third edition revised by Helen Rosenthal *et al.* 1949.
Stott, D. H.: Delinquency and Human Nature. 1950.
Voegtlin, C., and Hodge, H. C. (Editors): Pharmacology and Toxicology of Uranium Compounds. Two volumes. 1949.
Wells, K. F.: Kinesiology. 1950.
Wever, E. G.: Theory of Hearing. 1949.
Wheeler, R. C.: A Textbook of Dental Anatomy and Physiology. Second edition. 1950.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Captain T. Madill, O.B.E., to be Surgeon Rear-Admiral.
Surgeon Commander D. R. F. Bertram, O.B.E., has retired.
Surgeon Lieutenant-Commander (Emergency) W. S. Parker has been removed from the Emergency List on entry into the permanent R.N.V.R.
Acting Interim Surgeon Lieutenant-Commander G. A. Binns to be Surgeon Lieutenant-Commander.
Acting Interim Surgeon Lieutenant-Commander M. J. G. Davies has retired.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commanders J. B. Hutchison, V.R.D., F. E. D. Hallon, V.R.D., and C. A. Mather, V.R.D., have retired.
Surgeon Lieutenant-Commanders E. H. Parkinson, V.R.D., W. J. Heely, and R. L. Kennedy, O.B.E., have retired.
Surgeon Lieutenants G. P. Hartigan and V. O. B. Gartside to be Surgeon Lieutenant-Commanders.
W. S. Parker to be Surgeon Lieutenant-Commander.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. E. Rea has retired on retired pay and has been granted the honorary rank of Colonel.
Lieutenant (War Substantive Captain) D. K. Newbigging has relinquished his commission and has been granted the honorary rank of Major.
Short Service Commission (Specialist).—Captain I. E. Harries to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-Generals R. C. Priest, C.B., J. W. L. Scott, C.B., D.S.O., and R. W. D. Leslie, C.B., C.B.E., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.
Colonels (Honorary Brigadiers) E. W. Wade, D.S.O., O.B.E., W. P. Croker, and D. G. Cheyne, C.B.E., M.C., and Colonels G. D'R. Carr, M.C., F. S. Gillespie, F. G. Flood, O.B.E., M.C., G. A. Bridge, M.C., A. E. S. Pringle-Pattison, W. Campbell, K. P. Mackenzie, and E. Percival, D.S.O., M.C., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels R. L. Turner, O.B.E., T.D., and A. P. McEldowney, from Active List, to be Lieutenant-Colonels.
Majors (Honorary Lieutenant-Colonels) F. B. Mackenzie, D.S.O., M.C., T.D., and T. C. McKenzie, T.D., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.
Majors R. A. Stark, M.C., T.D., and W. Barclay, M.C., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O., and have been granted the honorary rank of Colonel.
Majors G. V. Davies, C. J. Fox, T.D., G. M. Heiron, and A. M. Hughes, O.B.E., M.C., T.D., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O., and have been granted the honorary rank of Lieutenant-Colonel.
Majors C. W. F. Greenhill, T.D., and E. T. H. Lea, having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.
Majors J. T. Wybourn, F. V. Allen, O.B.E., and P. B. Williams, from Active List, to be Majors.
Captain (Honorary Major) H. L. Cohen, having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.
Captain E. A. Downes, having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Colonel.
Captains H. S. Allen, O.B.E., J. F. Ward, H. P. Gabb, M.C., T.D., and L. B. Stott, M.C., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O., and have been granted the honorary rank of Lieutenant-Colonel.
Captains W McG. Mitchell, M.C., S. C. Swinburne, H. G. Dodd, H. M. Brown, A. W. Uloth, M.C., H. B. Dodwell, E. L. Hancock, and H. Wilson, M.C., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O., and have been granted the honorary rank of Major.

Association Notices

Diary of Central Meetings

SEPTEMBER

26 Tues. Publishing Subcommittee, 11 a.m
28 Thurs. **Adjourned Annual Representative Meeting**, 9.30 a.m. **Council** (after conclusion of adjourned A.R.M.)
28 Thurs. Board of Trustees of British Medical Guild (at conclusion of Council).
29 Fri. Public Health Committee, 2 p.m
29 Fri. Venereologists Group Committee, 2.30 p.m.

OCTOBER

2 Mon. Psychological Medicine Group Committee, 2 p.m.
3 Tues. Committee on Psychiatry and the Law, 2 p.m
4 Wed. Special Committee for Spa Practice Report, 2 p.m.
4 Wed. Film Committee, 4 p.m.
11 Wed. Private Practice Committee, 2 p.m.
13 Fri. Central Professional Committee, 11.30 a.m.
13 Fri. Ophthalmic Group Committee, 2 p.m
13 Fri. Science Committee, 2 p.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Boscombe, Bournemouth, Friday, September 22, 8.15 p.m., address by Mr. A. Lawrence Abel, M.S., F.R.C.S.: "The Cancer Problem To-day, with special reference to its Educational, Ethical, and Sociological Aspects." To be illustrated by lantern slides.

DONCASTER DIVISION.—At Milton Room, Danum Hotel, Doncaster, Thursday, September 28, 8 p.m., combined meeting with Doncaster Medical Society. Film evening.

NOTTINGHAMSHIRE BRANCH.—At Rushcliffe or Longcliffe Golf Course, Thursday, September 28, Notts v. Leicester B.M.A. Branches Golf Competition. Allen Golf Trophy.

SCUNTHORPE DIVISION.—At Radiotherapy Centre, Scunthorpe War Memorial Hospital, Sunday, October 1, 10.45 a.m., demonstration and discussion to be conducted by Dr. John R. Condon.

British Medical Guild: Formation of Local Branches

Open meetings to discuss this will be held on Sunday, September 24, at 3.30 p.m. in the Guildhall, Rochester, Kent: and at 6 p.m. the same day in the Nurses' Lecture Room, Lowestoft and N. Suffolk Hospital; and also on Tuesday, September 26, at 8.30 p.m. in the museum of the Norfolk and Norwich Hospital.

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 30 1950

GENERAL MEDICAL SERVICES COMMITTEE

PREPARATIONS FOR COLLECTION OF RESIGNATIONS

An all-day meeting of the General Medical Services Committee was held on September 21, with Dr. S. Wand in the chair. The committee learned with great regret of the death of Dr. C. Baxter, of Liverpool, who had been a member since 1943. A resolution of sympathy with his family was passed.

In presenting an agreed report on a meeting of representatives of the committee with officers of the Ministry of Health, the Government Actuary's department, and the Board of Inland Revenue, the chairman said that the Ministry had agreed that no conclusions would be drawn from the figures from the inquiry into remuneration until further discussion had taken place on certain adjustments which the committee would be seeking in the light of changes in incomes and practice expenses. It was hoped that the figures would be available to the Ministry by the middle of October. So far as possible the total income and total expenses were to be taken for a selected period ending December 31, 1949, or March 31, 1950. The method of selection for the expenses inquiry was that the British Medical Association should itself prepare a list of about 3,000 doctors, selected by taking every fifth name on its card index, but rejecting doctors known not to be in the National Health Service. The list would be sent to the Ministry, where rural and urban practices would be distinguished. In the opinion of the actuaries on both sides the size of the sample was sufficient.

British Medical Guild

The committee had before it draft memoranda which it is proposed should be issued at the appropriate time by the British Medical Guild. An earlier memorandum was issued in August setting out the Guild's proposals for putting into effect the decision of the Special Conference of Local Medical Committees to call for the withdrawal of practitioners from the Service in the event of a satisfactory settlement of their claims not being reached.

A long discussion took place on these documents, especially on the need for intensive propaganda locally for the benefit of those practitioners who had neglected to keep themselves abreast of events in the profession. In particular it was felt that the purpose and functions of the British Medical Guild should be made plain, and it should be ensured that Guild committees were set up in every area.

It was agreed unanimously that a document fully explaining the position and indicating that forms of resignation would be collected at a specific date should go out immediately to all practitioners.

Medical Practices Committee

The second report of the Medical Practices Committee, which has completed its survey of England and Wales as at January last, deals with the classification of areas throughout the country. The Ministry had forwarded for the consideration of the General Medical Services Committee a draft of a letter to executive councils suggesting lines of action which they might take, in consultation with local medical committees, to secure an adequate service in all areas—or, in the words of the draft, "to secure additional doctors in those areas in which they are most urgently needed," a phrase which the committee suggested should be replaced by ". . . which offer more scope for new entrants."

The committee considered this letter in detail, and agreed with its statement that existing practitioners might be encouraged to take new partners (or assistants with a view to partnership), but it was averse from a suggested alternative that the need for one or more doctors to set up in practice be advertised, with the promise that a fixed annual payment would normally be made. It was also desired that the view of the Medical Practices Committee that the law of supply and demand was now beginning to operate should be incorporated in the letter.

A letter from the West Riding Local Medical Committee was considered. This committee had submitted certain points to the Ministry on the classification of districts within its area. One paragraph in the Ministry's letter read:

> "A list of 4,000 is a maximum and was never envisaged as an average. An average of 3,000 has been taken by the Medical Practices Committee as representing a high optimum for a good general practitioner. The Minister sees no reason to object to the action of the Medical Practices Committee in this matter."

It was agreed to send this to the Medical Practices Committee for its observations.

Protection of Practices on Call-up

Dr. D. F. Hutchinson reported for a subcommittee which has been considering this subject. He said that the subcommittee felt that the system which was followed during the last war would not meet the case to-day. An entirely different type of scheme was suggested, based primarily on the idea that wherever possible the income of the practitioner who was called upon to serve should not be diminished as a result of his service, and that the extra cost should be borne centrally rather than by the local area, because the proportion of doctors called up in different areas might vary widely. The Ministry had been loath to approve any "freezing" of the list—that is, making all transfers only temporary during the period of emergency—but the subcommittee felt that it was essential to any protection scheme that the list should be closed, and any patients taken on thereafter should rank as temporary acceptances during the emergency period. One point concerned reception areas, which would receive a greatly increased population; it was thought that there should be a proviso that new doctors going into the area would be on a temporary basis.

It was pointed out that even a small call-up might unbalance the service in a rural or even in an industrial district. Moreover, civil defence would require more medical personnel than in the last war.

The committee gave general approval to the proposals. It was mentioned that the position of the private practitioner was to be considered by the Private Practice Committee and the general proposals extended accordingly.

Other Business

Among much other business—there were 50 items on the agenda—the draft amending regulations for the procedure for change of doctor were considered and approved. A proposed new certificate, intended to reduce and simplify the National Insurance certificates (in size and appearance very like the old), was also approved.

A draft E.C.L. from the Ministry giving effect to the recent agreement regarding payment for complications arising from pregnancy was noted. The chairman pointed out that this was actually an increase in the remuneration of general practitioners.

Attention was drawn to a situation which had arisen in one area of the North-west Metropolitan Hospitals Region, where there was a surplus of maternity beds and the county council had been importuned to persuade pregnant women to book them. It was agreed again to press upon the Ministry the desirability that all general practitioners wishing to conduct their own midwifery cases in the maternity hospital should be given facilities for doing so. This, with several other points, was referred for discussion by the committee's representatives at the next meeting with the Ministry's officers.

Very elaborate proposals for the investigation of cases of alleged excessive prescribing were placed before the committee by the Ministry, and the committee had before it also a large amount of correspondence with local medical committees, and reports and minutes from other bodies.

GENERAL MEDICAL COUNCIL AND THE APPROVED NAMES OF MEDICINES

In order to avoid the difficulties which arise from the multiplication of names for the same medicinal substance, the General Medical Council has adopted the practice of recognizing as Approved Names certain non-proprietary names which may be used freely by manufacturers.

The Approved Names are devised or selected in the first instance by the British Pharmacopoeia Commission, and the intention is that if any of the drugs to which those Approved Names are applied should eventually be described in the *British Pharmacopoeia* the Approved Name should be its official title. On the other hand, the recognition of an Approved Name does not imply that the substance will necessarily be included in the *British Pharmacopoeia.*

The Pharmacopoeia Commission is prepared to consider requests from manufacturers and others for Approved Names for products which appear likely to come into established use. Such requests should be accompanied by:

(*a*) reports of pharmacological and clinical investigations on the drug concerned;

(*b*) a number of suggestions for a suitable name, having regard to the need to avoid similarity to existing trade marks and other current names.

In the selection of an Approved Name the Nomenclature Committee of the Commission will be prepared to consult with authorized representatives of the manufacturer concerned, but the final decision will rest with the Pharmacopoeia Commission.

If a manufacturer should desire to issue under a proprietary name a drug for which an Approved Name has been provided, it is strongly recommended that the label shall bear the Approved Name of the substance in letters no less conspicuous than those in which the proprietary name is printed or written. In the following list some proprietary names are included for information under Other Names.

The following general principles are stated for guidance in devising new names:

1. Names should, preferably, be free from any anatomical, physiological, pathological, or therapeutic suggestion.
2. An attempt should first be made to form a name by the combination of syllables from the scientific chemical name, in such a way as to indicate the significant groupings of the compound.
3. Names should, in general, not exceed four syllables.
4. Names should be distinctive in sound and spelling, and should not be liable to confusion with names already in use.
5. Names which are difficult to pronounce or to remember should be avoided.
6. The addition of a terminal capital letter or number should be avoided.
7. Names used in the *United States Pharmacopoeia,* the *British Pharmaceutical Codex,* or in *New and Nonofficial Remedies* should receive preferential consideration.
8. The following terminations should be used:

-ine (Latin -ina)	..	for alkaloids and organic bases.
-in (Latin -inum)	..	for glycosides, glycerides, and neutral principles.
-ol	..	for alcohols and phenols (-OH group).
-al	..	for aldehydes.
-one	..	for ketones and other substances containing a >CO group.
-barbitone or -itone	..	for drugs of the barbiturate group.
-caine or -aine	..	for local anaesthetics.

Communications relating to Approved Names should be addressed to the secretary, British Pharmacopoeia Commission, 44, Hallam Street, London, W.1.

SUPPLEMENTARY LIST

Approved Name	*Other Names*
Alphaprodine	α-1:3-Dimethyl-4-phenyl-4-propionoxypiperidine.
Amidone	6-Dimethylamino-4:4-diphenylheptan-3-one. Physeptone.
Antazoline	2-*N*-Benzylanilinomethyliminazoline. Antistin; Histostab.
Benzhexol	1-*cyclo*Hexyl-1-phenyl-3-piperidino-1-propanol. Artane is the hydrochloride.
Betaprodine	β-1:3-Dimethyl-4-phenyl-4-propionoxypiperidine.
Chloramphenicol	D-(−)-*threo*-2-Dichloroacetamido-1-*p*-nitrophenyl-1:3-propanediol. Chloromycetin.
Chlorcyclizine	(±)-1-(*p*-Chlorobenzhydryl)-4-methylpiperazine. Histantin is the hydrochloride; Di-paralene is the hydrochloride.
Dapsone	4:4′-Diaminodiphenyl sulphone.
Decamethonium iodide	Decamethylene-1:10-bistrimethylammonium diiodide. C.10.
Dexamphetamine	(+)-Amphetamine. Dexedrine is the sulphate.
Diethazine	*N*-2-Diethylaminoethylphenothiazine. Diparcol is the hydrochloride.
Dimethyltubocurarine iodide	Dimethyl ether iodide of (+)-tubocurarine.
Diphenhydramine	Benzhydryl 2-dimethylaminoethyl ether. Benadryl is the hydrochloride.
Ethyl pyrophosphate	Tetraethyl pyrophosphate. T.E.P.P.
Gallamine	1:2:3-Tri(2′-diethylaminoethoxy)benzene. Flaxedil is the triethiodide.
Hexamethonium iodide	Hexamethylene-1:6-bistrimethylammonium diiodide. C.6.
Hydroxypethidine	Ethyl 4-*m*-hydroxyphenyl-1-methylpiperidine-4-carboxylate.
Isoamidone	6-Dimethylamino-5-methyl-4:4-diphenylhexan-3-one.
Isoprenaline	*iso*Propylnoradrenaline. Aleudrine is the sulphate; Neo-Epinine is the sulphate; Isupren is the hydrochloride; Neodrenal is the sulphate.

SUPPLEMENTARY LIST *(Continued)*

Approved Name	*Other Names*
Ketobemidone	4-*m*-Hydroxyphenyl-1-methyl-4-propionyl-piperidine.
Lignocaine	Diethylaminoacet-*m*-2-xylidide. Xylocaine is the hydrochloride.
Lindane	γ-1:2:3:4:5:6-Hexachloro*cyclo*hexane.
Menadoxime	Ammonium salt of 2-methylnaphthaquinone 4-oxime *O*-carboxymethyl ether. Kapilon soluble.
Mephenesin	1:2-Dihydroxy-3-(2′-methylphenoxy)propane. Myanesin.
Mepyramine	*N*-*p*-Methoxybenzyl-*N′N′*-dimethyl-*N*-2-pyridylethylenediamine. Anthisan is the hydrogen maleate; Neoantergan is the hydrogen maleate.
Methacholine chloride	Acetyl-β-methylcholine hydrochloride. Mecholyl Chloride; Amecol.
Methadol	6-Dimethylamino-4:4-diphenylheptan-3-ol.
Methadyl acetate	6-Dimethylamino-4:4-diphenyl-3-heptyl acetate.
Methoin	5-Ethyl-3-methyl-5-phenylhydantoin. Mesontoin.
Mustine	Di-(2-chloroethyl)methylamine. Nitrogen mustard is the hydrochloride.
Naphazoline	2-(Naphthyl-1-methyl)iminazoline. Privine is the nitrate.
Pentamethonium iodide	Pentamethylene-1:5-bistrimethylammonium diiodide. C.5.
Phenadoxone	6-Morpholino-4:4-diphenylheptan-3-one. Heptalgin is the hydrochloride.
Phenindamine	1:2:3:4-Tetrahydro-2-methyl-9-phenyl-2-azafluorene. Thephorin is the hydrogen tartrate.
Phenylpropanolamine	2-Amino-1-phenyl-1-propanol. Propadrine is the hydrochloride.
Potassium menaphthosulphate	Dipotassium 2-methyl-1:4-disulphatonaphthalene dihydrate.
Promethazine	*N*-(2-Dimethylamino-*n*-propyl)phenothiazine. Phenergan is the hydrochloride.
Quinalbarbitone sodium	Monosodium derivative of 5-allyl-5-(1-methylbutyl)barbituric acid. Seconal sodium.
Thiacetazone	4-Acetamidobenzaldehyde thiosemicarbazone.
Tolazoline	2-Benzyliminazoline. Priscol is the hydrochloride.
Troxidone	3:5:5-Trimethyloxazolidine-2:4-dione. Tridione.
Tripelennamine	*N*-Benzyl-*N′N′*-dimethyl-*N*-2-pyridylethylenediamine. Pyribenzamine is the hydrochloride.

PRESCRIBING OF PROPRIETARY MEDICINES

One of the main recommendations in the second report issued last July of the Joint Committee on Prescribing, under the chairmanship of Sir Henry Cohen, was that doctors taking part in the National Health Service should not prescribe proprietary preparations which are advertised direct to the public. The Ministry of Health has now arranged for doctors taking part in the Service, both in general practice and in hospitals, to receive a booklet naming about 700 medicinal proprietary preparations which should not be prescribed.

COURSES IN DOMESTIC ADMINISTRATION FOR HOSPITAL STAFFS

The Ministry of Health is organizing a series of 11-week non-residential courses in staff management to instruct those responsible for the recruitment, training, organization, supervision, and welfare of hospital domestic staffs. It is intended that the places on the courses will mostly be filled on the recommendation of hospital management committees or boards of governors.

Correspondence

Obligation to Emergency Cases

SIR,—I have read with surprise Dr. J. G. McDowell's letter (*Supplement,* September 16, p. 135) and entirely disagree with his final sentence. If two or more patients make a demand upon the same doctor at the same time, surely the doctor's first obligation is *not* to the patient who is on his list, but to the patient who most urgently needs medical care. As in the case that initiated this correspondence, an emergency call to a road accident is likely to need priority over the ambulatory cases waiting for attention at the surgery.

It would be a bad day for both the public and our own profession if doctors were to sacrifice their humanity in the name of personal convenience.—I am, etc.,

Birmingham. L. GOLDMAN.

SIR,—At a time when the profession is protesting against being subjected to rules and regulations, and against being turned into medical clerks, it is distressing to see a colleague's refusal to attend a road accident discussed in your columns under "terms of service" and "legal obligations" (*Supplement,* September 2, p. 120). Of the particular case I know nothing, and we are all agreed that at most road accidents there is little to be done for the injured but render first aid. We also have seen the cut radial and the precariously hanging limb.

Does Dr. J. G. McDowell (*Supplement,* September 16, p. 135) consider that the 30 or 40 patients in a waiting-room constitute a prior claim, when either of the above conditions may be lying outside? He is more fortunate than most of us if he sees two or three worth-while cases amongst the 30 or 40, and he will hardly contend that one of these is likely to suffer detriment if he is away half an hour. And when nothing but first aid can be rendered to the injured, is he disdainful of the comfort to the relatives that "all that was possible was done," or of the effect of his trained attitude on the crowd?

This is a question of vocation, not of "terms of service," and when the claims of efficiency in dealing with our crowded surgeries become a reason for refusing the calls of common humanity the traditions of our profession will have been lost indeed, and the esteem in which our fathers have been held will be withdrawn from us, not by a change of system, but by a change of heart.—I am, etc.,

Wembley. H. M. HARRIS.

Refusing N.H.S. Patients

SIR,—It is my privilege to live in a delightful community of some 5,000 inhabitants who are doctored by two practices each containing two doctors. Thus this small community may well be described as over-doctored. Recently two critical, cantankerous, and ungrateful patients from the other practice asked if my practice would accept their medical cards. This I refused to do, as some years ago these same patients were on my National Health Insurance list, and informed the other practice of the proposed secession of two of their adherents. The other practice took the view that, because the patients were dissatisfied with their treatment under the National Health Service Act, they constituted a source of embarrassment to them, and promptly wrote to the local committee asking for their names to be removed from their medical lists. The patients were now in a somewhat Gilbertian situation, and after frantic efforts to get on to the lists of several doctors in a neighbouring city had proved unavailing they invoked the aid of the local committee, who in turn summoned their allocation committee. This allocation committee promptly appointed my wife as doctor to these two people, but upon receipt of their communication advising us of this decision I wrote in, thanking them for the honour which they had done us, but regretting that we could not see our way to accepting.

Here then is a situation which I think worthy of wide publicity. Up till now doctors throughout the country have squirmed defencelessly and have been at the mercy of the

whims and fancies of their patients, and as a result many doctors have been metaphorically slapped in the face and kicked in the pants by patients who have used their veto crushingly, and often for no very good reason.

Mr. Bevan in publicizing his National Health Service has stressed that every patient is entitled to a free choice of doctor, and fortunately he has reserved to the doctors the right to refuse a patient. In this Gilbertian situation which has arisen my practice is standing on its rights and is refusing to accept these patients. Judging by the file of correspondence which has accumulated, it would seem that the foothold is somewhat precarious, and in order to preserve a proper balance I have called in my legal advisers in the form of my medical defence union, to whom all the facts have been communicated.

I should be interested to know if a similar situation has arisen in other practices, and if so what the outcome has been.—I am, etc.,

Lossiemouth. HUGH M. TUCKER.

The War Memorial

SIR,—If it is desired to record publicly the names of the fallen, then an inscribed tablet is most suitable.

I see no reason why large masses or figures of stone should be placed in the quadrangle, unless they form that indefinable thing known as a work of art. The proposed memorial shown in the photograph (*Supplement*, September 16, p. 131) is not a work of art.

It would, from your columns, be in accord with the wishes of most members if the memorial were not proceeded with, but the money devoted to the education of war orphans.—I am, etc.,

Lincoln. W. PATRICK ROE.

SIR,—It seems clear that there is a considerable body of members who feel that a very considerable proportion—if not all—of the money subscribed towards the memorial should be devoted to the education of the children of the fallen. With this view I agree. I should like, however, to suggest that such assistance should not be limited to education at Epsom College only. Many men are "old-school" minded and very keen that their sons shall follow them to their own old school. Also it is in my experience, which for a good many years was concerned with schoolboys, not advisable to consign a boy at an early age to any one particular school, for when he reaches the age of entry it may be that for psychological reasons, or on more general health grounds, that particular school may be unsuitable for him.

In my opinion educational grants to children of the fallen should be made available at any suitable and reputable school and/or university.—I am, etc.,

Bishop Auckland. G. H. BICKMORE.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Captain J. H. Bennett to be Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel (Honorary Colonel) A. R. Barlas, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Major J. Simons, J.P., from Emergency Commission, to be Major, and has been granted the honorary rank of Lieutenant-Colonel.

Captains (Honorary Majors) C. C. H. Chavasse and A. B. Cowley, having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: Geoffrey Ashe, M.B., Ch.B., D.T.M.&H., Senior Medical Officer, Somaliland Protectorate; G. T. Barnes, M.B., Ch.B., D.T.M.&H., Pathologist, Nigeria; William Barnetson, M.B., Ch.B., D.T.M.&H., Senior Medical Officer, Uganda; D. G. Snell, M.B., B.S., D.T.M.&H., Senior Medical Officer, Uganda; S. M. Adye-Curran, L.R.C.P.&S.I., Medical Officer, Tanganyika; D. H. Miller, M.B., Ch.B., Medical Officer, Hong Kong.

Association Notices

OPHTHALMIC GROUP COMMITTEE

As a result of elections the following have been elected to fill the vacancies on the Ophthalmic Group Committee caused by the retirement of members at the end of the 1949–50 session:

N. P. R. Galloway (representing Region 2).
J. J. Healy (representing Region 3).
O. G. Morgan (representing Region 4).
J. R. Wheeler (representing Region 6).
R. A. Greeves and D. A. Langley (representing non-members of the Group on the Central Ophthalmic List).

ELECTION OF MEMBERS OF COUNCIL TO REPRESENT THE SOUTH AUSTRALIAN, TASMANIAN, VICTORIAN, AND WESTERN AUSTRALIAN BRANCHES FOR THE PERIOD 1950–2

Owing to the resignation of J. H. Anderson, who was appointed a member of Council for the period 1949–52 to represent the above Branches, nominations were invited from the Branches concerned for a member to fill the vacancy. An unopposed nomination was received in favour of Myles Formby, T.D., M.B., F.R.C.S., and he has accordingly been elected a member of Council to represent the South Australian, Tasmanian, Victorian, and Western Australian Branches for the remainder of the period to the termination of the Annual Representative Meeting, 1952.

CHARLES HILL,
Secretary.

Diary of Central Meetings

OCTOBER

2	Mon.	Psychological Medicine Group Committee, 2 p.m.
3	Tues.	Committee on Psychiatry and the Law, 2 p.m.
4	Wed.	Journal Committee, 2 p.m.
4	Wed.	Special Committee for Spa Practice Report, 2 p.m.
4	Wed.	Film Committee, 4 p.m.
10	Tues.	Central Ethical Committee, 2 p.m.
11	Wed.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
11	Wed.	Private Practice Committee, 2 p.m.
12	Thurs.	Occupational Health Committee, 2 p.m.
13	Fri.	Central Professional Committee, 11.30 a.m.
13	Fri.	Library Subcommittee, 12 noon.
13	Fri.	Ophthalmic Group Committee, 2 p.m.
13	Fri.	Science Committee, 2 p.m.
13	Fri.	Colonies and Dependencies Committee, 2 p.m.
18	Wed.	Welsh Committee (at Lion Hotel, Shrewsbury), 2.15 p.m.
20	Fri.	Charities Committee, 2 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM CENTRAL DIVISION.—At Birmingham University (the Great Hall), Bournbrook, Wednesday, October 4 8.30 p.m. Dr. Charles Hill, M.P.: "The British Medical Guild." *(Change of date.)*

BUCKINGHAMSHIRE DIVISION.—At St. Mary's Hospital, Amersham, Bucks, Friday, October 6, 8.30 p.m., address by Dr. Robert Forbes, Secretary, Medical Defence Union: "Legal Hazards in Medical Practice."

COVENTRY DIVISION.—At Pilot Hotel, Burnaby Road, Coventry, Tuesday, October 3, 7.45 for 8.15 p.m. Supper-meeting. Inaugural address by the chairman: "The Role of Surgery in the Treatment of Peptic Ulcer."

EAST HERTS DIVISION.—At County Hospital, Hertford, Wednesday, October 4, 8.45 p.m., address by Lord Amulree: "Towards a Healthy Old Age."

GUILDFORD DIVISION.—At Brookwood Hospital, Brookwood, Thursday, October 5, 7.30 p.m., clinical meeting.

HERTFORDSHIRE BRANCH.—At Physiotherapy Department, County Hospital, Hertford, Wednesday, October 4, 8.15 p.m., annual general meeting. To be followed by East Herts Divisional meeting at which Branch Members will be the guests of East Herts Division. Address by Lord Amulree: "Towards a Healthy Old Age."

SWANSEA DIVISION.—At Osborne Hotel, Langland, Thursday, October 5, 7.30 p.m., address by Dr. T. W Davies (chairman): "The Problem of Tuberculosis." The lecture will be preceded by dinner.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY OCTOBER 7 1950

British Medical Association

ADJOURNED ANNUAL REPRESENTATIVE MEETING, 1950

Thursday, September 28, 1950

The adjourned Annual Representative Meeting, to complete the business which was left unfinished at Southport in July owing to lack of time, was held in the Great Hall of B.M.A. House, London, on Thursday, September 28. The chair was taken by Dr. J. A. BROWN (Birmingham), Chairman of the Representative Body, who was supported by the President of the Association (Sir Henry Cohen), the Chairman of Council (Dr. E. A. Gregg), and the Treasurer (Mr. A. M. A. Moore). The meeting began at 9.30 a.m., and completed its work at 6.15 p.m. There were about 100 motions and amendments on the agenda.

Procedure at Future Representative Meetings

A report was submitted by the Agenda Committee on the improvement of the procedure for dealing with the business of Representative Meetings. The present difficulties have arisen owing to the increase in membership of the Representative Body, and therefore of potential speakers, the increase in the volume of the Association's work, and the relationship between the Representative Body and the autonomous bodies. The Committee considered that a four-day meeting, with sessions continuing until 6.30 p.m. each day, was the maximum time which the majority of representatives would be willing to devote. It would therefore be undesirable to lengthen the duration of the meeting, and the imposition of a time-table for different sections of the report would sooner or later result in the mandatory dismissal of a number of motions.

The "starred motion" procedure adopted at Southport has proved satisfactory, and the Committee considered it should be extended. The Agenda Committee should meet at intervals during the meeting and examine the progress made, and make recommendations. The Chairman should have power to prevent "tedious repetition." Time-limits for speeches should be strictly imposed. An explanatory memorandum should be issued to Divisions describing the field of the autonomous bodies and pointing out the opportunities for examination of problems in these fields by the Council and its committees throughout the year.

After a brief discussion the recommendations of the Committee were agreed to.

MISCELLANEOUS MOTIONS BY DIVISIONS

The first business, which would ordinarily have been taken on the last day of the meeting at Southport, was the consideration of motions by Divisions and Branches not relating to reports of Council.

The Problem of Tuberculosis

Dr. C. O. STALLYBRASS (Liverpool) called upon the meeting to express its grave concern at the present inadequacy of the measures to deal with the growing problem of tuberculosis. It was not too much to say that a crisis had arisen. The waiting-list of cases had risen to 11,000. One of the causes of the crisis was the shortage of nurses in sanatoriums. If it was impossible to get nurses to go into the country they must be put in towns where amenities existed and paid adequately. There was no added risk in nursing in a sanatorium; the risk was the undiagnosed case in the general hospital. Another factor was the increased length of stay in hospital, largely owing to improved surgical and medical measures. He thought that too many arrangements were made for the ascertainment of cases while there were inadequate arrangements for treatment; the two things were getting out of step. Another important point to be remembered at the present time was that so many of these cases were in elderly people. There were not enough beds. In Scandinavian countries they had waiting beds instead of waiting-lists, and that was what they should aim at. There was gross inadequacy also in carrying out preventive work. If adequate methods of prevention and follow-up were to be instituted the number of tuberculosis officer-hours available for this work must be greatly increased. The Tuberculosis Advisory Committee had formulated an excellent scheme, but it must be implemented, and this could not be done on the cheap. We had not got in this country a scheme which was co-ordinated and properly proportioned between prevention and cure.

Dr. D. S. ROBERTSON (Edinburgh) said that it was a sad commentary on our civilization that so little, comparatively speaking, was done to prevent what was a preventable disease. It was true it was much more difficult to eradicate tuberculosis than to eradicate smallpox or cholera, but it was not impossible. In view of the amount spent on teeth and on spectacles, which in many cases were not necessary, and certainly were not matters of life or death, it was remarkable how little was spent on tuberculosis. He suggested that every Division of the Asssociation should put into operation a vigorous campaign on this subject with the object of dispelling indifference, and should give our legislators and administrators no rest until, regardless of anything else, a nation-wide attack on this disease was instituted.

Dr. E. A. GREGG (Chairman of Council) said that there was a report pending on this subject from the Tuberculosis Group Committee, and that report would be put forward at the next meeting of the Council in November.

The motion was carried unanimously.

Remuneration of Dentists and Pharmacists

Dr. K. C. BAILEY (West Somerset) moved a resolution expressing the strongest possible disapproval of the manner in which the recent alteration of the remuneration of dental practitioners has been applied.

The motion was carried.

Dr. DONALDSON (Belfast) moved:

That the British Medical Association refuse to co-operate in any action designed to cut down the remuneration of members of other professions within the National Health Service.

He said that this motion arose because of the feeling of unrest engendered in Belfast due to a report in the *Supplement* of July 8 (p. 18) of a deputation from the General Medical Services Committee to the Ministry of Health which seemed to envisage the possibility that remuneration for medical men might be increased at the expense of others working the

Service. The Minister of Health had stated that the general practitioner was the Cinderella of the National Health Service; probably he saw himself as the Prince Charming. The Minister had agreed to practitioners' remuneration before the Service started on the basis of the Spens Committee, and if he could not budget for the Health Service it was not their business. The Minister must not ask them to do his dirty work for him.

Dr. KELLY (Belfast), in supporting the motion, said that their case was plain and straightforward, and must not be sidetracked by herrings of any hue.

Dr. E. A. GREGG (Chairman of Council) considered that they should be particularly careful in a matter of this kind. For a long period of years they had striven in order that certain matters in relation to the Health Service should remain in their hands and that their advice should be taken by the Minister. There was evidence that in certain quarters prescribing had been unduly extravagant. The great body of doctors were loyally carrying on their duties, but it was always possible for a young and inexperienced practitioner to slip up. Those of them who had assistants knew perfectly well that from time to time they prescribed in a way which was not necessary. Sometimes also there might be thoughtlessness in this respect on the part of older practitioners. The result of all these slips was that a larger amount of money was being spent in meeting the cost of these prescriptions than should be spent. He hoped that this Belfast resolution in its present form would not be passed, because he thought it would be a very unwise thing to do. The meeting would be well advised to pass to the next business and not sponsor a resolution giving the impression that the doctors were not willing to co-operate in any way whatever.

Dr. E. C. DAWSON (Derby) considered the motion to be too binding. It might be that at some time it would be convenient for the British Medical Association to give an opinion on the remuneration of other professions in the Service.

Dr. J. C. WISHART hoped that nothing would be done which would have the effect of cutting down the remuneration of their brethren in the Service.

Dr. FRANK GRAY (Council) hoped that the Representative Body realized the implication of this motion. They had been concerned at the amount of work which general practitioners had to do—often unnecessary work. Would it not be right for the general practitioner to be relieved of some of this unnecessary work? But if this was done did it not follow that by reducing the work the number of prescriptions that he issued would be reduced, and therefore the remuneration of the chemists? Did Belfast—which, after all, had not got quite the same scheme as they had in Great Britain—wish them to say that general practitioners should go on doing unnecessary work because, if any steps were taken to cut it down, it would affect the money which the chemists received? The meeting would be well advised with a dangerous motion of this kind to pass to the next business.

Dr. S. WAND (chairman, General Medical Services Committee) said that the present position was that with the increasing cost of the Health Service the Chancellor of the Exchequer had imposed the necessity of economy, and the Minister had stated that what was saved, under present conditions, did not necessarily revert to the Treasury. To say that the medical profession would refuse to co-operate meant that it would not in any circumstances be a party to reducing the remuneration paid to the pharmacists, although part of that remuneration was due to over-prescribing. A number of doctors had been prescribing proprietary preparations for which a less costly but equally effective equivalent might have been prescribed. Was the profession to say that it would not co-operate in such an economy?

It was agreed to pass to the next business.

Representation of Profession on Local Authorities

Dr. W. N. LEAK (Mid-Cheshire) moved: "That this meeting considers that representatives on local authorities, etc., should not be penalized through membership of the medical profession." He pointed out that there were not many doctors on local councils, with the result that the profession was poorly represented and its ideals inadequately voiced on the committees which did the detailed work of public bodies. He complained of a bias exercised against doctors serving on committees for which they were technically qualified. To hinder doctors from serving in this way was an injustice to those who sent doctors to represent them on public bodies, and a disadvantage to the public bodies themselves, which were thus deprived of the full benefit of the knowledge and advice of those well qualified to impart it.

The motion was carried.

The British Medical Guild

Dr. J. G. R. CLARKE (South Bedfordshire) moved to request the Council to make strong representations to the British Medical Guild to take immediate steps to attain the objective of a united profession. He complained of a lack of interest in the development of the Guild. Only during the last few weeks had the necessary steps been taken in many areas to form a local committee. It would be helpful to publish in the *Supplement* a full account of the functions of the Guild. The time was approaching when the various areas should receive more attention from headquarters in this respect.

Dr. WATNEY ROE (Chelsea and Fulham) said that the trustees of the Guild would command more confidence if directly elected by the members of the profession. It would be much safer if there were no direct connexion between the Guild and the B.M.A.

Dr. A. C. E. BREACH (Bromley) said that they all wanted to ensure that the Guild was active and effective, but there was in the South Bedfordshire motion a suggestion of censure on what had so far been done, and that personally he thought was unfair.

Dr. H. GUY DAIN said that the Council had been driven by legal conditions to establish a method of collective bargaining, and the machinery had to be such as would not be open to the serious criticism on legal grounds which would attach to the Association itself should it undertake this responsibility. It was now of first importance to form the new organization and get it properly running. When it was started there was no urgent problem facing it, and people were inclined to refuse to look at it seriously. The real opportunity to use it was approaching. The General Medical Services Committee was inviting the Guild to take the responsibility for collective action by the end of this year, and it was essential to get down to the job and do it properly. Obviously the success of this business depended upon the small units in the profession. Here it was necessary to establish confidence between doctors when collective action was required. Those of them who had had occasion to look into it closely were satisfied with the methods which the Guild proposed, and they asked that it be made known in the different areas and that each Division should have its local committee. Some areas had taken it up with enthusiasm; others had not really looked at the problem. But it was urgent to get it going. This was the opportunity to show how successfully the medical profession could organize itself in the matter of its business affairs.

The South Bedfordshire motion was carried.

Dr. A. G. HOLMAN (East Norfolk) moved to request the Council to approach the Ministry to grant the pension rights of those Poor Law medical officers who had had superannuation contributions deducted in the past. Dr. WAND read the regulation on the subject and said that any individual case which had not come under the arrangements would be looked into by the Superannuation Committee and steps taken to see what could be done with the Minister.

The motion was carried as a reference to Council.

THE GENERAL PRACTITIONER AND THE HOSPITAL

The Southport Meeting adopted in an amended form a recommendation by Council on the general practitioner and hospital work. The full text of the resolution appeared in the *Supplement* of July 22 (p. 57). It called for the retention by the general practitioner of the smaller general-practitioner and cottage hospitals, and the setting aside for the general practitioner of certain wards in district hospitals; the setting up of clinical assistantships; the establishment of part-time appointments to be held by general practitioners; the retention and

encouragement in rural areas of the appointment of part-time general-practitioner specialists, and the encouragement of the attendance of general practitioners at hospitals for consultations, ward rounds, clinical and scientific meetings, and inclusion in hospital teams.

The interim report of the Council on the association of the general practitioner with hospital work was published in the *Supplement* of April 22 (p. 165).

Dr. W. N. LEAK moved on behalf of the South Lancashire and East Cheshire Branch a resolution deploring the tendency to oust the general practitioner from hospital work and calling on the Representative Body to take steps to remedy the ever-shrinking status and scope of the general practitioner. Apart from the effect on the general practitioner himself, it was very bad for the patients, who were not prepared to accept an outsider in the way in which they accepted their own doctor. Thus the patients were denied free choice.

Mr. STAVELEY GOUGH, chairman of the Committee on the General Practitioner and Hospital Work, said that the motion seemed to imply that nothing had been done, but that was not so. The report on "The General Practitioner and Hospital Work" had itself done a great deal to restore the situation, and the report was only an interim one. It was now hoped to build up the practitioner's return to hospital.

Dr. LEAK said that from the experience in his part of the country he thought Mr. Staveley Gough's optimism was not justified.

The motion was carried as an instruction to Council.

The General-Practitioner Specialist

Dr. LEAK, on behalf of Mid-Cheshire, further moved:

That this meeting considers that greater recognition should be given to the established practitioner with specialist experience, who seems strangely neglected in the Council's recommendations on general practitioners and hospital work.

He said that the people concerned felt very keenly having to give up their specialist jobs after many years. They might not have the F.R.C.S., but they were people with excellent records and experience, and trusted by their patients, having lived for a long period with their successes and their failures.

Mr. STAVELEY GOUGH said that he felt again that the wording of this motion showed a lack of understanding of the report. At least three sections of the report were concerned with the introduction of the general practitioner in a specialist capacity into the hospital system. The boards of the hospitals had a public duty to see that the members of the staffs held certain qualifications or had had certain experience as assessed by committees of their brethren or by tests in open competition following public advertisement. Thus any general practitioner having the necessary experience and qualifications could answer a public advertisement for a post and if he was a good man he would get the job. It had been realized that in the past there was an implication that he might not get the job because he was a general practitioner. But the report specifically stated that the fact of being a general practitioner would not be a bar.

Mr. LAWRENCE ABEL (Marylebone) moved an amendment to end the motion at the words "specialist experience," omitting the denigratory reference to the Council's recommendations. The report covered these established practitioners and declared that the appointment of general-practitioner specialists should be retained and encouraged. This was bound up with the grading question. The grading would be re-examined in 1951. Many men had suffered three years' diminution of income owing to the fact that they had been incorrectly graded.

The motion as amended was carried.

Designations of General Practitioners in Hospitals

Dr. A. G. HERON (Bristol) moved:

That the Council be requested to provide a clear designation for general practitioners engaged (*a*) in paid sessional work in hospitals, and (*b*) in honorary appointments for educational purposes, and shall endeavour to procure the acceptance of these designations by the regions, and that safeguards be set up so that a general practitioner attending a hospital as a clinical assistant for educational purposes shall not be used to fill an otherwise remunerable employment.

He said that the Council had laid it down as a principle that the term "clinical assistant" should be used only in its strictest sense. But in the planning of action later on in the report a dangerous ambiguity appeared to creep in. If these appointments involved useful work in hospital surely such work should be paid for, even though it had educational value. Why should the underpaid general practitioner be the only member of the profession still required to work on an honorary basis? What hope had the general-practitioner anaesthetist, for instance, of achieving consultant status, with the queue of senior registrars and registrars awaiting appointments?

Mr. STAVELEY GOUGH said that his committee approached this matter with some care. The term "clinical assistant" had in the past generally been associated with an honorary job. The first part of the committee's report was concerned with the endeavour to get hospital accommodation for the general practitioner. It was stated most specifically that if a post was created for educational purposes it must be purely educational and carry no degree of clinical responsibility towards the patient. If clinical assistantship carried with it clinical responsibility, this must be paid for. With regard to part-time appointments, they were satisfied that such appointments should be paid ones. The question of "no pay" or "pay" was steadily in the mind of the committee, and in the final report a clarification would be made.

Dr. WATNEY ROE supported the motion. The solution of the trouble was the early institution in hospitals and clinics of paid posts open to general practitioners.

Dr. HERON said that Mr. Staveley Gough seemed to come dangerously near accepting the principle of sweated labour in order to get general practitioners into hospital. The committee had not faced the question: When is a clinical assistant not a clinical assistant, and when he is not, what is he?

The Bristol motion was carried.

Dr. H. H. D. SUTHERLAND (Kensington and Hammersmith) moved a resolution welcoming and supporting the recommendations in para. 73 of the Annual Report of Council (for the full integration of the general practitioner and hospital services) and asking that a small committee in each area representative of the hospital staff and of the B.M.A. Division should be set up to work out the essential details to implement them. He said that some of them felt that, though this report was an excellent one, there was still an opportunity of making some demarcation between members of the staff who were paid and those who did the work in an honorary capacity. It might be difficult to differentiate the posts to which payment should attach and those which, being purely educational, should not be remunerated; but this might be easily overcome if these groups were set up in which members representing the hospital staff and others the local Division looked at the problem from the point of view of local need and opportunity.

Dr. R. C. MCCONNEL (Buckinghamshire) considered that the reference in the motion to the representatives of the hospital staff and of the Division as constituting the area committee tied it down too much, and he moved that these words be omitted. This was agreed to, and the motion was passed in the following form:

That this meeting welcomes and supports the recommendations in para. 73 and asks that a small committee in each area be set up to work out the essential details.

Dr. W. SMITH (Greenwich and Deptford) moved a resolution insisting that adequate use be made by regional hospital boards of the services of general practitioners as clinical assistants. He had in his area general practitioners who had been acting as clinical assistants for many years and who just did not know what was going to happen. If their assistance was not to be continued it would not be possible for the hospital to function. He hoped the motion would be regarded as a reference to Council.

In that sense the motion was carried.

The General Practitioner and Major Surgery

Dr. A. C. E. BREACH (Bromley) moved that there be omitted from the Council's interim report the statement that "it is stressed that major surgery should not be included in it," i.e.,

the scope of general-practitioner work, and the further statement under the heading "Ways in which integration may be achieved":

He [the general practitioner] should, of course, not undertake major surgery. He must keep to such work as is within his sphere. Major surgery should not be performed in general-practitioner hospitals, although, of course, even in the smallest hospital this may be necessary in an emergency.

He said that they were impressed by the overall excellence of this report. What Bromley was asking for was not a positive assertion of the right of the general practitioner to practise major surgery, but the deletion of a prohibition. They felt that if that prohibition was allowed to go through unchallenged it would come to be regarded as a part of the policy of the Association that a general practitioner, unless recognized by some other standards, such as assessment by selection boards and so forth, was not *ipso facto* entitled to practise the art in which he had qualified. If they once accepted the idea there was no limit to the number of restrictions that could be imposed under the Medical Acts. It was intolerable that any committee, whether Governmental or of their own profession, should say that a man who had achieved qualification as a surgeon must not practise surgery unless he had satisfied some extraneous board.

Mr. STAVELEY GOUGH begged the meeting not to be persuaded by an emotional approach to their rights as members of the profession. They were public servants. They had a responsibility to their patients and to their profession. The purpose of this report was to get general-practitioner beds back and new wards open to the general practitioner. There were two sections of general practitioners: those who did general practice only, and those who also did, and had a right to do, specialist work outside general practice. The bodies responsible for hospitals had a right, if asked for general-practitioner beds, to require them to be used for general-practitioner purposes. The general-practitioner specialist had other possibilities of entering the hospital, but he must be prepared to show that he had the necessary special experience.

Mr. C. F. MAYNE (Plymouth) supported all that Mr. Gough had said. He had spent ten years in general practice before becoming a specialist, during which time he was on the staff of a hospital as a general practitioner. There must be safeguards for the patient, and he thought those safeguards were provided for in the present report. It was wrong for general-practitioner surgeons to attack malignant disease in a small rural hospital when they were not in full collaboration with the radiotherapist of the area. The amendment in his view would have the effect of deleting certain safeguards which were in the patient's interests.

Lord HORDER (Marylebone) thought that the words which Bromley wanted deleted were unfortunate. Care must be taken not to lay down limits, whether it be to the practice of medicine, surgery, or midwifery. He did not mean by this that any general practitioner, however good he might be, should deal with a difficult and complicated surgical procedure for advanced malignant disease. That would be a travesty of common sense. But he thought it unfortunate that the word "must" came in ("He *must* keep to such work as is within his sphere"). It would be within the memory of them all that a short time ago they were threatened with a veto upon attending a woman for the delivery of her baby unless they had some special qualification or sanction to do so. They must notice how near they were standing to the sabotage of their own privileges. He would make the phrase to which Bromley objected read: "He would not undertake major surgery. He would keep to such work as is within his sphere."

Dr. A. E. J. ETHERIDGE (Hampstead) said that it must be borne in mind that impressions or opinions contained in any report of Council would receive the close attention of politicians. What was decided on professional grounds there that day might later be embodied in legislation. If these words were left in they might later have political action definitely limiting the functions of the general practitioner in this matter. No man worthy of his profession would undertake surgery which honestly was beyond him, but the speaker was bitterly opposed to any item which restricted or restrained any qualified man in what he might or might not do in practice. These words could well be omitted from the report without detracting from it in any way.

Dr. J. M. ALSTON (City of London) supported Bromley. He spoke as a member of a management committee in the Greater London area. It would be very unfortunate at the present time to take away from the general practitioner what he had carried out very well. He did not think it necessary to restrict him in this arbitrary way. The patient was guarded by the general practitioner's good judgment and by the good judgment of the other doctors who sent the patient into the general-practitioner hospital.

Dr. A. V. RUSSELL (Wolverhampton) also supported the Bromley amendment. They did not want to give a handle to any politician whereby it could be said that the profession itself wanted to exclude any general practitioner from doing surgery.

Mr. DICKSON WRIGHT (Marylebone), while applauding the report, thought that it would be improved by the omission suggested by Bromley. He did not like this *ex cathedra* way of talking about "major surgery" and leaving out "major medicine." Public opinion and hospital opinion would soon stop the doctor if he did more than he should. "Major surgery" was not a proper medical expression. There was a lay smell about it. When the patient said to him, "Is it major or minor?" he wanted to say it was minor so as to reassure him to the point of having it done, while at the same time he wanted to say it was major so as to convince him that he was doing a great deal for him. He really did not know where major surgery ended and minor surgery began.

The Bromley amendment to leave out the words in question was carried by a very large majority, and the interim report as amended was approved.

TRAINING OF THE GENERAL PRACTITIONER

Sir HENRY COHEN introduced the recently published report, the work of a special committee of the Council, on "The Training of the General Practitioner."

He said that the report described the various types of responsibility which would fall to the general practitioner. The essential point was that it emphasized the need for regarding general practice as a special form of practice and one which therefore demanded a special type of training. The report was a little different from the earlier one on the training of the doctor, for the Committee in that earlier case had a great deal of documentary evidence to consider. In framing the present report there were in fact no existing documents which gave them a lead. He hoped that the recommendations commended themselves to the Representative Body as they had already done to the Council.

Dr. T. MILLING (Bristol) moved to instruct the Council to emphasize to the Minister that as long as the present inadequate capitation fee prevailed, so long would the majority of general practitioners, beset with the difficulty of meeting expenses, have little if any time for study, rest, and recreation so rightly stressed by the Goodenough and Cohen committees as primary requisites to efficient practice. He said that the response to postgraduate courses in Bristol had been disappointing for the simple reason that general practitioners had not time to attend them.

The Bristol motion was carried.

Dr. H. G. F. HEAL (Willesden) moved:

That this meeting, having considered the report of the B.M.A. Committee on the Training of the General Practitioner, is of the opinion that the recommendations are unsatisfactory, especially in regard to the excessive length of the proposed training period, and requests Council to refer the matter back for further consideration.

He said that the trend of the recommendations was rather idealistic. They suggested too much regimentation of the practitioner from the time of his registration. With the additional year the medical student was already compelled to study for six and a half years before entering his profession, and the present report proposed to add a further three years, making nine and a half years in all, before the practitioner was allowed to undertake independent practice. This additional three years was too long and would inhibit candidates from entering the profession of medicine. There were also various economic and administrative considerations against these recommendations.

His Division was in agreement with the proposal that there should be a year during which the young practitioner acted as a trainee assistant; this was regarded as a valuable form of education for the prospective general practitioner. They considered, however, that the second or hospital year advocated in the report should definitely be abrogated in the case of those who had done military service, and the third year eliminated altogether.

Dr. A. E. J. ETHERIDGE (Hampstead) said that he was afraid that the recommendations in the report might be taken up by the politicians as a basis for restrictive legislation in the future. Surely it would be wise to refer this matter back. By all means the additional three years should remain as a suggestion, but it should not be regarded as something to lay insistence upon.

Dr. H. BARBARA WOODHOUSE (Harrow) said that the length of training for the general practitioner which was now suggested was comparable to that required for many specialties. If general practitioners were to do all this, why should they not have a remuneration comparable in all respects to that of all other specialists?

Dr. C. P. WALLACE (Guildford) considered that this was the most important subject before the Representative Body, and he supported wholeheartedly the Willesden amendment. The conclusion of this report was wrong, and he believed that it was wrong because the premises were wrong. One of the premises was that the status of the general practitioner had fallen, and that was stated in a sense which suggested that the fall was due to the incompetence of the general practitioner. He suggested, on the contrary, that never before in the history of the medical profession had the general practitioners in this country been so highly qualified. To-day it was necessary under the new Act for a young man to study for five or five and a half years before he qualified, and for another year before he registered. The suggestion in this report was that before he was off the leading-strings he should undertake another three or three and a half years. He also maintained that it was wrong to suggest that general practice was a special branch of medicine. This was a contradiction in terms. It was much nearer the truth when it was said that general practice was a coherence of all the specialties. He begged the meeting not to be intimidated by the fact that the report had been endorsed by *The Times*. He had been reading *The Times* for 30 years and had found very little wisdom in its first leading article, very much in its fourth, and even more in its correspondence. (Laughter.)

Dr. J. A. GORSKY (Westminster and Holborn) pointed out that the meeting was not asked to approve the report of the Committee but to approve the report of Council under this heading. Therefore he supported the Willesden amendment. He feared that, if the Government accepted the report, the Working Party's Report might be put into operation in certain respects at once. He urged that the report should be considered by the Study Groups of the Divisions and brought up again to the Representative Meeting next year.

Dr. J. C. ARTHUR (Gateshead) was of opinion that what young practitioners needed was not so much more training but more confidence to use the training they had already received. Some of them were afraid of doing midwifery cases because they had been told that they must not conduct confinements in a house. They were afraid of opening a septic finger because they were told that this was a matter for the hospital. What was needed was a change of heart on the part of their teachers which would give the students confidence in what they had been taught so that they could put it into practice themselves.

Sir HENRY COHEN, in reply, said how gratified he was that this report had given rise to so interesting a discussion—interesting, but unenlightened, because there was clear evidence from what had been said that the report had not been read very carefully. When this Committee met it was not concerned with political implications, it was an Education Committee. It was asked to advise on certain problems in general practice, and it was not the appropriate body to decide what the implications of its recommendations might be. Indeed, as they all knew, there had been established a General Practice Review Committee which recognized that there might be obstacles to the implementation of many of the recommendations in the report, but it completely hamstrung the workings of any committee whose primary purpose was education to have at the back of its mind what might be the political implications of its findings, and that would be entirely inappropriate for a committee of that Association, which, at any rate in a party sense, was essentially non-political.

The members of his Committee included some of the ablest general practitioners in the Association. They might be wrong in what they had decided, but to suggest that they were merely silly was the bathos of argument. The Committee was not unaware that the proposals it was putting forward had idealistic trends, but it believed that unless they were impelled by ideals they would achieve nothing, and any machinery without ideals was bound to rust.

At the end of his undergraduate training the student when registered was not capable of carrying out independent general practice. Every general practitioner of any note had appreciated that and had in fact fulfilled the conditions of this report by spending usually a year or 18 months in a hospital appointment and had usually gone as assistant to an established general practitioner for a period varying from a year to several years. The report recommended that instead of a student, on the completion of his undergraduate training, going directly into hospital if he wished to be a general practitioner, he should spend a year in general practice as a trainee assistant, during which period he would be remunerated. The Committee suggested that he should go into general practice first in order that he should know the scope, responsibilities, and potentialities of general practice, and then on coming back into the general hospital he would know what were the particular problems to which he should devote his attention. In other words, his year in general practice would have given him the proper orientation.

What was the common fate of students who had spent a year or more before going into general practice? Many of them had told him that they wished they had known the kind of work they would meet in general practice, in which case their work in hospital would have been more profitable to them. It was the unanimous view of the Committee that it would be advisable to spend a year as trainee assistant with an appropriate general practitioner and then to go to hospital. The third year presented a choice of opportunity and it might include special hospital appointments. A man might feel that he required to do a little more midwifery or to pay a little more attention to dermatology, or to ear, nose, and throat work, or he might like to spend a further period in general practice as an assistant. In other words, the three years were now suggested as an appropriate period of postgraduate training for the general practitioner and would cover the kind of work which he might well meet with in general practice. It was designed on a time-table of sequences which would give him a greater opportunity of understanding when he went into hospital the needs of general practice. He was perfectly certain that a very large number of those present would themselves have undergone that kind of training.

Sir Henry Cohen went on to say that they were concerned with one point which was to them of great significance—namely, that medicine, in both its extent and its value, had advanced enormously as an art and as a science, and it was quite futile that what was thought proper in 1858 should be thought appropriate to-day. It was for that reason that when "The Training of the Doctor" was put forward it was stressed that such training was designed to give every student in medicine a general medical background. Anyone who knew the facts and was not swayed by words was aware that to be an efficient general practitioner, to co-ordinate the knowledge both of medicine and of men which was necessary for general practice, it was essential to have a period of postgraduate study. It was for that reason that they stressed in this report the need for such study and also the sequences in which the various parts of it might usefully be taken. Every specialist in this country, whatever branch he followed, was now asked by his specialist organization to agree to conditions which would make specialist training a very heavy and arduous task.

They believed in this Committee that character and intellect of no less degree were necessary for general practice than for many other specialties, and it was because of that they emphasized

the need for this training. With it they hoped there would be a proper recognition of the general practitioner's status and services to the community. There could be little doubt that the status of the general practitioner had not been properly recognized *vis-à-vis* the specialist, and they had emphasized the need to bring the general practitioner in line with the specialist.

In conclusion, Sir Henry Cohen said that they recognized the difficulties which might face the immediate implementation of some of these recommendations. This three-year period, however, was merely the putting on paper of what in a very large number of instances in some form or other had been practised hitherto. General practice was indeed a special form of practice and required a special form of experience and grading in order that the proper responsibility might be discharged. (Applause.)

Dr. HEAL (Willesden) said that Sir Henry Cohen had stated that political considerations were not taken into account by his Committee. How anyone could consider recommendations so extensive as those embodied in this report and not deal with political implications he was at a loss to understand. He repeated that there was, however, too much regimentation of the general practitioner.

On a show of hands the Willesden amendment referring back to the Council for further consideration the recommendations concerning the excessive length of the proposed training period was carried. There voted: in favour, 231; against, 91.

The following motion was handed in and was put from the chair and agreed to without discussion:

That the Representative Body defers expressing its opinion on the Cohen report or on the report of Council under the heading "The Training of the General Practitioner" until such time as the Divisions have considered the report as suggested by the Council.

NUTRITION

Lord HORDER, chairman of the Nutrition Committee, formally moved approval of the report of Council under the heading "Nutrition," and this was given without debate.

OCCUPATIONAL HEALTH

In the absence of Dr. Vaughan Jones, chairman of the Committee, Dr. S. WAND presented the report under "Occupational Health." He said that they would all be glad to learn that Dr. Vaughan Jones, who had had a serious illness, was now very much better, and the meeting would desire that a letter be sent to him wishing him a speedy recovery. He had done excellent work as chairman of this Committee, and had played a very important part in bringing the subject to the forefront of medical practice. (Applause.)

Probably the outstanding item in the report was the reference to the Dale Committee, which was still sitting. He hoped it would not make any violent changes in the set-up of industrial medicine until a proper period of experiment had taken place. He moved a lengthy recommendation of Council for approval of revised scales of salaries for whole-time and part-time industrial medical officers (*Supplement*, June 10, p. 267).

The recommendation was adopted.

PUBLIC HEALTH

Dr. C. METCALFE BROWN, chairman of the Public Health Committee, moved the adoption of the Annual Report under "Public Health."

He referred to the negotiations on salaries in the Public Health Service. He had intended, had this item been reached at the Southport meeting, to speak with some indignation on this subject, but there had been a change since then in that the matter had been referred to arbitration. The two sides had been unable to agree, and, with the consent of both, the matter had been referred to the Industrial Court and the hearing would begin on October 9. As the matter was before the Industrial Court the less that was said about the details of the claim the better. He felt that arbitration was important not only from the point of view of the Public Health Service but of the whole profession.

School Health Service and the General Practitioner

Dr. METCALFE BROWN went on to move:

"Where, in the opinion of a medical officer employed by a local authority, a child needs special investigation (other than an ophthalmic examination) or treatment, he should send the child to a specialist only after prior consultation with the child's own doctor, upon whom rests the responsibility for general medical care.

In consulting the general practitioner, the medical officer should give him the opportunity to make the arrangements for the consultation or to agree—by replying or in the absence of a reply—that the arrangements should be made by the medical officer.

A copy of any special report on the child received by the medical officer should be sent to the child's own doctor.

He said that this was a prolonged matter which had had the consideration of a joint meeting of the Association with the Society of Medical Officers of Health. There was agreement about what should be done, and that was incorporated in the recommendation before the meeting. The general practitioner must have responsibility for the general medical care of his patient. On the other hand, the school medical officer had duties laid on him by statute with regard to the school child. It was essential that there should be no cleavage in this matter. He had consulted some of his colleagues, in particular the county medical officer of Lancashire, who, together with the speaker, served an area with a population of nearly 3 million, and although one of them had been in office for 12 years, and the other eight, neither had had the slightest difficulty with his colleagues in this matter.

The recommendation was carried.

Vaccination and Immunization

Dr. ELSIE WARREN proposed a motion urging that the Ministry, the local authorities, and general practitioners should all undertake a more intense propaganda campaign to bring home the value of vaccination and immunization. Such propaganda was promised to them before 1948.

Dr. METCALFE BROWN accepted the motion, which was adopted.

"BRITISH MEDICAL JOURNAL"

Dr. O. C. CARTER, chairman of the Journal Committee, presented the annual and supplementary Reports of Council under "British Medical Journal." He said that this report for convenience was referred to as the Report of the Journal Committee, but in fact was the report of a standing committee responsible for all the scientific publications of the Association. The Association published more medical journals than any publishing firm in the country. It published 13 quarterly journals, three of them acquired during the past year. In these publications were valuable contributions to medical literature. This great service was not only not costing the Association any money, but last year the net result of the work was a surplus of some £43,000, which had been ploughed back into other Association activities. (Applause.)

Of course the *British Medical Journal* still remained the most important of their publications, and its status and circulation continued to rise. The weekly circulation was now 76,000, and owing to the removal of restrictions on paper it had increased in size also. During the year 300,000 more copies had been issued than in the previous year and the complete set of *Journals* contained 1,000 more pages. There were those who had feared that as a result of the big increase in circulation and size of the *Journal* there would be a deficit at the end of the year, but this was not so, thanks to the valuable advertisement revenue and the fact that £20,000 worth of the *Journal* was sold to non-members. There was scarcely any place of importance in the world where the *Journal* did not go.

The *Supplement* still continued to be an important part of the *Journal*. It was hoped to revert as soon as possible to the pre-war practice of publishing the *Supplement* as a loose inset. One special number of the *Journal* during the year took the form of a symposium on "Fifty Years of Medicine." This was an outstanding success and was to be published in book form.

The publication of a popular health journal was a new feature and represented an enormous undertaking. The arrangements for this journal were going ahead. One important thing was to have the right man as Editor, and fortunately they had already the right man on the staff of the *Journal*—namely, Dr. Harvey Flack—and they wished him well in his big undertaking. (Applause.) The new journal would be issued early in the new year.

Dr. CATHERINE HARROWER (Glasgow) moved:

That the Representative Body deprecates the practice of the *Journal* in publishing the estates of deceased doctors.

She said that her Division felt that no useful purpose was served by this practice, which could have no relevant bearing on professional merit or status. She realized that these figures were published in the lay press, but she did not think a professional journal should make this concession to the curiosity of the public.

Dr. CARTER pointed out that such matters could not be kept secret, and the publication might occasionally serve a useful purpose.

The Glasgow motion was carried, but Dr. CARTER pointed out that the meeting could not instruct the Editor what he was to publish, it could only express its view.

MEDICAL ETHICS

Powers of Association in Regard to its Members

Dr. J. G. THWAITES, chairman of the Central Ethical Committee, moved:

That the Association take the following powers in regard to its members:

(*a*) Publication in the *Journal* of notices regarding expulsion, together with the relevant facts.

(*b*) Publication in the *Journal* of notices regarding censure, together with the relevant facts.

(*c*) Notification of expulsions to all local medical committees, all regional consultants' and specialists' committees, medical societies in the area in which the expelled member resides, and other appropriate medical organizations.

Dr. Thwaites said that during the last 50 years in the course of many disciplinary inquiries it had been shown that in some respects the disciplinary powers of the Association were not entirely effective or adequate. Therefore the Council put this recommendation before the present meeting. In case there was any apprehension with regard to these new powers he wished to say at once that there was no intention on the part of the Council to go witch-hunting. They knew from experience that in the profession there was occasionally friction arising, often founded on misunderstandings between doctors, but, whatever its cause, it was obvious that these frictions were of a non-malignant character, and in no sense was this recommendation intended to be directed towards such minor disputes and irritations as formed the major part of the ethical business. But in the medical profession as in all professions there was bound to be a very small hard core of individuals who seemed to have no ethical sense, who did not heed advice and did not intend to learn how to behave decently towards their colleagues. In the experience of his Committee their ethical powers were not effective in this class of case. The Association had the power of censure and expulsion, but censure and expulsion had always been a more or less secret affair. What was wanted was something which would bring home to these individuals the fact that they were doing harm to their profession and their colleagues.

His Committee had looked into the disciplinary powers held by comparable professions and found that in every case there was power not only to expel but to publish the name of the offender and the nature of his offence. He reminded the meeting that all these cases had to be dealt with at three stages—the Division, the Ethical Committee, and the Council—and that in every case they were dealt with only by medical people who were fully aware of the problems arising in practice. The Association took no cognizance of complaints against doctors by the lay public. There was nothing in this recommendation which need disturb the law-abiding members of the Association.

Dr. A. M. MAIDEN (Lincoln) moved:

That this meeting is strongly opposed to any extension of the disciplinary powers of this Association over its members and in consequence does not approve of the recommendations.

He said that his Division was very much perturbed by these proposals, though they admitted that they were brought forward by sincere men. The medical profession was governed by a plethora of regulations. The arm of the General Medical Council was a very long one, and the type of "crime" which the Ethical Committee was contemplating in these recommendations was a minor type of which the General Medical Council did not take cognizance. But the penalty which it was proposed to inflict was publication, and publication might be a very savage penalty. The investigating committee was an informal one; it was not composed of men who had had legal training. The evidence given before it could not be taken on oath, and the evidence was limited to those who were willing to give it. Further, there was no appeal. Was the honour of the medical profession going to be safeguarded by a witch-hunt like this? Expulsion alone should be the punishment.

Dr. ALASTAIR FRENCH (Harrow) begged the meeting to think carefully before it passed this recommendation, because the question involved the fundamental rights of every British citizen to have freedom within the law and a proper trial by a judicial body. If they passed this recommendation every individual member of the Association when he realized its implications would be bound to forgo his right of appeal against miscarriage of justice. He wondered whether those members of the Council who were also members of the General Medical Council approved of this usurpation of the functions of that body. Publicity would not enhance the prestige of the Association; it might in certain circumstances be to the advantage of the "rascal" who had been thrown out.

Dr. J. A. GORSKY (Westminster and Holborn) begged the meeting to throw out this malicious recommendation. Dr. Thwaites had mentioned that they had considered the procedure in comparable professions. But what he had forgotten to say was that the legal opinion upon which this rule was based was given in two interesting cases, one of them referable to the Motor Traders' Association and the other to the Stock Exchange. Was the Association comparable with either of these bodies? It was important to appreciate that the Ethical Committee would act as a limited tribunal. It could publish its decisions, but no one would have a right to demand a reason for them. Moreover, if these recommendations were agreed to any member of the Association who might disagree with the verdict and continued to meet professionally the man who had been expelled would himself be liable also to expulsion. (Cries of "No.")

Dr. S. NOY SCOTT (Plymouth) spoke in favour of the recommendation. He stressed the extreme rarity with which the proposed new rule would be applied. He assured them that the Committee did not come to its decision without very careful and prolonged consideration. It had seen the force of most of the objections which might be raised. The fact remained that in the case of these offenders expulsion did not really affect them, but publication would get under the thickest elephantine skin.

Dr. FRANK GRAY (Council) said that the Association, if it published a sentence of expulsion which was quite ineffective, would make itself a laughing-stock.

Dr. THWAITES, replying on the discussion, reminded the meeting that they were professional men inquiring into complaints by one professional man against another. The proposal that a man would render himself liable to expulsion if he met the expelled member had been taken out. The Association did not take any action on cases which were in the province of the General Medical Council, and, on the other hand, the General Medical Council did not touch certain offences with which the Association dealt.

Dr. MAIDEN said that what his Division was quarrelling with was not the present disciplinary procedure but its extension. They were being asked to give undesirable powers to certain individuals in their profession.

The Lincoln amendment, affirming that the meeting was strongly opposed to any extension of the disciplinary powers of the Association, was carried on a show of hands: in favour, 155; against, 115.

Rules of Procedure Governing Ethical Matters

The next recommendation of Council was for approval of the revised rules governing procedure in ethical matters of a Division not itself a Branch, of a Branch composed of one Division, and of a Branch composed of several Divisions; that all be urged to adopt the revised rules; and that after July 31, 1951, the British Medical Association should not accept responsibility for any ethical proceedings otherwise than in accordance with the rules. The rules were set out in Appendix III to the Annual Report of Council.

This was agreed to without discussion.

The revised Rules of the Central Ethical Committee (Appendix III of the Annual Report) were also approved.

It was further moved that the resolution of the Annual Representative Meeting, 1946, concerning the procedure of the Central Ethical Committee with regard to action against a member who accepted an appointment which was the subject of an Important Notice, be rescinded in favour of the revised rules.

This was agreed to.

Rules for Medical Consultations

Approval was next sought for the proposed ethical rules for medical consultations in practice, other intra-professional obligations, guidance for professional conduct in relation to dentists, and examining medical officers' ethical rules (Appendix IV of Annual Report).

Dr. H. N. MILES (Worcester and Bromsgrove) moved that the practice of attending practitioners asking consulting practitioners to visit and examine patients unattended, save in exceptional circumstances, should be considered unethical. It was reported by a specialist in his Division that this practice of asking specialists to visit unattended was becoming quite common in his area. He believed that the general practitioner and the specialist both derived benefit from the contact, and, from the patient's point of view, the patient's confidence in the specialist was very much increased by the tactful introduction by the general practitioner and his approval of what the specialist had to say. If the specialist visited the patient unattended it ceased to be a consultation.

Dr. N. NELSON (Dundee) opposed the Worcester amendment. After all, if the consultation took place at the specialist's house the patient usually went unattended by his general practitioner, and what was the difference between that and an attendance at the patient's house?

Dr. THWAITES said that they were all in agreement with the intention of the amendment, but he suggested that the final word should be "undesirable" rather than "unethical."

With this alteration the amendment was carried.

Dr. H. L. TAYLOR (Newcastle-upon-Tyne) drew attention to a discrepancy in the rules concerning the ethics of medical consultation. It was laid down under "Other intra-professional obligations" that a practitioner ought not to accept as his patient anyone who was under the active care of a colleague, save in certain exceptional circumstances. But a later rule laid it down that when a practitioner was asked for treatment by a patient and had reason to believe that the patient was already under medical care and that the request was made without the knowledge of the attending practitioner, and the patient refused to permit him to communicate with such practitioner, then, if the circumstances were exceptional, the practitioner was at liberty to examine the patient and to tell him his findings and conclusions, though he should not accept the patient for treatment. Newcastle thought that this clause allowed too much latitude to the individual doctor, who would be the only arbiter of what should be done.

He moved that this rule be referred back.

The Newcastle amendment was lost.

In moving the paragraph in the ethical section dealing with television, Dr. THWAITES said that this was a vexed question. On the visual screen complete anonymity could not be preserved, and there were many programmes in which medical men appeared and in which their names were announced. The Ethical Committee was keeping an eye on this situation.

PRIVATE PRACTICE

Dr. I. D. GRANT, chairman of Private Practice Committee, moved the reception of the sections of the report under this heading. The record of the committee had been one of steady but not spectacular achievement. The remuneration of the medical officers of approved schools had been increased. The new car badge had proved useful in overcoming parking difficulties. He could not say that the situation with regard to doctors' cars was satisfactory, but until devaluation occurred some progress was made; since then the Government had insisted on the greatest possible number of cars being sent for export. The Motor Manufacturers Association were doing the best they could.

Dr. J. C. WISHART (Bromley) asked the Council again to explore the possibilities of an absent subscriber telephone service, and Dr. GRANT undertook on behalf of his committee to do so, at the same time begging for suggestions about a feasible method.

A motion by Dr. W. SMITH (Greenwich and Deptford) expressing complete dissatisfaction with the position of doctors in obtaining new cars was passed.

In reply to a Derby motion asking that the policy of the Association that fees for certification under the Lunacy Act be at least two guineas should come into force, Dr. GRANT said that the fee had been agreed with the associations of local authorities, but it had not yet been possible to get a date fixed for bringing it into effect.

Dr. HALE-WHITE (Marylebone) moved that a directive should be given that the doctor of an ex-Service patient should, with the patient's permission, have the right of access to copies of Service medical reports and records. Dr. GRANT said that this matter had been taken up, and the position now was that the Ministry of Health would send to the local executive council in any area the necessary records on application. Dr. WAND added that the records would be available to any doctor, National Health Service or private. The motion was withdrawn.

Dr. ALSTON (City of London) had two motions concerning the passage of documents or reports between coroners and certifying doctors, but Dr. GORSKY said that what the City asked for was in fact already the practice of coroners or their officers.

ASSOCIATION FINANCE

The TREASURER (Mr. Moore), in presenting the financial report, said that the accounts were clearly set out in the Financial Statement appended to the Annual Report of Council. Without being unduly optimistic he could say that the Association was in a sound position. It might surprise representatives to be told that the Association spent a sum approaching £20,000 a year in paying the fares of members attending meetings at B.M.A. House. The expenses of the regional offices were growing, but it was expected that as these offices were used more and more by Divisions there would be a corresponding decrease in capitation grants from the head office.

It was difficult to budget for the coming year. Subscription income was expected to increase by about £40,000; other sources of income would remain more or less at the same level. Expenditure was increasing heavily, and on this point he must sound a note of warning. If the income was substantial so indeed was the expenditure.

After stating that the Finance Committee was unable to recommend a life membership subscription, which in any case would be less attractive to members because it would not be possible to charge the subscription when computing income tax liability, Mr. Moore made one proposal for subscription remittance—namely, that the subscription of non-clinical professors should be three guineas per annum. Apparently non-clinical professors—about 80 of whom were members of the Association—were unable to make the same use of the local services of the Association as other members.

This recommendation was agreed to.

Dr. KELSON FORD (Chelsea and Fulham) urged that more should be spent on the improvement of amenities at B.M.A. House. Mr. Moore reminded the representatives of what had been done already, but said that he was willing that the matter should be looked into further.

In response to a Doncaster motion, that payment of adequate subsistence allowances should be made to members attending Council, committee, or Representative Meetings, Mr. Moore said that he was now prepared to approach the matter with a little more sympathy than his predecessors. But he estimated that if a subsistence allowance were paid to Council and committee members it would entail an expenditure of some £4,000 a year, and, if it were paid to representatives away from home for five nights in the year, almost another £4,000. He was prepared to have this referred to the Council for consideration.

In concluding the business under "Finance" Mr. Moore said how grateful he was to the accountant, Mr. W. S. Giles, and his staff for the very efficient work they carried out.

BUILDING

Mr. L. DOUGAL CALLANDER, chairman of the Building Committee, who introduced this part of the Annual Report, said that the south wing in Tavistock Square was almost completed and several tenants were already occupying the building. The question of setting up a travel bureau on the ground floor was being considered. Fluorescent lighting had been installed in the library. Very extensive alterations were being carried out in the House at Edinburgh. An office had been obtained at Glasgow. At Cardiff a property to serve as the Welsh House of the Association had been purchased. In the near future a house was being bought in Dublin for the Irish Medical Association. He described in detail certain plans for adding to the facilities at the London headquarters, but mentioned the difficulty in obtaining the necesary licences. Like Mr. Moore, he paid a tribute to the helpfulness of the accountant and his staff.

SCIENCE

Mr. LAWRENCE ABEL, acting chairman of the Science Committee, in introducing the report under this heading, said how greatly they all deplored the death of the chairman of the committee, Dr. R. G. Gordon. No tribute could be too high to his services to the Association. Mr. Abel then reviewed the Association prizes, research scholarships, and lectures.

Dr. R. M. S. MCCONAGHY (Torquay) moved that the question of the administration of analgesics in accident cases by unqualified persons be considered by a special committee set up by the Council. It was stated in the report that the Council saw no objection to morphine being administered by an adequately trained ambulance attendant to a person suffering from serious injury. This was giving a power to ambulance attendants which was not at present given to trained nurses.

Mr. LAWRENCE ABEL said that the Council had no knowledge of any maladministration of morphine under such conditions in the Services in wartime, and what was the difference between the battlefield and the roads of England to-day? A dose of morphine given by a person, not indeed medically qualified but qualified by experience, might quite likely save a life.

The Torquay motion was lost.

PUBLIC RELATIONS

Dr. H. G. DAIN, chairman of the Public Relations Committee, said that they had been very active during the year, although their work was not always apparent. The whole publicity situation from the point of view of the profession was constantly under survey.

Dr. N. STRANG (South Shields) moved a resolution deploring the lack of measures by the committee to counteract adverse reports on the medical profession which so frequently appeared in the Press. Dr. J. C. ARTHUR (Gateshead) supported this motion, saying that the time had come for a change of direction in public relations policy. Much had been said about the difficulties under which practitioners laboured; it was time the public was made to realize the good work done in general practice to-day. Dr. A. E. J. ETHERIDGE (Hampstead) also supported. He considered that the B.M.A. had an extremely "thin" Press. He called for more active functioning of the department.

Dr. H. B. MORGAN, M.P., said that these criticisms were unfounded. The Public Relations Department should keep up its good work, and he hoped it would not listen to criticism of this kind. The Press had never been representative of public opinion in this country. The department was not to be expected to rebut every petty criticism of the profession, justified or not.

Dr. DAIN said that the critics had very much mistaken the function of public relations. A resolution in the name of Gateshead talked about "the prevalent tendency to denigrate the doctor." The only people he had heard doing that were doctors who wrote to the Press and said that for one reason or another they were bound to give bad service. The department could not contradict every statement in the Press, but when the public relations officer came upon a misstatement he did everything possible to get the paper to print a correction. The Press did tend to make much of cases against doctors in court; that could not be counteracted, though he thought there were not now the big headlines for doctors' misdoings that there were some years ago. He begged doctors if they had grievances to bring them to the Association and not to write letters in the lay Press.

Dr. STRANG said that doctors who wrote to the Press did so in a feeling of despair because Headquarters were not doing it for them.

The South Shields resolution was lost by a large majority. A resolution from Manchester that regional Press relations officers be appointed to deal with questions appearing in the local Press which affected the interests of practitioners was also lost. Chelsea and Fulham wanted a broadcast debate to be arranged on the present position of practitioners in the National Health Service, but this also did not find favour with the meeting, and a further motion regretting that the committee had failed to acquaint the public with the inadequacy of the remuneration received by general practitioners was met by a motion to proceed to the next business. This was a motion by Belfast deprecating as undignified the appearance of letters in the daily Press discussing the remuneration of doctors, and this was carried.

ARMED FORCES

This section of the Annual Report was presented by Air Vice-Marshal D'Arcy Power, who paid a tribute, endorsed by the meeting, to Sir Percy Tomlinson for his able chairmanship of the Armed Forces Committee and wished him a speedy recovery from his illness. He mentioned the long delay in obtaining agreement on the Council's proposals for the revision of rates of pay for medical officers in the Services. The discussions had now been in progress for eighteen months.

The meeting approved the addition to the committee of six members directly elected by members in the regular and reserve Forces.

ORGANIZATION

Dr. H. ALEXANDER (Wandsworth) moved to amend the appropriate by-law to provide that every candidate for election to the Council for any constituency should be a member of one of the Divisions in that constituency. He was only asking, he said, that the principle which had applied in the past in the old larger constituencies should continue to apply in the new smaller constituencies under the recently adopted scheme for elections to Council.

Mr. LAWRENCE ABEL said that all that need be done, if it was desired to have as a candidate someone who "lived in the wrong street," was to elect him as an honorary member of the Division, when he would become eligible for election to Council. The Wandsworth proposal was ridiculous and most undemocratic. Parliamentary candidates did not have to live in the constituency for which they were nominated.

Mr. H. H. LANGSTON (Winchester) supported the Wandsworth proposal, which conformed to the policy Winchester had put forward at the Special Representative Meeting. A member of Council should live and practise in a Division in the

constituency he represented. Dr. FRANK GRAY also supported the motion. There should be one rule for everybody the country over.

The Wandsworth motion was carried by the necessary majority.

A motion was on the agenda concerning affiliation with the Indian Medical Association; it was withdrawn by the mover, but the Chairman of Council said that he would like at that meeting to express their appreciation of the opportunity of having associated with them their medical colleagues in India. ("Hear, hear.")

Dr. J. A. PRIDHAM, chairman of the Organization Committee, in concluding the business paid a tribute, endorsed by the meeting, to the work of the honorary secretaries of Divisions and Branches.

Remainder of Report

Dr. I. D. GRANT, in presenting the section under "Scotland," expressed gratitude for the renovation of the Edinburgh House, the acquisition of an office in Glasgow, and the appointment of an Assistant Scottish Secretary.

Dr. H. R. FREDERICK, chairman of the Welsh Committee, spoke appreciatively of the Welsh House in Cardiff, and also of the work done behind the scenes in making it possible for Wales to have a directly elected representative on the General Medical Council.

The CHAIRMAN OF COUNCIL moved the adoption of the sections of the report concerning "World Relations," "Other Association Activities," and the evidence given on behalf of the Association to the Royal Commission on Capital Punishment. With regard to this last he referred to the excellent work done by Dr. Macrae, Deputy Secretary, in preparing the memorandum.

Dr. R. FORBES presented the report under "Patenting in the Medical Field," and moved the following recommendation:

That the Representative Body approves and urges the adoption of the policy of patenting in the medical field by members of the profession, provided that patents are assigned to the National Research Development Corporation to secure that the inventions and discoveries to which they relate are made available, developed, and exploited in the best interests of the public.

He said that this did not really vary the policy of the Association with regard to patenting. It implemented what the Association had had in mind some years ago, though at that time a method of accomplishing it did not present itself.

The motion was adopted.

This completed the business, and on the motion of Dr. ALASTAIR FRENCH an enthusiastic vote of thanks was accorded to the Chairman, Dr. J. A. BROWN, who, in his response, paid a compliment to the secretaries and staff at B.M.A. House.

The meeting was followed by a meeting of the Council and of the trustees of the British Medical Guild. These meetings were necessary because the technical effect of adjourning the Annual Representative Meeting at Southport was to postpone the beginning of the term of office of a number of members of the Council and of members of the Trust to the end of the Adjourned Meeting. The resolutions carried at the meeting of members of Council at Southport were made resolutions of the Council, and the same procedure was followed at the subsequent meeting of the trustees of the Guild.

CALL-UP OF DOCTORS

A small number of doctors who are regular reservists have been called back to H.M. Forces for a further period of service. A further number have received warning notices. It has been confirmed with the Ministry that any doctor who, prior to his recall, was engaged in general practice and whose name was included in the list of an executive council should (unless he decides to give notice of withdrawal from the Service) make deputizing arrangements where possible through his partner or partners or by the employment of a locum tenens or assistant for the conduct of his practice during his absence. His name will be retained on the medical list of the executive council until his return.

The General Medical Services Committee has submitted proposals to the Ministry for the protection of absentee doctors' practices in the event of more extensive mobilization, and these proposals are now under consideration. The question of protection of private practice is also to be considered by the Private Practice Committee of the Association.

Association Notices

Diary of Central Meetings

OCTOBER

10	Tues.	Central Ethical Committee, 2 p.m.
11	Wed.	Private Practice Committee, 2 p.m.
11	Wed.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
12	Thurs.	Occupational Health Committee, 2 p.m.
12	Thurs.	Special Committee for Spa Practice Report, 2.30 p.m. (*Change of date and time.*)
13	Fri.	Central Professional Committee, 11.30 a.m.
13	Fri.	Library Subcommittee, 12 noon.
13	Fri.	Colonies and Dependencies Committee, 2 p.m.
13	Fri.	Ophthalmic Group Committee, 2 p.m.
13	Fri.	Physical Medicine Group Committee, 2 p.m.
13	Fri.	Science Committee, 2 p.m.
16	Mon.	Armed Forces Committee, 2 p.m.
18	Wed.	Publishing Subcommittee, 11 a.m.
18	Wed.	Welsh Committee (at Lion Hotel, Shrewsbury). 2.15 p.m.
19	Thurs.	Dermatologists Group Committee, 10.30 a.m.
20	Fri.	Charities Committee, 2 p.m.

NOVEMBER

1	Wed.	**Council**, 10 a.m.

Branch and Division Meetings to be Held

CITY DIVISION.—At St. Leonard's Hospital, Nuttall Street, Kingsland Road, London, N., Tuesday, October 10, 8.30 p.m., meeting.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, October 12, 7.30 p.m., dinner; 8.45 p.m., joint meeting with British Medical Guild. All medical practitioners in the area of the Division are invited.

HAMPSTEAD DIVISION.—At Central Library (Arkwright Road entrance), Wednesday, October 11, 8.30 p.m., meeting to form Hampstead Division of British Medical Guild and election of local Guild Committee. All medical practitioners in the area of the Division are invited.

HERTFORDSHIRE BRANCH.—At Waterend Barn, St. Albans, Friday, October 13, 8 for 8.30 p.m., Dinner-dance.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverton Avenue, Kingston-on-Thames, Tuesday, October 10, 8 for 8.30 p.m. Dr. P. M. F. Bishop: "Endocrinology in General Practice."

NORFOLK BRANCH.—At Stuart Hall, St. Andrew's Street, Norwich, Wednesday, October 11, 7.30 p.m., reception; 8 p.m., talk by Mr. R. R. Simpson: "Shakespeare and Medicine."

SOUTH-WEST ESSEX DIVISION.—At Clinic Hall, Thorne Coombe Maternity Hospital, 714, Forest Road, Walthamstow, E., Wednesday, October 11, 8.30 p.m., lecture by Dr. Stanley White, Ph.C.: "Clinical Aspects of the Newer Antibiotics, with Special Reference to Chloromycetin." Lantern slides and probably a short film will be shown.

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, October 13, 8 p.m., address by Mr. McIntosh Marshall: "Some Obstetrical Problems in General Practice."

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Wednesday, October 11, 8.15 p.m., annual B.M.A. lecture by Dr. Keith Simpson: "The Reconstruction of Crime." To be illustrated by lantern slides. The lecture should be of interest to the legal profession and certain members of the Police Force.

British Medical Guild: Formation of Local Branches

An open meeting will be held on Sunday, October 8, at 3.30 p.m. in the Exhibition Hall Restaurant, Belle Vue Gardens, Manchester, to discuss the formation of a local branch.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY OCTOBER 14 1950

THE BRITISH MEDICAL GUILD*

The British Medical Association is a company registered under the Companies Acts. It is permitted by the Board of Trade to dispense with the word "Limited" in its title, but the price of that dispensation is the inclusion of two provisions in its Memorandum of Association. The first is the proviso to Clause 3:

"Provided that the Association shall not support with its funds any object or endeavour to impose on or procure to be observed by its Members or others any regulation restriction or condition which if an object of the Association would make it a trade union."

The second is Clause 4:

"The income and property of the Association, from whatever source derived, shall be applied solely towards the promotion of the objects of the Association as set forth in this Memorandum of Association, and no portion thereof shall be paid or transferred directly or indirectly by way of dividend or bonus or otherwise, by way of profit to the persons who at any time are or have been Members of the Association, or to any person claiming through any of them, provided that nothing herein shall prevent the payment in good faith of remuneration to any officers or servants of the Association, or to any Member of the Association or other person in return for any services actually rendered to the Association."

Let us re-examine the effect of Clause 4. Put simply, it is that the Association is prevented by its constitution from contributing towards any loss which its members might sustain in following the advice of the Association. In this respect the Association is prevented from financing a fighting fund.

The proviso to Clause 3 is of considerable significance. The Association must not do things which, if it did them, would make it a trade union. To appreciate the importance of this proviso one needs to examine the legal position of a trade union. In law a trade union is a combination which has as its principal objects the regulation of the relations between workmen and masters, or between workmen and workmen, or between masters and masters, or the imposing of restrictive conditions on the conduct of any trade or business, and also the provision of benefits to members. We can set aside the first of these objects, because we are advised that a doctor is neither a master nor a workman. But we cannot dismiss the second object, because we are advised that legally medical practice would be held to be a business.

It follows that should the Association have as one of its objects the imposition of restrictive conditions on the conduct of medical practice it might be held to be acting as a trade union and so in conflict with its constitution. This is entirely a matter of legal interpretation. The fact we must face is that there is a consensus of legal opinion that for the Association to organize withdrawal from any service, or a general refusal to enter a service, might well be held to conflict with Clause 4 of its Memorandum of Association. If the Association were exposed to the risk that it could be challenged on this point, the result would be that any person or persons so disposed might—for example, during a major dispute involving the profession—seek from the court an injunction to restrain the Association from using its funds in contravention of its Memorandum. While such an action was *sub judice* the Association might well be rendered ineffective and be unable to continue the activity which was challenged for as long as the matter was under consideration by the courts.

To sum up, we are legally advised that in the constitution of the Association there are two weaknesses which might militate against the Association playing its full part in any conflict between the profession and other bodies or persons. It is true that, so far, the Association's actions have not been challenged. It is possible, too, that the lawyers might be wrong, for the matter could be finally determined only in the courts. But in the presence of such doubts the Council decided that in one way or another these weaknesses must be removed.

Alternatives Considered

A number of solutions were considered. It might be possible to dispense with the proviso to Clause 3 and Clause 4 by withdrawing the request to the Board of Trade to omit the word "Limited" from the Association's title. On the other hand it would hardly be consistent with the Association's standing and prestige to be known as the British Medical Association Limited, and in any case we might incur an obligation to pay income tax where at present we enjoy immunity. Further, if it were subsequently held that the Association was in reality a trade union it might lose its registration under the Companies Act altogether.

Next was considered the conversion of the Association into a body of an entirely different constitution, trade union or other. The short answer to this is that a necessary preliminary to the creation of a new organization on a new basis would be to wind up the Association and to distribute its assets among its members.

Next was considered the possibility of forming a parallel yet distinct body which would be free from the impediment on the two points which might fetter the Association's activities under its present constitution. The possibility of establishing a parallel trade union was explored. Those who favour this form of organization have emphasized the protection which is afforded to trade unions by the Trade Disputes Act, 1906.

Without going into the obscurities of trade union law, the short effect of Sections 3 and 4 of that Act is to give immunity from legal proceedings for certain acts which ordinarily would be actionable wrongs, provided that these acts are committed in furtherance of a trade dispute or committed by or on behalf of a trade union. This Act of 1906 was passed following a decision of the courts which seriously menaced the legality of trade unionism. An action for damages brought against a union of railwaymen succeeded on the ground (*inter alia*) that picketing by the union members was unlawful and that the union was responsible for the wrongful acts of its members and officials. The expression "trade dispute" is defined in the Act as meaning a dispute (connected with employment) "between masters and workmen or between workmen and workmen" and the expression "workmen" is defined as meaning "all persons engaged in trade or industry." In the opinion of learned counsel the medical practitioner is not employed in trade or industry and is not a workman within the meaning of the Act. Learned counsel advise us that, unlike a trade union of workmen, a trade union composed of medical practitioners could derive no protection from these sections of the Act.

Moreover, the sanction of expulsion or threatened expulsion from a trade union as a means of depriving a member of

*The substance of some observations made by the Secretary at a meeting of Birmingham practitioners on October 4.

opportunities for employment (under the "closed shop" principle), which can safely be imposed by workmen's trade unions because of the Trade Disputes Act, is not one that can be effectively imposed by an organization of medical practitioners, even if the profession favoured this method of bringing dissidents into line.

In the light of such considerations as these, the lawyers advised the Association that in the organization and enforcement of collective action a medical trade union would be no more effective than a body with a different form of constitution. They advised, in brief, that there were no substantial advantages for us in the trade union form of organization.

Parallel Body

After carefully considering all these factors, the Council finally came to the conclusion that the whole of its difficulties could be met by leaving the Association's present constitution unchanged and by establishing as a parallel body a board of trustees which, within the normal limits of law but without the limitations of the Association's constitution, could seek to impose restrictions on the conduct of medical practice and organize collective action in disputes with public or other bodies.

The British Medical Guild has been set up for this purpose and its functions are described in the statement below.

BRITISH MEDICAL GUILD

The following statement has been sent to every general practitioner in the National Health Service:

The Special Conference of Local Medical Committees in June decided that, if a satisfactory settlement of the profession's claim for an increase in the remuneration of general practitioners was not speedily achieved, practitioners were to be advised to terminate their contracts with local executive councils and that the necessary preparations should be made at once.

You will shortly receive a letter from the trustees of the British Medical Guild inviting you to complete a form of resignation from the National Health Service. The conditions and safeguards under which such resignations would become effective are explained later in this document.

This is a drastic step. You will naturally wish to know the reasons for it. You may well also wish to know, if you do not already know, what the British Medical Guild is, and why it should be writing to you on such a matter.

What the Guild is

Q.—What is the Guild ?

A.—The Guild is a trust fund vested in trustees. The trustees are members for the time being of the Council of the British Medical Association.

Q.—Why was the Guild established ?

A.—The British Medical Association is prohibited by its constitution from taking part in trade union activities. For example, it is unable legally to organize or finance collective withdrawal from the National Health Service. Nor could it compensate from its own funds any member who suffered financial hardship as a consequence of collective withdrawal. In 1948 some members pressed strongly for the Association to be converted into a trade union. Lengthy investigation showed that such a conversion was neither desirable nor practicable. The Association's legal advisers gave their opinion that the profession could acquire the desired additional power by setting up a British Medical Guild which could act for the profession in an emergency. Accordingly the Guild was established in 1949 by a resolution of the Representative Body at Harrogate.

Q.—Has the Guild any local organization ?

A.—Yes, the trustees have recently invited honorary secretaries of B.M.A. Divisions to take the initiative in setting up local Guild committees in their areas. Members of the profession within the area of each committee will then be divided up into groups of eight to twelve under a group organizer. Thus every practitioner—member or non-member of the B.M.A.—will be enabled to take part in discussions with his *immediate* colleagues on any dispute which is referred to the Guild.

Q.—What is the policy of the Guild ?

A.—The Guild is not a policy-making body. The policy of the profession will continue to be framed by the Representative Body of the B.M.A. and (within their respective fields) by the Conference of Local Medical Committees and the Central Consultants and Specialists Committee.

Q.—What is the membership of the Guild ?

A.—There is no membership. The Guild is *not* a separate body which doctors can join. It is a legal instrument, but an essential one.

Q.—What is the subscription to the Guild ?

A.—There is no subscription to the Guild. The three main sections of the profession (general practitioners, consultants and specialists, and the public health service) have established, or will shortly establish, separate defence funds, and the Guild will, as and when necessary, receive grants from the separate funds. Individual members of the profession will be asked to contribute to the trust fund for their own section of the profession and not direct to the Guild. Thus no practitioner will be asked to subscribe twice.

Q.—If the Guild has no *separate* policy, income, or membership, what is the function of the local Guild committee and its organizers ?

A.—*To facilitate discussion in small groups, to persuade members of the profession to accept the policy favoured by the majority, and to secure unity during a conflict.*

Q.—Who will decide whether general practitioners are to be asked to resign from the National Health Service ?

A.—The Conference of Local Medical Committees.

The Remuneration Issue

Q.—Is the question of withdrawal an urgent one ?

A.—Yes. The dispute with the Government over general-practitioner remuneration has now dragged on for over two years. It is a claim for an upward adjustment of the Central Pool the size of which was not negotiated before the appointed day. The Government has consistently refused to say what in its view should be the size of the general-practitioner "pool" in order to carry out the Spens recommendations, having regard to the rise in the cost of living since 1939. The British Medical Association has insistently pressed its claim for additional moneys in the "pool," basing its claim on a betterment factor of 70%. Since the cost-of-living figure was assessed by a distinguished economist over a year ago, there has been a further rise in the cost of living. Yet the Ministry, in spite of repeated representations, is unable or unwilling to say what the betterment factor should be to-day, and therefore what should be the correct amount of money in the "pool." The profession's claims have been discussed with the Minister and his officers on many occasions. There has already been one inquiry into general-practitioner incomes. Now there are to be two further inquiries: one into total remuneration received by general practitioners from N.H.S. sources during the year ended March 31, 1950; and a second inquiry into the percentage of income which practitioners pay in practice expenses.

In spite of the further delay these inquiries entail, the Conference of Local Medical Committees in June agreed to await their results. These will be considered by a Special Conference in December. The Conference also decided in June that, if a satisfactory settlement was not reached as a result of these inquiries, practitioners were to be advised to terminate their contracts with local executive councils.

Q.—What is likely to happen to the present dispute ?

A.—Prophecy is dangerous. There is a possibility that the dispute will be referred to arbitration, either under the National Health Service (Amendment) Act, 1949, with the consent of both parties, or compulsorily under the Conditions of Employment and National Arbitration Order, 1940, which is still operative.

But a willingness to resign in certain circumstances is an essential part of the fight.

Collecting and Holding Resignations

Q.—How does the Guild come into all this ?

A.—The General Medical Services Committee at their meeting on September 21 asked the trustees of the Guild to inform every general practitioner in the National Health Service that it is intended in a letter, to be issued not before November 1, to invite practitioners to complete a signed form of resignation from the Service.

Q.—Why was November 1 chosen as a date ?

A.—To allow time for local discussion.

Q.—What will happen to these signed forms of resignation ?

A.—They will be *held* by the honorary secretary of the local Guild committee *pending* a decision by the Special Conference of Local Medical Committees to be held in December on whether these resignations should be handed in to local executive councils.

Q.—What am I committing myself to if I sign this form of resignation ?

A.—The Guild undertakes that the resignations will only be *used*: (1) In connexion with the *present* dispute with the Ministry over the remuneration of general practitioners. (2) If the resignations of not less than 80% of practitioners in the Service are held; with the proviso that, even if the resignations of 80% are obtained, they will be handed in to the local executive council *only* if the Special Conference of Local Medical Committees so decides.

The Guild further undertakes that the resignations will be *destroyed*: (1) If the dispute is satisfactorily settled, or (2) if the Special Conference of Local Medical Committees so decides, or (3) if 80% of resignations are not held, or (4) if at any time the practitioner concerned requests in writing that his resignation form should be destroyed.

Thus every practitioner will know that his undertaking will not be put into effect unless at least 80% of general practitioners have given similar undertakings. There will be every opportunity for local meetings of practitioners before any decision is taken.

General Questions about Withdrawal

Q.—What happens to my compensation if I leave the Service ?

A.—A general practitioner who has established a claim to compensation for the goodwill of his practice in no way prejudices his compensation by temporarily removing his name from the medical list.

Q.—Is my superannuation affected if I resign ?

A.—A practitioner on resigning from the Service does not lose his superannuation rights if he re-enters the Service within 12 months.

Q.—What will happen to essential medical services if general practitioners withdraw from the Service ?

A.—In the event of withdrawal practitioners would, of course, carry on with their work. But as they will no longer be in contract with executive councils, the question of payment of fees would be a matter for arrangement between patient and doctor. It is not recommended that certificates of incapacity should be withheld.

Q.—What about the question of readmission to the medical list if a practitioner leaves the Service as the result of collective decision during the dispute with the Ministry ?

A.—It will be a *sine qua non* of a satisfactory settlement of the dispute that there shall be no disturbance of the practitioner's position on the medical list or lists in which his name previously appeared, including the restoration of his former patients to his list.

Time-table for Action

The trustees of the Guild are confident that you will agree that the time has arrived when strong measures must be taken. The steps necessary to carry out the decisions of the Conference of Local Medical Committees fall into two phases:

From receipt of this letter to November 1 ..	Organization and discussion through local Guild committees and groups.
From November 1, on the issue of further instructions by the trustees ..	Collecting and holding of signed forms of resignation.

You are urged as a first step to attend meetings of your local group of practitioners which are now being arranged by local Guild committees. These meetings will afford an opportunity for frank discussion and enable the trustees to estimate the support they can count on during the second phase of the preparations for withdrawal.

If by any chance a local Guild committee has not yet been appointed for your area, will you please ask the local B.M.A. secretary what is being done in the matter ?

PAY OF MEDICAL OFFICERS IN THE ARMED FORCES

Further representations have been made to the Ministry of Defence. The B.M.A. wrote to the Ministry:

"There is probably no need for me to inform you that the specific exclusion of the medical branches from the pay increases recently announced for the Forces as a whole has had a most depressing effect upon medical officers.

"We find difficulty in explaining to our members how it comes about that, although we took up this matter with you as long ago as March, 1949, it has not proved possible to settle new pay rates for the medical branches with the same speed as new rates appear to have been worked out and announced for the other branches."

The following reply has been received:

"I am sorry that we have not been able to meet your delegation again before now, and that we are still not ready to do so. I can assure you, however, that we are doing our utmost to reach early conclusions on the remuneration of medical officers in the Forces, and we will arrange another meeting with you at the earliest possible date. We hope this will be very soon."

GENERAL MEDICAL AND PHARMACEUTICAL SERVICES: REVISED LIST OF APPLIANCES AND REAGENTS

The Minister of Health, after consultation with the British Medical Association and the Central N.H.S. (Chemist-Contractors) Committee, has decided to add the following to the lists of appliances and reagents which may be prescribed in the National Health Service.

Appliances

Applicators.
Arm slings.
Bandages:
  Cotton or rayon and elastic.
  T shape.
Breast shields.
Connexions.
Funnels.
Perfusion fittings:
  Set for intravenous administration of perfusion fluids.
Pinchcocks.
Sponge rubber.
Urinals, portable.
Urine sugar analysis set.

Reagents

Diagnostic solution-tablets of copper.
Gerhardt's reagent.
Indicators required for measurement of pH of urine.
Litmus papers.
Rothera's reagent.
Strong solution of ammonia.
Urine sugar analysis set.

(This contains: test tube, dropper, colour chart, instruction sheet, and analysis record, with one bottle of 36 diagnostic solution-tablets of copper, in a suitable container. The tablets contain: copper sulphate, anhyd., 0.01875 g.; citric acid, anhyd., 0.3 g.; sod. hydroxide, anhyd., 0.25 g.; sod. bicarbonate, 0.0625 g.; excipient.)

The new provisions come into force on December 1.

HANDBOOK FOR GENERAL PRACTITIONERS

The Ministry of Health has prepared a handbook explaining to general practitioners the provisions of the National Health Service. Copies will be sent to executive councils for distribution. An extra copy will be sent to a doctor who employs an assistant not on the executive council's list.

HEARING OF PUBLIC HEALTH DISPUTE

The Industrial Court began on October 9 to hear the case for improved terms and conditions of service for public health medical officers. The claims had been submitted through the Whitley machinery, but negotiations broke down. Representatives of the staff and management sides of Committee C of the Medical Functional Whitley Council were present at the hearing.

ULSTER CHEMISTS DEFER RESIGNATION

More than 500 chemists in Northern Ireland, who were due to leave the health service on October 1 for reasons similar to those of the Scottish chemists (*Supplement*, September 16, p. 134), have postponed this move for two months, since the threatened 8% reduction of their pay has not been made in the months of July and August, as had previously been expected.

British Medical Association

COUNCIL AND COMMITTEES FOR 1950-1

COUNCIL

Ex Officio

Professor Sir Henry Cohen, Liverpool, *President*.
Dr. E. A. Gregg, London, *Chairman of Council*.
Mr. A. M. A. Moore, London, *Treasurer*.
Dr. J. A. Brown, Birmingham, *Chairman of Representative Body*.
Dr. A. W. S. Sichel, Capetown, South Africa, *President-Elect*.
Dr. C. W. C. Bain, Harrogate, *Immediate Past-President*.
Dr. S. Wand, Birmingham, *Deputy Chairman of Representative Body*.
Dr. T. Rowland Hill, London, *Chairman, Central Consultants and Specialists Committee*.

Thirty-nine Elected by Grouped Branches in Great Britain and Northern Ireland

England and Wales :

Dr. H. Alexander, London.
Dr. J. C. Arthur, Low Fell, Co. Durham.
Dr. Alexander Brown, Linton, Cambs.
Mr. L. Dougal Callander, Doncaster.
Dr. J. Cottrell, Grimsby.
Mr. S. F. L. Dahne, Reading.
Dr. E. C. Dawson, Derby.
Dr. W. E. Dornan, Sheffield.
Dr. D. B. Evans, Wrexham.
Dr. R. Gibson, Winchester.
Dr. H. M. Golding, Bristol.
Mr. A. Staveley Gough, Watford.
Dr. F. Gray, London.
Dr. R. Hale-White, London.
Dr. D. F. Hutchinson, London.
Dr. I. G. Innes, Hull.
Dr. R. P. Liston, Tunbridge Wells.
Mr. Percy Malpas, Liverpool.
Dr. J. I. Milne, Manchester.
Dr. J. A. Moody, Ilford, Essex.
Dr. J. R. Nicholson-Lailey, Taunton.
Mr. D. R. Owen, Chester.
Dr. R. R. Powell, Reigate, Surrey.
Mr. D. S. Pracy, Atherstone, Warwickshire.
Dr. J. O. M. Rees, Guildford.
Dr. F. M. Rose, Preston.
Dr. A. V. Russell, Wolverhampton.
Dr. S. Noy Scott, Plympton, Devon.
Dr. H. H. D. Sutherland, London.
Mr. J. W. Tudor Thomas, Cardiff.
Dr. J. G. Thwaites, Brighton.
Mr. Weldon P. T. Watts, Newcastle-upon-Tyne.
Dr. Angus Weston, Greenford, Middlesex.

Scotland :

Dr. Mary Esslemont, Aberdeen.
Dr. J. G. M. Hamilton, Edinburgh.
Dr. W. Jope, Blantyre, Lanarkshire.
Dr. W. M. Knox, Glasgow.

Northern Ireland :

Dr. N. S. Dickson, Templepatrick, Co. Antrim.
Mr. Ian J. Fraser, Belfast.

Seven Elected by Branches outside Great Britain and Northern Ireland

Professor J. S. English, Newtownards, Co. Down.
Dr. P. C. C. Garnham, Slough, Bucks.
Dr. Isaac Jones, London.
Dr. H. B. Morgan, London.
Dr. P. T. O'Farrell, Dublin.
Mr. J. A. Stallworthy, Oxford.
One vacancy.

Ten Elected by Representatives as a Whole

Mr. A. Lawrence Abel, London.
Dr. O. C. Carter, Bournemouth.
Dr. H. Guy Dain, Birmingham.
Dr. R. Forbes, London.
Dr. J. A. Gorsky, London.
The Rt. Hon. Lord Horder, London.
Dr. J. A. L. Vaughan Jones, Leeds.
Mr. H. H. Langston, Winchester
Dr. J. A. Pridham, Weymouth.
Sir Lionel Whitby, Cambridge.

Two Elected by Representatives of Scottish Constituencies

Dr. Ian D. Grant, Glasgow.
Dr. G. W. Ireland, Ford, Midlothian.

One Elected by Representatives of Constituencies in Wales, including Monmouthshire

Dr. H. R. Frederick, Port Talbot, Glam.

Two Elected by Public Health Service Members

Dr. C. Metcalfe Brown, Manchester.
Dr. J. M. Gibson, Huddersfield.

Three Elected by Representative Body to Represent the Services

Major-General Sir Percy Tomlinson, Hove.
Air Vice-Marshal D'Arcy Power, Kingston Hill, Surrey.
One vacancy.

One Elected by Women Members

Miss Annis Gillie, London.

COMMITTEES

I. STANDING COMMITTEES

(Note.—The President, Chairman of Representative Body, Chairman of Council, and Treasurer are members, *ex officio*, of all Standing Committees.)

AMENDING ACTS COMMITTEE

Mr. A. Lawrence Abel, London.
Dr. A. C. E. Breach, Orpington, Kent.
Dr. H. Guy Dain, Birmingham.
Dr. Mary Esslemont, Aberdeen.
Dr. J. A. Gorsky, London.
Dr. D. F. Hutchinson, London.
Dr. J. A. Moody, Ilford, Essex.
Dr. A. V. Russell, Wolverhampton.
Dr. H. H. D. Sutherland, London.
Dr. E. C. Warner, London.

ARMED FORCES COMMITTEE

Dr. J. L. McCallum, London.
Dr. J. E. Rusby, Leeds.
Mr. Eric Steeler, London.
Dr. Angus Weston, Greenford, Middlesex.
One representative from each of the following: Medical Branch, Royal Navy; Royal Army Medical Corps; and Medical Branch, Royal Air Force.
With power to co-opt one representative from each of the following Services: Royal Naval Medical Service, Royal Army Medical Corps, Royal Air Force Medical Service, Royal Naval Volunteer Reserve, Royal Army Medical Corps (Territorial Army), and Royal Air Force Medical Service (Volunteer Reserve).

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

Members Appointed by Representative Body :

England and Wales: Mr. R. L. Newell, Cheadle, Cheshire; Mr. A. Dickson Wright, London.
Scotland: Dr. Alexander Smith, Stonehouse, Lanarks.
Northern Ireland: Vacancy.

Members Appointed by Council :

Mr. A. Staveley Gough, Watford, Herts.
Dr. S. Cochrane Shanks, London.

Members Appointed by Regional Consultants and Specialists Committees :

Mr. Roy Banham, Northampton.
Dr. W. A. Bourne, Hove.
Mr. G. H. Buckley, Blackpool.
Professor P. C. P. Cloake, Birmingham.
Dr. Beryl D. Corner, Bristol.

Dr. A. A. Cunningham, Kingston-on-Thames, Surrey.
Mr. E. R. Frizelle, Leicester.
Mr. W. H. George, Birmingham.
Mr. H. L. Hardy Greer, Belfast.
Professor S. J. Hartfall, Leeds.
Dr. T. Rowland Hill, London.
Dr. A. W. Holgate, Chester.
Mr. H. H. Langston, Winchester.
Dr. R. D. Lawrence, London.
Dr. R. G. McInnes, Oxford.
Mr. O. E. J. McOustra, Cheltenham.
Mr. P. Malpas, Liverpool.
Dr. Robert Marshall, Belfast.
Dr. J. Murray, Iver Heath, Bucks.
Dr. A. A. McI. Nicol, Sunderland.
Dr. R. A. Noble, Cambridge.
Mr. D. W. C. Northfield, London.
Dr. A. G. Ogilvie, Newcastle-upon-Tyne.
Professor T. H. Oliver, Manchester.
Dr. W. Esmond Rees, Swansea.
Mr. T. Holmes Sellors, London.
Professor G. I. Strachan, Cardiff.
Mr. E. Cowper Tamplin, Southsea.
Mr. J. M. Ridley Thomas, Norwich.
Dr. E. C. Warner, London.
Mr. Donald Watson, Bradford.
Dr. J. Wilkie, Sheffield.

Members Appointed by the Consultants and Specialists Subcommittee of Scottish Committee :

Professor L. J. Davis, Glasgow.
Dr. I. D. Easton, Perth.
Mr. I. Simson Hall, Edinburgh.
Dr. J. G. M. Hamilton, Edinburgh.
Dr. J. B. King, Edinburgh.
Mr. N. J. Logie, Hallyards, by Banchory.
Mr. W. S. Mack, Glasgow.
Mr. T. Murray Newton, Glasgow.
Dr. A. R. Wilson, Inverness.
Dr. J. H. Wright, Glasgow.

Co-opted Member :

Mr. C. E. Kindersley, Bath.

Together with five part-time consultants and specialists; two members appointed by the General Medical Services Committee; one member appointed by each of the following committees: Occupational Health, Public Health, and Private Practice; and one member by each of the following Group Committees: Anaesthetists, Consulting Pathologists, Dermatologists, Non-Professorial, Ophthalmic, Orthopaedic, Otolaryngologists, Physical Medicine, Psychological Medicine, Radiologists, Registrars, Spa Practitioners, Tuberculosis and Diseases of the Chest, and Venereologists.

CENTRAL ETHICAL COMMITTEE

Dr. E. C. Dawson, Derby.
Dr. R. Forbes, London.
Dr. H. R. Frederick, Port Talbot, Glam.
Dr. G. W. Ireland, Ford, Midlothian.
Dr. J. F. Lambie, Glasgow.
Dr. T. W. Morgan, New Malden, Surrey.
Dr. S. Noy Scott, Plympton, Devon.
Dr. H. H. D. Sutherland, London.
Mr. J. W. Tudor Thomas, Cardiff.
Dr. J. G. Thwaites, Brighton.
Mr. N. E. Waterfield, Little Bookham, Surrey.
Dr. F. B. Winfield, Birmingham.

CHARITIES COMMITTEE

Dr. Janet K. Aitken, London.
Dr. Trevor R. Bryant, Tredegar, Mon.
Dr. H. M. Golding, Bristol.
Dr. H. W. Pooler, Ashover, near Chesterfield.
Dr. H. Robinson, Tunbridge Wells.
Dr. N. B. Stewart, Edinburgh.
Dr. N. E. Waterfield, Little Bookham (Representative of Association on Council of Epsom College).
Mr. A. Dickson Wright, London (Representative of Association on Committee of Management of the Royal Medical Benevolent Fund).

COLONIES AND DEPENDENCIES COMMITTEE

Dr. J. Cottrell, Grimsby.
Professor J. S. English, Newtownards, Co. Down.
Dr. P. C. C. Garnham, Slough, Bucks.
Mr. J. L. Gilks, Petersfield, Hants.
Dr. Isaac Jones, London.
Mr. C. F. Mayne, Plymouth.
Dr. H. B. Morgan, London.
Dr. P. T. O'Farrell, Dublin.
Dr. J. B. Wrathall Rowe, Wealdstone, Middlesex.
Mr. J. A. Stallworthy, Oxford.
One vacancy.
One member appointed by the Organization Committee

FINANCE COMMITTEE

The Chairman of the following Committees: Organization, Journal, Science, Private Practice, Central Ethical, General Medical Services, and Building.
Dr. H. Guy Dain, Birmingham.
Dr. T. Gardner, Featherstone, near Pontefract.
Dr. Fenwick Lishman, Bishop Auckland.
Dr. J. O. McDonagh, Stanley, Perth.

GENERAL MEDICAL SERVICES COMMITTEE

Dr. W. Jope, Blantyre, Lanarks (Chairman of Conference of Local Medical Committees).

Six Elected by Representative Body:

Dr. J. Bleakley, Bangor, Co. Down.
Dr. H. Guy Dain, Birmingham.
Dr. H. H. Goodman, Newcastle-upon-Tyne.
Dr. F. Gray, London.
Dr. W. M. Knox, Glasgow.
Dr. S. Wand, Birmingham.

With twenty-seven Direct Representatives of Local Medical Committees in Great Britain and Northern Ireland. Six to be elected by the Annual Conference of Representatives of Local Medical Committees, two nominated by the Central Consultants and Specialists Committee, one nominated by the Medical Women's Federation, one nominated by the Society of Medical Officers of Health, with power to co-opt.

JOURNAL COMMITTEE

Dr. O. C. Carter, Bournemouth.
Dr. Mary Esslemont, Aberdeen.
Dr. J. A. Gorsky, London.
Dr. W. N. Leak, Winsford, Cheshire.
Dr. R. P. St. L. Liston, Tunbridge Wells.
Dr. J. C. Matthews, Downton, Wilts.
Dr. S. Noy Scott, Plympton, Devon.
Dr. R. W. L. Ward, Doncaster.
Chairman of the Central Ethical Committee.
One member appointed by the Organization Committee.
One member appointed by the Science Committee.

OCCUPATIONAL HEALTH COMMITTEE

Dr. H. Alexander, London.
Mr. L. Dougal Callander, Doncaster.
Dr. N. J. Cochran, Burton-on-Trent, Staffs.
Dr. B. Hutchison, Cambuslang, Lanarks.
Dr. J. A. L. Vaughan Jones, Leeds.
Professor R. E. Lane, Manchester.
Dr. J. B. Wrathall Rowe, Wealdstone, Middlesex.
Dr. Donald Stewart, Birmingham.
One member appointed by the following Committees: Private Practice, Central Consultants and Specialists, General Medical Services, Public Health, and Dermatologists Group.
Three members nominated by the Association of Certifying Surgeons.
Four members nominated by the Association of Industrial Medical Officers.
With power to co-opt.

ORGANIZATION COMMITTEE

Dr. H. R. Frederick, Port Talbot, Glam.
Dr. F. Gray, London.
Dr. Kate Harrower, Glasgow.
Dr. I. G. Innes, Hull.
Mr. H. H. Langston, Winchester.
Dr. J. H. E. Moore, Leeds.
Dr. J. A. Pridham, Weymouth.
Dr. F. M. Rose, Preston.
One member appointed by the Colonies and Dependencies Committee.
Chairman of Conference of Honorary Secretaries.

PRIVATE PRACTICE COMMITTEE

Dr. O. C. Carter, Bournemouth.
Dr. Robert Forbes, London.
Dr. H. M. Golding, Bristol.
Dr. E. W. Goodwin, Leicester.

Dr. J. A. Gorsky, London.
Mr. A. Staveley Gough, Watford.
Dr. I. D. Grant, Glasgow.
Dr. Mona Macnaughton, Newcastle-upon-Tyne.
Dr. T. W. Morgan, New Malden, Surrey.
Dr. H. H. D. Sutherland, London.
Dr. C. W. Warner, Liverpool.
Dr. F. B. Winfield, Birmingham.
One member to be appointed by each of the following Committees: Central Consultants and Specialists, Public Health, and General Medical Services.
With power to co-opt.

PUBLIC HEALTH COMMITTEE

Dr. R. Gordon Cooke, Derby.
Dr. H. Guy Dain, Birmingham.
Dr. Mary Esslemont, Aberdeen.
Dr. J. A. Ireland, Shrewsbury.
Dr. J. B. Miller, Bishopbriggs, Lanarkshire.
Mr. D. S. Pracy, Atherstone, Warwickshire.
Dr. J. Riddell, Edinburgh.
Dr. C. O. Stallybrass, Heswall, Cheshire.
Dr. J. A. Stirling, Chesterfield.
Dr. J. B. Tilley, Newcastle-upon-Tyne.
Two members of Council elected by Public Health Service members: Dr. C. Metcalfe Brown, Manchester; Dr. J. M. Gibson, Huddersfield.
Two members nominated by the Society of Medical Officers of Health.
One member appointed by the Private Practice Committee.
One member appointed by the Central Consultants and Specialists Committee.
With power to co-opt three additional members.

SCIENCE COMMITTEE

Mr. A. Lawrence Abel, London.
Dr. Janet K. Aitken, London.
Mr. Hugh Carson, Birmingham.
Professor L. P. Garrod, Harpenden, Herts.
Dr. R. P. Liston, Tunbridge Wells.
Dr. J. C. Macarthur, Carluke, Lanarkshire.
Dr. J. R. Nicholson-Lailey, Taunton.
Mr. L. N. Pyrah, Leeds.
Professor R. J. Willan, London.
Dr. J. C. Matthews, Downton, Wilts.
One member to be appointed by the Journal Committee.

SCOTTISH COMMITTEE

Members of Council:
Dr. Mary Esslemont, Aberdeen.
Dr. Ian D. Grant, Glasgow.
Dr. J. G. M. Hamilton, Edinburgh.
Dr. G. W. Ireland, Ford, Midlothian.
Dr. W. Jope, Blantyre, Lanarkshire.
Dr. W. M. Knox, Glasgow.

Members Elected by Divisions in Scotland:
Dr. J. C. Adam, Forres.
Dr. F. A. Anderson, Stranraer.
Dr. W. D. Anderson, Glasgow.
Dr. J. T. Baldwin, Penicuik.
Dr. R. B. Bell, Alloa.
Dr. W. Gibson, Old Kilpatrick.
Dr. W. Nicol Gray, Helmsdale.
Dr. Kate Harrower, Glasgow.
Dr. J. Wallace Henderson, Renfrew.
Dr. J. M. Johnstone, Leven.
Dr. J. Kelman, Perth.
Dr. D. Dale Logan, Newmains, Lanarkshire.
Dr. K. McLay, Galashiels.
Dr. A. F. Wilkie Millar, Edinburgh.
Dr. D. Myles, Forfar.
Dr. A. Smith Pool, Glasgow.
Dr. R. Richards, Aberdeen.
Dr. D. S. Robertson, Edinburgh.
Dr. R. A. B. Rorie, Dundee.
Dr. A. Scott, Ayr.
Dr. J. G. B. Shand, Cults.
Dr. J. Watson, Thornhill.
Dr. D. C. Wilson, Inverness.
One vacancy.
Together with three representatives of Scottish Royal Medical Corporations.
With power to co-opt not more than three members.

WELSH COMMITTEE

Members of Council Representing Branches in Wales and Monmouthshire:
Dr. D. B. Evans, Wrexham.
Dr. H. R. Frederick, Port Talbot, Glam.
Mr. J. W. Tudor Thomas, Cardiff.

Secretaries of the North Wales and South Wales and Monmouthshire Branches:
Mr. J. T. Rice Edwards, Newport, Mon.
Mr. O. Vaughan Jones, Menai Bridge, Anglesey.

Representatives in Representative Body of Constituencies in Wales, Monmouthshire, and Shropshire:
Dr. Trevor R. Bryant, Tredegar, Mon.
Mr. C. J. Cellan-Jones, Swansea.
Dr. J. F. Clarke, Newtown, Mont.
Dr. T. W. Davies, Swansea.
Mr. J. B. Dobson, Mold, Flints.
Dr. C. E. Harries, Cardiff.
Dr. Wilfred V. Howells, Swansea.
Dr. D. M. Hughes, St. Clears, Carmarthen.
Dr. J. A. Ireland, Shrewsbury.
Dr. A. Maddock Jones, Llandudno.
Dr. J. Griffith Jones, Pontypridd.
Dr. H. C. C. Joyce, Rhiwbina, near Cardiff.
Dr. E. O. Lakey, Rhyl, N. Wales.
Dr. J. O. McCarter, Whitchurch, Salop.
Dr. H. Moffit, Aberdare.
Dr. D. G. Morgan, Cardiff.
Dr. G. P. Williams, Holyhead.
Dr. M. G. Williams, Cardiff.
Dr. Oscar Williams, Llanelly.

II. GROUP COMMITTEES

(NOTE.—One-third of the members of the Group Committees will retire annually by rotation.)

ANAESTHETISTS GROUP COMMITTEE

*Dr. J. F. Bereen, Belfast.
Dr. H. W. Featherstone, Burton-on-Trent.
Dr. A. C. Forrester, Glasgow.
*Dr. T. Cecil Gray, Liverpool.
*Dr. R. P. Harbord, Harrogate.
*Dr. G. S. A. Knowles, London.
Dr. W. Alexander Low, London.
Dr. Z. Mennell, Petworth.
Dr. W. W. Mushin, Cardiff.
Dr. G. Organe, London.
One vacancy.

CONSULTING PATHOLOGISTS GROUP COMMITTEE

Dr. E. N. Allott, Beckenham, Kent.
*Professor D. F. Cappell, Glasgow.
Professor R. Cruickshank, London.
Dr. S. C. Dyke, Wolverhampton.
*Dr. J. D. Allan Gray, London.
Dr. J. G. Greenfield, London.
*Dr. P. Lazarus-Barlow, Hastings.
Dr. W. H. McMenemey, London.
Professor R. J. V. Pulvertaft, London.

DERMATOLOGISTS GROUP COMMITTEE

*Dr. G. W. Bamber, Liverpool.
Dr. R. T. Brain, London.
Dr. F. F. Hellier, Leeds.
Dr. D. Rhys Lewis, Swansea.
*Dr. I. H. McCaw, Belfast.
*Dr. R. M. B. Mackenna, London.
Dr. J. R. Simpson, Exeter.
Dr. J. Ferguson Smith, Glasgow.
Dr. H. J. Wallace, London.
Dr. C. H. Whittle, Cambridge.
Dr. J. E. M. Wigley, London.
Dr. D. I. Williams, London.

FULL-TIME NON-PROFESSORIAL MEDICAL TEACHERS, LABORATORY AND RESEARCH WORKERS GROUP COMMITTEE

Dr. T. Anderson, Glasgow.
Mr. B. N. Brooke, Birmingham.
Dr. J. C. Brundret, Liverpool.
Dr. M. M. Bull, Cambridge.

*Members elected as a result of recent elections.

Dr. H. E. Harding, Sheffield.
Dr. P. D'Arcy Hart, London.
Dr. J. F. Heggie, London.
Dr. M. C. G. Israels, Manchester.
Dr. H. W. Kosterlitz, Aberdeen.
Mr. A. G. R. Lowdon, Edinburgh.
Dr. F. R. Magarey, Cardiff.
Dr. W. R. M. Morton, Belfast.
Dr. C. L. Oakley, Bromley.
Dr. M. R. Pollock, London.
Dr. I. Rannie, Newcastle-upon-Tyne.
Dr. A. H. T. Robb-Smith, Oxford.
Dr. G. R. Tudhope, Dundee.
Dr. Dorothy Woodman, Bristol.
One vacancy.

OPHTHALMIC GROUP COMMITTEE

Dr. H. R. Bickerton, Liverpool.
Mr. N. Cridland, Southsea.
Sir Stewart Duke-Elder, London.
Mr. L. P. J. Evans, Birmingham.
Dr. N. P. R. Galloway, Nottingham.
Dr. R. U. Gillan, London.
*Mr. R. A. Greeves, London.
Dr. J. J. Healy, Llanelly.
*Mr. D. A. Langley, London.
Mr. F. W. Law, London.
Dr. E. G. Mackie, Sheffield.
Dr. J. Marshall, Glasgow.
Mr. O. Gayer Morgan, London.
Dr. V. Purvis, Chesterton, near Bicester.
Mr. A. McK. Reid, Liverpool.
Dr. J. N. Tennent, Glasgow.
Mr. J. W. Tudor Thomas, Cardiff.
Mr. F. O. Walker, Dartford.
Mr. J. R. Wheeler, Belfast.
Together with six members to be appointed by the Council of the Faculty of Ophthalmologists and one member appointed by the General Medical Services Committee.

ORTHOPAEDIC GROUP COMMITTEE

Mr. R. Barnes, Glasgow.
Mr. N. L. Capener, Exeter.
Mr. H. O. Clarke, London.
*Mr. V. H. Ellis, London.
Mr. C. G. Irwin, Newcastle-upon-Tyne.
Mr. S. A. S. Malkin, Nottingham.
Mr. A. B. Pain, Leeds.
*Professor Sir Harry Platt, Manchester.
Mr. Philip Wiles, London.
One vacancy.
President for the time being of British Orthopaedic Association.

OTOLARYNGOLOGISTS GROUP COMMITTEE

Mr. A. D. Bateman, Bath.
Mr. E. D. D. Davis, London.
Mr. R. L. Flett, Derby.
Mr. R. B. Lumsden, Edinburgh.
Dr. J. E. G. McGibbon, Liverpool.
Mr. F. A. MacLaughlin, Belfast.
Mr. R. D. Owen, Cardiff.
Mr. E. Cowper Tamplin, Southsea.
Mr. Donald Watson, Bradford.
Dr. Gavin Young, Glasgow.

PHYSICAL MEDICINE GROUP COMMITTEE

Dr. R. G. Anderson, Cheltenham.
Dr. L. D. Bailey, Northwood.
Dr. P. Bauwens, London.
Dr. F. S. Cooksey, London.
Dr. W. S. C. Copeman, London.
Dr. J. Cowan, Manchester.
Dr. M. H. Jupe, London.
Dr. J. W. T. Patterson, Droitwich.
Dr. W. S. Tegner, London.
Dr. D. Wilson, Bognor.

PSYCHOLOGICAL MEDICINE GROUP COMMITTEE

Dr. N. H. M. Burke, St. Albans.
Professor H. V. Dicks, London.
*Professor D. R. MacCalman, Leeds.
Dr. P. K. McCowan, Dumfries.
*Dr. W. G. Masefield, Eastbourne.
*Dr. Doris Odlum, London.
Dr. J. R. Rees, London.
Dr. T. P. Rees, Warlingham, Surrey.
Professor T. Ferguson Rodger, Glasgow.
Dr. J. Ivison Russell, York.
Dr. W. Rees Thomas, London.

RADIOLOGISTS GROUP COMMITTEE

Dr. G. L. Buckley, Bournemouth.
Dr. J. O. Y. Cole, Londonderry.
Dr. S. Whately Davidson, Newcastle-upon-Tyne.
Dr. J. L. A. Grout, Sheffield.
Dr. R. A. K. Harper, London.
Dr. J. B. King, Edinburgh.
Dr. R. Boulton Myles, Worthing.
Dr. S. D. Scott Park, Glasgow.
Dr. Ralston Paterson, Manchester.
Dr. S. Cochrane Shanks, London.
Dr. J. V. Sparks, Bristol.
Dr. C. G. Teall, Birmingham.
Professor B. W. Windeyer, London.

REGISTRARS GROUP COMMITTEE

Central Group Council to be elected, comprising three members from each hospital region, including one from a teaching hospital and one from a non-teaching hospital.

SPA PRACTITIONERS GROUP COMMITTEE

Dr. R. G. Anderson, Cheltenham.
Dr. J. E. Dawson, Droitwich.
Dr. C. R. Gibson, Bath.
Dr. T. G. Reah, Harrogate.
Dr. R. W. Stewart, Buxton.
Dr. D. Wilson, Bognor Regis.
Dr. W. Yeoman, Harrogate.

TUBERCULOSIS GROUP COMMITTEE

Dr. C. K. Cullen, London.
Dr. T. W. Davies, Swansea.
Dr. P. W. Edwards, Market Drayton, Salop.
Dr. J. E. Geddes, Birmingham.
Dr. F. Hall, Preston.
Dr. R. Y. Keers, Tor-Na-Dee, Aberdeenshire.
Dr. H. Ramsay, Theydon Bois, Essex.
Dr. F. Ridehalgh, Leeds.
Mr. T. Holmes Sellors, London.
Dr. W. H. Tattersall, Reading.
Dr. H. G. Trayer, Manchester.
Dr. J. Norris Whyte, Co. Antrim.

VENEREOLOGISTS GROUP COMMITTEE

*Dr. D. J. Campbell, Sheffield.
Dr. A. H. Harkness, London.
Colonel L. W. Harrison, London.
Mr. A. J. King, London.
Dr. S. M. Laird, Ipswich.
Dr. R. Lees, Manchester.
*Dr. W. N. Mascall, London.
Dr. A. E. W. McLachlan, Bristol.
*Dr. I. N. Orpwood Price, London.
*Dr. Mary Michael Shaw, London.
Dr. C. H. Wilkie, Leicester.
One vacancy.

III. OTHER COMMITTEES

ADVISORY COMMITTEE RE SALARIES OF WHOLE-TIME PUBLIC HEALTH MEDICAL OFFICERS

Dr. C. Metcalfe Brown, Manchester.
Dr. R. G. Cooke, Derby.
Dr. J. M. Gibson, Huddersfield.
Dr. F. Gray, London.
Dr. F. Hall, St. Annes-on-Sea.
Dr. Jean Mackintosh, Birmingham.
Dr. J. A. Stirling, Chesterfield.
Dr. Charles Hill.

REPRESENTATIVE BODY AGENDA COMMITTEE

Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Dr. S. Wand, Birmingham (*Deputy Chairman of Representative Body*).
Dr. A. Beauchamp, Solihull, Warwicks.

*Members elected as a result of recent elections.

Dr. Walter Jope, Blantyre, Lanarkshire.
Dr. R. Cove Smith, London.
Dr. W. Woolley, Bristol.

SPECIAL ARRANGEMENTS COMMITTEE FOR ANNUAL MEETING, 1951

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. C. W. C. Bain, Harrogate (*Immediate Past-President*).
Dr. E. R. Cullinan, London.
The Rt. Hon. Lord Horder, London.
Mr. R. H. Maingot, London.
Sir Heneage Ogilvie, London.
Mr. C. D. Read, London.
Chairmen of the following Committees: Science, Central Consultants and Specialists, General Medical Services, and Public Health.
With power to co-opt.

BUILDING COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. Alexander Brown, Linton, Cambs.
Mr. L. Dougal Callander, Doncaster.
Dr. O. C. Carter, Bournemouth.
Dr. H. Guy Dain, Birmingham.
Dr. P. J. Gibbons, Liverpool.
Miss Annis Gillie, London.
Dr. D. F. Hutchinson, London.
Dr. J. A. Moody, Ilford, Essex.
Dr. J. G. Thwaites, Brighton.
Dr. H. Vickers, Uxbridge.

COMMITTEE ON THE ASSOCIATION OF THE GENERAL PRACTITIONER WITH HOSPITAL WORK

Three representatives appointed by each of the following Committees: Health Centre, Private Practice, Public Health, and General Medical Services.
Six representatives appointed by the Central Consultants and Specialists Committee.

COMMITTEE ON CO-ORDINATION OF POLICY RE REMUNERATION

Chairmen or nominees of the General Medical Services, Private Practice, Public Health, Central Consultants and Specialists, Occupational Health, and Scottish Committees.
Dr. E. A. Gregg, London (*Chairman of Council*).

COMPENSATION AND SUPERANNUATION COMMITTEE

Three members to be appointed by the General Medical Services Committee.
Three members to be appointed by the Public Health Committee.
Three members to be appointed by the Central Consultants and Specialists Committee.

FILM COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Mr. A. Lawrence Abel, London.
Sir Alexander Biggam, Edinburgh.
Mr. V. Zachary Cope, London.
Dr. J. Cottrell, Grimsby.
Dr. P. Hansell, London.
Professor H. R. Hewer, London.
Dr. R. P. Liston, Tunbridge Wells.
Professor G. P. Meredith, Leeds.
Dr. R. G. W. Ollerenshaw, Manchester.
Dr. P. Phillips, Bristol.
Mr. H. Reid, Liverpool.
Dr. J. B. Wrathall Rowe, Wealdstone, Middlesex.
Dr. C. M. Seward, Exeter.
Dr. Angus Weston, Greenford, Middlesex.
Mr. A. Dickson Wright, London.
Chairman or nominee of the Science Committee, together with two representatives of the B.M.S.A.

GENERAL PRACTICE REVIEW COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. H. Alexander, London.
Dr. G. O. Barber, Great Dunmow, Essex.
Dr. L. W. Batten, London.
Dr. Alexander Brown, Linton, Cambs.
Mr. V. Zachary Cope, London.
Dr. H. Guy Dain, Birmingham.
Dr. N. S. Dickson, Templepatrick, Co. Antrim.
Dr. H. R. Frederick, Port Talbot, Glam.
Miss Annis Gillie, London.
Mr. A. Staveley Gough, Watford.
Dr. Ian D. Grant, Glasgow.
Dr. D. M. Hughes, St. Clears, Carmarthen.
Dr. G. W. Ireland, Ford, Midlothian.
Dr. J. A. L. Vaughan Jones, Leeds.
Dr. W. Jope, High Blantyre, Lanarkshire.
Professor Hilda N. Lloyd, Birmingham.
Dr. J. I. Milne, Manchester.
Dr. R. R. Powell, Reigate, Surrey.
Dr. J. O. M. Rees, Guildford, Surrey.
Dr. J. Revans, Southampton.
Dr. A. T. Rogers, Bromley.
Dr. J. A. Stirling, Chesterfield.
Dr. J. G. Thwaites, Brighton.
Dr. C. W. Walker, Cambridge.
Dr. S. Wand, Birmingham.

HEALTH CENTRE COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*)
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. G. O. Barber, Great Dunmow, Essex.
Dr. A. Beauchamp, Solihull, Warwicks.
Professor J. S. English, Newtownards, Co. Down.
Dr. P. J. Gibbons, Liverpool.
Miss Annis Gillie, London.
Mr. A. Staveley Gough, Watford.
Dr. F. Gray, London.
Dr. D. F. Hutchinson, London.
Dr. C. F. R. Killick, Williton, Somerset.
Mr. G. Lowe, Tiverton, Devon.
Dr. G. MacFeat, Douglas, Lanarkshire.
Dr. T. W. Morgan, New Malden, Surrey.
Mr. D. R. Owen, Chester.
Sir Arthur Porritt, London.
Dr. A. Talbot Rogers, Bromley, Kent.
Dr. J. A. Scott, London.
Dr. H. R. Youngman, Cambridge.
Dr. J. Yule, Stockport.
Together with a representative of the General Medical Services Committee and observers of the Ministry of Health.

INTERNATIONAL RELATIONS COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Mr. A. Lawrence Abel, London.
Dr. J. Clayre, Southampton.
Dr. Alfred Cox, London.
Dr. H. Guy Dain, Birmingham.
Dr. S. C. Dyke, Wolverhampton.
Dr. J. C. Matthews, Downton, Wilts.
Dr. G. de Swiet, London.
Chairmen or nominees of the Organization, Journal, Science, General Medical Services, and Colonies and Dependencies Committees, Chairman or nominee of the Committee of Management of the Empire Medical Advisory Bureau, together with a representative of the British Council and of the B.M.S.A.

COMMITTEE ON NUTRITION

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Mrs. M. C. Bowley, Harpenden, Herts.
Dr. G. F. Buchan, London.
Dr. Harriette Chick, Cambridge.

Professor S. J. Cowell, London.
Professor G. P. Crowden, London.
Sir Jack Drummond, Nottingham.
Professor R. W. B. Ellis, Edinburgh.
Mrs. E. Hedley-Prole, London.
The Rt. Hon. Lord Horder, London.
Dr. F. Avery Jones, London.
Dr. Jean Mackintosh, Birmingham.
Professor J. R. Marrack, London.
Professor V. H. Mottram, Shaftesbury, Dorset.
Dr. R. A. Murray Scott, Leeds.
Dr. H. M. Sinclair, Oxford.
Dr. R. E. Smith, Rugby.
Dr. Donald Stewart, Birmingham.
Dr. J. G. Thwaites, Brighton.
Professor John Yudkin, London.
Together with one representative from the Ministry of Health as an observer, with power to co-opt four.

COMMITTEE ON ORGANIZATION OF SCIENTIFIC SECTIONS AT ANNUAL MEETINGS

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Mr A. Lawrence Abel, London.
Professor L. P. Garrod, Harpenden, Herts.
Professor Sir James Spence, Newcastle-upon-Tyne.
Dr. J. G. Thwaites, Brighton.
Dr. J. V. Wilson, Harrogate.
With power to co-opt.

PARLIAMENTARY ELECTIONS COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. S. F. L. Dahne, Reading.
Dr. H. Guy Dain, Birmingham.
Dr. H. R. Frederick, Fort Talbot, Glam.
Dr. F. Gray, London.
Dr. J. G. Thwaites, Brighton.
Dr. S. Wand, Birmingham.
Representative of the Medical Women's Federation.

JOINT COMMITTEE ON FEES FOR PART-TIME WORK UNDER LOCAL AUTHORITIES

Three members to be appointed by the Central Consultants and Specialists Committee.
Three members to be appointed by the Private Practice Committee.
Three members to be appointed by the Public Health Committee.

PUBLIC RELATIONS COMMITTEE

Dr. E. A. Gregg, London (*Chairman of Council*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. H. Guy Dain, Birmingham.
Dr. C. Metcalfe Brown, Manchester (or nominee).
Dr. F. Gray, London.
Dr. W. M. Knox, Glasgow.
Six representatives to be appointed by the General Medical Services Committee.

COMMITTEE ON SALARIES OF MEDICALLY QUALIFIED TEACHERS, ETC.

Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. Janet K. Aitken, London.
Dr. James Fenton, London.
Professor A. C. Frazer, Birmingham.
Dr. G. W. Harris, Cambridge.
Professor A. St. G. Huggett, London.
Dr. M. C. G. Israels, Manchester.
Dr. I. Rannie, Newcastle-upon-Tyne.
Dr. S. Cochrane Shanks, London.
Sir Lionel Whitby, Cambridge.
Together with a representative of the Staff of the Medical Research Council.

COMMITTEE RE REPORT ON SPA TREATMENT

Dr. R. G. Anderson, Cheltenham.
Dr. C. W. Buckley, Ashbourne, Derbyshire.
Professor Sir Henry Cohen, Liverpool.
Dr. J. E. Dawson, Droitwich.
Dr. C. R. Gibson, Bath.
Professor S. J. Hartfall, Leeds.
The Rt. Hon. Lord Horder, London.
Dr. G. D. Kersley, Bath.
Dr. T. G. Reah, Harrogate.
Dr. F. A. Smorfitt, Southam, Warwicks.
Dr. R. W. Stewart, Buxton.
Dr. D. F. Whitaker, Guildford.
Dr. D. Wilson, Bognor Regis.
Dr. H. Barbara Woodhouse, Stanmore, Middlesex.
Dr. W. Yeoman, Harrogate.
Together with Ministry of Health observers.

WAR MEMORIAL COMMITTEE

Professor Sir Henry Cohen, Liverpool (*President*).
Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. J. A. Brown, Birmingham (*Chairman of Representative Body*).
Mr. A. M. A. Moore, London (*Treasurer*).
Dr. H. Guy Dain, Birmingham.
Together with the chairmen or nominees of the Building, Armed Forces, Charities, and Organizations Committees.
With power to co-opt.

COMMITTEE ON PSYCHIATRY AND THE LAW

Dr. F. Bodman, Bristol.
Dr. Denis Carroll, London.
Dr. Hermann Mannheim, London.
Mr. Claud Mullins, Petworth, Sussex.
Dr. Doris Odlum, London.
Dr. T. P. Rees, Warlingham, Surrey
Dr. J. G. Thwaites, Brighton.
With representatives of the Magistrates' Association.

JOINT COMMITTEE OF B.M.A. WITH PHARMACEUTICAL SOCIETY

Dr. E. A. Gregg, London (*Chairman of Council*).
Three members appointed by the Private Practice Committee.
Three members appointed by the General Medical Services Committee.
One member appointed by the Scottish Committee.
Chairman or nominee of the Central Ethical Committee.
Together with representatives of the Pharmaceutical Society.

B.M.A. AND ROYAL COLLEGE OF NURSING LIAISON COMMITTEE

Dr. E. A. Gregg, London (*Chairman of Council*).
Dr. Mary Esslemont, Aberdeen.
Mr. A. Staveley Gough, Watford.
Dr. H. Joules, London.
Mr. M. P. Reddington, London.
Chairmen or nominees of the Central Consultants and Specialists, Private Practice, Central Ethical, Occupational Health, and Public Health Committees.

JOINT COMMITTEE OF B.M.A. AND T.U.C.

Eight members to be selected for any meeting from the following panel:
Mr. A. Lawrence Abel, London.
Dr. H. Alexander, London.
Dr. C. Metcalfe Browne, Manchester.
Dr. J. Cottrell, Grimsby.
Dr. H. Guy Dain, Birmingham.
Dr. Ian D. Grant, Glasgow.
Dr. F. Gray, London.
Dr. E. A. Gregg, London.
Dr. H. F. Hollis, Leeds.
Dr. J. A. L. Vaughan Jones, Leeds.
Professor R. E. Lane, Manchester.
Mr. R. L. Newell, Cheadle, Cheshire.
Dr. R. Nightingale, Stockport.
Dr. Donald Stewart, Birmingham.
Mr. J. W. Tudor Thomas, Cardiff.
Dr. S. Wand, Birmingham.

JOINT FORMULARY COMMITTEE OF B.M.A. AND PHARMACEUTICAL SOCIETY

Four members to be appointed by the General Medical Services Committee.
Two members to be appointed by the Central Consultants and Specialists Committee.
Two members to be appointed by the Science Committee.
Two members to be appointed by the Royal College of Physicians.
Together with representatives of the Ministry of Health.
With power to co-opt.

THE S.H.M.O. GRADE

The following circular has been sent by the Ministry of Health to hospital boards:

Senior Hospital Medical Officers†

The extent to which the medical establishments of hospitals should include senior hospital medical officer posts has been discussed with the profession, and the following paragraphs embody the agreement which has been reached in the fields in which such posts are appropriate.

Future Appointments to Established Consultant Posts

Consultant posts in the medical establishments of hospitals should not be filled by senior hospital medical officers except where, after advertisement, no candidate applies who is regarded as of consultant status by the appropriate Advisory Appointments Committee, but the post cannot be left vacant if the essential needs of the service are to be met.

In these exceptional circumstances, a board should not offer the vacant appointment to one of the applicants as a senior hospital medical officer post, but should take the following steps:

(*a*) consider whether by a rearrangement of the duties of the appointment the field of applicants of consultant status could be extended;

(*b*) if this course is not practicable or fails to attract candidates of consultant status, the vacancy may be readvertised as a senior hospital medical officer post.

Appointment of Part-time General Practitioner to S.H.M.O. Posts

Boards should not overlook the possibility that in some specialties general practitioners may be qualified for part-time appointments on the senior hospital medical officer scale—for instance, as assistant anaesthetists, assistant geriatricians, assistant paediatricians, or as medical officers in charge of small infectious diseases hospitals.

Revision of Establishments: Effect on Existing Officers

Boards should now proceed to revise their establishments, making proper provision for senior hospital medical officer posts in accordance with the principles set out below. Any such revision should not, however, be allowed to affect the personal status of the officers at present holding a post the status of which is changed as a result of the revision. This means that practitioners personally graded as senior hospital medical officers who are holding consultant posts or those personally graded as consultants holding posts which become senior hospital medical officer posts should retain their present personal status. When such a post becomes vacant, however, it should be advertised with its revised status, and a new appointment made in accordance with the grading of the post.

*Specialties in Which Establishments Should Not Provide for Senior Hospital Medical Officer Posts, Except in the Circumstances Set out Below (Such Specialties Being Marked *)*

* Anaesthetics. General medicine. General surgery (including urology, proctology, *orthopaedics, and *ophthalmology). Obstetrics and gynaecology (practised together). Cardiology. Dermatology. Otolaryngology. Neurology. Neurosurgery. *Paediatrics. *Pathology. *Psychiatry and mental deficiency. Plastic surgery. *Radiology. Thoracic surgery.

Specialties in Which Establishments May Provide for Senior Hospital Medical Officer Posts

These specialties are set out in alphabetical order, specifying in each case the type or types of appointment for which senior hospital medical officer posts are appropriate.

Blood Transfusion.—Posts below that of director of regional blood transfusion service.

Diseases of the Chest.—Posts in a restricted part of this field—e.g., limited to routine tuberculosis dispensary work only; posts as medical officers of sanatoria either in charge of small units or below the rank of superintendent in charge; and posts as assistant to a consultant in charge.

Geriatrics.—Posts below the rank of head of a large department; and other posts where the scope for investigation and active treatment or the clinical responsibility is insufficient to justify consultant status.

Infectious Diseases.—Medical superintendents of small hospitals; at other hospitals posts below that rank.

Obstetrics (practised alone).—(1) Posts at antenatal and post-natal clinics. (2) Posts in maternity departments which are under the general supervision of a consultant.

Ophthalmology.—Posts primarily concerned with non-operative work—e.g., refraction.

Orthopaedics.—Posts primarily concerned with non-operative work.

Paediatrics.—Posts at welfare centres and other posts primarily concerned with child welfare.

Physical Medicine.—Post of officer in charge of a small clinic; in large departments posts other than head of the department.

Psychiatry and Mental Deficiency.—(1) Posts of medical superintendent of small institutions; at larger mental institutions some posts below that rank. (2) Posts primarily concerned with limited fields of psychiatry.

Venereal Disease.—As for Physical Medicine.

Specialties in Which Establishments May Provide for Assistantships to Consultants Remunerated on the S.H.M.O. Scale

Anaesthetics.—Hospital establishments should include an adequate complement of widely experienced anaesthetists of consultant status (vide paragraphs 79 to 81 of the pamphlet "Development of Consultant Services"). In addition to this complement of consultants and to trainees, there will often be a need in some hospitals for assistant anaesthetists remunerated on the senior hospital medical officer scale.

Pathology.—The staff of a pathological department should consist of consultants and trainees as appropriate, with a limited field for the appointment of assistant pathologists remunerated on the senior hospital medical officer scale. The complement of consultants must depend on the size of the department, but, in any event, where there are separate sections each in the charge of a pathologist under the general control of the head of the department—e.g., morbid anatomy, biochemistry, haematology, bacteriology, blood transfusion—each should be of consultant status.

Radiology and Radiotherapy.—The establishment of radiodiagnostic or radiotherapeutic departments should include at least one practitioner of consultant status with trainees as appropriate. Where the complement of consultants and trainees is not sufficient to deal with the work of the department, it may be necessary to appoint assistant radiologists of narrower training and with more limited responsibility than the consultant, remunerated on the senior hospital medical officer scale.

Specialties not Mentioned Above.—Boards should not establish any consultant or S.H.M.O. post in a specialty not mentioned above without the approval of the Ministry.

† It should be made clear that, although the term "senior hospital medical officer" is used here and elsewhere as a convenient phrase for identifying and describing a particular grade and salary scale, there is every advantage (provided the grade is made clear) in describing the posts concerned in terms of the specialty involved—e.g., assistant anaesthetist, assistant paediatrician, etc.

ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES

MOTIONS AND AMENDMENTS FROM LOCAL MEDICAL COMMITTEES

Remuneration

MOTION by Middlesex: That this Conference instructs the General Medical Services Committee to request the British Medical Guild to arrange to collect signed resignations forthwith.

MOTION by Buckinghamshire: That this Conference is of the opinion that a more equable distribution of the Practitioners' Fund would result if the capitation fees for that part of a practitioner's list between 500 and 1,500 were loaded, and instructs the General Medical Services Committee to give careful consideration to this opinion and empowers the Committee to act thereon without a further reference to the Conference.

MOTION by Wolverhampton: That this Conference urges the General Medical Services Committee that, in reaching any agreement on arbitration, it should use its best endeavours to ensure that the court is in fact independent.

Mileage

AMENDMENT by Berkshire: That this Conference considers the mileage fee for rural practitioners is still inadequate.

AMENDMENT by Oxfordshire and Oxford: That this Conference expresses dissatisfaction with the amount of mileage remuneration, and instructs the G.M.S. Committee to press for a mileage "pool" of £10,000,000, in which all practitioners shall participate if they have patients beyond two miles from their surgeries.

Basic Salary

MOTION by Gateshead: That this Conference endorses the Committee's view that appeals against the non-award of basic salary shall be addressed to the Medical Practices Committee and not to the Minister of Health, and instructs the Committee to continue to press this point.

Maternity Medical Services

AMENDMENT by Worcester City: That it is the opinion of the Conference that the sending by post to the patient of a request to attend by appointment should be deemed to constitute a serious attempt to carry out a post-natal examination.

MOTION by Middlesex: That this Conference is of the opinion that maternity cases should be accepted at clinics or hospitals only on the recommendation of the general practitioner.

General Practitioners and Hospital Maternity Units

MOTION by Newcastle-upon-Tyne: That more beds should be made available in hospital maternity units for general-practitioner obstetricians.

Maternity Medical Services—Range of Treatment

AMENDMENT by Middlesex: That this Conference does not accept the view of the Ministry as stated in paragraph 52, and instructs the General Medical Services Committee to press for a special fee for circumcision.

Mileage in Maternity Cases

AMENDMENT by Bedfordshire: That in mileage areas the payment for mileage should be 3s. per outward mile in excess of two miles in all maternity cases irrespective of whether the full service, Part I, Part II, or any lesser service is given.

Constitution and Procedure of Medical Service Committees

AMENDMENT by Gateshead: That with reference to paragraph 74 of the Committee's report, where an inquiry by the Medical Service Committee is deemed necessary, such inquiry shall be held within three months from the date on which the complaint is lodged.

Publicity for Disciplinary Cases

AMENDMENT by Worcester City: That this Conference considers that the Ministry's reply on the subject of publicity in disciplinary proceedings is unsatisfactory, and requests the General Medical Services Committee to press further for the exclusion of the doctor's name from the published decision of the tribunal.

Co-operation Between Hospital and General-practitioner Services

MOTION by York: That this Conference views with grave concern the absence of co-operation between the regional hospital boards and the general-practitioner service, and strongly urges the General Medical Services Committee to take steps to remedy this unsatisfactory state of affairs.

Remuneration of General Practitioners on the Staffs of Cottage Hospitals

MOTION by Durham: That this Conference is of opinion that the remuneration of general practitioners on the staffs of cottage hospitals with large out-patient departments should include a payment, as provided for in paragraph 10 (*b*) of the Terms and Conditions of Service for hospital medical and dental staff (England and Wales), in addition to the normal remuneration based upon the number of occupied beds.

Specially Expensive Drugs

MOTION by Worcester City: That *all* types of supporting and corrective pessaries should be added to the list of specially expensive appliances for the supply of which dispensing doctors paid by capitation fee may receive payment over and above such fee.

List of Appliances

MOTION by Worcester City: That *all* types of supporting and corrective pessaries should be added to the list of appliances which general practitioners can prescribe for their patients.

Trainee Assistants

MOTION by Lancashire: That this Conference deplores the continuation of the Trainee Assistant Scheme, and instructs the General Medical Services Committee to secure its abolition.

Fees for Dental Anaesthetics

AMENDMENT by Worcester City: That this Conference is of the opinion that practitioners called upon to administer anaesthetics for dentists should insist upon receiving the full fee laid down in the Regulations prior to the recent cut in dentists' remuneration.

Frivolous and Unjustified Emergency Calls

MOTION by Gateshead: That, with reference to paragraph 163 of the Committee's report, the attention of the meeting be drawn to the fact that, up to the present, all Government propaganda has urged the public to make more use of the doctor and not less.

MOTION by Middlesex: That this Conference instructs the General Medical Services Committee to demand from the Ministry the formulation of rules for patients to prevent frivolous calls on the services of general practitioners and that these rules be printed on the Medical Card.

Reinstatement of Demobilized Service Personnel in Doctors' Lists

AMENDMENT by Middlesex: That this Conference does not accept the Ministry's statement, and urges the General Medical Services Committee to take this matter up again.

School Health Service and the General Practitioner

AMENDMENT by Middlesex: That under no circumstances should a local health authority medical officer refer a school-child to any specialist (other than for ophthalmic examination) unless requested (in writing) to do so by the child's family doctor.

Aftercare

AMENDMENT by Middlesex: That this Conference considers the present system whereby health visitors attend mothers, children, and others without the knowledge of the family doctor to be against the best interests of the persons visited.

Arrangements for Practice in a National Emergency

MOTION by Hampshire: That this Conference is concerned about the calling up of doctors in the event of hostilities, and urges the General Medical Services Committee to arrange with the appropriate authority that the doctors who are on the Reserve by reason of their having served in the last war are not called up at once, to the detriment of their practice, pending the call-up of other medical men.

MOTION by Hampshire: That this Conference instructs the General Medical Services Committee to arrange with the Ministry that in the event of war all medical practitioners engaging in practice in an area other than their own shall automatically be placed on a special list of the executive council of that area. The executive council shall have power to remove their names from its list at the end of hostilities.

Superannuation

MOTION by Bedfordshire: That when a practitioner retires or dies before becoming entitled to superannuation the Government contributions of 8% plus interest should be paid to the practitioner or his personal representative in addition to his own contributions of 6% plus interest.

MOTION by Lancashire: That the method of calculating the superannuation to which a doctor becomes entitled should ensure that there is no reduction of the amount of the superannuation by reason only of the employment of an assistant.

Financial Position of Elderly Practitioners

MOTION by Cambridgeshire: that the attention of this Conference is drawn to the plight of many elderly practitioners who are unable to retire on account of financial stringency; and that approach be made to the Minister of Health to investigate the possibility of financial aid for these practitioners to enable them to retire.

Compensation

MOTION by Hampshire: That this Conference, seriously disturbed at the continued delay in fixing the amount of compensation payable to individual doctors for their practice, recommends that an adequate sum from the Compensation Fund be set aside to meet the claims not yet agreed. The balance, to be divided among the agreed claims, would raise considerably the compensation value of their practices, which up to now has been arbitrarily fixed at one year.

MOTION by Isle of Wight: That the amount of repayment of capital value of practice payable on retirement be subject to increment or decrement according to the then value of the £ relative to the £ in 1948.

Appointment of Part-time Regional Medical Officers

MOTION by Bristol: That appointments of part-time regional medical officers shall be made only after consultation with local medical committees in the area, as is the case with appointments of part-time regional medical officers of the Ministry of National Insurance and the Ministry of Labour and National Service.

Prescribing and Dispensing—Dispensing Capitation Fee

MOTION by Durham: That this Conference begs to draw the attention of the Minister to the very great discrepancy between the sum of 6s. 6d. per annum (plus special drug payment) per patient granted to dispensing practitioners for the supply of drugs and the sum of 15s., which is the appropriate cost to the Exchequer of supplying drugs to each prescribing patient.

Status of General Practitioners

MOTION by East Riding of Yorkshire: That in any negotiations with the Minister it should be impressed on him that the dissatisfaction of the profession with the National Health Service is not limited to the question of remuneration, but also includes the conditions of service and the tendency to lower the status of the general practitioner.

Removal of Names from Doctors' Lists

MOTION by East Sussex: That this Conference requests the General Medical Services Committee to make representations to the Minister with a view to obtaining the amendment of Form E.C.22A in order to include the information which was contained in National Health Insurance Form G.P.34 (Green), thereby enabling a practitioner to know when a patient has transferred to another practitioner in the neighbourhood of his practice.

Alteration of Terms of Service

MOTION by Berkshire: That it is desirable that the General Medical Services Committee should consult local medical committees in all cases before agreeing to changes in or additions to regulations affecting general practitioners.

Appreciation of Work of G.M.S. Committee

MOTION by Buckinghamshire: That this Conference is impressed by the immense field of work which has been covered in the past year by the G.M.S. Committee and expresses its appreciation of the results so far obtained. It wishes to place on record that the efforts of the committee are steadily improving the working of the National Health Service.

MOTION by Devon and Exeter: That this Conference congratulates the General Medical Services Committee on the vast amount of work which it has achieved during the last year and on the success which has crowned its efforts in so many of the problems which it has tackled.

Secretaryship of G.M.S. Committee

MOTION by Wolverhampton: That this Conference considers that it is absolutely essential, in view of the approaching conflict, that the secretary of the General Medical Services Committee should have ample G.P. experience.

H.M. Forces Appointments

ARMY

Colonel W. C. Mackinnon, late R.A.M.C., having reached the age limit for retirement, has been retained on the Active List supernumerary to establishment.

Lieutenant-Colonel W. G. S. Foster, O.B.E., from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Major W. Stewart, M.B.E., to be Lieutenant-Colonel.

Captains J. P. Scrivener, M.B.E., and H. D. G. Hetherington to be Majors.

War Substantive Captain A. C. Byles has relinquished his commission and has been granted the honorary rank of Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major F. G. L. Dawson, having attained the age limit of liability to recall, has ceased to belong to the Regular Army Reserve of Officers.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels (acting Colonels) G. E. Parker, D.S.O., F. R. Langmaid, O.B.E., T.D., and H. Sissons, O.B.E., T.D., to be Colonels.

Major (acting Colonel) W. H. D. Patterson, T.D., to be Colonel.

Lieutenant-Colonel G. Rigby-Jones, M.C., to be acting Colonel.

Lieutenant-Colonel H. J. Croot has resigned his commission.

Majors (acting Lieutenant-Colonels) R. Passmore, P. G. McGrath, M. J. Lindsey, M.C., F. J. Manning, T.D., W. D. F. Lytle, O.B.E., M. W. Gonin, D.S.O., T.D., and J. Smith, O.B.E., T.D., to be Lieutenant-Colonels.

Majors C. J. Wells, M.B.E., C. Berens, and J. R. Macintyre to be acting Lieutenant-Colonels.

Captains (acting Majors) D. T. Rowlands and C. S. McKendrick to be acting Lieutenant-Colonels.

Captains P. B. Williams and M. C. L. Smith, M.C., to be Majors.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: E. J. Bury, M.R.C.S., L.R.C.P., D.P.H., D.T.M.&H., Director of Medical Services, Gambia; G. I. Shaw, M.M., M.B., Ch.B., D.P.H., D.T.M.&H., Deputy Director of Health Services, Hong Kong; G. B. Smart, M.B., F.R.F.P.S., D.P.H., D.T.M.&H., Pathologist, Hong Kong; K. H. Uttley, M.D., D.T.M.&H., Deputy Director of Medical Services, Hong Kong; K. C. Yeo, M.D., D.P.H., D.T.M.&H., Deputy Director of Medical and Health Services, Hong Kong; C. R. Subryan, M.B., D.P.H., Deputy Director of Medical Services (Health), British Guiana; W. G. L. Allan, M.B., Medical Officer, Tanganyika; K. W. Blaikie, M.B., Medical Officer, Uganda; S. G. Cowper, B.S., Ph.D., D.T.M., Pathologist, Mauritius; C. E. Gorrod, M.B., Ch.B., D.P.H., Medical Officer of Health, Kenya.

Association Notices

Diary of Central Meetings

OCTOBER

16	Mon.	Armed Forces Committee, 2 p.m.
18	Wed.	Publishing Subcommittee, 11 a.m.
18	Wed.	Welsh Committee (at Lion Hotel, Shrewsbury), 2.15 p.m.
19	Thurs.	Dermatologists Group Committee, 10.30 a.m.
19	Thurs.	Radiologists Group Committee, 2 p.m.
20	Fri.	Charities Committee, 2 p.m.
25	Wed.	Central Council of the Registrars' Group, 2 p.m.
27	Fri.	Consulting Pathologists' Group Committee, 2 p.m.

NOVEMBER

1	Wed.	**Council**, 10 a.m.

Branch and Division Meetings to be Held

CHESTERFIELD DIVISION.—At Chesterfield Royal Hospital, Friday, October 13, 8.45 p.m., presidential address by Dr. R. R. Lane: "Some Reflections on General Practice."

GREENWICH AND DEPTFORD DIVISION.—At Miller Hospital, Greenwich High Road, London, S.E., Friday, October 20, 8.45 p.m., meeting.

LEWISHAM DIVISION.—At Miller Hospital, Greenwich High Road, London, S.E., Friday, October 20, 8.45 p.m., joint meeting with Greenwich and Deptford, and Woolwich Divisions.

NORTH OF ENGLAND BRANCH.—At New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, October 19, 7.15 p.m., clinical demonstration by Mr. F. Braithwaite: "Some Principles of Plastic Surgery"; 8.45 p.m., address by Mr. L. W. Plewes: "Hand and Finger Infections."

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, October 16, 9 p.m., Professor Wilfrid Gaisford (Manchester): "Infections in Children."

STRATFORD DIVISION.—At Queen Mary's Hospital for the East End, West Ham Lane, Stratford, London, E., Tuesday, October 17, 8.30 p.m., clinical meeting.

SWANSEA DIVISION.—At Swansea General Hospital, Thursday, October 19, 8 p.m., clinical meeting.

SWINDON DIVISION.—At Goddard Arms, Swindon, Wednesday, October 18, 7.30 for 8 p.m., dinner. Address by Dr. Keith Simpson: "Crime and the Doctor."

British Medical Guild Meetings to be Held

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, London, S.W., Friday, October 20, 8.45 p.m.

ISLE OF WIGHT.—At Whitecroft Hospital, Newport, Isle of Wight, Sunday, October 15, 11.30 a.m., formation of local Guild Committee, etc. All Island medical practitioners are invited to attend.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY OCTOBER 21 1950

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

RELATIONSHIP TO JOINT COMMITTEE AND WHITLEY MACHINERY

A meeting of the Central Consultants and Specialists Committee was held at B.M.A. House, London, on October 5. It was intimated that Mr. R. L. Newell, who has been chairman of the Committee since its formation, did not seek re-election to the chair, owing to his many commitments and his recent appointment as dean of postgraduate medical studies, Manchester University. The Committee passed a warm vote of thanks to Mr. Newell for his exceptional services in the chair. Dr. T. ROWLAND HILL was elected chairman of the Committee in Mr. Newell's stead.

Mr. KINDERSLEY took the chair before Dr. Hill was formally elected, and he presided during a preliminary discussion on the relationship of the Committee to the Joint Committee and the Whitley machinery. He reminded the Committee that the Joint Committee was formed in order that consultants and specialists might speak with one voice. Six of its members were appointed from the Central Committee. The relationship had been friendly and satisfactory.

After a brief discussion the relationship to the Joint Committee was reaffirmed.

The chairman then introduced the question of the Whitley machinery. Those who had attended the meetings of the Whitley Council, he said, were learning how to do the work, and it would be a pity, at this early stage, to disturb the arrangement.

It was pointed out that, as the Central Committee had reaffirmed its position in relation to the Joint Committee, it seemed to follow that the latter had the confidence of the Commitee in this respect also, and would automatically continue as the staff side of Whitley. It was understood that the Joint Committee would report from time to time on what had been done, and thus what was happening in the Whitley negotiations would be made known.

In reply to a question whether the staff side of Whitley had the power to commit the profession generally, the CHAIRMAN (Mr. Kindersley) pointed out that once an agreement had been reached it was, of course, binding, and he went on to make a serious plea that those who were concerned in these negotiations should be trusted to look after the interests of the profession. If everything had to be referred back to the individual organizations, which in turn might decide that it must go to the regions, they would get nowhere.

The Secretary pointed out that the Joint Committee made certain that it was expressing the point of view of the profession, going back to it on any item on which it felt doubt. Mr. LAWRENCE ABEL also said that members might feel assured that anything of a major nature would not be agreed without prior consultation with the committee. A member expressed the hope that that statement would be emphasized, because it would carry great reassurance. It was agreed that the present position be continued.

Review of Grading

Dr. ROWLAND HILL, who was now in the chair, presented a report of the Executive Committee. The recent Representative Meeting had expressed dissatisfaction with the composition of the former grading committees. The Executive Committee felt that in view of the Ministry's undertaking to carry out a review of practitioners originally graded S.H.M.O. in the latter half of 1951 there would be no possibility of persuading the Ministry to reconsider the grading of individual practitioners before such revision, but it felt that the time had now come when the Ministry should be pressed to announce the date of the 1951 review. The Committee endorsed the view of the Representative Body that the review of grading should be extended to include general practitioners working in hospitals under para. 10(b) of the Terms of Service; also that the Joint Committee be urged to consider and discuss with the Ministry the procedure to be adopted in carrying out the review.

At its previous meeting the Central Committee received representations from the Public Health Committee of the Association that in two regions medical officers of health who were in charge of isolation hospitals had been graded as to their clinical status by a professional committee on which consultants in infectious diseases were not represented. The Ministry had been questioned on this matter and had replied that in both the regions concerned the treatment of infectious diseases was regarded as a branch of general medicine, not as a separate specialty, and in these circumstances, especially as so long a time had elapsed since the gradings, it was not considered right to intervene.

It was pointed out in the Committee that the diagnosis and treatment of infectious diseases had been recognized both by the Ministry and the profession as a separate specialty, and that it should not be open to a regional board to act in a manner inconsistent with this decision; nor was it felt that the lapse of time was a sufficient excuse to prevent any rectification. It was agreed to bring these views to the attention of the Ministry and to ask that rectification should be retrospective.

The Committee devoted some time to the detailed consideration of the N.H.S. (Appointment of Specialists) Regulations recently issued by the Ministry and also to the regulations on the procedure to be adopted in the case of registrars. Among other proposals which the Committee resolved to put forward was that the medical staff of the hospital or group of hospitals concerned in the appointment of a specialist should have at least three representatives on the appointments committee, one of whom should, if practicable, be in the same specialty as the practitioner to be appointed.

On the question of registrars the suggestion was made that, in general, registrars should be appointed to teaching and non-teaching hospitals jointly, spending a period of their tenure in a hospital under a board of governors and another period in a hospital under a regional board. Mr. KINDERSLEY said that registrars were just as valuable in non-teaching hospitals as in teaching, and in both classes of institution they would get useful experience. The idea of this interchange was opposed by some members on the grounds of practicability, but the general view was accepted that an arrangement could be made regionally between teaching and non-teaching hospitals whereby a period in the last year of the senior registrar's appointment might be spent in each of the two classes of hospital. Any procedure whereby a registrar who had not been in a teaching hospital would be prejudiced in seeking a consultant appointment was to be deprecated. To institute a shuttle service of some kind was thought not to be impracticable.

The Committee as usual had a long agenda of more than 50 items, including such matters as study leave, private beds, medical administration, domiciliary consultations, advisory committees, mileage payments, and superannuation, which occupied it for the whole day. Some important matters were referred for special discussion at the next meeting.

SIXPENCE CHARGE FOR PRESCRIPTIONS

NEW REGULATIONS IN MANX HEALTH SERVICE

Tynwald, the Isle of Man parliament, has approved new regulations in response to the call for economy that followed the presentation of an estimate of £800,773 for the National Health Service in the island this year. Since October 1, chemists are required to charge sixpence for every form of prescription for medicine, and extra for every medicine bottle or carton unless the customer provides his own container. Dentists are entitled to 10% of the amount by which fees for their services under the scheme exceed £1—in other words, for 30s. worth of treatment the patient pays one shilling. All children under school-leaving age, irrespective of the school they attend, receive free treatment through the Health Service only from the dental officers at the school clinic. Parents who prefer to select a private dentist for their children must pay for the treatment at the ordinary fee. Amounts paid to chemists and to dentists under the new regulations will be deducted from the fees paid to them by the Health Service Board.

The provisions were opposed on behalf of the dentists' and chemists' associations. The Isle of Man Medical Association (there are over sixty doctors on the Island) also petitioned against the draft regulations, on the ground that they were capable of abuse, or liable to cause confusion or embarrassment between doctor and patient. No limit was provided to the amount that could be put on one prescription form, and under the old Health Insurance system several prescriptions were often written on one form. In some cases doctors dispensed their own medicines, but no allowance had been made for this.

In reply, Mr. T. C. Cowin, chairman of the Health Service Board, said that the charge of sixpence was for one form, which might have three or more prescriptions on it if it related to only one person. A doctor did not prescribe for people *en masse*; he prescribed individually. The charge of sixpence would act as a deterrent to people who, because they were getting the service free, tried to "cash in" whether they wanted it or not. Provision was made whereby the board could exempt old people or young people suffering exceptional hardship. But the board would evolve a system by which the chemist could know who was exempt. He disagreed with the argument that the scheme should not be adopted because England had intended to charge a shilling but had been unable to put the charge into effect. Why had they to wait for England? The chemists had suggested that the doctors should collect it, but the chemist had a shop, a cash register, and change.

Refusal to Comply

Both the chemists and the doctors are reported to be refusing to comply with the Health Board's regulation. After the meeting of the executive committee of the Isle of Man Medical Society a spokesman said the doctors would support the Chemists' Association in their stand against what he described as the "arbitrary and improper" action of the Medical Service Board in introducing new regulations without adequate prior consultation with the Advisory Council constituted by the Act.

"The Society views with grave alarm," the spokesman said, "the state of chaos in which the Health Services are now operated in the Isle of Man, and we are anxious to avert a complete breakdown of the scheme. The Advisory Council is composed of professional men and laymen, and it should be consulted before any fundamental changes are made, otherwise the whole scheme is doomed to failure."

On October 6 the Manx Chemists' Association decided on a "united front with the doctors." The following statement was issued by Mr. Charles H. Kerruish, the honorary secretary:

"Acting on information not available at the extraordinary general meeting of the association of Thursday, October 5, the committee of the Manx Chemists' Association felt compelled to contact all members of the association and place the facts before them. As a result it was unanimously agreed by all members contacted that the committee on behalf of its contacted members should issue an official notice as follows:

"'Manx Chemists' Association: official notice. The public will not be called upon to pay the sixpenny prescription form or the container charge until further notice by members of the Manx Chemists' Association. By order of the committee, Chas. H. Kerruish, honorary secretary. This is the only official notice issued by the above association.'"

C.M.S. SALARIES IN EAST AND CENTRAL AFRICA

The Uganda Government has agreed to implement the proposals for improvements of salaries in the Colonial Medical Service recently negotiated between the British Medical Association and the Colonial Office. The new salaries, which will date from July 1 last, are as follows:

Director of Medical Services	£1,950
Deputy Director of Medical Services ..	£1,775
Medical Superintendent, Mulago ..	£1,725
Assistant Director of Medical Services	£1,700
Senior Medical Officer	£1,650
Medical Officer	£865; £865; £935 by £35 to £1,005 (EB) by £45 to £1,140 (PB) by £45 to £1,320 (EB) by £45 to £1,590

(EB = Efficiency Bar; PB = Promotion Bar)

Proposals about specialist salaries are under consideration.

Discussions are still proceeding with the Governments of Northern Rhodesia and Zanzibar.

ADDITIONS TO LIST OF SPECIAL DRUGS

In response to representations made by the B.M.A. the Minister of Health has included the following drugs in the list of those for which doctors receive payment over and above their capitation fee: streptomycin and preparations of streptomycin; dihydrostreptomycin and preparations of dihydrostreptomycin; *para*-aminosalicylic acid.

Vitamin B_{12} is now included in "liver extracts and the active principles of liver."

REMUNERATION OF MEDICAL ADMINISTRATIVE OFFICERS OF REGIONAL HOSPITAL BOARDS, MEDICAL SUPERINTENDENTS, AND REGIONAL PSYCHIATRISTS

Following earlier discussions with the Ministry on the remuneration of these officers, it was decided that the Joint Consultants Committee's claim for a review of the exising scales should be referred to the Whitley Council. The staff side of Committee B of the Medical Functional Council has now tabled its claim, and the first meeting with the management side took place recently. The management side has asked for further time in which to consider the claims, and discussions will be resumed early in December.

MATERNITY MEDICAL SERVICES

The Minister of Health has been considering, in consultation with the representatives of the medical profession, the payments to be made by executive councils in the case of women who have made arrangements to be confined at a hospital and to have the necessary antenatal care there, but who find themselves unable to attend there because of some complication arising out of pregnancy and call in their own general practitioner or a general-practitioner obstetrician. It has been agreed that in cases of this kind the general practitioner should be able to enter into arrangements and claim payment under the maternity medical services, the payment to be at the rate of 10s. 6d. (7s. 6d. if the doctor is not a general-practitioner obstetrician) for each time the doctor sees the patient in connexion with the treatment required—i.e., the same payment as for a single antenatal examination, with an overriding maximum of the full Period I fee.

The following conditions would normally qualify for this extra payment in these cases: toxaemia of pregnancy, antepartum haemorrhage (when not an "obstetric emergency"); any pelvic or vulval abnormality arising out of pregnancy; genito-urinary infections; hyperemesis gravidarum. If in doubt the executive council should consult the local obstetric committee and accept their advice.

WHITLEY COUNCILS FOR THE HEALTH SERVICES

The Ministry of Health announces that Professional and Technical Council "B" has agreed the salaries to be paid to assistants in dispensing. These range from £110 p.a. at age 16 to £290 p.a., with annual £10 increments, to £370 commencing at 22. They have also decided the circumstances under which technicians in physics departments may be paid the higher rates appropriate to medical laboratory technicians.

GENERAL MEDICAL COUNCIL

INCREASE OF REGISTRATION FEES

A special meeting of the General Medical Council was held in London on October 10, with the president in the chair, for the principal purpose of deciding upon an increase of fees for first registration under the Medical Acts.

Three new members were introduced and took their seats—namely, Dr. Walter Russell Brain, representing the Royal College of Physicians of London, Professor Hilda Lloyd, representing the Royal College of Obstetricians and Gynaecologists, and Professor J. W. McLeod, representing the University of Leeds.

Professor Hilda Lloyd is the first woman to take her seat on the General Medical Council. The late Dr. Christine Murrell many years ago was elected a direct representative, but died before she could take her seat.

The Council decided that in the exercise of the powers conferred upon it under Section 24 of the Medical Act, 1950, on and after October 11 the amount of the fees payable on first registration under the Medical Acts should be eleven guineas, whether application for registration is made by virtue of qualifications granted in the British Isles, of recognized qualifications granted elsewhere in the Commonwealth, or of recognized qualifications granted in foreign countries. Fees for the registration of additional qualifications, including the D.P.H., will not be increased.

The Council considered certain matters *in camera*. No disciplinary business was taken.

JOINT ANNUAL MEETING, 1951

Members of the B.M.A. wishing to attend the Joint Annual Scientific Meeting with the Medical Association of South Africa in Johannesburg next July are offered a wide choice of travel arrangements. The various itineraries which have been prepared are being sent to those who have provisionally notified their intention to attend the meeting. Any other members who would like to receive them are asked to make immediate application to the Secretary of the Association at B.M.A. House.

The Organizing Committee in Johannesburg has urgently requested information on the numbers likely to travel by the different routes and on the wishes of members in regard to accommodation in Johannesburg during the period of the meeting. The committee is anxious also that the B.M.A. should proceed at once with the appointment of certain officers of the Scientific Sections, and these appointments must be completed in the near future. For these reasons members who are thinking of going to the Joint Meeting and have not yet notified the Secretary are particularly requested to do so immediately. They will then receive detailed information about travel arrangements, costs, etc., and will be asked to complete and return a registration form at an early date.

GENERAL MEDICAL SERVICES COMMITTEE

ELECTION OF DIRECT REPRESENTATIVES, 1950–1

The following direct representatives upon the General Medical Services Committee have been *elected unopposed* for the Groups mentioned:

Group A1
Dr. J. T. Baldwin (Penicuik, Midlothian).

Group A3
Dr. J. R. Langmuir (Glasgow).

Group A4
Dr. R. C. Hamilton (Kilmarnock).

Group H
Dr. A. B. Davies (Walsall).

Group I
Dr. F. A. Smorfitt (Southam, Warwickshire).

Group J
Dr. C. F. R. Killick (Williton, Somerset).

Group K
Dr. R. W. McConnel (Wendover, Bucks).

Group L
Dr. J. D. R. Murray (Exmouth, Devon).

Group M
Dr. J. C. Pearce (Diss, Norfolk).

Group N
Dr. H. S. Howie Wood (Isle of Wight).

Group O
Dr. D. F. Whitaker (Guildford).

Group P
Dr. A. W. Gardner (Lewes, Sussex).

Group Q
Dr. A. T. Rogers (Bromley, Kent)

Group R
Dr. D. F. Hutchinson (Middlesex).
Dr. A. N. Mathias (London, N.W.2).

Group S
Dr. J. L. McKenzie Brown (London, E.18).
Dr. C. M. Scott (New Barnet, Herts).

Group T
Dr. Max Sorsby (London, E.5).
Dr. H. H. D. Sutherland (London, W.10).

Group U
Dr. J. B. Young (Belfast).

In the contested Groups—namely, A2, B, C, D, E, F, and G—the results were as follows:

Group A2
Dr. C. J. Swanson (Aberfeldy, Perthshire). *Elected.*
Dr. I. M. Macleod (Inverness).

Group B
Dr. J. C. Arthur (Gateshead). *Elected.*
Dr. F. Lishman (Bishop Auckland). *Elected.*
Dr. H. Dickie (Morpeth, Northumberland).
Dr. F. J. Stevenson (Carlisle).

Group C
Dr. H. F. Hollis (Leeds). *Elected.*
Dr. H. Thorp (Todmorden, Yorks). *Elected.*
Dr. R. H. Sunderland (Bradford).

Group D
Dr. A. Campbell (Accrington, Lancs). *Elected.*
Dr. P. J. Gibbons (Liverpool). *Elected.*
Dr. S. A. Winstanley (Urmston, Manchester). *Elected.*
Dr. J. Stewart (Blackpool).

Group E
Dr. J. B. Bennett (Hyde, Cheshire). *Elected.*
Dr. I. M. MacAlister (Wallasey).

Group F
Dr. D. B. Evans (Wrexham). *Elected.*
Dr. A. E. Jenkins (Pontypridd). *Elected.*
Dr. A. Maddock Jones (Llandudno).

Group G
Dr. E. W. Goodwin (Leicester). *Elected.*
Dr. A. S. Wilson (Gosberton, Lincs). *Elected*
Dr. E. J. Allan (Glossop).

Correspondence

Tribunal and Medical Services Committees

SIR,—Among the many vigorous and constructive decisions of the Representative Body at Southport was a directive to Council to make a thorough examination, with legal assistance, of the status, composition, procedure, and functioning of the medical service committees and tribunal and to report before the end of this year. The decision was unanimous, and it is therefore safe to assume that this subject is of topical as well as permanent interest to the profession. Having given some study to the matter, and fortified myself with some eminent legal advice, may I be permitted to express an opinion on the problem as I see it, in the hope of provoking informed comment?

It must be admitted at once that the system, as we know it, is in line with systems which have in recent years been inflicted upon other branches of the national life. It cannot be fully considered in isolation, and, indeed, it is only a small part of a problem which is keenly exercising the minds of many people inside and outside Parliament: How far is it in the best interests of the country that powers which have hitherto belonged only to the judicature should be allowed to pass into the hands of Ministers of the Crown? It is generally admitted that, in a state of national emergency, some such transference of power is inevitable, and that tribunals, courts martial, and other devices for obtaining summary justice must be accepted as a necessary evil; but it would be a tragic and retrograde step if England were to allow more orderly processes of justice, which are the pride of our democracy and the envy of the civilized world, to be permanently displaced in peacetime by arbitrary and hastily conceived expedients.

Some doctors, with understandable modesty, argue that this is a legal problem and that they have not the technical training to discuss it. Surely they are mistaken. The laws of England are made by Parliament, which is by no means composed of lawyers. Others argue that it is only doctors like "that horrid fellow X" who come within the clutches of the disciplinary system. But this is not so. I am convinced, after two years' service on a medical services committee, that A or B or C or any other doctor trying to do his job in an imperfect world is just as likely to be caught up in the toils of this machine. It only requires that we should do something to arouse the anger of some spiteful type of patient to become the object of an attack which will at the best involve us in great trouble and anxiety and which may lead to much more serious consequences.

The whole system at present in operation is so widely at variance with the accepted principles of justice that it is hard to criticize it constructively. At no level is it related to the judicial system of the country, so that erroneous interpretations of the law are probable. Evidence before the services committees is not taken on oath and there is no penalty for false statements, so that errors on questions of fact are all too possible. At no level do the provisions ensure that those called upon to judge disputes are independent or unbiased in their approach. Perhaps the most calamitous feature of the whole set-up is that it is, from top to bottom, an instrument of ministerial power which can be guided and modified by political considerations.

It would seem impossible to modify the system adequately by minor alterations in the regulations. A fresh approach to the whole matter is necessary and no doubt new legislation will be required. It may be that the best solution is to replace the services committees with judges of the High Court holding court on circuit in the various county towns of England, aided perhaps by lay and medical assessors, with an independent central court of appeal, properly constituted as such.

No doubt this thorny question will receive the attention of the newly reconstituted Amending Act Standing Committee of the B.M.A.—I am, etc.,

Orpington, Kent. A. C. E. BREACH.

Obligation to Emergency Cases

SIR,—As a single-handed practitioner it is my custom to leave my name and seat number at the office when I visit the theatre. I therefore have some 1,500–2,000 extra patients at risk during my leisure hours. I think the least the executive council can do would be to provide a box free of charge in the theatre, with medical equipment. It also occurs to me that I have my neighbours' private patients "at risk" to me also, as their doctors have no legal obligation to attend them, so my potential list must be a third greater than that for which I am paid.—I am, etc.,

Liverpool, 17. H. M. BLAQUIERE.

SIR,—May I try to relieve Dr. H. M. Harris's distress (*Supplement*, September 30, p. 141) by pointing out that Dr. X was charged (see *Supplement*, September 2, p. 120) not with violating any canon of humanity, not with betraying his vocation, but with a breach of his terms of service? Dr. X's nose appears to have been well and truly rubbed in one paragraph of the official terms of service. It seemed to me that on a purely legalistic point it was not clear that the paragraph was at all applicable, and I am still hoping that some colleague learned in the law will let us have his views on that one point.

The verdict against Dr. X seems to render every one of us liable to a heavy fine if we fail to respond instantly and in all circumstances to the demand by any flurried layman that we attend an accident.—I am, etc.,

Launceston, Cornwall. DONALD M. O'CONNOR.

SIR,—I am surprised and shocked at Dr. J. G. McDowell's letter under the above heading in the *Supplement* of September 16 (p. 135).

Apart from any considerations of "availability" or "terms of service," common sense, humanity, and the traditions of the profession all dictate that a doctor summoned to a serious road accident should go at once, unless either he is too ill to go or a patient he is attending at the time cannot safely be left. If two or more patients make a demand upon the same doctor at the same time, the doctor's first obligation is to the patient whose need is the more urgent. All this is, to me, so obvious that I am surprised that anyone with any regard for the reputation of the profession should even be in doubt on the subject.—I am, etc.,

Aylsham. JOHN SAPWELL.

Difficulties of the G.P.

SIR,—I would like to reassure Dr. J. A. Frais (*Supplement*, September 9, p. 128) and agree that the difficulties of G.P.s should be presented to the public fully and in every possible way. I still maintain, however, that statements such as the particular one referred to in my letter (*Supplement*, July 29, p. 73) condemn themselves by the obviousness of their exaggeration, and probably do their originators the greater harm.

Our difficulties are both diverse and numerous. High on the list, I think, is the difficulty of free time for the busy practitioner. It can hardly be denied that, without "group practice," the frequent after-hour and night-calls give him little or no time for leisure, and unless he can get a break away from his own premises complete relaxation is utterly impossible. If he leaves his premises he has to arrange for some other doctor to take his calls, and to leave someone at home to take messages. I think many will agree that this is often impossible, or so difficult that one rarely contemplates it. Even an annual holiday is difficult to arrange. Locums are not always easily found, and domestic help to look after them frequently involves much arrangement and forethought. The end result is often that the practitioner, who has so little time normally to relax and enjoy his family, takes his holiday one time and his wife and family another. I think that inadequate leisure is certainly one of our major problems. Group practice and consequent duty-hours is probably the answer, though groups cannot always be easy to form.

I have heard of members of other professions suggesting remuneration of G.P.s as a yardstick in settling their own, but I have never heard a suggestion that anything approaching the same number of duty hours (or expenses) be involved. Long and often worrying hours at the constant beck and call of a not over-thoughtful public are often our daily (and nightly) lot, and I find it hard to suppose that any other section of the community would tolerate these conditions. Let this point then be brought home to the public. This is surely the background—an unhappy one it is—a background of hard work and anxiety, and the many smaller irritations we all know so well and which we exasperatedly record in these pages from time to time. Against this background the G.P. finds himself liable to be reported and investigated for *any* allegation made by a patient, and yet he himself has no redress whatever against the frivolities of some of his flock. I have on one occasion received a note through the letter-box in the evening, requesting my immediate attendance on a patient, only to find on arrival that the house was locked up and the patient asleep and expecting my visit the following morning, and every G.P. I am sure could with me quote many such abuses of our services.

I feel, too, that it is not widely enough stressed that all except real emergency calls should reach the doctor before 10 a.m. One all too frequently experiences the unreasonable late call which takes one back to within a few yards of a call made earlier in the day on the normal visiting round.

On the financial side the heavy expenses which come out of income cannot be stressed enough: rising cost of car upkeep, heavy telephone bills, electricity and heating accounts, secretarial and domestic help, and general wear and tear on premises, to mention but a few. Some of us have built and equipped modern surgeries separate from our houses, a high capital expenditure with high upkeep costs.

Of our many difficulties the above are but a few which seem to me to be prominent in our daily lives and for which we must seek a solution. They should be brought to the public notice on every possible occasion. One cannot dispute that there are many more problems, but perhaps an improvement in these basic ones would at least let us view the lesser ones in a happier frame of mind.

Let Dr. Frais's suggested committee expend its energies in trying to publicize the nature of our difficulties and the justness of our cause, and not, as I stated in my earlier letter, become involved in any slanging campaign.—I am, etc.,

Feltham, Middlesex. A. P. HARDMAN.

Clash of Dates

SIR,—Many inquiries are being made why there is a clash of dates between the meeting of the L.M.C. Conference and of the Annual Meeting of the Association of Executive Councils.

At the end of the last conference in June I told the secretary of the B.M.A. that the suggested date for the conference was that of the Annual Meeting. I received an assurance that, as so long notice had been given and the conference was not tied to a particular date at that time, there should be no difficulty in avoiding the clash. I left it at that and was more than surprised when I discovered that the date had not been altered. Your readers will realize that, as the date of the meeting at Harrogate had been fixed months before in consultation with the municipal authorities, it was impossible for it to be altered. Indeed, no suggestion was made that this should be done.

I think the clash is most regrettable, as many doctors whom one would have wished to see at both meetings, and who could most usefully take part in the proceedings of both bodies, will now be prevented from attending one or other.—I am, etc.,

NOEL E. WATERFIELD,
President, Association of Executive Councils (England).

*** The Secretary of the B.M.A. states: The Annual Conference of Local Medical Committees has by long custom taken place on a late Thursday in October, and the clash of dates was reported to the G.M.S. Committee at its meetings on July 27 and September 21. The Committee gave careful consideration to the matter, but decided for a variety of reasons—including the timing of the Special Conference—that it was impracticable to change the date. Arrangements have been made for prior consultation between the secretaries of the two bodies before the dates of future conferences are arranged.

Organizing our Clerical Work

SIR,—I was very interested in the article by Miss E. Dorothy Willis and Miss Anne G. Shaw published in the *Supplement* (September 16, p. 132). It seems that they have come to a simple solution of the clerical work that troubles all general practitioners. I have worked the same system since 1935 and found it very efficient in a practice that was, up to 1948, 90% private. It saves a considerable amount of time, and I often wish I had started it years before.

There is one criticism I should like to make. In the scheme the writers describe the two wall racks would seem to take up about 11 ft. of linear wall space. This, I feel, is an over-elaboration of a good system. I have kept my cards in a compartment in my desk drawer with guide cards numbered 1–31. Cards are posted into the day of the month indicated by the number, and cards for the following month in front of a guide card after 31, if the posting date would overlap the present month—for example, date patient visited, September 2; date of next visit five weeks ahead, October 7; the card would be posted in front of the blank and re-posted on September 30.

The whole of the visiting list even in a large practice only needs a depth of about 9 to 12 in. of a drawer, and all work is done at the ordinary writing-desk. Otherwise the routine is identical: it is simple, time-saving, and appeals to those of us with a lazy streak in our make-up.—I am, etc.,

Newcastle-upon-Tyne. H. B. PORTEOUS.

War Service

SIR,—I find myself somewhat in disagreement with your correspondent Dr. E. H. Travers regarding his views on payment in the Forces (*Supplement*, September 9, p. 126). As a serving officer in the recent war I had constantly to tell critics that I did not join the Services for the money involved even though I could ill afford to make this statement as a lieutenant in 1939 and after. The assertion that we, as medical men, should be bribed to join the Forces is a deplorable one, and this in effect is what your correspondent suggests. Personally I counted it a privilege to be worthy of service. As for the "others," those who did not or would not make themselves available for a host of reasons which they are still attempting to justify, I would suggest that their claims for exemption be more thoroughly examined if there is a "next time" and not assume that since they were indispensable [*sic*] in 1939–45 they are equally so now. I am sure that many of us would readily be able to supply a few names for consideration. However, "they" have had to live with their consciences since their evasion, ours are fortunately clear.—I am, etc.,

London, S.W.15. F. ELLIOTT.

Fate of the Disabled Doctor

SIR,—May I put in a plea for the disabled doctor, sometimes at a comparatively early age paying for the stress of the last war? Some of the disabilities that I have in mind are coronary occlusion, hypertension, and diabetes mellitus, but there are many more. These disabilities may be so severe as to necessitate the doctor giving up his present work, but need not render him completely unemployable. Only those doctors, however, who have been forced by illness to look for lighter work probably realize how difficult this is to find. General practice, in its present form, is out of the question; the hospital service is rightly recruited from the younger men, and public health work is debarred by the medical standard required for purposes of superannuation. By law, industry must absorb its 3% of disabled employees, and I submit that the National Health Service should impose on itself some similar requirement. Examples of non-clinical work where the doctor's training would not be wasted are the keeping of hospital records and the compiling of statistics. Non-exacting clinical work would be child-welfare and school clinics, the importance of which

Dr. I. C. Monro stressed in his recent letter (*Journal*, September 16, p. 678), and medical referee work.

May I suggest that in order to assess the magnitude of this problem the British Medical Association draws up a register of disabled doctors? In conclusion I would add that I have no axe to grind. After many anxious months following two major operations I have, thanks to the kindly influence and introduction of my surgeon, found a very suitable job.—I am, etc.,

GRADE C.

The War Memorial

SIR,—I should like to add my support to the views of Drs. W. P. Roe and G. H. Bickmore (*Supplement*, September 30, p. 142). Certainly I think an inscribed tablet the most suitable memorial combined with memorial grants towards the education of children of the fallen, and not necessarily at Epsom, excellent though that College is.—I am, etc.,

Thame, Oxon. C. H. BARBER.

National Service Medical Officers

SIR,—It was with pleasure that I read the letter from "R.A.F. Medical Officer" in the *Supplement* of September 16 (p. 135). He has dealt most adequately with the effect of National Service on each of us individually, but I do not think he lays sufficient stress on a far more important aspect of the matter—namely, the lowering of the standard of medicine that will be practised by the present generation of doctors now stagnating in Service sick-quarters. What clinical skill shall we have after two years treating shaving rashes, painful feet, and spots in healthy adolescents? Even the unattractive alternative of signing on for a short service commission mentioned by "R.A.F. Medical Officer" by no means guarantees one a hospital appointment: that is covered by the singularly elastic and much-used expression, "Subject to the exigencies of the Service."

The B.M.A. would be doing a great service to British medicine if they would intervene on our behalf, so that for the last year or even six months we could refresh our memories by working in a Service hospital prior to taking our share of responsibility in civil life at the same time as fulfilling our obligations under the National Service Act.

For obvious reasons I cannot sign my name to this letter.—I am, etc.,

ANOTHER R.A.F. MEDICAL OFFICER.

Withdrawal from Health Service

SIR,—I am frequently reminded that a generation ago 97% of G.P.s signed their resignations from the panel. It is debatable how many would have stuck to their principles had the then Minister of Health called their bluff, but it worked. We got the arbitration for which we had asked.

Usually the fallacious corollary follows that as we did it once we can do it again. But, Sir, the state of economics in general practice in those days and now is vastly different. When I signed my old resignation the average G.P. in this part of the world derived at least 75% of his earned income from private practice and less than 25% from the panel, so that if he resigned he could still count on at least 75% of his former income on which to exist during the fight; and remember that the then panel patients were used to paying directly or through some club for their wives, families, and dependants, and probably a high proportion of them would have paid cheerfully for themselves. As long as the profession held together (a doubt which obtains even more acutely now) we were risking very little. We were, in fact, in a very strong position then.

Had we refused to enter the new Service on the appointed day the same conditions would have obtained, but, on the advice of the Association and with the Minister dangling his £66m. whip before our eyes, reluctantly we did so, and now the conditions are entirely altered.

Here, now, the average G.P. derives over 90% of his income from the N.H.S. and less than 10% from his remaining private practice. This means that if he withdraws now he can hope to enjoy less than 10% of his present income; and the State patients, having for over two years paid out only shillings for certificates and already paying far more for their doctoring than they ever did in their lives before, will certainly not pay up as their fathers would have done.

It would seem, therefore, that, leaving out every other consideration, if a mass withdrawal is engineered now the Minister of Health, who is certainly no fool, would simply have to sit back smiling to think of the money we were saving the Exchequer till we are forced by poverty to admit ourselves beaten and crawl back with our tails between our legs. Then when we have demonstrated our lamentable weakness he can impose a heavy cut on the capitation fee (probably then with the approval of the general public), knowing that we are helpless and can do nothing about it.

I have refrained from mentioning all the other conditions which would be added facts making a mass withdrawal a lamentable flop. Surely this is enough.

I do hope, Sir, we will not go on with this folly and make a public exhibition of our ineptitude. We signed away our birthrights two years ago. At least let us keep the mess of pottage.—I am, etc.,

St. Neots, Hunts. H. C. CRAVEN VEITCH.

SIR,—Would you be so kind as to permit me to answer some of the questions raised by your correspondent, Dr. Rosefield, in the *Supplement* (September 16, p. 135)?

(1) The act of resignation carries with it certain necessary and inevitable consequences. As soon as a doctor resigns from the Service he is entitled to his part of the contributions (6%) which has been paid towards superannuation, and he loses any right to the 8% paid by the Minister since the N.H.S. came into being. On rejoining he would have to begin his contributions again for the purpose of calculating his pension—he could thus suffer a substantial loss.

(2) There is the matter of the doctor's list. Once his resignation is effected all patients on his list are removed. If he rejoins, all patients would again have to register. Doctors with large lists might not find themselves so well off.

(3) To re-enter, a fresh application has to be made; it is by no means certain that this would be granted automatically, especially in over-doctored areas.

(4) The legal position is very complicated, but the matter might be referred to compulsory arbitration. The findings of this court would have to be accepted by the profession, which might be very unpleasant.

No doubt in due course the B.M.A. will advise the profession of the grounds on which they are prepared "to accept battle" this time. We can only hope they will be sounder than some of the "principles" which were put forward in 1948.—I am, etc.,

Worthing. HAROLD LEESON.

*** The Secretary writes: On resignation from the Service a practitioner does not lose superannuation rights if he re-enters the Service within twelve months.

Occupational Risk of Medical Practice

SIR,—I would be most grateful if you could shed some light on the problem of whether or not the conduct of a general medical practice involves an occupational risk. This matter has interested me for some time, and comes into my mind every time I have occasion to treat a case of open tuberculosis, or to attend upon some other case of serious infectious illness. Recently I read in the public press that a doctor in practice in Lincolnshire had contracted infantile paralysis while treating an epidemic of that disease in his area, and just prior to this I noted with regret that there had been deaths in the medical and nursing profession consequent upon an outbreak of smallpox in Glasgow. Bearing these facts in mind, and remembering that every other general practitioner has a duodenal ulcer, and remembering, too, that insurance statistics show that the average general practitioner dies at the age of 52 of either coronary thrombosis or some other heart complaint, it seems to me that doctoring is definitely fraught with risk.

If this is the case, what then is the attitude of the State when it is confronted with the fact that a doctor has been killed, or permanently incapacitated, by general practice? Does it express regret for a life lost in its service, in the same way as, say, the War Office does when an officer is killed on active service? Or does it simply ignore such sentimental usages, and proceed directly to the advertisement of the vacancy so that some other willing applicant for an early death may take his place? Finally, does it do anything concrete to provide financial security for the wife and family of the deceased doctor, on a level consistent with their former status, or are the latter in exactly the same position as John Citizen's wife and family when he has the misfortune to die of any of the above-mentioned complaints?

This matter seems to me to be one of importance at this time, since the minimum service under the National Health Service Act which qualifies for a pension is, I understand, ten years. This means that I have slightly less than eight years to go before I qualify for a pension, and I shudder to think what will happen if I am permanently incapacitated by some sickness which I contract from one of my patients, or if I am disabled as a result of a heart or other disease.—I am, etc.,

Lossiemouth HUGH M. TUCKER.

Increasing the Capitation Fee

SIR,—The question of increasing the capitation fee on the first thousand patients has gained wide support among a large section of the profession, but some of us are not entirely happy that the desired result of helping the less fortunate of our colleagues would be achieved in this way. It is obvious that, if any doctor can continue to practise with a list of 500 or less, then he has either private means or a considerable private practice or other appointments, and indeed I think it will be generally agreed that what little private practice remains is more concentrated in certain areas.

I would suggest, therefore, that in order that those most in need should benefit—those with lists between 500 and 2,000 patients—the extra capitation fee should be paid for the next 1,000 patients after the first 500. I assume that the basic salary would help the genuine 500-or-under list, which is another argument in favour of the suggestion.—I am, etc.,

Newport Pagnell, Bucks. A. A. CLAY.

G.P.s as Employed Persons

SIR,—In the courts it is very difficult to enforce a right that has been previously waived. The Crown has had the opportunity to classify G.P.s as employed persons, but has in fact, by its officers, classified us as self-employed persons, and confirmed this 52 times a year in the case of every practitioner by instructing us to stamp our cards weekly as such. The matter of our status should be definitely decided in the courts, by test case if necessary, as many may find the uncertainty demoralizing.—I am, etc.,

Walsall, Staffs. FRANCIS W. KEMP.

Change of Doctor

SIR,—I do want to congratulate the G.M.S. Committee of the B.M.A. on the arrangements made, in consultation with the Minister of Health, for limiting the right of patients to change their doctor. I am sure I am speaking for all the older tiring practitioners whose livelihood is constantly at the mercy of the young upstart down the road making a great show of his hospital learning but without real experience. There is now some chance that we shall be able to keep our lists up. Especially in a rather backward country area like this, where to write a letter to the executive council with a view to making a change in the future would be more than most patients could undertake, we shall now be pretty safe. Congratulations! If any member is this way, I hope he will call in. I would be glad to show him some pretty shooting.—I am, etc.,

Bonar Bridge, Sutherland. DONALD MCGREGOR.

SIR,—In this age of form-filling the simple way in which a patient could change his N.H.S. doctor was surprising and encouraging. It is difficult to understand why it has been replaced by a much more complicated procedure (*Supplement*, September 23, p. 137) which will need extra administrative labour at a time when the country's resources are said to be stretched to the full. It almost looks as if form-filling has been introduced for its own sake. This new administrative arrangement will not stop patients changing doctors for frivolous reasons: this can be done only by the doctors themselves and is quite simple if neighbouring doctors co-operate, as Dr. Tucker shows in his letter (*Supplement*, September 30, p. 141).

The main effect of this change must be to slow up the rate at which a new practitioner's list grows. The difficulties in the way of a squatter are considerable, and include the high cost of housing, the delay in dealing with an application for permission to practise, even in an "open" area, and the method of payment, which is always three to six months in arrears. If it is really desired to encourage doctors to start up in under-doctored areas it is surprising that it has been made more difficult to do so.—I am, etc.,

Orpington, Kent. L. M. FRANKLIN.

SIR,—The revised arrangements for changing doctors which came into force on October 1 have prompted me to examine two facts: (1) the initiative came from the General Medical Services Committee of the B.M.A.; (2) the Minister at first refused to accede to the committee's request, but later co-operated.

The committee represents the views of the majority of G.P.s who are, for the most part, established practitioners. The latter have a vested interest in large lists. On the other hand, the Minister is, *pro tem.*, the fairy godmother of the young practitioner trying to build up his practice. He sees in his new regulations a serious threat to the well-being of his protégés.

Few patients are likely to avail themselves of the new method, which involves either an interview with their present doctor or correspondence with the executive council (except on change of address). Why, then, did the Minister co-operate? I suggest that he is merely waiting for the outcry from the young practitioners before restoring the *status quo*, thereby gaining considerable kudos with the rising generation.

The new regulations are easy in theory, but not in practice. Apart from the extra bother involved, it is extraordinary how many members of the general public believe that they are now wedded for life to their present doctors, or that they can change only if they move to another town. Already I can quote several instances of these misapprehensions. Surely such a state of affairs was never intended by the General Medical Services Committee. Where is our cherished free choice of doctor now?

Two alternatives lie before us. Either the *status quo* must be restored, or adequate publicity must be given, in very simple words, to the gist of the new regulations. I believe that the solution lies in the latter, and that each executive council should publish a suitable notice in its local newspaper(s). Furthermore, I can see no real need for retaining the method of transfer by consent. It only confuses the issue, and a letter to the executive council is a much more gentle way of changing delicate horses in midstream.—I am, etc.,

York. S. S. HART.

SIR,—I do not know whose idea it was to make these new arrangements, but to my mind we are no better off than before, nor is the patient who is disgruntled and wishes to select a new doctor. Surely the person who really suffers is the doctor, who, after spending considerable time and energy on a patient, finds suddenly that his list will be reduced by the amount of the patient who has changed, despite all his trouble and bother.

The sensible thing would have been to leave things as they are, but credit the doctor with his patient for the current quarter anyway. In other words the patient can change when he likes, but the doctor does not suffer one quarter's loss of that capitation fee.—I am, etc.,

Sheerness. A. MADWAR.

Public Relations

SIR,—During the debate on public relations at the Representative Meeting on September 28 (*Supplement*, October 7, p. 143) it was repeatedly said that recent letters to the lay press from practitioners were to be deprecated, as denigrating themselves and their work. On reading them with closer attention, does it not emerge that the writers are trying, in weariness

of body and frustration of soul, to get the public to realize the burden of the Act and the extent of its exploitation? Perhaps one speaker realized this; hence the effervescence. But we require no such clamant defence of our actions in our own debate, though its content and even manner might be useful in "another place."

It may well be that we expect impossibilities of our public relations department, hence the attempts to get at the public direct in hopes of mitigating the not uncommon attitude of (1) press the button; (2) criticize the results.

Perhaps the story has reached you of the lady owner of a "long-sitting" lipoma of a well-covered part sending for her doctor at 11.30 p.m. because she thought it would be convenient for him to see her in bed. If apocryphal, it is not too great a caricature of a public relationship which we should be glad to see altered.—I am, etc.,

Kington-on-Arrow, Herefordshire. G. W. DRYLAND.

Part-time Appointments

SIR,—It has been stressed repeatedly by every branch of the profession that they are opposed to a full-time salaried service, yet part-time appointments in hospitals are being advertised as full-time ones without prior consultation with the staffs of the hospitals concerned.

An example of this has been brought to my notice in this area, where a part-time radiologist has been recently retired on reaching the age limit. His appointment has been advertised, and I think filled by this time, by a full-time man, thus depriving the district of any private *x*-ray facilities, apart from the hardship sustained by the retiring radiologist, who is unable to dispose of the practice and plant he purchased when originally appointed.

In my opinion part-time appointments should be scheduled by the B.M.A., and they should not be advertised in the *Journal* as full-time appointments except after consultation with the staffs of the hospitals concerned.—I am, etc.,

Newport, Mon. J. T. RICE-EDWARDS.

Pay in the Armed Forces

SIR,—Regarding the recent increases in pay for the armed Forces, it is to be noted that no announcement is yet forthcoming on the matter of increased remuneration for serving medical officers.

Presumably the matter is still under discussion, but unless the new rates, when revealed, represent a substantial increase over present rates recruitment will fall to a very low level indeed. There is already a marked discrepancy between Service rates and those obtaining in general practice. For example, the minimum rate payable to a "trainee assistant" is about £15 a week; in addition to this, board and lodging or an equivalent allowance are supplied. Also a car allowance of about £100 per annum is provided if the assistant is fortunate enough to possess a car.

The Service rate for an equivalent position—i.e., lieutenant, R.A.M.C., or F/O, R.A.F.—is 22s. a day, and incidentally, apropos this latter rate, it is interesting to note that in 1925 the rate for the same rank was 21s. 8d. per day. So the pay of medical officers of this rank has risen by 4d. per day over the last 25 years. So it may be seen that the pay of the junior medical officers must be at least doubled in order to fairly relate them to civilian rates.

Finally, may I enter a plea for the plight of National Service medical officers? I sincerely hope they will not be dealt with in the same light as the other National Service men have been recently. The National Service doctor is a trained professional man. He is at present performing duties throughout the Services equal to and as responsible as those which the smaller number of regular officers have to perform. He cannot be lightly grouped together with the conscript of 18 years, who has no trade or profession and is, in fact, a liability requiring training for the bulk of his two years' service.

I trust those who are discussing this matter will ensure a fair deal for the serving medical officer.—I am, etc.,

SERVING MEDICAL OFFICER.

Poor Prospects of Assistants in General Practice

SIR,—In these days when there is much ado about the remuneration of G.P.s I should like to say a word or two about the invidious position of assistants as exemplified by my own two years' experience.

After two years in hospitals I married and was in my first assistantship for over a year. There were 6,700 patients, and after 12 months I inquired about a partnership. I was informed that the practice couldn't afford it," and, as my employer honestly yet crudely put it, "Why should I for no personal advantage give you a large slice of my income?"—a remark that ably sums up the whole problem.

I then started quietly to look round for a job with prospects, and got myself on to a short list for a vacancy. The result was that another man got the post, and I got the sack on the grounds that "if you are unsettled you can leave."

Next phase—three months in lodgings doing locums, looking for a job with a house and prospects. We were finally chosen out of about 40 applicants for a job with partnership in six months in a growing practice of over 5,000 "units" (what a dreadful word!). At a cost for removals of nearly £30, we moved in.

In those six months I have borne by far the greater share of the work. We have had two weeks' holiday (the boss is having four weeks). We have been obliged to man the telephone for an average of 151 hours per week (out of a possible total of 168 hours) for 24 weeks. The only requests we ignored were one that we should pay a woman to sit in and take calls on our half-day, and another that my wife should act as receptionist in surgery. After all that I am refused a partnership. "Have not come up to expectations," was the mumbled excuse with downcast eyes. I was the third assistant "with view" in two years.

I have applied repeatedly for practice vacancies without result. *The Lancet* states that younger men have little chance with 40–50 after each post. Having bought a car and furniture, we lack the capital to buy a house and to see us through the lean period of setting up on our own, the course Mr. Bevan advises for young doctors.

Maybe we have been unfortunate, but many must be worse off, especially those with young families. A friend of mine has had 50 hours off duty in seven months as an assistant. There must be hundreds like us milling round from "prospect" to "prospect," getting nowhere, stooging for established men who regard having an assistant as an excuse to have an easy time, and who regard the promise of partnership as a convenient dodge to keep a man docile and willing while his wife becomes a telephone drudge.

It seems to me that, the old approach of entry into general practice by purchase having been closed, no new doors have really been opened. I imagine the sum total of frustration and resentment pent up in the breasts of Britain's 1,650-odd assistants could be diverted into more useful emotional channels by a little wise administration from the top directed towards giving us all a bit of a break for a change.—I am, etc.,

FAIR PLAY.

POINTS FROM LETTERS

Improving the Prescription Pads

Dr. FRANK HAMILTON (Birmingham) writes: I invariably get into difficulties with the prescription pads issued by the N.H.S.—the so-called Form E.C.10—and waste a good deal of time trying to tear prescriptions off without ripping them in two. Many have to be rewritten every day. If the wire staples holding them together were inserted from the back instead of the front, it would be a much easier manœuvre just to lift each form off, simply by first prising up the bent-over ends of the wire.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

B.M.A. LIBRARY

The following books have been added to the Library:

Association for Research in Nervous and Mental Diseases. Vol. 28, Multiple Sclerosis and the Demyelinating Diseases. 1950.
Belton, M.: Good Beginnings. 1950.
Birch, C. A. (*Editor*): Emergencies in Medical Practice. Second edition. 1950.
Bladergroen, W.: Physikalische Chemie in Medizin und Biologie. Zweite Auflage. 1949.
Boas, E. P., and Boas, N. F.: Coronary Artery Disease. 1949.
Bridges' Food and Beverage Analyses. Third edition by Marjorie R. Mattice. 1950.
Colby, F. H.: Essential Urology. 1950.
Collari, S.: La Schermografia di Massa nella Diagnosi Precoce delle Malattie Sociali. 1950.
Daels, F.: Le Problème du Cancer. 1950
Davison, W. C.: Compleat Pediatrician. Sixth edition. 1949.
Deri, S.: Introduction to the Szondi Test: theory and practice. 1949.
Deutsch, F.: Applied Psychoanalysis. 1949.
Dougherty, J. M., and Lamberti, A. J.: Textbook of Bacteriology. Second edition. 1950.
Doyle, L.: Handbook of Obstetrics and Diagnostic Gynecology. 1950.
Emerson, H.: Selected Papers: published on the occasion of his seventy-fifth birthday. 1949.
Fischer, A., and Sellei, C.: Funktionelle Diagnostik innerer Erkrankungen. 1950.
Freud, S.: Aus den Anfängen der Psychoanalyse. 1950.
Gelfand, M.: Schistosomiasis in South Central Africa. 1950.
Grey, M. E.: Progressive Professional Nursing. 1950.
Groddeck, G.: Exploring the Unconscious. 1950.
Harris, H. J.: Brucellosis (Undulant Fever). Second edition. 1950.
Hawley, P. R.: New Discoveries in Medicine: their effect on the public health. 1950.
Hill, C. (The Radio Doctor): Bringing Up Your Child. 1950.
Hutton, M.: Teach Yourself Home Nursing. 1950.
Illingworth, C. F. W.: Short Textbook of Surgery. Fifth edition. 1950.
Imperati, L.: Le Insufficienze Acute del Circolo Periferico Shock. 1950.
Johnson, P. Y.: Healing Fingers: the power of Yoga pranic healing. 1950.
Jordan, H.: Tropical Hygiene and Sanitation. Second edition. 1950.
Kerr, Sir J. G.: A Naturalist in the Gran Chaco. 1950.
Koos, E. L.: Sociology of the Patient: a textbook for nurses. 1950.
Kraus, M.: The Atlantic Civilization: eighteenth century origins. 1949.
Krueger, W. W.: Fundamentals of Personal Hygiene. Fifth edition. 1950.
McCall, J. O., and Hugel, I. M.: Movable-Removable Bridgework. 1950.
Maduro, R.: Les Suppurations Chroniques de l'Oreille Moyenne. 1949.
Manson's Tropical Diseases. Thirteenth edition, edited by Sir Philip H. Manson-Bahr. 1950.
Marliangeas, J.: Guide Pratique de la Laborantine. Deuxième édition. 1949.
Massart, R.: La Chirurgie du Mouvement. 1949.
Meyer, A. E. H., and Seitz, E. O.: Ultraviolette Strahlen. Zweite Auflage. 1949.
Mezger, J.: Kompendium der homöopathischen Therapie. 1950.
Mouriquand, G., and Dechavanne, D.: Vade-mecum de Théraputique Infantile. 1949.
Movitt, E. R.: Digitalis and Other Cardiotonic Drugs. Second edition. 1949.
Müller, M.: Prognose und Therapie der Geisteskrankheiten. Zweite Auflage. 1949.
Newns, G. H.: Aids to Materia Medica. Fourth edition. 1950.
Oswald, A.: Die Erkrankungen der endokrinen Drüsen. 1949.
Overstreet, H. A.: The Mature Mind. 1950.
Regenbogen, E.: Diagnostische und therapeutische Eingriffe des Internisten. 1949.
Rhazes: The Spiritual Physick of Rhazes. Translated from the Arabic by A. J. Arberry. 1950.
Rimpau, W.: Die Leptospirose. 1950.
Romer, A. S.: The Vertebrate Body. 1949.
Samuels, J.: De Samuels-therapie: weerlegging van het rapport Brutel. 1949.
Schmidt, H.: Fortschritte der Serologie. Lieferung I und II. 1950.
Science in Progress. Edited by George A. Baitsell. Sixth series. 1949.
Selye, H.: Physiology and Pathology of Exposure to Stress. 1950.
Senise, T.: Il Riso in Psicologia. Seconda edizione. 1950.
Sexton, W. A.: Chemical Constitution and Biological Activity. 1949.
Sharpe, E. F.: Collected Papers on Psycho-analysis. 1950.
Sommers, I. G.: Histology and Histopathology of the Eye and its Adnexa. 1949.
Sorsby, A.: Medicine and Mankind. Second edition. 1950.
Stokvis, B.: Autosuggestieve Psychotherapie. 1950.
Vara López, R.: La Craniectomia a Través de los Siglos. 1949.
Verhandlungen der deutschen Gesellschaft für Kreislaufforschung. 15 Tagung. Hypertonie und Hypotonie. 1949.
Vesalius, A.: Illustrations from the Works of. By J. B. DeC. M. Saunders and C. D. O'Malley. 1950.
Voss, H., and Herr, R.: Taschenbuch der Anatomie. Dritte Auflage. Band I. 1950.
Wesson, M. B.: Urologic Roentgenology. Third edition. 1950.
Wilder, R. M.: Primer for Diabetic Patients. Ninth edition. 1950.
Wolf, H.: Klinik der Zahn-, Mund-, und Kieferkrankheiten. 1950.
Worth and Chavasse's Squint. Eighth edition, by T. Keith Lyle. 1950.

B.M.A. FILM LIBRARY

The following films have been presented to the Film Library:

Anaesthesia in the Dental Chair—Adults. Author: Imperial Chemical Industries, Ltd.
Anaesthesia in the Dental Chair—Children. Author: Imperial Chemical Industries, Ltd.
Cerebral Cortex of the Monkey. Author: Imperial Chemical Industries, Ltd.
Control of Infection in Surgical Dressings. Author: Imperial Chemical Industries, Ltd.
Birth of a Drug. Author: Imperial Chemical Industries, Ltd.

Association Notices

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.

2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and a sum of money slightly less than the amount of the Sir Charles Hastings Clinical Prize, will be awarded for the second best essay submitted.

3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.

4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

5. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950.

6. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for an award of either of the prizes in any subsequent year.

7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.

8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

9. Each essay must be typewritten or printed and must be accompanied by a sealed envelope, enclosing the candidate's name and address, firmly affixed to the essay.

10. Inquiries relative to the prizes should be addressed to the Secretary.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work.

If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary not later than November 1, 1950. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prizes *due regard will be given to evidence of personal observation*. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and childbearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing to the Secretary by November 1, 1950, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

REGISTRARS GROUP

NORTH-EAST METROPOLITAN REGION

A general meeting of registrars in the North-east Metropolitan Region will be held at B.M.A. House on Thursday, November 2, at 8 p.m. All registrars in the region are invited to attend.

Diary of Central Meetings

OCTOBER

25 Wed. Central Council of the Registrars' Group, 2 p.m.
26 Thurs. Annual Conference of Representatives of Local Medical Committees, 10 a.m.
27 Fri. War Memorial Committee, 11.30 a.m.
27 Fri. Consulting Pathologists Group Committee, 2 p.m.

NOVEMBER

1 Wed. **Council**, 10 a.m.
2 Thurs. Otolaryngologists Group Committee, 2 p.m.

DECEMBER

7 Thurs. Committee on Psychiatry and the Law, 2 p.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Royal Bath Hotel, Bournemouth, Friday, October 27, 7.30 for 7.45 p.m., annual dinner.

CHELSEA AND FULHAM DIVISION.—At Chenil Galleries, Chelsea Town Hall, King's Road, London, S.W., Friday, October 27, 8.30 p.m., general meeting. The Paddington, Kensington and Hammersmith, and Westminster and Holborn Divisions are invited as guests.

DERBYSHIRE BRANCH.—At Devonshire Royal Hospital, Buxton, Sunday, October 22, 3 p.m., combined meeting of Glossop, Buxton, and Matlock Divisions. Lecture by Mr. A. G. G. Melville: "Radiation Aspects of Civil Defence." All members of the medical profession in the area are invited to attend.

EAST HERTS DIVISION.—At Luton and Dunstable Hospital, Wednesday, October 25, 8.30 p.m., members are invited to a meeting of the South Bedfordshire Division.

FURNESS DIVISION.—At Orthopaedic Department, North Lonsdale Hospital, Tuesday, October 24, 8 p.m., combined meeting with Barrow and Furness Clinical Society.

MONMOUTHSHIRE DIVISION.—At St. Cadoc's Hospital, Caerleon, Thursday, October 26, 8 p.m., address and practical demonstration by Dr. G. King: "Hypnotism."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Edmonton, N., Friday, October 27, 9 p.m., film: "The Treatment of Infections of the Hand."

OXFORD DIVISION.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, October 25, 8.15 p.m., symposium by Drs. R. W. Armstrong, R. G. McInnes, C. W. M. Whitty, J. E. Duffield, and Sir Hugh Cairns: "The Operative Treatment of Mental Disorders."

SOUTH ESSEX DIVISION.—At Nurses Lecture Theatre, Oldchurch Hospital, Romford, Friday, October 27, 9 p.m., divisional meeting.

SOUTH MIDDLESEX DIVISION.—At Public Health Department, Bath Road, Hounslow, Wednesday, October 25, 8.45 p.m., Dr. F. J. V. Jenner: "Common Skin Diseases and their Treatment" (illustrated by slides).

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Bow, E., Friday, October 27, 3 p.m., clinical meeting. Ear, nose, and throat demonstration by Mr. N. Asherson.

TUNBRIDGE WELLS DIVISION.—At Spa Hotel, Tunbridge Wells, Saturday, October 28, dinner and social evening.

WIGAN DIVISION.—At The Hollies, Wigan Lane, Wigan, Thursday, October 26, 8.15 p.m., annual general meeting.

Meetings of Branches and Divisions

COVENTRY DIVISION

On September 16 the chairman of the Division, Mr. Trevor Berrill, and Mrs. Berrill held a reception to which they invited all members of the Division and their wives. They entertained 150 guests during an evening which was singularly pleasant and enjoyable.

On September 27 the members of the Division were invited to pay a visit to the Rehabilitation Unit of the Ministry of Labour and National Service by the medical director, Dr. C. R. Hoskyn. Rather more than thirty members of the Division accepted the invitation and spent an instructive afternoon inspecting the gymnasium and workshops. They were then entertained to tea by Dr. Hoskyn and his team of workers, following which instructive discussion was encouraged.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY OCTOBER 28 1950

GLASGOW OFFICE OF B.M.A.

There was a large and representative gathering at the official opening on October 18 of the Regional Office at 234, St. Vincent Street, Glasgow (Tel.: Glasgow Central 5597). In addition to those who took part in the ceremony, those present included Dr. J. G. M. Hamilton, deputy chairman of the Scottish Committee of the Association, Dr. W. M. Knox, chairman of the General Medical Services Subcommittee (Scotland), and the Scottish Secretary of the Association, Dr. E. R. C. Walker, together with members of the Scottish Committee, officers and representatives of the Glasgow and West of Scotland Branch of the Association, the Divisions of the Branch, the local medical committees of the Western Regional area, bodies established under the National Health Service Act, and the principal medical organizations and allied bodies in the Western Region.

The officer in charge is the recently appointed Assistant Scottish Secretary, Dr. J. T. McCutcheon.

An extensive scheme of alterations and redecorations has been carried out with pleasing effect, the premises providing an adequate public office, a committee room, and the Assistant Scottish Secretary's room. Adjoining is the Glasgow office of the Medical Insurance Agency.

Loyal Supporters

Dr. I. D. Grant, chairman of the Scottish Committee, presided. He began by saying that that day they were seeing in the provision of a regional office the fulfilment of an ambition which many of them in the West had nursed for a long time. It was sometimes felt that their colleagues across the Border were apt to regard the Scots as clannish and partisan, but he assured them that nowhere in the United Kingdom would they find more loyal supporters of the Association. It had been suggested in some quarters that Scottish members wanted to secede from the Association because of London domination, but that was not true. Scots had always taken a prominent place in the counsels of the Association, and he instanced the work of Dr. J. B. Miller and Dr. W. Jope.

The developing need for autonomy in domestic affairs had been recognized by the Association, first by the setting up of a standing Scottish Committee in 1903, then the appointment of a full-time secretary for Scotland in 1919 when the Scottish House was opened in Edinburgh; and now they had an Assistant Scottish Secretary and a regional office in Glasgow. They did not think that they had been ill-served by the Association. On broad national issues they themselves felt that they were better served by discussion on a United Kingdom basis, but on all domestic matters they were granted as much freedom as the most ardent Scot could desire. The Association not only laboured for doctors, but always kept in the forefront of their deliberations the welfare of the patient. Doctors felt that they had a duty unselfishly to attend to the needs of those who were sick or afflicted, and they would carry out that duty. That did not mean, however, that they agreed with the views which Governments of various political hues imposed on doctors by way of terms and conditions of service.

Dr. Grant went on to speak of the assistance given by Headquarters towards the proposed reconstruction of B.M.A. House, Edinburgh, although that work was meantime held up because of the lack of a building licence. Now they had also agreed that Scotland should have an Assistant Secretary. Dr. McCutcheon was known to all of them as a most capable colleague. His charm of manner and disarming smile enabled him to smooth away all difficulties, and he was certain that that same serenity, tact, and charm would make the regional office a pleasant place to visit.

They were indebted to Dr. Walker and to Miss Brookes, chief clerk, for the artistic furnishings. Equally they were indebted to Mr. Giles, the Association's accountant, for all he had done. Miss Munro, previously of Scottish House, had become clerk in charge of the regional office, and he extended to her a most cordial welcome.

Office Declared Open

Dr. J. B. Miller, vice-president of the Association and a former chairman of the Representative Body, declared the offices open. He recalled that the Glasgow and West of Scotland Branch was founded in 1876, the first president being Allen Thomson, the distinguished anatomist. Since 1876, two annual meetings had been held in Glasgow. The first was in 1888, when the president was Sir William Gairdner. The only other Annual Meeting to be held in Glasgow was that in 1922, when Sir William Macewen was president. Of the medical politicians of note he need mention only one name—J. C. MacVail, who was a member of the committee which drew up the modern constitution of the Association.

"During these years," he added, "the Branch and its various Divisions has had no abiding place for the soles of its feet, and members, therefore, are delighted to have this beautiful suite of rooms."

The Association existed for two purposes—to promote the medical and allied sciences and to look after the honour and dignity of the members of the profession. In opening these new premises—and he had great pleasure in doing so formally—they were taking further steps towards the fulfilment of these objects.

Dr. A. Macrae, Deputy Secretary of the Association, apologized for the absence of Dr. Charles Hill, Secretary, owing to his parliamentary duties. It gave him great pleasure, he said, to be present, together with Mr. John Pringle, the Association's public relations officer, and Mr. Giles. They were pleased to be there to express on behalf of London Headquarters the friendliest of greetings—the warmest family greetings—to the members in Scotland. They knew the heavy burden which had fallen on the shoulders of the Scottish Secretary, but they were also aware of how fortunate they were in having such an able Scottish staff. They were very glad indeed that a valuable reinforcement—probably a long overdue reinforcement—had been provided in the appointment of Dr. McCutcheon as Assistant Scottish Secretary.

Dr. L. Dougal Callander, chairman of the Association's Building Committee, apologized for the absence of Dr. Gregg, Chairman of Council, who was in America. Dr. Callander added that he had always looked upon Dr. Miller as one of the doyens of the Association. They could never forget his inimitable and brilliant chairmanship of the Representative Body during the most critical period in the Association's history. He had done a great deal for the Association, and for his added service that day they thanked him most sincerely.

PUBLIC HEALTH COMMITTEE

The first meeting of the new session of the Public Health Committee of the Association was held on September 29 under the chairmanship of Dr. C. Metcalfe Brown.

The Committee reappointed the representatives on the staff side of Committee C of the Medical Whitley Council. The panel of deputy representatives was also reappointed.

The chairman reported on the dispute between the management and staff sides of Committee C in regard to the remuneration and conditions of service of public health medical officers. He said that five meetings of Committee C had been held, but as it had not been possible to reach agreement both sides had decided to refer the matter for arbitration under the Industrial Courts Act, 1919. [Proceedings before the Industrial Court opened on October 9.]

A letter from the Ministry of Health before the Committee related to the agreement reached by representatives of the Association and the associations of local authorities in November, 1949, regarding fees for part-time services undertaken by medical practitioners for local authorities. This letter stated that the local authority associations were still of the opinion that consideration of the question of the operative date of the agreement should be deferred. The Committee expressed concern at this continued delay and instructed its representatives on the Joint Committee on Fees for Part-time Work under Local Authorities to press for the implementation of this agreement.

Whitley Machinery and Dual Appointments

It was reported to the Committee that the Ministry had suggested the setting up of a Joint Subcommittee of Committees B and C of the Medical Whitley Council to consider problems relating to the contracts and remuneration of medical officers holding appointments under both hospital authorities and local authorities. This matter had been receiving the attention of the Public Health Committee during the past session.

Information was placed before the Committee confirming that no specialist in infectious diseases had been present on the Review Committee on the occasion of the grading of medical officers of health who were in charge of isolation hospitals in certain regions. A report was made to the Committee on recommendations being considered by the Central Consultants and Specialists Committee with a view to retrospective adjustments being made in those cases where injustices had occurred. One of the proposals to come before the Central Consultants and Specialists Committee was that the rectification of these anomalies should be carried out on the occasion of the review of gradings which would be taking place in 1951.

Membership of Local Authority Committees

The position of medical practitioners in relation to membership of the council or committees of local authorities was also considered. The present position appeared to be that a medical practitioner would be disqualified from such membership if he undertook regular sessional work under a local authority or if there were some general expectation of work under the authority. Representatives were appointed to seek a meeting with the Ministry to ensure that medical practitioners were not debarred from any rights of membership of the council or committees of a local authority which were open to other members of the public.

Following representations made by the Committee during the last session, it was reported that the Ministry was taking steps to issue a circular to local authorities on the use of a single composite form for notifying cases of infectious diseases and of food-poisoning. The proposed form appeared to the Committee to meet its suggestion for the simplification of the present procedure for notifying infectious diseases.

Advertisement Ban

In view of the introduction of a contributory superannuation scheme in Northern Ireland, the Committee expressed the view that advertisements from local authorities in Northern Ireland should not be accepted for publication in the *British Medical Journal* if the salaries offered were less than the appropriate Askwith minimum.

PUBLIC HEALTH SERVICE DEFENCE TRUST

The first meeting of the trustees on the newly established Public Health Service Defence Trust was held at the conclusion of the meeting of the Public Health Committee. The trustees, who are members of the Public Health Committee, signed the Declaration of Trust and appointed the following officers: chairman, Dr. C. Metcalfe Brown; honorary treasurer, Mr. A. M. A. Moore; secretary, Dr. A. V. Kelynack.

The Trustees decided to issue, at an early date, to public health medical officers a letter appealing for funds. The trustees recommended that the annual contribution should be at the rate of 2s. per £100 of remuneration.

PRIVATE PRACTICE COMMITTEE

REGULATIONS FOR CREMATION

The first meeting of the new session of the Private Practice Committee was held on October 11. Dr. I. D. GRANT was re-elected to the chair.

Lord HORDER attended to assist the Committee in its consideration of the recent report of the Interdepartmental Committee on Cremation. He said that the Cremation Council of Great Britain, in its evidence to that body, had urged the simplification of the law relating to cremation and that if possible the procedure should be made more economical. It had been hoped that the Interdepartmental Committee would be satisfied with a simple certificate from the attending doctor and that the confirmatory certificate might be eliminated. After all, the doctor who gave the latter only viewed the body and was dependent for information on the doctor who had been in charge of the patient. The Interdepartmental Committee, however, did not see its way to agree.

One recommendation of the Committee was a departure from present practice. It proposed that the confirmatory certificate should also serve the purpose of the present form whereby the medical referee gave authority to cremate, and that this certificate should be given by the medical officer of health, who would thus take over the functions of the medical referee.

After discussion the Private Practice Committee arrived unanimously at the conclusion that the confirmatory certificate should be retained, but it was averse from the proposal that the medical officer of health should take over the functions of the medical referee. It considered that this should be an independent appointment by the cremation authorities, and that the appointed person should not necessarily be the medical officer of health.

The question of fees for certificates was also considered, and it was agreed that a suitable fee both for Form B, the certificate of the medical attendant, and for Form C, the confirmatory certificate, would be two guineas.

Fees for Special Services

It was reported to the Committee that after interviews with the immigration authorities for Australia, Canada, and New Zealand it had been agreed that the recommended fee for completion of reports on adults and unaccompanied children proceeding to those Dominions should be increased to one guinea, and for accompanied children to 7s. 6d., except in the case of New Zealand, where the report is more comprehensive and the fee for accompanied children should be 10s. 6d.

Discussions with the Shipping Federation on the remuneration of part-time medical officers for vaccination and immunization of seamen had reached a satisfactory conclusion.

An unsatisfactory position was revealed concerning those cases in which a doctor is called upon by the police to give emergency treatment but the police are not responsible for the fee. It was stated that the police in certain areas still customarily called doctors who had been police surgeons, although their appointment had now terminated. The feeling of the Committee was that if the patient was conscious his own doctor should if possible be called, and if the police were compelled to send for some other doctor an arrangement concerning remuneration should be made.

The scale of payment to general practitioners called upon to perform services on behalf of the police was also mentioned. It was agreed that the honorary secretary of the Metropolitan Police Surgeons Association should be invited to be present when the Committee discussed the matter; also that the scale of fees payable in the Metropolitan Police area should be as widely published as possible.

The Committee had proposed a revision of the scale of sessional fees for medical officers of industrial rehabilitation units, but the Ministry of Labour and National Service was unable to agree that there was a sufficiently good case for increasing these fees to £3 3s. for each session as against the present rate of £2 15s. The claim for mileage allowance, however, was conceded. The Committee decided to continue to press for a larger sessional fee.

A request for more liberal payment for part-time regional medical officers was considered. It was pointed out, however, that the remuneration of part-time officers did not compare unfavourably with that of whole-time officers, and that the moment to deal with part-time remuneration would be when the recommendations of the committee considering whole-time salaries were known.

Doctors' Cars

On the subject of doctors' cars the ASSISTANT SECRETARY (Dr. L. S. Potter) made a statement in which he said that the only real obstacle to doctors' obtaining cars was the extreme shortage of cars for the home market. The number of cars produced, expressed in round figures month by month, might seem large, but, as this was shared among many hundreds of dealers in all parts of the country, the number of cars at the disposal of a particular agent was only a fraction of the number of doctors on his books. It was pointed out that the Association continued to maintain a department wholly occupied with the large amount of correspondence on car priorities, and all that could be done was being done. A new and complicating factor was the possible effect of the rearmament programme.

The Committee also considered the car badges issued by the Association and recommended that information about the availability of these devices should be published periodically in the advertisement columns of the *Journal*.

OCCUPATIONAL HEALTH

The first meeting of the session of the Occupational Health Committee of the Association was held on October 12. Dr. J. A. L. Vaughan Jones was re-elected to the chair. Two new members were welcomed—namely, Dr. N. J. Cochrane (Burton-on-Trent) and Dr. B. Hutchison (Cambuslang). Certain subcommittees were reappointed, including one on remuneration.

The new scale of salaries for industrial medical officers, whole-time and part-time, which was recently approved by the Representative Body was set out in a printed leaflet which was distributed to the members. Methods of implementing the new scales were considered. The suggestion was made that there should be a general approach to employers on the subject, but it was agreed to defer action until the publication of the award of the Industrial Court, expected shortly, on public health medical officers' salaries.

The Committee briefly considered a report from the Central Ethical Committee on the ethical aspects of a suggestion which had been placed before it that the Ministry of National Insurance should as a matter of routine inform employers of cases where employees received benefit for industrial dermatitis. Attention was also drawn to the possible dangers of such a procedure. The matter was referred to the Occupational Dermatitis Subcommittee for further consideration.

The Committee scrutinized Form B.I.91 of the Ministry of National Insurance—the medical report on claimant under the Industrial Injuries Acts (prescribed diseases). It was the opinion of several members of the Committee that the form was not very suitable for cases of industrial dermatitis, and that there should be a separate form for such cases. It was agreed to transmit a recommendation to the Ministry in that sense.

A short time ago the Committee held a special meeting to consider the draft manual on industrial first aid to be issued by the St. John Ambulance Association. It considered that the draft needed extensive revision, although this in no way diminished its appreciation of the initiative taken by the body which had brought it forward. Comments had been sent to the St. John Ambulance Association, and its reply was awaited.

It was reported that the Branch Council of the North of England Branch had expressed the opinion that the examination of suspected cases of pneumoconiosis should be accelerated; also that a copy of the report of the findings of the board should be sent to the patient's doctor. This opinion had been transmitted to the Ministry of National Insurance, which had replied that the question of acceleration was being looked into. It was bound up with the question of medical staff requirements which were now under review. With regard to informing the patient's own doctor of the findings, the Ministry agreed that this should be done in these pneumoconiosis cases, and arrangements were being made accordingly.

COST OF HEALTH SERVICE IN SCOTLAND

According to a news report the Scottish N.H.S. local executive councils paid out £17,115,185 in the year ended March 31 last for medical, dental, pharmaceutical, and ophthalmic services, and the expenses of administration and superannuation. The number of people on doctors' lists was just short of five million, and they received 12,584,154 prescriptions during the year, and 613,121 routine eye examinations. The total expense breaks down as follows: Doctors received £5,185,206, dentists £5,436,922, pharmacists and appliance makers £3,763,433, and opticians £2,331,708. Administration cost £222,754, or 1.3% of the total expenditure.

WHITLEY COUNCIL REGIONAL APPEALS COMMITTEES

The following are the names and addresses of management side secretaries:

Newcastle.—J. L. Streeting, Ministry of Health Regional Office, 1, Osborne Road, Newcastle-upon-Tyne, 2 (Newcastle 28861).

Leeds.—F. Stead, Ministry of Health Regional Office, Century House, South Parade, Leeds, 1 (Leeds 32771).

Sheffield.—J. R. Taylor, Ministry of Health Regional Office, Government Buildings, Block 5, Chalfont Drive, Western Boulevard, Nottingham (Nottingham 77711).

East Anglian.—C. A. Harding, Ministry of Health Regional Office, Government Offices, Block D, Brooklands Avenue, Cambridge (Cambridge 54461).

North-east, North-west, South-east, and South-west Metropolitan.—H. V. White, Ministry of Health, 1, Richmond Terrace, Whitehall, London, S.W.1 (Whitehall 7621).

Oxford.—Miss M. Soper, Ministry of Health Regional Office, 17, Bath Road, Reading, Berks (Reading 60481).

South-western.—A. E. Merriott, Ministry of Health Regional Office, 19, Woodland Road, Tyndalls Park, Bristol, 8 (Bristol 26671).

Wales.—J. H. Clement, Welsh Board of Health, Cathays Park, Cardiff (Cardiff 5120).

Birmingham.—J. E. Worth, Ministry of Health Regional Office, 139, Hagley Road, Edgbaston, Birmingham, 16 (Edgbaston 0932 and 1533).

Manchester and Liverpool.—H. G. Jones, Ministry of Health Regional Office, Sunlight House, Quay Street, Manchester, 3 (Deansgate 2444).

THE AMENDING ACTS COMMITTEE

The Amending Acts Committee, set up as a result of a resolution of the Representative Body at Southport this year, met on October 19. Dr. H. H. D. Sutherland was elected chairman for the current session. A preliminary discussion took place on terms of reference and method of procedure. The committee is anxious to proceed with its work with all possible speed and has arranged to meet about once a month.

PAYMENT ON ACCOUNT FOR EXPENSIVE PRESCRIPTIONS

To help chemists who have to dispense expensive prescriptions, particularly if they may otherwise fall into financial difficulties through being newly set up in business, the Minister of Health has agreed that certain categories of prescriptions, including those where the ingredients have an aggregate value of at least £20, may be specially and rapidly priced in advance of the routine pricing and payment under the National Health Service. A letter on the special procedure for this has been sent to those concerned.

Questions Answered

Extension of Professional Accommodation

Q.—*I have had my house extended so as to have a larger surgery and waiting-room and to allow more privacy for my family. The old professional rooms have been reconverted to a living-room and hall. Am I entitled to income-tax relief for this reconversion?*

A.—The expenditure is clearly in the nature of capital outlay incurred to improve future conditions, and no deduction can be claimed. The Income Tax Act of 1945 introduced a new allowance for capital expenditure of a similar nature, but it is restricted to "industrial" and "agricultural" buildings, and would not apply to premises used for professional purposes or, for example, retail trade.

Allowance for Car

Q.—*What income-tax allowances may be claimed in respect of a car used in practice?*

A.—The standard allowances are: (1) initial allowance, at 40% of the amount paid for the car, and (2) wear-and-tear allowance, at 25% on the written-down value of the car. The former allowance can be claimed for the year following the year in which the car was purchased. If the car is used for private as well as professional purposes, some restriction of the above allowances will be due—e.g., in the ratio of the mileage for the two purposes.

Visitor from Abroad

Q.—*Under what conditions do I become liable to pay British income tax? I am a South African and will be spending approximately a year in Britain doing postgraduate work. I am living almost entirely on capital.*

A.—The questioner has evidently come to the United Kingdom for a temporary purpose only, and will accordingly not be liable for any financial year (i.e., for a year ending on April 5) in which he is not residing in this country for six months. For any financial year in which he is so resident, he will be liable to account for income tax on any *income* he receives in this country. Amounts of *capital* received will not be liable to income tax.

Correspondence

The S.H.M.O. Grade

SIR,—Workers in the field of tuberculosis will be dismayed by the recent announcement (*Supplement*, October 14, p. 162) by the Ministry of Health concerning the posts that may suitably be filled by senior hospital medical officers. It appears that medical officers who have spent years in specializing in the field of tuberculosis will, in the vast majority of cases, be unable, under this ruling, to attain consultant rank. It is specifically stated that those who choose to remain in the field of chest clinic work in particular are unlikely to be eligible for consultant status.

This decision follows upon the Ministry's discussion with professional bodies, and it is difficult to avoid the conclusion that not only the Ministry of Health itself but consultants in other fields of medicine, who at present of course represent most of the professional bodies having the ear of the Ministry, are determined to maintain the degraded position of the tuberculosis service that has been its lot for some decades.

It was hoped with the advent of the National Health Service that this position would be radically altered and that all medical officers who had made a single specialty their life work would be considered on equal terms provided their individual achievement was of sufficient merit. Here, however, we have the singling out of a specific branch of medicine (among others such as geriatrics and infectious diseases) as a specialty in which, whatever one's personal achievement, the likelihood of consultant grading is remote.

With the present shortage of beds and the emphasis for the greatest responsibility in the care of the tuberculous falling upon the chest clinic physician and his staff, the present decision is obviously extremely short-sighted. There is no doubt that to-day tuberculosis forms the greatest problem facing the Health Service, and yet a national service chooses to disregard its national responsibilities. Until tuberculosis workers are given the recognition which their work and responsibilities demand, there is little hope of drawing the best men into this field and of maintaining the high standard of efficiency that is required to control the disease.—I am, etc.,

London, W.12. PETER STRADLING.

SIR,—Would it be permissible to ask, How should the agreement which has been reached between the Ministry and the Joint Committee "go far to allay much of the dissatisfaction," as suggested in your leading article (*Journal*, October 14, p. 876)? The dissatisfaction to which you refer does not arise out of the future but out of the past application of this grade, and there is nothing in the Ministry's circular (*Supplement*, October 14, p. 162) which would in any way "allay" any of this dissatisfaction. As far as the future use of the S.H.M.O. grade is concerned, the profession would have possessed an efficient remedy simply by refusing to apply for such appointments. Moreover, the B.M.A., if it was not satisfied with any of these appointments, could have black-listed them and refused to advertise such appointments in the *Journal*. Hitherto we have been told by both the Ministry and the B.M.A. that the S.H.M.O. grade was purely an interim measure which was to be abolished altogether, and now we are informed that its use has not only been extended over a wide field but even applauded by the B.M.A. To say the least, this is somewhat confusing and contradictory.

The Joint Committee is certainly to be congratulated on their ceaseless *efforts* but not on their *achievements* to undo the damage which was originally done by the Grading Committees. As the Ministry's circular clearly states that "practitioners personally graded as senior hospital medical officers who are holding consultant posts . . . should retain their present personal status," I doubt very much that there will be even one of the many senior hospital medical officers who will join publicly the B.M.A. in expressing congratulations to the Joint Committee. The only positive achievement seems to be that for the first time the Ministry openly admits that senior hospital medical officers *do* consultant work without the status or salary

of consultants, and in a country which for centuries prided itself with a deep sense of justice and fair play this would appear to be far more an occasion of feeling ashamed than being congratulated upon.

The Ministry's circular is a further step towards the final defeat, and it would have been far better to recognize it as such instead of making an illogical and hopeless effort to hail it as a victory.—I am, etc.,

Colchester. F. KELLERMAN.

SIR,—In your leading article (*Journal*, October 14, p. 876) you say that the Ministry's circular on the subject is a welcome approach to the delicate problems of the S.H.M.O. grade and should go far to allay much of the dissatisfaction that has been felt about it. While this is to some extent true, it will surely create new problems. Who is to define a "small" hospital? If the patient with a faulty bladder or rectum is always to be assured of attention by a consultant, why should the tuberculous or mentally sick patient be denied this right unless he happens to be admitted to a large hospital? Does not this ruling tend to establish a discrimination between specialties which is contrary to the Spens recommendations?

Which are the "limited fields of psychiatry"? Child guidance, which deals with the seeds of adult disorder? Mental deficiency, which concerns probably 1% of the population? Delinquency? Or merely the paranoia which is rapidly overtaking many previously stable members of our profession?

The circular also recommends, in a footnote, that S.H.M.O.s should be described as assistants. Should we not then insist that they be employed as such and never be asked to accept full responsibility even in a "small unit" or "limited field"? —I am, etc.,

Morpeth, Northumberland. C. GUY MILLMAN.

80% Resignations

SIR,—In the statement issued by the British Medical Guild and circulated to general practitioners we are informed that "the Guild undertakes that the resignations will only be used . . . if the resignations of not less than 80% of practitioners in the Service are held." Also "the Guild further undertakes that the resignations will be destroyed . . . if 80% of resignations are not held." Who chose 80%? Was it decided by the Council of the B.M.A., by the General Medical Services Committee, or by a conference of representatives of Local Medical Committees? It was certainly not decided or approved by the Representative Body. When the chairman of the General Medical Services Committee spoke of withdrawal at Southport, he omitted any reference to this all-important decision.

If the cause is just, we should be prepared to stand fast with a much smaller majority. It would be too absurd if a coalition of those who are comfortable and satisfied, those who would not resign on principle, those who are timid, and some who just lack vision, forming a minority of 21%, should be in a position to dictate the policy of the whole body of general practitioners.

It may well be that in waiting for 80% we are "riding for a fall," and nothing would be more disastrous for the profession at the present juncture.—We are, etc.,

W. L. WINSLOW SMITH,
Chairman of the Guildford Division.
G. L. MCCALL BLAIR.
C. P. WALLACE.

SIR,—I was amazed to read that, unless 80% of those doctors in the N.H.S. favour withdrawal, this action will not be taken. Such a figure is surely unnecessarily high and is unlikely to be reached. Failure to reach the objective will spell defeat and the end, for many years, of our hopes of constructing a service worthy of our profession and our country.

Surely if two-thirds of those concerned are in favour of withdrawal this will constitute a majority adequate to attain our objects and to demonstrate to the Minister and to the country our extreme dissatisfaction with the present state of affairs. It appears that, by placing the figure so high, the whole plan has been sabotaged before it has been begun. One can already discern the same subversive elements at work that gave rise to the astounding *volte-face* at the last plebiscite. Cannot a more reasonable figure be substituted before it is too late?—I am, etc.,

East Horsley, Surrey. BASIL S. GRANT.

Trainee Assistants

SIR,—I was very pleased to see that the Lancashire Local Medical Committee had proposed a motion for the abolition of the trainee assistant scheme to be discussed at the annual conference of Representatives of the Local Medical Committees.

I have just completed a year as a trainee assistant. I have learnt a great deal and gained much experience, but I am sure I have done as much work as most ordinary assistants, and my principal has had my services paid for almost entirely by the State.

It seems to me to be quite wrong that some arbitrarily chosen doctors are able to have an assistant for practically nothing. The intentions of the scheme are obviously good, but I am sure that very few practitioners can afford the time to treat an assistant more like an apprentice. Hitherto young doctors who wished to enter general practice were prepared to obtain the necessary experience at their own expense, and I am sure would still be prepared to do so.

It is a pity that the money being spent on the trainee scheme could not be used in some way to encourage the formation of partnerships, which are very difficult to obtain at the present time. Since the abolition of the goodwill value of practices a principal stands to lose money by taking a partner, and such partnerships as are offered must find some return for the principal.—I am, etc.,

TRAINEE ASSISTANT.

The Doctor's Clerical Work

SIR,—Mr. E. D. Willis and Miss A. G. Shaw (*Supplement*, September 16, p. 132) give an account of a "simplified" system of recording visits which, however, still seems unnecessarily complicated. The following system has been in use in my practice for the two and a quarter years that have elapsed since the inception of the National Health Service and has given complete satisfaction with a minimum of clerical labour.

The basis of the system is the N.H.S. continuation card, not the complete record, and, in contrast to Willis and Shaw's paper, "card" here refers to a single continuation sheet. The only apparatus used is a small box to hold cards in the surgery and a strong rexine-covered cardboard wallet to fit comfortably in the jacket pocket and hold both cards and a selection of N.H.S. forms for use when visiting.

When a request for a visit is received the current continuation card is extracted from the patient's records (or a new one is made out), the date on which the visit is to be made is inserted in the appropriate column, and the card placed in the box. Guide cards for the days of the week or month can be used if the bulk of visiting is great, but are not necessary otherwise. Before starting a round of visits the cards for that day are taken out of the box, sorted into the order most economical of time and petrol, and put in that order in the wallet. As each patient is seen, notes are entered direct on the card and all necessary prescriptions and certificates written. The date for the next visit is then written on the next line of the card, which is transferred to the back of the bundle. On return to the surgery cards are sorted, those requiring further visits being placed in the box and those finished with being placed in a filing tray.

It will be observed that the only work which cannot be delegated is the recording of clinical notes at the time of seeing the patient. Furthermore, nothing is written more than once, as no visiting book, visiting list, or notebook is kept. Unexpected visits ("While you're here, Doctor, would you mind seeing . . .") are recorded on fresh continuation cards, of which a supply is carried in the wallet. (The waste of cards involved by so doing is trivial compared with the waste of time that would be occasioned if rough notes were made and afterwards transcribed.)

The wallet is made like the covers of a book, with a limp back. Cards are held in place against the back cover by strips

of elastic which pass across the two lower corners. There is a pocket on the front cover which contains small bundles of prescription and certificate forms stapled together at the corner. The complete books would of course be too bulky, especially in view of the stroke of bureaucratic genius which separated the first from the intermediate and final certificates. Before the war it will be remembered that all the usual N.H.I. certificates were on a single form. Is it too much to hope that this admirable arrangement should be reverted to?—I am, etc.,

J. W. NICHOLAS.

Silver End, Essex.

POINTS FROM LETTERS

Clear Demands

Dr. J. W. O. FREETH (Dorchester, Dorset) writes: It has become clear that the general practitioner wants something done, and done at once, to improve his remuneration and conditions of service. It has also become clear that at present the holding of meetings between the B.M.A. and the Ministry of Health is, for this purpose, a waste of time. The frustration is such that practitioners are now considering either (*a*) the withholding of certificates, or (*b*) withdrawal from the Service. In my opinion neither of these is practical. If certificates were refused, the terms of service would be broken and executive councils could withhold part of the remuneration, so that only the profession would be worse off. Withdrawal from the Service would mean getting the compensation money at once, but would interfere with superannuation and with the right to continue to practise in the same locality as heretofore. Either action may be further complicated by the National Arbitration Order of 1940, and by the Industrial Courts Act of 1919, so that it is impossible to foresee any clear victory by adopting one of these expensive methods of persuading the Government that we need more pay. However, there is a much more effective and cheap way of getting some satisfaction. The factors which persuade politicians to act are not reasoned documents and accounts, nor even the £7,000,000 publicity campaign which the American Medical Association is organizing, but actions like those of the suffragettes of forty years ago. The Ministry will give us more remuneration if we can create a popular and persistent demand that we should have it. . . . Every general practitioner should have a rubber stamp, and all certificates of whatever nature should have the words "Your Doctor Needs More Pay" stamped across them. Income-tax and all other papers passing through our hands should be similarly treated. . . . We should stick up notices, big and small, telling the world that his doctor needs more pay, until he really understands that we mean it. . . . The time for polite requests to the Ministry has gone, but the time for financial suicide by resigning or withholding certificates is not yet here, for any Government will listen to the demands of the voters (and non-voters) if the demands are proclaimed with sufficient force. We must make our demands clear to all.

Association Notices

AREAS OF LEEWARD ISLANDS AND ST. LUCIA BRANCHES

Notice is hereby given by the Council to all concerned that it is proposed to transfer the Island of Dominica from the area of the Leeward Islands Branch to the area of the St. Lucia Branch. It is also proposed to exclude the Island of St. Eustatius from the area of the Leeward Islands Branch, it not being a British Colony.

Any member or body affected by this proposal and objecting thereto is requested to write to the Secretary of the Association by December 9, 1950, stating the objection and the ground therefor.

CHARLES HILL,
Secretary.

PROPOSED ENFIELD AND POTTERS BAR DIVISION

Notice is hereby given that the Council has formed an Enfield and Potters Bar Division of the Metropolitan Counties Branch; the area of the new Division to comprise the postal and urban districts of Enfield and the urban district of Potters Bar.

CHARLES HILL,
Secretary.

SCOTTISH COMMITTEE
Session 1950–1

Election to fill vacancy in the three representatives of the Group of eight Divisions comprising Orkney, Shetland, Caithness, Sutherland, Inverness, Outer Islands, Ross and Cromarty, and Argyllshire.

Only two members having been nominated under the election procedure laid down in the Standing Orders of the Scottish Committee, a further election is, on the instructions of the Scottish Committee, to be held for the purposes of filling the vacancy. Under the Standing Orders nominations for this election shall be in writing and may be made (*a*) by a Division or (*b*) over the signatures of not fewer than three members in the grouped Divisions. Nomination under (*a*) does not invalidate nomination under (*b*) or vice versa. Nomination forms have been sent to the honorary secretaries of the Divisions in the Group, and can also be obtained on application to the Scottish Office. Nominations should be sent to me at the Scottish Office, 7, Drumsheugh Gardens, Edinburgh, not later than Saturday, November 4, 1950.

E. R. C. WALKER,
Scottish Secretary.

Diary of Central Meetings

NOVEMBER

1	Wed.	**Council**, 10 a.m.
2	Thurs.	Otolaryngologists Group Committee, 2 p.m.
7	Tues.	Orthopaedic Group Committee, 2 p.m.
8	Wed.	Medical Witnesses Subcommittee, 2.30 p.m.
9	Thurs.	General Medical Services Committee, 11 a.m.
10	Fri.	Ophthalmic Qualifications Committee, 11.30 a.m.
15	Wed.	Film Committee, Executive Subcommittee, 2.15 p.m.
16	Thurs.	International Relations Committee, 2 p.m.
17	Fri.	Amending Acts Committee, 2 p.m
17	Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
24	Fri.	Venereologists *Group Committee*, 2 p.m.

Branch and Division Meetings to be Held

EAST NORFOLK DIVISION.—At Norfolk and Norwich Hospital, Wednesday, November 1, 2.45 p.m., annual general meeting.

FINCHLEY DIVISION.—At Finchley Memorial Hospital, N., Tuesday, October 31, 8.30 p.m., election of new secretary.

KENSINGTON AND HAMMERSMITH DIVISION.—At Postgraduate School of Medicine, Ducane Road, London, W., Tuesday, October 31, 8.30 p.m., clinical meeting. Dr. C. L. Cope and Dr. E. G. L. Bywaters: "A.C.T.H. and Cortisone."

KESTEVEN DIVISION.—At George Hotel, Grantham, Thursday, November 2, 7.15 for 7.45 p.m., address by Dr. F. G. Tryhorn, D.Sc., F.R.I.C.: "Forensic Chemistry as it Affects the Medical Profession." The lecture will be preceded by a dinner.

MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, October 27, 8.45 p.m., annual general meeting.

STOCKPORT DIVISION.—At Stockport Infirmary, Tuesday, October 31, 8.30 p.m., annual general meeting.

SWANSEA DIVISION.—At Guildhall, Swansea, Thursday, November 2, 7.30 p.m., annual dinner.

SWINDON DIVISION.—At Stratton St. Margaret Hospital, Swindon, Sunday, October 29, 11 a.m., clinical meeting. Non-members of the B.M.A. are invited.

WORCESTERSHIRE AND HEREFORDSHIRE BRANCH.—At Herefordshire General Hospital, Hereford, Thursday, November 2, 3 p.m., clinical meeting.

British Medical Guild Meetings to be Held

FINCHLEY.—At Finchley Memorial Hospital, Tuesday, October 31, 9 p.m., election of new secretary and formation of group.

STOCKPORT.—At Stockport Infirmary, Tuesday, October 31, 9 p.m., meeting of all medical practitioners in the area for formation of local organization of British Medical Guild.

B.M.S.A. ANNUAL REPORT

The British Medical Students Association has issued its annual report for the year 1949–50. It provides a record of work performed during the year, and is obtainable from the secretary, Mr. A. E. Vince, at B.M.A. House, Tavistock Square, London, W.C.1.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY NOVEMBER 4 1950

ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES

The Annual Conference of Representatives of Local Medical Committees was held at B.M.A. House, London, on Thursday, October 26. The chair was taken by Dr. W. JOPE (Blantyre, Lanarkshire), who was supported by Dr. S. Wand, chairman of the General Medical Services Committee. The annual report of that Committee, published in the *Supplement* of September 2, was the basis of most of the day's business.

Dr. Arthur Kelly, Assistant Secretary of the Canadian Medical Association, was present and was welcomed by the Chairman.

A motion by Birmingham that the Annual Conference be held at a date just before the Annual Representative Meeting in July, instead of in October as at present, was lost.

WORK OF THE GENERAL MEDICAL SERVICES COMMITTEE
Statement by the Chairman

Dr. WAND said that the Committee had had a very active year. A number of improvements in the terms and conditions of service had been effected. The inquiry into the volume of work being undertaken by G.P.s had proceeded and it was hoped to have fully detailed and analysed information in the near future. On the Whitley question the arbitration machinery had not yet been determined; it was under discussion. The whole of the staff side of Whitley was in agreement about the general terms of arbitration, but the management side had not seen fit as yet to take their point of view.

On the question of mileage, in view of the difficulties which had arisen it had been suggested that there should be a complete inquiry into the whole mileage position. The Government had agreed and a special committee had begun work. The basis on which mileage payments had been paid dated back for many years before the war and it was time the whole position was revised. The Rural Practitioners Subcommittee had been asked to investigate the dispensing capitation fee, and the inquiry was now taking place. Steps had been taken in connexion with basic salary to get certain improvements in the present position regarding cases in which it was considered that the Minister had been unreasonable in allowing basic salary on appeal. The scope of the Inducement Fund had been extended.

On the question of the petrol tax, in the remuneration inquiry now proceeding the Committee was to be given the opportunity of making representation that the practice expense figures should be adjusted in view of the imposition of the new tax.

In the maternity field they had been able to persuade the Ministry that cases which had been in hospital and which came to them for treatment of complications arising out of pregnancy should carry a fee. On the question of change of doctor the Ministry had accepted their point of view and the machinery was already in being. The Ministry had made it clear that, where doctors wished to exchange practices, such facilities would be given as far as possible, and the Medical Practices Committee was doing what it could to help in that field. Representations had been made on the regulations governing the conduct of the medical service committees and the Ministry had published an explanatory handbook on this subject. The result would be watched by a special subcommittee which was sitting under the chairmanship of Dr. Dain, and further amendments to the regulations would be pressed.

With regard to certification, a number of improvements had been made since the last Annual Conference. After long discussions with the Ministry they had been able to get a considerable improvement in the position under the Act. Those who had read carefully the list in its attenuated form as finally decided would agree that the certificates required now were little more than those required in practice before the passing of the Act. In future all forms of new certificate would require the sanction of a special interdepartmental committee on which they had representatives before being added to the "free list."

A number of subcommittees had been set up. One of them was dealing with the question of protection of practices; another with assistants, and a third with the position of trainees. On the vaccination question a fee of 5s. had been agreed after the Ministry and the local authorities had at first suggested a fee of 2s. 6d., and after representations the Ministry had given as its view that if vaccination or immunization could not be completed for causes outside the doctor's control the fee would still be paid. Representations had been made concerning physiotherapy services in remote rural areas, and there were now arrangements whereby certain doctors with the necessary experience would be able to provide such services. Steps had been taken whereby it was hoped the practitioners might be more adequately represented on hospital boards and management committees. On the criteria for determining the difference between a salaried partner and an assistant their contentions had been accepted by the Minister. He was glad to be able to say that they had been able to persuade the Minister to increase compensation payments to doctors who had retired or representatives of deceased doctors from 1.25 to 1.4 year's purchase, and it was hoped when statistics were available that this might be increased to 1.5.

He went on to refer to the growing volume of newspaper publicity concerning complaints made by patients against doctors. This was bringing the Service into discredit. Although in tribunal cases the name of the doctor was not published, it was not difficult in many areas to pin-point the doctor, who might find himself very embarrassed over a matter which was not his fault. Very often he felt that insufficient allowance was made for the fatigue of the doctor at the end of the day. They had pressed on the Ministry the need for propaganda to the public on the use of the Service in a sensible sort of way, and the Ministry had promised to put some propaganda across, but so far it had been of a very limited kind. It was the purpose of the Committee to bring home the need for more adequate propaganda.

In conclusion Dr. Wand said that it was the purpose of the Committee to see that the Health Service was satisfactory and that the conditions of work for the doctor were the best possible. When it was remembered that their association with the hospitals had not yet been properly determined, that the remuneration problem had not been settled, that the postgraduate education question remained open, it would be realized that they had still before them a tremendous amount of

constructive work. They had set up a Joint Committee with the Central Consultants and Specialists Committee, and another useful liaison was with the World Medical Association, from whose Conference he had just returned. That body had a Social Security Committee on which their own member, Dr. J. A. Pridham, had a seat. (Applause.)

THE REMUNERATION PROBLEM AND THE INQUIRY

Postponement of Special Conference

Dr. WAND, in opening the subject of remuneration, said that it would be remembered that they had agreed with the Ministry on an inquiry into practice expenses and into doctors' incomes which should be completed by a certain date. It had also been agreed that the machinery of the British Medical Guild should be put into operation, and again certain steps had been taken to ensure, if possible, its completion within a certain time. A Special Conference was to be called in December in order to discuss these matters. They had now received certain information which made it necessary that a resolution should be put to the present Conference to vary the date of that special meeting. During the last few weeks there had been a printers' strike in London, and this had held up certain matters. The document that went out to individual practitioners concerning the Guild had been delayed and up to the moment only 58% of local Guild committees had been set up. It was very important that the setting up of these committees should be completed and in particular that the consolidation of the small groups should be made effective.

Again, it was not possible because of printing difficulties for the Ministry to get out the 20,000 documents to executive councils by the determined date. When they were received the councils were in the course of the preparation of the quarterly cheques, so that again there had to be delay, and the full results were not yet available. So far as the expenses inquiry was concerned great progress had been made in the compilation of the figures, but unfortunately a very large number of the accounts were found not to have been agreed between doctors and their local inspector of taxes. They were now awaiting the actuary's opinion on whether the amount of information in hand was statistically sufficient to justify a general figure. He was certain that the Ministry was anxious to get on with this work. He wanted the Conference to believe, as he did, that these delays were impossible to avoid. He accordingly moved:

That in view of the information just received that the official inquiries now proceeding cannot, for reasons outside the control of the Ministry and the General Medical Services Committee, be completed by the end of the year, the special Conference be postponed until March, 1951, or the completion of the inquiries, whichever is the earlier.

He read into this resolution that the meaning was that not only should the inquiries be completed, but the discussion by the Committee on the results of those inquiries should be completed also. One thing they did not want to do was to cramp themselves by a predetermined time-table.

Dr. S. JOHNSTON (Halifax): Can we have some assurance that whatever settlement is arrived at it will be retrospective?

The CHAIRMAN: That is not at the moment before the Conference, but it is the policy of the General Medical Services Committee, if that is any comfort to you.

Dr. I. D. GRANT: Does that mean that the earliest possible date for resignations being effective will be June 1?

The CHAIRMAN: In practice, yes.

The resolution was carried with two or three dissentients.

The British Medical Guild

A motion by Middlesex was moved instructing the Committee to request the British Medical Guild to arrange to collect signed resignations forthwith.

Dr. C. T. MILLS (Worcester) moved an amendment to the effect that the publication of the Minister's decision on the surveys now going on should precede the collection of resignations, unless the publication were unreasonably delayed.

Dr. A. V. RUSSELL (Wolverhampton) supported the amendment. He had every confidence that if they were given time to organize and get things moving they could get up to full strength.

Dr. MAX SORSBY (London) said that the whole purpose of the postponement was to organize themselves in such a way that they would be sure of achieving success.

Dr. W. WOOLLEY (Bristol) could not agree with any suggestion that they had been rushed. They had had nearly a year to get the new machinery set up.

Dr. A. BEAUCHAMP (Birmingham) said that there was a great deal to be done in the education of the rank and file of the work to be done, and the members of the Conference, he hoped, profession, and its members had to be told in plain straightforward fashion exactly what was intended.

Dr. FRANK GRAY (London) agreed that there was much hard would take the lead in that work. The amount of information which it was necessary to put across to the periphery was tremendous. He hoped it would be understood that the Guild machinery was not something just set up for a few months. It was a machinery which must be there all the time so that people in the periphery could know what was going on.

The Worcester amendment was carried with one dissentient.

A motion by London requesting the Guild to inform all practitioners approximately to what extent the capitation fee would be augmented if the just demands of the profession were conceded was referred to the Committee for consideration in the preparation of the documents which would go out.

Proposed Withholding of Medical Certificates

Dr. F. J. ROBERTSON (Newcastle-upon-Tyne) moved:

That in the opinion of this meeting, no mass withdrawal from the Service could be effective without the withholding of medical certificates.

He said that mass resignation by itself was an empty threat. They must take their gloves off in order that it might be a short sharp fight, even though the general public might be inconvenienced.

Dr. A. M. MAIDEN (Lincoln) said that the vast majority of practitioners in his area felt that if resignations were to be effective they must be effective quickly, and the only way of getting quick results was to refuse to give certificates. Some people had suggested that mass resignation was to a certain extent immoral. "If that be the case, let us go the whole hog, refuse certificates, and at least make our criminality of short duration."

Dr. F. M. ROSE (Preston) said that the only thing that would make the Guild successful in the constituencies was a strong line of action, and the public must be the spearhead.

Dr. J. B. BENNETT (Cheshire) asked whether the Conference realized that it was not necessary for the patient to have a certificate to get sickness benefit. Any satisfactory information was sufficient. He failed to see how in his area he was to make a living unless he issued certificates and charged for them.

Dr. A. V. RUSSELL (Wolverhampton) supported the motion. "If we are going to fight, let us fight, and if it causes upset and dissatisfaction, well, it must do so."

Dr. A. CAMPBELL (Accrington) also supported. He said that some of his constituents would not come out at all unless they went the "whole hog."

Dr. J. P. JOHNSON (Wigan) said that in his area at a meeting 100% of those present said that they would agree to resignation if the withholding of certificates was made a part of the policy, but only a few were willing to withdraw unconditionally.

Dr. FRANK GRAY (London) begged the Conference to be realists. Supposing it came to resignation, was not public opinion one of the most important ways of bringing pressure on the Ministry? Every doctor would be in a position to influence public opinion through those patients who came to him. But if the doctor said, "This is a strike, and I will not give you certificates," he would be throwing away the opportunity of influencing the very people who would be on his side. And who would be hurt? Not the community at large, but only those who were ill, those whom their professional training compelled them to help. Would this be a weapon? Certificates could be obtained from osteopaths and others. There was nothing to prevent the Ministry of National Insurance accepting a certificate from a clergyman. The weapon would only break in their hands and damage themselves.

Dr. I. D. GRANT said that if it was going to be war it had to be total war, and in total war some innocent people suffered.

The Newcastle motion that no mass withdrawal from the Service could be effective without the withholding of medical certificates was carried by a large majority.

Dr. R. C. R. GETHEN (Surrey) said that his committee was dissatisfied concerning a clause in the document sent out by the British Medical Guild—the clause, namely, relating to the right of a practitioner to withdraw his resignation papers at any time. It seemed to them that there was insufficient safeguard against practitioners who might, having handed in the resignation form, subsequently cancel their resignation without the knowledge of their local colleagues. If it was not practicable to delete this clause it should be required that in the event of any cancellation all the other signatories in the locality should be informed by the Guild secretary. Only in this way could they get knowledge of what their colleagues were doing, and so maintain a united front. Dr. T. W. MORGAN (Surrey) spoke in the same sense, and a motion to this effect was carried.

The Necessary Majority

Dr. S. JOHNSTON (Halifax) referred to the 80% majority required, and thought that figure should be reconsidered. It would be better to leave the question of the adequacy of a working majority to the discretion of the General Medical Services Committee.

Dr. J. C. ARTHUR (Gateshead) hoped the 80% would not be altered.

Dr. WAND said there was something in the point that if the majority proved to be a unit or two below 80% it ought not to paralyse their action. What was wanted was something to the effect that the Committee would decide what was an adequate majority of the profession to justify them in going forward with the resignations. In the opinion of the Committee this majority should be round about 80%, but if it proved to be 79% it ought not to stop them from taking action. He suggested that this question be referred to the Committee in the light of the discussion.

This was agreed to.

He added that he interpreted that vote as indicating the wish of the Conference that the figure of 80% should be preserved unless some very good reason could be found for a slight alteration in the percentage. (Indications of approval.)

Dr. KENNEDY (I.O.W.) moved a resolution recommending that any practitioners who were unwilling to hand in their resignations should be invited to give an undertaking that they would not accept a patient on the list of a colleague whose resignation had been put into effect. Dr. I. D. GRANT suggested that assistants of members who did come out should be asked to give a similar undertaking.

Dr. WAND said that the proper undertaking for a man to give was an undertaking to resign; otherwise he was not with them. No undertaking other than resignations should be valid. But in view of what Dr. Grant had just said concerning assistants—and there were others who might be brought in in the same connexion—he suggested that this problem should be referred to the Committee.

This also was agreed to.

Loading of Lists

Dr. R. W. MCCONNEL (Buckinghamshire) asked the Conference to express the opinion that a more equitable distribution of the Practitioners' Fund would result if the capitation fees for that part of a practitioner's list between 500 and 1,500 were loaded. He asked that the Committee be instructed to give careful consideration to this opinion and be empowered to act thereon without further reference to the Conference.

Dr. WILSON (Inverness) moved as an amendment that the loading should be, instead of between 500 and 1,000, the first 1,000. He urged that that was a better method of loading.

Dr. SMITH POOL (Glasgow) said that of 659 practitioners in Glasgow, 463 had lists of under 2,500. It was quite obvious that there was great hardship in many cases. Only in the higher list practices did the figures approximate to Spens. An increase for the first 1,000 on the list would encourage partnerships. He supported the Inverness amendment.

Dr. W. M. KNOX (Glasgow) said that they were all in agreement that redistribution would be a good thing, but if it were proceeded with without any addition to the pool it would work out badly.

Dr. F. E. GOULD (Birmingham) reminded the Conference that it had already agreed that it was the extra moneys which should be distributed in this particular manner. What both the motion and the amendment asked was that present moneys should be redistributed, and he thought that should be turned down.

Dr. C. W. NYE (East Riding) thought that the Buckinghamshire motion would be helpful in readjusting the remuneration of practitioners in over-doctored areas. They would by loading the capitation fee for the part of the list between 500 and 1,500 give an indication of what they felt the capitation fee ought to be.

Both the Inverness amendment and the Buckinghamshire motion (each relating to the redistribution of present moneys) were lost.

Dr. A. V. RUSSELL (Wolverhampton) moved to urge the Committee that in reaching any agreement on arbitration it should endeavour to ensure that a court of arbitration should be in fact independent and unbiased. It had been said that if they went to arbitration they would not get all they wanted, which might be true, but it was also true that the Minister would not get all that he wanted. With an independent arbitration they would at all events get a fair deal.

The motion was carried.

Dr. C. W. NYE (East Riding) moved that in any negotiations with the Minister it should be impressed on him that the dissatisfaction of the profession with the Service was not limited to the question of remuneration, but also included the conditions of service and the tendency to lower the status of the general practitioner. The mover was greeted with cries of "Agreed."

Dr. WAND said that his Committee had been very urgent on this question of status in all their talks with the Minister and his officials.

Rural Mileage

Dr. R. ROSE (Berkshire) moved: "That this Conference considers the mileage fee for rural practitioners is still inadequate." For a long time past the rural practitioner had not received an adequate grant. The rural practitioner was called upon to do considerable journeys, involving excessive wear and tear of his car, and in several respects he was disadvantaged as compared with his urban colleague.

Dr. W. F. HUDSON (Oxfordshire), who said that 4.3d. per quarter was the unit payment for mileage in his area, considered that the Minister must have been extremely pleased when he heard that the Committee was "satisfied" with the addition made not long ago to the mileage pool. His local medical committee felt great dissatisfaction at the amount of mileage remuneration and wanted the General Medical Services Committee to press for a mileage pool of £10m., in which all practitioners would participate if they had patients beyond two miles from their surgeries.

Dr. WAND said that it must not be supposed that the Committee obtained the additional half-million for mileage easily; it never got anything easily. But the Rural Practitioners Subcommittee was satisfied. He had been informed of doctors with very large lists, living in small towns and serving neighbouring villages, who obtained as much as £2,000, or in one case £3,000, in mileage. When the Doctors' Remuneration Tables were produced a little while ago it was found that the average net income of the rural practitioner was greater than that of his colleague in the town. It was also evident that any addition to the mileage fund must at the present moment be at the expense of the general fund, which meant that the capitation fee would be reduced. He hoped that Oxfordshire would be asked how they arrived at their claim for a mileage pool of £10m. It was a "nice round sum," but it seemed to him fantastic.

Dr. C. F. R. KILLICK (chairman of the Rural Practitioners Subcommittee) described the work which had been undertaken to secure proper mileage remuneration for country practitioners.

He considered that the rural practitioners were being well compensated for their special difficulties. It was ridiculous to come to that Conference and claim that the mileage pool should be increased to £10m. There were still isolated difficulties which he hoped might be overcome when the review now taking place was completed.

Dr. R. ROSE (Berkshire) said that the rural practitioners in his county felt that they were not getting quite enough. Dr. Wand had quoted wholly exceptional cases, but exceptional cases did not alter the position of the average doctor.

The Berkshire amendment declaring that the mileage fee was still inadequate was lost, and an Oxfordshire amendment to press for a mileage pool of £10m. was ruled out.

Basic Salary

Dr. J. C. ARTHUR (Gateshead) moved to endorse the Committee's view that appeals against the non-award of basic salary should be addressed to the Medical Practices Committee and not to the Minister of Health, and to instruct the Committee to continue to press the point. He said that this was a self-evident matter and moved it without a speech. The motion was carried.

Maternity Services

Dr. C. T. MILLS (Worcester), in connexion with the maternity medical services, moved that the sending by post to the patient of a request to attend by appointment should be deemed to constitute a serious attempt to carry out a post-natal examination.

Dr. WAND did not think this to be justifiable. The sending by post of one request to attend was not a very serious attempt. The Ministry had been asked to indicate what was meant by a serious attempt, but had preferred to leave the matter fluid. They would, however, press the point. They must be reasonable about this. They could not agree to the suggestion of the Worcester motion.

The Worcester motion was lost.

Dr. H. VICKERS (Middlesex) asked the Conference to express the opinion that maternity cases should be accepted at clinics or hospitals only on the recommendation of the patient's general practitioner. Their patients were being taken away from them to have their babies in hospital, and health visitors were telling their patients that there was no need to bother their doctors.

Dr. W. WOOLLEY (Bristol) said that this motion would bring the midwifery work into line with other parts of their work. Dr. N. NELSON (Dundee) said that for years expectant mothers had attended hospitals and clinics and had engaged beds at hospitals. He saw no reason why they should upset these arrangements now.

The Middlesex motion was carried, as was also a motion by Newcastle-upon-Tyne that more beds should be made available in hospital maternity units for general-practitioner obstetricians.

Dr. C. D. MEADOWCROFT (Middlesex) asked the Conference not to accept the view of the Ministry (as set out in para. 52 of the Annual Report) concerning circumcision. The Ministry was unwilling to prescribe a specific fee for circumcision, because in the light of current medical thought it did not wish to encourage an increase in the number of such operations. It seemed as though this operation, if done by a general practitioner, might be looked upon, like abortion, as illegal. General practitioners could do the job infinitely better than a junior house-surgeon.

The Middlesex motion on this subject was lost.

Dr. D. R. SNELLGROVE (Bedfordshire) moved that in all maternity cases in mileage areas the payment for mileage should be 3s. per outward mile in excess of two miles, irrespective of the amount of service given. His committee saw no reason why a difference should be made in mileage payment as between Part I and Part II. Attendance under Part I might involve as many visits and as much work as under Part II.

Dr. KILLICK said that the Rural Practitioners Subcommittee had felt that it was a fair thing that if they did half the work they should get half the fee, and they could not see that it should come out of the ordinary mileage fund.

The motion was lost.

The Filling of Vacancies

Dr. A. SCOTT (Ayrshire) moved that steps be taken to give powers to Medical Practices Committees, in decisions concerning the addition of names to a medical list, to ensure that the letter of the law did not clash with established ethical principles. He gave an instance in which an assistant had applied for permission to start practice in the same area as his principal, unknown to the latter. The local medical committee turned down the application, but the Medical Practices Committee in Edinburgh, to the general astonishment, approved it.

Dr. I. D. GRANT, as a member of the Scottish Medical Practices Committee, said that they could not refuse an application from anyone to practise in an area unless they were satisfied that that area was already adequately served. He mentioned a case in which a doctor who had been assistant to a principal in the area, and was under a bond not to practise there, nevertheless made an application, and, the area being under-doctored, the committee, after taking the best advice they could, were unable to turn him down. It must, however, be for the profession to say—after very careful consideration—whether they wished to extend the powers of the Medical Practices Committee.

Dr. F. E. GOULD (Birmingham) said that the problem could be solved in the majority of cases by reason of the fact that the applicant would want a basic salary or an inducement grant, to which they need not agree, and thus the case would fall to the ground.

Dr. G. P. WILLIAMS (Anglesey) said that it appeared from what had been stated that assistants' bonds were useless.

Dr. WAND said that, of course, if there was a legal agreement this could be enforced in courts of law, but the Medical Practices Committee had no legal authority to take note of any ethical principle. If that committee got involved in ethical questions it would open up a channel whereby some of its work might cause dissatisfaction in the profession. Members of the Medical Practices Committees who were present endorsed Dr. Wand's statement.

The motion was accepted as a reference to the General Medical Services Committee.

Medical Service Committees

Dr. J. C. ARTHUR (Gateshead) moved that, where an inquiry by a medical service committee was deemed ncessary, such inquiry should be held within three months of the lodging of the complaint. At present the interval between the receipt of a complaint by the executive council and the hearing by the appropriate tribunal might drag on for as long as six months. Originally they had asked for a limit of only six weeks, but they had been told that that might not be long enough to complete investigations in certain cases. But it should not be more than three months.

The motion was carried.

On the motion of Dr. A. C. E. BREACH (Kent) the General Medical Services Committee was requested to co-operate to the fullest extent with the B.M.A. Council in undertaking at once a full investigation of the status, composition, procedure, and functioning of the tribunal and medical service committees, taking legal evidence, and publishing a full report with recommendations as a preliminary step to securing amending legislation. This was in line with a resolution passed at the Annual Representative Meeting.

The meeting also, at the instance of Worcester, carried a resolution declaring the Ministry's reply on the subject of publicity in disciplinary proceedings unsatisfactory, and requesting the Committee to press further for the exclusion of the doctor's name from the published decision of the tribunal, except where that decision was to remove the doctor's name from the medical list.

Several resolutions at this stage of the Conference were passed without discussion. One by York urged the Committee to take steps to remedy the absence of co-operation between the regional hospital boards and the general-practitioner service. Another by Worcester called for the addition of all types of supporting and corrective pessaries available to the prescribing doctor to the list of specially expensive appliances for the supply of which dispensing doctors, paid by capitation fee, may receive payment over and above such fee.

Trainee Assistants

Dr. J. J. DEVLIN (Manchester) proposed a motion deploring the continuation of the trainee assistant scheme and calling for its abolition. The scheme, he said, induced a general sense of frustration and futility. Young men should be given an opportunity of going into practices where they would have an opportunity of succession or of becoming partners.

Dr. S. A. WINSTANLEY (Manchester) said that this scheme did not implement for a moment the Spens Committee's recommendation. It was actually preventing certain practitioners who needed an assistant from engaging one because they believed that if they waited long enough they would be subsidized. He was afraid the scheme was subsidizing the acquisitive practitioner.

Dr. TALBOT ROGERS (Kent), as chairman of the subcommittee dealing with this matter, agreed that the present scheme was not the one envisaged in the Spens report. His committee had been instructed that at the end of a further year, now running out, they should collect evidence on how the scheme was working and report back to the General Medical Services Committee whether the scheme should be continued.

Dr. WAND said that he was prepared to accept motions on this subject as a reference to his Committee. He thought he had got the feeling of the Conference fairly well. The Committee had recently asked the Council of the Association to refuse advertisements for trainee assistants at rates of remuneration in excess of those laid down in the scheme. In a scheme of this kind it would be unfair to submit definite opinions until it had been running for some little time.

The various motions on this subject were referred to the Committee. They included one by Bristol deploring the abuses of the scheme and instructing the Committee to ensure that local medical committees exercised very much greater care in the selection of trainers.

Fees for Dental Anaesthetics

On a motion by Worcester City—

That this Conference is of the opinion that practitioners called upon to administer anaesthetics for dentists should insist upon receiving the full fee laid down in the regulations prior to the recent cut in dentists' remuneration—

Dr. WAND said that they had pressed this over and over again and were still pressing it. They had been in consultation with their dental friends, who went with them to the Ministry on one occasion, but they had not got what they asked for.

The motion was carried.

Dr. W. N. MAPLE (East Sussex) moved that such fees should be received automatically by the doctor through the executive council for the area. The Ministry's suggestion was that dental anaesthetic fees should be the subject, apparently, of a wrangle between dentists and anaesthetists. Surely it was desirable that there should be an agreed scale.

Dr. WAND said that they were trying to get this settled without amending legislation, but if they were tied down to a particular method it would definitely need amending legislation.

The motion was agreed to as a reference to the Committee.

Frivolous Calls

Dr. J. C. ARTHUR (Gateshead) moved formally, and it was agreed, that the attention of the Ministry should be drawn to the fact that, up to the present, all Government propaganda had urged the public to make more use of the doctor and not less.

Dr. A. N. MATHIAS (Middlesex) moved to instruct the Committee to demand from the Ministry the formulation of rules for patients to prevent frivolous calls on the services of general practitioners, and that these rules should be printed on the medical card. He said that there were 96 pages of rules concerning the conduct of doctors to their patients, but no rules for the conduct of patients.

Dr. WAND said that the Public Relations Department had been in communication with the Ministry and indications of the line of propaganda that would help them had been sent, but the Ministry's propaganda had been very weak. The trouble was that there was no sanction which could be applied.

The Middlesex resolution was agreed to.

A motion by Blackburn that the defined hours of night visits for the purpose of payment of emergency treatment should be from 6 p.m. to 9 a.m. was met by a motion to proceed to the next business.

Dr. WAND said that after the modifications which had recently been made in the definition of night visits it was a little churlish to bring the time forward to 6 p.m., and that in any case it was largely a matter of local application.

Dr. A. N. MATHIAS (Middlesex) moved that the Conference should not accept the Ministry's statement set out in para. 171 of the Annual Report that the reinstatement of demobilized Service personnel in doctors' lists would involve the employment of a substantial number of additional clerks and therefore could not be undertaken. This was an example of bureaucratic inertia.

Dr. WAND said that they were told that a large number of these demobilized people came back to other areas and that the check would need a considerable number of clerks, who were in short supply.

The motion was withdrawn.

School Health Service and the General Practitioner

On the motion of East Sussex the opinion was expressed that under no circumstances should a local health authority medical officer refer a schoolchild to any specialist (other than for an ophthalmic examination) except with the approval, expressed or implied, of the child's family doctor.

Aftercare

Dr. BARBARA WOODHOUSE (Middlesex) moved:

That this Conference considers the present system whereby health visitors attend mothers, children, and others without the knowledge of the family doctor to be against the best interests of the persons visited.

She said that the health visitor was valuable, but the value was minimized because it was often not carried on in co-operation with the family doctor. In many cases there was overlapping, and in some actual antagonism. General practice was in great danger of being shorn of its completeness. Maternity was disappearing from its purview and general-practitioner hospital beds were being snatched from them. Instead of general practice it would soon have to be called "limited practice" unless they took a firm stand and kept the responsibility for their patients.

After a brief discussion the motion was carried apparently unanimously.

On a motion by Durham it was agreed to draw the attention of the Minister to the very great discrepancy between the sum of 6s. 6d. per annum (plus special drug payment) per patient granted to dispensing practitioners for the supply of drugs and the sum of 15s. which was the approximate cost to the Exchequer of supplying the drugs to each prescribing patient.

This concluded the consideration of the Annual Report, which was then approved.

Arrangements for National Emergency

A motion stood on the agenda in the name of Hampshire expressing concern about the calling up of doctors in the event of a national emergency and urging the Committee to arrange that doctors who were on the reserve by reason of having served in the last war should not be called up at once, to the detriment of their practice, pending the call-up of other medical men.

Dr. D. F. HUTCHINSON (G.M.S. Committee) said that the position to-day with regard to the call-up of doctors was entirely different from that which obtained before the last war. There were now some 20,000 doctors in this country who were under a legal liability to serve if recalled. He agreed with Hampshire that to uproot a man because he had such legal liability, entirely irrespective of what he was doing in the civil profession, was ridiculous. They had impressed upon the Ministry the urgency of deciding upon some screening machinery, and at a conference during the previous week a skeleton plan had been worked out. The position now was that a subcommittee had been formed to hammer out details. It was

likely that these details would not differ widely from the arrangements in force during the last war.

The Hampshire motion was carried.

Hampshire had a further motion instructing the Committee to arrange with the Ministry that in the event of war all practitioners engaging in practice in an area other than their own should automatically be placed on a special list of the executive council of that area.

Dr. HUTCHINSON made a further statement on this motion. The broad outlines of a protection of practices scheme had been discussed. The plan which it was hoped to operate was that a practitioner who was called up should have his remuneration from the Services made up to the net annual figure of his civil practice, on the basis of the last quarter's payment. This would be a first charge on the pool, so that such a burden would fall on every part of the country, instead of on the local area. This would be a fairer method, although, of course, it would entail that the capitation fee would be somewhat lower. It was hoped shortly to publish a scheme to the profession.

The Hampshire motion was carried.

Superannuation

Dr. D. R. SNELLGROVE (Bedfordshire) moved that when a practitioner retired or died before becoming entitled to superannuation the Government contributions of 8% plus interest should be paid to the practitioner or his representative in addition to the repayment of his own contributions of 6% plus interest.

The motion was withdrawn after Dr. Wand had given an assurance that the Superannuation Committee had the point under consideration.

On a further motion by Lancashire, that the method of calculating the superannuation to which a doctor became entitled should ensure that there was no reduction of the amount by reason only of the employment of an assistant, Dr. WAND said that on the face of it this was a reasonable proposition, but on meeting one of the officers of the Ministry and discussing the matter they encountered certain arguments which it was difficult to meet. The Government was anxious to superannuate people on their earnings. When a man had an assistant, if they employed the method indicated in the Lancashire motion, it would mean that the Government would pay a greater amount in superannuation than would have been the case had the principal and assistant been in practice in the same area or even in the same house, but separately, having the same size of list. He thought they should leave the matter there. Where a list exceeded 4,000, the argument was even stronger on the Ministry's side.

The motion was referred to the General Medical Services Committee.

Dr. W. P. HEDGCOCK (Cambridgeshire) moved to draw the attention of the Conference to the plight of many elderly practitioners who were unable to retire on account of financial stringency. He urged that an approach should be made to the Minister to investigate the possibility of financial aid for these practitioners to enable them to retire. In earlier years this matter had been dealt with by the National Insurance Defence Trust.

Dr. WAND said that under the former Insurance Acts some of the moneys held in trust funds were devoted to this purpose, but it was not a very popular thing and during the last years of the Act it was used hardly at all. The Compensation Superannuation Committee had a similar resolution before it from the Annual Representative Meeting and had decided to initiate discussions with the Minister. The possibilities would be explored, but it should be remembered that they were tied down by the limits of their pool and that any such payments might come as a further charge on the pool. He accepted the motion as a reference to the Committee, but he warned representatives that it was a difficult problem with the Ministry in a service on which a ceiling had been set, with claims in other directions.

Compensation

Dr. F. R. B. H. KENNEDY (Isle of Wight) moved that the amount of repayment of capital value of practice payable on retirement should be subject to increment or decrement according to the then value of the £ relative to the £ in 1948. The value of the £ might depreciate considerably. The CHAIRMAN suggested that they should be careful about this motion. There was an Act on the statute book under which £66m. was the global sum for compensation, and no allowance was made for any variation. It might be more cautious to refer this to the Committee. The mover agreed to that course.

Dr. P. LOWDEN (Hampshire) moved that, in view of the continued delay in fixing the amount of compensation payable to individual doctors, the Conference should recommend that an adequate sum from the compensation fund should be set aside to meet claims not yet agreed. The balance, to be divided amongst the agreed claims, would raise considerably the compensation value of the practices, which up to now had been arbitrarily fixed at one year. He did not want to see compensation consigned to the limbo of post-war credits.

Dr. L. S. POTTER (Assistant Secretary) said that they had been waiting a long time for the regulations implementing the compensation clauses, and he was now promised that a full statement would be made shortly, probably to appear in the *Journal* within the next fortnight. It was often said that this was the profession's own money; that was true, and it was all the more important that it should be distributed equitably. He believed that there was evidence now in the hands of the department which made a fairly accurate estimation possible. They had been pressing the department for advance payments to doctors who had retired and were entitled to the full amount. The business of completing the assessments was going forward. Delay was unavoidable, but everything was being done in the interests of expedition.

The Hampshire motion was referred to the Committee.

Part-time Regional Medical Officers

Dr. W. H. HAYES (Bristol) moved that appointments of part-time regional medical officers should be made only after consultation with local medical committees in the area. Dr. W. WOOLLEY said that he had tried to find out how such officers were appointed. He was told that the appointments were made centrally, but were not advertised, and that as far as possible men with small lists were chosen. It seemed a hole-and-corner way of choosing these men. They ought to be men in whom practitioners would have faith.

Dr. WAND said that this matter was under consideration to the extent that representations had been made to try to get local medical committees in on this.

The Bristol motion was carried.

In dealing with a motion from Berkshire that the General Medical Services Committee should consult local medical committees in all cases before agreeing to changes in or additions to regulations affecting general practitioners, Dr. WAND said that the Conference elected its executive committee, and if that committee was to do its work it was not reasonable that it should have to refer everything to the periphery. On the matter of regulations he could recall no regulation that had been put out for a long time now without the fullest consultation with the Committee. That was a great achievement and it was a very good thing that the Government had been persuaded that it was the right thing to do. In what other field in this country was that likely to obtain? If through an excess of democracy everything had to be referred to the local committees they would get nowhere. If any major problem came up, of course the Committee would consult either the Conference or the local committees.

The Berkshire motion was "lost unanimously."

General-practitioner Hospitals

Dr. G. D. THOMPSON (Lancashire) moved:

That this Conference deplores the present apparent policy of converting general-practitioner hospitals to other uses, and strongly urges the Committee to take immediate steps to secure the reversal of this policy.

He said that on October 4, 1949, the Minister had explicitly encouraged the use of local hospitals at which general practitioners in the neighbourhood could attend cases which, for various reasons, could not be treated at home. Unfortunately regional hospital boards were not carrying out that policy. They were converting general-practitioner hospitals to other uses. He knew of about 30 cases all over the country in which this was being done, two of them in his own county. It was in this way that the status of the general practitioner was being lowered. Surely it did not need an F.R.C.P. to treat pneumonia? There should be more general-practitioner hospitals, not less.

Dr. T. W. MORGAN (Surrey) said that he was interested in a hospital of 44 beds which had been recommended for change of use. They had for the last 16 months been trying to fight this recommendation. His colleagues in that particular hospital had been offered two alternatives: one, the use of a smaller hospital which some years ago was given up as a modern hospital and had since been used for the chronic sick; the other, clinical assistantships at the general hospital. While the matter was still under negotiation the local hospital management committee had issued a notice of closure within 12 days; they had stated that no more cases were to be admitted after October 31. This was while negotiations were still in progress with the regional board. General-practitioner hospitals were an essential factor in keeping up the standard of the general practitioner. This decision had been condemned by two borough councils and by the executive council for Surrey.

The Lancashire motion deploring the present policy and calling for immediate steps to be taken for its reversal was carried unanimously.

Dr. R. C. BURTON (Sheffield) asked the Committee to reconsider its decision that no payment be requested for practitioners who complete the forms of investigation into virus infections in pregnancy, issued by the Ministry. He urged that as a matter of policy an adequate fee should be requested for the completion of any forms of investigation along the lines of research. The danger was that if these forms were sent in without a fee attached the Minister would be given a loophole through which he could push more and more work on them and this would eventually by regulation be included in the terms of service.

Dr. WAND pointed out that the completion of these forms was not compulsory. The Conference had been stressing the need for improvement of status and the desire of practitioners to be associated with more scientific work. It was important to show their good will towards the Ministry or anybody who was conducting an inquiry of this kind so long as the inquiry was reasonable, and he hoped the Conference would support the Committee.

The Sheffield motion on this subject was lost.

Secretaryship of the G.M.S. Committee

Dr. A. V. RUSSELL (Wolverhampton) moved:

That this Conference considers that it is absolutely essential, in view of the approaching conflict, that the Secretary of the G.M.S. Committee should have ample general-practitioner experience.

Dr. Russell desired to alter the terms of his motion, but the Conference would not permit him to do so. He said that they were about to lose the experience of Dr. Hill, and it was important to ensure that the Secretary of the Committee, which would be the headquarters of the fight which lay ahead of them, should be a man with special knowledge of general practice.

Dr. W. WOOLLEY (Bristol) hoped the Conference would defeat this motion. It was for the Committee to choose its own secretary. The motion if passed would hamper its hands.

Dr. WAND: Do I need to say anything about this motion? (Cries of "No.")

The motion was lost, only one or two hands being held up in its favour.

Elections

It was announced that Dr. W. Jope had been re-elected Chairman of the Conference unopposed.

The six members of the General Medical Services Committee elected by the representatives at the Conference were the following: Dr. A. Beauchamp, Dr. S. A. Forbes, Dr. I. G. Innes, Dr. J. A. Pridham, Dr. F. M. Rose, Dr. W. Woolley.

The Defence Trusts

The report of the trustees of the National Insurance Defence Trust and the G.M.S. Defence Trust as to action taken during the past year and as to the contributions received from Local Medical Committees was submitted to the Conference. Dr. WAND, chairman of the trustees, spoke of the healthy state of the investments and appealed for regular and adequate subscriptions to the Fund. This was the only means by which the Committee could measure the support available at the periphery.

Vote of Thanks to Committee

Dr. S. NOY SCOTT (Devon and Exeter) proposed a motion congratulating the General Medical Services Committee on the vast amount of work which it had achieved during the last year and on the success which had crowned its efforts in so many of the problems which it had tackled. The motion was supported by Dr. R. MCCONNEL (Buckinghamshire) and by Dr. B. HUTCHISON (Lanarkshire), and carried by acclamation.

The Conference ended at 5.30 p.m., after according a vote of thanks to its Chairman.

CONFERENCE DINNER

At the close of the Conference the representatives assembled for dinner at the Dorchester Hotel, with Dr. W. JOPE in the chair, the members of the General Medical Services Committee being the guests. The health of the Committee was proposed by Dr. WILFRED HUDSON, who said that during the day the Committee had come in for some occasional criticism, but they all agreed that it had done a grand job of work and deserved their thanks. Dr. S. WAND, in responding, referred to Dr. Hill's resignation. That was a suitable moment, he said, to say how sorry they were and how grateful for what he had done in the past. They must not be selfish. They had had his services for a number of years. Their best wishes followed him in this new turn in his career, and they hoped it would carry him to very high places. Dr. Wand also paid a tribute to Dr. Stevenson, the present secretary of the Committee, to Dr. Potter, and to the clerical staff. He made a special acknowledgment of the work of Mr. Scrivener, who had been clerk of the Committee and of the Insurance Acts Committee before it for many years.

Dr. DAIN made an appeal for contributions to the Dain Fund, the purpose of which was to help to educate the sons and daughters of doctors, particularly National Health Service doctors, who had fallen by the wayside. He asked for individual contributions and contributions from local medical committees. A collection taken at the tables realized £157, which was a record.

Dr. W. M. KNOX proposed the health of the chairman of the Conference, whom he complimented on his masterly handling of the day's proceedings, and Dr. JOPE, in his reply, paid a further tribute to Dr. Hill. Dr. HILL was given an ovation on rising to speak. He said that his decision to leave the Association had not been taken without a great deal of thought, but he was convinced that it was the right course to take. No one who had spent many years in the service of the Association could leave it without a feeling of sadness. He had received there "an immensity of kindness," and he referred in particular to the present Chairman of Council, Dr. Gregg, to Dr. Wand, the chairman of the Committee, Dr. Jope, the chairman of the Conference, and Dr. Dain. Dr. Hill concluded by saying that now that he had decided to take his chance in another field he hoped his work there might not be without value to his colleagues in the medical profession.

Dr. ARTHUR KELLY, assistant secretary of the Canadian Medical Association, who was welcomed as a guest, said that he had been particularly interested during the Conference in the references to general-practitioner hospitals. In Canada the general practitioners constituted the staff of the majority of hospitals. They were proud of the capabilities of their general practitioners, and deprecated any loss of their rights. He

wanted to see an open door for the general practitioner in hospitals, and he hoped that the present trend in Great Britain would be reversed.

Brief remarks were made by Dr. STEVENSON, who paid a tribute to Dr. Hill on behalf of the assistant secretaries and the staff, and by Dr. MCCUTCHEON, the Assistant Scottish Medical Secretary, who spoke as a newcomer in that capacity though not as a representative.

A clever entertainment added to the enjoyment of the evening.

MEDICAL PRACTICES COMMITTEE

The Medical Practices Committee has issued the following amendments to the four schedules compiled from its survey (*Supplement*, August 5, p. 77).

Schedule I

England: Counties

DELETIONS

Derbyshire.—Urban District of Ripley.

Leicestershire and Rutland.—Melton Mowbray (excluding Somerby.

Schedule II

England: Counties

ADDITIONS

Cheshire.—Insert "except Cheadle Hulme" after Cheadle and Gatley; Marple Bridge.

Derbyshire.—Urban District of Ripley.

Kent and Canterbury.—Insert "except the Poverest Ward" after the Urban District of Orpington.

Leicestershire and Rutland.—Melton Mowbray (except Somerby).

Suffolk (East).—Insert "Wickham Market with Orford and Otley" after the Rural District of Deben.

DELETIONS

Cheshire.—Bredbury and Romiley.

Derbyshire.—Rural District of Chapel-en-le-Frith.

Lincolnshire (Holland).—Delete the words "with the exception of Gedney Hill" after the Rural District of East Elloe.

Lincolnshire (Kesteven).—Ancaster; Caythorpe; Navenby.

Sussex (East).—Crawley Development Area (Rural District of Cuckfield).

Sussex (West).—Crawley Development Area.

CORRECTIONS

Durham.—Urban and Rural Districts of Barnard Castle, etc., should read: Urban and Rural Districts of Barnard Castle (with the exception of Middleton-in-Teesdale and Gainford); Rural District of Darlington.

Norfolk.—Rural District of Erpington should read: Rural District of Erpingham.

Schedule III

England: Counties

ADDITIONS

Cheshire.—Bredbury, Romiley, and Woodley; Hazel Grove and Bramhall; Cheadle Hulme.

Derbyshire.—Rural District of Chapel-en-le-Frith.

Devon and Exeter.—Brixham; Torrington.

Surrey.—Crawley New Town.

Sussex (East).—Crawley New Town.

Sussex (West).—Crawley New Town.

Schedule IV

England: Counties

ADDITIONS

Cheshire.—Malpas.

Kent and Canterbury.—Poverest Ward of Orpington Urban District (area adjacent to St. Paul's Cray).

Lincolnshire (Kesteven).—Ancaster; Caythorpe; Navenby.

Suffolk (East).—Wickham Market (Deben Rural District).

DELETIONS

Devon and Exeter.—Brixham; Torrington.

Lincolnshire (Holland).—Gedney Hill (East Elloe Rural District).

CORRECTIONS

Kent and Canterbury.—St. Mary's Cray should read St. Mary Cray.

Suffolk (East).—Pressingfield (Hartismere Rural District) should read: Fressingfield (Hartismere Rural District).

THE DOCTOR-PATIENT RELATIONSHIP

WEEK-END COURSE AT ASHRIDGE

The General Practice Review Committee considered at a recent meeting a suggestion that the Association should participate in a week-end course at Ashridge on the general theme of the doctor–patient relationship. Ashridge is the residential college near Berkhamsted, Hertfordshire, which, in addition to the full-time courses at its House of Citizenship, organizes short courses and discussions on subjects of public interest.

It is proposed that the week-end shall be March 9–12, 1951, and the course will be open to all medical practitioners. There will probably be five speakers (one of whom will be lay) to open talks on subjects connected with general practice and its trends, and those present will then break up into discussion groups to consider the various points raised. The General Practice Review Committee considers the suggestion a very valuable one which should provide an excellent forum for a reasoned exchange of views on conditions in general practice to-day.

The fee for the course, including accommodation at Ashridge, is £3 10s. Full particulars about application for the course and the number of participants who can be accommodated will be announced as soon as possible, but this preliminary notice is published in order that practitioners may make a note of the date.

MANX CHEMISTS' DISPUTE

Chemists in the Isle of Man are still not prepared to operate the regulation making a charge of sixpence on each prescription form. They have raised the objection that other regulations might be introduced in "the same inconsiderate manner."

Representatives of the Isle of Man Medical Society had a conference with the Isle of Man Health Services Board on October 18, and on October 20 stated that their differences with the Board had for the moment been settled.

In a statement issued by the Society previously the following observation was made: "It must be clear to all that the fundamental trouble lies in the endeavours of the Health Services Board to manage without those statutory bodies, the Advisory Council and the Services Committee, which were designed to assist in the running of a highly technical service by providing technical advice."

The doctors have been complaining for some time that decisions are made without consultation with the bodies set up under the Act to give technical advice.

THE NATIONAL FORMULARY

Some weeks ago a firm of pharmaceutical manufacturers issued, by means of a circular letter to doctors, a leaflet containing an indication for the exhibition of one of its proprietary preparations. The leaflet was adapted for inclusion in the *National Formulary* and was headed: "National Formulary, 1949." Inquiries were received from doctors and local medical committees whether this leaflet had been issued with the approval or with the authority of the Joint Formulary Committee. In order to remove all possible doubt, the firm in question has authorized the publication of the following letter addressed to the publisher of the *National Formulary*.

Dear Sirs,

We understand that the issue by us of a leaflet headed "1949 National Formulary. A summary of the uses of Crookes Lacto-Calamine" may inadvertently have given the impression that you countenance the advertising of proprietary products in the *Formulary*.

Such of course was not our intention and we wish to express our regret for any embarrassment we may have caused you.

We shall not issue similar leaflets in the future.—Your faithfully,

CROOKES LABORATORIES, LTD.

Heard at Headquarters

Presidents of the W.M.A.

The General Assembly of the World Medical Association heard with much regret at its meeting in New York that Dr. Charles Hill, its retiring president, was prevented by his Parliamentary duties from being present. Dr. Hill is succeeded as president by Dr. Elmer L. Henderson, also president of the American Medical Association. Those of us who may be so misguided as to think that the way of the American doctor is easy will be interested to know that as a youth Elmer Henderson worked on a farm. Deciding to take up medicine, he financed his own education by picking cotton, selling men's wear, running street cars, managing rides in an amusement park, and fixing pipes for a gas company. This kind of experience is, we understand, not uncommon in the U.S.A. and lends point to the saying that America is the land of opportunity. Dr. Henderson is a practising surgeon in Louisville, Kentucky, and served overseas in the war of 1914–18 as a major. In the war of 1939–45 he was chairman of the committee which arranged for the supply of physicians, dentists, and veterinarians for the fifth Service Command. Although he is past his sixtieth year, he gets up at 6.30 a.m. to begin his day's work.

The president elect of the W.M.A. is Dr. Dag Knutson, who will preside over the Fifth General Assembly of the W.M.A. in Sweden next year. Dr. Knutson is a member of the board of the Swedish Medical Association and has been its president since 1946. He has been an active member of the organizing committee and then of the council of the W.M.A. since 1946. He is a specialist in internal medicine and is head of the University Polyclinic for Internal Disease at Karolinska Sjukhuset, Stockholm.

More about W.M.A.

An innovation which was warmly appreciated at this year's meeting of the W.M.A. was a scientific session held during one afternoon. Those present were fascinated by the film shown by Dr. Alfred Blalock, chief surgeon at Johns Hopkins' Hospital, Baltimore, in his discussion on recent advances in surgery of the heart. Delegates also had the opportunity of listening to Dr. Louis K. Diamond, of Boston, speaking on the therapeutic uses of blood and blood derivatives; to Professor Hans Selye on stress and the general adaptation syndrome; and to Dr. Albert F. R. Andresen, of Brooklyn, on peptic ulcer. They were particularly interested in Dr. Andresen's remark that he had not used antacids for more than 30 years.

Another innovation was the holding of a meeting of medical editors, when Dr. Morris Fishbein, editor of the *Bulletin* of the World Medical Association, was in the chair. Of the papers read at this meeting the most interesting was the contribution by Dr. Joseph Garland, editor of the *New England Journal of Medicine*, on "Editorials, their Significance and Possibilities." This was a scholarly contribution which made those medical editors present go home and think afresh about the position of the leading article in contemporary medical journalism. Dr. Stanley B. Weld, editor of the *Connecticut State Medical Journal*, read a paper on medical advertising in which he gave a well-informed account of the control exercised by the American Medical Association through its Bureau of Pharmacy and Chemistry on the advertisement of drugs and appliances in the American medical press. When this article is printed in the *Bulletin* of the World Medical Association it will be of much help to editors of medical journals in other countries. In the absence of Professor M. W. Woerdeman, Dr. Fishbein gave an interesting informal talk on the inquiry which is now being conducted in America into the highly complicated work of abstracting and indexing medical literature. He drew attention to the need for co-operation in this kind of work, a form of co-operation which is in fact being encouraged by Unesco through its Co-ordinating Committee on Abstracting and Indexing of the Medical and Biological Sciences. Dr. Sandford V. Larky, librarian to the Welsh Medical Library, Baltimore, read a paper packed with information on the medical journals of various countries and of their indexing and abstracting. Dr. Hugh Clegg, Editor of the *British Medical Journal*, devoted most of his paper on anonymity in medical journalism to bringing forward arguments in favour of signing book reviews.

Correspondence

G.P.s on Hospital Staffs

SIR,—Recent correspondence in the *Journal* has shown that much thought is now being given to the problem of teaching medical students something about general practice. Unfortunately there is little agreement on how this can best be achieved.

The man who wishes to specialize to-day and get on to the staff of a teaching hospital has too much knowledge and experience to acquire in his own field to enable him to spend any time in general practice and so learn what to teach the students about it, while the general practitioner is far too busy to find time for the daily teaching of students, whom it has been suggested should be attached to him. Indeed, the relationship between patient and practitioner would be badly upset if a third person were to listen to every confidential chat.

An obvious solution to the problem is to appoint one or more suitable general practitioners to the staff of every teaching hospital. The G.P. in an occasional lecture, round, or out-patient attendance with or without his colleagues on the staff, and at an occasional visit to his own surgery, would be able to present a picture of general practice to the students. At the same time his contact with the staff would ensure a better appreciation of the problems of general practice in the hospital and lead to a closer co-operation between the hospital and the local practitioners. If it is true that the G.P. is the backbone of the medical services, it is incredible that he has been kept off the staff for so long.

Any student who has had the principles of medicine taught him at his medical school, and who has learnt about the problems of general practice from the G.P. on the staff of his hospital, should be fully qualified to take up a post as an assistant or junior partner in practice. He would not then have to waste any of his precious weeks sitting aimlessly in a surgery watching his tutor fill up endless forms and make wonderfully quick and usually accurate diagnoses as a result of his previous knowledge of the patients.—I am, etc.,

London, W.8. H. STEPHEN PASMORE.

Disciplinary Machinery in the N.H.S.

SIR,—Dr. A. C. E. Breach (*Supplement*, October 21, p. 168) is to be congratulated on bringing forward one of the most fundamental long-term problems in the conditions of service. The growing flood of instances of executive fines of an unparalleled viciousness must give rise to grave disquiet in the minds of doctors trying their hardest to make the best of a very hotch-potch Service.

As was feared in the beginning, the administrative bodies set up are already getting bogged down in the execution of regulations and in watching the economy of the Service. Ideas of improvement in conditions will slowly be strangled. Certain members of these administrative bodies with preconceived ideas of penalizing bad doctors (a very characteristic mixture of love and hate with which the public think of the profession) are making life burdensome for the ordinary doctor, who at any moment may be caught in the many traps set for his unwary feet.

For years the citizens of this country have battled to wrest power from centralized authority and to set checks and safeguards. It is quite obvious that we have been chosen as an example of the reverse of this process—of how a great and learned body of men can be beaten into submission and how disciplinary machinery set up can be controlled by a Minister of the Crown in civil life more rigidly even than by any commander in the armed Forces.

In the main the medical members on these committees do sterling work and few mistakes have been made as yet. But the danger is too great. Disciplinary procedure must be put

into the hands of an independent judiciary just as arbitration must be put into independent hands. The G.M.C. has just conceded this and the Minister must do likewise.—I am, etc.,

London, W.C.1. J. L. McCALLUM.

SIR,—A history don has reminded me that a revolution was necessary to abolish the Star Chamber. As your correspondent points out (*Supplement*, October 21, p. 168), Star Chambers are gradually being called again into existence in all walks of life.

Doctors and dentists are subjected to heavy fines, as in Star Chamber days anyone might be, with but a farce of a trial. A milkman was recently fined by a trade union for getting up too early. A workman was fined for doing too much work, etc. Doctors are already subject to the discipline of the General Medical Council. No other court should be necessary except that of the ordinary law of the land.

The recent case of a medical man being told by a mob in which order he should see his patients raises an old question. Many years ago witnesses of an accident would call all the doctors in the neighbourhood, till at last doctors refused to attend an accident without the written summons of a policeman. This the policeman would refuse to give, but the onus was on the police. Later, therefore, the police were well trained in first aid and the patient was rapidly delivered to hospital. Now the onus is back on the doctor, and he is the subject of a People's Court with a Minister of Health at its head.—I am, etc.,

Bosham, Sussex. F. C. B. GITTINGS.

Financial Difficulty in Essex

SIR,—Now that the general practitioners are occupied with the problem of the threat to resign from the National Health Service, many who are earning a satisfactory income are wondering whether there is in fact any need for them to bother. Some of them are not convinced that some doctors are in real financial difficulty. In the hope that these figures may make them have second thoughts on the subject, I would like them to be known as widely as possible, not only in Essex but all over the country.

In Essex 50 doctors have between 500 and 1,000 patients on their list, and 192 doctors have less than 500 patients on their list. This latter group are in real financial difficulty and need the collective help of all doctors of good will to help them out of their plight.

In England and Wales there are 4,132 general practitioners whose net income is under £840.

In Essex 43 full-time hospital officers have lists of N.H.S. patients for which they draw a capitation fee out of the Essex pool. This money has to be paid into the regional hospital board. In effect the G.P.s are personally contributing to the cost of the hospital service.—I am, etc.,

Upminster, Essex. E. ANTHONY.

Cui Bono?

SIR,—We learn in practice that the common often deserves note more than the rare. It is for this reason that I report the following case.

A patient of mine was admitted, after consultation, for observation and treatment of an acute pelvic condition to a 120-bed hospital in London on July 25. Investigation, treatment, and nursing were admirably successful, and she was discharged on August 8.

On October 6 I received the first and only information I have had from the hospital concerning her, and this was of the briefest. I should add, in fairness, that in reply to a personal letter the consultant concerned had given me details of her case early in September, but clearly the hospital did not consider itself excused or it would not have written at all.

I believe I am not alone in finding that the appointments system is associated with longer waits for patients. It seems that increased clerical staffs at hospitals are associated with longer delays in receiving reports.

What was the name of the Roman who was wont to ask *cui bono*? I feel just like him.—I am, etc.,

London, N.W.3. LINDSEY W. BATTEN.

Association Notices

PROPOSED DISSOLUTION OF THE MERIONETHSHIRE AND MONTGOMERYSHIRE DIVISION

Notice is hereby given by the Council of the following proposal:

That the Merionethshire and Montgomeryshire Division should be dissolved; and that Merionethshire be transferred to the Caernarvon and Anglesey Division and that Montgomeryshire be transferred to the Shropshire and Mid-Wales Branch.

Any member or body affected by this proposal objecting thereto should write to the Secretary of the Association by December 2, 1950, stating the objection and the ground therefor.

CHARLES HILL,
Secretary.

October 31.

Diary of Central Meetings

NOVEMBER

7	Tues.	Orthopaedic Group Committee, 2 p.m.
8	Wed.	Arrangements Committee, 11 a.m.
8	Wed.	Medical Witnesses Subcommittee, 2.30 p.m.
9	Thurs.	General Medical Services Committee, 11 a.m.
10	Fri.	Ophthalmic Qualifications Committee, 11.30 a.m.
14	Tues.	Standing Ethical Subcommitee, 2 p.m.
15	Wed.	Committee on Association of General Practitioner with Hospital Work, 2 p.m.
15	Wed.	Film Committee, Executive Subcommittee, 2.15 p.m.
16	Thurs.	Publishing Subcommittee, 11 a.m.
16	Thurs.	International Relations Committee, 2 p.m.
17	Fri.	Amending Acts Committee, 2 p.m.
17	Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
24	Fri.	Venereologists Group Committee, 2 p.m.
29	Wed.	General Practice Review Committee, 2 p.m.

DECEMBER

7	Thurs.	Committee on Psychiatry and the Law, 2 p.m.
8	Fri.	Amending Acts Committee, 2 p.m.

JANUARY

9	Tues.	Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

BURNLEY DIVISION.—At "The Romany" Dance Hall, Nelson. *Friday*, November 10, 8 p.m. to 2 a.m., annual medical ball. Midnight cabaret.

CHESTERFIELD DIVISION.—At Chesterfield Royal Hospital, Friday, November 10, 8.45 p.m., Professor C. H. Stuart-Harris: "The Poliomyelitis Problem."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Friday, November 10, 8.30 p.m., Dr. William Evans: "Unwarranted Cardiac Invalidism."

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Friday, November 10, 8.30 p.m., B.M.A. Lecture by Professor J. R Rees: "The Anxiety States."

British Medical Guild Meetings to be Held

BURNLEY.—At Nelson Hotel, Nelson, Friday, November 3. 8.30 p.m., meeting of all medical practitioners in the area to discuss formation of local organization of British Medical Guild, etc.

LANCASTER AND MORECAMBE.—At Alexandra Hotel, Lancaster. Sunday, November 5, 3 p.m., meeting of all medical practitioners in the area.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.
Non-County Borough Councils.—Dartford.
Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY NOVEMBER 11 1950

British Medical Association

PROCEEDINGS OF COUNCIL

Wednesday, November 1, 1950

A meeting of the Council of the British Medical Association was held at B.M.A. House, London, on Wednesday, November 1, with Dr. E. A. GREGG in the chair. The meeting lasted from 10 a.m. until 6.30 p.m., and even then several important matters were left over for consideration at an adjourned meeting to be called for November 22.

Facing the members was a handsome flag which had been presented to the Association by the World Medical Association at the recent General Assembly of that body in the United States. The flag was a mark of recognition of the hospitality given to the previous assembly in 1949 at the Association House in London. The Chairman of Council, who with Dr. Wand, Dr. Pridham, and Dr. Clegg (Editor of the *British Medical Journal*) had attended the recent assembly, spoke of the interest of the meeting, the helpful contacts which had been made, and the hospitality of the American hosts. He proposed that a letter of thanks be sent to the World Medical Association for the flag, which he had accepted on behalf of the Council and had promised should have a place of honour in their building. The vote of thanks was heartily accorded.

Personal

The death of a former member of Council, Dr. F. S. Heaney, of Liverpool, was reported, and the Chairman was authorized to send a letter of condolence to his relatives.

The Council received with regret the resignation of two members—Surgeon Vice-Admiral Sir Sheldon Dudley and Major-General Sir Percy Tomlinson—in both cases owing to ill-health. It was decided to nominate Major-General J. C. A. Dowse for election as the representative of the Army Medical Service in place of Sir Percy Tomlinson.

Dr. Rowland Hill, the new chairman of the Central Consultants and Specialists Committee, was welcomed as a new member of Council *ex officio*.

The Council sent a message of sympathy and good wishes to its Clerk, Mr. A. Twelftree, who has been a patient in University College Hospital for two months. It was reported that he was making good progress.

Resignation of the Secretary

The Council accepted with deep regret the resignation of Dr. Charles Hill, M.P., from the office of Secretary of the Association. On behalf of the Council, the CHAIRMAN expressed warm thanks for the faithful and brilliant services which Dr. Hill had rendered to the Association for nearly 19 years. Dr. Hill, said Dr. Gregg, had shown extraordinary ability, both in the deliberations of the Council and its committees and in negotiations with the Ministry of Health and a multitude of other public bodies. The Council was confident that he would achieve high distinction in any field of activity in which he engaged. Members of Council, he added, found satisfaction in the fact that it was in the work of the Association that Dr. Hill had attained the stature which had now brought him into a wider field of public service. In the future, when they observed reports of his activities, they would say with pride, "He used to be our Secretary."

The Council decided unanimously to appoint Dr. Angus Macrae as Secretary of the Association in succession to Dr. Hill. The Chairman expressed the good wishes of the Council to Dr. Macrae in his new appointment. Dr. Macrae became an Assistant Secretary in 1935 and a Deputy Secretary in 1948.

Scottish Representation on Council

Dr. J. A. PRIDHAM presented the report of the Organization Committee. An unexpectedly complicated matter arose concerning Scottish representation on the Council. The contention of the Scottish Committee was that Scotland in relation to England and Wales was under-represented. The Organization Committee, while unable to accept this view, and pointing out that any of the ten elected by the Representative Body to the Council might be Scottish members, nevertheless considered that some slight readjustment might be made in the method of election whereby one of these ten would be starred as a Scottish representative. This recommendation, however, was afterwards withdrawn because the Scottish Committee regarded the proposal as of the nature of an expedient and found it unacceptable.

Dr. J. G. M. HAMILTON, for the Scottish Committee, contended that on a strict interpretation of the proceedings of the Annual Representative Meeting there were to be two representatives of the Stirling group of constituencies (No. 27), which would have the effect of increasing the total membership of the Council by one. The Organization Committee, on the other hand, had maintained that the by-laws laid down a certain total number of Council members which could not be exceeded. Dr. Hamilton's answer to this was that the total number of members was merely the sum of the individual items. The earmarking of candidates in the manner proposed by the Organization Committee, although it would give Scotland one extra seat, was, in the Scottish Committee's view, a bad method of election.

The matter arose again on the Report of the Scottish Committee itself, brought forward by Dr. I. D. GRANT. He said that in Scotland they were fully satisfied with the resolution passed at the Annual Representative Meeting giving an additional member to Group 27, but some dispute had arisen about the exact implications of the Representative Body's decision. Dr. F. GRAY said that on any fair-minded examination of the representation as between England and Wales on the one hand and Scotland on the other the Scottish membership at present was adequate.

The chairman of the Representative Body, Dr. J. A. BROWN, said that in his view the Representative Meeting was not fully alive to all the repercussions of this resolution. He thought the matter of difference between the Scottish Committee and

the Organization Committee should be discussed between them, with the help of legal advice in addition to that which the latter committee had already taken.

This course, after a brief discussion, was agreed to.

Other Organizational Matters

It was agreed that the seal of the Association be affixed to an agreement incorporating the Ceylon Medical Association. The Ceylon Branch had sought to become an incorporated body under this title and had submitted a draft memorandum and articles of association which had been approved by the Organization Committee.

The recommendation of the Representative Body that methods should be considered whereby Divisions might honour members who had rendered outstanding services had been discussed by the Organization Committee, but it was felt that such services were already usually recognized by making the member chairman of the Division or president or vice-president of the Branch.

The Council agreed to recommend to the Representative Body that no action be taken, apart from the means already available to Divisions, to honour such members.

Medical Practitioners' Handbook

Dr. PRIDHAM drew the attention of the Council to the newly issued *Medical Practitioners' Handbook*. He said that this was a most valuable compilation and might very well be considered almost indispensable to men actively engaged in practice. It contained a vast amount of highly compressed information. His Committee had decided to adhere to the previous practice of distributing a free copy of the *Handbook* (which was issued at the price of 5s.) to all new graduates. It was also proposed to insert a special note of welcome in the *Handbook* to the newly qualified practitioner.

Members who had already secured a copy of the *Handbook* spoke highly of its usefulness.

The Medical Whitley Council

Dr. C. METCALFE BROWN, chairman of the Public Health Committee, brought forward recommendations for the appointment of representatives and deputy representatives on the staff side of Committee C of the Medical Whitley Council, which deals with the remuneration and conditions of service of public health medical officers. Those appointed as representatives were the Chairman of Council or his nominee, the Secretary of the Association, Drs. C. Metcalfe Brown, J. M. Gibson, F. Hall, Charles Hill, J. A. Ireland, Jean M. Mackintosh, Wyndham Parker, J. A. Stirling, and J. A. Struthers, and the Scottish representatives were Drs. J. Riddell, W. G. Clark, and G. V. T. McMichael. The deputy representatives were Drs. K. Cowan, H. Guy Dain, I. G. Davies, Mary Esslemont, C. E. E. Herington, E. Catherine Morris-Jones, and H. C. Maurice Williams, and the Scottish deputy representatives Drs. G. Matthew Fyfe, J. Kelman, and B. R. Nisbet. The appointment of the Scottish representatives was subject to confirmation by the Scottish Committee.

Dr. Metcalfe Brown also reported that there had been five meetings of Committee C, but as no agreement had been reached between the staff side and the management side both had decided to refer the dispute for settlement under the Industrial Courts Act, 1919. The case was heard on October 9 and 10. As public health officers they were extremely grateful to the Association for its policy in this matter and for the support received, and especially to Dr. Charles Hill for his evidence in the arbitration proceedings and his advice on the presentation of the case and to Dr. Kelynack for marshalling the documents. Whatever the result, the Association had put forward a just case as effectively as possible.

Tuberculosis and the National Health Service

Dr. PETER EDWARDS, chairman of the Tuberculosis and Diseases of the Chest Group Committee, attended the Council to present a report, embodied in that of the Central Consultants and Specialists Committee, on tuberculosis and the National Health Service. He said that this report represented many meetings of the Group Committee and concerned itself with the treatment of tuberculosis on both the clinical and the public health side. It was a comprehensive document dealing with the principles to be observed in the development of future chest clinics, the question of hospital accommodation, the control and working of mass radiography units, the training of chest physicians, and the problem of nursing tuberculosis cases. A further section dealt with prevention, care and aftercare, and rehabilitation. He stressed the urgency of the problem of tuberculosis.

Dr. J. M. GIBSON, in congratulating Dr. Edwards and his Group Committee, said that, while they appreciated the interest of the Ministry concerning cases of tuberculosis left at home untreated or treated under unsatisfactory conditions, they could not feel that it was the best step to have these cases treated in a general hospital. He also hoped that the suggestion for the appointment of almoners in clinics would not be carried too far. The health visitor could do all the almoner work that was necessary in the tuberculosis clinic.

The report was approved.

Domiciliary Consultations in Psychiatry

Dr. W. G. MASEFIELD, chairman of the Psychological Medicine Group Committee, attended the Council to present the views of his committee on a resolution recently passed by the Central Consultants and Specialists Committee concerning domiciliary consultations in psychiatry. The resolution had asked that general practitioners should be supplied with a list of consultants undertaking domiciliary consultations in the area in which they practised, provided that the list contained the names of all consultants so available, and that the names of whole-time consultants were set out together in the list with a footnote to the effect that they should be called upon only when no part-time consultant was available. The Group Committee, said Dr. Masefield, was concerned at the effect of this resolution in the special field of psychiatry and was anxious to avoid any perpetuation of the distinction between whole-time and part-time consultants. It wanted to ensure that the well-established custom whereby a general practitioner might call on the psychiatrist of his choice for domiciliary consultation should continue. He should have a free choice to call upon the medical superintendent or other full-time member of the staff of the mental institution to which a patient was likely to be admitted. The recommendation of the Central Committee would be most unfortunate.

Dr. ROWLAND HILL, chairman of the Central Committee, said that he did not think his committee would object to an addition to its resolution providing for the special field of psychiatry in the way that Dr. Masefield had suggested. He recognized that in psychiatry a large proportion of consultants were full-time. He was prepared to bring the matter again before his committee.

The matter was left on that understanding.

Private Practice

Dr. I. D. GRANT, chairman of the Private Practice Committee, brought forward a recommendation on the question of protection of practices during service with the Forces. It read that where a general practitioner is unable to make suitable arrangements for his private practice appointments to be covered by a partner he be advised to notify his employing authorities when called for service in H.M. Forces and to ask that one-third of the fees or salary of the appointment be paid into his account during his period of service and that the remaining two-thirds be paid to the practitioner undertaking the work of the appointment.

Dr. O. C. CARTER pointed out that the resolution referred not to private practice at all but to contract practice. He also took exception to a preamble to the resolution which referred to the "negligible amount of private practice undertaken by N.H.S. practitioners." It was small, but not negligible, and no matter how small private practice might be something should be done to preserve it. Dr. W. M. KNOX pointed out that there was no reference in the recommendation to the preservation of the contract; it was solely concerned with the remuneration during absence.

It was agreed that the recommendation be referred back for reconsideration.

A section of the report of the Private Practice Committee was concerned with the report of the Interdepartmental Committee on Cremation. Lord HORDER said that the Cremation Society, of which he was chairman, found themselves entirely in consonance with the views of the Private Practice Committee, especially with regard to the danger of abolishing medical referee appointments and the mistaken policy of limiting the number of practitioners allowed to complete certificate C to a panel chosen by the local authority.

Association Finance and Buildings

Mr. A. M. A. MOORE (Treasurer), in presenting the accounts for the period, drew attention to the increasing expenditure of the Association, but on the other side he pointed out that the subscription income had remained steady at above the expected level; also that a large proportion of the expenditure had been capital expenditure on the new building.

Mr. L. DOUGAL CALLANDER submitted the report of the Building Committee, which was concerned largely with alterations and redecorations at B.M.A. House. The total cost of the contracts had worked out at less than was anticipated.

Dr. F. GRAY congratulated the Building Committee on the changes which had been made in the Council chamber to accommodate the enlarged Council.

Dr. P. T. O'FARRELL thanked the Council for the generous loan of £10,000 without interest to the Irish Medical Association for the purchase of a house in Dublin. Dr. I. D. GRANT for the Scottish Committee also thanked the Council for affording funds to take up the Glasgow Regional Office.

The Council gave authority for the establishment of reference library facilities in the Scottish House at Edinburgh at an initial cost for the first year of approximately £620.

The Popular Health Journal

Dr. O. C. CARTER, chairman of the Journal Committee, made a detailed statement on the forthcoming publication of the popular health journal, the suggested title of which was *Family Doctor*. He said that when this proposal was first brought before the Council two years ago the title proposed was *Family Doctor*, and in the meantime no better title had presented itself. He also gave details of the budget for the launching campaign, involving trade advertising and various forms of publicity.

The Council agreed that the title of the journal should be *Family Doctor*, and that the first issue should be published in April next year. It also authorized expenditure for the launching and first year's promotion of the journal.

Various Business

The Central Consultants and Specialists Committee brought to the Council an important statement of evidence on internal hospital administration which it was proposed to tender to a committee appointed by the Central Health Services Council to study the administration of hospitals. It was felt that this statement deserved longer discussion than could be given to it at the end of a long day, and in view of this and the general state of the agenda it was resolved to adjourn the meeting to a later date in November.

Before this was done, however, certain non-contentious business was taken. It was agreed, on the recommendation of the General Medical Services Committee, that the practice of offering positions as trainee assistants at salaries in excess of the amount allowed by the Government to a principal for employing such an assistant was undesirable, and instructions were given to refuse advertisements for the *Journal* when the salary offered exceeded such allowance.

In the terms of service of hospital medical staff, para. 12 (*a*) has given rise to a number of disputes between consultants and their employing authorities about the effective date from which seniority on the consultant salary scale should be reckoned. Most of these disputes have been satisfactorily settled, but a few cases remain where the employing authority has arbitrarily fixed a later date. The Council decided that the rights of an individual practitioner in this respect be tested at law at the joint expense of the Association and the Medical Defence Union in a case selected mutually.

On the report of the Compensation and Superannuation Committee Dr. R. GIBSON urged that the utmost publicity be given to all matters concerning compensation. He was informed that a full explanation of the position would shortly appear in the *Journal*.

The Welsh Committee was authorized to make the necessary arrangements at the appropriate time to secure the election of the Association's nominee for Wales on the General Medical Council.

The Northern Ireland Committee reported that a serious situation had arisen in Northern Ireland regarding the grading of anaesthetists. The policy of the hospitals authority there is to grade as consultants only those who possess a higher degree in addition to a D.A.—a policy at variance with that obtaining in Great Britain. The Council supported the Committee in taking up the matter with the Ministry of Health.

Dr. R. P. LISTON, for the Film Committee, presented a report on his representation of the Association at the film session of the International Medical Congress at Verona, when the B.M.A. film on the treatment of hand infections received a prize for the best film on medical matters.

Certain recommendations of the Science Committee relating to the Association prizes were agreed to, and on the recommendation of that Committee it was also agreed to ask the Home Office to arrange for lectures to local meetings of the profession on the effects of atomic explosions from the medical—particularly the first-aid—point of view.

On the recommendation of the Central Ethical Committee it was agreed to inform the World Medical Association that the Council concurred with its recent pronouncement on euthanasia, that the practice was contrary to the spirit of the Declaration of Geneva and was to be condemned in any circumstances.

A proposal by the Colonies and Dependencies Committee that arrangements should be made for the secretary of the Committee (Dr. Grey Turner) to visit Gibraltar, Malta, Cyprus, and certain Branches in the Near East was sanctioned.

A sum of £687 received in subscriptions and legacies and standing to the credit of the B.M.A. Charities Trust Fund was allocated among medical charities in accordance with proposals of the Charities Committee.

The Council adjourned until November 22.

THE BRITISH MEDICAL GUILD

A meeting of the Trustees of the British Medical Guild was held at B.M.A. House, London, on Wednesday, November 1, with Dr. E. A. GREGG in the chair. In reply to a request Dr. S. WAND, chairman of the General Medical Services Committee, repeated the explanation he had given to the Conference of Local Medical Committees the previous week of the postponement of the Special Conference originally arranged for December and now fixed for March, 1951, unless the completion of the inquiries into practice expenses and N.H.S. income now being undertaken by the Ministry should be reached earlier.

Dr. R. P. LISTON urged the need for educating practitioners at the periphery in the purposes of the Guild. Dr. H. H. D. SUTHERLAND suggested that in areas where the local organization was not working properly certain practitioners who fully knew the subject should be selected to act as organizers. The Guild should also produce a short document, re-edited from time to time, which would be the vade-mecum of those entrusted with the organization. Dr. NOY SCOTT commented on a lack of information about the Guild and its purposes. Dr. FRANK GRAY said that a heavy responsibility rested on the trustees of the Guild, who were members of the Council of the British Medical Association, and it was fortunate that matters had

now been so arranged that the majority of members of Council had certain regional responsibilities. They should certainly do what they could to encourage the local groups in their areas. Dr. HALE-WHITE pleaded for a more systematic consideration of matters of the Guild at meetings of the trustees. Dr. R. GIBSON wanted better "public relations" for the local groups. Dr. J. A. MOODY considered that it was to practitioners with the large lists that the Guild would have particularly to address itself. Dr. A. BROWN spoke of Guild organization in a rural area, and Dr. F. M. ROSE, Dr. I. G. INNES, and Dr. H. ALEXANDER discussed peripheral organization generally.

Mr. LAWRENCE ABEL said that consultants were just as uninstructed in this matter as many general practitioners. If it was difficult to educate a general practitioner who had had thirty years of National Health Insurance, how much more difficult was it to bring the real position home to consultants. Dr. J. C. ARTHUR said that the practitioners in Gateshead were prepared to act with their fellows on the understanding that 80% of resignations over the whole country were secured, and that it was conceded that a fight could not take place without somebody getting hurt. Dr. A. V. RUSSELL said that some consultants seemed to be of opinion that this was a "general-practice war" and took no interest in it. Mr. TUDOR THOMAS said that group leaders must be well equipped with all the information and arguments they wanted. He suggested that a detailed commentary and series of arguments be sent to Guild secretaries.

Dr. WAND pointed out that the Guild had already issued two memoranda to local secretaries with instructions on procedure, and had issued a statement to every general practitioner explaining the purpose and functions of the Guild. Local Guild Committees had been asked to arrange for group leaders to hold meetings of general practitioners to clear up points of doubt and test the general feeling of practitioners in the area. This dispute had been going on for two years. There had been Special Representative Meetings and Conferences one after another, all of which had emphasized the importance of action. What they wanted was more than money, but in order to bring about the desired improvement of the Service it was necessary to have more money in the pool, and for this object the backing of the profession was essential. If people at the periphery were still not informed of the position it must be because people at the centre had not hit upon the right method of informing them.

The CHAIRMAN said that this had been a desultory discussion, but a very necessary one, and the conclusion that appeared to follow was that there was a necessity for much greater personal activity on the part of every trustee of the Guild. There might also be a need for simplification of some of the literature sent out, and for giving it greater pungency.

The Recent Conference of Local Medical Committees

Questions were asked by some trustees concerning the resolutions of the Conference of Representatives of Local Medical Committees (*Supplement*, November 4), in particular the resolution concerning the withholding of certificates in the event of a dispute, and the responsibility of the General Medical Services Committee (to which these resolution had been referred), the Council of the British Medical Association, and the Guild Trust respectively. The CHAIRMAN explained that the Guild was not a policy-making body but an instrument for implementing the policy of the Association by methods which the Association itself could not use.

Dr. WAND said that if certain resolutions were endorsed by his committee it would be his duty to inform the Chairman of Council, who might consider calling a special meeting of Council.

Mr. LAWRENCE ABEL pointed out that the resolution to withhold certificates in the event of a dispute would affect the whole profession, and if such a resolution was to be referred to the General Medical Services Committee he thought it should also go to the Central Consultants and Specialists Committee and the Public Health Committee. Dr. F. M. ROSE said that while such a resolution undoubtedly affected all branches of the profession its effect for general practitioners far exceeded all the rest.

Dr. J. G. THWAITES said that the action contemplated by such a resolution might bring the whole profession into disrepute, and it certainly concerned the whole profession.

Dr. WAND said that if his committee endorsed the opinion of the Conference on this particular issue it meant that it felt that this fight was sufficiently important to justify temporarily unpopular measures to ensure its success. It would be for the Public Relations Department to see that the public understood the reasons for the fight.

Dr. THWAITES: I want an assurance that we can debate the matter at some time.

The CHAIRMAN: It will have to be debated, and if there is matter which requires action the Guild will have to set about it. Can we not leave it at that?

Before the meeting of Trustees was concluded Dr. Angus Macrae was appointed secretary of the Guild in place of Dr. Charles Hill.

EXECUTIVE COUNCILS' ASSOCIATION

SIR JOHN CHARLES AT ANNUAL MEETING

The third annual meeting of the Executive Councils' Association (England) was held at Harrogate on October 26 and 27 under the presidency of Dr. NOEL E. WATERFIELD.

Sir JOHN CHARLES, Chief Medical Officer to the Ministry of Health, gave an inaugural address in which he declared that the National Health Service was the freest in existence, but that freedom could continue only if everyone taking part, practitioners and patients alike, regarded themselves as members together of a service and co-operated in making it as effective as possible. More was needed on the part of the practitioner than his personal and traditional responsibility for the individual patient; he must consider the Service as the acceptance of a duty to the community as a whole, and the patient on his part must use the Service sensibly.

He considered that the total number of general practitioners was probably adequate with the present maximum list at 4,000, though if the maximum was lowered a different state of affairs might arise. The distribution of practitioners, however, could still be improved. Executive councils had a particular interest in co-operating with the Medical Practices Committee in taking action to improve distribution. The Ministry was now confirmed in the view that the best way of getting additional doctors in an area was as partners or assistants of settled doctors.

The cost and volume of prescribing, Sir John Charles added, was still causing anxiety. In the second year of the Service 211 million prescriptions were issued at an average cost, in the second half of 1949, of 3s. 1¼d. It was difficult to believe that medicine-drinking on this scale was of even temporary benefit to the health of the nation. The general practitioner could make his main contribution to improvement by a judicious regulation of his own prescribing. The investigation of excessive prescribing by individual doctors was being resumed, and a special investigating unit had been established by the Ministry. Any prima facie case would be discussed with the doctor concerned, but might be referred to the local medical committee. Co-operation was also called for in the relations between general practitioners and hospitals. General practitioners could help by not calling on the Emergency Bed Bureau before they had themselves tried to get the case admitted in the ordinary way. Unnecessary reference of patients to out-patient departments should be avoided.

The Permitted Maximum

Dr. N. E. WATERFIELD, in the course of his presidential address, said that there was general satisfaction that the suggested charge of 1s. for a bottle of medicine had been dropped. Although it might have acted as a deterrent to some patients who would otherwise bother the doctor with trivial complaints, it might easily have prevented others from doing so when a real necessity arose. The necessity for the greatest economy in the Service was constantly impressed upon them, and in view of the economic situation, with large additional

funds required for defence, it appeared that there was little hope of the Service reaching a higher place in the priority list for many years to come. But the limitation on expenditure engendered a sense of frustration. The non-provision of health centres had been a disappointment to a number of practitioners who were looking forward to the day when it would no longer be necessary for them to use their private residences as their professional premises.

Dr. Waterfield said that he was going to be bold enough to make some comments on the controversial subject of permitted maximum lists. He agreed that in exceptional circumstances and with exceptional men the public might be able to obtain satisfactory service from practitioners with lists of 4,000, but he was convinced that in the great majority of cases satisfactory service could not be given and the objects of the National Health Service attained with lists of more than 3,000. If the new Service was to be a real one doctors would, in addition to the treatment of patients, have other and equally important duties to perform. They would have the duty to educate the public in health matters. They had also duties to themselves—to devote sufficient time to reading, to attendance at medical meetings, and to relaxation, so as to prevent them from becoming stale. There was a proposal on foot for a sliding capitation fee, with a substantial loading for the first thousand on the list. This would discourage the building up of large lists and materially benefit those with small or moderate lists; but it must be realized that unless more money was put into the pool those with large lists would suffer a reduction of income.

A number of doctors, for the most part in good-class residential areas, were suffering very serious financial loss due to the transfer of their private patients to the Health Service. The fixed annual payments or grants from the Inducement Fund were mere flea-bites and did little to alleviate the existing distress. He had never seen it suggested that a capital payment or a loan without interest might be offered to doctors who were willing to transfer to a district where their services were needed; but that, in his opinion, was the only long-term policy which would put these doctors on their feet again and get them into practice in areas where they could hope to earn a living.

After speaking of the dental, ophthalmic, and pharmaceutical services, Dr. Waterfield concluded with an acknowledgment of the really remarkable co-operation which existed between all members, lay and professional, of executive councils.

Doctors' Surgeries

On a matter brought forward from the Salford Executive Council urging that, when a doctor transferred his practice to a health centre, practice from the premises previously occupied by him should be prohibited for an agreed period, Dr. HOWIE WOOD (Isle of Wight) said that they must make sure that they did not prohibit the doctor from practising in his own premises. It was more than likely that a doctor would wish to avail himself of facilities for practice at a health centre and at the same time continue a practice for the convenience of patients who wished to see him at his own residence. Discussions with the Medical Practices Committee are to take place on this question.

On a cognate subject, Mr. A. N. WRIGHT (vice-president of the association) said that one executive council had asked whether a minimum standard for surgeries could be approved by the medical profession. At the present moment it was very difficult to suggest a standard, even if such was desirable, because of lack of facilities. The management committee of the association felt that executive councils had power to bring surgeries up to a standard which they desired, and it was felt that it should be left to the executive council in each area to take whatever action seemed necessary to improve the surgery accommodation available.

On the question of change of doctor, Mr. W. T. BOWEN (Birmingham) said that certain restrictions had now been imposed, but there had been no evidence of abuse or frivolous change. In Birmingham the figures had been carefully checked, and only 3% of those on the lists had changed their doctors for reasons other than a change of address. He considered these new regulations a betrayal of the principle of full freedom of choice. He moved the reference back of this part of the report with a view to approaching the Minister of Health, who had been unwisely stampeded by certain institutions. The motion was opposed on the ground that the new regulations should be given time to work, and was not carried.

Dr. HOWIE WOOD moved a resolution that the remuneration of all elements in the National Health Service should be on such a level as is necessary to prevent dissatisfaction and frustration. Major J. BURNIE (Bootle) seconded. If a first-class service was wanted, those in the Service in whatever capacity must be paid an adequate remuneration. After a slight discussion, in which some delegates thought it would be a mistake to interfere in what was the function of the Whitley Councils, the resolution was passed.

Another Isle of Wight resolution was that patients in hospitals admitting maternity cases should be granted the right, implicit in the Act, to have the general-practitioner obstetrician of their choice, and that the whole question of beds available to patients who chose to be attended by the general-practitioner obstetrician of their own selection should be reconsidered. Dr. R. W. MCCONNEL (Buckinghamshire) seconded the resolution, and Dr. J. A. IRELAND (Shropshire) said that the cottage hospital was losing its status as a maternity unit served by general-practitioner obstetricians, and this was interfering materially with the care of the parturient woman. After a lively discussion the resolution was carried by a large majority.

The 123 executive councils in England were represented by over 300 delegates. The new president is Mr. A. N. Wright, J.P. (Norfolk).

THE DAIN FUND

REPORT OF THE TRUSTEES, 1949–50

The period to which the report refers is the year September 1, 1949, to August 31, 1950. During the year a considerable number of requests for advice and help have been received, and it has been possible for the Fund to assist three new cases while continuing the grants for the school year 1950–1 to 12 old applicants, covering 15 children. As was explained in the last report the trustees decided to accept responsibility of a long-term nature in certain cases in view of the importance of ensuring the continuity of the education of the individual child. Three of these are medical students, all of whom are doing well, and the reports received from the deans of the medical schools show satisfactory progress. £75 is being allowed in each case.

Another case, where grants for school education have been given over a period of years, is receiving continued help (£50) to assist with the fees for the first year of training at a school of physiotherapy. Subject to a satisfactory report it is anticipated that for the further two years of the training a grant will be available from the local education authority for training fees and maintenance. Assistance towards school fees is being given to nine children, the grants varying between £30 and £95 for the school year. A further case was given a special grant of £30 towards clothes and school equipment. This child has been receiving help from the Dain Fund for two years, and it was with great satisfaction that the trustees heard that she had gained an open scholarship at a well-known girls' school.

In addition to the continued help as described above the trustees have been able to assist three new applicants, details of which are given below:

Case 1.—The daughter of a deceased doctor asked for help early in 1950 towards living expenses and payment for books until July, 1950, when she was taking the final medical examination. The report regarding this student was satisfactory and a grant of £30 was made immediately. This girl is now qualified and has obtained a hospital appointment.

Case 2.—A doctor's widow made application for assistance for her three children, two boys and a girl. This case was a particularly deserving one, and it was possible, in co-operation with the Royal Medical Foundation of Epsom College and the Royal Medical Benevolent Fund, to make arrangements for the children. The elder boy is being assisted by the Royal Medical Benevolent Fund and the local education authority. The younger boy has obtained a place

at Epsom College. The girl, now doing the Froebel training, was given £100, this amount being shared by the Dain Fund and Royal Medical Foundation of Epsom College.

Case 3.—A doctor (a widow) made application for help towards the fees of one of her four children. Reports stated that this boy showed considerable promise, and it was felt important that he should be able to stay on at the same school. A grant of £50 was made, and the trustees have been informed that he passed the School Certificate with credits in all subjects at the age of 14½ years.

The total sum of £970 was available for distribution. This was made up of £148 from investments, £75 gift from the proceeds of the Metropolitan Counties Branch ball, the balance being from donations from local medical committees and individual doctors. The total amount distributed in grants was £940.

It will be evident from this report that the Dain Fund is giving valuable assistance to many children. It is a matter of regret to the trustees that each year certain applications have to be refused owing to lack of funds. While greatly appreciating the support of many individuals and committees, the trustees hope that members of the profession will give real and practical help to the Fund by completing a form of covenant for seven years or by sending a donation to the secretary. A gift, even if a small one of one or two guineas given under the seven-year covenant, means that the trustees have at their disposal a sum of money nearly double in value. The trustees make a most earnest appeal for more funds.

In conclusion it is desired to acknowledge the help and co-operation of the Royal Medical Benevolent Fund, the Royal Medical Foundation of Epsom College, and certain local medical committees for their share in the responsibility of some of the cases assisted during the year.

H. GUY DAIN,
Chairman of the Trustees.

GENERAL PRACTICE IN SCOTLAND

There was a long agenda before a meeting of the General Medical Services Subcommittee (Scotland) at B.M.A. House, Edinburgh, on October 12, Dr. W. M. KNOX presiding.

The action of the Scottish Medical Practices Committee in admitting two doctors to the executive council areas of Ayrshire and of the Lothians and Peebles was strongly criticized. In the Ayrshire case an assistant practising as such was given permission to start up independent practice in the area of the former principal. The application, it was explained, had been made without the knowledge of the principal and granted against the recommendation of the local medical committee and the Ayrshire Executive Council.

Dr. SCOTT claimed that an important principle was at stake. They ought, if necessary, to have consulted the Minister. In defence of the Medical Practices Committee it was pointed out that the area was not over-doctored and that only on such grounds could they have rejected the application. No area so far had been declared closed. This was in line with the view which the profession had always hitherto expressed that direction, even negative, was objectionable. It seemed possible that the powers of the committee were either too little or too great and should be adjusted. Members also emphasized the need for a restrictive clause prohibiting an assistant from starting in opposition to a principal and which would be upheld in a court of law.

In the Lothians and Peebles case, the executive council rejected an application by two partners for permission to engage a permanent assistant on the ground that the combined lists totalled 2,098; that the whole practice, therefore, appeared to be within the scope of a single practitioner; and that it was unreasonable from the point of view of neighbouring practitioners. Subsequently, however, the Medical Practices Committee sanctioned the application of the would-be assistant for permission to be included in the council's medical list as a principal in partnership with the two original partners. The application was granted, it was stated, on the grounds that, since the applicant's partners were already included in the list, his exclusion could be no more than a technicality. While not disputing the correctness of the Medical Practices Committee's decision, the Lothians and Peebles Local Medical Committee expressed the belief that, if that interpretation of the terms of service was to be accepted, it appeared that any practitioner might employ a deputy for such period as he might wish without the consent of the executive council.

The Subcommittee decided that an *ad hoc* committee should be appointed to discuss with the Medical Practices Committee the points raised in discussion.

Differential Capitation Fees

Further consideration was given to the question of a differential capitation fee in respect of the first 1,000 patients, or some such number, on a doctor's list. When proposals were considered for either a fixed annual payment to all practices or a fixed annual payment to practices of, say, 1,000 or under, the fear was expressed that at some future date the question of a whole-time service might arise. It was left to the Chairman's Subcommittee to continue its consideration of the matter.

It was reported that not all areas had adopted emergency treatment schemes and that the "knock-for-knock" arrangement, commonly adopted in the old N.H.I. service, still obtained in these areas. The Subcommittee felt that it was desirable that in the new circumstances emergency treatment schemes should be adopted, though it should be left to local medical committees to determine the extent to which they should be applied.

In connexion with a request from the Dundee Local Medical Committee for comment regarding a proposal to employ local authority midwives under a hospital authority, the Subcommittee recommended that the Dundee Local Medical Committee should in the first instance approach the hospital authority and the medical officer of health with a view to discussing with him the repercussions of the proposed scheme. Should the outcome of this action not be satisfactory the local medical committee should report back, when the matter would be taken up with the Department of Health.

REGISTRAR APPOINTMENTS

The Ministry of Health has issued a circular (of which fuller details will be given next week) about the number of posts that should be held by registrars in England and Wales. About 150 appointments for senior registrars will become available annually. The number of training posts should not exceed 600 for senior registrars and 1,100 for registrars. At present there are too many in both grades. The maximum total number of posts for each regional area, including teaching hospitals in the area, should be as shown in the following table.

	Senior Registrar (Total for First, Second, and Third Year)	Registrar (Total for First and Second Year)
Newcastle	34	63
Leeds	36	65
Sheffield	42	76
East Anglia	18	32
N.W. Metropolitan	75	138
N.E. Metropolitan	48	86
S.E. Metropolitan	52	96
S.W. Metropolitan	83	151
Oxford	22	42
South-western	30	56
Wales	28	51
Birmingham	52	96
Manchester	52	96
Liverpool	28	52

ATTRACTING GENERAL PRACTITIONERS

The Ministry of Health has sent a circular (E.C.L. 115/50) to executive councils drawing attention to the schedules prepared by the Medical Practices Committee (*Supplement*, November 4, p. 188). In Schedule 1 areas with high average lists, executive councils are asked to consider, in consultation with the local medical committee, whether action should be taken to attract more doctors to the area. Executive councils with Schedule 2 areas, where the services may be inadequate, are asked to review them carefully in consultation with the local medical committee, and decide if it is desirable to increase the number of doctors there.

Other measures to be taken by executive councils in consultation with local medical committees include encouraging doctors to take new partners (or assistants, preferably with a view to partnership), and advertising the need for doctors to set up in practice in the area concerned. The possibility of an inducement payment might be included in the advertisement in the latter cases. Executive councils should maintain close touch with the local housing authority in order to help doctors obtain accommodation.

N.O.T.B. ASSOCIATION

At the eleventh meeting of the N.O.T.B. Association, held on October 13, Dr. J. N. Tennent was welcomed as the new chairman by Dr. David Wilson, who has retired from the chair but is continuing to serve on the committee. Mr. O. Gayer Morgan paid a tribute to Dr. Wilson's chairmanship lasting for ten years and covering a difficult period for the old N.O.T.B. and the present association.

It was noted with satisfaction that the memorandum put forward by the association on improvements to the Supplementary Ophthalmic Service has been accepted by the Ophthalmic Group Committee of the British Medical Association and, subject to certain minor changes, will go forward as a joint memorandum to the Ministry. There seem to be no immediate prospects of the cessation of the Supplementary Ophthalmic Service, and the memorandum has been prepared with a view to modifying and improving the existing service.

The association is submitting a memorandum to the interdepartmental committee which is considering evidence from interested bodies and persons on the statutory registration of opticians.

Questions Answered

Leave for Examinations

Q.—*Should the time taken for sitting for postgraduate examinations be taken out of the statutory period of holiday leave under the National Health Service, or be additional to the full holiday period?*

A.—An officer may take time for postgraduate examinations out of the statutory period of holiday leave. On the other hand, he may apply under paragraph 18 (*d*) of the Terms and Conditions of Service for "study leave," which includes the taking of examinations. Leave is granted for varying periods at the discretion of the board (*a*) without pay or expenses, or (*b*) with pay but without expenses.

Residential Emoluments

Q.—*Who fixes the rate of residential emoluments, and when there are grounds for appeal to whom should this be made? In one hospital here the resident registrars pay £100, while our hospital registrars pay £150 for the same accommodation as house-officers.*

A.—It is laid down in the Terms and Conditions of Service that a deduction at the rate of £100 per annum in respect of board and lodging and other services provided shall be made in the case of house-officers. In all other resident appointments charges for board and lodging are calculated in accordance with the services provided by the hospital management committee. This being so, there are likely to be differences in the charges made to house-officers and registrars who share the same quarters. If an officer holds the view that he is being overcharged for the services provided to him, he should take the matter up first with the hospital management committee concerned and bring evidence to support his claim.

Correspondence

Distribution of Central Pool

SIR,—In the coming months the profession is likely to cause the general public some inconvenience if the general practitioners withdraw from the National Health Service. This is inevitable in all disputes which have to come to such an unpleasantly forceful type of arbitration. The inconvenience caused will be resented more if we do not try to take the public into our confidence and explain as simply as possible the issues for which we are contending:

(1) That the general practitioner's remuneration has never been agreed upon.

(2) That in spite of many requests we have not been told what amount should be in the Central Pool to implement the Spens recommendation on which our acceptance of the National Health Service was based.

(3) That the total amount at present falls considerably short of what the financial experts advising the profession maintain it should be and that many doctors are very much worse off than before the scheme.

I feel also that in addition our leaders have been so far afraid to lead that they only timidly suggest that if any increase is gained by our efforts it should be just handed out equally to all to increase the capitation fee for the first 1,000. This means that those with maximum lists will be given a sum of money the majority of which will go back to the Chancellor of the Exchequer in income-tax and supertax and that the profession as a whole will be the loser to that extent.

The receipt of an adequate income throughout the profession should not depend on having to live in a crowded urban district. Would it be thought equitable in any other profession that a young man at the outset of his career should be able to acquire a maximum income and the wide responsibility entailed with a maximum list? Is there another Government-remunerated service where this is possible—dental profession apart?

The consultant is also at present content to take either a full-time salary or a part-time salary as a basis for his remuneration. Why should the G.P. not be as willing to receive a basic salary? But a basic salary should be graduated as is the consultant's, on an age scheme. If one does not like the word basic salary, call it an expense allowance.

This basic salary/expense allowance could commence as the "A" hospital post at £350, mounting in steps to £1,000 at 40 years of age, and should be the first charge on the Central Pool. The second charge on the Central Pool should be a capitation fee for the first 2,000 on a doctor's list, and the units should be of the same value throughout the country without deduction except for superannuation.

The next charge on the Central Pool should be anaesthetics, temporary residents, emergencies, and all other incidental expenses at present deducted before the doctor gets his capitation fee and which cause wide variations throughout the country. The rest of the pool should be divided among those with over 2,000 on their lists in units according to their extra numbers. These units would be less than those taken as a second charge and would vary from time to time as our present capitation does.

Mileage payments would still be needed, and there would be no inquiry into individuals' incomes by local committees before a basic salary were granted. The young man would be catered for, and as his family responsibilities grew he would know there would be an increase in income. And the man with a large list would know that as he got older he could shed a few without serious detriment to his income. A simple administrative adjustment could prevent the type who merely wished to sit down and take a few patients and draw a basic salary. This is the type who would have to explain to a committee his reasons—not the man who was trying to make headway. Lastly, if, when a partner is taken on, a proportion of the principal's compensation were paid to the principal—corresponding to the share arranged with the new partner—a number of assistants might well find that they had a greater chance of becoming partners.

This scheme would, I maintain, be fairer to all, easily worked, and could be applied to any size of Central Pool. Capitation fees for the first 2,000 and basic salary would be the same over the whole country, and inducement funds would rarely if at all be necessary.—I am, etc.,

Newcastle-upon-Tyne. H. B. PORTEOUS.

A Free Profession?

SIR,—We are about to hold meetings to decide whether doctors are going to extreme lengths to insist upon an increment to our remuneration, and there still seems to be a lot of misunderstanding concerning our motives. Many doctors and most members of the public seem to regard our case in a similar light to that of the gas workers and others. In some respects that is correct, but if that is all there is to it the sooner we drop it the better.

We are not going to get much sympathy from the public or the required amount of support from the profession in a mere scramble for more pay, even if there is statistical justification for it. The case of the hard-hit practitioners can be met by redistribution of the capitation fee according to a graduated scale. What we have to consider is whether Mr. Bevan's attitude to our claims has been consistent with our conception of a free profession or whether it constitutes the first major step along a road that leads to dictation by the Minister of Health. That is a question which is of vital concern to every doctor and patient whether the Service has improved his personal financial position or not.

If it can be shown that Mr. Bevan is overriding what have all along been just claims, that constitutes a challenge which we must take up now. Moreover, it must be made absolutely clear to the public exactly what is at stake. But anyone who regards the present juncture simply as a golden opportunity to get a little more money or to have a crack at Mr. Bevan would be well advised to go a little deeper into the matter.—I am, etc.,

Eye, Suffolk. J. SHACKLETON BAILEY.

Failure of Sheffield Health Centre

SIR,—Considerable acrimony between the profession and certain lay groups has resulted from the breakdown of negotiations for the opening of a health centre in Sheffield. The situation has brought to light an antagonism to the profession which should be known more widely so that, forewarned and thus fore-armed, we can guard these precious things in medicine that not only ensure our freedom but the freedom and care of our patients.

Briefly and factually, it was proposed to set up a health centre in Sheffield which involved the transfer of some doctors and their patients to the health centre. Certain local doctors said they were interested in the project, and discussions were undertaken without prejudice. At one time it seemed that the centre would be manned, but, as detail became clearer and other doctors in the area let it be known that they were not in favour, the original group decided against entering the centre. It may be stated that the projected centre provided amenities for doctors only—e.g., a communal surgery. Taking everything into consideration, the local medical committees and the profession generally backed the decision.

The stalemate prompted a member of the Sheffield Executive Council to state "that the people of Firth Park were being deprived of a health centre while doctors' surgeries in the area were overcrowded and people had to wait in the rain." It was ascertained, however, that no doctor in the area had a full list and no complaints had ever been received suggesting inadequate medical services.

The scene then shifted to the Sheffield City Council, where the views expressed were very illuminating if not complimentary. The same member of the executive council, as a city councillor, stated that "doctors were afraid of the health centre, as they feared the patients would get a better service, and that young doctors were getting £1,830 a year and 23% in Sheffield were getting over £3,000." She also stated "that doctors had allowed the local authority to spend money in plans for a centre and then they, the doctors, turned round and said, "No, we don't agree with it—we might lose a pound or two." She concluded by saying, "I do not know any other group of people in the city who would show themselves so lacking in public responsibility." This was followed by an alderman who said that the councillor already quoted "had made an exposure which should run round the country," and, "I did not know the doctors were so rich, but I almost feel that it is a pity that there was not conscription and that we cannot compel them to do it."

Such are the views of people who are in a position of responsibility, and it is perhaps as well to know what they think about us; and perhaps when we are conscripted they will conscript the patients for us to treat. But it is sad to reflect that only bitterness and harm to the advancement of medicine can result from such unwarranted attacks. In the discussions in the Sheffield Executive Council the position of the B.M.A. was correctly given by a professional member, but in the city council it was stated that the B.M.A. was in favour of the scheme, or, as a member stated, the breakdown was "the fault of the individual doctors, not of their trade union." Surely here is a pointer that the B.M.A. must get up to date and give a more definite lead in such cases—e.g., health centres in built-up areas—as there is a growing feeling that Headquarters is out of touch with the periphery.—I am, etc.,

Sheffield. A. STEPHEN.

Withhold Certificates

SIR,—Has the Medical Guild made up its mind whether it wishes to help to uphold the findings of the Spens Committee or not? According to the pamphlet recently sent round, I should say, "Definitely not." In the first place, the 80% asked for is unnecessarily high and 60% would be quite sufficient. Secondly, the proposed weapon—namely, that of charging patients—is one that will ricochet upon the doctor and no one else, for few of us will stand out for cash, and patients will merely run up bills which they have no intention of paying, while Mr. Bevan stands back and watches us starving ourselves into subjection. What better arrangement could he wish for?

No mention is made of whether we are to prescribe medicines on the N.H. scripts. Even if these are withheld, it will be very difficult for those who do their own dispensing to refuse to provide medicines. Tough opponents need tough resistance, and we should harden our hearts and use the one weapon with which we can force an issue—that is, the withholding of certificates. And this is calmly passed over. Unless this is done, the fight is doomed to failure.

It seems to me that the authorities responsible for this pamphlet are hoping that it will not receive full support, in consequence of which they can then put the onus on the wretched G.P. The whole affair savours of defeatism.—I am, etc.,

Pannal, Yorks. MAURICE H. JONES.

Control of the Midwifery Service

SIR,—There has recently been much discussion and dissatisfaction expressed with the division of control of the midwifery service under the National Health Service Act. Having worked in my present area for a year, I think I must consider myself fortunate in that no such division obtains in this area. In the county of Lanark area all antenatal clinics are run by members of the obstetrical and gynaecological staff of the hospitals within that area—i.e., consultants, senior hospital medical officers, and registrars. This has the undoubted advantage that uniformity of antenatal care in these clinics is obtained throughout the whole area. Furthermore, patients see the same personnel at the antenatal clinics as they do in hospital, which gives them a feeling of continuity of care. The system also allows our registrars to gain a very full experience in antenatal work, which is invaluable in the training of a consultant, and at the same time they have the opportunity of following and treating in hospital the patients they bring in from the clinics.

The nursing staff for the antenatal clinics come from the main hospital—i.e, from the Western Regional Hospital Board—while the local authorities supply premises, secretarial help, and some help by health visitors. The antenatal records are all kept in the main hospital, and should a practitioner be called in an emergency he can obtain full information by 'phoning up the registrar on duty at the main hospital. Should a practitioner desire a consultant's opinion apart from the antenatal services, out-patient sessions are run at the main hospital.

From my point of view this is a most happy state of affairs in which to work. I am sure it has been brought about by co-operation between the regional hospital board and the local authorities. It seems to me an example of what could well be followed in other areas.—I am, etc.,

East Kilbride, Lanarkshire. R. A. TENNENT.

Disciplinary Machinery in the N.H.S.

SIR,—I was delighted to read Dr. A. C. E. Breach's thoughtful and thought-provoking letter on the tribunal and medical services committees (*Supplement*, October 21, p. 168). They present a problem whose implications—at a time when one freedom after another is being withdrawn from the common man—pass beyond merely medical circles. And I should imagine that these extra-judicial bodies, obeying no rules of evidence, and with no appeal from their decision except to the Minister who set them up, ought to attract the burning interest of the legal profession.

These bodies are peculiar in many ways. They "try" only one kind of case—complaints by patients against doctors—and the defendant, if found guilty, stands to lose everything and to face complete professional ruin. If he is exonerated, and the complaint is found to be of a frivolous or malicious nature, does he recover costs, or can the plaintiff be censured or mulcted in damages? Certainly not.

In other words, the setting up of these bodies—more especially the setting up of the tribunal—is a retrograde step and one tending to place increasing power in the hands of the central executive. They might provide a short cut to tyranny, and can be compared only with the "Privilege" courts of the sixteenth century.

What is to be done about them? It is obvious that we must seek drastic reforms, which might lie along some such lines as the following:

(1) Rules of evidence must be carefully laid down for both committees and tribunal, and strictly followed.
(2) They must not be bodies which merely hear complaints from consumer against supplier, but also from supplier against consumer.
(3) The committee or tribunal must hear evidence on oath, and should be empowered to censure a plaintiff and to impose heavy costs when a complaint was found to be frivolous or malicious.
(4) Appeal to a superior court should be allowed on questions of law from the decision of a tribunal.
(5) Decisions should be unanimous; if not, appeal to a superior court on questions of fact should be allowed from a majority decision.
(6) Any decision given should be a *reasoned* decision, not an arbitrary one.
(7) Medical members of a tribunal should be appointed *by the profession* and given security of tenure and possibly a retainer.
(8) The law should be laid down by the superior court and *not* by the Government department concerned.

Though these are merely tentative suggestions, in which anybody more knowledgeable than I may pick holes, I hope that they will at least stimulate discussion and produce further suggestions—and perhaps not only from the medical sections of society.—I am, etc.,

Wolverhampton. VICTOR RUSSELL.

SIR,—I read with interest Dr. A. C. E. Breach's letter (*Supplement*, October 21, p. 168) on the subject of the tribunal and medical services committees, and am most grateful for his clear exposition of certain aspects of the present system.

The subject was under discussion at the last meeting of the Middlesex local medical committee and various suggestions were made for correcting existing inequalities as between doctor and patient.

Complaints can be made freely by patient against doctor, but never by doctor against patient. If a charge is proved the doctor may be liable for a heavy fine; if it is not proved, or even if shown to be entirely frivolous, the doctor is still penalized, for he has to endure the anxiety attendant on preparation of his defence, and besides this the fact that he has been called to defend himself may seriously injure his reputation. The doctor cannot even be granted costs, and therefore the time spent in attending the inquiry must involve financial loss. The patient on the other hand has nothing to lose. He may even fail to appear when his case is heard (as happened recently in Middlesex) and thus need run no risk of open censure should his complaint prove to be unfounded.

Surely, Sir, the rudiments of justice demand equal treatment for both parties. If the patient has the right to complain, the doctor should be granted the same right, and, if either defendant or complainant suffers injury or loss through no fault of his own, he should be granted compensation where the other party is responsible.—I am, etc.,

Stanmore, Middlesex. H. B. WOODHOUSE.

Prescribing of Drugs Advertised to Public

SIR,—In the list of proprietary preparations advertised directly to the public issued recently by the Ministry of Health I note that all neutral stabilized forms of aspirin, either in tablet or powder form, have been included in the list.

There are no equivalent medicines for these preparations in the *National Formulary*. I find them very useful in cases of rheumatism or acute respiratory conditions associated with chronic gastric disorders. Prescribing the standard preparation is likely to give rise to an inquiry. The only foolproof alternative is, therefore, to prescribe the following:

℞
Acid. acetylsalicylic. .. .. gr. 5
Calcium carb. .. .. gr. 1½
Acid. citric. .. .. gr. ½
Ft. pulv. c *dried ingredients*. Mitte xxx

This should meet with the full approval of the N.H.S. authorities. The drawback is that the chemist will probably receive about three or four shillings for making up these powders, whereas the same amount of proprietary tablets will cost only 2s. or 1s. 6d., and in all cases the formula is exactly the same. This probably is the case of various other preparations mentioned in the list of drugs.

I feel that the Minister should be approached and recommended that all useful and reasonably cheap drugs that are cheaper as standard medicines than if made up on prescriptions with the same formula should be allowed to be prescribed freely if they have no other cheaper recognized equivalent.—I am, etc.,

Aldershot, Hants. J. CHALON.

Threatened Hospitals

SIR,—As you undoubtedly know, the Kingston Victoria Hospital is conducting a campaign to preserve its identity as a general-practitioner hospital, and not to be the subject of a "change of use."

I have knowledge of a number of hospitals throughout the country in a similar predicament, but there must be many others whose continued existence can be regarded as precarious. I shall therefore be grateful if the staff of any other hospital in a similar plight will very kindly send me details as soon as possible.—I am, etc.,

Roselawn, New Malden, Surrey. T. W. MORGAN.

Promotion in the Armed Forces

SIR,—It will be interesting to know what the outcome of the 18 months' negotiations between the B.M.A. and the Ministry of Defence will be. This protracted delay will certainly not encourage medical officers to remain in the Services.

What the relative speeds of promotion in the different branches of the Army and R.A.F. are I do not precisely know, but in the Navy it makes peculiar reading. Excluding the medical and dental branches, the average age to promotion to lieutenant-commander is 30, then to commander rank in the executive, engineer, and electrical branches the zone of promotion is from two to eight years, in the supply branch it is from three and a half to eight and a half years, and in the instructor branch it is four years onwards. In other words, an executive, engineer, or electrical officer can become a commander from the age of 33 onwards.

With the medical branch it is entirely different. He usually becomes a surgeon lieutenant-commander at about 31, or later if the Cohen proposals are adopted. He then does six years as a surgeon lieutenant-commander, followed by a period of about

three years in the peculiar rank of acting interim surgeon commander, before becoming a fully fledged surgeon commander at about the age of 39–40 years, by which age his contemporaries in the other branches may have already attained a seniority of anything up to six years.

In the opinion of many doctors it was a pity that the terms of staff surgeon, fleet surgeon, etc., were ever changed.—I am, etc.,

SERVICE MEDICAL OFFICER.

Fair Conscription

SIR,—Recently the Prime Minister spoke on the wireless on civil defence. We all hope that this preparation for a state of emergency is somewhat premature, but by the same token I feel that now is the time to review the state of the medical profession in view of a possible call-up of reservists.

At present the position is that most of those who served in the last war are still on the reserve and could be subject to immediate call-up in a state of emergency. Many of those people served throughout the war, and, despite promises to the contrary, did not always find it easy to get jobs on their return to civilian life. These jobs frequently went to men who were of the same age and had been qualified the same time, but who during the war did not serve in the Forces, and thus gained far more civilian experience and possibly also higher qualifications. As matters stand at the moment, if another war started these same men would once more stay at home while the same group of ex-Servicemen were again called up.

If nothing is done about this until the emergency arises the usual excuse will be given—namely, that an ex-Serviceman is already trained and therefore of more value to the country immediately. I should like to suggest that it be made compulsory for every doctor who is fit and under 50, and who did not serve in the last war, to register at once. He should then be made to join a Territorial unit and be trained. I am a woman who entered the Army after two junior house jobs and, after three weeks at Crookham and one at the Army School of Hygiene, was considered fit to serve. I therefore do not feel that it would take very many hours a week to turn an experienced doctor into a suitable medical officer for any of the Forces.

These newly trained men should be the first to go in the event of a future war, and only after all of them have been called up should any ex-Serviceman be called upon. One thing I do remember hearing during my initial training was that it is very much easier to give something to the Army than to get it back. It will be no use for people once again called up to think about trying to get back to civilian life and give someone else a turn. If anything is to be done to plan this matter on a fair basis it should be done now, and I think my system is as good a way of arranging it as any.—I am, etc.,

Bath. LOIS E. N. PRICE.

Assistants in General Practice

SIR,—As one of the many hundreds of young doctors who have shared the frustration of "Fair Play" (*Supplement*, October 21, p. 172) during the last two dismal years, might I suggest that the time is ripe for the B.M.A. to take cognizance of the seriousness of the situation? It is not only that the young doctor is being exploited at the present time, but that the whole future and self-respect of the profession are at stake.

1. The maximum number on lists must be reduced (by stages if necessary) to 3,000 and eventually to 2,500.

2. Assistantships, except as a means of training or honest introduction to partnership, should be abolished.

3. Lists of localities (e.g., down to the level of wards) where young "squatters" are to be encouraged should be kept by all executive councils. These localities should include those where the doctor–patient ratio is less than 1:2,500.

4. It goes without saying that remuneration should be so increased that the capitation fees accruing from a present practice of 4,000 should accrue from a list of whatever maximum holds at the time: other salaries would vary either in proportion or according to some sliding scale.

5. There must be a complete mental reorientation on the part of the older practitioners. We are supposed to be brothers and sisters in a noble profession and not commercial competitors. The attitude of the Dr. McGregors (*Supplement*, October 21, p. 171) to the "young upstart down the road, etc.," must be modified, and they must realize that even the young have a right to practise in this profession.

Finally, may I suggest to my elders that if they base their demands for increased pay on some sound fundamental change in the system of the general medical services (such as that suggested above), then not only will they get a more sympathetic hearing from the public and Minister, but also they will take a step nearer the goal of professional unity and co-operation.—I am, etc.,

Edgware, Middlesex. A. D. MANNING.

SIR,—The conditions referred to in "Fair Play's" letter (*Supplement*, October 21, p. 172) are of course endemic to-day. There is only one way to treat this state of affairs now that the days of buying a share are passed, and that is to make it uneconomical for a principal to employ an assistant for a period of more than three months.

This could be ensured either by reducing the number of extra patients allowed in respect of each assistant (at present 2,400), or by making it necessary to give the assistant at least two-sevenths of the profit of the practice for doing half of the work (in the case of a one-man practice).

The underlying cause of this sad state of affairs is of course the internal mechanics of the National Health Service, in which the patient always comes last, for it is that unfortunate person who is subjected to the never-ending stream of disgruntled assistants.—I am, etc.,

ASSISTANT WITH DOUBTFUL VIEW.

SIR,—Need prospects of assistants in general practice necessarily be poor? "Fair Play's" experience (*Supplement*, October 21, p. 172) has not been a happy one. But not all assistants are faced with poor prospects. My own experience was quite the opposite.

After less than two years as an assistant my principal was instrumental in securing me a house and practice of my own. Furthermore he did all he could to "build me up." Smooth working in general practice very much depends on harmonious relationships with colleagues. Where relationships are healthy, holiday periods, half-days, and week-ends off are easily arranged.

"Fair Play" appears to have been up against it. But all senior colleagues are not ungenerous. I feel sure that if he keeps heart he will eventually find the right job.—I am, etc.,

Birmingham. ROBERT BROWNE.

SIR,—"Fair Play" (*Supplement*, October 21, p. 172) has reopened a subject which has for some time been out of the news. The whole question of the position and prospects of assistants in general practice was fully discussed during the early part of this year by a subcommittee consisting of principals and assistants (*Supplement*, August 5, p. 83), and the conclusions reached should, when implemented, do much to solve the difficulties which "Fair Play" enumerates.

Many of the disappointments in assistantship arise from the assistant's own failure to have written down at the outset the terms on which the job has been accepted. In the presence of a written agreement subsequent disputes can be settled through existing machinery of the Association. Without it protest may relieve the feelings of the injured party but will do little else. Model agreement forms are—I believe—supplied free to members; the only action required is for the assistant to make use of them.—I am, etc.,

Derby. JOHN GEMMELL.

*** Model agreement forms and advice are obtainable from the Association's Medical Practices Advisory Bureau.—ED., *B.M.J.*

Change of Doctor

SIR,—Practitioners in Scotland have just received notice of the new regulations regarding change of doctor. I believe I will be expressing the general feeling by saying that they are unpleasant but necessary.

The main reason why they are unpleasant is that they are a sad reflection on the poor ethical standards of the profession to-day. A large minority of general practitioners can be said to have used the methods and upheld the principles of barrow boys in the exercise of their profession. They have in effect put placards in front of their rather flashy stalls with the invitation: "Come to me! Everything free! Certificates and prescriptions *ad lib.* No questions asked."

We have been "nattering" at the National Health Service and the public in the manner of embittered spinsters, when in fact the trouble quite clearly lies with the doctors. We have gained the respect of nobody since the Service started, and we have not deserved to gain it. When we have pulled ourselves together and become men of honesty and high principles, I have no doubt we shall receive the just reward of our labours. At the moment we are getting just what we deserve.—I am, etc.,

Creetown, Kirkcudbrightshire. H. JARVIS.

POINTS FROM LETTERS

Fight Now

Dr. J. C. GILBERT (Bangor, Co. Down) writes: . . . I am certain that even a 40% withdrawal would wreck the National Health Service. Negotiation with the Minister is apparently impossible. General practice is doomed under present conditions. We must fight Aneurin Bevan *now*. This is our last chance. Let every man with guts get out.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieutenant-Commander (Emergency) R. Schofield has been removed from the Emergency List.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander (Retired) J. C. Moor, V.R.D., has been removed from the Retired List.

Surgeon Commander E. G. Thomas, O.B.E., V.R.D., has retired.

Surgeon Lieutenant J. G. Taylor to be Surgeon Lieutenant-Commander.

ARMY

Brigadier A. J. Beveridge, O.B.E., M.C., late R.A.M.C., has been granted the local rank of Major-General.

Lieutenant-Colonel L. R. S. MacFarlane, O.B.E., from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Major R. J. Niven, M.C., to be Lieutenant-Colonel.

Captain S. M. H. Naqvi has relinquished his commission and has been granted the honorary rank of Major.

Captain H. J. Elverson to be Major.

Short Service Commission (Type B).—Major P. T. Harper has retired, receiving a gratuity.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: L. W. Banks, M.B., D.T.M.&H., A. G. W. Branch, M.B., D.T.M.&H., C. P. Campion, M.B., D.T.M.&H., W. Crawford, M.B., D.T.M.&H., H. A. A. Doherty, M.B., F. W. W. Fox, M.B., W. T. M. Gilbert, L.R.C.P.&S.I., and S. E. Onwu, M.B., Senior Medical Officers, Nigeria; R. E. Barrett, M.B., D.T.M.&H., D.P.H., Deputy Director of Medical Services, Nigeria; J. H. C. Clarke, M.B., D.T.M.&H., Senior Medical Officer, Northern Rhodesia; W. C. B. Harrison, L.R.C.P.&S.I., Deputy Director of Medical Services, Northern Rhodesia; A. J. Johnson, M.B., D.T.M.&H., Assistant Director of Medical Services, Sierra Leone; H. D. Elliott, M.B., Medical Officer, Kenya; P. D. Kemp, L.R.C.S., Medical Officer, Uganda; G. K. M. Knomo, M.B., Medical Officer, Nigeria; W. G. Smart, M.B., Medical Officer, Tanganyika; A. W. Mearns, M.B., D.P.H., Medical Officer, Jamaica; V. Romanowski, M.D., Temporary Medical Officer, Nigeria; M. Szryo, M.D., Anaesthetist (Medical Department), British Guiana.

Association Notices

NOTICE TO SHIP SURGEONS

BRITISH MEDICAL ASSOCIATION—MARITIME SUBCOMMITTEE

The Private Practice Committee of the British Medical Association has reappointed for the current session a subcommittee to consider all questions affecting medical practitioners concerned with merchant shipping.

The subcommittee will hold its first meeting of the session at B.M.A. House, Tavistock Square, London, W.C.1, on Thursday, November 30, at 2 p.m., and any doctors in active practice as ship surgeons who find it convenient to attend are invited to do so, if possible giving notice by letter or telephone of their intention to come.

A. MACRAE,
Secretary.

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships, as follows:

An Ernest Hart Memorial Scholarship, of the value of £200.
A Walter Dixon Scholarship, of the value of £200.
Four Research Scholarships, each of the value of £150.

These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1951. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 31, 1951, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December

31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prize *due regard will be given to evidence of personal observation.* No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and childbearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

Diary of Central Meetings

NOVEMBER

14	Tues.	Standing Ethical Subcommittee, 2 p.m.
• 15	Wed.	Committee on Association of General Practitioner with Hospital Work, 2 p.m.
15	Wed.	Film Committee, Executive Subcommittee, 2.15 p.m.
16	Thurs.	Publishing Subcommittee, 11 a.m.
16	Thurs.	International Relations Committee, 2 p.m.
• 17	Fri.	Amending Acts Committee, 2 p.m.
17	Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
22	Wed.	***Adjourned Council Meeting***, 10 a.m.
24	Fri.	Venereologists Group Committee, 2 p.m.
27	Mon.	Psychological Medicine Group Committee, 2 p.m.
29	Wed.	General Practice Review Committee, 2 p.m.
30	Thurs.	Maritime Subcommittee, 2 p.m.

DECEMBER

6	Wed.	Central Consultants and Specialists Committee, 11.30 a.m.
7	Thurs.	Committee on Psychiatry and the Law, 2 p.m.
8	Fri.	Amending Acts Committee, 2 p.m.

JANUARY

9	Tues.	Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

BLACKBURN DIVISION.—At Swan and Royal Hotel, Clitheroe, Thursday, November 16, 8 p.m. to 1 a.m., annual dance.

BURTON-ON-TRENT DIVISION.—At General Infirmary, Burton-on-Trent, Tuesday, November 14, 8 p.m., meeting.

CAMBERWELL DIVISION.—At 134, Denmark Hill, Camberwell, London, S.E., Tuesday, November 14, 8.30 p.m., Mr. Lawrence Abel: "Assessment of Surgical Risk."

EAST HERTS DIVISION.—At County Hospital, Hertford, Thursday, November 16, 8.30 p.m., meeting.

EDINBURGH AND SOUTH-EAST OF SCOTLAND BRANCH.—At B.M.A. House, 7, Drumsheugh Gardens, Edinburgh, Wednesday, November 15, 8.30 p.m., symposium to be led by Sir Alexander Gray: "Industrial Rehabilitation." Members of Granton Rehabilitation Unit will be present to answer questions.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Friday, November 10, 8.30 p.m., address by Dr. William Evans: "Unwarranted Cardiac Invalidism."

HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, London, N.W., Tuesday, November 14, 8.30 p.m., Dr. J. A. Hobson: "Alcohol and Alcoholics."

LAMBETH AND SOUTHWARK DIVISION.—At Wingfield House, 261, South Lambeth Road, London, S.W., Tuesday, November 14, 8.30 p.m., meeting.

LEIGH DIVISION.—At Boar's Head Hotel, Leigh, Tuesday, November 14, 8.30 p.m., annual general meeting. Address by retiring chairman, Dr. L. G. Rymer Roberts: "A Visit to the Pyramids and Other Ancient Monuments of Egypt."

READING DIVISION.—At Royal Berkshire Hospital, Reading, Thursday, November 16, 8.30 p.m., lecture by Dr. Robert Forbes: "Legal Hazards in Medical Practice."

SOUTH BEDFORDSHIRE DIVISION.—At Nurses' Home, Luton and Dunstable Hospital, Luton, Friday, November 17, 9 p.m., Dr. Donald Teare: "Medical Methods in Criminology" (illustrated).

SOUTH WARWICKSHIRE DIVISION.—At Warneford Hospital, Leamington Spa, Thursday, November 16, adjourned annual general meeting to follow British Medical Guild meeting (see below).

SOUTHAMPTON DIVISION.—At Polygon Hotel, Wednesday, November 15, 8.30 p.m., general meeting of the Division to be held in conjunction with the Southern Counties Veterinary Society and Southern Branch of the Society of Medical Officers of Health.

SUNDERLAND DIVISION.—Thursday, November 16, (1) at Royal Infirmary, Sunderland, 3 p.m., annual address by Professor J. W. McNee: "Jaundice"; (2) at Seaburn Hotel, Sunderland, 7.30 p.m., annual dinner.

British Medical Guild Meetings to be Held

LAMBETH AND SOUTHWARK.—At Wingfield House, 261, South Lambeth Road, London, S.W., Tuesday, November 14, 8.45 p.m., discussion to be opened by Dr. L. S. Potter (Assistant Secretary, B.M.A.): "Present Position of General Practice." Questions will be answered.

SOUTH WARWICKSHIRE.—At Warneford Hospital, Leamington Spa, Thursday, November 16, 8 p.m., meeting of all medical practitioners in the area for the formation of local committee of British Medical Guild. To be addressed by Dr. E. E. Claxton.

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 18 1950

COMPENSATION FOR PRACTICES

FINAL DATE FOR CLAIMS

The publication of the regulations implementing the provisions of the Amendment Act makes it possible to review the present position with regard to the assessment and payment of compensation for the loss of the right to sell the goodwill of general medical practices.

Under the Act of 1946 a sum of £66m. was earmarked for the payment of compensation, and the Minister was empowered to make regulations governing the assessment of goodwill and the arrangements for payment to those entitled. The main principles of these regulations were agreed by the Negotiating Committee in 1948 and may be summarized as follows:

(1) *Claims* from all practitioners entitled to compensation had to be submitted for assessment on a prescribed form by the end of October, 1948, but a period of six months was allowed during which late claims might be sent in.

The following were entitled to claim:

(*a*) Doctors whose names were included on the general medical services list of an executive council on July 5, 1948.

(*b*) Doctors who had retired and the representatives of doctors who had died between the passing of the Act and the appointed day and whose practices had not been sold (N.H.S. Act, Sect. 37). In addition provision for further claims by partners under the Amendment Act was contained in the regulations (Reg. 4).

(2) *Assessments* were to be based on the average of the accounts for the last two complete years before July 5, 1948, with special provision where the practice had changed hands within this period and for other anomalies. Clearly it would have been impossible to cover all the various circumstances by regulations, and therefore:

(3) A *Practices Compensation Committee* was established to advise the Minister on assessments. This committee contains a majority of medical men nominated by the B.M.A. Its only function is to determine the assessments in cases referred to it by the Minister. In fact, this has meant all cases which were not quite straightforward.

The Practices Compensation Committee is a statutory committee established by regulation with limited terms of reference and should not be confused with the Association's Compensation and Superannuation Committee, which replaced a subcommittee of the Negotiating Committee and is a committee of the Council.

(4) *Arbitration.*—The Negotiating Committee, and in particular its nominees to the Practices Compensation Committee, realized that no committee could be regarded as infallible when dealing with such a difficult question as the assessment of goodwill. It therefore pressed for, and obtained, the right of appeal to arbitration.

(5) *Payment of Compensation.*—Compensation is payable on the death or retirement of a practitioner, and retirement is defined as "retirement from practice as a medical practitioner providing general medical services under Part IV of the Act, or under Part IV of the National Health Service (Scotland) Act, 1947." If the amount of compensation has not been ascertained on the relevant date, it is to be paid as soon as possible after the amount is known, with the important proviso that any practitioner who claims to suffer hardship by delay can appeal to the Minister at any time for a payment on account. It is for the Minister to decide what sum shall be "fair and reasonable having regard to the evidence before him." He is under no obligation to consult the Practices Compensation Committee.

(6) Provision for interest to be payable on the sums standing to the credit of each doctor.

(7) A clause providing for additional and amending regulations to give effect to the Amendment Act, which had been promised but was not actually passed until December 16, 1949.

The Amendment Act has an important relation to the assessment and payment of compensation. First, it provides for a deferred appointed day for partners, and this means that a new group of doctors has been added to the list of those entitled to claim. This group is not large, but until February 16, 1950, it could not be known how many additional claims there would be. As these claims could not be submitted before the new regulations were published, they still await assessment. Secondly, it provides for the immediate payment of compensation in lieu of purchase price where shares are transferred in pursuance of partnership agreements in force on July 5, 1948.

Calculation of the Compensation Payable to Individual Practitioners.—When an assessment has been made the individual practitioner is notified and is given fourteen days within which he may, if he wishes, appeal for the amount of the annual loss to be determined by arbitration.

A simple arithmetical calculation is all that is necessary to determine the factor to be applied to the annual loss (*i.e., the value of the goodwill* at one year's purchase). The aggregate of all assessments divided into £66m. will give the rate, in years' purchase, that every doctor will receive. It is still impossible to announce this figure because all the assessments have not been completed.

There are two reasons for this:

(1) *Late Claims.*—Apart from the small group of partners who qualify under the Amendment Act, there are a number who, for a variety of reasons, failed to comply with the regulations and omitted to submit claims before April 30, 1949. In some cases the cause has been illness or the absence abroad of either the doctor or his accountant, and there have even been losses in the post. There is, however, definite evidence that a few doctors failed to send in claims because they thought that the time to do so was *on retirement.* The new regulations make it possible for bona-fide late claims to be accepted up to the end of this year (Clause 5), but *after the final date,* a short period of grace being allowed, *no further claims will be admitted.* In the interests of the growing number of doctors, or their representatives, now entitled to payment in full and suffering hardship through delay, further extension of time is impossible. Similarly, the withholding of or the failure to produce the required information under the regulations cannot be allowed to hold up the work of assessment now nearing completion.

(2) *Appeals to Arbitration.*—Though very small in relation to the total, there have been a substantial number of appeals to arbitration. Every effort has been made to deal with these expeditiously, but it has been impossible to complete the hearing of appeals in partnership cases until the new regulations were in force. It seems unlikely that the work can be completed for at least some months.

Advance Payments

When the work of assessments began, it was only possible to make a rough estimate of the rate at which compensation would ultimately be payable, and it was accepted that to protect the interest of the majority an upper limit must be imposed on payments of capital on account which would allow a safe margin. Evidence has since accumulated which has made a more accurate estimation possible, and indeed interest has been paid on a provisional rate of 1½ years' purchase. There is no doubt a case for more caution where repayment of capital is concerned, because overpayment of interest can be adjusted whereas capital once paid could not be recovered. Nevertheless, the Association is satisfied that a wider latitude is justified and that considerable hardship results from the too cautious adherence to rigid limits. For some time it has been urging the Ministry of Health to review the evidence in the hands of the Department and to increase the amounts payable

particularly to doctors who have retired or to executors who are anxious to wind up estates. The Department has intimated that in these categories the maximum amount payable in advance will be increased.

The New Regulations

The regulations are complex, and many of them are merely consequential following the passing of the Amendment Act. The important points, however, can be summarized quite briefly.

(1) The last date for the acceptance of any claims still outstanding is December 31, 1950, though there is a further extreme limit of two months after that date. As some claims are new claims a period of grace is justified.

(2) The principle of assessments in partnerships is clarified as foreshadowed in the original regulations, which applied mainly to single-handed practices. For example, a doctor who bought a practice a year or so before the appointed day is assessed on the accounts on which the purchase price was based. This would not be reasonable where a doctor bought a share, since it might result in partners being assessed by different methods. Clearly each partner should receive compensation in proportion to the share of the whole practice he held on July 5, 1948. The new regulations make this possible.

It will be seen from Regs. 7 and 8 of the 1950 regulations that, except where the Practices Compensation Committee considers special circumstances, the annual values of the shares of members of a partnership are to be calculated on the receipts for the two relevant accounting years regardless of any change in the membership of the partnership since the beginning of the first of the two accounting years. The same principle applies where a single-handed practitioner took a partner during the period. But where, for example, two doctors enter into partnership with one another and buy a practice after the beginning of the first of the two accounting years, the annual value of each doctor's share is to be calculated by reference to the average gross yearly receipts as estimated for the purpose of the purchase. This type of case is therefore to be dealt with on the same basis as that prescribed in the 1948 regulations where a single-handed practitioner bought a practice within the same period.

(3) Where one member of a partnership appeals to arbitration the assessment in relation to the whole practice will be considered.

(4) Where a partnership agreement in existence on the appointed day provides for the purchase of a share by instalments the compensation payable under the Amendment Act to the vendor may also be paid in instalments.

REGISTRAR GRADES

REVIEW OF APPOINTMENTS

The Ministry of Health has sent the following circular (briefly referred to in these columns last week) to hospital boards:

1. As boards will be aware, the Minister has had under review the numbers of appointments at present held in the hospital service in the grades of senior registrar and registrar. It has from the outset been made clear that these are regarded as training grades for potential consultants (or senior hospital medical or dental officers). It follows also that the total number of such appointments, particularly in the senior registrar grade, should be closely related to the number of openings likely to be available annually, since it is not justifiable from the point of view either of the service or of the individual to multiply training posts regardless of the probable needs for the recruitment of trained men.

2. It has also been indicated that training should be continued only for those practitioners who appear likely to benefit from it, and in particular that promotion from one grade to another should be competitive. The conception is one of a training ladder, up which the trainee proceeds as far as his abilities permit, and which at any time an individual practitioner may have to leave if he appears unlikely to benefit from further training. The base of the ladder should be the first year in the registrar grade, a post which should normally be obtained at least two years after qualification. (The junior registrar is not essentially a trainee of this kind, and is referred to again in para. 13 below.)

The registrar should be reviewed at the end of the first year, and if satisfactory should normally proceed to a second year in that grade. Those wishing to proceed further should then seek an appointment in open competition as senior registrar, the number of posts available being considerably less than the number of second-year registrar posts, thus allowing for a careful selection from among the applicants. The senior registrar should also be reviewed at the end of the first and second years, proceeding to the next year if considered satisfactory.

At the end of the third year as a senior registrar training should be complete, and appointment for a fourth year should be very exceptional and for the most part confined to certain specialties such as thoracic surgery, neurosurgery, or plastic surgery—if there are special circumstances justifying a further year of training—or to persons who have completed a training, as, for example, general physicians or general surgeons, and who now wish to take up other specialties such as psychiatry, ophthalmology, oto-rhino-laryngology, etc.—if there are special circumstances in which it is thought desirable to facilitate such further training.

150 Appointments Annually

3. Against this background it is necessary to consider what should be the present numbers of senior registrars and registrars in the service and to fix the training establishment from time to time. The information available indicates that for some years to come the number of appointments available to senior registrars who complete their training at hospitals in England and Wales is unlikely to exceed 150 annually. This includes not only consultant and senior hospital medical or dental officer appointments necessary to make good wastage through death or retirement, but also a proportion of additional posts and openings in other services and overseas as well as in hospitals in this country.

On this basis it appears that the number of training posts in England and Wales should not at present exceed the following:

Senior registrars	600
Registrars	1,100

The figure for registrars is a total of those in the first and second years of training, and that for senior registrars is a total of those in the first, second, and third years of training. The figures assume a wastage at the end of each year, as indicated in para. 2.

4. The present numbers in England and Wales considerably exceed the above, being upwards of 1,400 in each grade. It is therefore essential to take steps to bring the number of training posts as quickly as possible into line with the numbers required.

5. In taking these steps the objective should clearly be:

(*a*) To fix for each hospital regional area an establishment of training posts properly distributed between the different specialties and situated in those hospitals where adequate facilities in staff, beds, etc., are available for training.

(*b*) To reduce the present numbers by (i) making appointments in future only up to the new establishment figures; (ii) discontinuing appointments of senior registrars now in their third or subsequent years as the individual's present year of appointment ends. (But see end of para. 2, as applied by para. 9 (ii) for exceptions.)

(*c*) To make alternative appointments for carrying out the work of the hospitals in so far as the reduction in numbers of senior registrars and registrars necessitates the appointment of a substitute.

These points are dealt with further in the paragraphs that follow.

Fixing Establishments

6. In determining what posts should exist and in what hospitals, it is desirable that the position at both teaching and non-teaching hospitals should be looked at as a whole within each regional area. This will ensure the best use of all the facilities available, enable the needs of all specialties to be considered together, and facilitate arrangements for the training of an individual to be shared if desired between a teaching and a non-teaching hospital. The regional board and the board or boards of governors in each regional area are therefore requested to consider urgently together what trainee posts should be provided in the area within the maxima indicated below, and to submit their joint proposals to the Minister not later than January 1, 1951.

In preparing these proposals the co-operation of the dean or director of postgraduate medical studies of the university for the area should be sought; and they should indicate the number of senior registrar and registrar posts it is proposed should be provided in each specialty, and the hospitals where the posts are to be held. The Minister will review these proposals as a whole (with particular reference to the distribution between specialties which can be satisfactorily determined only on a national basis) and will approve them with or without modification accordingly.

7. After taking into account such factors as population, the number of consultants, the available training facilities, and the number of beds in the different regions, it would appear that the maximum total number of posts for each regional area (including teaching hospitals in the area) should be as follows:

	Senior Registrar (Total for First, Second, and Third Year)	Registrar (Total for First and Second Year)
Newcastle	34	63
Leeds	36	65
Sheffield	42	76
East Anglia	18	32
N.W. Metropolitan	75	138
N.E. Metropolitan	48	86
S.E. Metropolitan	52	96
S.W. Metropolitan	83	151
Oxford	22	42
South-western	30	56
Wales	28	51
Birmingham	52	96
Manchester	52	96
Liverpool	28	52

The distribution between specialties will, of course, need to vary slightly from region to region, according to the training facilities available in the various specialties in each region. The concentration of teaching resources in London in both undergraduate and postgraduate teaching hospitals will naturally have to be taken into account in determining the final regional distribution.

Reduction in Numbers

8. In addition to fixing total establishments, an approximate distribution in each region of the total into numbers for each year of training must obviously be made, though this distribution may vary a little at different times. It is also essential for the reasons already given to take the earliest possible steps to bring the numbers of registrars and senior registrars in posts into accordance with the number of posts in the new establishment and the approximate distribution by year of training. Accordingly, when the distribution of posts by specialty and hospital has been determined, it will be necessary to decide which of the existing first-year registrars or first- or second-year senior registrars can continue for a further year, and where new appointments in the first year of each grade can be made during the coming year. In addition to the information asked for in para. 6, the regional proposals should therefore also include a statement of the number of registrars and senior registrars by specialty in each year of training it is proposed to retain or recruit in the region during the coming year.

9. When the establishment proposals have been approved by the Minister—which will be as soon as possible after January 1, 1951—it will be for the boards to apply them to existing numbers and new recruits. The approved figures should be strictly adhered to from the date of approval onwards (though, as indicated in para. 8, the distribution into numbers for each year of training may sometimes vary a little). This means that from that date:

(i) The number of first-year registrars or senior registrars recruited during the year should be the number (within the approved total) which boards have decided is appropriate for the time being.

(ii) As the existing registrars and senior registrars reach the end of their personal year of appointment, second-year registrars and third-year senior registrars should have their appointments terminated (unless in the exceptional cases mentioned at the end of para. 2 there are special circumstances justifying appointments for a further year of training); and first-year registrars and first- and second-year senior registrars should be reviewed and reappointed for a further year's training only so far as that is possible within the approved total establishment figures for the region.

10. From the date of this memorandum, and in advance of any approval of establishment, it is desirable that what steps are possible should be taken to begin the reduction in numbers of present trainees. Accordingly, from now on boards should not renew the appointment of any second-year registrar whose personal year of appointment ends, or of any third (or subsequent) year senior registrar save in the exceptional cases mentioned at the end of para. 2 and subject to what is said in para. 11 (*a*) as to possible temporary interim arrangements if an alternative appointment is required. In renewing other appointments, or recruiting first-year registrars or senior registrars, they should have regard to the necessity for reducing numbers and to the probable maxima that will be approved.

Alternative Appointments

11. It is appreciated that in some instances—though not necessarily in all—a reduction in the numbers of persons in training in hospitals may necessitate the appointment of other practitioners as assistants in their place. Where a board is satisfied that the work of the hospital necessitates an alternative appointment in place of a *senior registrar*, but not otherwise, the following are among the steps which may be taken:

(*a*) An existing senior registrar whose appointment is not renewed for a further year as a trainee may be offered an appointment for one year only as a temporary senior registrar at his present salary rate. This is intended as a strictly interim arrangement, with the double purpose of assisting boards to overcome temporary staffing problems, and of giving the individual practitioners concerned a longer opportunity of seeking other work.

(*b*) Alternatively, boards may appoint a suitably experienced general practitioner (normally one with a higher qualification and experience as a senior registrar or registrar) on a part-time basis to act as a clinical assistant. This is intended as a long-term method of meeting staffing difficulties in the senior-registrar field, and has the advantage of providing a valuable link between the general practitioner and the hospital services. In making appointments of this kind it will be necessary for boards to satisfy themselves not only that the practitioner has the experience and qualifications required, but also that his commitments in general practice will not prevent his devoting the time needed to carry out the duties of the hospital post. The remuneration of part-time general practitioners appointed as clinical assistants will be announced later.

12. Where it is necessary to terminate the appointment of an existing registrar or senior registrar, the board will no doubt wish, when thanking him for the services he has given, to draw his attention to other possible openings. In addition to the various fields of civilian medical practice in this country, both within and outside the National Health Service, some of these practitioners may be interested in openings abroad or in H.M. Forces. A note about these is appended which should be brought to the notice of each person concerned.

Junior Registrar

13. As mentioned in para. 2, the grade of junior registrar is not regarded as a training grade like that of registrar, and the present title is misleading. In future, therefore, the grade should be called "senior house officer," the definition, remuneration, etc., of the post remaining unchanged. It is, of course, not proposed that the establishments in hospitals of the grade now to be known as senior house officers should be increased on account of the change of nomenclature. Nor does the change affect the method of recruiting registrars, who will still be persons with normally at least two years' hospital practice since registration.

Other Openings

1. *H.M. Forces.*—There is an urgent need for specialists. There are at present about 400 vacancies for such officers in the

Navy, Army, and Royal Air Force." They are particularly required in the following specialties: anaesthetics, surgery, otology, radiology, psychiatry, pathology, dermatology, and venereology. In addition there are over 100 vacancies for general duty officers. Those interested can obtain further information from:

Navy.—The Medical Department of the Navy, Admiralty, Queen Anne's Mansions, St. James's Park, London, S.W.1.

Army.—The Under-Secretary of State for War, The War Office (A.M.D.s), London, S.W.1.

Royal Air Force.—The Under-Secretary of State for Air (M.A.1), Awdry House, Kingsway, London, W.C.2.

2. *Colonial Medical Service.*—About 200 posts on a permanent or temporary basis are available in many parts of the Colonial Empire. Those interested can obtain further information from the Director of Recruitment, Colonial Service, Sanctuary Buildings, Great Smith Street, London, S.W.1.

3. *University and Hospital Appointments Abroad.*—A number of university and hospital appointments are vacant or will shortly be vacant principally in the Middle East and South-east Asia. Those interested can obtain further information in the first instance from the Technical and Scientific Register, York House, Kingsway, London, W.C.2.

BRANCH SURGERIES

An important principle affecting the establishment of branch surgeries has recently been made plain in a case that was taken to a successful appeal to the Ministry of Health.

Before the appointed day a firm of practitioners maintained a branch surgery at a village situated some three to four miles from the main surgery. In the light of experience gained over a period of 13 years it was found that the branch surgery was unnecessary. On the appointed day the practitioner concerned, on applying to have his name included in the medical list maintained by the executive council, excluded the branch surgery address. He maintained that the council, in accepting the application, could not have been unaware of the new arrangements.

Subsequently the council requested the doctor to reopen the branch surgery and insisted that it had powers to do so under Section 7 (4) of the First Schedule, Part I, of the General Medical and Pharmaceutical Services Regulations. The case then went to appeal, and the Minister ruled that the order of the executive council requiring the doctor to open the branch surgery be quashed.

GENERAL MEDICAL SERVICES COMMITTEE

FIRST MEETING OF NEW SESSION

The first meeting of the new session of the Committee was held at B.M.A. Headquarters on Thursday, November 9. Dr. S. WAND was unanimously re-elected chairman. About 10 new members were welcomed individually. The Committee expressed its regret at the retirement of several old members, special mention being made of Dr. P. V. Anderson, whose length of service on this Committee and the old Insurance Acts Committee wellnigh constituted a record.

On the proposition of Dr. HOWIE WOOD the Committee placed on record its gratitude to Dr. Charles Hill for his services as secretary and extended a warm welcome to Dr. Angus Macrae.

Dr. O. C. Carter was again co-opted to the Committee. The Scottish, Rural Practitioners, Health Centres, Protection of Practices, and other subcommittees were reappointed. The Assistants Subcommittee had its reference extended to include the interests of newly established principals.

The Committee set up a subcommittee to review the trainee assistants' scheme and make recommendations. The CHAIRMAN said that there was a good deal of feeling with regard to this problem and it was desirable to have a strong subcommittee. A representative subcommittee of 15 was appointed, and to this the various resolutions on this subject passed by the recent Conference were referred.

A letter from the London Local Medical Committee was read propounding the problem of attendance by trainee assistants at courses in midwifery. Dr. FRANK GRAY said that in London a certain number of trainers had been approved, but there was difficulty in arranging midwifery training. Such training was essential because the assistant on completing his traineeship might have to go to a part of the country where there was a great demand on the general-practitioner service for midwifery. The London Committee had come to the conclusion that a month's full-time course with practical instruction was the best procedure. This was in the spirit of the scheme, but he was not entirely sure that it was in the letter of it, and he hoped that the well-meant effort of London might have approval. Dr. D. F. HUTCHINSON mentioned a part-time course extending over three months which had been arranged in Middlesex and was working very well indeed.

Dr. J. C. ARTHUR suggested that the question deserved a little further consideration. If it was ordained that trainee assistants should receive instruction in obstetrics at some hospital outside the ordinary purview of general practice it might look as though they were adopting the attitude that further instruction in obstetrics at some training centre was desirable in the case of the general practitioner.

It was agreed to refer this question to the newly appointed subcommittee.

One other question regarding assistants engaged the attention of the Committee. Apparently it is the Ministry's view that it is necessary for a doctor, although he has got the required consent for the employment of an assistant, to notify the executive council should his assistant leave and to reapply for permission to employ a new assistant. The matter arose out of a difference of opinion between the West Ham Local Medical Committee and the executive council, on which the Ministry was asked to adjudicate. Its adjudication was to the effect that consent of the council to the employment of an assistant by a general practitioner applies to a particular named assistant, and that fresh consent is required in the event of a change in the person employed or even if there is a long break in the continuity of the employment of an assistant during which time conditions may have changed.

This requirement was objected to by the Committee, and the matter was put down as one of those to be discussed at the next meeting with the Ministry.

The Remuneration Position

The Committee received a report on the present position with regard to the inquiries into practice expenses and income from National Health Service sources, and it had also before it certain resolutions passed at the Conference. A full discussion on the situation took place, and encouragement was given to new members to express their views. It was agreed that a letter be sent to the Ministry deprecating these continued delays, even though it was appreciated that they were in part due to circumstances over which neither side had control, and asking for further discussions to take place on the various items outstanding from the last meeting. It was agreed also to ask the trustees of the British Medical Guild to send out a letter explaining the altered timetable to British Medical Guild committees and group leaders, and in the meantime to do everything possible to perfect the local machinery of the Guild. The CHAIRMAN suggested that regional conferences of group leaders might be possible as a future expedient.

The Conference resolution that no mass withdrawal from the Service could be effective without the withholding of medical certificates was specifically put to the Committee and endorsed *nem. con.*

Discussion took place on the Isle of Wight resolution that practitioners who were unwilling to hand in their resignations should be invited to give an undertaking not to accept on their list any patients who were on the list of a resigning practitioner. In support of this, Dr. HOWIE WOOD pointed out that, if resignations to the extent of 85% were obtained, the outstanding 15% of practitioners would still be a potential source of danger. Other members of the Committee supported this point of view, but some thought that it would offer too futile a means for a few doctors to salve their consciences by remaining in the Service, and one member at least was against the recognition of a group of "non-collaborationists."

The CHAIRMAN suggested that it be remitted for consideration at the next meeting on what action should be taken to secure the support of house-officers, registrars, full-time employees of local health authorities and institutions, and those who for various reasons did not see their way to sign the resignation form. Possibly it might be necessary later to appoint a small committee to look into the mechanics of resignation. The matter was deferred until the next meeting.

Rural Practitioners

On the report of the Rural Practices Subcommittee a proposal for a new mileage scheme by the Holland (Lincolnshire) Local Medical Committee was considered. The proposal was forwarded to the Government Mileage Committee. The subcommittee made the point—endorsed by the main committee—that any new distribution scheme should be referred to local medical committees before it was put into operation.

It was agreed on the proposal of the subcommittee that the name "Mileage Fund" should be changed to "Rural Practitioners Fund."

Medical Service Committees

The subcommittee which under Dr. Dain's chairmanship has been considering the constitution and procedure of medical service committees submitted a number of alterations which it proposed to recommend to be made in the handbook on medical service committee procedure prepared by the Ministry of Health. The proposed alterations were approved, and the resolutions bearing on medical service committee work which were passed at the recent conference were referred to the subcommittee. It was agreed that at the next meeting with the Ministry the question of publicity in disciplinary proceedings should be brought forward. The point it is desired to press is that a doctor's name should be withheld from the published decision of the tribunal except where that decision is that the doctor's name be removed from the medical list.

Amending Bill

It was reported that the Amending Acts Committee, which was meeting shortly, desired to learn of those matters which the Committee thought should be included in the programme for the amendment of the present Act and its ancillary regulations. Many matters were put forward last year for inclusion in the amending Bill, including the question of drugs and appliances for private patients and the reform of the disciplinary procedure. The General Medical Services Committee agreed to pass on from time to time any matters which it considered should be the subject of amendment.

Notification of Pneumonia

The notification of pneumonia was the subject of a letter from the Ministry of Health. At present what is called "acute primary (including influenzal) pneumonia" is not notifiable. The General Register Office had suggested that pneumonia should be notifiable in four categories, and, as the onus of placing patients in these categories would fall upon the general practitioner, the views of the Committee were sought. The Committee, after consideration, agreed to suggest that there should be only two categories, and not four—namely, acute primary pneumonia and acute secondary pneumonia, with any particulars of such cases if possible.

Discount on Drugs

It was reported that complaints were being received from dispensing doctors concerning the effect of the reduction of the "on-cost" allowance from 33⅓% to 16⅔%. This was said to result in the doctor's suffering a loss of 4% on cost price when supplying certain proprietary preparations (which may be necessary for the patient). When the reduction in the "on-cost" allowance was made by the Ministry the Committee registered a strong protest, but was unable to secure any concession for the doctors concerned. It now appears that the dispensing doctor is out of pocket on every supply of a proprietary to his patient. It was agreed to take this up with the Ministry.

Correspondence

Assistants in General Practice

SIR,—I have read with interest and sympathy the plight of "Fair Play" (*Supplement*, October 21, p. 172) and his fellow assistants. This state of affairs is not new, as the pursuit of a partnership by an impecunious assistant has always been an uncertain and arduous task. The only consolation I can offer him is that partnerships under such conditions as he describes would have meant an unhappy atmosphere and the continuation of his "dog's life" as a junior partner.

The true solution of this problem lies with the Minister initiating something on these lines:

(1) A capitation fee of 26s. 6d. for the first 1,000 patients, 22s. 6d. for the second 1,000 patients, with the remainder at the present figure.

(2) The limit of numbers for principals reduced from 4,000 to 3,000.

(3) The limit for assistants be reduced from 2,500 to 1,500.

(4) The total cost of an assistant to his principal be a minimum of £900 per annum.

Let us consider the effect of these four points. (1) The principal with 4,000 at the present rate would lose very little on 3,000 at the suggested rate. (2) An assistant could make a satisfactory start as a principal on 800 units. (3) The "misuse" of an assistant under conditions (3) and (4) will be much more unlikely than it is now.

Under such conditions I am convinced that: (1) The standard of general practice would rise again. (2) The hospital outpatient department would not be choked up with half-examined cases and those requiring minor surgery and dressings. (3) The practitioner would have an opportunity for improving personal contact with his patients and so re-establish the former doctor-patient relationship. (4) A profession with so many aggrieved and frustrated members can never be a united one, and never in the history of the profession has unity been more desirable than it is to-day.—I am, etc.,

Stalybridge, Cheshire. A. WYNROE.

Meeting of Unestablished Doctors

SIR,—Principals with inadequate lists, assistants without view, and other unestablished general practitioners comprise a section of our profession for which insufficient is being done in order to overcome the great difficulties which these doctors are experiencing.

It is widely recognized that the arrangements for entry into general practice as a principal are at present grossly unsatisfactory. It is extremely difficult to obtain an assistantship with view, there are insufficient executive council vacancies to satisfy the demand, and in most parts of the country the outlook facing the "squatter" is bleak. Many assistants are faced with poor prospects and undesirable conditions of employment, and the plight of some, as instanced by your correspondent "Fair Play" (*Supplement*, October 21, p. 172), constitutes a disgrace to the whole profession. The entrants into general practice who have achieved the status of principal, but who have only small lists of patients, are finding, in many cases, that they have little hope of significantly increasing the size of their practices within a reasonable time.

Little is being achieved by the numerous individual complaints which are being expressed both in private and in the medical press. A growing number of "unestablished" general practitioners, who have been discussing the state of affairs outlined above, have come to the obvious conclusion that doctors who are placed in the unfortunate circumstances to which I have referred should get together in order to produce and present their case for a square deal. An open meeting has therefore been arranged and will be held at the Russell Hotel, London, W.C.1, on Wednesday, November 29, at 8.15 p.m. It is hoped that doctors concerned will endeavour to attend this meeting, as it is clearly important that the views of as many as possible should be heard and discussed.

A statement on the professional problems of assistants and other "unestablished" (or inadequately established) general practitioners has been prepared. This statement also contains suggestions by which improvements for this section of our profession could be effected. I should be pleased to send a copy to anyone interested.—I am, etc.,

145, Upper Clapton Road, London, E.5. H. REZLER.

Change of Doctor

SIR,—I think Dr. D. McGregor's letter (*Supplement*, October 21, p. 171) asks for a reply, even although it might prejudice my opportunity of obtaining some shooting should I ever have the good fortune to be passing through Bonar Bridge.

I think that to regard one's younger or newly qualified colleagues as "young upstarts" is a somewhat unenlightened attitude on the part of the older members of what calls itself a liberal-minded profession. Experience can be acquired only in the course of years, and the refreshing optimism of the newly qualified is surely one of the lighter sides of medicine.

It is apparent from reading your correspondence columns that the "older tiring practitioners" are not in the least troubled by their consciences when it comes to exploiting the "young upstarts" as assistants.—I am, etc.,

London, S.W.15. C. W. A. SEARLE.

*** We have received a number of other letters in similar vein. The writers seem to have misunderstood Dr. McGregor's ironical letter.—ED., *B.M.J.*

General Practitioners and Hospitals

SIR,—Some months ago the executive committee of the Fellowship for Freedom in Medicine nominated a subcommittee, with wide terms of reference, to investigate the relationship between the general practitioner and the hospital services.

It has long been an accepted function of the Fellowship to watch the general practitioner's interests. Of late, the essential necessity of this duty has become even more obvious by reason of the undoubted tendency of some, at least, of the regional hospital boards to discount the general practitioner's potentialities. In many cases they have not only engineered his removal from posts in which he has for years exercised his skill (aided perhaps by a humanitarian approach, the direct outcome of his "general" work), but, even more important, have entirely altered the constitution and function of institutions for years accepted as general-practitioner hospitals, not only by the doctors themselves but also by the populations they serve.

Many instances of the truth of this have been collected by the subcommittee of which I have the honour to be chairman. We feel, however, that throughout the country there must be many other local hospitals which had G.P. or partially G.P. staffs, the members of which have suffered as the result of arbitrary action on the part of regional boards or hospital management committees. I would add that all members of the subcommittee have been most impressed by the awareness of the existing dangers shown not only in the Annual Report of the Council of the British Medical Association, but also by the important resolutions passed at the Annual Representative Meeting at Southport.

The object of this letter, therefore, is to ask that any relevant information may be made available for our inquiry. For this purpose a form of questionary is in preparation, copies of which will be forwarded on application to me, c/o The Fellowship for Freedom in Medicine, 45, Nottingham Place, London, W.1.—I am, etc.,

G. J. V. CROSBY.

Agreement has been reached through the Whitley Council on the salaries of secretaries and other officers in postgraduate teaching hospitals. The hospitals are in four groups, and salaries of secretaries range from £1,400 to £1,700 in the first group, down to £700 to £900 in the fourth group. There is in addition a London weighting allowance.

Association Notices

Diary of Central Meetings

NOVEMBER

20	Mon.	Registrars' Group Executive Committee, 2 p.m.
21	Tues.	Special Committee for Spa Practice Report, 2 p.m.
22	Wed.	**Adjourned Council Meeting**, 10 a.m.
22	Wed.	Board of Trustees, British Medical Guild, 12 noon.
24	Fri.	Public Health Committee, 2 p.m.
24	Fri.	Venereologists Group Committee, 2 p.m.
27	Mon.	Psychological Medicine Group Committee, 2 p.m.
29	Wed.	General Practice Review Committee, 2 p.m.
30	Thurs.	Maritime Subcommittee, 2 p.m.

DECEMBER

6	Wed.	Central Consultants and Specialists Committee, 11.30 a.m.
7	Thurs.	Committee on Psychiatry and the Law, 2 p.m.
7	Thurs.	Medical Students and Newly Qualified Practitioners Subcommittee, 2 p.m.
8	Fri.	Amending Acts Committee, 2 p.m.
13	Wed.	Private Practice Committee, 2 p.m.

JANUARY

9	Tues.	Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

CITY DIVISION.—At Finsbury Health Centre, Pine Street, London, E.C., Tuesday, November 21, 8.30 p.m., meeting. Talking film: "Angina Pectoris."

CORNWALL DIVISION.—At Regent Annexe, Truro, Monday, November 20, 5 p.m., annual meeting; election of officers. Dr. Charles Hill, M.P.: "The Present Position."

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Royal Oak Hotel, Alderley Edge, Wednesday, November 22, 8.30 p.m., lecture by Mr. Norman W. Bolton: "Acute Appendicitis."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, November 21, 2.30 p.m., clinical meeting.

NORTH OF ENGLAND BRANCH.—At New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, November 23, 7.15 p.m., film: "The Treatment of Normal Breech Presentation"; 8.45 p.m., address by Professor Andrew M. Claye: "Some Observations on the Second Stage of Labour."

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, November 20, 9 p.m., Dr. C. H. Adderley: "Laboratory Tests and their Application in General Practice."

OXFORD DIVISION.—At Maternity Department, Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, November 22, 8.15 p.m., annual general meeting.

SOUTH ESSEX DIVISION.—At Nurses' Lecture Theatre, Oldchurch Hospital, Romford, Friday, November 24, 9 p.m., clinical lecture by Professor V. W. Dix: "Infections of the Urinary Tract."

SOUTH MIDDLESEX DIVISION.—At Jersey Rooms, Red Lion Hotel, Hounslow, Thursday, November 23, 7.30 for 8 p.m., annual dinner-dance.

SWANSEA DIVISION.—At Osborne Hotel, Langland, Thursday, November 23, 7.30 p.m., lecture by Mr. J. Pennybacker.

TOWER HAMLETS DIVISION.—St. Andrew's Hospital, Bow, E., Friday, November 24, 3 p.m., Dr. W. J. O'Donovan: "Dermatology."

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Councils.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY NOVEMBER 25 1950

DURHAM AND THE "CLOSED SHOP"

LOCAL MEETING

On November 1, 1950, the Durham County Council decided that all its staff should be members of an appropriate trade union. On November 10 a letter was sent by the county council to all its medical officers requesting evidence of membership of a trade union, and stating that if evidence of such membership was not furnished by November 22 the employee concerned would be given notice and would be offered re-employment on condition that he or she became a member of a trade union. The letter stated that, in the case of doctors, membership of the B.M.A. would meet the requirements of the county council.

News of the issue of this letter was received at B.M.A. House on November 15. Immediately a letter was sent by the Secretary of the Association to every medical officer employed by the Durham County Council reminding them of the Association's opposition to the "closed shop" and inviting them to postpone their action on the county council's letter until after a meeting of medical officers convened for November 18 at the Bishop Auckland General Hospital.

The meeting was attended by 36 medical officers employed by the Durham County Council. Letters of support were received from five medical officers who were unavoidably absent. Of the remaining 12 medical officers employed by the county council, two were known to be in hospital and one was on holiday. The chair was taken by Dr. G. Fenwick Lishman, immediate past-president of the North of England Branch.

Dr. C. Metcalfe Brown, chairman of the Public Health Committee, addressed the meeting. He explained that he was speaking as a member of the Council of the B.M.A., a member of the Council of the Society of Medical Officers of Health, and a trustee of the British Medical Guild. He said that the "closed shop" issue affected the whole profession. The B.M.A. was resolutely opposed to any requirement by an employing authority that medical practitioners should be obliged to join any trade union or professional organization. The fact that membership of the B.M.A. was acceptable to the Durham County Council was totally irrelevant. The B.M.A. was naturally anxious to include as many doctors as possible within its membership, but it was absolutely opposed to any acquisition of members by coercion. The resolution of the Durham County Council was an intolerable interference with the private affairs of individual doctors. The medical profession was united in its opposition to this policy, and the Durham medical officers could count upon the support of the British Medical Guild, which was backed by ample funds. The Medical Women's Federation wholeheartedly supported the policy of the B.M.A. and had sent a letter to its members. Dr. Metcalfe Brown believed that the Royal College of Nursing, the Royal College of Midwives, and the National Union of Teachers were also determined to oppose the county council's decision. The Government's position had been made clear in the House of Commons, where the Parliamentary Secretary to the Ministry of Health had stated that the Government regretted the action taken by the Durham County Council. Dr. Metcalfe Brown concluded by advising the medical officers to ignore the county council's letter of November 10.

Mutual Protection

A speaker pointed out that these events emphasized the necessity for the medical officers to stick together for mutual protection. He had felt in the past that the B.M.A. was concerned only with the interests of general practitioners, and he was delighted to find that the Association was prepared to take such energetic action on behalf of members of the public health service. It was totally unreasonable of the county council to demand that medical officers should comply with their request within twelve days or be dismissed.

Another speaker inquired about the position of holders of combined appointments—i.e., county district M.O.H. and assistant county M.O.H. Dr. Metcalfe Brown explained that termination of these appointments would involve the consent of the Minister of Health.

Collective Agreements Honoured

Dr. E. Grey Turner, Assistant Secretary, stated that the county council need have no fears about collective agreements. The B.M.A. would continue, as in the past, to negotiate collective agreements on behalf of the medical profession, and any agreements reached would continue, as in the past, to be honoured by the whole profession. He had never understood the argument sometimes put forward by advocates of the "closed shop" to the effect that union members could not bear to work alongside non-union men. In his experience the doctors working in a hospital would never dream of inquiring which of their colleagues were members of the B.M.A. or any other professional organization, let alone of objecting to any who were non-members. All that mattered was that doctors should give good service to their patients and to the public, and there was absolutely no reason to suppose that a doctor would give less good service to his patients because he happened not to be a member of the B.M.A. or any other organization.

County Council's Instructions Ignored

The meeting resolved by a unanimous vote to ignore the county council's instructions and to affirm its wholehearted support for the policy of the B.M.A. in regard to the "closed shop." Arrangements were made for those medical officers who were absent from the meeting to be contacted personally.

Dr. Lishman concluded the meeting by expressing thanks to Drs. Metcalfe Brown and Grey Turner, and said that he had never presided over a meeting at which the unanimity of feeling was more clearly obvious.

PUBLIC HEALTH COMMITTEE

"CLOSED SHOP" IN DURHAM

A special meeting of the Public Health Committee of the Association was held on November 16, under the chairmanship of Dr. C. METCALFE BROWN, principally to discuss two matters, the first of which was the situation in Durham following the resolution of the county council requiring all members of its staff to be members of an appropriate trade union.

The Committee had before it the full details of the correspondence which had taken place, a report of the adjournment debate in the House of Commons the previous evening, opened by Dr. Charles Hill, and the history of the subject in connexions other than Durham. In 1946, on the occasion of the Willesden dispute, the Minister of Health had stated that, while he was anxious that doctors should join a trade union, he considered that this matter should not be determined by the unilateral action of local authorities. In 1947 the Annual Representative Meeting declared it to be undesirable in principle that any practitioner should be required to join any body, B.M.A. or other (saving a defence society), and that where an authority imposed upon its officers or candidates for

office any such requirement the Association should protest to the authority concerned, and afford financial help to any practitioner suffering as a result of following the Association's advice.

It was reported that the clerk of the Durham County Council had been informed of the policy of the Association, and the county council had been asked to receive a deputation and in the meantime to withdraw its requirement. A letter had been sent to all medical officers, whole-time and part-time, employed by the county council, asking them to attend a meeting to be held at Bishop Auckland on November 18. The meeting would be addressed by one of the members of the Association's secretariat, and, to the great pleasure of the Committee, its chairman, Dr. Metcalfe Brown, agreed also to attend. It was agreed unanimously that the action of the Durham County Council was to be greatly deprecated.

The Withholding of Certificates

The second matter considered by the Committee arose out of the resolution of the recent Conference of Representatives of Local Medical Committees on the withholding of medical certificates in the event of a mass withdrawal from the National Health Service. The Council had referred this resolution for their comments to the Public Health and to other committees.

The matter was discussed at some length. It was agreed at once that in the event of mass withdrawal of general practitioners public health medical officers should be advised to give them all legal support within their power, but the question of certification raised other issues. The position of salaried officers in local government service was stated by one member of the Committee to the following effect: local authorities carrying out statutory duties could not extend these without appropriate legislation; medical officers engaged by local authorities were in contract to carry out the statutory duties of their authority and could not be diverted to other duties for which there was no statutory sanction; certificates signed by local authority medical officers were not in the same category as those signed by general practitioners, and refusal to sign them would render the medical officer liable to dismissal; no good purpose would be served by asking medical officers in local government not to sign certificates as heretofore, but certainly they should refuse to sign any additional certificate; it would be contrary to recent legislation for whole-time officers of local government bodies to prescribe for or treat the general public.

This view was generally in harmony with what the Committee felt. Some question arose about the clause in many agreements—"such other duties as the council may from time to time impose." The view was expressed that this could be interpreted only as referring to additional statutory duties which might be placed upon the local authority or which enabled the authority to carry out its administrative duties.

It was decided after discussion that the Council be recommended to express the opinion that the withholding of certificates in the event of mass withdrawal of general practitioners should not include private certificates, and that patients who were treated privately should be afforded all the usual facilities. The Committee was unanimous in its view that no additional certification should be undertaken by public health medical officers in the event of general practitioners withdrawing from the Service, and that public health medical officers should not undertake treatment which is normally given by general practitioners.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

County Council.—Durham.

Non-County Borough Council.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

APPOINTMENT OF CONSULTANTS AND SPECIALISTS

In July last the Minister laid before Parliament regulations regarding the machinery for the appointment of specialists. They came into effect on September 1 and revoked the regulations made in 1948. Some nine months previously the Ministry had indicated to the Joint Committee the nature of certain amendments which it was proposed to make to the original regulations, but the amendments embodied in the new regulations differ in many respects from those suggested earlier. The Joint Committee had insufficient time to comment on the new regulations in their final form.

Although the new regulations are in some respects an improvement on the old, they are unlikely to commend themselves to the profession in their entirety.

The new regulations prescribe by definition the classes of appointment to which they relate—i.e., those of consultant and S.H.M.O. (or S.H.D.O.) status. This removes the doubt which might have arisen under the original regulations about whether the regulations applied to a particular appointment.

The regulations preserve the advisory appointments committee procedure, and the principal changes of interest to the profession are those relating to the alterations in the composition of these committees.

In the case of appointments to non-teaching hospitals the total membership of the committee (7) and the members nominated by the board and hospital management committee (5 and 2 respectively) remain as before. But of these seven members it is now laid down for the first time that two (one nominated by the board and one by the H.M.C.) must be laymen. The presence of one layman, possibly as an impartial chairman, is perhaps of advantage. It is difficult, however, to see what can be gained by increasing the lay representation on a committee whose sole function is to weigh the respective merits of candidates for a clinical post, particularly when the effect is to reduce the representation of the senior medical staff of the hospital with whom the successful candidate will have to work. Hitherto the H.M.C. was free to nominate two medical practitioners as its representatives on the advisory appointments committee, and where two hospital management committees were concerned in the appointment it was possible for each to appoint a medical representative. This will not be possible under the new regulations. Admittedly under the new regulations the H.M.C. is obliged to nominate a member of the medical staff of the hospital concerned, but in practice this was usually done before.

It is difficult to avoid concluding that the deliberate introduction of more lay influence into matters which are the intimate and almost the sole concern of the profession is a definite policy and one which must cause grave disquiet.

It is the view of the Central Consultants and Specialists Committee as well as the Joint Committee (which has in fact made strong representations to the Ministry) that there should be at least three representatives of the medical staff of the hospital on the appointments committee, and that, when two or more H.M.C.s are concerned in the appointment, the medical staff of each hospital group should be represented.

Previously two of the medical members of the committee had to be engaged in the specialty concerned, one from within and one from outside the region. Now only one such member —from outside the region—is obligatory.

There is provision for augmenting the committee where the officer is to be employed partly under a local authority.

Appointments to Teaching Hospitals

In the case of an appointment to a teaching hospital, the total membership of the advisory appointments committee has been increased from seven to eight, and the representation of the university has been increased from two to four, bringing it into equality with that of the board of governors. Here again there is an obligation to appoint two laymen on the committee.

Previously the board of governors had the "direct" nomination of four members, a fifth being appointed after consultation with the regional hospital board of the area. Now the board has the direct nomination of only two members, the third being nominated after consultation with the regional hospital board and the fourth after consultation with the "appropriate" Royal College. Neither of these latter two may be members of the hospital medical staff. Of the two members directly nominated by the board of governors one must be a layman, the other a member of the medical staff of the hospital concerned. The net result of these changes is that this last member may be the only representative of the hospital medical staff on the committee, although it is of course open to the university to nominate members of the medical staff from among its three professional nominees. This possible loss of representation of the medical staff of the hospital is a retrograde step.

Provision for the appointment of two consultants in the specialty concerned has been retained in the case of teaching-hospital appointments, although—as already noted—this representation has been reduced in the case of the non-teaching-hospital appointment.

Where the teaching hospital is associated with the University of London it is provided that the University shall consult the appropriate medical school in regard to the nomination of two of its professional members. This provision might usefully be applied throughout the country.

It is interesting to note that in both the original and the present regulations the duty of the advisory appointments committee is to select such applicants as it considers suitable for the appointment and to submit their names to the board, which is responsible for making the appointment. In practice the advisory appointments committee often recommends only one candidate, and the appointment by the board is largely a formality. Some boards of governors, however, have adopted the policy of appointing an officer from the names selected by the advisory appointments committee, on the advice of their medical committee, and this is a practice which might with advantage be extended.

The lack of adequate consultation between the accredited representatives of the profession and the Ministry has resulted in amending regulations which leave a lot to be desired. Frequent changes in the regulations are to be deplored, but clearly some of the above points must be rectified if they prove unworkable. The Ministry has constantly been reminded that the full support of the profession to changes in the terms and conditions of service can always be achieved if there is ready consultation and give and take on both sides.

CONDITIONS OF SERVICE OF HOSPITAL MEDICAL STAFF

During the past months discussions have been proceeding, either directly between the Joint Committee and the Ministry, or through Committee B of the Whitley machinery, on a number of points affecting terms and conditions of service of consultants and other members of hospital medical staffs.

Remuneration of Medical Superintendents, Regional Administrative Medical Staff, and Regional Psychiatrists

The Joint Committee has never accepted the method of determining the salaries of medical superintendents laid down in the terms of service, and when the committee advised hospital staffs in June, 1949, to accept permanent contracts based on the terms it was on the understanding that negotiations with the Ministry would continue on a number of outstanding points, of which this was one.

Up to the time when the medical Whitley machinery was established no agreement had been reached with the Ministry, and it was therefore decided to pursue the matter through Whitley, as it was one affecting the terms of service.

In the case both of regional administrative medical staff and of regional psychiatrists provisional rates of remuneration were laid down by the Ministry, after discussions with the representatives of the profession, but before the publication of the Spens Committee Report, and it was understood that the salaries would be reviewed in the light of the findings of that committee. So far, however, no adjustment has been made, and the position of these officers was accordingly raised with the Ministry and more recently in the Whitley machinery.

At the beginning of July the staff side of Committee B put forward proposals for the improvement of the salaries of medical superintendents, regional administrative medical staff, and regional psychiatrists, but when these proposals were discussed with the management side at a meeting on September 29 the latter asked for a further period of time in which to consider the proposals, and it was agreed that the discussions should be resumed not later than the first week in December.

Pay-bed Regulations

Some twelve months ago the Joint Committee submitted proposals to the Ministry for a modification of the Pay-bed Regulations, the effect of which would have been to abolish the detailed classification of operations as "major," "intermediate," and "minor"; to omit the detailed fees laid down for particular procedures; and, as an alternative, to specify maximum fees in certain specialties for the guidance of the profession. It was thought that the committee had reached a substantial measure of agreement with the Ministry and had convinced the Department of the need for a higher overall maximum than 75 guineas in exceptional circumstances—e.g., multiple or complicated operations.

At a recent meeting, however, the Ministry, while agreeing that the present detailed schedules of operations contained many anomalies, informed the committee that it now felt that their retention was a necessary protection for the patient. Certain other points in the regulations on which the committee is seeking amendment are still under discussion, and the Ministry has asked the Joint Committee to assist the Department in reviewing the detailed schedule of operations with a view to its improvement.

Medical Examination on Appointment

Under the terms of service the passing of a medical examination is a condition of appointment to a hospital medical post within the National Health Service. Over the past twelve months the Joint Committee has repeatedly represented to the Ministry that, in view of the length and cost of medical training, it is unjust that a practitioner should be debarred from a hospital appointment because he cannot satisfy the requirements of a medical examination. Indeed, had such a rule operated in the past many distinguished consultants might not have reached their present positions. The committee has urged that no practitioner should be barred from a hospital post unless his employment is prejudicial to the health of his colleagues or patients, and has suggested that to meet the position there might be some adjustment of the sick-leave arrangements and superannuation provisions for those officers who fail to pass a medical examination.

The Ministry has agreed to waive the requirement in the case of house-officers, subject to an appropriate modification of the sick-leave entitlement, but is unwilling to extend the principle to posts above the house-officer grade. The committee attaches great importance to this point of principle and proposes to pursue the matter in Whitley Committee B.

Loan of Patients' Records

Requests are frequently made by outside bodies for the loan of patients' hospital records, and quite often it is in the patients' interests that these records should be available when questions such as further treatment or the assessment of a disability are being considered. There is no doubt, however, that the nationalization of the hospital service, coupled with the growth of the "Welfare State," has given rise to some anxiety that the degree of confidence surrounding patients' medical records would—at least to some extent—be lost.

The Joint Committee is therefore glad to be able to state that the Ministry has accepted the view that such records should not be loaned to outside bodies, including other Govern-

ment Departments, without the production of the patient's written consent, or without the knowledge and approval of the consultant in charge of the case.

Consultants Acting as Locumtenents

Following discussions in Whitley Committee B it has now been agreed that where, in exceptional circumstances, a consultant is engaged in a locum capacity to deputize for an S.H.M.O. he shall be paid at the rate of 5 guineas per notional half-day. The present rate of remuneration is 3½ guineas.

Retention of Fees (Para. 14 of Terms of Service)

The Joint Committee is discussing with the Ministry the classification of various types of examination and report which are within or outside the scope of the service to be provided under Section 3 of the Act, as set out in the Schedule to para. 14 of the terms of service, and it is hoped that an early announcement will be made on this point.

Consultation

Occasionally the Ministry has issued instructions to hospital boards on matters affecting the interests of hospital medical staff without consulting the profession, and the Joint Committee has asked that there should be adequate consultation with it on all such matters in the same way as the G.M.S. Committee is consulted on matters affecting general practitioners working in the National Health Service. The Ministry has agreed to do this so far as it is practicable.

MANX PRESCRIPTION DISPUTE

POSSIBILITY OF SETTLEMENT

The dispute between the Manx Chemists' Association and the Isle of Man Health Services Board about the payment by the public of sixpence for each prescription to the chemists may be settled. According to *The Times* of November 21, the chemists are willing to resume service immediately if the Board gives three months' notice from October 1.

On November 10 the Chemists' Association gave notice to the Board that they would withdraw from the Health Service on November 13.

The dispute began on October 1, when the Chemists' Association decided not to operate the regulation approved by Tynwald, the Manx Parliament, that a charge of sixpence be made for every doctor's prescription, and that a charge be made for containers supplied, on the ground that they had not had adequate notice from the Health Board to impose the charge.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

The General Medical Services Committee decided on November 9 to reappoint the subcommittee which had been engaged in examining the various problems of assistants in the National Health Service. To widen the scope of the subcommittee, it has been reconstituted as the Assistants and Young Practitioners Subcommittee. It will now examine not only the difficulties of assistants but also the problems which face young doctors entering general practice for the first time.

The subcommittee will hold its first meeting on Wednesday, December 13, and it would be pleased to consider any problems or suggestions which practitioners in either of the two categories mentioned may care to put forward.

The subcommittee is also anxious to have representatives of these two classes of practitioners among its membership, and any assistant, or doctor who has recently entered practice, who would care to join the subcommittee is invited to apply to the Secretary at B.M.A. House.

KINGSTON VICTORIA HOSPITAL

The General Medical Services Committee of the B.M.A. has stated that it "is deeply concerned by the action of the South-west Metropolitan Regional Hospital Board in the matter of the Kingston Victoria Hospital." The committee considers that a full public inquiry should be held before further action is taken.

IRISH DOCTORS AND MILITARY SERVICE

Under the National Service Acts at present in force in Great Britain male doctors who are citizens of the Irish Republic, or of Irish birth or domicile, become liable for call-up to the armed Forces of Great Britain when they have been resident in this country for two years, unless they are by then over 30 years of age or are regarded by the Ministry of Labour and National Service as resident here for a purely temporary purpose, such as postgraduate study.

JUNIOR REGISTRARS

One of the changes resulting from Circular R.H.B. 50/106 on registrar grades (*Supplement*, November 18, p. 204) is the abolition of the title "junior registrar," consequent upon the decision of the Ministry that this type of post is not regarded as a step in the training ladder. In future this type of post will be considered that of a "senior house officer," the salary remaining unchanged.

Unfortunately this decision does not appear to have been notified to hospital management committees, by whom junior registrars are at present appointed, and advertisements of appointments in this grade are still being received for publication in the *Journal* except for teaching hospitals, which are already adopting the title of "senior house officer."

This is likely to continue for a little while until the position becomes clarified. But it is as well to remind intending applicants for posts advertised as junior registrar that although the salary is unchanged the designation of the post may be, and that in any case they should not regard the post as conferring upon them the status of a specialist in training.

The choice of the title "senior house officer" for these posts raises certain complications in view of the fact that in many hospitals it has already become the practice to classify the house appointments on the £350 to £450 scale as "senior" and "junior." The abolition of the junior registrar, although a wise move, creates a new problem of nomenclature.

The use of the three registrar grades was intended to overcome the multiplicity of designations, though there was much to be said for casualty officer, R.M.O., etc. At any rate, some suitable title will have to be found for the erstwhile junior registrar, though it is possible the Minister will need to reconsider the suitability of "senior house officer."

SCOTTISH COMMITTEE

The provision of a reference library and reading facilities at Scottish House was approved by the Scottish Committee at a meeting at Edinburgh on October 10. The scheme will be recommended to Council without prejudice to future developments in connexion with major alterations to Scottish House. The total estimated cost is £620, including furnishings (£220), books (£300), and staff (£100). In addition, it is expected that there will be a sum of £50 annually in respect of replacements of books.

In a report to Council on the proposal the Committee stated that the provision of reading- and writing-room facilities was envisaged as part of the major alterations to Scottish House which had already been approved by Council. As, however, it was most unlikely that these alterations would be made in full for a number of years, the Scottish Committee felt that provision should be made for library facilities without further

delay. The proposal was strongly supported by the Edinburgh Division, which pointed out that the libraries of the Royal Colleges were available only to their Fellows and that the only facilities generally available were those of the University Central Medical Library. For a time these were, and might again be, withdrawn and in any event were now available only to Edinburgh graduates. The Committee felt that the establishment of such facilities as recommended would serve as an experiment for the long-term arrangements which were proposed in connexion with the major alterations to Scottish House and also for the establishment of similar facilities in other centres. There would be placed at the disposal of practitioners a modest selection of standard books, together with quarterlies published by the Association, and the leading world periodicals, dictionaries, etc. The library would be available during office hours and during the evenings.

Scottish Representation on Council

There was a long debate on the question of Scottish representation on the Council. The Committee had before it proposals of the Organization Committee to give effect to the resolution of the Annual Representative Meeting that, in view of the fact that Group 27 comprised 1,757 members, the representation of this Group on the Council should be increased from one to two.

The view was expressed that the amendments proposed by the Organization Committee would in fact be contrary to the intentions of the Representative Body as set out in resolutions already passed by it.

The Scottish Committee considered that there could be no reasonable doubt that the intention of the Annual Representative Meeting was that its resolution would have the effect of altering the decision "that the number of members of Council elected by members in the Branches in Great Britain and Northern Ireland be increased from 22 to 39," and that the resolution "that two members of Council be elected by the representatives of constituencies in Scotland, one member by the representatives of constituencies in Wales with Monmouthshire, and 10 by the Representative Body as a whole" would be unaffected.

The view of the Committee was that the Organization Committee had no power to vary a decision of the Representative Body without the specific authority of that body, and that there was nothing in the Minutes of the Annual Representative Meeting to indicate that its decision on this point was subject to conditions. A starring of one of the 10 representatives to be elected by the Representative Body as a whole in favour of Scotland seemed to be simply in the nature of an expedient, and was not in itself an acceptable procedure.

Other Business

Dr. I. D. Grant (Glasgow) and Dr. J. G. M. Hamilton (Edinburgh) were reappointed chairman and vice-chairman of the Committee respectively.

In connexion with the representation on the Scottish Committee of the Grouped Highlands and Islands Divisions, it was reported that only two nominations for three places were timeously received—namely, those of Dr. W. Nicol Gray (Helmsdale) and Dr. D. C. Wilson (Inverness), who were accordingly elected. Two late nominations had been received. A vacancy accordingly existed, and it was resolved that this should be filled by a further postal election.

Dr. J. T. McCutcheon, the recently appointed Assistant Scottish Secretary, attended his first meeting of the Scottish Committee in an official capacity and was welcomed by the chairman.

THE B.M.A. IN WEST AFRICA

A general meeting of members of the B.M.A. in Nigeria is to be held at the pathological laboratory of the General Hospital, Broad Street, Lagos, at 5 p.m., on Friday, January 12, 1951, in order to discuss the possible formation of a Branch of the Association in Nigeria. There are 150 members in the territory. This is the largest unorganized group of members in the Commonwealth.

FACULTY OF OPHTHALMOLOGISTS

At a meeting of the council of the Faculty of Ophthalmologists held on October 13 it was agreed that a subcommittee consisting of the president, Mr. Frank W. Law, Mr. A. B. Nutt, and Mr. T. Keith Lyle should again interview Sir John Charles at the Ministry of Health on the question of the position of orthoptists in the organization of medical auxiliaries.

The Education and Research Subcommittee was asked to consider questions of postgraduate training, the revised criteria for consultants and specialists, and the section on ophthalmology in the Government publication "The Development of Consultant Services."

In connexion with the charging of fees for supplying certificates to outside bodies following ophthalmic examination, it was reported that the British Medical Association had decreed that it was in order for a fee to be charged, and this decision was endorsed.

It was reported that the following committee had been recognized by the Minister of Health to deal with future admissions to the Central Professional Committee's list of ophthalmic medical practitioners with the prescribed qualifications: The Hon. G. J. O. Bridgeman, Mr. Nigel Cridland, Mr. N. P. R. Galloway, Mr. J. J. Healy, Mr. H. V. Ingram, and Mr. E. G. Mackie. It was agreed to ask the Faculty's representatives to put forward the resolution that no ophthalmic medical practitioner should be admitted to the list unless he held a contract with a hospital, from S.H.M.O. grade upwards, and that if he relinquished his post he should cease to be included on the list.

The Faculty's views were requested on the following resolution which appeared on the agenda of a meeting of an ophthalmic services committee:

"That in view of the efficient service rendered by persons and firms included in executive councils' ophthalmic lists and of the excellent administrative machinery built up by executive councils, the Minister of Health be urged to take such action as will ensure the continuance of the existing Supplementary Ophthalmic Service on a permanent basis."

The council expressed the view that it did not consider that ophthalmic services committees were or should be concerned with matters of policy.

With reference to elections to the council, in view of the fact that it is necessary to hold a regional election and a national election in 1951, it was agreed that the regional election should be held first. It was agreed that the annual general meeting should be held on Wednesday, March 28, 1951. It was agreed that the Faculty's representatives on the Ophthalmic Group Committee, British Medical Association, should be re-elected.

THE FELLOWSHIP FOR FREEDOM IN MEDICINE

EXPANSION OF POLICY

The annual general meeting of the Fellowship for Freedom in Medicine was held on Saturday afternoon, November 18, at Caxton Hall, Westminster, under the chairmanship of Lord HORDER. In presenting the honorary secretary's report, Dr. E. C. WARNER said that the membership was just below 3,000; 178 new members had joined during the year. The principle of having lay associate members was agreed to at the last annual meeting, and Dr. Warner now presented a set of rules, which was adopted. The minimum annual subscription for such associates is one guinea.

Preservation of Private Practice

Dr. A. C. E. BREACH introduced a report of a subcommittee which has been considering matters for incorporation in a future amending Act. The one on which he laid most stress concerned the preservation of private practice. Two principal suggestions had been forthcoming. One was that, coupled with the provision of free drugs and appliances for private patients, there should be a system of grants-in-aid for patients who occupied private beds or rooms, the grants to be based on the cost to the State had these persons occupied a public bed.

The second suggestion was that there should be power for the individual citizen to contract out of the Service altogether and receive from the State a refund representing the cost to the State had he and his family remained in the Service. The new Australian national health insurance system, based on a combination of voluntary insurance and Government aid, was of interest in this connexion. The Fellowship had been in touch with persons in the insurance world with a view to the possibility of a group of insurance companies offering full cover without medical examination.

Dr. R. HALE-WHITE said that the insurance companies were rather timorous about such proposals, though he was not without hope that with a favourable Government something of the kind might be achieved. One company had indeed agreed that if there were a sufficient number of applications there would be no need for preliminary medical examination, the company taking, as doctors under contract did, the rough with the smooth, but the proposal was not carried further.

Dr. J. A. GORSKY referred to a statement of policy of the Canadian Medical Association in 1949 in the form of an insurance scheme, the State providing insurance premiums, in whole or part, for persons who were judged to be unable to provide for themselves. Dr. ALASTAIR FRENCH said that he understood the Canadian policy did not imply the intervention of an insurance company; the scheme was to be run by the profession itself.

Lord HORDER reminded the meeting that the matter arose out of a concern for the preservation of private practice. The executive would continue to explore possibilities.

The British Medical Guild

Dr. BREACH further reported on the relations between the Fellowship and the B.M.A. He said that it was realized that changes in the Service might be brought about more rapidly through the B.M.A. organization, which, moreover, had been recognized by the Ministry. The Fellowship had never feared losing its identity in the larger body. To urge matters of Fellowship policy in the B.M.A. a committee had met during the Annual Representative Meeting at Southport and the adjourned meeting in London, and had successfully supported certain motions which were in line with the policy of the Fellowship and had ensured that such motions were not sidestepped by procedural exigencies. They had also done their best to reassert the authority of the Representative Body over the autonomous bodies. Autonomy so far had been properly exercised, but they had insisted that the question should be raised every year whether autonomy should be continued. Members of the Fellowship were encouraged to secure election to the Representative Body and to the Conference of Local Medical Committees, which committees were among the few pieces of real democracy under the Act.

Dr. E. T. WRIGHT urged that a gesture of encouragement from that meeting to local British Medical Guild committees should be made. Dr. H. H. D. SUTHERLAND spoke to the same effect. The Fellowship, which was no cave of Adullam, had shown, and should further show, that they were one profession and not divided.

Lord HORDER said that the question of the British Medical Guild had not come before the executive; therefore at the moment the Fellowship had no policy on the subject. He himself had been opposed to the Guild at its formation, feeling that the Association itself should take whatever responsibility attached to these matters. But, the policy having been adopted, he thought they should stand by the Guild, and he hoped that it would prove to be stronger than the Association did two years ago. He felt that they were more than willing to be recorded as wholeheartedly in support of the Guild.

A show of hands was taken, and there were only one or two dissentients from this view.

The Kingston Dispute

Dr. G. J. V. CROSBY presented a report of a subcommittee which has been investigating the position of general practitioners in relation to hospitals. He said that there had been some loss of contact between the general practitioner and the hospital medical officer. This was not necessarily the fault of any particular group, but every encouragement should be given to the younger hospital officers to realize the general practitioners' capabilities. Diagnostic facilities should be made available to general practitioners throughout the country, but the general practitioner himself must accept some degree of responsibility in interpretation. Consideration had been given to the relation of regional hospital boards and hospital management committees to the general-practitioner hospitals, and a good deal of information had been collected. Referring to the Kingston Victoria Hospital case, he said that they were all heartily in support of Dr. Morgan and his colleagues.

Dr. T. W. MORGAN, who was cordially welcomed, said that, while it was true that regional hospital boards had been given autonomy, they had also been given a directive by the Minister (Circular R.H.B. (49) 132), and it was upon that circular that Kingston practitioners were relying in their fight. They had the assurance of certain high officials of the Ministry that the action of the board was deprecated, but apparently they were not prepared at the moment to come into the open. The hospital had had 12 days' notice to stop admissions; they had informed the management committee that they intended to take no notice of that order. It was stated that the hospital was to be closed on November 30, but on November 30 they would find the hospital still full, and the next move must lie with the authorities. Admittedly the general-practitioner staff had had an alternative offer, but one which they regarded as totally inadequate. If general practitioners were excluded from the hospital altogether then the standard which had been maintained would inevitably go down. The issue at Kingston had been raised from a local to a national level. The practitioners there had taken a stand for the preservation of freedom. What would happen on November 30 he did not know, but they were prepared to take the consequences in the interests of the status of general practitioners in this country. (Applause.)

Lord HORDER put the following resolution, which was carried unanimously:

That this meeting of the Fellowship for Freedom in Medicine considers that in the changed social conditions of to-day there is an increased need on medical grounds and an increased demand on the part of patients for general-practitioner hospitals. It deplores the decision of certain regional hospital boards and hospital management committees to convert general-practitioner hospitals to other use, contrary to the advice of the Minister himself (Circular R.H.B. (49) 132), and pledges support to the Kingston Victoria Hospital and to all other hospitals similarly threatened in their efforts to resist such changes.

It was stated that the Kingston praetitioners had received noteworthy support from Brigadier Skentelbery, and it was resolved to elect him as the first lay associate of the Fellowship. His wife, Dr. Barbara Skentelbery, was already a member.

Growing Influence of the Fellowship

Lord HORDER, who had postponed his address to the end of the meeting, then spoke briefly on the growing influence of the Fellowship. He had always maintained that the chief influence of the Fellowship was on the moral plane, and that it might well be that for the first year or two its achievements would be of the intangible type. But after what had been stated that afternoon it would be agreed that they were realists as well as idealists. They had started from scratch, at a time when the profession was stunned by the blows that had been delivered a few months earlier. The morale of the profession had then fallen to a very low level; it had lost faith in itself. It had resigned itself to dragooning by a dictator.

Therefore the tasks of the Fellowship at that period were quite considerable. It had to restore the morale of the profession. It had to disillusion the public in face of the weight of political propaganda designed to convince them that now for the first time in history they enjoyed a perfect health service. It had to call attention to inherent defects in the Service itself, especially as these affected professional standards. It had to provide remedies for deficiencies in the Act, and they were not yet satisfied that they had the complete answer about how such deficiencies should be dealt with. It set itself also to permeate the British Medical Association with the ideals that animated the Fellowship. These activities were basic and continuous.

Policy had to be defined also in relation to a number of other matters not unimportant. It was regrettable that the first sign of a "show-down" with the Minister was likely to be on the question of the pay packet. He had hoped that it might have been on the unsatisfactory nature of present-day medical practice. All the same the Fellowship supported wholeheartedly any strong action which the British Medical Association might take to obtain a satisfactory settlement with regard to remuneration, and was doing its best to publicize the fact that this claim was in respect of a portion of payment already agreed in principle, lest the public be induced to think that it was a case of the doctors demanding higher remuneration. They demanded only the adjustment of an outstanding claim which was recognized two years ago. If this was to be the first "show-down" then the Fellowship was "in on it."

After referring to other matters which had already been before the meeting, Lord Horder made a passing reference to the "closed shop." The attitude of the Fellowship on this matter was like that of President Coolidge's parson towards sin—it was "against it."

"I claim that in respect of these matters," he said in conclusion, "we have made definite progress. The very fact of our existence is a stimulus to the profession, whose morale, by the way, is definitely higher than it was even 12 months ago. It is you who are the Fellowship. It is by your lively interest that it will flourish. I am not worried about our membership still hovering about 3,000. It is true that we should like double that membership, and more. But 3,000, with wisdom and courage and energy, can save medicine in this country. At this moment the focal point in the resistance against increasing deterioration of standards, against the loss of our liberty, against the denial to the community of our expert contribution to its health and happiness, is the Fellowship. The conclusion that we must go forward is inescapable for me. My faith in the Fellowship remains what it has always been, and I think I have the support of this meeting in saying that we should redouble our efforts in support of the freedom of medicine." (Applause.)

Dr. KELLY, assistant secretary of the Canadian Medical Association, said a few words concerning the stimulus he had derived from the lively spirit abroad in British medicine and from his contact with the Fellowship in particular, and gave some account of the system of medical care sponsored by his association.

On the proposition of Dr. HALE-WHITE a hearty vote of thanks was accorded to Lord Horder, and the three hours' meeting terminated.

IRISH MEDICAL ASSOCIATION

ANNUAL MEETING, 1951

Ireland offers an attractive alternative to members of the British Medical Association who do not propose to attend their annual meeting in South Africa next year. During the first week of July the Irish Medical Association will hold its annual congress in University College, Galway, and cordially invites members of the British Medical Association to attend.

While full details of the four-day programme will be available early in the New Year, arrangements are already well in hand for the principal events of the meeting. These include the president's reception, annual dinner, a number of clinical sessions, a dance in aid of the Royal Medical Benevolent Fund, and a motor tour through Connemara.

Eighteen hundred years ago Galway was the principal city on the west coast of Europe, and to-day it offers, more than any other Irish town, the mellow charm of antiquity. During the Middle Ages this fair "City of the Tribes," as it is called, carried on an extensive trade with Spain, and a link with those days is still seen in its quaint architecture and ancient traditions. Salmon and trout fishing in the Corrib, which runs through the city, is the finest in Ireland. The angler is, indeed, offered an endless variety of lakes and rivers in the majestic Connemara scenery. Less than two miles from the city, on Galway Bay, is the resort of Salthill, where there is a splendid 18-hole golf course. Thirty miles off Galway lie the Aran Islands, with their colourful community of Gaelic-speaking fisher-folk. There is a regular steamer service and hotel accommodation on the largest of the islands.

July is a busy month in Galway, and visiting doctors are advised to book early. Details of hotels and other facilities can be had from the Irish Tourist Association, Upper O'Connell Street, Dublin.

REGISTRARS' GROUP

OPENINGS FOR PRACTICE

The first meeting of the central council of the Registrars' Group of the Association was held recently at B.M.A. House. The council comprises three representatives of each Regional Registrars' Group, at least one of whom is from a teaching hospital and at least one from a non-teaching hospital. Sixteen regional groups were represented at the meeting.

The council was pleased to receive a report that over 1,200 registrars had already joined the Group.

A number of matters of importance to registrars were discussed. The council had before it a draft memorandum for distribution to all registrars on "Future Openings for Registrars," which had been prepared by a special subcommittee appointed to consider the matter. This memorandum explains that, while the council will continue to press for an increase in the number of consultant appointments in accordance with the Ministry of Health's pamphlet, *The Development of Consultant Services*, it is inevitable that a number of those at present in the registrar grades will not secure consultant posts. In an endeavour to assist these registrars the memorandum offers advice regarding openings in medical practice outside the consultant field.

The council has referred certain problems to regional groups for discussion and for report back to the council before final decisions on policy are taken. Regional groups have been asked to consider, among other matters, the proper ratio between senior registrars and consultants and between registrars and senior registrars in the future hospital establishments, and the Ministry of Health circular recently issued to hospital authorities about the appropriate use of the S.H.M.O. grade.

The council expressed approval of the circular which has recently been issued by the Ministry of Health to hospital authorities indicating that in future, at non-teaching hospitals, senior registrars and registrars will be appointed by the regional hospital boards. This circular letter also included advice on the composition of the committees of selection.

The central council of the Group will meet at least twice annually, and it has appointed 10 of its members to form an executive committee, which will meet at least quarterly.

INOCULATION AND POLIOMYELITIS

DOCTOR ACQUITTED OF NEGLIGENCE

What must be the first case of its kind has resulted from the charge made by a parent that a medical practitioner was negligent in inoculating a child who developed poliomyelitis. The case first came before the Medical Service Committee of the London Executive Council. The father, Mr. A, who is a layman, said that he took his child to Dr. X for inoculation against diphtheria. Dr. X gave the injection, stating that immunization against whooping-cough was included. Eighteen days later, according to Mr. A, the child appeared to be unwell, developing symptoms of a cold, together with vomiting and diarrhoea. Dr. X considered that the boy was suffering from bronchitis, and prescribed medicine. A fortnight after that the doctor gave a second inoculation against diphtheria, the parents informing him that the child still showed symptoms of a cold. Seventeen days later Mr. A came to the conclusion that his son might be suffering from poliomyelitis. Dr. X saw the child on the same day and had him admitted to hospital, where the diagnosis was confirmed.

Mr. A told the committee that from a conversation he had had with a doctor at the hospital he had formed the opinion that his son's condition resulted from the whooping-cough immunization. An examination of some literature strengthened his conviction. He also contended that Dr. X should have been warned by the symptoms which the child exhibited after the first injection, and should have refrained from administering the second injection, and that Dr. X's giving the second inoculation amounted to negligence.

Dr. X told the committee he was satisfied when he made both the first and the second injection that, although the child had a slight cold, there was nothing in his condition to contra-indicate their administration. The vaccine and prophylactic had come from a reliable source and were administered in standard quantities. He was confident that the injections did not cause the poliomyelitis.

The committee found on questioning Mr. A that he had obtained advice from an organization "which is opposed to vaccination and like treatment."

The committee found no evidence to support the allegation of negligence on the part of the doctor. There was nothing to suggest that he had failed on any occasion to examine the child properly or to respond when asked to visit. The committee was satisfied that Dr. X acted in accordance with his professional opinion, and that there was no failure on his part to exercise due care and attention.

On May 25 the London Executive Council endorsed the decision of its Medical Service Committee. Mr. A appealed to the Minister of Health, and the Minister dismissed the appeal.

Questions Answered

Rubber Stamp or Signature?

Q.—*(a) Is it legal to use a rubber stamp of my signature on prescriptions given in general practice? (b) What is the position in hospitals?*

A.—(*a*) Apart from prescriptions for Dangerous Drugs, Schedule Four poisons, and substances covered by the Penicillin Act—i.e., penicillin and streptomycin preparations—and the Radioactive Substances Act, prescriptions need not be in any particular form and need not even be in writing. All that is necessary is that sufficient information must be supplied to the pharmacist to enable him to make a proper entry in the prescription book—i.e., ingredients and quantity of medicine, name of prescriber, name of patient, and date on which the prescription was given. In the cases of prescriptions for drugs included in the Acts mentioned above it is specifically stated in the Acts that the prescription must bear the prescriber's usual signature. While a prescriber who habitually uses a facsimile signature might argue that he is within the letter of the law, it is most unlikely that any pharmacist would dispense one of these prescriptions on such a signature. A final legal decision would probably require a judicial decision in a test case.

The regulations of the National Health Insurance specify that prescriptions must bear the prescriber's signature in his own handwriting, and facsimile signatures cannot therefore be accepted (General Medical and Pharmaceutical Regulations, 506, Schedule I, para. 7 (10)).

(*b*) *Non-poisons.*—There are no laws governing the supply of non-poisonous substances (apart from those covered by the Penicillin and Radioactive Substances Acts) in hospitals. It is of course desirable, and the usual custom, for drugs supplied to in-patients or out-patients to be recorded on their prescription sheets as a record of treatment. In such cases the use of facsimile signatures would be quite legal.

MEDICINES CONTAINING POISON

(1) *Supply to Out-patients.*—The medicine, whether a First Schedule poison or not, must not be supplied except by, or on and in accordance with, the prescription of a registered medical practitioner or dentist (for dental treatment). This prescription need not necessarily be in writing.

If the medicine contains a First Schedule poison a record must be kept on the premises in such a way that the following particulars can be traced for two years after the date of supply: (i) name and quantity of the poison supplied; (ii) date of supply; (iii) name and address of person to whom supplied; (iv) name of medical practitioner or dentist who supplied the drug or name of prescriber.

These facts are usually recorded on the case-sheet, and, provided these facts can readily be traced, it is not strictly necessary for the prescription on a case-sheet to be signed. The usual custom, however, is for the prescriber to sign or initial the prescription. In such cases the use of a facsimile signature appears to be legal, but the prescriber should, in his own interest, be certain that this method is not abused by unauthorized persons using the stamp, since he would almost certainly be held responsible for the prescription. He would be in a most invidious position if an unauthorized person stamped an incorrect prescription with his signature and then denied having done so.

(2) *Supplies for Use in the Institution.*—A medicine containing a poison (whether a First Schedule or not) must not be supplied except on a written order signed by a medical practitioner, dentist, or by a sister or nurse in charge of a ward, theatre, or other section of the institution. In an emergency the medicine containing poison can be supplied in the absence of a written order on the undertaking of the person ordering the medicine to supply such an order within twenty-four hours.

The written orders may be signed orders for stock preparations or prescriptions for individual patients. Such prescriptions on the patients' case-sheets are often initialled instead of signed by the prescriber. The legality of this practice has not been finally decided. Dewar, in his *Textbook of Forensic Pharmacy*, makes the following comment on this position: "In another connexion, the Poisons Rules require a prescription to be 'signed' by the person giving it with his usual signature, and the unqualified reference to 'signed' in the present connexion might conceivably be taken as implying that initials are sufficient." Here the use of a facsimile signature appears to be of doubtful legality and would probably be challenged by a pharmacist.

DANGEROUS DRUGS

(1) *Institutions Maintained by Public Authority out of Public Funds or by Charity or Voluntary Subscription.*—The procedure indicated above for Schedule One poisons applies with the additional requirement that the prescription must be in writing. The Act allows initialling in place of signing by the prescriber. It is almost certain that no pharmacist would accept a facsimile signature for a dangerous drug.

(2) *Private Institutions.*—Private institutions are not exempt from the provisions of the Dangerous Drugs Act regulations, and drugs must be obtained on prescriptions for individual patients exactly as in private practice.

Definition of Writing.—The Interpretation Act, 1889, S.20, states that writing includes printing, lithography, photography, and other modes of representing or reproducing words in a visible form.

Treating Oneself

Q.—*Is a registered medical practitioner who treats himself for an illness legally disqualified from issuing a medical certificate of incapacity for work on his own behalf under the National Insurance Act?*

A.—The Ministry of Health has ruled that a medical practitioner cannot have his name included on his own medical list, but the Ministry of National Insurance Certification Regulations are silent on the subject of a general practitioner giving himself a certificate. It is unlikely that the M.N.I. would accept such a certificate as conclusive evidence of incapacity.

Ownership of X-ray Films

Q.—*Are hospital patients who pay for their x-ray films entitled to them as their property, or are they the property of the hospital?*

A.—The ownership of the film is vested in the hospital where the film is taken, but the question posed does not really represent the actual state of affairs. Private patients do not pay for their *x*-ray films but for the radiological opinion. In certain long-term cases, such as pulmonary tuberculosis, it is of the utmost importance that whoever is dealing with the case should have access to all the films. This is always possible.

Correspondence

80% Resignations

SIR,—I have recently attended two meetings—a group meeting of the general practitioners in the Upper Ward of Lanarkshire, which is largely a rural area, and a meeting of all Lanarkshire doctors to elect the local committee of the British Medical Guild. From figures supplied by group leaders it would appear that more than 80% of Lanarkshire general practitioners are willing to resign from the National Health Service.

The younger practitioners and those with small lists are impelled by the necessity for increased remuneration, but the younger practitioners wish something more concrete than the statement that they will not have to suffer financial hardship as a result of their action. Those with big lists whose incomes may at present fully implement the Spens Committee recommendations are willing to resign out of loyalty to their colleagues.

It must not be assumed from the figure of 80% that the great majority of general practitioners in Lanarkshire are in favour of giving to the British Medical Guild, the General Medical Services Committee, or any other central body, complete independence of judgment and action—far from it. They are dissatisfied with the amount of information so far vouchsafed to the periphery and wish to be treated not only as ordinary members of the medical profession but as individuals who like to think they still retain some slight powers of reasoning.

They are told that the objectives are increased remuneration and improvement of the status of general practitioners in the National Health Service. Amplification of these points is required, including detailed information regarding the increased remuneration aimed at and the steps to be taken to improve the status.

Again, should it be decided to withdraw from the Service on July 1, 1951, they wish to know exactly what is to happen with regard to attendance on patients, certificates, fees, etc. It might be a salutary experience for our leaders if, armed with nothing more than the meagre information available, they were to meet groups of general practitioners and had to answer their many pertinent questions.

It may be thought that the details asked for could be supplied at a later date—after the necessary assurance of 80% had been obtained—but in my opinion if these gaps were filled in now it would be possible to get not the present unstable, rather distrustful 80%, but a more satisfied, united, and larger percentage of the profession.

I would like to add that the views expressed are purely personal and are based on my impressions of the attitude of the general practitioners who were present at the two meetings mentioned.—I am, etc.,

R. MCLEAN.
Chairman, Lanarkshire Division, B.M.A.

SIR,—I should like whole-heartedly to associate myself with the letters on this subject from the Guildford Division and from Dr. Basil S. Grant (*Supplement*, October 28, p. 179). The 80% minimum was decided upon at the Special Conference before this year's A.R.M. Gateshead put down a motion, introduced by Dr. Arthur—but not, I am sure, with any "subversive" motive—asking for a minimum figure of 85% of resignations. This was strongly opposed, and finally a reluctant compromise on a figure of 80% was reached, and accepted by the G.M.S. Committee.

At the time I voted against the proposal, because I could think of nothing more likely to make an attempt at resistance useless from the start. However, it is cheering to realize that a Special Motion aimed at destroying this 80% desideratum was passed at the Conference on October 26 and accepted by Dr. Wand.

Dr. Arthur's fearful warning that Gateshead practitioners would not support the profession in its approaching fight unless 80% of resignations was insisted upon prompts me to think that, after all, Gateshead is not the *only* area in the country, and that what Gateshead thinks to-day is not necessarily what England will think to-morrow.

In any case, 80% is not necessary for success: a two-thirds majority in favour of resignation should be ample.—I am, etc.,

Wolverhampton. VICTOR RUSSELL.

Lothians and Peebles Case

SIR,—In the *Supplement* of November 11 (p. 196), under the heading "General Practice in Scotland," a report is given of a meeting of the General Medical Services Subcommittee (Scotland) on October 12. Criticism was made of the action of the Medical Practices Committee in a Lothians and Peebles case in which the committee overruled the rejection of an application by the executive council. Two partners with a combined list of 2,098 were permitted to adopt a further partner after the latter had been refused permission to act as assistant. The grounds of the refusal in the first instance by the executive council were "that the whole practice appeared to be within the scope of a single practitioner and it was unreasonable from the point of view of neighbouring practitioners."

As this case reads on paper surely any reasonable person would agree with the view of the executive council. Certain facts of relevant importance, however, do not appear to have been given the place they merit at the meeting to which you refer, and it is fortunate in the interests of justice and fair play that the Medical Practices Committee appear to have grasped them. These facts are:

(1) The age of the senior partner (near the age to retire).

(2) The ill-health of the senior partner, as borne out by the very strong medical certificates.

(3) The unusually large private practice that had of necessity to be carried on.

(4) The inconvenience of making patients who could not be attended locally travel five or seven miles to the surgeries of the two nearest neighbouring practitioners.

(5) The fact that an attempt was made by the two partners to carry on the practice for eighteen months after July, 1948, until they gave up the task as beyond their powers.

The Medical Practices Committee undoubtedly saved the situation for patients and doctors alike in a case presenting rather unusual features.—I am, etc.,

THE SENIOR PARTNER CONCERNED.

Leadership Needed

SIR,—I am afraid Dr. Hill's tenure of office has seen the degradation of the profession at the hands of an astute politician, the Minister of Health. Mr. Bevan saw the weakness in the B.M.A. leadership and has exploited it to the full. It is true that up to the present the profession has felt an acute yearning for a proper leader and expression of its proper wish. The formation of the Guild and the movement towards direct action is evidence of awareness in leading circles, but I feel the latter are unwilling to risk their own position with the Ministry to support it.

It is obvious that only certain sections of the country are prepared to take direct action, but I feel that if those areas were organized and led the result would be capitulation by the Ministry. Middlesex is the third from worst-paid capitation, and I feel that, even if we were to organize local action and proceed, we would be successful. The under-doctored sections of the county which do not seem to be willing to join the Guild could be left to their own devices, and no harm done, provided the sections that went into action were united.

Another point where the B.M.A. has let the profession down is over the demand for which it is meant to be fighting. We want (1) implementation of Spens; (2) higher rates for the first 1,000 and (to encourage the self-satisfied council-house practices with large lists) a lower rate for the third and fourth thousand, unless a partner is taken; and (3) a uniform capitation rate. The B.M.A. should remember that its demands should be reasonable in the eyes of the general public if it wishes to encourage public support. Also, too little attention

has been paid by the Minister and the B.M.A. to the plight of assistants who go from job to job without finding anybody to take them on permanently and the younger doctors who cannot find an entry into practice anywhere.

It is a minority who will not join the Guild movement—those who have the larger industrial practices and are not encouraged to eliminate the unemployment among younger men. If they do not support us, very little harm would be done by ignoring them. We should carry on and take direct action. If we cannot get action through the B.M.A., surely it would be better to resign from it and join another more resolute body.—I am, etc.,

Hampton Hill, Middlesex. I. E. D. McLEAN.

Withdrawing from Health Service

SIR,—Dr. Craven Veitch (*Supplement*, October 21, p. 170) hoists the white flag before the contest is joined. He states: "Here, now, the average G.P. derives over 90% of his income from the N.H.S. and less than 10% from his remaining private practice. This means that if he withdraws now he can hope to enjoy less than 10% of his present income."

What an extraordinary fallacy! Here in Salford if it comes to a withdrawal we shall issue posters in short terse English, calling attention to this fact and saying that patients will be treated just the same but will have to pay for their treatment and that on a cash basis. We are already classed as vermin, so a little more opprobrium will not hurt. Let us for once show a united front.—I am, etc.,

Salford, Lancs. STANLEY HODGSON.

Disciplinary Machinery in the N.H.S.

SIR,—Dr. A. C. E. Breach is to be congratulated on his excellent letter (*Supplement*, October 21, p. 168). Prior to the inception of the N.H.S., one of the basic principles of the B.M.A. was the right of appeal from these tribunals, to the law courts. Because the Service is comparatively new and the routine work of these committees is not published, few think of their real significance. Meanwhile we are becoming conditioned to their existence.

As Dr. Breach points out, the Ministry can make these tribunals subservient to its wishes. In addition the personnel lack legal training; and the complainant is absolved from any penalty, financial or otherwise, no matter how outrageous a false accusation may be. Thus the defending doctor is without redress but, should he be considered guilty, liable to a savage sentence quite foreign to modern standards.

Much of the procedure is reminiscent of the ill-famed Revolutionary Committee of Public Safety. They are not required to furnish reasons for their findings, and their sessions are held in secret. The Minister decides what shall be published of their work. So far we have heard of the major misdeeds of a very few doctors, who have been severely fined. But the public remains ignorant of their routine work.

Lately much has been heard of controls. These may or may not be a good measure in industry, but certainly not in the courts. To-day it is possible for the central administration to control disciplinary tribunals, and we may find them with similar powers in wage-dispute arbitration. In the nation's interest we must resist such encroachments on our essential freedoms, and in this particular instance call for reform of these tribunals and medical service committees.—I am, etc.,

London, S.W.18. T. J. LEE.

British Medical Guild

SIR,—Can some pronouncement be made on the precise "loss" to practitioners which would be made good by the Guild in the event of mass resignation? Even if a practitioner could resume superannuation, he will not receive any N.H.I. remuneration between retirement and re-entry. His superannuation, however, is based on total remuneration received during his years of service, and if therefore there is any loss by reason of cessation will this be made good, and when?

As the practitioner will treat patients as private patients, how is the loss of remuneration to be calculated? As an example: N.H.S. quarterly cheque £500 not received, but £50 received in fees from former N.H.S. patients and £300 due from others. Is the loss to be £450 or £150? Must a practitioner exercise all his legal rights against the debtors before his loss can be determined? How soon will the loss be made good? How is income-tax to be dealt with? How will total loss compare with the fund available to meet such loss? Does not the deed constituting the Guild refer to "hardship" and not to loss? What loss amounts to hardship?

The whole problem bristles with difficulties which should be cleared up as soon as possible. Could some official statement to this effect be made?—I am, etc.,

Worthing, Sussex. HAROLD LEESON.

Failure of Sheffield Health Centre

SIR,—I read with interest Dr. A. Stephen's letter (*Supplement*, November 11, p. 198) on the subject of acrimony between the profession and certain lay groups, resulting from the breakdown of negotiations for the opening of a health centre in Sheffield.

Lest it should be thought that this is merely an isolated case, I wish to relate certain similar experiences during the negotiations about the health centre at Stechford. At the stage when the Ministry had for the time being turned down this latter project some members of the City Council, together with some members of the Birmingham executive council, sought to persuade the Ministry to reverse its decision on the ground that the doctors in the Stechford area were keen and anxious to participate.

Seeing that we had on previous occasions shown that we were by no means unanimous, a meeting was called in which five of the six doctors concerned (one could not be present, as he was a newcomer who had not yet settled in the district) met representatives of the two sponsoring bodies. When it was found that some of the doctors appeared unwilling to transfer their practices to the centre, one of the members of the executive council, who is also a member of the Birmingham City Council, deplored their attitude and said that health centres were provided for in the Act and were the will of the people. Although it was pointed out to him that the Act envisaged doctors who wished to do so practising outside health centres, he said that, if we persisted in obstructing the creation of a centre at Stechford, he would be prepared to fight us with every weapon on which he could lay his hands; that he would be prepared to organize trade union opinion in the area against us and call a public meeting of the people of Stechford to point out to them that the doctors were standing between them and the increased amenities which would be available to them if a centre were opened in Stechford.—I am, etc.,

Stechford, Birmingham. T. W. MASTERS.

Hospital Taken

SIR,—Your annotation in the *Journal* of November 11 (p. 1106) entitled "Hospital Threatened" prompts me to write, especially on the subject of your last paragraph—"presumably the regional board would have to reconsider its decision."

The North Herts and South Beds Hospital, Hitchin, had been in existence for over a century as a general-practitioner hospital, but a week after the issue of the circular you mention all the existing general practitioners on the staff were given notice to quit, having carried on the work of the hospital for over a year under the National Health Service.

We appealed to the Minister direct, with no result. The public was so disturbed that a petition to the Minister was organized by a few patients, and over 8,000 signatures against the change were obtained—a large percentage of the population—in just over a week. Result *nil*.

Our patients, now denied our services in hospital, regret the change as much as we do, as they and the general practitioners before us had built up a fine hospital.

I should mention that our past and present M.P.s have both taken great interest in the situation, and we still hope for some general-practitioner beds at the least, and at the most the return of the hospital to its former use.—I am, etc.,

Hitchin, Herts. ALAN S. PORTER.

Pay of Doctors and Dentists

SIR,—The following paragraph is from the *Daily Telegraph* of October 19:

"According to the annual report of the Executive Councils' Association (England), the highest total payment, £39,986,729, went to the 8,972 dentists in the Service. A total of 17,545 doctors received £37,999,462."

If the figures are accurate, they would seem to show that Mr. Bevan values one dentist at nearly two general practitioners (that is, after allowance is made for the higher overhead expenses of the dentist). I am not suggesting that the dentists are overpaid, nor that their payment should be cut.—I am, etc.,

Grantham, Lincs. D. V. HARRIS.

Examination for Hospital Reserve

SIR,—I would like to draw attention to the forms supplied to hospitals for medical examination of candidates for the National Hospital Reserve Service, which are proving the reverse of an incentive to enrolment.

The majority of women available in this area for this service are middle-aged married folk with long experience as State-registered nurses and/or with the St. John Ambulance or Red Cross, who gave valuable help in a similar capacity during the last war and are willing to do so again.

They object strongly, however, to spending at least an hour in submitting to a detailed examination which they feel to be largely unnecessary and which will involve submission of facts in their private lives which will be open to scrutiny by the hospital clerical staff. Surely a simple certificate from the candidate's own doctor that he or she is fit for this part-time emergency service would have met the case.—I am, etc.,

Beccles, Suffolk. C. GRANTHAM-HILL.

M.P.U. Scheme

SIR,—Practitioners all over the country will have received the M.P.U.'s latest pamphlet proposing an alternative scheme in our negotiations with the Government. This of course constitutes a serious threat to undermine the proposed strategy advocated by the British Medical Guild. It is only through lack of cohesion that we stand in our present plight.

While in no way wishing to support the proposals of the M.P.U., they are to be congratulated on an excellent exhibition of staff work and publicity without, so far as I am aware, half the funds available that the Guild could call on if the need presented itself. May I suggest that we of the B.M.A. and Guild profit by this excellent piece of propaganda (though contrary to our views) and embark upon a publicity campaign via the press and *Journal* that will evoke morale and cohesion in our own ranks and public sympathy, which is an all-important essential if we are to win our coming struggle?—I am, etc.,

Shipley, Yorks. J. A. FRAIS.

Jobs and Jobless

SIR,—*Vide* "Fair Play's" letter (*Supplement*, October 21, p. 172) on the 1,650 frustrated assistants and the scores of advertisements in the *Journal* of the same date for registrars, house-surgeons, casualty officers, etc. Could not some of the frustrated—perhaps jobless—assistants fill such posts?

It may be that they might think it *infra dig.* to accept such. But a medical training was meant primarily for the relief of suffering, and that end can be achieved whether as a specialist, G.P., or humble house-surgeon. Secondly, half a loaf is better than no bread—i.e., better earn a small stipend than be unemployed.

But principals who amass 6,700 patients and then leave an unfortunate assistant (£700 plus keep) to cope with the greater part of the work while they themselves collect the fat should be sternly dealt with. Their patients are not getting the attention they should—cannot possibly do so with only two doctors to work a practice of that number. Also, the hard unremittent work with leisureless days is bound to tell on the health of an assistant.

Surely overcrowded surgeries and overtired doctors ought not to exist under the Health Act. The remedy, I think, would be to make the N.H.S. a service in deed and in truth like the Navy or Army is, so that the entrants would not have to pay (and borrow) £2,000 to £4,000 to set themselves up in practice but could, like an Army man, start as a junior and progress.

The scheme would work like this. The principal amasses 4,000 units. It is realized he cannot cope with all this number himself, but instead of the full capitation fee on the last 2,000 he is allowed only a nominal sum—say 5s. per head—and the Government provides him with and pays for (plus keep and car) two assistants. This would (*a*) give unemployed assistants employment; (*b*) benefit the patient, since there are now three doctors where there were only two doctors previously, and thus more time can be given to individual patients; and (*c*) it will benefit the principal in that he should have more leisure and undisturbed nights than he otherwise would.

I am also in favour of having no evening surgeries. With overworked doctors and overcrowded surgeries no medical man or woman should be unemployed. Somewhere there should be a niche, large or small, which each might fill and thus avoid a valuable training going to waste.—I am, etc.,

Keighley, Yorks. F. M. E. DAVIES.

S.H.M.O. Grade

SIR,—I have been amazed to find such little protest in your columns against the B.M.A.'s acceptance of the grading of S.H.M.O. This is a grade which has been foisted upon the profession and was never envisaged in the Spens Report or in discussions with the profession prior to July, 1948.

There can be little doubt that many men who, prior to July, 1948, were engaged wholly in specialist practice and possessed the necessary specialist qualifications have been "degraded" by their fellow specialists on grossly inadequate grounds and are therefore deprived of their legitimate income.

It would now appear that the B.M.A. has finally accepted this grade and proposes to do nothing about its members who have been placed in this humiliating position. G.P.s propose to withdraw from the Service because their terms are not satisfactory and they are supported by the B.M.A. Does the B.M.A. propose to ignore the gross injustice to an equally honourable section of their membership? If so, I think that the ethics of the profession must have reached a very low ebb.—I am, etc.,

Macclesfield, Cheshire. A. GRIFFITHS.

POINTS FROM LETTERS

Strike Action

Dr. D. GWYN JONES (Tymawr, Cardigan) writes: . . . The projected strike is doomed to failure if it is not a total strike. As long as we continue issuing certificates or treating patients, then it is no strike at all. We must not have anything at all to do with the N.H.S. when the day of the strike dawns. Maybe there will be hardship and unnecessary suffering among the public, but unless we are prepared to allow this the strike will be of no avail, and we will find ourselves slipping back to the N.H.S. one by one. . . .

Ruins

Dr. GUY NEELY (London, S.E.3) writes: In my district a hospital which served out-patients for seventy years and was an educational centre for many of us is closed and through neglect becoming derelict. There are many ruins—Glastonbury, Rievaulx, and the like—which remind one of the predatory Henry VIII. Another Welshman in his own lifetime has his monument here in historic Blackheath. John of Gaunt said something about inky blots and parchment bonds, something about shame too. But no doubt the planners are very pleased with themselves and will give us a new set of forms in due course.

Association Notices

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and a sum of money slightly less than the amount of the Sir Charles Hastings Clinical Prize, will be awarded for the second best essay submitted.
3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes
4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.
5. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950.
6. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for an award of either of the prizes in any subsequent year.
7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.
8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.
9. Each essay must be typewritten or printed and must be accompanied by a sealed envelope, enclosing the candidate's name and address, firmly affixed to the essay.
10. Inquiries relative to the prizes should be addressed to the Secretary.

Diary of Central Meetings

NOVEMBER

27	Mon.	Psychological Medicine Group Committee, 2 p.m.
29	Wed.	General Practice Review Committee, 2 p.m.
30	Thurs.	Maritime Subcommittee, 2 p.m.

DECEMBER

6	Wed.	Trainee Assistants Subcommittee, 10.30 a.m.
6	Wed.	Central Consultants and Specialists Committee, 11.30 a.m.
7	Thurs.	Committee on Psychiatry and the Law, 2 p.m.
7	Thurs.	Medical Students and Newly Qualified Practitioners Subcommittee, 2 p.m.
8	Fri.	Amending Acts Committee, 2 p.m.
13	Wed.	Private Practice Committee, 2 p.m.
15	Fri.	Ophthalmic Group Committee, 2 p.m.

JANUARY

9	Tues.	Amending Acts Committee, 2 p m

Branch and Division Meetings to be Held

BLACKBURN DIVISION.—At Queen's Park Hospital, Blackburn, Wednesday, November 29, 8 p.m., Annual B.M.A. Lecture by Professor J. W. McNee: "Some Problems of Jaundice."

COVENTRY DIVISION.—At Room 7, Coventry and Warwickshire Hospital, Tuesday, November 28, 8.30 p.m., second clinical meeting. Discussion: "The Early Diagnosis of Malignant Disease."

FURNESS DIVISION.—At Orthopaedic Clinic, North Lonsdale Hospital, Monday, November 27, 8 p.m., combined meeting with Barrow-in-Furness Clinical Society. Dr. F. S. Cliff, consultant dermatologist to the area, will show and discuss a number of skin cases.

HARROW DIVISION.—At Clay Pigeon Hotel, Field End Road, Eastcote, Ruislip, Tuesday, November 28, 8.30 p.m., address by Dr. Ronald Teare.

RICHMOND DIVISION.—At Royal Hospital, Richmond, Friday, December 1, 3.30 p.m., clinical meeting.

ROCHDALE DIVISION.—At Out-patient Department, Rochdale Infirmary, Monday, November 27, 8.30 p.m., combined meeting with Rochdale Pharmaceutical Society. Two films: "Birth of a Drug"; "Industrial Dermatitis."

ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, November 30, 8.30 p.m., lecture by Dr. P. Bishop: "The Clinical Use of Cortisone." All medical practitioners in the area of the Division are invited.

WESTMINSTER AND HOLBORN DIVISION.—At Westminster Arms Hotel, 75, Page Street, London, S.W., Thursday, November 30, 7.30 for 7.45 p.m., dinner meeting. Address by Dr. R. Forbes (Secretary, Medical Defence Union): "Medico-Legal Hazards in General Practice." Members of the Division may be accompanied by professional or lay guests.

Meetings of Branches and Divisions

BIRKENHEAD AND WIRRAL DIVISION

The adjourned annual general meeting was held on October 2. Dr. H. S. Pemberton (chairman) presided, and 25 other members of the Division were present. Dr. J. A. Elliot (Hoylake) was unanimously elected chairman of the Division for the ensuing year and took the chair. Dr. A. V. J. Russell was unanimously elected vice-chairman for the same period. The following officers and representatives were appointed: honorary secretary-treasurer, Dr. R. W. L. Pearson; assistant secretary and public relations secretary, Dr. H. C. W. Baker; representatives in Representative Body, Drs. Pearson and Russell; representatives in Branch Council, Drs. Elliot and Pearson. Drs. Carlisle, Farr, McAfee, and O'Friel were appointed to serve on the executive committee, and Dr. Hatton was also appointed to serve thereon as the representative of the public health service. It was suggested that the executive committee consider co-opting Dr. D. Wilkie as a member.

Dr. E. S. A. Ashe proposed the following motion, which was seconded by Dr. N. E. Mawby:

"We, the members of the Wirral Division, are thoroughly dissatisfied with the General Medical Services Committee and the inability to come to terms with the Minister of Health regarding increased remuneration for general practitioners, and we hereby propose that the present committee resign and a new committee be appointed."

A discussion took place, and on being put to the vote it was declared lost.

Dr. W. Laing thereupon moved the following resolution:

"The members of this Birkenhead and Wirral Division are thoroughly dissatisfied with the present National Health Service. They consider the B.M.A. as constituted is powerless to deal effectively with any Government unless the Association can enforce the opinions of the majority. The British Medical Guild should be constituted so as to carry out effectively the will of the majority."

On being put to the vote, the resolution was carried with only three dissentients.

The secretary gave a review of the functions of the British Medical Guild, and several members took part in the ensuing discussion.

A hearty vote of thanks was passed to Dr. H. S. Pemberton for his services as chairman, and to Dr. W. R. Floyd for his valuable services as a member of the executive committee over so long a period.

COVENTRY DIVISION

The first ordinary general meeting of the Division for 1950-1 was held on October 3, when between 60 and 70 members of the Division listened to the inaugural address of the chairman, Mr. Trevor Berrill, who spoke on the role of surgery in the treatment of peptic ulcer. Stressing the importance of the problem in view of the prevalence of ulcer, he discussed the aetiology, with special reference to the parts played by vagal and hormonal secretion. Ogilvie's conception of hormonal imbalance as in other stress diseases was felt to be the more acceptable theory. Comparison was made between the optimistic outlook of the surgeon with the somewhat defeatist attitude shown by the usual medical diet chart. Of operative treatment, vagotomy had a place, probably a restricted one, for duodenal and anastomotic ulcers, but partial gastrectomy was the treatment of choice. In support of these views an account was given of a follow-up of 100 cases treated by partial gastrectomy in Coventry with over 90% of satisfactory results.

The address was greatly appreciated and enjoyed by the Division, and an enthusiastic vote of thanks was accorded the chairman.

The annual church service of the Division was held in Stivichall Parish Church on October 22. The service was conducted by the vicar, the Rev. T. Bland, M.A. The lessons were read by the chairman, Mr. Trevor Berrill, and the vice-chairman, Dr. J. Ballantine. The address was delivered by the Rt. Rev. Dr. Neville Garton, Lord Bishop of Coventry. Dr. Garton spoke of the importance of the spiritual needs of the patient and of the usefulness of collaboration between the patient and the doctor.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY DECEMBER 2 1950

British Medical Association

PROCEEDINGS OF COUNCIL

Wednesday, November 22

The meeting of Council which was adjourned from November 1 owing to unfinished business was held at B.M.A. House, London, on November 22, with Dr. E. A. GREGG in the chair.

The congratulations of the Council were accorded to Dr. H. Guy Dain on the attainment of his eightieth birthday, and it was also resolved to send a letter of congratulation to his mother, who is aged 101. The Council learned with regret of the illness of Dr. Alfred Cox, former Secretary, and sent him a message of sympathy, expressing hope for his speedy recovery.

Internal Hospital Administration

Dr. T. ROWLAND HILL, chairman of the Consultants and Specialists Committee, presented for approval a statement of evidence on medical administration of hospitals which it was proposed should be given to the committee appointed by the Central Health Services Council to study internal hospital administration. He said that while his Committee did not support the old idea of the all-purposes medical superintendent, who was not only head of the hospital but also had clinical charge of all patients, it thought there was room in many hospitals for a medical administrator who would be not so much the chief as the colleague of the clinical staff.

Dr. F. M. ROSE objected to one proposal in the draft evidence. Representative medical advisory committees were to be set up at both regional board and hospital management committee level, and to be recognized as a vital link in the administrative machinery, which was all to the good, but it was laid down that at regional board level not less than 50% of the members of such advisory committees should be elected directly by the consultants in the region, and at hospital management committee level "wholly by the medical staff of the hospital or group of hospitals." This would eliminate general practitioners and was entirely contrary to the policy of the Association. Dr. VAUGHAN JONES and other members supported this objection.

Dr. ROWLAND HILL explained that there was nothing in the recommendation to prevent the setting up of advisory committees containing representatives of all branches of the profession, including general practitioners, but in the recommendation they had had in view the need for a committee of the staff which would be concerned in intimate matters arising between the staff and the employing body.

Dr. S. WAND said that there had been a widening gap between the general practitioners and the hospitals, and many of them felt that if this gap was to be closed it could be done only by the inclusion of general practitioners of the area on bodies which could make representations about policy. Unless there was general-practitioner representation on the advisory body which was concerned with the intimate running of the hospital they were not going to get anywhere.

Dr. DAIN said that there was at present a tendency to remove doctors from administration of every kind, particularly and most dangerously from hospital administration. He was glad that this document affirmed that a medical superintendent should be in charge, but it should be stated at what size of hospital medical superintendency should start. Obviously with a small hospital of 30 beds it would not be necessary to appoint a medical superintendent, but there must be a size at which the task of administration became so big that a medical man should be in charge.

After considerable further discussion on the question of advisory and staff committees Dr. ROWLAND HILL undertook to redraft the appropriate paragraphs, and at a later stage the following was agreed to, to form part of the evidence:

"At hospital management committee level and, where the staff desire it, at the individual hospital level, medical staff committees should be established and officially recognized as a vital link in the administrative machinery. In addition, elected medical advisory committees should be recognized in relation to boards of governors, regional hospital boards, and hospital management committees, and these committees should be representative of the medical staff and other sections of the profession—e.g., general practice and public health. They should have access to hospital boards and committees for the purpose of tendering professional advice to those bodies on the work and administration of hospitals. At regional board level not less than 50% of the members of such advisory committees should be elected by consultants in the region, and in addition other sections of the profession such as general practice and public health should be adequately represented."

The statement of evidence was then approved.

On another recommendation of the Consultants and Specialists Committee it was agreed to participate in the organization of a forthcoming conference projected by the Institute of Public Administration on the administration of the National Health Service.

Dr. ROWLAND HILL, speaking on the question of the review of S.H.M.O. in 1951, said that his Committee endorsed the view of the Representative Body that the review should be extended to cover general practitioners working in hospitals under para. 10 (*b*) of the terms of service, and had urged the Joint Committee to make representations to that effect.

Policy of Withholding Medical Certificates

Dr. WAND, chairman of the General Medical Services Committee, reported that after careful consideration the Committee had expressed its agreement with the resolution of the recent Conference of Local Medical Committees that mass withdrawal from the Service would be ineffective without the withholding of medical certificates. He said that the policy of withholding certificates had been considered on previous occasions when disputes were pending with the Ministry of Health, but it had been turned down. Circumstances had now arisen which placed the matter on a different footing. The vast majority of the people of this country were now on doctors' lists. In former days when they were contemplating withdrawal of service the amount of contract work was considerably less—in terms of

remuneration it was between 30 and 40%—but it was now something over 95%. It was felt by those at the periphery—he emphasized that this decision was one from the periphery—that withdrawal of service was unlikely to be effective unless it was accompanied by withholding of certificates. The amount of feeling in favour of this policy shown at the recent conference had amazed him. The resolution at the conference, passed by an overwhelming majority, was due to a wave of feeling and was not inspired by memoranda from the centre.

Dr. S. F. L. DAHNE welcomed Dr. Wand's statement. The feeling at the periphery was not merely inspired by dissatisfaction on the matter of remuneration, but on many other aspects of the Service.

Dr. METCALFE BROWN, chairman of the Public Health Committee, said that whatever the feeling might be at the periphery there were many members of the Association who would stick to their old ethical standards in this matter. On the public health side they had the utmost sympathy for general practitioners, and with general practitioners the question of withdrawal from the Service and withholding certificates primarily lay. But those of them who were not general practitioners still had the right to express their views. The Public Health Committee had considered the matter. If general practitioners decided to withdraw from the Service their public health colleagues would support them, but on the other question it felt that the certificates withheld should not include private certificates. Apart from the ethical considerations, was it wise strategically to withhold private certificates, upsetting the patients by withholding something from them which they had a right to expect?

Dr. G. W. IRELAND said that the General Medical Services Committee was perhaps not equipped to deal with the question on a broad basis. Its function was protective. A good deal of its work had to be focused on remuneration. It had to adopt a crisis technique. It was ill equipped to deal with overall policy. The overriding question was how to make the Service a good one, how to iron out anomalies, and thereby to secure a good temper in the profession. He begged the Council to look at the matter very seriously and in all its aspects.

Dr. J. G. THWAITES said that if this policy went forward it would undoubtedly cause a big split in the profession. There would be so substantial a number of objectors as to do away with the possibility of getting 80% of resignations. Practitioners would not agree to withdraw if it meant withholding from their patients something necessary to their well-being. Had not the General Medical Services Committee failed to grasp the significance of this proposal? It asked the medical profession to do something which was entirely contrary to their duties to the State. The act would be unethical and would cause hardship to patients, cutting off some of them from any source of income. The proposal had been described as something temporarily unpopular which it would be the job of the Public Relations Department to explain to a bewildered public. He wondered whether anybody had asked the Public Relations Officer what was his opinion on the proposal. To proceed on the policy that the end justified the means was very dangerous. "You say you are out to improve the status of the profession, and the first thing you do is to lower the status in the eyes of the public." Although the General Medical Services Committee was bound to take the instruction of the Conference, it did not mean that the Association, of which the Council was the executive, was bound to agree. They had no right to lower their standards just as a matter of tactics. Dr. Thwaites also pointed out that the resolution carried at the Conference was on the supplementary agenda and therefore, unlike the resolutions on the original agenda, had not been considered by local medical committees throughout the country.

Dr. J. A. GORSKY said that Dr. Thwaites had expressed the views which he himself held. He also uttered a warning. Under Section 13 of the National Insurance Act it was not only doctors who could furnish certificates acceptable for the payment of sickness benefit.

Dr. J. A. PRIDHAM urged that no definite decision be taken that day, but that the whole situation be studied. Other branches of the profession had their grievances. Each had its impact on the others. The trouble with the registrars, for example, affected general practitioners. Had not the time come for some high-level discussions to co-ordinate the different branches of the profession, when these questions at issue would possibly fall into line?

Dr. I. D. GRANT was of opinion that no sympathy was to be expected from the general public in any stand made to improve remuneration or status. It seemed impossible to take resolute action without hurting someone, but such resolute action was justified if it brought the dispute to a quick end. Dr. HALE-WHITE said that it seemed to have been overlooked that ethical considerations might not have been absent from the minds of general practitioners when they dealt with this resolution. It might be that it was not so unethical after all to withhold certificates. The public was going to be inconvenienced anyway. Dr. W. JOPE, speaking as chairman of the Conference, said that he was tremendously impressed by the unanimity of opinion. The majority in favour of withholding certificates in the event stated was overwhelming. Dr. DAIN said that while he had admired the speeches of Dr. Thwaites and Dr. Ireland he thought they had put the ethical question on a wrong basis. He did not believe that there was any ethical question at all.

Dr. ANNIS GILLIE believed that the public would understand the motive behind the withholding. Dr. F. M. ROSE said that the two arguments used against this proposed strategy, that it would be ineffective, and that it would impose a cruel penalty on patients, cancelled each other out. Dr. H. B. MORGAN, M.P., begged the Council not to endorse drastic action. If the case of general practitioners was as strong as he thought it was they should be able to get negotiations going without such resort.

Dr. H. H. D. SUTHERLAND said that Dr. Thwaites and Dr. Ireland were in some way above the battle. This fight was not primarily over the question of inadequate remuneration: it concerned the loss of status, overwork, abuses of the Service, the threatening powers of the Minister, the high amount of expenses, the lack of health centres, and many subsidiary points. As for certificates, they all knew that the Ministries and allied bodies had been empowering their employees to demand from doctors National Insurance certificates for purposes other than National Insurance. Mr. LAWRENCE ABEL suggested from his experience of local meetings that the periphery was still largely uninformed about the position.

Dr. R. P. LISTON said that it now appeared that the resolution carried at the Conference of Local Medical Committees had not been discussed by the representatives with their constituents. In March, 1948, at the Special Representative Meeting, motions calling for the withholding of certificates were defeated. He thought they were still bound by that adverse vote. If necessary another Special Representative Meeting should be called before the Council took any decision. If it was considered that they were not bound by the vote of 1948 the matter should be referred to a plebiscite or, preferably, to the local British Medical Guild groups. Dr. NOV SCOTT thought that any vote in the constituencies would be inconclusive. He begged the Council not to come to any decision that day. Dr. FRANK GRAY said that he still held the view, which he had stated at the Conference, that the withholding of certificates would be entirely useless and one of the most damaging things they could do. He believed the decision of the Conference to be a tragic blunder, but, the decision having been made, to go against it would be an even more tragic blunder. No decision should be taken that day.

Dr. W. M. KNOX said that among the rank and file in Glasgow there was a strong feeling that certificates should be withheld. Mr. A. STAVELEY GOUGH said that he had been amazed at the strong feeling at the periphery, uninstructed or not, and he thought it would be dangerous for the Council to take a line contradictory to the Conference. Dr. ALEXANDER BROWN believed that the majority of the profession in his area were of opinion that to resign from the Service without withholding certificates would be to cut their own throats. Dr. H. M. GOLDING urged that if this question was referred to the constituencies it should be stated exactly what certificates it was proposed to withhold. Obviously certain certificates—deaths, infectious diseases, etc.—must be given.

The CHAIRMAN (Dr. Gregg), speaking personally, said that he held most strongly, as he had put it to the Representative Body in 1948, that to withhold certificates would be about the worst thing the profession could do. It would place them in the worst possible position with the public. Moreover, he was not satisfied about opinion in the periphery. Speaking as Chairman, there were one or two points to clear up. He was not sure how far they were bound by a negative vote—one turning down a resolution—on a point of detail in the Representative Body.

The SECRETARY read the appropriate by-law, from which it seemed that the Council was not bound by a vote of the Representative Body defeating the resolution in 1948.

Dr. WAND, replying on the debate, said that as chairman of the Committee he was in great difficulty. If they were going to fight they must fight to win, and they must have a weapon which could be used effectively. In his Committee, as in the Council, they were trying to ensure a proper service, with difficulties and hindrances removed, and for this purpose they required a large sum of money. Dr. Thwaites had made a most admirable plea on the grounds of ethics. But which was the greater evil: to allow the Service to go along as it was, with all its difficulties and anxieties, or to take some drastic step, even though such a step might be hurtful to a section of the public? The resolution passed at the Conference, even though it had not been specifically discussed between the representatives and their constituents, must have been in their minds to have secured such widespread support, and information which had come in since had revealed the support at the periphery. The members of the General Medical Services Committee, who were very responsible people, had agreed that the action proposed should be supported if when the time arrived it was felt that this was the course required to ensure success.

Dr. Wand went on to suggest that the Council should be satisfied with the undertaking that if and when the decision was made to withdraw service the machinery which his Committee regarded as essential for the successful carrying out of such withdrawal would be placed before all practitioners, and the question of certification, with the arguments for and against, would be clearly set out, so that a Special Conference would once again have the opportunity of discussing it fully in the light of the debate which had taken place in the Council that day.

The CHAIRMAN said that the General Medical Services Committee—like the old Insurance Acts Committee—with its associated Conference was a creation of the B.M.A. and part and parcel of the machinery of the Association. It was the channel which the Association had found most satisfactory for the conduct of certain of its affairs. Certain expressions of opinion had now come to the Council along that channel, but there remained a certain amount of doubt about the extent to which they reflected the opinion of the periphery. He thought the question might well be referred to the local committees of the Guild so far as these were already established. The reference should, of course, include a clear explanation of the particular classes of certificates it was intended to withhold. With the information thus acquired the Council would be able to help the General Medical Services Committee in carrying out its work.

Dr. GRAY said it would be a wise step for the General Medical Services Committee to refer this matter to the local committees, but if the Council itself did so it might be interpreted as going behind the back of the Committee and of the Conference.

The CHAIRMAN agreed with this point of view, saying that the only consideration was to ascertain the attitude at the periphery, inasmuch as the resolution carried at the Conference had not previously been discussed when the representatives were instructed. So long as they got reliable information the precise method by which it was obtained was not very important.

The Council agreed by a large majority to refer the matter back to the General Medical Services Committee for consideration and action in the light of the discussion which had taken place.

The Durham Case

Dr. METCALFE BROWN, chairman of the Public Health Committee, said that with Dr. E. Grey Turner, Assistant Secretary, he had attended on the previous Saturday a meeting in Durham of the medical officers employed by the county council. The meeting was unanimously in accord with the policy of the Association. The meeting was attended by 36 medical officers employed by the county council. Letters of support were received from five others who were absent. Of the remaining twelve, two were known to be in hospital and one on holiday. He had assured them of the support of the Association should any of them suffer as a result of their adherence. It was a highly satisfactory meeting. The Royal College of Nursing, the Royal College of Midwives, the Medical Women's Federation, and the National Union of Teachers were all taking the same stand. The chairman of the Durham meeting, Dr. G. Fenwick Lishman, past-president of the North of England Branch, said at the end that he had never presided at a meeting at which the unanimity of feeling was so obvious.

Other Business

In presenting a brief report of the General Practice Review Committee Dr. ALEXANDER BROWN said that the Committee had approved an analysis under twelve main headings of the range of its inquiry. Certain of the topics listed would be the subject of a field investigation.

Dr. H. H. D. SUTHERLAND submitted a report of the Amending Acts Committee, which had discussed the broad outline of its work in the light of a memorandum prepared by four of its members. It had decided to invite the co-operation of certain other committees and to study developments in other countries, particularly in Australia. Its terms of reference were to consider what changes were desirable in the National Health Service Act, the subsequent Acts for Scotland and Northern Ireland, the Amendment Act of last year, and the regulations and orders made under them.

On the report of the Public Relations Committee, presented by Dr. FRANK GRAY, it was agreed that, subject to the National Insurance Defence Trust consenting to pay half the actual expenditure as in previous years, the Committee be authorized to spend up to £10,000 in respect of 1951.

On the report of the War Memorial Committee, presented by Mr. L. DOUGAL CALLANDER, it was stated that the sculptor had substituted a figure representing "Sacrifice" for the one which depicted "Welfare," so that the group of figures now symbolized the whole field of service in medicine, including the battlefield. The response to the appeal (£7,791 up to October 27) had been sufficiently satisfactory to justify starting the work, but a great deal more money was necessary. Dr. H. R. FREDERICK suggested that the names of subscribers should be published.

The Council received a statement showing the extent to which the recommendations made by the Association in conjunction with the Defence Societies had been incorporated in the Medical Act, 1950.

The Council, which began its business at 10 a.m., rose at 5 p.m.

THE BRITISH MEDICAL GUILD

A meeting of the Board of Trustees of the British Medical Guild was held at B.M.A. House on November 22, with Dr. E. A. GREGG in the chair.

The Trustees received a memorandum prepared for their information on the dispute regarding the remuneration of general practitioners. The secretarial staff were congratulated on the preparation of the document.

A statement was made on the areas in which no Guild organization had so far been set up. It was stated that in a number of areas, although officers and committees had been appointed, so far no notification of this had been received at Headquarters.

Dr. NICHOLSON-LAILEY urged the need for a more attractive presentation of information to the periphery. The information was succinct and well prepared, but it was not set out in a manner to catch the eye. Dr. J. I. MILNE suggested the appointment of a paid organizer to "ginger up" the Guild. The CHAIRMAN promised that all these questions would be considered by the Executive.

It was reported that the Public Health Service Defence Trust had been formally established, the trustees being the members of the Public Health Committee for the time being in office who were willing to serve. An appeal for funds had been issued to public health medical officers. The suggested contribution was at the rate of 2s. per £100 of remuneration.

The resignation of Mr. R. L. Newell from the Board of Trustees and its executive committee was reported on his ceasing to be a member of Council. Dr. T. Rowland Hill was appointed to fill the vacancy in the executive committee.

THE KINGSTON HOSPITAL DISPUTE

MASS MEETING OF PROTEST

About 1,200 people of Kingston and Malden filled the largest hall in the locality on November 22 in a demonstration of protest against the decision of the South-west Metropolitan Regional Hospital Board to change the use of the Kingston and Malden Victoria Hospital from a general-practitioner hospital, which has been its status for more than fifty years, to a gynaecological unit. In numbers and enthusiasm it was an impressive assembly, and although behind it there was, of course, a good deal of organization, the spontaneity of the public feeling evoked was unmistakable. One objector described it as a "packed meeting," because some of the front seats had been reserved, but the major part of the hall, which was free to every citizen, was as enthusiastic as the "packed" part. The whole of the proceedings was relayed by loudspeakers to the street outside.

The Mayor of Kingston, who was in the chair, accompanied by the Mayors of Malden and Norbiton, said that about twelve months ago the Kingston and Malden councils wrote to the regional hospital board asking it to defer putting into effect the alteration of status of the Victoria Hospital and to receive representations on a matter which so vitally affected the people of the district. It was not his function to criticize the board, but neither of the authorities was afforded the opportunity of discussion and the decision went forward.

Mr. J. BOYD-CARPENTER, M.P. for Kingston, said that during the year or so in which he had been actively interested in this matter he had carefully avoided bringing party politics into the discussion, and he regretted that it should have been suggested that those who opposed the board's decision were seeking political ends or were expressing hostility to the National Health Service. In the early months of this year the chairman of the Kingston Group Hospitals Committee and three of his colleagues who had opposed the regional board's scheme were removed by the board, and other persons substituted. The board was not responsible to the House of Commons or to the county or borough councils, nor was it elected by anybody. As was said of the old corporations, it had neither a body to be kicked nor a soul to be saved.

The public, he went on, had been stirred by the spectacle of a small unit struggling for survival, and still more by the apparent immunity to democratic process with which regional hospitals boards were endowed. It was in small hospitals of this sort that patients could secure the continuance of their treatment by their family doctor. He honoured the courage of those who in defiance of authority were carrying on, some of them taking their professional lives in their hands. He hoped that those in positions of responsibility would not exercise their full legal powers; if they did they would not be lightly forgiven by the people of that district.

A way out had been suggested by the British Medical Association: let the present position continue for a year, during which period a public inquiry should be held. This would give feelings a chance to cool and permit the working out of a new arrangement. Those who had committed themselves in this controversy on either side should not take part in the renewed discussions.

A Rebel Board

Brigadier SKENTELBERY, chairman of the hospital, said that the press had called this a rebel hospital, but the real rebels were the regional board. He read from the circular issued by the Minister in October, 1949, to regional boards pointing out that the local loyalty which such hospitals commanded must not be ignored in any reorganization. On the regional board there was only one general practitioner, and on the Kingston Group Management Committee no general practitioner at all. If this hospital were turned over to specialist use it would be a severe deprivation to the public. The alternative offered by the regional board was an annexe built in 1882 which fifteen years ago Surbiton thought not good enough for its purpose. It had no operating theatre and no *x*-ray plant, whereas the Victoria was excellently equipped in this respect. Moreover, it would be nothing like so handy for the people of Kingston and Malden.

Dr. T. W. MORGAN, chairman of the honorary medical staff of the hospital, said that the regional hospital board appointed a review committee to examine the needs of the region; they visited all the groups and at Kingston met several of the staff of the Victoria. They asked what was the greatest need of the district, and the answer was quite obvious—more beds. There were only 700 to 800 beds for the acute sick in the whole group, covering a population of about 230,000. The number should be 1,700. All the specialties, not gynaecology alone, needed extra beds. The local medical advisory committee was asked to study the problem, and recommended that plans should be started now to provide an adequate bed complement as soon as the building even of hutted hospitals became practicable.

As medical men they recognized the urgent necessity for beds for all purposes. At the county hospital there were 75 beds for maternity and 32 for gynaecological cases. The suggestion was that the 32 should be taken over to increase the maternity complement, and that the gynaecological section should be transferred to the Victoria. Dr. Morgan showed that if this were done, owing to the various provisions which would have to be made, there would actually be accommodation for only 29 gynaecological beds at the Victoria, so that the complement would be smaller than now. Incidentally, of course, gynaecological cases were treated now, along with others, at the Victoria. He warmly repudiated the suggestion that the doctors were interested financially in the maintenance of private beds. The private rooms had always been full since the National Health Service Act came into operation, but not with fee-paying patients. No urgent case had been turned away from that hospital while a private room remained vacant. He also stated that, of 39 doctors in Kingston and Malden, 26 were on the staff of the hospital. The other 13 had never applied for inclusion; if they had done so they would not have been refused. There was no "closed shop."

Dr. Morgan warned the public of Kingston that if this hospital was transferred to another use and closed to the general practitioner it would mean that the ability of general practitioners to serve their patients would be diminished; they would tend to become mere sorting officers rather than physicians. "We are not against the Minister of Health. All we want to do is to provide him with the necessary information such as this meeting can give of the 'local loyalty' of which he has spoken in his circular, and to demand that the Kingston Victoria Hospital be retained on its present basis."

Mr. LAWRENCE ABEL made a rousing speech, declaring how much better was the general practitioner associated with such a hospital than the one who never entered a hospital after he had qualified. It was of enormous benefit to patients, when seriously ill, to have their own doctor to look after them in hospital. He described the action of the regional board as "bureaucracy gone mad."

When the meeting was thrown open for questions the first speaker was a patient of the hospital, who testified warmly to the attention he had received there, but at the same time, "being a humanist and not a 'hoggist,'" felt that the regional hospital board's point of view was quite reasonable in the interests of the good health of the community as a whole. Another speaker, the secretary of the local Labour Party, hoped that Mr. Boyd-Carpenter's suggested compromise would be accepted. Other speakers from the floor who ran contrary to the general feeling of the meeting had difficulty in making themselves heard, although the chairman did everything he could to ensure that every speaker got a fair hearing.

It was evident that the meeting was almost unanimously in accord with the protest. Forms were distributed for signature to a petition to be presented at the bar of the House of Commons praying that this retrograde step in the development of the National Health Service be prevented and that general practitioner hospitals such as the Kingston Victoria be firmly established as an essential part of the Service.

HOSPITAL EXPENDITURE

A circular from the Ministry of Health to hospital boards and committees emphasizes the responsibility of boards in giving their approval to the estimates of hospital management committees. The circular continues:

"It is one of their primary functions to plan and supervise the provision of services, and therefore to assess the relative merits of various developments in their respective regions in accordance with broad considerations of regional planning. As a part of this duty the Minister relies on them to scrutinize closely and, if necessary, revise the proposals of the committees for maintenance expenditure, and thus prepare for him reliable estimates on the basis of which the national position can be assessed and brought under review with other claims upon the budget.

"When dealing with the estimates for 1950–1 the Minister first approved the total figure for a region and then delegated to the regional hospital board the allocation of sums to the several committees within the regional total. This method of central allocation was inevitably inexact and took little account of varying standards. In the interval, however, there has in the hospital service been a marked increase in knowledge and experience of financial control. It should now be practicable, by co-operation between officers of the Ministry and representatives of the board, to make a sound assessment of the claims of the various hospital units in the Service. In the situation now prevailing this offers the best prospects of an equitable distribution of whatever proportion of the national resources can be made available for the purpose."

DISPLACED REGISTRARS

VIEWS OF THE JOINT COMMITTEE

It is important that the profession should know that the Ministry's proposals for dealing with the registrar problem contained in R.H.B. 50/106 (*Supplement*, November 18, p. 204) were not agreed by the Joint Committee. Indeed, during the discussions which took place the committee informed the Ministry that an unrealistic approach to the problem had been made, and that the proper way of remedying a situation for which the Government itself was partly responsible was gradually to increase consultant establishments to the levels suggested in the Ministry's memorandum on *The Development of the Consultant Services*.

Before commenting on the Ministry's proposals it will be as well to look more closely at the position. At the end of the war a considerable number of supernumerary registrar appointments was created under the Government scheme for the postgraduate training of ex-Service practitioners. In addition, during the first two years of the National Health Service there was a considerable expansion of registrar appointments, with the result that there are now upwards of 1,400 practitioners in each of the registrar and senior registrar grades.

Under present conditions the registrar cannot be regarded solely as a postgraduate student, and there is little doubt that the need for an increasing number of experienced practitioners in the hospitals has accounted, at least in part, for the increase in the number of registrar posts. Nevertheless, it is undesirable that practitioners should be trained in substantially greater numbers than the prospects of achieving consultant status permit, and the primary factor in determining the registrar "establishment" must be the number of new consultants required over the next few years.

If it be accepted that a national health service must provide an adequate consultant service covering the whole of the country, the first step in determining the proper establishment of registrars must be to decide whether the present number of consultants is sufficient. It is on this fundamental issue that the Joint Committee and the Ministry disagree.

At the beginning of the Service the Ministry issued its memorandum on *The Development of the Consultant Services*, and, revised and brought up to date, this was reissued early in 1950. On the basis of the memorandum the number of consultants that would be required in the various specialties to provide a full consultant service is about 7,500 employed whole-time, or a proportionately larger number employed part-time.

At present there are about 5,000 consultants in the Service, a large proportion serving part-time, and there is already evidence that this number is insufficient to provide a full consultant service in various parts of the country. The Joint Committee pointed out to the Ministry in the strongest possible terms that the existence of a substantial number of highly trained registrars presents an unparalleled opportunity of creating additional consultant posts and in turn a consultant service capable of covering all parts of the country.

The Ministry's proposals, however, will in fact prevent any expansion except of the most limited kind for some years to come. The age distribution of the 5,000 consultants is uneven, but about 80 can be expected to retire annually through age over the next five years. In addition there will be a smaller number of S.H.M.O.s retiring whose posts will be filled by consultants. This overall wastage the Ministry estimates to be somewhere in the neighbourhood of 100.

After allowing for this wastage, for probable openings for practitioners of consultant status in other spheres—e.g., H.M. Forces, the medical teaching schools, research, Colonial Service, *and for the expansion of consultant services*—the Ministry estimates the number of vacancies available for senior registrars who have completed their training as unlikely to exceed 150 a year.

It is understood that the Ministry has just begun a country-wide survey of hospital medical staffing, and the Joint Committee urged that no severe "pruning" of registrar establishments of the order now contemplated should be made until the results of the survey were available. But the Ministry, without awaiting the outcome of the survey, and in spite of its own memorandum, now predetermines that the present number of consultants is adequate. It is difficult to avoid the conclusion that the Ministry's action is governed by financial considerations rather than the needs of the Service. In the meantime 800 senior registrars, many of whom were encouraged to take up their training by the Government at the end of the war, are to have their appointments terminated with little prospect of obtaining the consultant posts for which they have been trained.

The loss of some 300 registrars over the whole country will probably not create an acute problem in medical staffing, but the Ministry realizes that in reducing the senior registrar establishment by nearly 60% alternative arrangements will be needed to maintain the work of many hospital departments. It proposes, therefore, that hospital boards might offer senior registrars whose appointments are not to be renewed a temporary appointment for one year at their present salary. This step is solely at the discretion of the board in the light of the needs of the hospital, and although it would be a mistake for all displaced senior registrars to expect such an appointment it is to be hoped that in this way the drastic effect of the Ministry's proposals may be tempered and a proportion of senior registrars be given a further year in which to find consultant posts or other professional work.

As a long-term policy the Ministry suggests that boards might offer clinical assistantships to suitably experienced general practitioners. So far the National Health Service has tended to widen the gulf between the general practitioner and hospital work, and any effective measure to link the general practitioner with the hospital by providing opportunities for hospital work would be welcomed by the profession.

Unfortunately it is doubtful whether the Ministry's proposals are practical. The work which the senior registrar undertakes requires the continuing responsibility of one man; in most specialties it involves highly technical procedures and, in the teaching hospitals, undergraduate teaching.

Under the present conditions of general practice it is doubtful if many general practitioners will be able to give the time necessary for registrar appointments, and it would be difficult

for work of this nature to be undertaken by a succession of practitioners each giving, say, one or two sessions a week. Clearly the Ministry's proposals require careful examination by both consultants and general practitioners before they can be commended in their present form.

One change about which there will be little regret is the abolition of the junior registrar grade as a step on the training ladder. There is no doubt that, however useful the salary scale attached to this grade for the remuneration of a necessary type of senior house-man, it has had the effect of encouraging young practitioners with little experience to regard themselves as having been accepted for training as specialists.

The Joint Committee has already informed the Ministry that, in its proposals for controlling the registrar establishments over the next few years, it has virtually brought to a standstill any development of the consultant services of the country, and has dealt most unrealistically with the opportunity now presented for bringing to fruition the Minister's undertaking to provide a consultant service covering the whole country. The expenditure of £1,000,000—a small sum in comparison with the cost of the Service as a whole—would provide an additional 500/600 part-time consultants, and it is to be hoped that wisdom will prevail before the experience of a considerable number of highly trained senior registrars is lost to the hospital service.

STATEMENT BY REGISTRARS' GROUP

The recent Ministry of Health circular on "Review of Appointments to Registrar Grades" (*Supplement*, November 18, p. 204) was considered at a special meeting of the Executive Committee of the Registrars' Group on November 20, after which the following statement was made:

The Executive Committee of the Registrars' Group of the B.M.A. has considered the Ministry of Health circular on "Review of Appointments to Registrar Grades," and on behalf of the Group it wishes to express its most profound disagreement with many of the proposals in the circular. The Ministry's proposals provide for the automatic dismissal of the majority of the most senior registrars on the completion of the normal tenure of their appointments.

The Executive Committee, on behalf of the Registrars' Group, protests in the strongest possible terms against this decision.

1. The Committee holds the view that the Government must accept responsibility for the present situation. The Ministry of Health clearly envisaged, in its pamphlet *The Development of Consultant Services*, a considerable increase in the number of consultants; and in anticipation of this policy, in the immediate post-war period, encouraged ex-Service men to train as specialists in registrar appointments by the provision of grants for this purpose. The Registrars' Group deplores the fact that 1,100 registrars and senior registrars are now to be dismissed solely on a numerical basis without regard to their suitability for future consultant posts. It is felt most strongly that this is entirely a wrong principle and that registrars of unquestioned ability should not be dismissed merely because their numbers are in excess of the artificially restricted opportunities for promotion.

2. The Ministry's proposal that the dismissal of registrars should commence forthwith, before the hospital establishments have been announced, is most strongly deplored.

3. The Committee points out that the arrangements for continuing the work at present undertaken by the large numbers of registrars and senior registrars who are to be dismissed, as proposed in the Ministry's circular, are quite inadequate. It is noted that no suggestion whatsoever is made for covering the work undertaken by the 300 registrars (immediately affected) who are not to be replaced on the completion of their appointments. General practitioners with the necessary qualifications, time, and ability are not available to take over the work of senior registrars. Furthermore, the Group is strongly opposed to the principle of general practitioners' undertaking specialist work in large numbers. It is also opposed to any suggestion that the work now done by registrars could be carried out by senior house officers.

4. It will be quite impossible to absorb the dismissed registrars in H.M. Forces and the Colonial Medical Service. There is no great demand in the Forces for general physicians, and the Ministry's proposals necessarily include the dismissal of large numbers of highly trained physicians.

5. The further expansion of consultant services is the first and most urgent need, and provides the best solution to the problems now created. This would overcome the proposed anomaly whereby the recruitment of untrained men to the registrar grade will continue while trained men are being dismissed on completing their appointments in the senior registrar grade. The Ministry's circular gives no reason why the proposals in its pamphlet *The Development of Consultant Services* should not be implemented. It is realized that available bed accommodation sets a limit to the expansion; but the reduction in the numbers of registrars and the mass of work in out-patient departments will make an increase in consultant establishments imperative. In this connexion it is to be noted that (*a*) many consultants are undertaking work grossly in excess of their contracted number of sessions; and (*b*) a considerable amount of consultant work in all departments is at present being carried out by senior registrars and by registrars.

6. The Committee urges that the Ministry's proposals for the reduction of registrar establishments should not be implemented until agreement has been reached on the matter between the Minister and the profession.

MEETINGS OF REGISTRARS

A general meeting of registrars in the South-west Metropolitan Region (Eastern Area) will be held at B.M.A. House on Wednesday, December 6, at 5 p.m.

A general meeting of registrars in the North-west Metropolitan Region will be held at B.M.A. House on Tuesday, December 5, at 6 p.m.

PUBLIC HEALTH COMMITTEE

THE DURHAM ISSUE

A meeting of the Public Health Committee of the Association was held on November 24, with Dr. C. METCALFE BROWN in the chair. The chairman gave an account of his visit, with Dr. E. Grey Turner, Assistant Secretary, to the meeting of medical officers of the Durham County Council on the previous Saturday to discuss the decision of the county council that all its staff should be members of their appropriate trade unions (*Supplement*, November 25, p. 209). The meeting had resolved by a unanimous vote to ignore the county council instruction and to affirm its whole-hearted support of B.M.A. policy in regard to the "closed shop."

The Industrial Court

It was reported to the Committee that the Industrial Court had sat on four occasions on the arbitration issue. The staff side had set out to obtain information concerning not only existing salaries of medical officers in the public health service but also the cost of the increase if their proposals were brought fully into effect. Two surveys on a questionary basis had been undertaken, and from the information obtained it was possible to assess each medical officer's salary under the proposals. The information obtained as a result of these surveys had been made available to the Court.

Other Business

The Committee had before it a resolution from the General Medical Services Committee that in no circumstances should the local health authority medical officer refer a school child to any specialist (other than for ophthalmic examination) except with the approval, expressed or implied, of the child's family doctor. The chairman of the Committee said that this represented no difference in substance from the resolution which the Committee had recommended last session. It was agreed to draw the attention of medical officers of health to the policy of the Association as set out in the resolution carried at the recent adjourned Representative Meeting and ask them to inform those of their officers who were likely to have to deal with this problem.

A resolution from the Annual Representative Meeting which had been referred to the Committee urged that more intense propaganda be undertaken for vaccination and immunization. The feeling of the Committee was against press propaganda, and it was suggested that personal propaganda by general practitioners and health visitors formed the most useful method. This suggestion was referred to the General Medical Services Committee.

The question of "dual appointments" again came forward. It had been agreed at an interview with the Ministry that this matter should be settled on a proper basis. It was deplorable that two and a half years after the appointed day a fundamental matter of this kind should remain undecided. The Committee decided to refer the matter to the staff side of Committee C, with a request that a settlement be sought through Whitley machinery.

A suggestion of Dr. Percy Stocks, of the General Register Office, had been received from the Ministry of Health regarding the notification of pneumonia. Four categories were suggested—acute primary pneumonia, atypical pneumonia, influenzal pneumonia, and pneumonia secondary to specific infective diseases not themselves notifiable. The council of the Society of Medical Officers of Health had supported this classification. It was pointed out that the onus would rest upon general practitioners. Therefore, the question had been considered by the General Medical Services Committee, which had suggested only two categories—namely, acute primary pneumonia and acute secondary pneumonia, the cause to be stated if possible. The Public Health Committee agreed with this view.

A request from the Amending Acts Committee concerning items to be included in the programme for amendment of the present National Health Service Acts and regulations and orders was referred in the first instance to the council of the Society of Medical Officers of Health, together with certain points brought forward by individual members.

The Committee considered a redraft of Puerperal Pyrexia Regulations, the present draft being regarded as somewhat ambiguous. Certain suggestions for classification were made. One of these was that the phrase "pyrexia during the puerperium" should be substituted for "puerperal pyrexia."

The Society of Medical Officers of Health was thanked for transmitting to the Committee the results of a survey on the extent to which medical officers of health were undertaking administrative responsibilities for arrangements made under the National Assistance Act.

PART-TIME NATIONAL SERVICE

The Armed Forces Committee of the B.M.A. has considered the duties which the three armed Forces will require from conscript medical officers during their period of part-time National Service. The requirements at present laid down by the three Service Departments differ considerably in extent. The committee, while appreciating the difficulty of making the requirements uniform in the three different Services, has represented to the Ministry of Defence that there should be more similarity than is at present planned.

INDUSTRIAL INJURIES INSURANCE

The rules for medical certification and for claiming injury benefit under the Industrial Injuries Act have been slightly modified by regulations which came into force on November 28. These regulations allow a doctor to give special intermediate certificates (used where incapacity has already lasted at least 28 days and is likely to be prolonged) at intervals of up to four weeks, even though he is seeing the patient more frequently. Claims to injury benefit may be made and dealt with on the strength of these special intermediate certificates, in advance of a further certificate confirming that the patient did in fact remain incapable of work throughout the period as forecast. Similar arrangements have already been made for certification under the National Insurance Act for sickness benefit.

Heard at Headquarters

A Good Woman

That there is nothing new about the strange demands patients occasionally make on their family doctors is emphasized by the following letter which a doctor received about 50 years ago soon after starting general practice:

"Dear Sir,

A few lines to see if yould could find me a good woman one that would rather go in as housekeepper or one that would marry I want a good country woman one that is a good milker and butter maker as I have gote some mony lift to me by a frend so I would like to get a woman with a hundred or two if I can get a woman with a little money I am fore trying to get into a small Farm I want a woman about 40 or between 40 & 50 years of age I want a good living woman as their is no middle addged woman round here so I hope you will do what you can fore me as I have no frends nothing but my mother and she is nearly blind so if you can see your way to help me I will give you a present in Gold if you get me a good woman You might write answer to this letter and let me know if you are going to look out fore one to me and oblige me."

The Litigious Patient

The story was told at the last meeting of the Ophthalmological Section of the Royal Society of Medicine of a paranoid patient who was operated on for cataract. Dissatisfied with his treatment, he tore off his dressings, then reported the nurse to the matron, the house-surgeon to the hospital committee, and the ophthalmic surgeon himself to the General Medical Council. Failing to get any satisfaction in all these endeavours, he turned round on his solicitors and reported them to the Law Society.

A General Practice Section

The inaugural meeting of the General Practice Section of the Royal Society of Medicine was extremely well attended, and this the youngest Section for the oldest branch of medicine has every prospect of a useful existence. But what was remarkable was the number of specialists who attended the meeting. Everywhere one looked one saw faces familiar in regional surgery, ophthalmology, ear, nose, and throat work, radiology, and the like. Perhaps one of the chief services of the Section will be to give specialists a new insight into the mysteries of general practice. Quite properly, the Section is beginning its discussions with definitions: What is general practice?

Peak of Earning Capacity

After Professor Bradford Hill had delivered his presidential address to the Royal Statistical Society (which was summarized in the *Journal* of November 24), his predecessor in the chair, Sir Geoffrey Heyworth, proposed a vote of thanks to him. In so doing he said that when it came to doctors' incomes he was struck by the small variation shown in the earnings of members of the profession throughout their lives up to the peak of their earning capacity at the age of 54. The pattern, said Sir Geoffrey, was a very different one from that obtaining in the fields of industry and commerce, where the fall in income after the age of 54 was not seen. The income of workers in industry generally rose continuously until the age of retirement, unless, of course, their career was interrupted because their doctors had not done their job properly, and coronary thrombosis or peptic ulcer or other occupational disease cut down the earning capacity in the last age group.

Financing the W.M.A.

Just as in the United Nations Great Britain and the United States seem to bear the major liability, so in the World Medical Association. Looking at the subscriptions to the Association for the last year one notices that the British Medical Association's share was £545, and that of the American Medical Association about £800 (2,340 dollars), the two making together very nearly as much as the other 22 subscribing associations. The smallest subscription (£3) was from the Icelandic Medical Association.

ARMED FORCES MEDICAL OFFICERS

INCREASES IN PAY

On November 20 a deputation from the Armed Forces Committee of the B.M.A., headed by the chairman, Air Vice-Marshal D'Arcy Power, met officials of the Defence Departments and learned the increases in pay which were about to be announced by the Government for medical officers in the armed Forces.

The Association's original proposals represented, broadly, average net remuneration in the National Health Service, with an addition of 20% to compensate for the unavoidable disadvantages of a career in the armed Forces. The Defence Departments rejected the Association's estimate of civilian remuneration and its assessment of the disadvantages of a Service career (*Supplement*, May 20, p. 223). On July 6, a deputation put forward the Association's case to the four Defence Ministers in person (*Supplement*, July 15, p. 29). In August the Government announced substantial pay increases for the armed Forces as a whole, but excluded the medical and certain other branches, to which it stated that separate consideration was being given. In the next two months the Ministry of Defence was repeatedly urged to expedite its decisions in respect of the medical branches. Pay increases for medical officers have now been announced dating retrospectively from September 1, 1950—i.e., the date from which the pay increases in other branches of the Services took effect.

TABLE I.—*General Duty Officers*

Rank	Increase Awarded (Daily Rates)	Total Remuneration* of Regular General Duty Officers (Annual Rates)		
		New	Old	Increase
	s. d.	£	£	£
Acting Surg. Lieut. / Lieut. / F/O.	4 6	917	835	82
Surg. Lieut. / Capt. / F/Lieut.	4 6	1,026	944	82
After 2 yrs.	4 6	1,081	999	82
,, 3 ,,	7 0	1,127	999	128
,, 4 ,,	7 0	1,181	1,053	128
,, 6 ,,	7 0	1,236	1,108	128
Surg. Lieut. Cdr. / Major / S/Ldr.	7 0	1,346	1,218	128
After 2 yrs.	7 0	1,400	1,272	128
,, 4 ,,	7 0	1,455	1,327	128
,, 6 ,,	7 0	1,510	1,382	128
Surg. Cdr. / Lieut.-Col. / W/Cdr	8 0	1,682	1,536	146
After 2 yrs.	8 0	1,737	1,591	146
,, 4 ,,	8 0	1,792	1,646	146
,, 6 ,,	8 0	1,847	1,701	146
,, 8 ,,	8 0	1,901	1,755	146
Surg. Capt. / Col. / G/Capt.	10 0	2,029	1,846	183
After 2 yrs.	10 0	2,084	1,901	183
,, 4 ,,	10 0	2,139	1,956	183
,, 6 ,,	10 0	2,194	2,011	183
Surg. Capt. / Brig. / A/Cdre.	10 0	2,248	2,065	183
Surg. Rear Adm. / Maj.-Gen. / A/V/M	10 0	2,668	2,485	183
Surg. Vice Adm. / Lt.-Gen. / A/Marshal	15 0	3,215	2,942	273

* Includes pay, marriage allowance, and ration allowance grossed from £61 p.a. tax-free to £95 p.a.

Increases Awarded

The increases for medical officers are set out in Table I. Except in the first five years of service, and except in the ranks of surgeon vice-admiral, lieutenant-general, and air-marshal, the increases for general duty officers are considerably lower than the Association's original proposals. The deficiency is especially marked in the middle ranks, which is where the Association considered that improvement was most needed. It had, however, become clear in the course of the prolonged discussions with the Defence Departments that the Association's claim for a lead of 20% over civilian general-practitioner remuneration could not easily be substantiated. The increases now awarded by the Government represent, in an average career, a lead of 8–10% over corresponding civilian remuneration. (The exact percentage cannot be stated, because the average remuneration of civilian general practitioners is not yet accurately known.) This lead, though modest, will certainly go far to compensate the medical officers in the armed Forces for the unavoidable expenses and disadvantages of a Service career. It is probably fair to state that the new remuneration of general duty officers is not unreasonable in comparison with civil life.

TABLE II.—*Specialist Officers*

Rank	Total Remuneration* of Regular Specialist Officers (Annual Rates)					
	New		Old		Increase	
	R.N.	Army	R.N.	Army	R.N.	Army
	£	£	£	£	£	£
Surg. Lieut. .. / Capt. ..						
After 4 yrs.† ..	1,272	1,254	1,144	1,126	128	128
,, 6 ,,† ..	1,327	1,309	1,199	1,181	128	128
Surg. Lieut. Cdr. ..	1,492		1,309		183	
Major		1,492		1,291		201
After 2 yrs. ..	1,546	1,546	1,363	1,345	183	201
,, 4 ,, ..	1,601	1,601	1,418	1,400	183	201
,, 6 ,, ..	1,656	1,656	1,473	1,455	183	201
Surg. Cdr. ..	1,828		1,627		201	
Lieut.-Col. ..		1,828		1,609		219
After 2 yrs. ..	1,883	1,883	1,682	1,664	201	219
,, 4 ,, ..	1,938	1,938	1,737	1,719	201	219
,, 6 ,, ..	1,993	1,993	1,792	1,774	201	219
,, 8 ,, ..	2,047	2,047	1,846	1,828	201	219

* Includes pay, marriage allowance, and ration allowance grossed from £61 p.a. tax-free to £95 p.a.
† Graded specialists.

Specialists

Unhappily, the specialist position is different. The rates of specialist pay in the Royal Navy and R.A.M.C. remain respectively at 5s. and 4s. a day for graded specialists, but are raised to 8s. a day for full specialists. (In the Royal Air Force there is no specialist pay, but specialists will continue to receive accelerated promotion.) A glance at Table II will show that the new remuneration of clinical specialists in the armed Forces does not compare with the salary scale of consultants in the National Health Service. It approximates much more closely to the senior hospital medical officer scale. On November 20 the Association's representatives pointed out that this was bound to lead eventually to a second-rate specialist service in the armed Forces. The Defence Departments disputed this, and stated that for a variety of reasons it was not possible for the armed Forces to pay the salaries received by consultants in the National Health Service.

The deputation urged that local overseas allowances, which play an important part in compensating the medical officer in the armed Forces for the expenses of overseas service, should be reviewed as frequently and as expeditiously as possible, and that in cases where an increase was made the increase should be back-dated to the time when the necessity for it first arose.

National Service Officers

The deputation also made energetic representations on behalf of National Service medical officers. The Defence Departments were urged to grant the increased rates of pay to all National Service medical officers, on the grounds that the latter are fully trained for their medical duties when they join the armed Forces and cannot be compared with other conscripts, who have to spend the first 18 months of their service in learning their duties. The Defence Departments were also urged to grant the full rate of marriage allowance to married National Service medical officers, on the grounds that the upper age limit for the call-up of doctors is four years later than that for the rest of the community and that a high proportion of National Service medical officers are therefore married and have family responsibilities as heavy as those of regular officers.

The Defence Departments replied that the position of National Service officers had been carefully considered by the Government before its decisions were made and that no exception could possibly be made in favour of any one group. The deputation pointed out that the Government did not hesitate to make exceptions with regard to the medical profession in matters such as the upper age limit of call-up. These arguments were of no avail. The position is, therefore, that National Service medical officers will receive the increased rates of pay only in their last six months of service and will at no time receive the full rate of marriage allowance.

In the past two years an immense amount of work has been undertaken by the Armed Forces Committee in preparing rational pay proposals and arguing them with the Defence Departments. The Government's pay decisions are a meagre return for the committee's efforts. The pay increases awarded to medical officers only slightly exceed those recently (and hurriedly) awarded to all other officers, and to all outward appearances it would seem, therefore, that the labours of the Armed Forces Committee have been but wasted energy. The committee will gladly swallow this disappointment, however, if the new pay-rates succeed in promoting contentment and efficiency in the medical branches of the armed Forces.

It is hoped that the pay increases will lead to an improvement in the rate of voluntary recruitment. The Association will closely observe this important index of success or failure, reserving the right to reopen the question of remuneration if the results of the present revision should prove disappointing.

NINTH ANNUAL GENERAL MEETING OF THE BRITISH MEDICAL STUDENTS' ASSOCIATION

[FROM A SPECIAL CORRESPONDENT]

The Ninth Annual General Meeting of the British Medical Students' Association was held in the University of Manchester on November 9–11, and was attended by 65 delegates representing 23 medical schools. Apart from the business sessions of the meeting all delegates enjoyed a very warm reception from their Manchester hosts and from the South Lancashire and East Cheshire Branch of the B.M.A., who entertained them to an informal tea. The Manchester Student Representative Council entertained them at a formal dinner, at which the toast of the association was proposed by the president of the B.M.A. Branch, Mr. R. L. Newell, and replied to by Dr. P. L. C. Diggory, the retiring president. Following this dinner the delegates were invited to attend the Manchester Students' Winter Ball.

On the first day of the meeting the election of an honorary president to succeed the late Professor J. A. Ryle was discussed, and it was decided that in future the honorary president should be appointed annually and that for the coming year Professor Sir Geoffrey Jefferson should be asked to accept this office.

Foreign Relations

In debating international work the association reported that during the last year a very large number of exchanges between medical students in this country and abroad had been arranged. The association is contemplating various schemes for increasing the scope of these exchanges and is attempting to obtain financial support for these projects. The retiring president reported on the World Student Congress of the International Union of Students in Prague, and, after approving his report, the meeting passed a series of resolutions to ensure that no formal links remain between the B.M.S.A. and the International Union of Students. At the same time it was agreed that the B.M.S.A. should co-operate with other interested medical student organizations with a view to setting up a non-political international medical student service to encourage and to facilitate the exchange of medical students, to direct and organize international medical student clinical congresses, and to serve as an international medical student news service. The new organization would not be confined to Western countries, and it was hoped that all interested medical student associations will avail themselves of it.

Medical Act, 1950

There was a lively discussion on the Medical Act, 1950, and it was reported that during the hurried passage of this Bill through the two Houses of Parliament the association had taken very vigorous and at least partially successful action to modify many of the original clauses. The present position was that many of the rules and regulations which would be of vital importance to medical students have still to be discussed and formulated by the General Medical Council. A large number of resolutions and recommendations to the General Medical Council were passed by the meeting, the main ones dealing with the nature and status of the junior house-officer. It was recommended that such officers should have charge of a minimum number of 20 beds in a teaching hospital and a larger number in a non-teaching hospital. Delegates felt keenly that the introduction of this scheme, though in itself acceptable to the student body, might give rise to considerable hardship if it were applied during the present generation of medical students, whose "contract of service" would thereby be altered, and a motion was passed recommending that the "appointed day" be deferred until October 1, 1954. It was pointed out also that Colonial students studying in Britain might well wish to serve their "intern year" on return to their own countries, and the association therefore recommended that suitable Colonial hospitals should be approved for this purpose to enable such students to obtain full British registration. The annual general meeting felt that the terms "general medicine" and "general surgery" as used in the Act should include paediatrics, skins, orthopaedics, casualty, E.N.T., eyes, etc.

Student Health

The meeting discussed at length the report of the British Co-ordinating Committee on Student Health, which advocated the establishment of a rehabilitation or post-cure centre for students recovering from tuberculosis. It was pointed out that no reliable figures of the incidence of tuberculosis were available, but the student committee had just completed a special survey which indicated that the incidence of tuberculosis among medical students was approximately five times as great as among the general community. It was reported that, although no official negotiations had yet taken place, a large number of influential bodies had been approached on an informal basis, and it was felt that the time had now come to set up a properly constituted British Students Tuberculosis Foundation and a British Students Tuberculosis Trust Fund. The annual general meeting gave formal approval to this course, so that the B.M.S.A. will become a founder member of both bodies. With or without help of various interested charitable organizations, it is proposed to purchase premises in the London region which could be used by both medical and other students studying in Britain. The facilities would cover the needs of a student fit for discharge from a sanatorium but unfit to return to work, and it was hoped to establish a university atmosphere with laboratory and lecture facilities so that a student might continue his studies, under medical supervision, as a form of occupational therapy.

Miscellaneous Matters

Among the many other resolutions passed at the meeting was one to establish a permanent Education Subcommittee, whose first task would be to survey the curricula of the various medical schools and prepare a report. This committee would also undertake to review and to comment upon the various recent reports on medical education.

The Grants Secretary reported considerable progress made during this year in the adjustment of various awards, but the attention of the meeting was also called to the fact that there were many wide discrepancies in remuneration by local education authorities for the same standard of academic ability. The association undertook to look into this matter in the coming year.

It was reported that the Canadian Association of Medical Students and Internes had asked to be affiliated to the B.M.S.A. This request was warmly welcomed and formally approved; it was hoped that very close and cordial relations would be established between the two associations in the future.

Finally the thanks of the British Medical Students' Association were expressed to the British Medical Association for its manifold help and encouragement and in particular for the continued and valued assistance of Mr. L. Vince. The free loan of medical films, the awards of essay prizes, and the reduced student subscription to the *British Medical Journal* all testified to the help given and interest taken by the B.M.A. in student matters.

Mr. Robin Coppock, of Cardiff, was elected Student President for the coming year, and Mr. H. A. Milne, of St. Mary's, becomes the new Secretary.

Correspondence

Officials with Maps

SIR,—The rural practitioner regards with some concern the division of country districts under the terms "open," "under-doctored," and so forth—this especially in the light of Mr. Bevan's recent announcements concerning extra inducement payments to encourage more doctors to settle in the thinly populated areas.

The terms to which I have alluded can be applied to most urban areas quite realistically, and do give a practical indication of the present position and desirable future policy. In the country the use of these terms becomes much more arbitrary, as the areas are ill-defined and the actual places of residence of doctors bear no constant or exact relationship to the area or extent of their field of practice. A doctor may attend everyone in the place he lives in, or on the other hand he may attend very few of the people there and do most of his work outside the town. In the latter case this may not be evenly distributed round the perimeter but concentrated in one or two directions, sometimes to a considerable distance. Thus officialdom with a map on which each doctor's residence is pin-pointed is very often completely misguided even if trouble is taken to consider the effect of population, arrangement of partnerships, numbers on doctors' lists, and so forth.

You can get a closed area with only one doctor in it if that doctor happens to have his residence in a small village. He has a protected monopoly with no limitation on the extent of his practice. This may extend into an area labelled "under-doctored." In his immediate neighbourhood there is no other doctor, and in emergency another one is difficult to obtain. On the other hand, in the "under-doctored" area there may not be a doctor within five miles, but there are perhaps half a dozen serving the area, and at least one is obtainable within a quarter of an hour in emergency. There are one or two branch surgeries, and, what with the number of doctors serving the area and the consequent competition, patients are very well attended and get as wide a choice of doctor as might be expected in a small "over-doctored" town.

The matter becomes serious when the country doctor has to face the ultimate consequences of this completely unrealistic labelling of his field of practice. In the country efficient service of any sort can be provided only if units serve large areas. If good work is to be attracted to the country under a capitation system it is essential, especially in sparsely populated areas, that doctors should remain comparatively few and far between. People who think they can improve things with the help of a map and a few coloured flags are as misguided as those who think they can interfere with the balance of nature indiscriminately.

Suppose you plant a doctor in the middle of the sort of "under-doctored" area I have described. He will, however inefficient, take a large proportion of patients in his immediate neighbourhood, but if he is to make any sort of living he will be forced to make more and more encroachments upon the lists of his neighbours, and will extend his practice even beyond their residences. He will certainly extend into the neighbouring "over-doctored" area. The final result gives relatively little improvement to the "under-doctored" area, while it generally reduces the standard of efficiency and life of all the doctors for miles around. They face reduced incomes and are forced to go to patients even further afield from their places of residence in attempts to maintain a subsistence. In the long run there may be a thicker and more evenly spread lot of doctors, but probably these will become of a less energetic type, and between the lot of them will not be able to place as much skill and hard work at the disposal of the countryside as did their relatively sparse but better-paid predecessors.

In a thinly populated area the pattern of practices is so intricate, and the effect of introducing one doctor anywhere so catastrophic and far-reaching, that little but harm can be done to everyone concerned by the heavy and insensitive hand of officials armed with labels and maps. Certain inducement grants and basic salaries are a help but should be very carefully dealt out, and then only by those who know the areas concerned extremely well. But there is far from sufficient money available for inducement grants to keep hard-working efficient men in the country if their areas of practice are going to become more and more limited to their own village or thinned out until they have to cover half a county in search of a living.—I am, etc.,

Eye, Suffolk. J. SHACKLETON BAILEY.

Approach M.P.s

SIR,—I have been asked to write to you in the belief that what follows will be of interest to all general practitioners. At a meeting of my committee held on November 16 the following resolution was passed unanimously:

Believing that as the Minister of Health is responsible to Parliament for the conduct of his Ministry it would be appropriate for each Division of the British Medical Association to bring to the notice of Members of Parliament our present grievances, the Lindsey (Lincs) Local Medical Committee urges the General Medical Services Committee to request all Divisions to approach their local Member and put before him the relevant arguments.

My committee have asked me to write both to you and to the General Medical Services Committee on this matter and to stress that our suggestion is an adjunct and not an alternative to any contemplated Guild action. We are fully aware of the disadvantages of making our case in any way a party issue, but feel nevertheless that the simple measure suggested in our resolution might result in the creation of an informed body of opinion on both sides of the House. We can see no disadvantage in this, and feel that it might help to get our terms of remuneration agreed either by negotiation or by arbitration without recourse to the desperate step of mass resignation.

We feel that our suggestion is simple, can be carried out with very little expenditure of time and energy, can do no harm, and might result in greatly increased sympathy for our profession in the House.—I am, etc.,

A. M. MAIDEN,
Honorary Secretary, Lincs (Lindsey) Local Medical Committee.

No Mass Resignations

SIR,—It would appear that the real doctor-patient relationship—namely, what the patients think of us—is deteriorating rapidly. To-day I overheard a patient say that the cost of National Insurance stamps is being increased because the doctors are asking for more money. Every time I read a newspaper report about the B.M.A. it appears to be on a money issue and gives the impression that we are asking for an increase in pay. The only other reports in which we are mentioned, so far as I can see, are those which describe some doctor's misdemeanours, or those which say how much we are costing already. Why is our Public Relations Department powerless to prevent this constant impression of mercenary medicos? Even if it were true, surely it would be the duty of the P.R. Department to make it appear not so.

But, Sir, it is not true. The General Medical Services Committee, by talking glibly of mass resignations, is proving itself to be completely out of touch with the ordinary G.P. and with

the spirit of the country as a whole. In this town 100% of the doctors decided that they had no desire to bring themselves to the level of workers striking for more pay at a time of national crisis, for, knowing what a bad press we always have, that is what it would seem to the general public.—I am, etc.,

Hatfield, Herts. KENNETH C. HUTCHIN.

"Closed Shop" at Durham

SIR,—The Minister of Health must be deeply disturbed by the decision of the Durham County Council to compel the doctors in that area to join a trade union, as in that case his medical personnel must inevitably cost him more. Under his contract with the regional board a surgeon or anaesthetist, who may only have a contract and be paid for one half-day a week in a particular hospital, is liable to be called upon at any hour of the day or night for an emergency operation in that hospital or any other hospital in the group without further payment. Would any trade unionist who had a contract for a 40-hour week be willing to work at night or on Sunday not only in his own town but in any neighbouring town without receiving double overtime?

It is surprising that the trade unionists, who have fought so hard for their rights, should be willing to admit to their numbers a body of men whose lack of business knowledge and adherence to their principles could only sabotage their movement.—I am, etc.,

Camberley, Surrey. LESLIE HARTLEY.

Service Pay

SIR,—It is now several weeks since the pay of Army officers, excluding those in the R.A.M.C., was raised. May I draw your attention to the injustice still directed against the serving medical officer debarred from resigning his commission?

My pay as a recognized specialist is £1,022 p.a., compared with the civilian £1,700 to £2,750 p.a. It is, however, often stated that our pay cannot be raised, as it would be unfair to officers of other corps. Apart from the fact that medical officers are commissioned after qualification, when some six years older than their non-medical colleagues, it is interesting to see if this statement is justified.

Five years ago, as a temporary lieutenant-colonel, I commanded a field ambulance in a brigade. The other three lieutenant-colonels in the brigade, though younger than I, drew higher pay, as medical officers were not eligible for command pay of 10s. per diem.

Now, whereas I am in my substantive rank of major, one of these three is a brigadier, the youngest is a substantive lieutenant-colonel, and the third has retired on pension (an infantry officer becomes eligible for a pension approximately seven years before a medical officer).

It will be seen that, whether regarded *vis-à-vis* his professional or military counterparts, the Army medical officer is at a considerable financial disadvantage.—I am, etc.,

SERVING M.O.

Trainee Assistants

SIR,—At the Annual Conference of the Representatives of the Local Medical Committees (*Supplement*, November 4, p. 181), the representatives for Manchester are reported to have said that the system of trainee assistants should be abolished on the grounds that it was subsidizing acquisitive practitioners, and that a young practitioner should have the opportunity of assistantship with a view to succession or partnership.

May I point out, first, that the argument is more applicable to those principals who employ permanent assistants without a view, and, secondly, that the scheme does not compel young practitioners to become trainee assistants. Those that do so—some hundred of them—do it because they feel they will be better fitted for a good assistantship with a view or for starting in general practice on their own.

The proposers of the resolution appear to have lost sight of the fact that a young practitioner out of hospital or the Services has not the faintest idea of the intricacies of general practice, a fact recognized by the members of the Cohen Committee. During his year of training the trainee learns much to help him to secure a good post with a view.

One does not deny that the principal who takes on a trainee assistant derives some benefit by doing so; one has a right to expect some return for one's labours, and this was recognized by the planners of the scheme.

If, as stated by the representative for Bristol, the scheme is being abused by some practitioners, and it does not conform with what was intended by Spens, then the scheme should be so modified to conform with Spens and to prevent abuses, but not abolished—I am, etc.,

London, S.W.3. R. CASTILLO.

British Medical Guild

SIR,—We, the undersigned, duly elected members of the committee of the British Medical Guild for St. Marylebone, London, W.1, wish to suggest the following important points.

(1) Definite membership of the Guild (contrary to the B.M.A. circular dated October 12, 1950) should be by payment of subscription, such subscription to be deducted from the annual B.M.A. subscription. In case of non-members of the B.M.A. a nominal payment to be agreed.

(2) We feel that the object of the Guild should be primarily the promotion of the interests of the general-practitioner section of the National Health Service.

(3) We feel we are expressing the dissatisfaction existing at present among a large section of the general practitioners in the N.H.S. (who are loyal members of the B.M.A.) at the present constitution of the British Medical Guild.—We are, etc.,

E. T. WRIGHT, *Chairman*. E. JACOBS.
R. M. BELL, *Secretary*. H. N. LEVITT.
J. L. BOYD. C. R. MCCLURE.
G. D. FLEMING.

Inside the N.H.S.

SIR,—A few weeks ago I was called at 9 a.m. one morning to a woman of 60 who had already been suffering from acute abdominal pain and vomiting for some hours. She was in great distress both of body and mind. She was alone in her flat, had not long since had a breast removed for carcinoma, and her husband was in hospital with coronary thrombosis. Yet, for all my attempts, it was impossible to get her admitted to hospital until the afternoon of the following day.

In a letter just received from the hospital I learn that she had a strangulated internal hernia and that about 18 in. of the bowel was gangrenous. "Infamous" was the laconic comment of one of my colleagues. And so it was. Many a man has been hauled in front of the G.M.C. and branded with that much-misused word for far less. But how can one brand an abstraction like the Ministry of Health with anything?

More recently than this I was called in the early afternoon to an old lady of 76 who had just been knocked over in the street. She had been carried to her flat, in which she lived alone, and it was reasonably clear that she had a fractured femur. Even so it was not possible to get her into hospital until the following day, and then only by calling out a surgeon to make a domiciliary visit.

The feeling of futility and frustration as one gets at the end of a telephone trying to get a patient admitted to hospital has to be experienced to be believed. It is clear that the Civil Service mentality, with "passed to you" as its motto, has dropped its very tentacles on medicine. How often is one advised to "try another hospital," or even dismissed with a breezy "Nothing doing." If the hospitals are as full as they say, and it is not feasible to send out some patient who would be going out possibly in a few days' time, then it should be permissible for the G.P. to get these cases admitted immediately into a private nursing-home, and he should be at liberty to call in the surgeon of his choice to deal with the case. The Ministry of Health would of course be liable for paying the account of the nursing-home.

A popular ditty of the past was called "I stopped, and I looked, and I listened," and one notes that the singer had at least the merit of listening. Is it not now about time that someone stopped and looked inside the N.H.S. and, what is more, listened to what those who have most of the running of

it have to say? Or is the permission (as stated in the Acts) to have beer prescribed on an E.C.10 thought to be adequate compensation to the electorate for the potential tragedies referred to above?—I am, etc.,

G. L. DAVIES.

Brighton.

Appointments at St. Paul's Cray

SIR,—When Miss Hornsby-Smith made her remarks about us in the House of Commons on November 16 she was clearly badly informed both about the procedure by which a doctor enters general practice and the details of our own cases. The general procedure is well known, but in view of the publicity that has arisen we should like to give a factual outline of how we started in practice.

In September, 1948, one of us (J. D. P.) applied to the L.C.C. for a house on one of the new housing estates with a view to starting a group general practice, and in December of that year was granted the tenancy of his present house as explained to the London County Council by the chairman of the housing committee on November 21. He obtained permission to practise in June, 1949. In July, 1949, and March, 1950, respectively, two more of us (L. M. F. and E. T.) applied for permission to practise, the area being an "open" one, and, despite the opposition of the local medical committee, were given permission some months after applying. Like three other doctors who started in practice in the area about this time, and whom Miss Hornsby-Smith seems to have overlooked, we both practise from privately owned houses.

It was learned in June of this year that the area had been "closed" although the population was, and still is, rapidly growing. Since we are limiting the size of our lists, it seemed clear that there would be insufficient doctors to serve the population adequately, and the three of us therefore supported the application which the fourth (R. T.) made in June for permission to practise. This was eventually granted in October of this year. He had obtained a house from the L.C.C. in August, 1950, after the tenancy had been offered to, and refused by, several other doctors.

Although Miss Hornsby-Smith made many inaccurate and irrelevant remarks, she touched on an important problem—namely, that the ability to enter general practice has largely become a question of the ability to acquire a house from which to practise. If her remarks lead to any easing of the difficulties which confront young entrants into practice—difficulties of which we are only too well aware—they will not have been entirely valueless.—We are, etc.,

L. M. FRANKLIN. E. TUCKMAN.
J. D. PAULETT. R. TEPPER.

St. Paul's Cray, Kent.

Terms of Slavery

SIR,—Exactly what do we hope to achieve by our threatened withdrawal from the National Health Service? This is a question I have been asked by lay people and I have heard asked by doctors working in the National Health Service.

It is strange that there are many doctors who cannot define any dissatisfaction with the N.H.S. Act except some vague feeling that the remuneration is inadequate. The events of the past 10 years have so trained us that we no longer protest or reason why as our liberties are cancelled and our wills subjected to the will of the administrator and all-powerful political remote-control. There are so many unsatisfactory facets of the Act as applied to the general practitioner that it is entirely beyond the scope of this letter to mention more than one.

Recently the big national dailies carried leading-column accounts of the resignations of three separate practitioners from the National Health Service. All resigned because they are dissatisfied with the terms of slavery imposed on the G.P., not on account of the remuneration, bad enough as it is.

A doctor on the list of the Warwickshire Executive Council has, in his own reported words (*Daily Express*, November 11), resigned because "I did not realize when I signed my contract that I had signed away my civil liberty to the extent that I have done. To be condemned on the unsupported word of a woman, not on oath, without the normal protection of the law, is more than I can tolerate." This doctor had, it is reported, five complaints made against him. Four were baseless. On the fifth he was reprimanded because he asked for a child to be brought to the surgery instead of visiting it.

Every day every doctor in the Service risks being the victim of any one of his patients' complaints, real or frivolous, made to the executive council. He can be tried, condemned, reprimanded, and fined sums of money on the evidence of any one of his patients who feels aggrieved on account of some transgression or omission on the part of the doctor. But however unreasonable the patients are, the doctor has no redress whatever. A patient can call him at two in the morning 10 miles into the country for the pleasure of telling the doctor that he would like a prescription for cotton-wool. The doctor can do nothing but have the patient removed from his list and so deprive his family and himself of a few more shillings of his dwindling income.

I have been called five miles into the country to see a baby reported as having "a terrible swelling on the buttock." On arrival at the cottage I was attacked by a savage dog, which I beat off with my black bag. The mother made no apology for this reception but departed down the garden to find the baby, who had gone for a walk with an elder sister. When examined, the baby was found to have a small fibrotic nodule in the buttock due to an antidiphtheria injection given some weeks previously. The nodule had been discovered accidentally the night previously while bathing the baby. I was denied the satisfaction of having this patient removed from my list, as she belonged to a sick colleague, a little of whose work I was doing in addition to my own.

The two other practitioners who resigned this week-end are reported as being (1) "fed up with killing myself treating people with colds in the nose," and (2) "having lost faith in myself as a result of the present conditions."

These courageous three have refused to bow down in the house of Rimmon, and their names should be honoured wherever doctors meet to discuss resignation—subject to 80% of the profession doing the same.

I plead that the *B.M.J.* will give all publicity to such cases and that every case of resignation of this type should be investigated fully. These sacrifices must not be allowed to go unnoticed. They must not be made in vain. Let the Minister know that there are still some doctors who value the integrity and honour of a once-respected profession sufficiently to risk placing ideals before cash receipts. Perhaps then he will listen more tenderly to the arguments which at present move him so little.—I am, etc.,

E. C. ATKINSON.

Sheffield.

THE B.M.A. LIBRARY

Under the rules of the B.M.A. Library a member of the Association may borrow a book for 28 days unless it is recalled by the librarian for the use of another member, in which case it must be returned at the expiration of 14 days from the date of issue. This may appear to be a hardship on those members whose commitments make it difficult for them to read a book in 14 days, but unfortunately no other arrangement is possible.

About 7,000 books are borrowed from the Library each year; and of this number some 20% are in great demand and are therefore restricted to a 14-day period. This applies only to new books, and when a book is popular a number of copies are purchased for loan to members. Every effort is made to meet the demands of members for such books, but there is a limit to the number of copies that can be purchased, especially since, after a comparatively short time, they are no longer in demand and remain on the Library shelves. It is not possible to extend the period of the loan indefinitely, nor is it possible to purchase a large number of copies of individual books, for the financial outlay would be out of all proportion to the service rendered. Comparison with subscription libraries is for various reasons inappropriate.

The Science Committee, which is responsible for the management of the Library, is anxious that members should be aware that the full resources of the Library, which are considerable, are always at the disposal of members, whose wishes will, so far as possible, be met without undue delay or inconvenience.

H.M. Forces Appointments

ARMY

Colonel T. H. Twigg, late R.A.M.C., having reached the age for retirement, has been retained on the Active List, supernumerary to establishment.

ROYAL ARMY MEDICAL CORPS

Major J. B. Evans has retired, receiving a gratuity.
Captain T. C. R. Archer to be Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel H. S. Waters, formerly I.M.S., to be Lieutenant-Colonel.
Major (Honorary Colonel) D. J. P. Parker, formerly I.M.S., to be Major.
Major (Honorary Lieutenant-Colonel) G. F. J. Thomas, formerly I.M.S., to be Major, retaining his honorary rank.
Major (Honorary Lieutenant-Colonel) J. M. Drew, O.B.E., formerly I.M.S., to be Major.
War Substantive Captain Phyllis M. Edwards, from Women's Forces Employed with R.A.M.C., to be Captain, and has been granted the honorary rank of Major.

SUPPLEMENTARY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel C. H. Budd, M.C., T.D., D.L., to be Honorary Colonel of a Supplementary Reserve Unit.
Major E. V. Bevan, from Territorial Army, Active List, to be Major.

REGULAR ARMY: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Captain F. S. Airey has relinquished his commission and has been granted the honorary rank of Major.

ROYAL AIR FORCE

Group Captain J. Hutchieson has retired on account of medical unfitness for Air Force service.
Squadron Leader W. Laurence has relinquished his temporary commission, retaining the rank of Wing Commander.
Squadron Leader R. J. Young has been transferred to the reserve (class D).
Flight Lieutenants G. H. Dhenin, J. E. Adamson, W. G. Alexander, P. R. Travers, J. C. A. L. Colenbrander, and E. S. Odbert to be Squadron Leaders.
Flight Lieutenant B. Sykes (employed with the Medical Branch of the R.A.F.) has resigned her commission, retaining the rank of Squadron Leader.
Flight Lieutenant G. Clayton has relinquished his temporary commission, retaining the rank of Squadron Leader.
Mary E. G. Sherwell (employed with the Medical Branch of the R.A.F.) to be Squadron Leader (permanent).

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leader S. Ball has resigned his commission and retains his rank.
Flight Lieutenant J. R. Groves has relinquished his commission on appointment to the reconstituted R.A.A.F., retaining the rank of Squadron Leader.

INDIAN MEDICAL SERVICE

Major A. C. Taylor, O.B.E., has retired, and has been granted the honorary rank of Colonel.
Majors C. S. Gamble and J. D. Munroe have retired, and have been granted the honorary rank of Lieutenant-Colonel.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: G. Graham-Cumming, M.B., D.P.H., Senior Health Officer, Hong Kong; G. V. A. Griffith, M.D., Senior Medical Officer, Hong Kong; H. R. Hudd, M.D., D.A., Specialist (Anaesthetist), Uganda; J. A. McDonald, M.B., and J. M. Vaizey, M.D., D.T.M.&H., Medical Officers, Uganda; E. Carloni, M.D., Medical Officer, Tanganyika; J. J. T. Klimczynski, M.D., Assistant Medical Superintendent (Temporary) Mental Hospital, Barbados; M. Rucinski, M.D., Medical Officer (Temporary), British Guiana.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

County Council.—Durham.
Metropolitan Borough Councils.—Fulham, Hackney, Poplar.
Non-County Borough Council.—Dartford.
Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

Association Notices

PRIZES FOR NURSES

The Council of the British Medical Association is prepared to consider the award in 1951 of prizes of the value of 20 guineas for the best essay, and 10 guineas for the second best essay, submitted in open competition by each of the following categories of nurses: (i) Student nurses; (ii) State-registered nurses working in a hospital; (iii) State-registered nurses not working in a hospital (i.e., district nurses, private nurses, etc.); (iv) State-enrolled assistant nurses.

The subjects of the essays for 1951 are:—Category (i): The handling of a patient on admission to hospital. Category (ii): What a nurse can do in preparing a patient for operation—including the handling of the nervous individual in strange surroundings. Category (iii): The opportunities of the nurse doing domiciliary work to educate the public in health matters. Category (iv): The special problems of nursing the long-term cases in hospital.

The purpose of these prizes is the promotion of systematic observation among nurses. In awarding the prizes *due regard will be given to evidence of personal observation.* No essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize.

Nurses who are undergoing a course of training at a hospital are eligible to compete under category (i); nurses registered by the General Nursing Council are eligible to compete under categories (ii), (iii), or (iv), whichever is appropriate.

If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award shall be made.

Each essay must be typewritten or legibly written in the English language, must be unsigned, and have attached to it a note containing the name and address of the candidate and the category into which he or she falls. Essays, which it is suggested should consist of from 2,000 to 5,000 words, must be forwarded so as to reach the Secretary of the British Medical Association not later than March 31, 1951.

Preliminary notice of entry for this competition is required, and a special form for this purpose is obtainable from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and a sum of money slightly less than the amount of the Sir Charles Hastings Clinical Prize, will be awarded for the second best essay submitted.
3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.
4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.
5. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950.
6. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a

contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for an award of either of the prizes in any subsequent year.

7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.

8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

9. Each essay must be typewritten or printed and must be accompanied by a sealed envelope, enclosing the candidate's name and address, firmly affixed to the essay.

10. Inquiries relative to the prizes should be addressed to the Secretary.

OCCUPATIONAL HEALTH PRIZE

The Council of the British Medical Association is prepared to consider the award of an "Occupational Health Prize" in the year 1951. The prize consists of a certificate and a money award to the value of £50. The prize is established by the Council of the Association to encourage interest and research in the field of occupational health. The prize will be awarded biennially. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essay submitted must include personal observations and experiences collected by the candidate in the course of his work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1950. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A prizewinner in any year is not eligible for a second award of the prize. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Each essay must be typewritten or printed on one side of the paper only, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS

The Council of the British Medical Association is prepared to consider the award, in 1951, of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "The Importance of Accurate History-taking in Diagnosis." In their essays students will be expected to refer to cases within their own experience.

The purpose of this competition is to promote systematic observation among medical students. In awarding the prize *due regard will be given to evidence of personal observation.* No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. A prizewinner in any year is not eligible for a second award of the prize.

Any medical student who is a registered member of a medical school in the United Kingdom and the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number of essays received. In 1950 three prizes of £50 and three prizes of £20 each have been awarded. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a form of application which can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary not later than January 31, 1951. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Diary of Central Meetings

DECEMBER

4	Mon.	Subcommittee *re* Occupational Dermatitis, 2.30 p.m.
6	Wed.	Trainee Assistants Subcommittee, 10.30 a.m.
6	Wed.	Central Consultants and Specialists Committee, 11.30 a.m.
6	Wed.	Catalogue Subcommittee, 3.30 p.m.
7	Thurs.	Nursing Subcommittee, 11.15 a.m.
7	Thurs.	Committee on Psychiatry and the Law, 2 p.m.
7	Thurs.	Medical Students and Newly Qualified Practitioners Subcommittee, 2 p.m.
8	Fri.	Amending Acts Committee, 2 p.m.
12	Tues.	Central Ethical Committee, 2 p.m.
13	Wed.	Publishing Subcommittee, 11 a.m.
13	Wed.	Private Practice Committee, 2 p.m.
14	Thurs.	General Medical Services Committee, 11 a.m.
14	Thurs.	Staff Side of Committee "C," 11.30 a.m.
15	Fri.	Ophthalmic Group Committee, 2 p.m.
21	Thurs.	Journal Committee, 2 p.m.

Branch and Division Meetings to be Held

CHESTERFIELD DIVISION.—At Chesterfield Royal Hospital, Friday, December 8, 8.45 p.m., joint meeting with pharmacists to discuss problems of dispensing, arranged by Dr. J. P. Davie.

DARTFORD DIVISION.—At Brook Hospital, Shooter's Hill, Woolwich, S.E., Wednesday, December 6, 8 p.m., clinical meeting.

EAST HERTS DIVISION.—At Lister Hospital, Hitchin, Thursday, December 7, 8.30 p.m., clinical meeting.

FINCHLEY DIVISION.—At Finchley Memorial Hospital, Friday, December 8, 8.45 p.m., meeting.

GUILDFORD DIVISION.—At St. Luke's Hospital, Guildford, Thursday, December 7, 7.30 p.m., clinical meeting.

HAMPSTEAD DIVISION.—At Hampstead General and North-west London Hospital, Haverstock Hill, London, N.W., Wednesday, December 6, 8.30 p.m., lecture by Dr. R. T. Brain: "Some Problems in Dermatology." Illustrated by lantern slides. All medical practitioners in the area of the Division are invited.

HOLLAND DIVISION.—At Peacock and Royal Hotel, Boston, Sunday, December 10, 7 for 7.30 p.m., "Ladies' Night."

KESTEVEN DIVISION.—At George Hotel, Grantham, Thursday, December 7, 7.15 for 7.45 p.m., address by Dr. Margaret MacPherson: "Tuberculosis in Children—Prevention and Treatment."

MANCHESTER DIVISION and Manchester Local Medical Committee.—At Midland Hotel, Manchester, Tuesday, December 5, 7.30 for 8 p.m., medical ball; 9 p.m., dinner.

MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, December 8, 8.45 p.m., talk by Mr. M. H. Wostenholm: "The Discharging Ear."

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Monday, December 4, 8 p.m., annual dance and cabaret.

NUNEATON AND TAMWORTH DIVISION.—At the Red Lion Hotel, Atherstone, Tuesday, December 5, 8.45 p.m., films of interest to general practitioners.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Friday, December 8, 8.30 p.m., address by Dr. E. G. Sita-Lumsden: "The Diagnosis and Management of Tuberculosis in General Practice."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, December 8, 8 p.m., special lecture by Dr. Paige Arnold: "Atomic Warfare and its Relation to Medicine."

WEST BROMWICH AND SMETHWICK DIVISION.—At West Bromwich and District General Hospital, Sunday, December 3, 11 a.m., annual meeting.

Meetings of Branches and Divisions

PRESTON DIVISION

Professor H. L. Sheehan, of Liverpool, delivered the Annual B.M.A. Lecture to the Preston Division on November 14 at the Preston Royal Infirmary, with Dr. Andrew Gibb, chairman of the Division, in the chair. There was a large and appreciative audience of over eighty members. Professor Sheehan took for his subject "Clinical Aspects of Hypopituitarism," and illustrated it with an excellent series of lantern slides. Simmonds's syndrome is a subject which he has made particularly his own, and he successfully demonstrated the mechanism which produced the train of symptoms and physical signs attendant on destruction of the anterior lobe. In particular he debunked the fixed idea that the victim of Simmonds's syndrome is invariably emaciated. He showed one slide of a woman who was a living skeleton. This case had been diagnosed as Simmonds's disease about 27 years ago, and this illustration up to the present day had been copied from one textbook to another as typifying the disease. In fact, the patient had died five days after the photograph was taken, and necropsy showed a normal pituitary gland.

The lecture was followed by a discussion, and the lecturer answered a number of questions.

A vote of thanks was proposed by Dr. J. G. Lord and seconded by Dr. M. J. Flynn. A collection which was taken for the Royal Medical Benevolent Christmas Gift Fund realized seven guineas.

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 9 1950

GENERAL MEDICAL COUNCIL

178TH SESSION

The 178th session of the General Medical Council opened at 44, Hallam Street, London, W., on November 28, under the presidency of Professor DAVID CAMPBELL.

Mr. J. T. Morrison, F.R.C.S., as representative of the University of Liverpool for the term of one year, and Dr. D. S. Torrens, as representative of the University of Dublin for the term of five years, were introduced by Sir Henry Cohen and Dr. Moorhead respectively, and took their seats.

President's Address

The PRESIDENT began his address with a sympathetic reference to four former members of the Council who had died since the previous session—Dr. Edwin Matthew, Lord Hacking, Professor Dilling, and Sir William Thomson. Three other members had resigned or retired—Lord Moran, Dr. Joseph Bigger, and Dr. Matthew Stewart. He then went on to welcome five new members "whose qualifications are as varied as they are complementary"—Dr. Russell Brain, Professor McLeod, Mr. J. T. Morrison, Dr. D. S. Torrens, and Professor Hilda Lloyd. Professor Lloyd was not the first woman to become a member of the Council; that honour belonged to the late Dr. Christine Murrell, who was elected a direct representative in 1933, but died before she could take her seat. Professor Lloyd, however, had the distinction of being the first woman to undertake the full duties of membership of the Council. He also remarked that it was a happy coincidence that, when in the field of medical education the responsibility of the Council was extended beyond the undergraduate into the postgraduate or post-qualification stage, the Presidents of the three Royal Colleges in England were numbered among their members.

After a tribute to his predecessor in the chair, the late Sir Herbert Eason, and the paramount part which he had played in the discussions which had helped to shape the Medical Act, 1950, the President outlined the principal amendments made in the measure by the House of Commons, where the Minister of Health was in charge of the Bill "and laid us under a great obligation to him by one of his most masterly, if not one of his most masterful, displays of Parliamentary accomplishment."

The educational provisions of the Bill had been amended as follows. The Order of the Privy Council approving regulations of the Council by which the period of employment in a resident medical capacity in one or more approved hospitals or institutions was to be prescribed, was made subject to approval of the draft of the Order by resolution of each House of Parliament. He believed that some apprehension might still exist that the draft of the Order might be laid before Parliament prematurely. It should have been removed by the explicit assurance of the Minister that this is not going to be sprung upon the student immediately. It is going to take between a year and two years to make these arrangements. Members of the Education and Examination Committees, and the Council as a whole, would be under no illusion about their complexity or the time it will take to complete them.

"New provision was made empowering the Council to allow house officers who satisfy the Council that they will be, or have been, prevented by lasting physical disability from embarking on, or completing, any period of experience of the practice of surgery or midwifery, to count in lieu an equivalent period of experience of the practice of medicine (section 5 of the Act)."

As to amendments of the disciplinary provisions of the Bill, a requirement had been added about the arrangements to be made by the Medical Disciplinary Committee for the hearing of cases that at least two of the members of the Council elected by the profession, being members of the committee, must be eligible to attend every hearing (Section 15 (4) of the Act). The Minister had made it clear in accepting the amendment that the requirement was a requirement to invite two such members, but that proceedings before the committee were not to be invalidated because members so invited did not attend a hearing.

The scope of the rules of procedure to be made by the Medical Disciplinary Committee had been extended in order to secure that the rules should include provision for requiring that matters should not be referred to the committee until they had, in the manner provided by the rules, been brought before and investigated by a committee of the Council constituted in accordance with the rules (section 16 (2) (*a*) of the Act). Members would appreciate that the committee of first instance would in effect be the Penal Cases Committee as they now knew it. There was no mention of that committee in the Act of 1858, and the amendment made the procedure of the committee subject to regulation by statutory instrument.

"A further amendment affecting both the committee of first instance and the Medical Disciplinary Committee requires the latter committee to include provision in the rules for securing that any member of the Penal Cases Committee, other than the president, who has acted as such in relation to any matter shall not act in relation to that matter as a member of the Medical Disciplinary Committee (section 16 (2) (*a*) of the Act).

"The acceptance of this amendment by the Minister on the simple ground that 'the idea is that those who have already taken part in screening have a tendency to pre-judge' was the last word in a lengthy and ardent discussion of the proposal extending back to the preliminary stages of the preparation of a Bill.

"It would ill become the person who for the time being holds the office of president to discuss the certificate of immunity from bias which Parliament has thus granted to him; and it would not be fruitful to seek for the rationale of the protection against bias in reality, or even in appearance, against which it has been thought right to protect other members of the Council who might have served in the dual capacity. Our business is to accept cheerfully the decision of the Legislature and to make it work. I doubt not that we shall be able to man both committees as separate organizations.

"By another amendment arrived at after an amount of debate which has probably surprised my colleagues as much as it did me, the language of the subsection which makes findings of fact by superior courts in matrimonial proceedings conclusive evidence of any fact so found (section 18 (2) of the Act) was mollified in order, as the Minister put it in words which I would fain borrow, 'so to muffle the blade of the axe as to make it almost look like a benediction.'"

The President concluded by stating that the Council was not in a position to proceed to the appointment of the Medical Disciplinary Committee and the legal assessor or assessors to that committee at the present session, because the Act required the committee to include at least two lay members of the Council, and two such members additional to Lord Nathan who were to be nominated by the King with the advice of the Privy Council had not yet been nominated. In these

circumstances the Council felt that it was its duty to meet again in February, 1951, when the Medical Disciplinary Committee would be appointed and would set to work on its draft rules of procedure. At that meeting any disciplinary cases left over from the present session would be taken.

DISCIPLINARY CASES

Charge Against a Practitioner by a Patient

The Council on November 28 considered the case of John William Paterson Collier, M.B., Ch.B., registered as of Church Road, Yapton, Sussex, who was summoned on the charge that he called on April 9, 1949, at the house of a Mrs. Hitchman for the purpose of attending her infant child and was under the influence of alcohol to such an extent that his professional judgment was impaired. Information in the case was received from the Ministry of Health. The case was called at the previous session of the Council but was adjourned owing to the illness of certain witnesses.

Dr. Collier appeared in answer to the charge, accompanied by Mr. Gerald Howard, K.C., instructed by Messrs. Hempsons, on behalf of the Medical Defence Union of Scotland. The facts of the case were presented by Mr. Harold Brown, instructed by the solicitors to the Council.

Mr. Harold Brown said that Mr. and Mrs. Hitchman were on Dr. Collier's list. On April 7, 1949, he delivered Mrs. Hitchman of a male child. On the evening of the following day, at about 7.45 p.m., the parents thought the child looked ill, and, following a call by the district nurse, several unsuccessful efforts were made to get in touch with Dr. Collier by telephone. No answer was received to repeated calls, but at last, shortly after midnight, Dr. Collier arrived at the house. Mr. Hitchman said that the doctor was the worse for drink, that his breath smelt of alcohol, that he stumbled upstairs, and stumbled again when he went out of the door. Mrs. Hitchman stated that in the bedroom he slumped down on the bed, made a cursory examination of the child, and said, "The baby's all right." He left within ten minutes, and as he went out rubbed his hand over the nurse's face. The baby died within twenty minutes of Dr. Collier's departure; in the meantime the husband had telephoned Dr. Collier's then partner, but the baby was dead by the time he arrived. The district nurse, who was in the house from 7.30 p.m. to 1.30 a.m., had refused to give evidence, and the evidence, therefore, was confined to the husband and wife.

In cross-examination Mr. Hitchman refused to accept the suggestion that, being worried by the delay in the doctor's coming, and perhaps rather indignant, he made an inference about Dr. Collier's condition which was not justified. No post-mortem examination was made on the child, and Dr. Collier gave the certificate. He added that he and his wife were still on Dr. Collier's list.

Mrs. Gladys May Hitchman gave supporting testimony. She also stated that this was her third child, and the first had died apparently of a similar illness, so that she was naturally anxious. Asked whether she still had confidence in his skill and ability she replied, "Yes, as a doctor."

Dr. Collier, in giving evidence on his own behalf, said that the baby was premature and a sickly infant. The first child had died of atelectasis, and the parents were worried about this one. He had made a careful examination of the child on the morning of the day of this occurrence, but could find nothing really wrong. That evening he went to a party at a Bognor hotel, and between 11 and 11.30 p.m. he received a call and left for home at once. Arriving at his house, he collected his bag, and went to the Hitchmans'. He strongly denied that he was under the influence of drink. The child was breathless but no more ill than it had been in the morning. There was no more that he could have done for the child than he did. He considered that the child was at any time likely to die, but there was no special reason to expect sudden death that night.

In cross-examination he said that he put "atelectasis" on the death certificate. The child weighed 5¾ lb. Asked whether he appreciated that the baby had the same complaint as the first one, he said that he never made a definite clinical diagnosis. He was also asked whether he was surprised to learn that after his departure from the house the nurse sent for his partner; he replied, "I cannot say I thought about it." He learned from his partner of the baby's death an hour or so afterwards. He had taken a very moderate amount of alcohol at the party.

Dr. Collier was questioned about the cause of the baby's death. He said that where sudden death of such an infant occurred one had to select among a number of congenital states. The trouble did not appertain to the heart or brain; everything pointed to the chest, and he put down atelectasis as the differential diagnosis. From birth, although respiration was established, it was shallow respiration. The child always had a bluish tinge. It was not taking the breast properly.

Three witnesses who had been with Dr. Collier at the party testified to his absolute sobriety, as did another witness who saw him on his return home.

Mr. Howard, in a closing speech on behalf of Dr. Collier, said that the only thing for which he had to reproach himself was for leaving his practice unattended for a number of hours. He asked the Council to dismiss the allegation of being under the influence of alcohol and of any consequent negligence.

The Council deliberated *in camera*, and on the readmission of strangers the President announced that the Council had found that the facts alleged against Dr. Collier in the charge had not been proved to their satisfaction. The case was dismissed.

Cases Coming up for Judgment

The Council considered the case of Mrs. Ethel Grundy Toward, registered as of Birtley, Co. Durham, who, at a previous session, had been found to have been convicted at Gateshead on July 19, 1948, of driving a motor-car when under the influence of drink or drugs to such an extent as to be incapable of having proper control. Mrs. Toward appeared and produced satisfactory testimonials, and the Council decided not to instruct the Registrar to erase her name, and dismissed the case.

Cases Arising out of Convictions

The Council considered the case of Eric Leonard Neil Shoeten Sack, registered as of Trinity Court, Gray's Inn Road, London, W.C.1, who was summoned on the charge that he had been convicted at the Tower Bridge magistrates' court on March 13 last of receiving two suitcases containing property to the value of £50, knowing the same to have been stolen, and was fined £20 and 10 guineas costs. Dr. Sack appeared, and was accompanied by Mr. Leigh Taylor, of Messrs. Hempsons, solicitors, instructed by the Medical Defence Union.

The Council's solicitor having stated the facts revealed at the police court, and that Dr. Sack had given notice of appeal but had subsequently withdrawn it, the respondent went into the witness-box and in reply to Mr. Taylor said that at the time of the occurrence he held the position of ophthalmic registrar at King's College Hospital. In order to control nervousness and excitability he began to take sodium amytal fairly regularly, though when he was away from his work he did not take it. On the Monday of the week in which this occurrence took place, following some dispute between himself and a colleague, he began to increase the dose, and on the day in question he took as much, altogether, as 24 g. He had an appointment that afternoon with the Medical Defence Union; he remembered leaving their offices, but recalled nothing else until he found himself in a taxi with police officers and with the open suitcase in front of him. His memory of the events of that afternoon was quite incomplete. He had told this story to the magistrate, who had said that he had never known a man so drugged as not to know what he was doing. He decided to appeal, but afterwards withdrew his appeal in order to avoid further publicity. He had now altogether given up sodium amytal and felt himself absolutely confident of avoiding it altogether in the future. In reply to a question he said that the dosage on which he started was 3 g. a day.

Dr. Robert Forbes, secretary, Medical Defence Union, said that Dr. Sack came to see him by appointment on the day in question, and while he was taking the preliminary notes of the interview he was struck by his general demeanour, and began to take a professional interest in him. His face was congested, his pupils dilated, and he had some difficulty in speech and in holding up his head, and towards the end of the interview he was rather worse than at the beginning. He had made a note at the time, "His demeanour appeared to be that of someone who was under the influence of a drug." His demeanour and appearance were now quite different.

Mr. L. H. Savin, F.R.C.S., who was Dr. Sack's chief at King's College Hospital, said that Dr. Sack had held the appointment for about two months. He was a highly conscientious man, exceedingly scrupulous, a man of rather nervous temperament, and inclined to worry if a patient was not doing as well as he wished. His offence was certainly not in keeping with his normal character. He saw him after the conviction, at which time he could not speak coherently, and he called a psychiatrist colleague to see him. In the course of the next few hours he had recovered.

Dr. John Henry Watkin, medical superintendent, Leavesden Mental Home, under whom Dr. Sack was now working, said that he had formed a very high opinion indeed of his character. He was a keen medical officer, excellent at his work, and in extremely good relationship with his colleagues. From his own observation of Dr. Sack after three weeks' daily contact he had found no indication whatever that he was taking drugs.

In reply to questions Dr. Watkin said that sodium amytal was known as a drug of addiction, but he had not seen many patients addicted. He thought the danger of addiction was likely to be very much less than with morphine sulphate. The effect of the drug wore off very quickly. Asked whether a person who had taken the drug was likely to give an entirely fictitious name to the police, Dr. Watkin said he thought it quite likely.

Mrs. Sack gave evidence on behalf of her husband, saying that he was now entirely free from any influence of drugs.

Mr. Leigh Taylor, speaking on behalf of Dr. Sack, said that following the conviction eight months ago he had managed to maintain his freedom from the drug despite the stress and strain of his experiences, culminating in his appearance before the Council.

After the Council had deliberated *in camera* the President announced that the conviction had been proved, but in order to assist Dr. Sack to overcome the tendency to which he attributed the act leading to his conviction the Council had decided to postpone judgment for one year, until November, 1951, when Dr. Sack would be required to appear before the Council again and to produce testimonials from professional colleagues as to his conduct in the interval, with special reference to the question whether he had continued to refrain from the use of drugs.

The Council considered the case of Frederick James Hopkins-Husson, registered as of Ann Street, Edinburgh, M.B.Calcutta, 1941, who was summoned on the charge that at York Assizes beginning on November 5, 1949, he had been convicted of an offence against a boy aged 14 between June 1 and 30, 1949, at Stockton-on-Tees, and had been sentenced to be imprisoned for 12 calendar months. In May, 1950, the Council, on the application of the practitioner, postponed the inquiry pending the result of an appeal. The Council's solicitor presented the facts of the case, and Dr. Hopkins-Husson was represented by Mr. Harold Brown, counsel.

In opening the case for the respondent, Mr. Brown referred to the legal arguments in the Spackman case, on which there was judgment by the House of Lords. It was held that the Council could not go behind a conviction, but he felt that certain facts should be placed before the Council. This was not an ordinary case in which there was a conviction and nothing more to be said. As the Lord Chief Justice had stated in the Court of Criminal Appeal, the trial judge was obviously in favour of acquittal. The trial judge had stated that the verdict was an unexpected one; he deferred pronouncing sentence from Durham to York assizes, and in passing sentence he said that he did not agree with the verdict and did not understand it. When the matter came before the Appeal Court the Lord Chief Justice considered it to be so important that he ordered it to be heard before a full court of five judges. The appeal was dismissed on the ground that the court could not interfere with the verdict of the jury. The boy in question had not been treated by the doctor, though he was on the doctor's list. The point might arise on some occasion whether being on a doctor's list constituted a professional relationship. The family of the boy continued to be patients of the doctor for months afterwards, and, as the judge had said, "Can you believe the parents believed that boy's story?" Mr. Brown submitted that, even if the Council could not go behind a conviction, if they were presented merely with the bald fact of the conviction they would be incompletely armed with the relevant facts. The surrounding circumstances were a matter for the consideration of the Council.

Dr. Hopkins-Husson, in giving evidence, said he had at all times maintained his innocence. Since his release he had resumed practice in the same district and now had 1,600 patients on his list. Evidence of character was given by a doctor who had been a fellow student of Dr. Hopkins-Husson and by two patients. A statutory declaration was read, and the evidence as to character given at the assize court was repeated.

After deliberation *in camera* the Council found that Dr. Hopkins-Husson had been convicted of the misdemeanour, but it did not see fit to direct the Registrar to erase his name.

The Council considered the case of William Melrose, registered as of St. Paul's Square, Liverpool, L.R.C.P., L.R.C.S.Ed., 1924, L.R.F.P.S.Glas., 1924, who appeared on the charge that he had been convicted at Liverpool City Magistrates' Court on July 14, 1950 (after having pleaded guilty), of being found drunk, and had been fined 10s. The Council found the conviction proved, and the President stated that this was not the first time that Dr. Melrose had appeared before the Council in consequence of convictions for drunkenness. The Council took a grave view of this further conviction, which indicated that a habit of intemperance had been formed. It postponed judgment for two years, and at the end of the first year Dr. Melrose would have to appear before the Council with testimonials regarding his conduct in the meantime.

The Council considered the case, adjourned from two previous sessions, of Nigel Harold Maurice Russell Monro, registered as of Sloane Avenue, London, S.W.3, M.R.C.S.Eng., L.R.C.P.Lond., 1936, who appeared to answer to a series of convictions.

The first conviction was on January 23, 1947, at Ashford, Kent, for failing to comply with the Dangerous Drugs Regulations in respect of keeping a proper register. In February, 1947, he was convicted at Bow Street of insulting behaviour and assaulting a constable. In July, 1949, he was convicted at the West London court of being drunk and disorderly and of assaulting a constable. On this latter charge he was ordered to find surety for his good behaviour for the next twelve months. In November, 1949, he was convicted at the Central Criminal Court of assaulting his wife, thereby occasioning her actual bodily harm, and was sentenced to twelve months' imprisonment. The Council's solicitor, in describing the offence against the Dangerous Drugs Regulations, said that most of the entries were defective, many of the lines were taken up by dots, and quantities were given with Roman numerals but without denominations. The Home Office removed the doctor's authorization under the Dangerous Drugs Act.

Dr. Monro, speaking in his own defence, said he appreciated that these were serious charges, but he wanted the Council to understand the circumstances behind each conviction. The inaccurate or incomplete entries in the register were due to a technical error. He had in fact entered the drugs in the book but had entered them on the wrong page. He was wrong in adopting a hostile attitude towards the investigating authorities. He did not regard his first conviction as justified, and it was his sense of grievance, combined with the fact that he was not well at the time—and he had at that time been having drugs; he did not wish to hide anything from the Council—which accounted for the circumstances of the second conviction a fortnight later. The police officer pushed him along and would not listen to any explanation. Then for a period of two and a half years there was nothing against him. The third conviction arose out of a similar incident. The assault upon the police was the result of his resentment of physical compulsion; the police officer shoved him, and he shoved him back. He realized that he should not have done so. The assault upon his wife which led to the fourth conviction was the culmination of much domestic unhappiness. He bitterly regretted his loss of temper; he had suffered physically and mentally as the result. But the whole circumstance was magnified because this was at a time when he was under surety for good behaviour, and his breach of recognizances explained the severity of the sentence. Since leaving prison in July he had been engaged in private practice in London, and he read a number of grateful and appreciative letters which he had received from his present patients.

The Council considered the case in private. The President then said that these serious convictions had led the Council to consider whether it was in the public interest that Dr. Monro should continue to be a registered practitioner; but in view of his frank statement and the recent testimonials from patients the Council had decided to give him a further chance. Judgment would be postponed for two years, until November, 1952, but the Council would desire to see Dr. Monro in November, 1951, when he would be required to produce testimonials from professional colleagues and other persons of standing concerning his conduct in the interval.

In three cases down on the list for hearing it had been impossible to secure the attendance of the practitioners concerned, and the cases were postponed until the special February session.

Unproved Allegation against a Doctor

The Council considered the case of Florence Joseph O'Driscoll, registered as of Moss Lane, Liverpool, 9, M.B., B.Ch., 1928, N.U.Irel., who was summoned on the charge that on May 31, 1950, he was under the influence of drink so as to be incapable of carrying out his professional duties towards patients waiting to consult him, in particular in the case of a Mrs. Doreen Shone, one of the said patients. The Council received information in this case from the Chief Constable of Liverpool. The practitioner was represented by Mr. D. Braben, counsel, instructed by Messrs. Behn, Twyford, and Reece, solicitors.

Mr. Gerald Howard, K.C., *presented the facts to the Council.* He said that Mrs. Shone was not present and the only evidence would be that of two police officers. Inspector James Smale, of the Liverpool Constabulary, said that on May 31, in response to a telephone message, he, with a detective sergeant, went to the doctor's surgery. The doctor leaned against the door, his breath "smelt of spirits," and the inspector told him he was not in a fit condition to deal with further patients that night, to which the doctor replied, "I understand, inspector." When he told the doctor the nature of the complaint which had been received he asked for the name of the complainant, which was not given him. He considered that the doctor was under the influence of drink and unfit to deal with patients. Both officers were cross-examined, and Sergeant Metcalfe, when asked by what right he entered the house, agreed that they were on "rather delicate ground," but they were never told that they could not come in. Inspector Smale agreed that he asked the doctor his age, the facts of his tenancy, and whether he was married. The doctor's answers were all "thought over." He did not ask him how many drinks he had had ; he could see that he had had too many.

Dr. O'Driscoll, in evidence, said that Mrs. Shone was a patient on his list to whom he was giving antenatal treatment. When she came to his surgery on the night in question he inadvertently called her by the name of another patient, afterwards apologizing for his mistake. He was aware of nothing which caused Mrs. Shone to bring her complaint beyond the fact that he had called her by the wrong name. He thought the officers had forced themselves into the house, and to justify their action were going to make out a charge of drunkenness. His evening surgery had been open for an hour and a half, during which time he had seen about a dozen patients, none of whom had made any complaint. Two patients who had visited the doctor on the evening in question affirmed his sobriety, and another witness testified to the same effect.

After an address by the respondent's counsel the Council deliberated for a very short time *in camera*, after which it was announced that it had found the facts alleged not proved to its satisfaction.

Alleged Canvassing

The Council considered on December 1 the case of Eugene Wlodzimierz Collis, registered as of Woodstock Road, Oxford, M.D.Vilno, 1937, who was summoned on two charges relating to the procurement of patients. The first concerned the canvassing of the patients of the practice of Dr. G. G. Cooke, of Oldbury, Worcestershire, and the second of canvassing the patients of the practice of Drs. Lockley, Howson, and Barrada, who were in partnership in Oldbury, and specifically of procuring or endeavouring to procure five patients of this practice and, in two of the cases, their families also. The charge relating to one of these five cases was dropped owing to the inability of the patient to attend as a witness and the inadmissibility of a statutory declaration.

Dr. Collis attended, with Mr. E. J. P. Cussen, counsel. The complainants were Dr. R. M. Howson and Dr. Hazem Barrada, who were represented by Mr. Norman Richards, counsel. Dr. N. E. Waterfield, a member of the Council, said that similar charges were considered by the Central Ethical Committee of the British Medical Association, and as he was a member of that committee he thought it advisable that he should take no part in the present proceedings.

Mr. Norman Richards said that the charges covered the period, May, 1949, to September, 1950. Dr. Collis in 1949 settled in practice in Oldbury, purchasing the house of a Dr. Harper, who had died. In the summer of that year it became known that Dr. G. G. Cooke, another practitioner in the town, was about to retire, and there had been inquiries about who was to succeed to his practice. On July 18 Dr. Collis received a letter from the chairman of the executive council stating that he understood that, provided the executive council, the local medical committee, and the Medical Practices Committee agreed, he would be prepared to take over Dr. Cooke's practice on October 1, a condition being that by that time he would have obtained a permanent assistant with a view to partnership. The letter went on to say that in that case it would be advisable for him to get an assistant early in September. On August 11, however, he received another letter stating that it was understood to be agreed that Dr. Cooke's partner, Dr. Squair, was the logical successor in the practice.

The first charge related to a Mrs. E. H. Round, of Oldbury, who stated that Dr. Cooke was first called in to attend her mother-in-law in an accident, but later she asked Dr. Collis to attend privately. Dr. Collis was told that Dr. Cooke was the doctor who had Mrs. Round and her family on his list. Later on Dr. Collis called at the house without being requested and told Mrs. Round that he was taking over Dr. Cooke's practice. Thinking this to be the normal procedure, she handed over to him the medical cards of her family. In the second case a Mr. Benjamin Sadler, who had been Dr. Harper's patient, went to Dr. Harper's surgery and found Dr. Collis in possession. It was alleged that Dr. Collis asked about Mrs. Sadler, who was a patient of the practice of Dr. Mence, to which the present complainants were the successors, and told Mr. Sadler that if he could have both him and his wife on his list he could get them "full benefit." On this Mrs. Sadler went to the surgery, and, it was alleged, after some conversation was told that she was on the books of his practice. In a third case it was alleged that a Mr. Benjamin Griffiths, who wanted to come on to Dr. Collis's list, was told that his acceptance was subject to the transfer of the five members of his family, and Mr. Griffiths was induced to sign and return the cards. Another patient, Mrs. Daisy Cutler, who was on Dr. Barrada's list, was induced to sign a form of application for acceptance on Dr. Collis's list. Another patient who was on Dr. Barrada's list, a Mrs. Fletcher, desiring to have her child circumcised by Dr. Barrada under a private arrangement, arranged for the transfer of the child to the list of Dr. Collis, and then, it was alleged, Dr. Collis endeavoured to procure Mrs. Fletcher herself and her husband, who were patients of the partnership practice, to sign forms of application for acceptance by him.

Evidence bearing out counsel's statement was given by all these witnesses. Mrs. Round said that, after she had surrendered the cards, she realized that something was wrong or unethical. Mr. Sadler said that some months after Dr. Collis had taken both himself and his wife on his list he came round to their house, said that he was very much upset because people were complaining of him, and asked Mr. Sadler to sign a paper, which he did, though he did not read it. It was understood that this paper was a declaration that the change had been made on Mr. Sadler's initiative, and that it related not to the present inquiry before the Council, but to the inquiry by the Ethical Committee of the British Medical Association.

Dr. Collis, in evidence on his own behalf, said that he practised in Poland until 1939, served in the Polish Army until 1941, then volunteered for service in the British Forces and went in the R.A.M.C. to West Africa until July, 1944, when he was demobilized. In 1941 he was placed on the temporary *Medical Register* and transferred to the permanent one in 1946. From 1944 to 1949 he practised at various places as locumtenent, and in May, 1949, at Oldbury, purchased the house of a Dr. Harper who had recently died. He made the purchase by putting an advertisement in the *British Medical Journal*. While carrying on his practice there he had a conversation with Dr. Cooke, and learned that he proposed to retire. Dr. Cooke had a partner, but he understood that he had no intention of following on in the practice. The chairman of the executive council told him that there was no reason why he should not succeed to the practice, and he took that to be an indication that he was likely to succeed. Accordingly he took an assistant and made certain alterations to the premises. At his first meeting with Mrs. Round she said she would like him to be her private doctor. Later she said she had heard that Dr. Cooke was going to retire and that he was taking over the practice. He was surprised at the statement, because everything so far had been confidential ; he assumed that Dr. Cooke had divulged the information. He had had no idea of wilfully taking patients away from other doctors. Mr. Griffiths came to the surgery, told him that he was a patient of the late Dr. Harper, and asked him to accept him. Dr. Collis denied that he asked for the transference of the family ; on the contrary, he told Mr. Griffiths that he was a new man starting from scratch. What several of the witnesses had said was inaccurate and confused. The episode concerning Mrs. Fletcher occurred when he was away on holiday, and he never heard of the operation having been performed by his locumtenent until it was brought to his notice by the solicitors as a subject of complaint.

In reply to Sir Henry Cohen he said that he started at Oldbury 18 months ago from scratch ; he now had a list of 1,800, and he agreed it was likely that patients had come on to his list from that of the partners who were the complainants.

Mr. Cussen said that Dr. Collis was a Pole, and here and there his English had been difficult to follow even in the witness-box, so that it was very likely that this would account for confusion and misunderstanding in the various conversations which were the subject of evidence.

After a brief deliberation *in camera* the Council found that the facts alleged against Dr. Collis in the notice of inquiry had not been proved to its satisfaction, and dismissed the complaint.

Relationship with Female Patient

The Council considered on November 30 and December 1 the case of Illtyd Gwyn Williams, registered as of Tynewydd Road, Barry, Glam., M.B., Ch.B.Ed., 1923, who was summoned on the charge that in February, 1948, and on numerous occasions thereafter during the period ending in or about October, 1948, he had sexual intercourse with Mrs. Ceinwen Williams, of Barry, with whom at all material times he stood in professional relationship.

The complainant was Mrs. Ceinwen Williams, whose counsel, Mr. Morgan, in presenting the complaint, said that in 1940 Dr. Williams became the family doctor of Mrs. Williams's father and mother, and from 1945 or thereabouts Mrs. Williams's doctor also. At first Mrs. Williams was on the doctor's National Health Insurance list, but later, owing to reaching a higher income scale, she passed out of the National Health Insurance and continued as a private patient. The two people became friendly, and in December, 1947, Dr. Williams proposed marriage and was accepted. On the strength of this proposal Mrs. Williams permitted intercourse to take place. In October, 1948, she noticed a cooling off on the doctor's part, the engagement was broken, and a breach of promise action was begun which resulted in the complainant's favour, with damages of £1,500 and costs. Mrs. Williams gave evidence as to the professional attendances of Dr. Williams. She underwent a major operation in July, 1947, and it was Dr. Williams who made the necessary arrangements and attended her during convalescence.

Dr. Williams in his answer stated that from the time Mrs. Williams and he became engaged he treated her as his future wife and no professional relationship existed between them. He denied that there had been any cooling off on his part. It was Mrs. Williams's general behaviour which resulted in the break.

The Council after private deliberation found the facts proved and that Dr. Williams had been guilty of infamous conduct in a professional respect, and instructed the Registrar to erase the name of Illtyd Gwyn Williams from the *Medical Register*.

Restorations

It was announced that the following names had been restored to the *Medical Register*: William Hamilton, Gerald Donagh Flatley, and Henry Charles Coutts Hackney.

Latin Titles in the Pharmacopoeia

Of the business of the Council other than disciplinary the only item of note was the report of the Pharmacopoeia Committee, embodying a report of the British Pharmacopoeia Commission, which stated that the use of Latin titles for the monographs in the *British Pharmacopoeia* had been reviewed, and it was the unanimous opinion of the Commission that the main titles of the monographs in the volume of 1953 should be stated in English. It was proposed that Latin titles formerly used should be retained as synonyms, but that Latin titles should not be coined for new monographs. In the *Addendum* which is about to be published it is felt, in view of this decision, that no useful purpose would be served by inventing Latin titles for the monographs on preparations of human blood, which will appear as a separate section with titles in English.

ASSISTANTS AND UNESTABLISHED DOCTORS

SPECIAL GROUP ASKED FOR

A meeting was held in London on November 29 which was attended by a large number of unestablished practitioners and assistants. Dr. H. Rezler, in the chair, invited discussion on a provisional statement of policy which had been submitted by an interim committee, and asked for a decision concerning ways and means of putting forward the views of this group of doctors.

The discussion which followed covered a wide field, and included entry into general practice, the new procedure for the change of doctor, distribution of general practitioners, and the difficulties met with by doctors with small lists and assistants who had no prospects of becoming principals. The meeting approved by a large majority a resolution to apply to the British Medical Association for the formation of a Special Group as provided for in its constitution.

CHEMISTS' DISPUTE SETTLED

The dispute in the Isle of Man between chemists and the Manx Health Services Board has been settled (*The Times*, December 1). Chemists' shops are now dispensing National Health Service prescriptions.

DOCTORS' COMPENSATION

General practitioners who are entitled to claim compensation for the loss of the right to sell the goodwill of their practices and who have not yet submitted their claims should do so *at once*. Claims should be made by *December 31*. Claims made after that date will not be accepted unless the Minister of Health is satisfied that the delay was due to special circumstances. *Claims made after February 28, 1951, will not be accepted in any circumstances.* Doctors must *not* wait until their retirement before submitting claims.

Doctors who are in doubt about their title to compensation or who require claim forms should write to the Ministry of Health (A.G.D.3c), Whitehall, London, S.W.1.

INVESTIGATION INTO GENERAL PRACTICE

An inquiry into general practice is to be carried out by the General Practice Review Committee of the B.M.A. This Committee was set up by the Council in the summer of this year, and its chairman is Dr. C. W. Walker, of Cambridge.

At a meeting on November 29 the Committee decided that the inquiry should be in two parts. The first part consists in a personal investigation into practices by a single medical investigator with a co-investigator whose identity may vary according to the area. For this purpose it is hoped to obtain a random sample of 200 practices, the sample to be divided up between areas approximately corresponding to the regional hospital board areas in England, Scotland, and Wales.

The second part of the inquiry is to be carried out by means of a postal questionary sent to all general practitioners. There are about 20,000 general practitioners, and these will probably be divided up into groups of 500, doctors in each group being asked to reply to only two questions. In this way replies to about 80 questions can be obtained from the 40 groups.

The samples will be drawn and the questions framed with statistical precautions in mind, and the replies will be analysed by a statistician. Some of the material obtained from the intensive inquiry into 200 practices may also be subjected to statistical analysis.

"CLOSED SHOP" AT DURHAM

MEETING OF DOCTORS

On November 28 the Durham County Council was reported to have reaffirmed its decision to dismiss any of its employees who did not provide evidence of membership of a trade union or professional association. A second meeting of medical officers employed by the county council was accordingly held on December 2 at Durham. Thirty-nine medical officers attended and five others sent letters of support. Dr. William Hunter, honorary secretary of the North of England Branch of the B.M.A., took the chair.

The meeting was addressed by Dr. E. Grey Turner, Assistant Secretary, who said he had read in the Press an argument put forward by the county council in support of its closed shop policy—namely, that non-members of unions or associations should not enjoy the benefits of terms and conditions of work negotiated by the unions or associations. This was a selfish and narrow-minded attitude, he said, which did not appeal to doctors. The B.M.A. was quite content that the small minority of non-members should enjoy the fruits of its labours on behalf of the medical profession. Indeed, any non-member could walk into B.M.A. House in London and receive expert advice and help without hindrance or charge. The Association was convinced that an open-handed and generous attitude to non-members was far the best way of persuading them to become members.

Dr. Grey Turner gave further evidence of united support from the medical profession in opposition to the closed-shop policy and called upon the Durham medical officers to continue their resistance to the county council's instructions.

There followed a brief discussion. To meet the possibility of token dismissals by the county council, arrangements were planned by which the work of dismissed medical officers would not be undertaken by any other doctor. The meeting resolved unanimously to adhere to its earlier decision to ignore the instructions of the county council. Arrangements were again made to contact personally those doctors who were unavoidably prevented from attending the meeting.

CARIBBEAN CONFERENCE

A British Medical Association Conference will take place at Port of Spain, Trinidad, in the week beginning January 8, 1951. The Conference will consist of a business meeting, which will be attended by delegates from the Caribbean Branches of the Association and by Dr. H. Guy Dain and Dr. H. B. Morgan from the Council, and of a number of scientific sessions. The agenda for the business meeting will be heavy and will include discussion of the impact upon the medical services of the proposed federation of the Caribbean Colonies, of the relations between the B.M.A. Branches and the Colonial Governments, and of the relations between the medical profession and the Press. The Honorary Secretary of the Conference will be Dr. J. A. Waterman, 24, Coblentz Avenue, Port of Spain, Trinidad.

MEDICAL EXCHANGES WITH NORTH AMERICA

The International Relations Committee of the B.M.A. is in consultation with the Canadian and American Medical Associations in an endeavour to work out a scheme by which a limited number of British doctors could visit Canada or the U.S.A. each year in exchange for the same number of visiting doctors from North America. The visits will be for professional purposes and will be at the expense of the doctors concerned. The object of the scheme will be to overcome currency barriers, and in due course it will be submitted to the Bank of England for approval.

SHORT-SERVICE COMMISSIONS IN R.A.M.C.

The War Office has announced new regulations with regard to short-service commissions in the R.A.M.C. These provide for the recruitment of general duty medical officers, specialist medical officers, and women doctors. Commissions will be granted for a period of eight years from the date of appointment, of which any period from two to eight years may be spent on the active list and the balance in the Regular Army Reserve of Officers. Extensions of one or more years on the active list may be granted up to a total of eight years' active-list service.

Applicants with less than 12 months' service on full pay as a medical officer will be appointed in the rank of lieutenant. Those with 12 months or more of such service, whether National Service or other, will be appointed in the rank of captain. Promotion to captain takes place on completion of a total of 12 months' service on full pay.

On the satisfactory completion of the active-list period, short-service officers will receive on retirement tax-free gratuities as under:

For two years' service, £240.

For three years' service, £450 plus £150 for each year's completed service over three years.

Heard at Headquarters

Disciplinary Delays

At its recent session the General Medical Council had 17 disciplinary cases on its list, but some of them were postponed until a special session in February, and one until May. Only one case involved a charge of canvassing, and that was dismissed. Such charges seem to have diminished in number in recent years. The Council is notably patient with offenders. One practitioner was convicted of certain misdemeanours in 1945. He was summoned to appear before the Council, but failed to turn up owing to illness. The hearing was postponed at no fewer than six sessions. In 1948 the case was dealt with and the convictions proved, but judgment was postponed for a year. At the end of that year it was postponed for a further six months. When the case came forward at the session just held it was stated that the practitioner had had another conviction and was now in prison. The Council thereupon postponed judgment for a further three months.

R.C.S. and G.M.C.

Reference was made at the recent session of the General Medical Council to the close connexion between that body and the Royal College of Surgeons of England. The first President of the General Medical Council, in 1858, was Sir Benjamin Brodie, a Past President of the Royal College. The second President of the Council, Mr. J. H. Green, was also a Past President of the Royal College, and so was a later President of the Council, Mr. John Marshall. Those who have been Presidents of the Royal College and members of the Council include Sir William Lawrence, Richard Quain, Sir James Paget, Sir John Simon, and Sir Henry Morris, among others, and the present President of the Royal College, Sir Cecil Wakeley, is a member of the Council. With the election of Professor Hilda Lloyd as a member of the G.M.C., the Council has now among its members the Presidents of the three Royal Colleges in London.

Eye Service

The recent conference of executive councils at Harrogate threw some light on unexpected benefits from the National Health Service. One story told was of a charlady who, wanting a pair of spectacles, managed to get two pairs, and two pairs for her husband, and also a pair for her aged mother. Unfortunately, the mother died soon after she had been fitted, but were the spectacles wasted? Not at all. They were placed on her in her coffin, and the daughter declared that they made her look ten years younger. The neighbours all came in and said she "looked lovely."

REGISTRARS' GROUP

South-east Metropolitan Region.—A general meeting of registrars in the South-east Metropolitan Hospital Region will be held at B.M.A. House on Friday, December 15, at 7 p.m.

South-western Region.—A general meeting of registrars in the South-western Hospital Region will be held in the board-room of the Bristol Royal Infirmary on Tuesday, December 12, at 7.45 p.m.

South-west Metropolitan Region (Western Area).—A general meeting of registrars in the South-west Metropolitan Hospital Region (Western Area) will be held at the Royal South Hants Hospital, Southampton, on Saturday, December 16, at 3 p.m.

Correspondence

General-practitioner and Consultant Surgeons

SIR,—I do not often write about remuneration, but besides being important to the recipient it has a sort of prestige value and gives an indication of the value put on the services rendered. From this point of view it will probably be of interest to general practitioners—perhaps even to the Minister of Health, who is probably unaware of a lot that is done in his name—to state a few facts that have just been brought to light by representatives of the regional hospital board when they visited our local hospital to discuss the way the surgical needs of the local population may best be met. I am slightly affected by these matters, but I will try to put them quite fairly.

Our little hospital is one in which for some fifty years the local practitioners have done most of their own surgery, calling in consultants, etc., when desirable. Now this is changed, and we have one local practitioner appointed as S.H.M.O. (which, in spite of the prejudice against the grade, is a good thing) and a visiting surgeon who comes regularly once a week. The figures given to us at the meeting by the representatives of the regional hospital board show that in 1949 the S.H.M.O. and the surgeon between them performed 53 operations, while the general practitioners—whose remuneration, such as it is, comes from the "staff fund"—performed 433. These figures do not show quite what will happen this year, for the surgeon did not really function much till about July. Still, they are striking, and no less striking is the regulation that whereas a paid anaesthetist is provided for the surgeon and S.H.M.O. no anaesthetist is provided—or can be provided—for a G.P. surgeon.

The economics of this situation are intriguing. It was originally reckoned that operations would be performed on four days a week, and so four anaesthetic sessions were provided for. Now, however, that it proves that there is barely work for the S.H.M.O. and the visiting surgeon for one session each week the anaesthetists are to be cut down to two—a clear saving for the regional hospital board of two sessions a week, while doctors "give" anaesthetics for G.P. surgeons, who do the lion's share of the work, and get nothing for it. The economy drive is thus proving a strong incentive to the regional boards to use practitioners in hospitals—the recent action of the Minister about them replacing registrars is suggestive—for where G.P.s do the work they apparently get nothing, while the employment of a "surgeon" involves payment of an anaesthetist as well.

Even supposing—as may happen—that this year the S.H.M.O. and surgeon between them do 150 operations at Winsford and the G.P.s as few as 300, it will, I think, strike most people as unjust that the 150 should be paid for and that the 300 should be performed and anaesthetized by the G.P.s at financial loss to themselves, for the "staff fund" was really intended as a sort of token payment to G.P.s for looking after cases in hospital after they had been operated on by paid surgeons. We have carried on so far because our patients have wished it and because it was obviously the right thing to do. Had we not done so these patients would have been swelling the waiting-lists of other hospitals, for, inconvenient though it may be for the planners and sometimes for the doctors, if patients cannot get their own doctor to treat them in the local hospital they display the strongest objection to being operated on by an outsider, however much he may be recommended by the regional hospital board.

The Treasury may, as was implied by the regional board representatives, approve of these invidious financial regulations—as the Act lays down that it should—but that does not alter the fact that such unjust regulations should be changed forthwith, for even a G.P. is worthy of his hire.—I am, etc.,

Winsford, Cheshire. W. N. LEAK.

Unite the Profession

SIR,—At the moment we have a breathing-space before we begin to collect signatures to forms of resignation from the N.H.S. We must utilize this opportunity to survey the position.

No one can deny that this country deserves the finest medical service that it can afford, and no one can deny that there is much room for improvement in the one that it has got, and it is unlikely that it can function efficiently if many of its workers are unhappy in their work. Certainly a great many doctors are unhappy for a variety of causes. Some are financially embarrassed, others are working too hard, many feel that they are not doing the work of which they are capable or for which they have spent years of training. Some are uncertain of their future, some cannot find a sphere of work at all.

One of the causes of a great deal of difficulty is the fundamental disagreements between different branches of the profession. The most wise and sympathetic Minister of Health would find it difficult to decide between conflicting advice and claims.

Surely it would be useful now for the good of the Service, the general public, and the profession if all branches tried to reach agreement on those matters which at present divide them. Afterwards the next step must be for a common agreement on those remedies necessary to remove the present discontents. I mention some of the most pressing: remuneration for G.P.s and the public health officers; a better distribution of properly paid work among G.P.s so that none are overworked and there is room for more of those who wish to enter general practice; the present position of registrars; the vexed question of grading; the uncertain position of many specialists; and the frustrations of many in the public health service. We should be in a much stronger position if we could get together as a united profession and present to the country and the Minister a united claim to remedy our grievances.

Many of the problems that seek a solution affect more than one of the sections of the profession. As *The Times* pointed out in an excellent leading article on November 25, which dealt with the latest decree limiting the number of registrars, if these able men must find other spheres of usefulness, it leads directly to an examination of the numbers of G.P.s and how to get more men into practice. In turn this may lead to an integration of the hospital and G.P. services, so ending the lamentable divorce that now exists.

There are widely differing views on the maternity service. I am informed that the official standard of maternity beds in hospitals is based on providing for 75% of the expected number of confinements. If so, many members of the admirable corps of midwives will find themselves redundant. I have also been told that it would be cheaper to make a grant to women who decide to have their babies at home, pay for the G.P. obstetrician and midwife, and provide a home help where necessary, keeping only sufficient hospital beds for the complicated cases and for those whose home circumstances were impossible. Thus, besides a saving in costs, beds would be released for other pressing claims—e.g., tuberculosis.

I have not attempted, nor could I ask for space, to make an exhaustive examination of the points where remedies are needed or to show how interrelated are the different sections of the profession. At the moment the G.P. section is not only the most numerous but the better organized and has the most political experience. Moreover, it is the only one with a fighting fund. Nevertheless, its members know that they are members of a great profession and still feel that the wrongs of one branch are the affair of all. In the new British Medical Guild a

weapon is being fashioned to help each and every section. Here and now is an opportunity that shouts for recognition, but if allowed to slip may suffer the fate foretold by Shakespeare for those who fail to use a favourable tide.

To sum up, let the B.M.A. during the next few months make a determined effort to bring together all sections of the profession and iron out so far as possible their conflicting aims; then formulate a joint programme on which all can unite as a fair and just demand which will help to provide the country with a far better health service. There can be no doubt that such a programme backed by the whole profession would have an appeal and a weight behind it that neither the country nor the Minister could ignore.—I am, etc.,

Weymouth, Dorset. J. A. PRIDHAM.

Hospital Threatened

SIR,—There are many historical cases in which a resolute minority has forced a decision upon a reluctant majority, and doubtless some of the Kingston G.P.s who have obtained notoriety in their fight against the regional hospital board visualize themselves as such a historic band. Such victories, however, are won only when certain basic prerequisites are present—namely, that the case to be fought should be good and demonstrably in the public interest and that the fight should be conducted with scrupulous fairness and attention to such virtues as truth and a willingness to grant that the other side may also be socially activated.

The G.P.s at Kingston Victoria Hospital have lost because their revolt had not these sound foundations. The regional hospital board has done everything in its power to have its schemes publicized and criticized. The Press have been at every meeting of the board and the hospital management committee at which this question has been considered. The need was first given priority at a meeting eighteen months ago in the Victoria Hospital by the people who are now fighting it. It has been considered by, among others, the Medical Review, Surrey Area, Maternity, Chest Services, and Medical Advisory Committees of the board, and by the Group Medical Advisory Committee at Kingston. Dr. T. W. Morgan, as secretary of the latter, wrote to the hospital management committee that "the provision of an adequate gynaecological unit should be one of the first considerations." Its effects on staffing, finance, and turnover of patients have all been gone into in great detail. But no meeting of the *whole staff* has ever been called at the Victoria.

Yet neither in your columns nor that of any other periodical has the scheme been given with any accuracy. In the middle of November a leaflet was distributed in Kingston which declared (and underlined) "the Victoria Hospital is to be closed down." This was entirely untrue and possibly for that reason the leaflet bore no imprint and no one knows if it was issued by an individual doctor or the Conservative Party, whose former public relations officer is running the campaign.

Briefly, the change of user at the Victoria is necessary because the staff told the medical review committee that the needs of the area were maternity, gynaecology, orthopaedic, tuberculosis, and chronic-sick beds in that order. The present scheme answers all these demands, but the full details of the change can be understood only on the spot. The final result will be a pure G.P. unit at Surbiton, a gynaecological unit with its own operating theatre, each surgical team at Kingston will have its own theatre, an orthopaedic and fracture unit of 35 beds will be set up, 48 beds for tuberculosis will be opened, and an extra ward of 25 beds and 26 cots added to the maternity block. A change of user without purpose would be condemned by all: a change from which such benefits flow should be commended by all.

A demand has grown up for beds solely in the charge of G.P.s, and the Ministry of Health has suggested to hospital boards that they should make some effort to set aside beds "for such things as are within the scope of the G.P." Surbiton Annexe was offered to the G.P.s of Kingston in an attempt to fulfil that suggestion. Many people have examined it and think it can be made suitable; some of the Victoria G.P.s think it is unsuitable. To resolve this problem we need to know many things. How many beds per G.P. and what things are "within the scope of the G.P." are clearly the most important.

In the Kingston Hospital Group there are, according to the local executive committee list, 125 practitioners. There is no hospital solely staffed by G.P.s: at four G.P.s attend and are governed by the board's general policy that all hospital patients are under control of a specialist. For 153 beds in these smaller hospitals there are 38 sessions of specialist cover plus group services.

If G.P. beds are really "vital to the standard of medicine" should these 153 beds be solely under G.P.s, and are they enough for 125 practitioners? If they are enough for the type of case one has in mind, the case that a G.P. can look after if only he can be sure that the patient will have some nursing attention and that instruction *re* medicines and diet will be carried out, how are admissions to be arranged? Is the G.P. still to make his own decision on which case will go to the G.P. unit and which to the district hospital under consultant care? Can a hospital management committee responsible for the finance of the beds—in this group about £125,000 a year—be quite happy just to invite G.P.s to use the beds without employing them or having some direct contract of service? And if G.P.s have time to do this hospital work how does it affect on the one hand the registrar problem and, on the other, how does it reflect on the asserted busyness of the G.P. and on his rate of remuneration?

Clearly, much thinking is needed on this subject, and the South-west Metropolitan Regional Hospital Board is seeking a solution by proposing different experiments in different hospital groups; but nailing flags to masts, fighting to last ditches, and all the other procedures that were threatened at Kingston will get the G.P. nowhere. If G.P. beds on something like the above scale were provided all over the country they would cost the country some £20m. a year: and the country will want to be convinced by reason, not swayed by emotion, if it is to spend that proportion of the cost of the hospital service in this way.—I am, etc.,

D. STARK MURRAY,
Kingston Group Laboratory.

Public Relations

SIR,—There are several points in the letter from Dr. K. C. Hutchin (*Supplement*, December 2, p. 230) with which I find myself in complete disagreement. However, I particularly wish to comment on his remarks with regard to the work of our Public Relations Department. Dr. Hutchin makes the amazing suggestion that the P.R. Department should misrepresent when it seemed in our interest to do so.

The B.M.A. P.R. Department has built up with the Press a reputation for reliability and honesty that is of the greatest value to the Association in all its contacts with the public. The P.R. Department is in the charge of a very experienced journalist of the highest integrity. Honesty, even in public relations, is the best policy. How Dr. Hutchin expects we can foresee what comments will be made in the press I cannot imagine. In the case he specifies, it is the fact that three newspapers inaccurately reported that the increased contribution was for the National Health Service. The public relations officer immediately sent a letter of protest to the editors concerned. One editor ignored the letter, another published it in full, and the third replied in a personal letter of apology.

Our Public Relations Department is very wide awake.—I am, etc.,

H. GUY DAIN,
Chairman, P.R. Committee.

SIR,—I can well sympathize with Dr. K. C. Hutchin (*Supplement*, December 2, p. 230) and his colleagues in their desire not to strike for more money in a time of national crisis. Many doctors resent having to discuss money in a service whose first thought should be to pay them properly. Nevertheless, the General Medical Services Committee, with the duty of safeguarding our interests, has to swallow its pride and deal with the situation. In so doing, it is discussing a strike for more money. That is a fact, whether some like it or not: personally, I do not.

This being the case, surely Dr. Hutchin's suggestion that the Public Relations Department should suppress the truth and make this fact appear not so is a most dreadful one. It out-

Goebbels Goebbels and reduces us to the level of Moscow Radio. It is a direct insult to the integrity of our public relations officer. Few of us seem to realize that the P.R.O. to a medical organization has a most invidious job, calling for a superman. He has to publicize people who shrink from publicity like the plague. He has to expound the motives of people who would be horrified to think their motives needed expounding at all. He has to run a Chelsea Flower Show with exhibits limited to shrinking violets. Every time the Press publishes something that doctors do not like he is asked why he did not stop it. Yet if an ordinary reporter, uncertain in his ignorance of the motives of certain doctors (for example, those in Sheffield who recently refused to join a health centre), tries to interview them he is told abruptly that doctors do not talk to the Press; so that the poor P.R.O. trying to convey the truth has no support whatever from anybody.

When members of the B.M.A. start to help the Public Relations Department will be time enough for them to start criticizing it. Meanwhile, for pity's sake, let it stick to the truth.—I am, etc.,

Ashtead, Surrey. W. EDWARDS.

Refusal to Sign Death Certificates

SIR,—Much has been written in the *Journal* recently about the members resigning from the N.H.S. I am an opponent of this attitude, as I have already disclosed in the questionary which was sent to us a few months ago.

A local meeting of the Association was held in Burnley last year concerning this point, and I proposed then that the most effective way for us to act was by *not* signing a death certificate: let us attend to the living, but the relatives can look after their dead. I am sorry to say that the motion did not receive a seconder. The Assistant Secretary of the Association from London was present and turned down the proposition by saying it was too drastic. But, I added, what about the transport workers who go on strike and make citizens walk in rain and snow; also the miners who down tools and leave us with fireless grates?

I know that paragraph 11 in every form for medical certificates of the cause of death says "that the practitioner shall sign and give to some person required by this Act to give information concerning the death, etc." In my opinion, if this is to be a strike let us strike hard, and I am certain the Minister of Health will be compelled by public opinion to listen to us before a week passes.

It is so easy for many to sign forms about resignation, but when it comes to the time of trial some will falter—as is evident from the tone of the letters in the *Journal*—especially those practitioners with families and the burden of insurance and building societies.

When the negotiations take place, out-of-pocket expenses such as telephone, petrol, and the cost-of-living index should be considered. The medicals have had a raw deal, but we have ourselves to blame. A second ballot should not have been demanded.—I am, etc.,

Barnoldswick, Yorkshire. T. M. GLEN.

*** A registered medical practitioner is bound, under the Registration of Births and Deaths Acts of 1874 and 1926, to give a certificate of death in relation to a person he has attended during the fatal illness, provided he knows the cause of death. —ED., *B.M.J.*

Fair Conscription

SIR,—I feel that Dr. Lois Price's letter on fair conscription (*Supplement*, November 11, p. 200) calls for some comment. Is the R.A.M.C., which since its formation has had as fine a record as any regiment or corps in the British Army, to be officered, in the event of another emergency, largely by men selected for their failure to serve their country in the last war? Dr. Price was considered fit to serve after three weeks at Crookham and one at the Army School of Hygiene, but is she justified in regarding this as a reasonable standard of training for male officers? Did she have battle experience during her four weeks' initial training, or indeed in the whole of her Army career?

If there should be another emergency in the near future, Territorial officers will be required to serve in the field at the outset, and those who qualified just before or at the beginning of the late war, whom Dr. Price has particularly in mind, will be needed to take command of units. The probable consequences of carrying out Dr. Price's suggestion need no elaboration from me.

Generally speaking, men do not serve their country in time of war in order to qualify themselves for a civilian appointment on demobilization, and there seems no good reason why doctors should be any exception to this rule, particularly as they have the advantage over most other soldiers of being able to practise their profession in the Army, an advantage often overlooked by disgruntled temporary Service M.O.s.

It is difficult not to agree with many of Dr. Price's views, but, if really fair conscription is to be attained, those fit young doctors who stayed behind in the last war, leaving out of account those ready to serve who could not be spared, should be made to serve in any future emergency in some capacity other than that of officers in an honourable corps. This, however, would lead to such shortage of medical man-power that quite obviously fairness is impracticable.—I am, etc.,

Winchcombe, Glos. E. H. EASON.

Independent Inquiry into General Practice

SIR,—I am writing to plead for a serious examination of the position of general practice. The numerous letters which are written to journals and the general sense of dissatisfaction which pervades family doctors emphasize that all is not well with general practice. I am convinced that the universal agitation for increased remuneration will not, even if completely satisfied, produce any permanent happiness, since this ultimately depends on a good job well done, and it is obvious that the job is not a good one under present working conditions and, even with the best will in the world, cannot be done well. I should like to plead for an independent commission of inquiry to report on the state of general practice, to lay down basic needs which must be satisfied if the family doctor as we knew him is to be rehabilitated, to investigate the means by which the recommendations could be implemented, and to present to the people through the Government or directly a statement of the problem and its suggested solution.

Finally I should like to express my views on the basic needs of general practice. As I see them they are:

(1) An adequately trained doctor with time and opportunity to remain adequately trained.

(2) The individual care of one patient by one doctor with the assistance of specialist and public health services.

(3) Limitation of the number of patients to that which can be properly cared for and the doctor to eschew other remunerative employment.

(4) Adequate facilities for the practice of medicine. Radiological and laboratory facilities are as much extensions of manual examination as the stethoscope and the sphygmomanometer.

(5) Adequate record keeping.

I feel that this is a very urgent problem if the family doctor is to be saved before the present tendency to clinic and hospital care becomes too fixed for change to be possible. I believe it would be for the ultimate good of the community and could produce a race of practitioners that would equal the best that specialism could produce.—I am, etc.,

Blackburn, Lancs. FRANK LIVESEY.

*** An inquiry is to be carried out (see p. 239) by the General Practice Review Committee of the B.M.A.—ED., *B.M.J.*

Count Their Blessings

SIR,—I wonder how many of your correspondents, who are constantly writing in to grouse about money matters, realize how well off they are. I wonder, too, how they would like to be in my position.

I qualified three years ago, and my present total assets amount to £100, £90 of which was gained doing a locum this summer. Despite this, however, I am studying full-time for my D.P.H. so as to enter the so-called underpaid public health service.

I am, moreover, not grumbling: on the contrary I am happy and proud to be pursuing my interests. I have tried to take locums whenever I can, but the familiar phrase "Car essential" just makes me laugh: I could not afford a car (much less a wife) in a year of Sundays.

I lost my entire life's savings a couple of years ago during a bout of serious illness, but I did not go squealing to any medical charity, for reasons of pride and independence, and because I have confidence that, barring any further disasters, I can eventually make good. Is pay low in public health? £700 a year will be untold wealth to me. I will hardly know what to do with all that money.

I suggest that some of those who complain that they cannot carry on on £2,000 a year stop to count their blessings while they may and to appreciate just how lucky they are. To me they are rolling in cash; a humbler life would do them a world of good—perhaps they could sell their second Daimler to make ends meet.—I am, etc.,

London, N.4. ADAIR GIRBY.

Three Months' Grace

SIR,—From letters published in the *Supplement* it is obvious that many doctors have not a proper grasp of the situation in regard to resigning from the Health Service. It should be understood that three months' notice has to be given to the Ministry of Health on withdrawal, and before that three months is ended patients will be still treated under the scheme and doctors will still be paid. But what is important to the profession is to understand that, if the resignations amount to 80%, the Minister will have three months to come into line and agree to decent treatment of the doctors, and that the Health Service to patients may never be interrupted.—I am, etc.,

London, N.W.11. L. S. WOOLF.

Three Things Needed

SIR,—Strong play on the question of loyalty is now being made in all letters and discussions about the proposed withdrawal of doctors from the N.H.S. Many groups command our loyalty, and we do well to remember that loyalty to our colleagues in the profession is not *ipso facto* the most important.

This play on the question of loyalty must make many of us, even if we are not well-off or "self-satisfied possessors of council-house practices" (*Supplement*, November 25, p. 217), feel that we should, perhaps against our convictions, vote for resignation in order to support unknown colleagues. I should like to suggest that we need three things:

(1) Accurate facts about the incomes of doctors, and, especially, accurate facts about the average practice expenses.

(2) A clause in the proposed resignation forms so that we can, if we feel we should, vote against resignation at this time, but promise resignation if a smaller majority than that proposed by the Guild, say 70%, vote in favour of it.

(3) A plan, prepared on the lines of that drawn up by the M.P.U., which we shall put into practice if an increase in the capitation fee is obtained.

—I am, etc.,

Cosham, Hants. V. H. MARTINDALE.

POINTS FROM LETTERS

Shilling on Prescriptions

Dr. CONN MCCLUSKEY (Dungannon, N. Ireland) writes: Both Mr. Bevan and Dr. Edith Summerskill have recently declared at political meetings that a great quantity of unnecessary medicine is being prescribed and drunk or thrown out. Surely it follows that the Government has a moral duty to stop this excess? The most obvious way of doing this is to go ahead with the levy of one shilling on each prescription. One, I think, is entitled to presume that the only reason that they do not implement the measure (already on the statute book) is that it would cost the Labour Party votes or even their ruling majority in Parliament. . . . As things are now, every time I show myself at my surgery door, even outside hours, I am followed into the house by a patient who wants a prescription for something or other. . . .

Association Notices

AREA OF WEST NORFOLK AND EAST NORFOLK DIVISIONS

Notice is hereby given by the Council that it is proposed to transfer the civil parish of Fakenham from the area of the West Norfolk Division to that of the East Norfolk Division. Any member affected by this proposal and objecting thereto is requested to write to the Secretary of the Association by January 6, 1951, stating the objection and ground therefor.

A. MACRAE,
Secretary.

Diary of Central Meetings

DECEMBER

12	Tues.	Central Ethical Committee, 2 p.m.
13	Wed.	Publishing Subcommittee, 11 a.m.
13	Wed.	Private Practice Committee, 2 p.m.
14	Thurs.	General Medical Services Committee, 11 a.m.
14	Thurs.	Staff Side of Committee "C," 11.30 a.m.
15	Fri.	Ophthalmic Group Committee, 2 p.m.
18	Mon.	Armed Forces Committee, 2 p.m.
20	Wed.	Committee on the Association of the General Practitioner with Hospital Work, 2 p.m.
20	Wed.	Film Committee, 2 p.m.
21	Thurs.	Journal Committee, 2 p.m.

JANUARY

9	Tues.	Amending Acts Committee, 2 p.m.
24	Wed.	Consulting Pathologists Group Committee, 2.15 p.m.
31	Wed.	Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—At 30, Half Moon Lane, Camberwell, London, S.E., Tuesday, December 12, 8.30 p.m., Mr. P. Mitchener: "Right-sided Abdominal Pain."

DORSET DIVISION.—At Kings Arms Hotel, Dorchester, Wednesday, December 13, 8.30 p.m., address by Dr. E. J. Jarrett: "Present Trends in the Treatment of Diabetes."

ENFIELD AND POTTERS BAR DIVISION.—At West Lodge Park Hotel, Thursday, December 14, 8.30 p.m., social meeting.

HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, London, N.W., Tuesday, December 12, 8.30 p.m., an informal talk by Sir Henry Souttar.

LANCASTER DIVISION.—At Lecture Theatre, The Storey Institute, Market Street, Lancaster, Saturday, December 16, 8.30 p.m., B.M.A. Lecture by Professor A. M. Boyd: "Intermittent Claudication."

MIDLAND BRANCH.—At Medical Institute, 154, Great Charles Street, Birmingham, Thursday, December 14, 3 p.m., 89th annual meeting, paper by Dr. D. S. Pracy: "Midwifery in General Practice."

RICHMOND DIVISION.—At Richmond Hill Hotel, Richmond, Wednesday, December 13, 7.30 p.m., annual dinner and dance.

ROCHDALE DIVISION.—At Exchange, Town Hall, Rochdale, Thursday, December 14, 8 for 8.30 p.m., annual dinner.

SOUTH BEDFORDSHIRE DIVISION.—At Warden Tavern, Tuesday, December 12, 8.30 p.m., annual general meeting.

SOUTH-WEST ESSEX DIVISION.—At Clinic Hall, Thorpe Coombe Maternity Hospital, Walthamstow, London, E., Wednesday, December 13, 8.30 p.m., lecture by Surgeon-Commander G. D. Wedd, R.N.: "Medical Aspects of Atomic Warfare."

SWANSEA DIVISION.—At Osborne Hotel, Langland, Thursday, December 14, 7.30 p.m., lecture by Professor H. Scarborough.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, December 13, 8.30 p.m., clinical meeting.

WEST HERTS DIVISION.—At Nurses' Home, The Peace Memorial Hospital, Watford, Wednesday, December 13, 8.30 p.m., B.M.A. Lecture by Professor L. P. Garrod: "The History and Uses of Antibiotics."

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

County Council.—Durham.

Metropolitan Borough Councils.—Fulham, Hackney, Poplar.

Non-County Borough Council.—Dartford.

Urban District Councils.—Denton, Droylsden, Houghton-le-Spring, Huyton-with-Roby.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY DECEMBER 16 1950

DISPLACED REGISTRARS

JOINT COMMITTEE DISAGREES WITH MINISTER

An emergency meeting of the Joint Committee was held on December 6 to consider the recent Ministry Circular R.H.B. (50) 106 on registrar establishments (*Supplement*, November 18, p. 204).

The committee was informed that the following statement had been made by the Minister in the House of Commons on November 30 (*Journal*, December 9, p. 1338):

"This circular, which has been grossly misrepresented, was issued after full consultations with the profession's representatives. Its object is in the interests of the profession itself—to secure a proper relationship between the numbers of training posts for future specialists and the number of specialist posts likely to be available. In estimating the latter it allows for a reasonable annual expansion over and above mere replacements in present posts, and the numbers of training posts will be reviewed as and when further expansion occurs in later years. The urgency of the circular is that the number of trainees has already risen to nearly twice the number needed to produce the specialists likely to be required and about four times the pre-war number, a situation thoroughly unfair to all concerned. The circular was not prompted by economy—indeed, it provides for alternative appointments if necessary for the work of the hospital."

Although there was consultation between the Ministry and the Joint Committee prior to the issue of the circular, the Committee made it perfectly clear to the Ministry that it completely disagreed with the Ministry's proposals for dealing with the problem. To this extent the Minister's statement in the House is capable of misunderstanding.

The original fears of the Committee have not been allayed by reports it has received from consultants and registrars throughout the country, and the Committee has urged the Ministry to reopen discussions on the whole question and to postpone the implementation of the proposals pending the outcome of these discussions.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

THE REGISTRAR GRADES

A meeting of the Central Consultants and Specialists Committee was held at B.M.A. House on December 6, with Dr. T. ROWLAND HILL in the chair.

The CHAIRMAN reported on a special meeting of the Joint Committee which had been held earlier that day at which consideration was given to the Ministry's circular concerning the review of appointments to registrar grades. He said that the Joint Committee proposed to issue a statement on the subject. [The statement appears above.] It was proposed also that the chairman of the Joint Committee should inform the Secretary of the Ministry of the serious view taken of the registrar position, which made it desirable that the proposals in the circular should be deferred pending further discussion.

Apart from the question of senior registrars, the Joint Committee had expressed the view that the number of registrars in the country should be determined by the needs of hospital work and not be estimated from the vacancies for hospital appointments.

Dr. COCHRANE SHANKS urged that the number of senior registrars as related to the requirements of the consultant services should be considered, not as a global figure, but in terms of the specialties.

The registrars' representative on the Committee made a full statement of the feeling of registrars on this subject. He pointed out that many senior registrars had been doing consultant work; also that it had been urged that for such appointments three years was the minimum required in training, whereas the Ministry was now interpreting this as the maximum. The opinion was expressed by one member that it was not so much economy as administrative incompetence which had led to the view that there was no need for an increase of consultants.

A question was asked about the staffing of health centres from the consultants' point of view and whether registrars could be absorbed in this way. Dr. D. F. HUTCHINSON said that he did not think it had been envisaged that consultants should be attached to health centres, which were intended to be general-practitioner centres only, and Dr. R. D. LAWRENCE agreed that the purpose of health centres was to encourage group practice by general practitioners, who would staff the centres. No doubt health centres, when established, would offer excellent openings for registrars who had gone into general practice.

The Committee passed a resolution expressing its entire disapproval of the Ministry's circular on the review of appointments to registrar grades, and urging that no attempt should be made to bring it into effect. It was considered impracticable to work out the registrar establishment as quickly as the circular suggested, nor indeed could this be done at all until the establishment of consultants—including the establishment of consultants for each specialty—had been determined. The view was expressed that the employment of consultants over the age of 65 was blocking promotion for younger men.

The CHAIRMAN explained that the view of the staff side of Whitley Committee "B" was that 65 should be the firm retiring age, and that any appointments above that age should be supernumerary to the establishments.

Medical Administration in Hospitals

The Committee considered a statement of policy on the question of medical administration of hospitals which had been prepared for presentation to the committee of the Central Health Services Council which has been appointed to study hospital administration. In explanation the CHAIRMAN said that in essence the old practice of having medical advisory committees with access to the managers should be strengthened and perpetuated, but it was felt that there was an advantage, in addition, in many hospitals in having the day-to-day medical administration made the responsibility of a special member of the medical staff, appointed for the purpose. The old idea of the all-purposes medical superintendent—an institutional *Führer* or clinical "boss"—was not desirable, but the medical administrator or superintendent as colleague of the senior staff should in many hospitals be retained. At the same time it was felt that in certain types of hospitals, such as mental or infectious-diseases hospitals, there could be no question of the desirability of retaining a medical superintendent.

The desirability of having at the head of a hospital a medical man equipped to deal with the lay bodies which now considered that they should have a determining voice in the running of a hospital was pointed out. The statement of policy was criticized by certain members of the Committee, and it was eventually agreed that it should be referred to regional committees before coming forward for final adoption. The motion proposing this course was carried by 20 votes to 17. The document has already been before the Council of the Association and accepted with some slight modifications. These modifications will be embodied in the draft which is to be sent to the regions.

Ministry Survey: Complaint of Discourtesy

A complaint was received from the Birmingham Regional Consultants and Specialists Committee concerning the procedure adopted by the Ministry's team surveying the medical staffing in the region. It was stated that the inspection officers questioned house-officers and registrars on how many rounds certain of the consultants performed in the hospital, and at what time they arrived and how long they took over their rounds. This information was asked for, not from the consultants themselves, but from junior officers employed by the hospital management committee. One member complained that the visiting team at his hospital catechized consultants in the presence of a lay secretary.

The Committee unanimously passed a resolution disapproving of the manner in which, according to this report, the review of medical establishments and hospitals on behalf of the Ministry was being carried out in certain districts. It considered that it was lacking in normal professional courtesy.

Future Application of S.H.M.O. Grade

It was reported that the circular issued by the Ministry to hospital boards on the use of the S.H.M.O. grade had been referred to regional committees and the special groups of the Association, and the comments of these bodies were presented. One point made by the Psychological Medicine Group, which was endorsed by the Central Committee, related to the need for clarifying the phrase "limited fields of psychiatry." They felt that child psychiatry was a major field, and there was some misgiving lest it should be included in the "limited fields." The need for an assurance that promotion was possible from the S.H.M.O. grade was also stressed.

The Committee endorsed the view that the proceedings on this circular illustrated the value of consultation between the Ministry and representatives of the profession before instructions were issued to hospital boards.

Procedure on Complaints

Dr. ROBERT FORBES, secretary of the Medical Defence Union, attended by invitation to speak on a procedure for dealing with complaints. This procedure had been put forward by a group hospital management committee. He said that it was recognized that complaints would continue to be raised by hospital authorities concerning the work of members of hospital staffs and might be well or ill founded. When such a complaint was received by a hospital authority it could not be dismissed out of hand, and each hospital must determine for itself the procedure it would adopt towards the complaint received. In the Medical Defence Union it was thought that there would be material advantages if those who could speak on behalf of medical staffs of hospitals stepped in at this early stage and defined the procedure they considered reasonable and proper. He suggested that the matter be submitted to an expert committee for report and recommendations.

The Committee proceeded to set up a subcommittee for this purpose.

Other Business

On a report on the representation of the profession on hospital boards and hospital management committees, Dr. TALBOT ROGERS drew attention to the desirability of making sure that nominees were able and willing to serve. He said that failure to do this had sometimes been to the disadvantage of medical representation.

The Committee agreed to be represented on the International Hospital Federation.

A report was laid before the Committee on the suggestion that arrangements should be made for the holding of a national conference of representatives of consultants as and when the occasion might be desirable, and a draft scheme was presented for such a conference. It was pointed out that the conference would be purely advisory and not legislative. A Scottish representative said that this question had been considered in Scotland, where it was felt that no useful purpose would be served by such a conference. That appeared also to be the view of the Central Committee, and the matter was allowed to lie on the table.

REMUNERATION OF CHEST PHYSICIANS

In certain regions chest physicians are discontented over remuneration. Boards there are paying chest physicians only for the hospital work performed, leaving a balance to be paid when agreement on dual contracts and rates of pay for work done for local authorities has been reached. Other boards have agreed to pay a full salary and make their own arrangements with local authorities.

The delay over negotiation and settlement is causing great dissatisfaction, not only because of the hardship for those practitioners who are now carrying out the work, but also for the future of the specialty. A practitioner who holds a registrar appointment is not encouraged to take up a career as a chest physician when he recognizes that he may receive less remuneration than is received by consultants in other specialties.

The question of dual appointments was first raised at a conference with the Ministry of Health in March, when representatives of the B.M.A. urged that practitioners who work partly for a regional hospital board and partly for a local authority should have one contract with the authority in whose work they were predominantly engaged. It appeared that a satisfactory conclusion had been reached when the Ministry agreed to reconsider the matter. But the formula produced by the Ministry was most unsatisfactory. The matter was again pressed with the Ministry, but since a solution has not been reached it will be raised through Whitley machinery.

This problem must be settled before the rates of remuneration for the local-authority work can be determined. The policy of the Tuberculosis and Diseases of the Chest Group is a single contract at the standard rate of remuneration.

THE MANX CHEMISTS

As reported last week, the chemists' dispute in the Isle of Man has been settled. Members of the Manx Chemists' Association, who withdrew from the Health Service scheme because of regulations governing the charging for prescription forms and medicinal containers, are now dispensing in conformity with the Health Service Board's regulations for a period of three months to see how they work.

Though no statement has been issued by either side, it is understood that the chemists have obtained a concession that a specified period of notice will be given in respect of any further regulations affecting them, and that negotiations are to take place in respect of the Board's decision to debit the chemists' accounts with sixpence for each form of prescription dispensed between October 1, when the regulation came into force, and November 13, when they ceased to dispense under the Service.

Since the withdrawal of the chemists from the Service, and the subsequent emergency arrangements for handling prescriptions, the Manx police collected and distributed an average of 150 each day throughout the island over a period of 18 days.

PUBLIC HEALTH DISPUTE

The Industrial Court sat for four days hearing the case for higher remuneration put forward by representatives of medical officers in the public health service. On October 19—the last day on which it sat—the president of the Court asked for further information on the cost of the proposals put before it. This information, which was prepared in detail, was submitted to the Court on November 8. The medical officers' representatives made clear to the Court that their case was a matter of urgency and importance to the profession, and the Court appreciated this. The date when the Court will announce its decision is not known.

Further information will be published in this *Journal* when it is available.

COMPENSATION FOR GENERAL PRACTITIONERS

FINAL DATE FOR CLAIMS

General practitioners entitled to claim compensation for the loss of the right to sell the goodwill of their practices should submit claims for compensation *without delay* if they have not already done so.

Under regulations recently laid before Parliament claims may now be accepted until December 31, 1950. Claims made after that date will not be accepted unless the Minister of Health is satisfied that the delay was due to special circumstances. Claims made after February 28, 1951, will not be accepted in any circumstances.

Some doctors have been under the impression that these claims need not be made until they retire. This is quite incorrect. All outstanding claims should be made by the end of this year.

Doctors who are in doubt as to their title to compensation or who require claim forms should write to the Ministry of Health (A.G.D. 3C), Whitehall, London, S.W.1.

NATIONAL SERVICE FOR DOCTORS IN MEDICAL GRADES III AND IV

The Central Medical War Committee has been notified by the Ministry of Health that, with effect from December 1, registered medical practitioners who are placed in medical fitness Grade III or Grade IV by National Service Medical Boards, provided that they are considered suitable for employment in the armed Forces, are to be regarded as available for National Service in the same way as doctors in Grade I and Grade II.

It is not at present proposed that this should be applied to doctors who were placed in Grade III or Grade IV before December 1 and who may therefore have been officially informed that they are outside the field for call-up.

Doctors graded III or IV by National Service Medical Boards on or after December 1, 1950, cannot assume that they are unfit for National Service unless and until they are so notified by the Central Medical War Committee.

This change in the recruitment arrangements for doctors, which has been approved by the Central Medical War Committee, is necessary in view of the present shortage of medical officers in the Forces.

ALL-PAKISTAN MEDICAL CONFERENCE

The first All-Pakistan Medical Conference, which will be a purely scientific meeting, will be held in Karachi in the last week of February, 1951, under the auspices of the Pakistan Medical Association. Any members of the B.M.A. who expect to be in Pakistan at that time and might be able to represent the Association at the Conference are invited to communicate with the Secretary at B.M.A. House.

Heard at Headquarters

Week-end at Ashridge

The committee of the Association which is reviewing general practice has arranged for a discussion group during a March week-end at Ashridge in Hertfordshire, when the theme will be "The Doctor–Patient Relationship." Those who have never been to Ashridge will not be prepared for its attractions. It is a noble, baronial sort of place standing in a vast park, and, although less than 30 miles from London, the nearest railway station is three or four miles away. Ashridge has been in its time a monastery, a palace—Queen Elizabeth slept there, of course—a military hospital, and a residential college. Those who have spent a few days there are full of appreciation of its beautiful hall, refectory, and chapel, and also of the modern comfort of its bedrooms. The suggestion of past splendour seems to encourage rather than to intimidate discussion and study-grouping.

Questions Answered

Service in Forces

Q.—*House-officer appointments are advertised at the rates of £350, £400, or £450 for first, second, or third posts respectively. Is service in H.M. Forces allowable in making this calculation?*

A.—A house officer who obtains an appointment after completion of service with the Forces would receive salary in relation to the number of house-officer appointments previously held at the above scale. If, during his period of service in the Forces, he had acted as a house officer in a military hospital, he could count this in claiming salary in relation to the number of previous hospital appointments held. Most discharged medical officers have not had hospital experience while in the Forces, and therefore they cannot claim payment at a higher stage than colleagues who have held two or more house-officer appointments.

Superannuation and Income-tax

Q.—*Are superannuation contributions free from income-tax?*

A.—The 6% superannuation contributions paid under the National Health Service Act are free from income-tax. In practice they are included in the income-tax assessment, but a deduction is then made from the assessment equal to the amount of the contributions, thus cancelling them out.

Report for Police

Q.—*A female patient of mine collapsed while shopping. The same day the police asked for a report on the patient's health and the cause of her attack. I questioned this procedure, but the police officer said that it was quite in order and the usual thing when the police gave first aid. I consider that to give the report would be a breach of confidence and contrary to medical ethics. What is your opinion?*

A.—The police apparently require some sort of diagnosis for completion of their records, and in many cases they obtain this without difficulty. Nevertheless there is no requirement on a doctor to disclose professional information, and he is advised not to do so except where he has obtained the prior consent of the patient.

Locumtenent in Hospital

Q.—*I have heard that expenses incurred when taking up a post as a locumtenent (registrar) in hospital may be reclaimed from the hospital. Is this true?*

A.—No. There is nothing in the terms of service that would enable a hospital employing authority to defray the expenses incurred by a locumtenent in taking up his appointment.

Correspondence

Hospital Threatened

SIR,—May I beg the publicity of your columns to answer from first-hand experience one of the assertions made by Dr. D. Stark Murray (*Supplement*, December 9, p. 242)? He says, "The regional hospital board has done everything in its power to have its schemes publicized and criticized." I am afraid that that statement is diametrically opposed to the facts.

When the findings of the Review Committee were about to be sent to the Kingston Group Hospital Management Committee (of which I was at that time a member), the regional board issued a confidential memorandum which was issued to each member of the hospital management committee. Under the heading of "Change of Use of Hospitals," hospital management committees were advised to keep their plans secret until they were ready to be put into effect, so as to avoid the trouble which might be caused by opposition arising from local sentiment.

I protested strongly at the meeting of the hospital management committee at which these instructions were considered, and made public my views in the local press immediately afterwards. It is this policy of secrecy and total disregard of local opinion (which is much better informed than that of a politically bigoted person) that we at the Kingston "Vic" are fighting.—I am, etc.,

N. SKENTELBERY,
Brigadier,
Chairman, Kingston and Malden Victoria Hospital, and late member of Kingston Group H.M.C.

SIR,—Dr. Stark Murray's essay on philosophy (*Supplement*, December 9, p. 242) only too pointedly shows that his basic knowledge of the subject both of philosophy and the "Kingston Victoria" is sadly at fault, and his recognized manner of quoting extracts from reports reminds one of the old adage that "even the Devil can quote scripture for his purposes."

It is true that the Press have been present at every meeting of the regional board and the hospital management committee, but the "Victoria" has usually been discussed in "Part 2," which is taken *in camera*. This method of treatment was deliberate and part of an arranged plan to avoid publication of recommendations until the time arrived for their implementation.

The medical advisory committee at Kingston did agree that "the provision of an adequate gynaecological unit should be one of the first considerations," but Dr. Murray very carefully omits the governing phrase "as and when more beds become available in the group." That was the essential point of their decision. Dr. Murray, however, is most anxious to use it in its wrong context. The recommendations of the review committee, of which he was a member, can all be met without changing the use of the Victoria Hospital. Incidentally, in addition to being a member of that committee, Dr. Murray has stated elsewhere that he also gave evidence as an (alleged) member of the consulting staff of the Victoria. He was appointed to the staff in 1938 for a period of three years only; on the expiration of this period in 1941 his appointment was not renewed.

As is well known, Dr. Murray is also a member of the medical advisory committee for the region and also of the regional board. Now it is an established axiom of British jurisprudence that no one can at the same time be regarded as a witness, a member of the jury, and a judge in any particular case. Yet this has happened in this instance. This action gives a most unpleasant odour to the whole affair, is quite foreign to British methods, and provides an incontrovertible argument in support of a fresh inquiry into the matter.

Due to an unfortunate oversight, Dr. Stark Murray is correct on one point. We did issue a leaflet in November which bore no imprint, but to suggest that it was put out by the Conservative party is just wishful thinking on his part. We have scrupulously endeavoured to exclude politics from our campaign. However, politics did enter by the direct action of the Labour party in the area: they countered our leaflet with one issued by them officially. Although he is right in the first part of his remark, he is grossly wrong in the second part. The former public relations officer of the Conservative party is *not* running the campaign. We had the benefit of his advice on an honorary basis for some two weeks earlier on in our effort, but I understand he has been in Spain for some considerable time now.

Dr. Stark Murray states that there is no hospital in the area staffed solely by general practitioners. This is quite wrong. There are four, in which all the beds are in the control of the general practitioners, with adequate specialist cover available. It is due to this arrangement that the general practitioners are able to maintain a reasonably high standard in the service they are able to offer to their patients in the consulting-rooms and in the patients' homes. If this present arrangement is destroyed—and it appears that Dr. Stark Murray would have it destroyed—then the standard of general practice will inevitably fall, the patient will be the loser, and the Service will suffer. Is it the policy of the regional hospital board to build up a hospital service at the expense of the general-practitioner service? If this is so, I am sure it is not what Parliament intended nor what the public have been led to expect.

In the penultimate paragraph of his communication Dr. Stark Murray refers to a very pertinent aspect of the whole question—the financial control of the Health Service. In this he becomes curiously altruistic. In all the years before the advent of the Act general practitioners all over the country were performing hospital duties—not for nothing, but for the honour of their particular hospital, and with no thought of financial gains whatsoever. I am quite sure they are prepared to go on for many more years on exactly the same basis. The running costs of the general-practitioner hospital always bore favourable comparison with those of the larger ones, and I know that the weekly bed-cost was considerably lower in many cases than that of their neighbours. The raising of the finance bogy is just another of Dr. Stark Murray's red herrings. Dr. Murray can find—if he chooses to look—adequate evidence in financial statements of hospitals prior to 1948 that general-practitioner medical boards and the lay committees exerted all the conscientious care in the administration of their hospitals and in the provision of top-grade service to the patient that was, and still is, desirable, but of which he seems to think they are no longer capable. It would appear that he wishes to assume, in addition to that of the Minister of Health, the mantle of the Chancellor of the Exchequer.

Indeed, Sir, much thinking is still needed on this subject, and it is by "nailing flags to masts, fighting to last ditches," and asking for adequate public inquiry where the matter can be properly discussed that we sincerely hope such can be obtained, and which apparently Dr. Stark Murray, as the evidently self-appointed spokesman of the regional board, is anxious to avoid.—I am, etc.,

New Malden, Surrey. T. W. MORGAN.

"Posting" of House Officers

SIR,—In the contracts for house officers in the hospital in which I hold a post the following paragraph appears:

"The duties attaching to the appointment are those assigned to you by the management committee and, so far as is consistent with the proper discharge of those duties, include any additional duties undertaken from time to time as substitute for other house officers of the group during their temporary absence."

The implications of the liability to additional duties in other hospitals of the group are most serious. All house officers about to sign their contracts are urged to consider the effects of agreeing to this condition if it exists in their cases.

Regardless of assurances to the contrary, it places the candidate at the disposal of the management committee. The house officer is then in a similar position to a doctor in the armed Forces, in that he can be posted to and fro at a moment's notice. In the Services such conditions are accepted as inevitable, but in civil life they will produce insecurity, prevent the planning of one's own work, and be an unjustifiable intrusion into private affairs.

With such power the administrators can all too easily maintain house staff at those hospitals in the group which are either unpopular or do not provide the kind of experience wanted by the applicant. Moreover, such a "posting" can be made to be "consistent with the proper discharge of those duties" by the same authority.

Were a real emergency to arise, such that house officers were required to work elsewhere for a short period, it is certain that there would be an immediate response to the crisis without having to sign this ominous contract.—I am, etc.,

Rochester, Kent. G. P. DEBENHAM.

Withholding Certificates

SIR,—From the report on the Proceedings of Council held on November 22 (*Supplement*, December 2, p. 221), several highly ethical members were greatly concerned with what the public would think of us if we withdrew from the N.H.S. and withheld certificates (chiefly N.H.S. and private certificates). One member expressed the sentiment that, by withholding certificates, we would lower our status in the eyes of the public. Writing as a G.P., I think our status considerably deteriorated in 1948, and has not risen at all since then. I have the impression that the public is interestedly and (in the main) sympathetically watching to see whether the medical profession now has more enterprise than it had in 1948, and whether it will regain the public's respect by taking firm and concerted action in this present dispute, or whether its status will deteriorate still further by shirking a four-square and spirited fight for what we think are necessary improvements in conditions of service and remuneration.

To withdraw from the Service and still continue to issue certificates will be to fail in our endeavours at the outset. If I withhold certificates, I shall be sorry that my patients will have to suffer the inconvenience, but together we shall be fellow sufferers, for I imagine that my income will be considerably reduced until the dispute is settled. While I appreciate the hardship to my patients and their families for, I hope, a short time only, I further appreciate that my family and dependants are now adversely affected since the advent of the N.H.S., and that there will be little hope of improvement if the present conditions and remuneration continue. And 'tis said that "charity begins at home." I, for one, will withdraw from the Service only on condition that it includes withholding certificates, for I wholeheartedly agree with Dr. Alexander Brown, who expressed the belief that the majority of G.P.s in his area hold the opinion that to resign without withholding certificates would be to cut our own throats, and I have no intention of doing that to mine just to be, as some would call it, "highly ethical," but which I would describe as being plain adjectival foolish.

How the Minister of Health and the Chancellor of the Exchequer would gleefully rub their hands if we still issued certificates. They would then have (1) patients receiving treatment gratis (or almost gratis); (2) patients happily receiving their sick pay; (3) about fourpence per patient per week saved to the Exchequer; (4) G.P.s heading towards insolvency or knocking at the door of the National Assistance Board; but (5) doctors' status would rise—I wonder?—I, am, etc.,

Bradford, Yorks. G. R. GRANTON.

SIR,—In 1912 an insurance body refused to recognize a certificate for sick benefit because the signing practitioner was not in contract with the National Health Insurance scheme. It was held in the courts that they were bound to accept a certificate given by a registered medical practitioner, whether in contract with N.H.I. or not. The Ministry of National Insurance has apparently accepted this ruling.

Any registered medical practitioner can give valid N.I. certificates, and can obtain the forms free of charge from his local executive council. Many general practitioners seem to imagine that unless they are working under contract with an executive council they are unable to give valid certificates for N.I. purposes.

For practitioners within the Service to refuse certificates would be a breach of contract for which they could be fined to the extent of their payments due, and which would expose them to removal from the executive council list. If they resign there is no point in refusing certificates and every reason for giving them, since the National Health Service (according to Lords Beveridge and Simon) was introduced to discipline the certificate writer. To leave the Service *and* be meticulous in giving N.I. certificates is to strike a blow for freedom.—I am, etc.,

London, W.1. J. EWART PURVES.

Under regulations made on November 13, the National Health Service Amendment Act (with minor modifications) is extended to the Scilly Isles. The constitution of the executive council for the Isles is altered to consist of the following members: (*a*) members of the Council of the Isles who have formally expressed a desire to serve on the executive council; (*b*) medical and dental practitioners and registered pharmacists permanently resident or practising in the Isles who have formally notified their desire to serve; and (*c*) three members appointed by the Minister.

H.M. Forces Appointments

ROYAL NAVY

Acting Surgeon Lieutenant-Commander G. M. Baird to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commanders A. G. W. Hill and K. R. Pallot have been removed from the Active List.

Surgeon Lieutenants P. G. Dalgleish, J. E. Russell, H. H. G. Eastcott, and J. G. H. James to be Surgeon Lieutenant-Commanders.

ARMY

Lieutenant-Colonel P. J. L. Capon, from R.A.M.C., to be Colonel.

REGULAR ARMY RESERVE OF OFFICERS

Colonel C. Popham, O.B.E., late R.A.M.C., having exceeded the age limit of liability to recall, has ceased to belong to the R.A.R.O.

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) J. S. Richardson has ceased to belong to the Reserve of Officers.

Major J. D. Condon has ceased to belong to the Reserve of Officers.

Captains (Honorary Majors) K. D. Foggitt and R. A. Daly have ceased to belong to the Reserve of Officers.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Colonel C. H. Budd, M.C., T.D., has relinquished the appointment of Honorary Colonel of a T.A. unit on transfer of unit to the Supplementary Reserve.

Colonel R. A. Lennie, T.D., has relinquished the appointment of Honorary Colonel of a T.A. unit on transfer to the Supplementary Reserve.

Colonel C. A. Webster, T.D., having exceeded the age limit, has retired.

Captain (Honorary Colonel) J. C. Knox, C.B.E., has relinquished the appointment of Honorary Colonel of a T.A. unit on transfer to the Supplementary Reserve.

Lieutenant-Colonel A. C. Haddow, T.D., has been appointed Honorary Colonel of a T.A. unit, in succession to Colonel F. Whalley, C.B.E., D.S.O., T.D., whose tenure has expired.

Major A. K. Dougall, M.C., from T.A.R.O., to be Major.

Captain (War Substantive Major) J. F. Hedley has retired, and has been granted the honorary rank of Lieutenant-Colonel.

Captains (acting Majors) R. Semple and A. J. Daly to be Majors.

Captains G. D. W. Adamson, G. L. Broderick, E. J. Williams, C. G. Rob, M.C., R. H. Berry, I. G. Hardinge, J. C. Fletcher, A. J. Thomson, and J. Bunting to be Majors.

Lieutenant R. C. Webster to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel C. A. Ferguson, T.D., from Active List, to be Colonel.

Colonel A. C. Macdonald, M.C., T.D., having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Major (Honorary Colonel) A. O'Hanlon, T.D., having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Major (Honorary Lieutenant-Colonel) G. M. Lewis, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Majors (Honorary Lieutenant-Colonels) J. C. MacKay, O.B.E., M.C., T.D., H. G. Wimbush, T.D., and F. N. N. Roberts, T.D., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major M. L. Formby, T.D., from Active List, to be Major, and has been granted the honorary rank of Colonel.

Majors D. M. Mitchell, T.D., and G. G. Farrington, from Active List, to be Majors, and have been granted the honorary rank of Lieutenant-Colonel.

Major I. G. Hardinge, from Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel. (Substituted for the notification in a *Supplement* to the *London Gazette*, dated January 4, 1949.)

Majors A. F. Alsop and N. H. H. Longton, from Active List, to be Majors.

Majors L. D. Williams, D. P. MacIver, M.C., T.D., and E. Davies-Thomas, having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major R. D. W. Butler has ceased to belong to the T.A.R.O.

Captains (Honorary Majors) M. Park, J. G. Elmslie, L. T. Clarke, D. S. MacPherson, V. C. Cornwall, R. A. Highmoor, J. M. Martin, T.D., E. A. Sparks, C. E. Burridge, J. Murray, and D. McM. Carson, having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Captains J. Donovan and E. G. Wade, from Active List, to be Captains, and have been granted the honorary rank of Lieutenant-Colonel.

Captains C. R. S. Jackson, K. H. Smith, and H. Bolton, from Active List, to be Captains and have been granted the honorary rank of Major.

Association Notices

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and childbearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit the prize will not be awarded in 1951 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships, as follows:

An Ernest Hart Memorial Scholarship, of the value of £200.

A Walter Dixon Scholarship, of the value of £200.

Four Research Scholarships, each of the value of £150.

These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1951. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 31, 1951, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

DISSOLUTION OF THE MERIONETHSHIRE AND MONTGOMERYSHIRE DIVISION

Notice is hereby given by the Council that the Merionethshire and Montgomeryshire Division has been dissolved; that Merionethshire has been transferred to the Caernarvon and Anglesey Division; and that Montgomeryshire has been transferred to the Shropshire and Mid-Wales Branch.

A. MACRAE,
Secretary.

Diary of Central Meetings

DECEMBER

18 Mon. Armed Forces Committee, 2 p.m.
20 Wed. Staff Side of Committee "C," 11 a.m. (*change of date and time*).
20 Wed. Committee on the Association of the General Practitioner with Hospital Work, 2 p.m.
20 Wed. Film Committee, 2 p.m.
21 Thurs. General Practice Review Committee, 10 a.m.
21 Thurs. Journal Committee, 2 p.m.
21 Thurs. Occupational Health Committee, 2 p.m.
22 Fri. Colonies and Dependencies Committee, 2 p.m.
29 Fri. Science Committee, 2 p.m.

JANUARY

2 Tues. Organization Committee, 2 p.m.
9 Tues. Amending Acts Committee, 2 p.m.
10 Wed. Film Catalogue Subcommittee, 4 p.m.
24 Wed. Consulting Pathologists Group Committee, 2.15 p.m
31 Wed. Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

FURNESS DIVISION.—At Orthopaedic Department, North Lonsdale Hospital, Tuesday, December 19, 8 p.m., combined meeting with Barrow and Furness Clinical Society.

SOUTH ESSEX DIVISION.—At Hospital Cinema, Oldchurch Hospital Romford, Friday, December 15, 9 p.m., lecture by Mr. L. C. Oliver: "Cordotomy in the Treatment of Parkinsonism." To be illustrated by a ciné film and slides.

B.M.A. LIBRARY

The following books have been added to the Library:

Aitchison, J.: Dental Anatomy and Physiology for Students Second edition. 1950.
Assmann, H., *et al.*: Lehrbuch der inneren Medizin. Hrsg. von H Schwiegk und A. Jores. 6/7 Auflage. Zweite Band 1949.
Brand, G. (Editor): Trial of Heinrich Gerike and others. (Th Velpke Baby Home Trial). 1950.
Breen, G. E.: Fevers for Nurses. Third edition. 1950.
Bsteh, O.: Die Geschwürskrankheit des Magens. 1949.
Burn, J. H., *et al.*: Biological Standardization. Second edition 1950.
Clancy, F. J.: Doctor Come Quickly. 1950.
Clay, H. H.: Sanitary Inspector's Handbook. Seventh edition 1950.
Collens, W. S., and Boas, L. C.: Helpful Hints to the Diabetic 1949.
Crockford, H. D., and Knight, S. B.: Fundamentals of Physica Chemistry for Premedical Students. 1950.
Crowther, J. A.: Manual of Physics. Fifth edition. 1950.
Davis, J. G.: Dictionary of Dairying. 1950.
Del Conte, E.: Contribucion del Coeficient Citologico a la Fisiologia y Patologia de la Correlacion Hipofisotiroidea. 1948.
Dickinson, C. J.: Electrophysiological Technique. 1950.
Duke, W. (Editor): Trials of Frederick Nodder. 1950.
Engel, S.: Die Lunge des Kindes. 1950.
Fazekas, I. G.: Mästung durch Steigerung der Nebennierenrinden funktion. 1949.
Fishbein, M., and De Lee, S. T.: Joseph Bolivar De Lee. 1949.
Forbes, J., and Mann, W. N.: Clinical Examination of Patients 1950.
Gask, G.: Essays in the History of Medicine. 1950.
Gatenby, J. B., and Beams, H. W. (Editors): The Microtomist's Vade Mecum. Eleventh edition. 1950.
Glover, E.: Freud or Jung. 1950.
Green, D. E., and Knox, W. E. (Editors): Research in Medical Science. 1950.
Grosse-Brockhoff, F.: Einführung in die pathologische Physiologie 1950.
Harkness, A. H.: Non-gonococcal Urethritis. 1950.
Henderson, T.: Principles of Ophthalmology. 1950.
Hobart, F. G., and Melton, G.: Concise Applied Pharmacology and Therapeutics. Third edition. 1949.
Kuntz, A.: Textbook of Neuro-anatomy. Fifth edition. 1950.
L'Eltore, G.: La Tubercolosi: problema medico-sociale. 1949.
Lhermitte, J., *et al.*: Réflexions sur la Psychanalyse. 1949.
Lima, P. A.: Cerebral Angiography. 1950.
Maingot, R. (Editor): Techniques in British Surgery. 1950.
Modern Trends in Obstetrics and Gynaecology. Edited by Kenneth Bowes. 1950.
Moritsch, P.: Die Schmerzverhütung bei chirurgischen Eingriffen 1949.
Nair, S. R.: Human Embryology for Medical Students. 1950.
New York Academy of Medicine: Social Medicine. 1949.
Niedermeyer, A.: Zur sozialen Hygiene von Schwangerschaft, Geburt und Wochenbett. 1949.
Ninni, M.: I Reticolociti: morfologia, fisiologia, clinica. 1949.
Osborne, J.: Dental Mechanics for Students. Third edition. 1950.

SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 23 1950

GENERAL MEDICAL SERVICES COMMITTEE

An all-day meeting of this Committee was held on December 14, with Dr. S. Wand in the chair, but at 6.30 p.m. its business was by no means completed and it was decided to hold a further special meeting on December 21. Much of the time was occupied in considering and deciding on the strategy to be adopted in the event of the dispute with the Government culminating in a withdrawal of service.

Another matter which occupied time was the consideration of a request by the Medical Practitioners Union to reopen discussions with a view to representation of that body on the Whitley Council either directly or through membership of the General Medical Services Committee. Three representatives of the Medical Practitioners Union attended and put forward their case for representation, at the same time giving assurances of their acceptance of the obligations which membership of the Committee would impose. After hearing the representatives the Committee decided by a very large majority that two nominees of the Medical Practitioners Union should be invited to attend the meetings of the Committee, pending a recommendation to amend the constitution of the Committee being referred to the Conference of Local Medical Committees and the Representative Body for confirmation. Meanwhile legal advice was to be sought on the Committee's powers of co-option.

The Committee also received five representatives of "unestablished practitioners," meaning by this term locumtenents and unemployed doctors seeking entry into general practice, newly established principals, and assistants, who put forward their views in support of an application which they had already forwarded to Council for the formation of a Special Group in the Association. They did not consider that the Assistants and Young Practitioners Subcommittee, recently set up by the Committee, had a sufficiently representative basis. The Committee's report on this claim will be made to the Council.

A full report of the meeting of the Committee will be published in the next issue.

G.M.S. SUBCOMMITTEE (SCOTLAND)

The General Medical Services Subcommittee (Scotland) at a meeting at B.M.A. House, Edinburgh, on November 30 decided that the question of the dispensing capitation fee in Scotland should be reopened with the Department of Health. The matter was the subject of a report by a subcommittee, which recommended the negotiation of a substantial increase, or alternatively a return to the method in operation in Scotland under the National Health Insurance scheme, by which dispensing practitioners were paid at the chemists' rate for the area.

Dr. G. W. IRELAND, chairman of the subcommittee, explained that there was a strong feeling that the fee of the dispensing doctor in Scotland was much too low. Chemists were receiving about 13s., as against the doctors' 5s. per head. Investigation showed that the cost of scheduled expensive drugs did not nearly account for this discrepancy.

The remuneration of dispensing doctors operating the "per script" method of calculation had been found to be substantially more than 5s., plus the cost of specially expensive drugs. Apart altogether from comparisons of this kind, it had been found that some doctors were spending more on drugs than they were receiving from executive councils for this pharmaceutical service.

Mileage Payments

After discussion it was agreed that the Chairman's Subcommittee inquire into the position which has arisen as a result of the decision of Renfrewshire Executive Council to discontinue mileage payments to doctors resident in the city of Glasgow. Dr. W. M. KNOX, who presided, pointed out that the matter had been taken up with the Department of Health, which considered that it was a matter of local arrangement, and for that reason was not prepared to take any action.

Dr. ANDERSON explained that the local medical committee received the executive council's circular on the 17th of the month, pointing out that the decision would take effect as from the first day of the month. Several doctors lived on the boundary. Those on the Glasgow side who went into the county were not now to receive any payment, whereas those living 10 yards on the county side of the boundary line would. Several doctors were having to part with old patients who lived in the county area.

The SCOTTISH SECRETARY, Dr. E. R. C. Walker, said a question of principle was involved—namely, whether these payments were to be regarded as relating to the situation of the doctor or that of the patient. Conflicting views were held on this point.

In connexion with medical practices compensation the Committee agreed with the appointment as referee of Mr. Raymond Jennings, K.C., B.C.L., to act in Scottish as well as English appeals, Scottish appeals being heard with the Scottish Medical and Accounting Assessors previously appointed.

Dr. Knox was unanimously reappointed chairman of the subcommittee.

PRIVATE PRACTICE COMMITTEE

A meeting of the Private Practice Committee was held at the Association House, London, on December 13, with Dr. I. D. GRANT in the chair. It was announced with regard to the forthcoming election of direct representatives to the General Medical Council that under the new Act there would be eight representatives for England and Wales, one of them to be resident in Wales. The procedure which would be followed for nomination of B.M.A. candidates was outlined.

Fees for Police Calls

Dr. R. D. SUMMERS, honorary secretary of the Metropolitan Police Surgeons Association, attended the meeting to discuss further the revision of the scale of fees for payment to practitioners called upon to perform services on behalf of the police. He stated that the Home Office had ruled that in the metropolitan police area when a surgeon attended one or more persons, at least one of whom was a case where attendance was prolonged or involved special examination or treatment, or was related to a possible charge of a serious nature, the fees which might be paid were three guineas in the day (8 a.m. to 8 p.m.) and four guineas at night. If the surgeon was engaged on his examination or treatment for more than one hour, the fee was five guineas in the day and seven guineas at night. The

Committee agreed to recommend to the Council that the metropolitan fees were considered fair payment for the duties involved, and that steps be taken to implement them generally.

Doctors' Telephones

The secretary of the Committee, Dr. Hadfield, presented the report of an interview which he had had with officers of the General Post Office on the possibilities of extension on a nation-wide basis of telephone facilities for doctors whose telephones were left unattended for varying periods. He felt satisfied that the General Post Office was aware of the problem and the fact that it was a growing one. Owing to the shortage of men and materials it was not possible to say when adequate facilities would be available all over the country, but the G.P.O. policy was directed to this end. The Committee agreed that the G.P.O. be asked to notify the Association of every new area where these facilities were available, and also asked for a reconsideration of the installation of the message-taking bureau method. The facilities which are being increased are transfer devices.

Ministry of Pensions Treatment Sessions

The Committee had asked for further information about the duties of practitioners undertaking treatment sessions for the Ministry of Pensions, the fees for which, it had been suggested, should be increased from 2½ guineas to 3 guineas. The Committee was informed that a "treatment session" was a session at which it was decided what treatment a patient required, and whether he should be treated in hospital, and, if so, what type of hospital. The "treatment board" was a one-man board; the doctor concerned must have a knowledge of Ministry of Pensions procedure, and would often be one who, in an ordinary board, would rank as chairman. The Committee agreed that if this work was to be done by a single doctor the fee should be three guineas.

Protection of Practices

During a previous discussion on a recommendation by the Committee concerning the protection of the private practice of a practitioner called up for service in the Forces it had been pointed out in the Council that the recommendation did not give security of tenure to the ordinary private practitioner, and on this and other grounds the recommendation was referred back to the Committee. The Chairman said that the Council had felt that when a man came back from service his part-time appointments should normally be restored to him. Dr. FORBES pointed out that it was hardly fair to ban the other practitioner permanently from taking certain appointments because he had assisted someone who had been away. After some discussion the consideration of what was acknowledged to be a rather delicate problem was deferred to the next meeting.

Other Business

A communication from Trinity House concerning increases of fees to be paid to general practitioners by the Corporation was regarded as very satisfactory. The practitioners concerned were those who acted as Trinity House District Medical Officers. The general fee for examination of candidates and personnel was 25s., and for the periodical examination of Workmen's Compensation Act cases existing on July 4, 1948, 42s.

Reports were presented by the Medical Witnesses Subcommittee and by the Maritime Subcommittee and were adopted.

A complaint was received from a practitioner that the fee payable for the examination of members of the Air Training Corps on fitness for gliding was only five shillings. The Committee agreed to press for one guinea, but suggested that if the "short form" of insurance certificate only was required it could be completed for half a guinea.

A letter from the honorary secretary of the Isle of Wight Local Medical Committee drew attention to the high cost of prescribing drugs for Service personnel on leave in relation to the remuneration paid. Dr. WAND said that it should be pointed out to the Service departments that when the present fees for occasional attendance on Service personnel were negotiated antibiotics were not used in the same way as now, and not only was treatment now much more expensive but doctors also had more facilities for dispensing then than they had now. It was agreed that representations on these lines should be made.

The Committee agreed to recommend to the Council that the tribunals under the Dangerous Drugs Regulations to which might be referred any suspected case of improper supply or prescription of drugs, and which, although arrangements had been made for them, had never met, should be reappointed, and that nominations of Association representatives for England and Wales and for Scotland should be made.

It was agreed, on the suggestion of the Isle of Wight Local Medical Committee, to ask the Ministry whether it would provide, for certification of incapacity, a form similar to E.D.652 which was drawn up during the last war by the Ministry of Labour for use in the case of persons who requested evidence for presentation to their employers of their incapacity for work. If the Ministry was not willing to reissue such a form it was suggested that it be asked to allow the Association to do so.

CHANGE OF GENERAL PRACTITIONER

When a general practitioner in the Health Service dies, goes away, or withdraws from the medical list, his patients are free to transfer to the list of another doctor—that is, they have the right to make an immediate transfer. The Minister of Health considers that this right should not be for an indefinite period. He will consider in due course making regulations limiting the period in which an immediate transfer is allowed. In the meantime, so that the practice in different areas may be uniform, he has asked executive councils to inform patients that, if they wish to choose a doctor other than the one named in the notice sent out under these circumstances, they should do so within 14 days of the date given in the notice.

This change is presumably made in consequence of regulations, which came into force on October 1, designed to limit the frequency of transfer (*Supplement*, September 23, p. 137).

TEMPORARY RESIDENTS

The Minister of Health has decided, after consultation with the General Medical Services Committee of the B.M.A., that payment of fees in respect of temporary residents should be restricted to cases in which treatment has actually been given. The wording of Form E.C. 19 will be amended accordingly.

Heard at Headquarters

A Question of Environment

The Hunterian Society staged a lively debate at the Apothecaries Hall on the question whether heredity was more fateful than environment, and the vote of the meeting decided that it was. One of the speakers on the side of environment as being more important than heredity was Professor J. B. S. Haldane, and the obvious weapon of the debaters who favoured heredity was to point to the Haldane family itself and the many people of high distinction in statesmanship, law, science, and philosophy who have borne the name of Haldane. But Professor Haldane, when he spoke, said that there were two sides to every pedigree. He recalled the exploits of Burke and Hare in Edinburgh, who inveigled travellers to a lodging-house, made them drunk, suffocated them, and sold the bodies to the anatomists. One of the bodies, which was recognized on the dissecting table by one of the students, was that of a Miss Haldane. He preferred to draw a veil.

B.M.A. LIBRARY

The following books have been added to the Library:

Paz Soldan, C. E.: La O.M.S. y la Soberania Sanitaria de las Americas. 1949.
Pneumoconiosis. Leroy U. Gardner Memorial Volume. 1950.
Poirier, J.: Traitement Homéopathique des Maladies du Cœur. 1949.
Pooler, H. W.: My Life in Three Counties. 1950.
Pou Diaz, J.: Tos Ferina. 1949.
Raymond, V., and Vallaud, A.: Le Benzolisme. 1949.
Ritter, A.: Notfallchirurgie. Zweite Auflage. 1949.
Roloff, W.: Tuberkulose-Lexikon: für Ärzte und Behörden. Zweite Auflage. 1949.
Romano, J. (Editor): Adaptation. 1949.
Routier, D.: Cardiologie. 1949.
Schleip, K., and Alder, A.: Atlas der Blutkrankheiten. Vierte Auflage. 1950.
Schneider, K.: Klinische Psychopathologie. Dritte Auflage. 1950.
Schoen, R., and Tischendorf, W.: Klinische Pathologie der Blutkrankheiten. 1950.
Siebeck, R.: Medizin in Bewegung. 1949.
Slocum, D. B.: Atlas of Amputations. 1949.
Soskin, S. (Editor): Progress in Clinical Endocrinology. 1950.
Vincent Memorial Hospital: Cytologic Diagnosis of Cancer. 1950.
Walker, K.: A Doctor Digresses. 1950.
Weber, F. P. (Editor): Further Rare Diseases and Debatable Subjects. 1949.
Willcox, R. R.: Textbook of Venereal Diseases. 1950.
Wolf, H. J.: Einführung in die innere Medizin. Vierte Auflage. 1949.
Yogananda, P.: Autobiography of a Yogi. 1950.

Correspondence

Hospital Threatened

SIR,—Dr. Stark Murray's extraordinary outburst (*Supplement*, December 9, p. 242) can be explained only by political bias and antagonism to G.P. hospitals. He implies that the scheme to alter the status of the Kingston Victoria Hospital and to close it down as a general hospital staffed by general practitioners and consultants is resisted only by a group of "die-hards." He omits to tell you that the Group Medical Advisory Committee voted against the scheme; that the Group Management Committee consistently voted against it; that twice the Group Advisory Committee voted for general-practitioner representation in the Group Hospital Management Committee, and no notice was taken. He omits to tell you that the proposed scheme does not mean an overall increase of beds, but is at the expense of "general" beds and beds for the aged sick. He says the Press were admitted at all the meetings, but omits to mention that they were excluded at private sessions when the matter was first brought up. He also omits to mention that the town councils of Kingston and Malden, and other public bodies, including the Surrey Executive Council, have appealed against the proposed scheme.

Admittedly, there are two sides to the question, but Dr. Murray's distorted version of the position will not help to a calm and considered review of the whole project and its implications. Indeed, I agree that "much thinking is needed on this subject"—particularly by Dr. Murray himself and by the regional board.

It is not a political question and never has been. It is entirely one of what is best for the community in this area: whether the loss of the general beds in the Kingston Victoria Hospital, and the effect on general practice, outweighs any gains made by altering the status of the hospital. And Dr. Murray's sneers at the staff of the Kingston Victoria Hospital and others will not "get him anywhere." The scheme will cause a serious rift in the medical profession in this area, as by far the greater majority of the doctors are emphatically on the side of the Kingston Victoria Hospital staff, for they bitterly resent the high-handed treatment of general-practitioner hospitals which is going on generally throughout the country.

A good general-practitioner service is as necessary for the community as any other part of the Health Service, and should be an integral part of it, and should be co-ordinated so far as possible with the hospital and other branches of the public health service as a whole. It has long been recognized, and recently been given expression to by eminent members of the profession, that a better standard of general-practitioner work can be obtained if the general practitioner can by some means have access to some hospital work. Lord Webb-Johnson, president of the Royal Society of Medicine, said on November 22 last: "All engaged in the practice of medicine will deplore the present tendency whereby general practitioners are deprived of opportunities which should be theirs at the local hospitals."

But we do not want the general-practitioner hospital as visualized by Dr. Murray. We want to retain the type of general-practitioner hospital as exemplified by the Kingston Victoria and Surbiton Hospitals, where the general practitioner works in conjunction with a consultant and specialist staff, and is able to learn what advances are being made, to see procedures carried out, and to discuss his cases with them—in short, a hospital which will prevent him from being left in medical isolation and help to keep up his standard of medicine and make him a more competent general practitioner to the community.

This so-called "revolt at Kingston" has aroused the interest of general practitioners all over the country, because they know the Kingston Victoria Hospital is fighting for an ideal, and they are all waiting to see whether the Minister of Health is going to stand by his recommendations on the matter of general-practitioner hospitals which he issued last year to regional boards, or whether he will continue to stand aside and let the matter be settled by "planners" who have no knowledge of general practitioners.—I am, etc.,

RALPH G. SMITH,
Chairman, Kingston Division,
British Medical Association.

Economy in the Health Service

SIR,—I have read with interest your leading article (*Journal*, December 2, p. 1262) and the letter from Dr. J. O. M. Rees (*Journal*, December 9, p. 1328): both are deserving of close attention. It appears that each writer is concerned to save the N.H.S. from bankruptcy, yet its early decease might conceivably lead to the rebirth of a far better service, founded on the basic principles laid down by the B.M.A. in 1945, and ensuring freedom and independence for doctor and patient alike.

With regard to some of the economies suggested, one point which often seems to be overlooked is the therapeutic value of a payment made by the patient. To the psychotherapist, or to any doctor trying to deal with a "recurring" complaint, this value is obvious, and it is readily grasped by the intelligent patient. It appears to have been overlooked by the Minister of Health. In a new and better service this aid to recovery could be retained if the patient were required to make a token payment (say, one shilling) for each service received and by providing a grant-in-aid to enable those to contract out who wish to do so.

Further, it seems that our administrators—those who sit on regional boards as well as those at the Ministry—have not recognized that a full use of the general-practitioner service, with freedom for the individual doctor to use all his skill and experience, would greatly reduce the burden on the far more expensive hospital service. The present employment of general practitioners as feeders of hospitals is sheer extravagance. Where the G.P. can admit his patients to his own hospital beds, he will almost certainly make the very best use of the available accommodation.

In this connexion, why does Dr. Stark Murray, in his letter about the Kingston Hospital (*Supplement*, December 9, p. 242), ask whether the G.P. is "still to make his own decision" regarding the admission of patients to hospitals? Is the G.P. unable to make a wise decision? In doubtful cases is he incapable of referring to a consultant for advice? Even a consultant may make a mistake, as the G.P. has reason to know.

As for the responsibility of the regional board, surely it is not beyond the ability of our administrators to devise a liaison between the G.P. serving his own hospital and the regional board of the area. It might be possible for the board to pay the G.P. a small fee for his services. I have even heard that this is done in some cases. Would that satisfy Dr. Stark Murray?

The free hotel service now given to hospital patients is, of course, a scandal: why free food in hospital and not if you are sick at home? Presumably the State wishes to encourage competition for the hospital bed.

Recently a patient of mine sustained a fractured skull at work. He was taken to hospital, where, after *x*-ray examination and dressing, they sent him home, as they had no free bed. Did the bountiful State grant him free food? Oh, no—not even free nursing: his wife had to give up her (paid) work in order to look after him, so they suffered a double loss. Such is the care of the State for the individual. And what a grand free hospital service it is—for vote-catching.

Mark, too, what a curious hybrid is the G.P. Dr. Stark Murray seems scandalized at the idea of a G.P. making "his own decision" in matters affecting his patients' admission to hospital, yet that same G.P. is counted fit to accept responsibility for a fractured skull, with no hospital equipment in case of need and no nurse on the spot to observe danger signs. How many consultants would care to accept this kind of responsibility—or the remuneration of 3½d. per week in return for their services?—I am, etc.,

Stanmore, Middlesex. H. B. WOODHOUSE.

Unestablished Doctors

SIR,—As intimated in my letter (*Supplement*, November 18, p. 207), an open meeting of assistants and other unestablished general practitioners was held on November 29 (*Supplement*, December 9, p. 239). The meeting was very well attended, and I believe that your readers may be interested to know the salient features which emerged.

(1) The meeting condemned the new transfer regulation, and numerous complaints of individual hardship since its inception were expressed from the floor.

(2) There was general support for the reduction of maximum lists to 3,000 patients to ensure better conditions for patients and doctors. It was stressed, however, that remuneration should be adjusted so that no loss of income results to practitioners who at present have maximum lists.

(3) The growing number of permanent assistantships was to be deprecated, and principals should be allowed a sufficient, but limited, time in which to find a suitable partner.

(4) The assistants and other unestablished practitioners were not adequately represented, and it was therefore decided by a large majority to apply to the Council of the British Medical Association for a special group to be formed for this section of the profession.—I am, etc.,

London, E.5. H. REZLER.

Service Pay

SIR,—I wish to express through our *Journal*, if I may, my views on the new rates of pay for medical and dental officers in His Majesty's Forces.

First, I feel sure that Mr. Emanuel Shinwell's announcement on November 29 that the increases in pay did not apply to National Service doctors and dentists until they have completed 18 months' full-time service must have struck a chill into the hearts of such officers. Surely none of us expected any discrimination between National Service and short-service or permanent officers in the medical and dental branches. These branches have always been different in many ways—one, for example, being the mode of entry—from any other branch of the Services. Why, then, as fully trained men and women when we enter, are we treated in regard to pay in the same way as other National Service men and officers?

It was stated in a signal issued by the Ministries concerned at the end of last August, when the general rises in pay were announced, that "medical and dental officers are being considered separately and will be notified later." Why, then, was it not even stated at that time that this would not apply to National Service officers, and only after three months' deliberation by the Government could they decide to make such an abrupt and distasteful discrimination?

A doctor who is conscripted into the Services and who does not wish to do more than the National Service period is given less remuneration than he could obtain in a civilian hospital, his cost of living is far more, and in many cases the experience he gains in medicine and surgery is far less.

Any non-National-Service officer of equivalent rank in any branch outside the medical and dental branches is receiving a salary insignificantly less (aircrew, actually more) than fully trained professional men in these branches, and yet we are supposed to be entitled to professional pay.

I believe it was put forward that one of the reasons why other National Service personnel were not getting the increased rates of pay until they had completed 18 months' service was that it was only at about this time they were really fully trained and of substantial benefit to the Services. Surely, then, does the Government's decision on November 29 imply that doctors and dentists are in this category too? If this is simply a method to encourage our professions to stay in the Services, I think the Government has made a most fallacious step. Such an attitude is far removed from being a virtuous incentive.

We have truly been given a raw deal. Why is it only we who are penalized for having to give up our civilian status as doctors and dentists to do our due share in serving our King and country? To those of us who are serving National Service medical and dental officers, I say the Government has got us where it wants us.

I am very anxious and would be very grateful to hear the views of other serving doctors on this matter of discrimination in relation to pay between National Service and others in the medical branches.—I am, etc.,

DISAPPOINTED R.A.F. M.O.

Association Notices

Diary of Central Meetings

DECEMBER

29 Fri. Science Committee, 2 p.m.

JANUARY

2 Tues. Organization Committee, 2 p.m.
9 Tues. Amending Acts Committee, 2 p.m.
10 Wed. Film Catalogue Subcommittee, 4 p.m.
17 Wed. **Council**, 10 a.m.
24 Wed. Consulting Pathologists Group Committee, 2.15 p.m
31 Wed. Amending Acts Committee, 2 p.m.

FEBRUARY

13 Tues. Meeting of Trustees, Dawson Williams Memorial Fund, 11 a.m.

Meetings of Branches and Divisions

WESTMINSTER AND HOLBORN DIVISION

A successful dinner-meeting was held on November 30, with Dr. Arnold Harbour in the chair. An instructive and entertaining lecture was given by Dr. R. Forbes, secretary of the Medical Defence Union, on "Medico-Legal Hazards in General Practice." Dr. J. Arthur Gorsky proposed the vote of thanks to the lecturer.

H.M. Forces Appointments

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Colonel Sir H. W. B. Cairns, K.B.E., has relinquished the appointment as Honorary Colonel of a T.A. unit on transfer of the unit to the Supplementary Reserve.

Lieutenant-Colonels (acting Colonels) J. W. Hirst, O.B.E., T.D., W. W. Crawford, T.D., and G. Rigby-Jones, M.C., to be Colonels.

Major (acting Colonel) D. P. Holmes to be Colonel.

Majors (acting Lieutenant-Colonels) R. A. Read, D. W. E. Lloyd, M.C., B. C. Jennings, C. Berens, C. J. Wells, M.B.E., A. McQuiston, and D. T. Rowlands, to be Lieutenant-Colonels.

Captains (acting Lieutenant-Colonels) I. W. Buirski, C. S. McKendrick, and J. R. MacIntyre to be Lieutenant-Colonels.

Captain D. R. Urquhart to be acting Major.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY DECEMBER 30 1950

PUBLIC HEALTH SALARIES

SOME COMPARISONS

The following table summarizes for easy reference comparisons between salaries at present paid in the public health service, salaries claimed by the medical officers, those offered in response by the local authorities, and those now awarded by the Industrial Court.

Category	Pay at Present	Pay Claimed	Pay Offered by L.A.s	Pay Awarded
Assistant M.O...	£735 × £25 p.a. to £935	£960 × £60 p.a. to £1,680	Grade I.—£750 × £50 p.a. to £950 Grade II.—£900 × £50 p.a. to £1,100	£850 × £50 p.a. to £1,150
Senior M.O. ..	£1,035–£1,435 at L.A.'s discretion × £50 biennially to £1,222–£1,435 depending on minimum	£1,680–£2,040 depending on population × £120 p.a. to £2,160–£2,520 depending on population	Grade I.—£1,150 × £50 to £1,350 Grade II.—£1,300 × £50 to £1,500 Grade III.—£1,450 × £50 to £1,650	£1,250 × £50 p.a. to £1,650
Deputy M.O.H.	£708–£1,410 depending on population and other factors. Increments and maximum discretionary	£1,780–£2,140 depending on population × £120 p.a. to £2,260–£2,620 depending on population	—	To be determined by negotiation
M.O.H. ..	£1,100–£2,310 depending on population and type of authority. Increments and maximum discretionary	£1,800–£3,120 depending on population × £120 p.a. to £2,280–£3,600 depending on population	£1,250–£2,700 depending on population × various increments to £1,650–£3,000 depending on population. Salary at discretion where population over 600,000. In Scotland where population under 60,000: £1,050–£1,450 × £50 (4) to £1,250–£1,650	£1,450–£2,700 depending on population × various increments to £1,650–£3,000 depending on population. Salary at discretion where population over 600,000

AWARD OF INDUSTRIAL COURT

The Industrial Court has now made its award on the terms of service of medical officers in the Public Health Service. Some of the claims made on behalf of public health medical officers have already been agreed, and were therefore excluded from the case presented to the Industrial Court. They will be embodied in the final agreement reached by the staff and management sides of Whitley Council Committee "C." The Industrial Court's award follows in an abridged form.

Parties.—Staff side of the Whitley Councils for the Health Services (Great Britain) Medical Council "C" and management side of the Whitley Councils for the Health Services (Great Britain) Medical Council "C."

Terms of Reference.—"To determine a difference between the management and staff sides of Committee 'C' of the Medical Council of the Whitley Councils for the Health Services (Great Britain) arising out of the staff side's proposals for revised salary scales and conditions of service for medical officers employed by local authorities."

1. The matter was referred to the Industrial Court for settlement in accordance with the provisions of the Industrial Courts Act, 1919.

The parties were heard in London on October 9, 10, 13, and 19, 1950.

2. The claim concerns approximately 2,000 medical officers employed by local authorities.

3. The present salary structure for the medical officers concerned had its origin in recommendations agreed to at conferences held in 1929 under the chairmanship of Lord Askwith at which representatives of the County Councils Association, the Association of Municipal Corporations, the Urban District Councils Association, the Rural District Councils Association, the London County Council, the Association of Education Committees, the Mental Hospitals Association, the Metropolitan Borough Standing Joint Committee, and the British Medical Association were present.

4. During the war period the scales were augmented by war bonus which amounted to £60 per annum.

5. An agreement was reached in March, 1946, between representatives of the British Medical Association on the one hand and representatives of local authorities on the other, for an interim revision of the Askwith Agreement.

6. The Askwith scales were again amended by agreement as from July 1, 1947.

7. The salaries paid at present are not uniform throughout the country owing to the operation of the discretionary clauses contained in the Askwith Agreement which were perpetuated in the amendments of 1946 and 1947, but the following table shows the present salary scales as amended in July, 1947:

	Minimum	Increments	Maximum
I. Medical officers employed in departments (having at least 3 years' experience subsequent to qualification, but without responsibility for the work of other medical officers)	£735	£25 p.a.	£935
II. Senior medical officers (in charge of services or departments)	From £1,035 but not exceeding £1,435, at local authority's discretion	£50 (biennially)	From £1,222 but not exceeding £1,435 depending on minimum
III. Deputy medical officers of health	From £708 to £1,410 depending on population, etc., but subject to application of Section I scale where duties include those of M.O. in department and that scale would be to the deputy's advantage	Increments and maximum discretionary	
IV. Medical officers of health	From £1,100 to £2,310 depending on population and type of authority	Increments and maximum discretionary	

NOTE.—The maxima were liable to be exceeded in particular cases at the discretion of the employing authority.

8. During negotiations the management side offered revised salary scales and conditions of service.

9. The scales claimed, set out briefly, are as follows:

Assistant medical officers:
£960 by annual increments of £60 to £1,680.

Senior medical officers:
Minimum from £1,680 to £2,040 depending on population.
Increments of £120 per annum.
Maximum from £2,160 to £2,520 depending on population.

Deputy medical officers of health:
Minimum from £1,780 to £2,140 depending on population.
Increments of £120 per annum.
Maximum from £2,260 to £2,620 depending on population.

Acting deputy medical officers of health:
Addition of £100 per annum to salary as senior or departmental medical officer.

Medical officers of health:
Minimum of £1,800 to £3,120 depending on population.
Increments of £120 per annum.
Maximum of £2,280 to £3,600 depending on population.
The maxima may be exceeded in particular cases at the discretion of the employing authority.

10. The scales offered, set out briefly, are as follows:

Assistant medical officers:
Grade I .. .. £750 by £50 to £950
Grade II .. .. £900 by £50 to £1,100

Senior medical officers:
Grade I .. .. £1,150 by £50 to £1,350
Grade II .. .. £1,300 by £50 to £1,500
Grade III .. .. £1,450 by £50 to £1,650

Medical officers of health:

In Scotland, population not exceeding 60,000
Minimum from £1,050 to £1,450
Increments of £50 (4)
Maximum from £1,250 to £1,650

In England, Wales, and Scotland, population not exceeding

75,000	Minimum between £1,250 and £1,650 Increments of £50 (4) Maximum between £1,450 and £1,850
100,000	Minimum between £1,350 and £1,850 Increments of £50 (5) Maximum between £1,600 and £2,100
150,000	Minimum between £1,550 and £2,050 Increments of £50 (5) Maximum between £1,800 and £2,300
250,000	Minimum between £1,750 and £2,250 Increments 2 at £100, 1 at £50 Maximum between £2,000 and £2,500
400,000	Minimum between £2,000 and £2,500 Increments 2 at £100, 1 at £50 Maximum between £2,250 and £2,750
600,000	Minimum between £2,100 and £2,700 Increments of £100 (3) Maximum between £2,400 and £3,000
Over 600,000	At discretion.

11. At the hearing it was stated that although the claim concerned both salary scales and conditions of service the main issue related to the salary scales. It was contended on behalf of the staff side that the salaries of public health medical officers should reflect parity of status with the other two branches of the medical profession—namely, the general practitioners and the hospital doctors and consultants. The management side maintained that public health medical officers formed part of the hierarchy of the local authority service and their salaries should be related to those of the local authority officers carrying comparable responsibilities.

12. In support of the claim it was submitted on behalf of the staff side that whereas public health medical officers are mainly concerned with preventive medicine, while general practitioners and the hospital doctors and consultants were concerned principally with curative medicine, preventive medicine is at least as important in its functions and responsibilities and the contribution which it can make to the general health of the community as a whole as the two curative branches. The public health medical officers are entitled to parity of status with the other branches of the profession, first, because the qualifications and education which they require are either the same as or similar to those of the other two branches (the public health officer wishing to become a medical officer of health has to spend one more year at least acquiring the Diploma of Public Health); secondly, because of their many and important functions and responsibilities; and, thirdly, because if suitable new entrants are to be attracted to this branch of the profession it must be made reasonably comparable with the other two—at present there is great difficulty in obtaining public health medical officers because the financial opportunities of general practitioners and the salaries of hospital doctors and consultants are much more favourable. The claim was designed to give the public health medical officer appropriate remuneration having regard to his functions and responsibilities and the value of his services and was based on the remuneration paid in the curative branches of the profession which derived from the Spens Report.

13. In explanation of the salaries claimed it was submitted that if it were possible to fix appropriate salaries for the lowest rank—viz., medical officers in departments (or assistant medical officers, the nomenclature used in the management side's offer) —and the highest rank—viz., medical officers of health—the scales for the other three ranks could be fixed between these limits, and the proposals for these three ranks had in fact been arrived at on that basis. The two typical examples of medical officers in departments are the school doctor who inspects and treats school-children and the doctor concerned with the maternity and child-welfare services. Both are employed on actual clinical work. Before entering the service of a local authority they must have had at least three years' experience in the practice of their profession, and in general they average 27 years of age on entering the public health service. The remuneration claimed was a minimum of £960 and a maximum of £1,680 which would be reached by annual increments of £60 on attaining 39 years of age. In the hospital field a junior registrar who enters at 25 or 26 years of age receives £670 on entry and after one year in that capacity may be appointed a registrar at £775 in his first and £890 in his second year. Subsequently he may become a senior registrar at £1,000 in the first year, £1,100 in the second year, £1,200 in the third, and £1,300 in the fourth and successive years. Then there is an intermediate grade of senior hospital medical officer who is higher than the registrar, being senior and older, but who has not attained consultant status and who gets a minimum of £1,300 with increments of £50, rising to a maximum of £1,750. In the field of general practice, a trainee assistant would receive a salary between £600 and £700 with the prospect of a partnership or an individual practice. While it was true that the work of the general practitioner was generally more arduous than that of the assistant medical officer employed by a local authority evidence showed that the average remuneration of the general practitioner under the National Health Scheme was £1,626 per annum with further emoluments from private practice and other medical appointments. It was pointed out that some assistant medical officers preferred the clinical work of these posts to the administrative work of the higher posts in the local authority service, and it was in the interests of the service that suitable officers should continue to do the clinical work. It was necessary to ensure that the salary scale would make this an attractive career. It was contended that the functions and responsibilities of the assistant medical officer were at least as great as those of the general practitioner. It would be quite wrong to suggest that the importance of the preventive work and to some extent the curative work which is done by the assistant medical officer in respect of the treatment of school-children or in respect of maternity and child welfare is less important than the work of the general practitioner. Although the claim is for parity of status between the different branches of the profession it is not a claim for equal pay, the *maximum* claimed after 12 years' service for the assistant medical officer being roughly equivalent to the *average* earnings of the general practitioner. The staff side regarded the management side's offer to assistant medical officers as totally inadequate and there was no justification for grading them or the senior medical officers.

14. As to the claim in respect of medical officers of health the minimum of £1,800 to £3,120 compares with the consultant's minimum of £1,700 and the maximum of £3,600 compares with the consultant's maximum of £2,700, leaving out of account the additional £500, £1,500, or £2,500 paid to 20%, 10%, and 4% of the consultants as distinction awards. As against the offer of the management side it was contended that when fixing the scales for medical officers of health it was quite unjustifiable to give the individual local authorities discretion to the extent of £400 or £500 when deciding the minimum of the scales which should apply to their officers.

Reference was made to the fact that there had been an upward revision of the scales of pay applicable to medical officers in the Colonial Service; that a committee was at present sitting to consider the scales of pay for medical officers in the service of the Government at home; and that it had been stated during a recent debate in the House of Lords that consideration would be given to scales of pay applicable to officers with medical qualifications in the armed Forces of the Crown.

15. Evidence was put before the Court as to the functions and responsibilities of medical officers of health and other public health service officers by reference to the numerous statutes relating to public health which contain provisions imposing duties upon them. Representative officers also gave evidence as to their duties and responsibilities. It was pointed out also that the position of the hospital doctors and general practitioners had improved relative to that of the public health service doctors by the acceptance of the recommendations of the Spens Report and the introduction of the National Health Service.

In the light of the evidence given it was argued that man for man the public health medical officers have functions and responsibilities not less important than those of general practitioners and consultants; that the national interest requires that the public health branch of the medical profession should have its fair share of the good men and its fair share of the best men in the profession; that the salary scales and conditions of service should be such as to attract to this branch its fair shares of the good men and the best men; that it follows as a matter of course that the Spens standard—i.e., the standard of medical remuneration established by the Spens Reports—and its implementation should be suitably applied to the public health branch; that for this purpose the salary scales proposed by the management side are not adequate and those claimed by the staff side are not more than adequate.

16. As to the calculation of the remuneration of part-time medical officers of health it was submitted that the method proposed in the claim—i.e., on the basis of the number of half-days occupied—was to be preferred to the method proposed in the offer—i.e., on the hours occupied. The method proposed in the claim followed that adopted in the Spens Consultants Report except that in that case a maximum of nine and a half elevenths was provided and the staff side were prepared to accept a similar limit in the case of the part-time medical officers of health. The offer in respect of deputy medical officers of health was wholly unacceptable, as it involved an indefinite delay in fixing their remuneration and proposed that it would be eventually decided by some other negotiating body on which the particular officers were not represented. With regard to the senior medical officers, the staff side agreed that such appointments should be made only where the local authority covered a population exceeding 250,000, but the staff side objected to the management side's proposal to divide senior medical officers into three grades notwithstanding their offer to give a right of appeal, because the proposal again gave discretion to the local authorities. In the staff side's view their proposal based on population was more appropriate and reasonable. With regard to the question of remuneration for mixed appointments—i.e., where two appointments are undertaken by the same officer—it was contended that the management side's offer was inadequate; such appointments involved a multiplicity of duties which warranted payment to the officer concerned of a salary appropriate to a higher post. Similarly, with regard to divisional medical officers acting as county district medical officers of health, it was submitted that the staff side's proposal was a fair one having regard to the officer's additional responsibilities. As to combined appointments, the staff side did not regard the management side's offer as adequate and maintained their claim for an extra £120. As to assimilation, the staff side objected to the management side's offer, for, whereas under the staff side's claim an officer on assimilation to the new scales proposed would be credited with his years of service in the post, under the management side's proposals there would be no such guarantee, it being within the absolute discretion of the employing authority to fix the point of entry into any new scales above the minima. As to the date of operation of any new scales resulting from the award, while the staff side did not object to the management side's proposals for giving effect to any increases they did contend that such increases should be retrospective to July 5, 1948, the date upon which new scales of payment had been introduced in the other branches of the Health Service, and not from October 1, 1950, as proposed by the management side. The staff side objected also to the management side's proposal that any new scales awarded should be maxima, and contended that the discretion hitherto given to local authorities in respect of increments and maxima should be continued. In respect of transfers, the staff side objected to the discretion allowed to the employing authority in fixing the commencing salary. It was submitted that if the local authority consented to an officer undertaking teaching duties he should be entitled to retain any fees paid in respect of such duties. In relation to sick pay, the staff side contended that the scheme to be applied should be that applicable to the hospital service in England, Wales, and Scotland.

17. As against the claim and in support of the management side's offer it was contended on behalf of the management side of the council that the public health medical service is a wholly distinctive service, different from the other two branches of the profession, which hitherto had quite properly been integrated with the rest of the local authority service, and there was now no more justification than formerly to align the remuneration of its officers with that of the general practitioners or the hospital doctors. Evidence in support of this contention was put before the Court, and it was submitted that for the purpose of fixing the appropriate scales of salary attaching to posts in the public health service regard should be had to the scales prevailing in the local authority hierarchy. This was the basis of the offer made by the management side.

18. In the view of the management side the scales claimed were not justified by the duties and responsibilities of the posts. In particular, it was submitted that the work of a general practitioner was far more arduous than that of an assistant medical officer, and it was pointed out that the *average* remuneration of the general practitioners (said to be £1,626) which was claimed as a maximum for the assistant medical officer required to be reduced by approximately £120 and by a further 2½%, representing respectively the Exchequer contribution to pension and the value of the sickness benefit to which the assistant medical officer in the local authority service was entitled. Even, therefore, on the basis of comparability with the general practitioner the maximum of the scale claimed for the assistant medical officer, it was contended, should not exceed £1,470. It was submitted that there was no real comparability between the work of the consultant and the medical officer of health, the one being a specialist doing clinical work demanding a very high degree of skill, the other being an administrator doing administrative work demanding a knowledge of medicine. In support of the offer, reference was made to the *Memorandum of Recommendations of the Joint Negotiating Committee for Chief Officers of Local Authorities*, and to the *National Scales of Salaries of the Administrative, Professional and Technical Divisions of the Local Authority Service*. It was explained that the management side considered that the duties and responsibilities of medical officers of health warrant parity with other chief officers of the local authorities with professional qualifications—viz., accountants and treasurers, and surveyors, chief education officers, and architects.

19. With regard to the claim made for remuneration based on parity of the duties and responsibilities of the public health medical officers with those of the general practitioners, it was pointed out that when making their recommendations in relation to the remuneration of general practitioners the Spens Committee had in mind the relative responsibilities and duties of all sections of the medical profession, and it was not to be assumed that, having proposed increases in remuneration of the general practitioner based on the arduous nature of his calling and the measure of his individual responsibility, the remuneration of all other members of the medical profession should be made comparable with that of the general practitioner. Unlike the general practitioner, whose services are required at all hours and who is called upon to deal with every

type of disease and casualty, the assistant medical officer works office hours of 38 per week in a limited field such as attendance upon school-children or maternity and child-welfare work.

20. As against the claim of the staff side and in support of the offer by the management side, it was pointed out that local authorities with the same population may have varying functions and in consequence their medical officers of health may have differing degrees of responsibility. It is most desirable, therefore, to have a comparatively wide range of salaries related to population. This was a feature of the agreed recommendations in respect of the chief officers of local authorities, and it was contended that the management side's offer giving the local authorities discretion within certain limits when fixing the scales of the medical officer of health provided the necessary flexibility and was to be preferred to the claim of the staff side for a fixed scale according to population without regard to the other local factors. Similar considerations applied in the case of assistant medical officers and senior medical officers and in the view of the management side justified their proposal for grading these officers. It was pointed out that in respect of these officers the management side would welcome the application of the same rights of appeal as in other branches of the Whitley machinery.

21. Where a medical officer acts as medical officer of health to more than one authority the management side agreed that his scale of salary shall be fixed according to the total population of the combined districts, but they could not agree to the staff side's proposal that he should receive in addition to this scale £120 per annum. As regards part-time medical officers of health, it was contended that their remuneration should be computed on an hourly basis, the Spens formula set out in the staff side's claim being inappropriate for public health medical officers. As to the claim that any new scales awarded should be made operative from July 5, 1948, it was pointed out that this was the operative date for the National Health Service, which was an entirely new service, and the considerations which justified the application of scales of salary for that service from that date do not apply in the case of the public health service, which was already then established. It was contended that any new scales for the public health service should operate from the date agreed for other local authority chief officers. The management side could not accept the proposal of the staff side that local authorities should have discretion to exceed the scales laid down. As to assimilation, the management side intended that the public health doctors should be dealt with in the same manner as other chief local authority officers. With regard to the claim in respect of the commencing salary of officers transferred from one local authority to another, it was submitted that the staff side's proposal might not be in the best interests either of the authority or of the doctors themselves. As to the claim for London weighting, it was submitted that in other industries and services it had been applied only to the lower-income groups generally and was not appropriate in the case of the officers now under consideration.

It was submitted that in respect of fees for teaching duties undertaken by officers in the public health service such officers should be treated on the same basis as other local authority chief officers. It was pointed out that the only difference between the staff side's claim and the management side's offer in regard to sickness payment was in respect of the scheme to be applied in Scotland. The staff side's claim was for a scheme to be applied universally in England, Wales, and Scotland, but it was pointed out on behalf of the management side that the sick-pay scheme applicable to local authority employees in Scotland differs from that applicable to those in England and Wales, and it was contended that it was desirable that all local authority staff within a particular area should be subject to a common scale of sickness payments.

22. At the hearing the parties agreed to the deletion of certain parts of the staff side's claim and the management side's offer.

23. At the conclusion of the hearing the Court requested the parties to furnish certain additional information, and on October 27 and on subsequent dates statements showing the numbers of public health officers employed by each local authority together with particulars of their salaries on entering their present posts and their current remuneration were sent to the Court. On November 7 and 8 further information, including an estimate of the cost of the staff side's proposals, was furnished to the Court.

The Award

24. The Court have given very careful consideration to the evidence and statements made on behalf of the parties and in the light of the situation as it exists at present award as follows:

The scales of salary for medical officers employed in the public health service in England, Wales, and Scotland shall be

Assistant medical officers or medical officers in departments, £850 per annum rising by annual increments of £50 to £1,150 per annum.

Senior medical officers, £1,250 per annum, rising by annual increments of £50 to £1,650 per annum.

Medical officers of health

Local Authority Population Not Exceeding	Minimum of Salary Scale Between	Annual Increments
75,000	£1,450 and £1,650	4 of £50
100,000	£1,550 and £1,850	5 of £50
150,000	£1,750 and £2,050	5 of £50
250,000	£1,950 and £2,250	2 of £100 1 of £50
400,000	£2,200 and £2,500	2 of £100 1 of £50
600,000	£2,300 and £2,700	3 of £100
Over 600,000	At discretion.	At discretion.

The salary scales for deputy medical officers of health, divisional or area medical officers, and for officers holding mixed appointments shall be determined by joint negotiation and agreement between the parties, and in the event of failure to reach agreement on this matter within a period of two months from the date hereof either party shall be at liberty to report such failure to the Court, and the Court will after hearing the parties determine the matter in dispute.

Part-time medical officers of health shall be remunerated in accordance with the Spens formula in respect of the consultants.

Medical officers of health holding combined appointments shall receive £100 per annum above the appropriate salary scale indicated by the total population of the combined districts for which they are medical officers of health.

Officers at present in post shall be assimilated to the new salary scales on the "corresponding points" principle—that is to say, each officer will be placed on the point in the new scale which he would have reached had the scale been operative at the date of his appointment to his present post. In addition, if a local authority in the exercise of the discretion permitted under the Askwith Agreements appointed a particular officer at a salary in excess of the minimum then current, the local authority shall in assimilating that officer to the scale now awarded fix his starting point at a similar amount above the new minimum, so, however, that the maximum of the new scale shall not be exceeded in such cases except at the discretion of the local authority.

The operation of the scales herein awarded shall not in any circumstances result in reducing the salary of any officer in post.

Sick pay shall be in accordance with the terms of the scheme set out in Appendix G[1] except that in Scotland officers shall be conditioned to the scheme in operation in Scotland for other local authority officers.

[1]Appendix G, not printed here, includes the following provisions for sick pay:

During the first year of service: one month's full pay and (after completing four months' service) two months' half pay. During second year of service: two months' full pay and two months' half pay. During the third year of local-government service: three months' full pay and three months' half pay. During the fourth to sixth year of local-government service: four months' full pay and four months' half pay. During the seventh to tenth year of local-government service: five months' full pay and five months' half pay. After completing ten years of local-government service: six months' full pay and six months' half pay. The council shall have discretion to extend the application of the foregoing scale in an exceptional case.

Medical officers may undertake teaching duties with the consent of the local authority upon such conditions, including conditions as to the retention of any part of the fees received therefor, as the authority may determine.

Where a medical officer transfers from one local authority to an appointment in the same grade with another local authority, service with the former authority in that grade may in the discretion of the new authority be credited in fixing the appropriate commencing salary.

This award shall operate from and including October 1, 1950, and the scales awarded shall with effect from October 1, 1950, be applied in accordance with the formula contained in the Third Schedule of Appendix G (ii), (iii), (iv), and (v),[2] adapted to comply with the assimilation terms of this award.

Except as provided herein the Court find against the claim by the staff side and the offer by the management side and award accordingly.

25. This award is the unanimous decision of the Court. The President's sudden illness precludes him from appending his signature hereto.

(Signed): G. MAURICE HANN.
WM. E. C. LAZENBY.
N. W. COLEMAN, *Secretary*.

[2]Appendix G includes the following paragraphs on operative dates (some examples omitted):

(ii) Where a local authority are at present paying a chief officer a salary less than the salary at the point of entry fixed by the local authority under the last recommendation, the local authority shall with effect from October 1, 1950, pay to the chief officer a salary which is half-way between his present salary and such point of entry and shall with effect from October 1, 1951, pay to the chief officer a salary commencing at the said point of entry. Provided that if an authority wish to defer the payment of the increase which becomes effective on October 1, 1950, until the financial year 1951–2 they may, at their discretion, add the amount of the increase due from October 1, 1950, to March 31, 1951, to the salary payable from April, 1951.

(iii) Any annual increments payable in accordance with the scale so fixed shall first commence to be paid on April 1, 1952, and shall be paid thereafter on April 1 in each year.

(iv) If after the scale and point of entry have been fixed . . . no immediate increase in salary is payable to the chief officer, but increments fall to be paid . . . then the first increment shall be paid on April 1, 1952, and subsequent increments on the anniversary of that day.

(v) If a chief officer was on April 1, 1949, within five years of pensionable age or if he reaches an age within five years of pensionable age on any day thereafter not later than October 1, 1951, the First Schedule [of salary and increments] shall operate in his case as from April 1, 1949, or the day when he reaches the age within five years of pensionable age, whichever is the later, so that he shall receive as from that day a salary . . . with increments . . . on the first and subsequent anniversaries of that day.

GENERAL MEDICAL SERVICES COMMITTEE

WITHHOLDING OF CERTIFICATES

Although it sat for seven hours on December 14 the General Medical Services Committee, with three major issues before it, was able to deal only with a small proportion of the agenda, and arranged to meet again on December 21. Its time was occupied with two or three important matters. Under the chairmanship of Dr. WAND it discussed at length the measures to be taken should the dispute with the Ministry eventuate in a withdrawal of service. In particular it discussed, as a necessary weapon in such a struggle, the withholding of such certificates as might be used for obtaining sickness benefit under the National Insurance and other Acts.

Several members gave their "constituency impressions" of the reaction to this proposal, and the very general report was that the withholding of such certificates was a necessary corollary to withdrawal.

The Committee decided to report to Council and to local medical committees.

The Committee addressed itself to a matter on which some confusion has arisen—namely, the class of certificates which would be withheld. A need for closer definition was felt. It was realized that this matter was not as easy as it might appear. There were, for example, the cases of pensioners and people to whom a certificate was essential if they were to continue to receive certain allowances and benefits, and there were, of course, death certificates and the like, which a registered medical practitioner is bound to give, and which would continue to be issued. A definition was agreed as to the material certificates for the purposes of the dispute—namely, those which might be employed for the purpose of obtaining sickness or other benefits under the National Insurance Act, 1946, and other relevant Acts.

Co-operation between the M.P.U. and the Committee

A deputation from the Medical Practitioners' Union attended with a view to reopening discussions on the representation of that body on the Whitley Council. Its spokesman was Dr. BRUCE CARDEW, general secretary. He said that the Union had felt that as a national organization it should be represented on the new machinery which was set up to negotiate on remuneration. The Union now wished to suggest that they be given representation on the General Medical Services Committee, where policy was determined, and that they should take their chance of representation on Whitley.

It appeared on further examination, said Dr. Cardew, that there was some constitutional difficulty over the manner in which membership of the Committee could be effected. He suggested as a temporary arrangement, until the matter was regularized by the Annual Representative Meeting and the Conference of Local Medical Committees, that representation should be by co-option. This would afford both sides a probationary period to see how the matter worked out. Numerical strength was not important. All that was desired was to have perhaps three representatives on the Committee to voice the Union's point of view. In the past there had been considerable hostility between his organization and other medical bodies, but the Union was now anxious to break this down and to work with all other organizations for the good of the profession.

Dr. Cardew answered a number of questions from the chair and from members. A full report of this discussion will appear in a subsequent issue.

After the deputation had withdrawn, the Committee considered the matter, and, three members dissenting, agreed to invite two members of the Union to attend future meetings of the Committee as observers, the arrangement to continue until the Representative Body of the Association and the Conference of Local Medical Committees have approved the Committee's action and decided whether to regularize the position by an appropriate amendment to the Committee's constitution.

"Unestablished" General Practitioners

The Committee received a deputation of five members representing about one hundred practitioners in the Greater London area who have forwarded an application to the Council for the formation of a Special Group of the Association "to comprise principals in general practice with inadequate lists of patients, assistants, and other unestablished general practitioners."

Dr. H. REZLER, the spokesman of the group, said that such a group was required in the Association because, in the first place, "unestablished" general practitioners were at present inadequately represented and were faced by serious problems which had been caused or accentuated by the National Health Service. They were aware that there was an Assistants and Young Practitioners Subcommittee of the General Medical Services Committee, but this, almost inevitably, was not a representative body, and its members could state only their individual opinions. Moreover, the term "young practitioners" was objected to; some of the practitioners in this petitioning group were middle-aged or even elderly. The speaker laid stress on the difficulties of entry into general practice, and on the swelling of the ranks of general practice by the continual entrance of more doctors from the medical schools, the Forces, and the ranks of "displaced" hospital registrars. It seemed quite possible that within the next year or two there might be serious unemployment in the medical profession.

The Council of the Association determines the creation of special groups, and the Committee's report on this application will be before the Council at its meeting on January 17.

REGISTRARS' GROUP

MANCHESTER MEETING

A General Meeeting of the Manchester Region Registrars' Group was held at the Manchester Royal Infirmary on December 1. Dr. R. M. FORRESTER was in the chair, and 103 members were present. The main item on the agenda was the motion: "This meeting welcomes the Minister's attempt to form a proper consultant–registrar ratio, but deplores the method by which this is to be achieved."

The CHAIRMAN said that one of the main objects that the Registrars' Group had pressed for was the formation of a proper consultant–registrar ratio, and the Minister's attempt at arriving at such a ratio was welcomed on this account. It was with its manner of achievement that registrars disagreed. The serious effect of the Minister's scheme on hospital manpower and the disastrous effects on hospital services consequent on dismissal of registrars were pointed out. Replacement of registrars by general-practitioner assistants could not be contemplated by hospitals, registrars, or general practitioners themselves. As to the alternative employment offered, neither the armed Forces nor the Colonial Medical Service was attractive, since many registrars had already served in the Forces and many now had family responsibilities. Entry into general practice was extremely difficult for registrars.

Three Proposals

The CHAIRMAN put forward three proposals which might help to solve the registrars' problem:

(1) *Expansion of Consultant Services.*—This had been officially envisaged. It was agreed that this could not be maximal at once, but even such expansion as was possible and necessary at the present time had not been effected, and dismissal of so many more senior registrars would make subsequent expansion more difficult inasmuch as that these trained men would have been lost to the service.

(2) *Improvement in Conditions in General Practice.*—It was agreed that there must inevitably be some wastage of registrars on the ladder to consultantship, and it was felt that the main outlet for them must be into general practice. Therefore, measures for improving conditions in general practice must be fully supported, and easier means of entry for registrars into general practice must be found.

(3) *Extension of Period of Tenure of Senior Registrar Appointments.*—This involved an entirely new principle—namely, the extension of tenure of senior registrar appointments for a limited period over and above the three years laid down by the Minister. Thus an increase in tenure of one year, making four years in all, and at the same time allowing the same number of entrants into the senior registrar grade as would otherwise obtain, would allow a 33% increase (over the Minister's figure) in the number of senior registrars employed at any one time. An increase of two years would provide a 66% increase, and of three years 100%. The actual figure of 1, 2, or 3 years could be decided when the full extent of expansion of consultant services was known. In any case it could be a variable figure, adjustable to the needs of expansion of the consultant service. As long as a definite maximum tenure was laid down there would be no blocking of new entrants, a feature which was of vital importance.

Dr. T. F. REDMAN pointed out one objection to the proposal to increase the tenure of senior registrar appointments—namely, that such an extension would prolong the period of insecurity before the registrar knew whether or not he was to get a consultant post. He put forward, as an alternative, the creation of junior consultant posts. This proposal was criticized by some members on the ground that they would have the effect of giving the Minister the services of fully trained consultants at less than a consultant's pay.

After further discussion of the Chairman's proposals by various members, during which the importance of registrars in hospital services, and the ill effect that their dismissal would have on the public, were stressed, Dr. ROSE proposed that "the present emergency can be met as far as is possible by extending the consultant services and by the creation, if necessary, of junior consultant appointments."

The motion was seconded by Dr. F. BRUN. The following amendments to the motion were made: (1) A "junior consultant" should be defined as a doctor paid at a salary intermediate between senior registrar and consultant, and with full clinical responsibility. (2) The term "junior consultant" should carry with it the right to promotion to full consultant in due course. The motion and the amendments were carried by 60 votes to 22.

Dr. E. FEINMANN then proposed: "The Chairman's statement of policy to be taken as the basis for future discussion and action." Dr. C. J. DEWHURST seconded the motion, which was carried unanimously.

The Chairman promised to present the registrars' case and their proposals at all levels with the utmost vigour.

CENTRAL ETHICAL COMMITTEE

The Central Ethical Committee at its meeting on December 12 started bringing up to date the statement of the Association's policy on indirect methods of advertising. The existing statement was drawn up in 1925. The Committee will prepare for the approval of Council a statement for the guidance of those members of the profession who speak and write for the public on medical or semi-medical matters. The part of the statement on such subjects as press interviews and television appearances will require long consideration.

A report was received that the Ministry of Health had issued a circular to hospital authorities calling attention to the necessity of obtaining the written consent of the patient prior to the loan of case papers to the Ministry of Pensions. The Ministry had also agreed to bring the contents of the circular to the notice of members of hospital staffs.

SUPPLEMENTARY OPHTHALMIC SERVICES

A circular from the Ministry of Health emphasizes that medical practitioners in the whole-time service of regional hospital boards, boards of governors, or hospital management committees cannot take part in the Supplementary Ophthalmic Services. Ophthalmic medical practitioners on ophthalmic services committees' lists may not claim fees under the Supplementary Ophthalmic Services for sight tests performed at hospitals where they are under contract as part-time officers.

Heard at Headquarters

Inquiry from France

The International Medical Visitors Bureau, whose director is Dr. H. A. Sandiford, at B.M.A. House, has heard from a French doctor who would like his daughter, aged 18, to spend the winter in London, preferably *au pair*, either to teach French or to look after children. Any doctor interested in making some arrangement with the French doctor may obtain particulars from Dr. Sandiford. Two members of the B.M.A. arranged holiday exchanges through the Bureau with French doctors during the summer, and the visits were a great success. Dr. Sandiford will provide information about arranging visits, and those interested should write to him well before the proposed time.

The Village Doctor

Rural practice, the disadvantages of which are sometimes stressed, has its compensations. Dr. W. N. Pickles gave a pleasant picture of it in an address to the Medical Officers of Schools Association the other day. He told how on a lovely evening in early summer he climbed to the top of one of the noble hills in his part of Yorkshire. One by one he made out the villages below him, each with its thin pall of smoke, and watched the evening train creep up the valley; and the curious thought occurred to him that there was hardly a man, woman, or child in any of those villages whose Christian name he did not know and with whom he was not on terms of intimate friendship. He confessed that he owed a great deal to his patients—the folk of the Yorkshire dales with their great friendliness and kindness of heart. They were just the people to help the doctor in such epidemiological investigations as had interested him. Matters like heredity and consanguinity had to be approached with care, but he had generally found co-operation and they were not quick to take offence. He had known the grandparents of most of his present patients and had been able to trace characteristics through generations.

Standing Order

The discussion in the council was on the setting up of a new medical advisory committee. It was objected that the gentlemen selected were old and set in their ways, but to this it was pointed out that they must be people of standing. "People of standing!" said the surgeon who had raised the objection, "Why, they've got one foot in the grave and the other in a roller skate."

Film Library Accessions

The B.M.A. Film Library is growing apace. Lately it has been enriched by some two dozen medical films, nearly all of them presented by Imperial Chemical Industries, which has agreed to give two copies of all its medical films to the Association. Nearly half the films in this latest acquisition are concerned with anaesthetic technique.

Thanking You

A novel attempt to save the doctor's time in his surgery is suggested by the following letter, which a general practitioner recently received from a patient: "Dear Sir,—I am wondering if you would be so kind as to call in on me and give me an order for more insulin and needles, also some codeine tablets. I have not had any tablets for a long time now and I feel I want some more. I thought perhaps this would save you time in your surgery hours. Thanking you. . . ."

Questions Answered

Basic Salary and Income-tax

Q.—*I am receiving the annual payment of £300 basic salary from the National Health Service. Is this grant assessable for income-tax? If it is, is it correct to include it with my other fees?*

A.—The salary can be included in the miscellaneous earnings assessable under Schedule D.

THE B.M.A. WAR MEMORIAL

The committee appointed by the Council in 1947 to consider the question of a war memorial to members of the medical profession who fell in the 1939–45 war has sought the advice of experts on the form the memorial should take, and, as previously reported, it has recommended to the Council that it should be a visible memorial located at B.M.A. House, London, fitting to the memory of the fallen and in keeping with the general architecture of the building. A fountain in the Court of Honour of B.M.A. House was considered the most suitable form of memorial, and a limited competition was instituted among three prominent sculptors. The design of Mr. James Woodford, R.A., R.S.B.S., was chosen. It consists in a memorial fountain surrounded by a group of figures sculptured in classic style in Portland stone, symbolizing the ever-developing range of medical research, service, and sacrifice. This model was exhibited at the Annual Meeting in Southport and Liverpool last July, and a photograph and description appeared in the *Supplement* of September 16 (p. 131).

Many members of the Association have expressed the view that scholarships for the children of the fallen would be a more appropriate form of memorial, and it was agreed that these should also be instituted.

In response to the appeal issued by the Chairman of Council to every member of the Association last July, £8,127 1s. has been received so far from 4,145 subscribers. Of this total, £313 15s. from 110 subscribers has been set aside for scholarships and other purposes. (The names of subscribers will be published in this *Journal*.) Sufficient funds are now available to start on the work, which it is expected will take 18 months to complete.

The cost of the memorial in the courtyard will be £6,500. There will, in addition, be certain expenses in connexion with its erection. These will be less than originally estimated, since it is necessary in any case to re-lay the Court of Honour because of subsidence during the war. The cost of this will not come out of the War Memorial Fund.

All subscriptions received from now on can be devoted entirely to the scholarship section of the War Memorial Fund, and members are invited to subscribe generously. This can be done at the time of renewing the annual subscription, and a space is provided for the purpose on the form. Those who have already asked that their subscriptions should be devoted entirely to scholarships will have their wishes met.

The War Memorial Fund can now be recognized as a charity, and it will be possible to accept covenants for this purpose. Those who might wish to take advantage of this opportunity over a period of more than seven years are invited to communicate with the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

General Practitioners and Hospitals

SIR,—Dr. W. N. Leak's letter (*Supplement*, December 9, p. 241) regarding the payment of general practitioners and consulting surgeons raises several points of interest, but consideration of these will tend to deflect attention from the danger which, perhaps unrecognized, threatens him and his G.P. colleagues at Winsford. I do not know the geography or the resources of the Winsford district, but I dare to forecast that in a few years' time no operations will be performed in his hospital by G.P.s.

The process of development in our hospital has been as follows. Ten years ago a visiting general surgeon and an E.N.T. surgeon came down from time to time to do special cases. The rest of the surgery, including most emergencies, was done by G.P.s. Gradually our two consultants were joined by a gynaecologist, an orthopaedic surgeon, and, most recently, by a genito-urinary surgeon. During this process we G.P.s shared in the advantages by increased opportunities for consultation and for discussion while assisting at operations or giving anaesthetics. But now the natural and easily foreseeable sequence has taken place. The specialist anaesthetist and the resident house-surgeon have made the G.P. unnecessary for the efficient treatment of the patient in hospital.

General practitioners are being discouraged from working in hospitals, and consultants are degenerating into mere specialists. Our enthusiasm and our efficiency are thereby lessened. The payment from the staff fund merely adds to our degradation, as the only possible excuse for it seems to me to prevent anyone belonging to the "doctor class" from being associated with voluntary work.

But this question of payment should not be allowed to divert us from the real problem. What must be decided is at what stage of development is the increased efficiency of any particular G.P. hospital bought at too great a cost in the consequent lowering of the standard of general practice in the neighbourhood. Unfortunately the standard of general practice is not recognized by the hospital service authorities as being their responsibility, and there, I think, lies the cause of our present decline and imminent fall.—I am, etc.,

Forest Row, Sussex. E. G. SIBLEY.

Hospital Threatened

SIR,—Dr. Stark Murray's letter (*Supplement*, December 9, p. 242) shows little sympathy with the G.P. It seems to me grossly unfair that the Victoria Hospital, Kingston (a comparatively up-to-date building), should be annexed by the board for specialist services, especially without suitable alternative accommodation being provided for immediate use. This is in contravention of the Minister of Health's circular on G.P. beds.

As a G.P. of over 30 years' standing I am convinced from personal experience that these beds are "vital to the standard of medicine," sufficient numbers cannot be provided in the foreseeable future, and therefore it is all-important that part-time registrar and clinical assistantships should be made available without delay.

I have every sympathy with the hospital registrars who are being dismissed, but believe that many of them would find a fuller life if a combination of general practice and hospital employment was made available to them. This can be achieved only by the reorganization of general practice as well as hospital staffing. During the past 30 years many branches of medicine and surgery have been removed from the G.P.'s sphere, and he is not the good all-round man his grandfather was. Something must be done to restore the balance.—I am, etc.,

London, W.14. C. WATNEY ROE.

Public Relations

SIR,—It appears to me that both Drs. Guy Dain and W. Edwards (*Supplement*, December 9, p. 242) have, unwittingly I am sure, attributed to me a suggestion which I had no intention of making. I did not suggest that our P.R. Department should misrepresent facts. Even if my words could, by taking one sentence out of its context, be made to mean this, I think it was sufficiently obvious to most intelligent readers that this was not my intention. The gist of my remarks was, I maintain, quite clear—that it is the duty of any P.R. department to make its employers appear in the best light possible.

As a member of the Association I must say I resent the assumption of your correspondents that the P.R. Department is sacrosanct and must not be criticized. The integrity of the P.R.O. is not in dispute, although for some reason both your correspondents refer to it in their replies to my letter. I would be the last to question it. In fact, I am not concerned with the reputation of the P.R.O. But what causes me considerable concern is the reputation of the medical profession.

In my view the P.R. Department should pay more attention to matters which are likely to enhance our reputation. I have been told by an experienced journalist on a national daily that rarely does the P.R. Department hand out stories about what doctors, individually or collectively, are doing for the public (e.g., how 90-odd % of those engaged in National Health Service practice are conscientiously doing their utmost to make the Service a success, or about some new discovery to ease the sufferings of mankind), but concentrates on the medico-political side of B.M.A. activities. In my view this is a mistake and contributes to the deterioration of our reputation.

After all, the letters P.R. stand for Public Relations, not Political Relations. If we build up a picture in the public eye of ourselves as we really are—working constantly for the public good and not particularly obsessed with thoughts of money—then, I think, when it does become necessary for our finances to become publicly in dispute, we shall have the solid backing of the public.—I am, etc.,

Hatfield, Herts. KENNETH C. HUTCHIN.

Negotiations Through Whitley Machinery

SIR,—Though I feel that for the sake of unity in a reasonable cause the movement to withdraw from the Health Service (unless a satisfactory settlement on remuneration is arrived at) should be supported, I greatly regret that payment should be the subject of the stand. At the Conference of Local Medical Committees last June a resolution was passed regretting the Minister of Health's failure to give an unqualified assurance that negotiations on general-practitioner remuneration will always be conducted through Whitley machinery, and instructions for preparations for withdrawal were, first, "in the event of the Minister failing to give the necessary assurance."

To my surprise nothing of this was mentioned in the circular letter sent to all G.P.s explaining the probable actions of the British Medical Guild. Can it be that the Guild does not think the matter of such importance as the amount of our pay; or does it think us less likely to be concerned about a matter of principle than about the state of our pockets?

It is a matter of importance to all citizens at a time when more and more of us are directly employed by the State that our employer should not be also the arbitrator of our disputes, and by taking a stand on this point we should be fighting for the liberty of every citizen (and I think the public could understand this) rather than, with however great justification, for our personal future as doctors.—I am, etc.,

London, E.11. SIDNEY ABRAHAMS.

Difficulty of Entering General Practice

SIR,—Having been through the difficult and anxious process of finding and settling into a practice since the war, I have the greatest sympathy for those who are now experiencing frustration and anxiety in finding a suitable opening with reasonable prospects. Conditions appear to be much worse than they were, and something should be done without delay to facilitate the smooth and easy absorption of these doctors, who are in any case badly needed to help with the mass of work falling on the general practitioner.

It is inevitable that they should feel some resentment of those who are already settled in practice with large lists, but many doctors who work appallingly long hours and seldom get away from their practices would gladly take a partner with whom to share the work and responsibility, but with remuneration on its present basis this is impossible. The obvious solution is to have a higher rate of capitation fee for the first 1,500, and a lower rate of capitation fee for the next 2,500, unless a partner is taken, in which case the new partner would also be entitled to the higher rate of capitation for his first 1,500 patients.

The problem of these unplaced doctors should have more urgent attention than the claims of those of us who are already settled in practice, just and pressing though our own claims undoubtedly are.—I am, etc.,

Sixpenny Handley, Wilts. PAUL HARRIS.

Withholding Certificates

SIR,—The original Guild schedule issued to doctors created as much stir as a damp squib, the reason being that the general practitioners were asked to fight with their hands tied behind their backs. When the Conference of Local Medical Committees, and later the G.M.S. Committee, both with overwhelming majorities, reversed their decision not to withhold certificates, the hopes of the G.P.s rose once again. Dr. Wand points out that this reversal was a result of the wave of feeling at the periphery. That is, some 20,000 G.P.s all over Great Britain were very sore with the feeble Guild policy.

The case was next considered by Council. There was much support, but various members opposed the new decision. I wonder how many of the latter are not G.P.s. The Public Health Committee chairman would give sympathy and support, but we must not withhold private certificates. The report (*Supplement*, November 25, p. 209) of his actual committee meeting was that private certificates should not be withheld from private patients. What exactly is meant? Patients who are private from choice, or the millions who become suddenly private in the event of withdrawal? How Aneurin Bevin would welcome those certificates in lieu of official forms. That Celt would not enjoy fighting such simpletons. He would think of the doctors of the Netherlands, who went to the extreme of withholding even death certificates, and so subdued the Nazi occupation forces in a day or two. A short fight and victory instead of a long-drawn-out disastrous struggle.

In Council some speakers repeated ethics, ethics, as an argument against. Now let us look at this certificate question from another angle. From time immemorial private certificates have been paid for by the patient. Do these ethical doctors agree to withholding official health certificates and charging for the alternative ones? That would place us in a worse position than Dr. Gregg envisages. We become spivs and racketeers, screwing extra "bobs" out of the individuals. Shame!

Last week a Guild meeting of our ward was called to organize groups, etc., and, of the twelve doctors who were not G.P.s invited, only one turned up. He described himself as an unemployed registrar—a true story that should ring a bell for all doctors under the yoke of the Ministry of Health.

Council now asks that the decision be referred back to the periphery. I appeal to all general practitioners to attend their meetings and support the decision of their local medical committees. Doctors outside general practice should also participate in Guild meetings before the Ministerial axe falls on them as it did on the registrars.—I am, etc.,

Birmingham. THOMAS J. CRONIN.

Distinction Awards for Part-time Specialists

SIR,—The reputation of our profession surely reached its nadir with Lord Moran's recent speech in the House of Lords on October 18 in justification of the specialist awards (*Journal*, October 28, p. 1005). Stripped of non-essentials, his argument appeared to be that no whole-time specialist could be expected to do his best, once his maximum salary was reached, without special awards as a prize for endeavour.

This, if true, is lamentable. But what is the justification for the large awards recently made to part-time specialists? Do they need an incentive? Already they earn in private practice two or three times the income of a general practitioner; a grateful Government has rightly allowed them to earn a salary up to £2,350 a year for work which they previously did for love of humanity; they can make another 800 guineas for domiciliary consultations; and now in addition they have the prospect of further Grade A, B, and C awards.

What incentive has the general practitioner to stir him to further effort or reward him for work well done? Merit will not help; proximity to a bus route, or a rising industrial suburb, is the index to his income. The better-class practice is ruined; the busy industrial doctor with 4,000 patients is perhaps reaping some financial benefit at the cost of his health or his conscience. He must work for a fixed income until retirement or, more probably, death claims him.

I know there is an official explanation for all this—the Spens report covers a multitude of sins. But, although a practitioner of 40 years' experience, and now too old to be much affected by these changes, I am tempted to forget the calm of maturity and to say, in the vigorous if vulgar idiom of a younger generation, Sir, it stinks.—I am, etc.,

Cardiff. C. W. SHEPHERD.

Merit Awards

SIR,—A letter has just been received at the offices of this association from a well-known consultant which begins, "I have been informed, from a source that I have no reason to believe is unreliable, that every member of the staff of the teaching hospitals above the age of 40 years has received a merit award. . . ."

The teaching-hospital consultants are said to be some 20% of all consultants; merit awards were to be distributed to 34% of all consultants.—I am, etc.,

NIGEL CRIDLAND,
Honorary Secretary.

Regional Hospitals' Consultants and Specialists Association (Non-Undergraduate Teaching Hospitals).

N.H.S. and Politics

SIR,—The curse on the N.H.S. is that instead of starting as a genuine health measure agreed between Parliament (both Government and Opposition) and the profession it was forced into being by an omnibus Act primarily to implement the politically inspired National Insurance scheme. The Act gave dictatorial powers to the Minister of Health, and this position was then given to a politician who cheerfully boasted his "abysmal ignorance" of medicine. As regards these powers it should be noted that although he professes to have no power to *improve* conditions of remuneration, etc., yet he has overnight by a stroke of the pen *cut* the pay of the chemists and dentists.

Only a childless cynic could be other than appalled at the housing position, which is not only, as any general practitioner can testify, producing an immense amount of avoidable physical and mental stress and disease, besides limiting the birth rate, but is also seriously interfering with the convalescence and aftercare of hospital patients. How can a heavily plastered elderly leg be properly nursed in a council house containing two families totalling perhaps ten members? Yet the overstrained hospital accommodation must be kept fluid or be overwhelmed. Now we have the crazy cutting down of hospital staffs. The whole Service totters.

Most assuredly we should approach every member of Parliament, but it should not be a haphazard affair left to local committees and divisions but a forceful, factual, and concise statement from H.Q. Local comment and examples can be added. Every M.P. is personally responsible to *all* in his constituency, and, although the Minister must take the ultimate and major blame, the M.P., if obstructive or inactive after briefing, cannot escape his share.

It is painfully obvious that the B.M.A. public relations service is as yet deplorably weak and ineffectual. If the public were properly apprised of the facts, the Minister, even this one, would be forced by public opinion to improve matters. We wrung out of him the right of open criticism. Let us use it.

Medicine should be above politics, but the present regime has made this ideal for the time unattainable, and it is therefore our duty not only to ourselves but to our patients—the nation—to ventilate the facts.—I am, etc.,

Newton Ferrers, Devon. W. F. BENSTED-SMITH.

Expensive Life

SIR,—Dr. Adair Girby (*Supplement*, December 9, p. 243) should consider that as he becomes older things that happen to many of us may happen to him.

He may find a girl willing to marry him. He may have four or five or more children. He may decide, or be forced, to go into general practice. He may have to buy a house, the only available one costing a lot of money and expensive to keep up. He will have to buy a car. If he is a success in practice he may find himself driving 50 miles a day throughout the year. He may have to have a second car in reserve—though probably not a Daimler. He may have to pay large sums in income-tax. He may even wonder how he came to write such a letter to the *Journal*.—I am, etc.,

Kidderminster, Worcs. PHILIP GRIFFITHS.

Obstetrics Forbidden to Assistants

SIR,—May I add my voice to those of the ever-growing multitude of dissentients which this Welfare State is producing?

I am informed that an assistant in general practice may not practise obstetrics, but that when he becomes a principal he may submit his name for possible inclusion in the Obstetric List. By that time, of course, he will not have practised obstetrics for so long that he will be refused.

It seems to me that the subject of obstetrics should be removed from the final examination and that a postgraduate diploma of proficiency should be granted after a suitable period of training. To carry this to its logical conclusion, all subjects should be removed from the final examination and diplomas should be given as appropriate to postgraduate training. The final examination could be replaced by a certificate of attendance at a recognized teaching hospital.

Now all this will mean that the G.P. as such will disappear, as no one will have the time or the inclination to gather all the necessary diplomas, and he will be replaced by various pseudo-specialists. The man who gets only his attendance certificate will, I suppose, be the descendant of the old-time G.P. As

obviously he cannot be called a general practitioner, may I suggest as an alternative title either "coryza control officer," or possibly "coryza certification officer"?

All this will be rather difficult in practice, but it should prove an administrator's paradise, which I suppose is all that matters.

Incidentally, when one has been licensed by the General Medical Council to practise obstetrics, can this be legally revoked some years later without adequate reason?—I am, etc.,

Normandy, Surrey. ROBERT P. HARWOOD.

*** The Secretary of the B.M.A. states that this matter is being discussed with the Ministry of Health.

Tuberculosis and the N.H.S.

SIR,—In one day this month my time-table was as follows: 2 a.m., out on maternity case; 10 a.m., visit and perform B.S.R. on a case of open pulmonary tuberculosis; 4 p.m., interview with regional medical officer, who informed me that my prescribing cost was 40% above the average, and if I did not come down to the average cost over the next three months I should know the reason why. These seemingly disconnected jottings emphasize the plight of the tuberculous patient for whom there is no sanatorium bed to-day.

It is, to my mind, unfair that the G.P., with his resistance lowered by the present conditions of overwork, should have to treat these unfortunate people (dare I add for 16s. a year?), with no hope of compensation should he contract the disease himself. He is even more handicapped by the present Ministry attitude on prescribing. If all prescriptions must be of "average" cost, long courses of P.A.S. and streptomycin are not encouraged.

The solution surely is to increase the number, pay, and status of the tuberculosis officers, who can usually spend their nights in bed and keep their resistance high; to hand over the treatment of all sufferers from tuberculosis to them; to encourage domiciliary visits for the purpose of A.P.s, B.S.R.s, and health education; and allow them to give the necessary drugs without the worry of running up their "average" cost of prescriptions for the quarter.—I am, etc.,

Caterham, Surrey. D. S. PORTER.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Major J. Shields to be Lieutenant-Colonel.

Major M. F. X. Slattery has retired on retired pay on account of disability.

Short Service Commission, Type "B."—Major A. A. Grace has retired, receiving a gratuity.

Short Service (Specialist) Commission.—Captain (War Substantive Major) A. O. McClay to be Major.

Short Service Commission.—Captain D. Gregory to be Major.

Women's Forces Employed with the R.A.M.C.—Captain I. M. Pinkerton has relinquished her commission and has been granted the honorary rank of Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) J. F. A. Forster, M.B.E., formerly I.M.S., to be Major.

Majors R. L. Sadler, A. M. Murray, and H. D. K. Wright have ceased to belong to the Reserve of Officers.

Captain (Honorary Major) J. R. E. Sansom has ceased to belong to the Reserve of Officers.

SUPPLEMENTARY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel R. A. Lennie, T.D., has been appointed Honorary Colonel of a Supplementary Reserve unit.

Captain J. C. Knox, C.B.E., has been appointed Honorary Colonel of a Supplementary Reserve Unit.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel F. A. E. Crew, T.D., having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Brigadier.

Lieutenant-Colonels W. Bowater, M.C., T.D., H. V. Walsh, T.D., and J. S. M. Connell, having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O., and have been restored to the rank of Brevet-Colonel.

Major (Honorary Colonel) A. Angus, T.D., having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Majors (Honorary Lieutenant-Colonels) J. M. F. Whitby, T.D., P. Lloyd-Williams, O.B.E., T.D., L. P. Marshall, M.C., T.D., and G. E. O'Riordan, T.D., having exceeded the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major (Honorary Lieutenant-Colonel) J. S. Miller has ceased to belong to the T.A.R.O.

Majors J. Burns, M.C., T.D., J. F. Bereen, D. S. Valentine, T.D., and S. G. Cowper, from Active List, to be Majors.

Majors J. L. Cowan and A. S. H. Walford have ceased to belong to the T.A.R.O.

Major H. Wilson, M.C., having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O. (Substituted for the notification in a *Supplement* to the *London Gazette* dated August 18.)

Captain H. R. R. Mavor, having exceeded the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Major.

Captains (Honorary Majors) J. H. B. Beal and D. Arnott, T.D., have ceased to belong to the T.A.R.O.

Captain C. J. Goodall, from Active List, to be Captain, and has been granted the honorary rank of Major.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: J. A. H. Andre, M.B.E., M.R.C.S., L.R.C.P., Deputy Director of Medical Services, Mauritius; C. E. S. Bailey, M.B., D.P.H., Assistant Director of Medical Services, British Guiana; J. K. Hunter, M.B., D.P.H., Assistant Director of Medical Services, Uganda; G. de B. Mitford-Barberton, B.M., Medical Officer, Uganda; E. J. Kirwan, M.Ch., Special Grade Medical Officer, Nyasaland; K. G. Lupprian, M.B., Medical Officer, Federation of Malaya; J. S. Oakey, M.B., Medical Officer, Tanganyika; J. J. O'Dea, M.B., Medical Officer, Northern Rhodesia; J. R. R. Wray, M.R.C.S., Medical Officer, Kenya; H. W. Conran, M.D., D.P.H., Medical Officer, Fiji; G. O. Hallman, M.D., Medical Officer, Fiji and South Pacific Health Service; G. Hollitscher, M.D., Lady Medical Officer, Federation of Malaya; O. James, M.B., Medical Officer (temporary), Barbados; B. Kalinsky, M.B., Medical Officer, British Guiana; B. Madhoo, L.R.C.S., Medical Officer, Mauritius; G. E. Stoker, M.R.C.S., Medical Officer (temporary). General Hospital, Barbados; A. Szeley, M.D., Medical Officer (temporary), Falkland Islands.

Association Notices

AREA OF LEEWARD ISLANDS BRANCH

Notice is hereby given by the Council to all concerned that it is proposed to exclude the Island of Dominica and the Island of Eustatius from the area of the Leeward Islands Branch. Any member affected by this proposal and objecting thereto should write to the Secretary of the Association not later than January 30, 1951.

A. MACRAE,
Secretary.

Diary of Central Meetings

JANUARY

2	Tues.	Organization Committee, 2 p.m.
9	Tues.	Amending Acts Committee, 2 p.m.
10	Wed.	Film Catalogue Subcommittee, 4 p.m.
12	Fri.	Ophthalmic Group Committee, 2 p.m.
17	Wed.	**Council**, 10 a.m.
24	Wed.	Consulting Pathologists Group Committee, 2.15 p.m.
31	Wed.	Amending Acts Committee, 2 p.m.

Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—At Dulwich Hospital, East Dulwich Grove, London, S.E., Tuesday, January 2, 8.30 p.m., B.M.A. Lecture by Dr. Keith Simpson: "Crime and the Doctor." To be illustrated by lantern slides. All medical practitioners in the area of the Division are invited.

HAMPSTEAD DIVISION.—At Hampstead General and North-west London Hospital, Haverstock Hill, London, N.W., Wednesday, January 3, 8.30 p.m., lecture by Dr. Denis Williams: "A Physician's View of the Prolapsed Intervertebral Disk."

INDEX TO VOLUME II FOR 1950

Names of contributors are printed in capitals. Subject entries for original articles, leading articles, annotations, and correspondence are indicated by the use of the symbols (O), (L), (A), and (C), respectively. Some subjects dealt with under various main headings in the *Journal*—e.g., "Annotations," "Any Questions?", "Leading Articles," etc.—are also set out under these headings.

A

Abderhalden, Emil, obituary of, 1397
Abdomen: Anaesthesia for abdominal operations (Stuart C. Cullen), 276
— Tumour in abdominal wall, 1506
Abdominal angina, 771 (A)
— pain, in cervical erosion, 648
ABELS, J: Medical students in Prague, 1003
ABORTION:
Case for abortion, 626
Clinical survey of 2,665 cases (Albert Davis), 123 (O); 152 (L); 367 (C), 626 (C), 1172 (C)
Ectopic abortion, 126
Habitual abortion: prophylactic value of progesterone pellet implantation (P. M. F. Bishop, N. A. Richards, and Richard Doll), 130 (O)
Mortality, 127
Post-abortal sepsis, 367
Repeated abortions; cause and treatment, 1505
Therapeutic abortion; methods, 128
ABRAHAMS, Sir Adolphe: Exercises in the bath, 1329
ABRAHAMS, D. Gordon: Intramuscular heparin, 1418 (O); 1433 (A)
Abreaction in treatment of skin disorders, 1300, 1322
Absenteeism in Royal Ordnance factories (parliamentary note), 54
Acetylcholine, properties of, 692
Acrylic splint for fixation of corneal graft, 1034
Acta Physiologica et Pharmacologica Neerlandica, 687
A.C.T.H. *See* Adrenals, adrenocorticotrophic hormone
Actinomycetes; their Nature, Occurrence, Activities, and Importance (Selman A. Waksman), 930
Actinomycosis of bone, 1218
Activity in advancing years (Marjory W. Warren), 921 (O); correspondence, 1120, 1175
ADAMS, A. V.: What is a chill?, 122
ADAMS, A. Wilfrid: Urethral sphincter guard, 1052
ADAMS, Douglas K., SUTHERLAND, John M., and FLETCHER, W. Bell: Early clinical manifestations of disseminated sclerosis, 431 (O); 451 (A)
ADAMS, John C. L.: "Dramamine" and sea-sickness, 947
Adaptation (Editor: John Romano), 402
Adaptation syndrome, 164
— — poliomyelitis after inoculation as manifestation of, 166
— — Stress and the general adaptation syndrome, 104, 215, 220
Addison, Viscount, Hon. D.Sc., conferred on, 373
Addison's disease, effect of cortisone in, 593
— — manifestations, diagnosis and treatment of (S. Leonard Simpson), 1164
ADENEY, G. C.: Mind and body, 1062
Adenoidectomy without tonsillectomy; indications, 121
Adenitis, cervical, tuberculous; treatment, 583
Adenoma sebaceum, 1367
ADLER, F. H.: Ocular effects of hypertension, 344
ADRENALS:
Adrenal cortex: Capillary resistance and adrenocortical activity (H. N. Dobson and J. J. R. Duthie), 971 (O)
— — histology and physiology of (M. H. Power), 285
— — Regulation of secretion of cortical hormones (Marthe Vogt), 1242 (O)
— — Relationship with adrenocorticotropic hormone, 1489
Adrenocorticotropic hormone and antihormones, 156 (A)
— — and stress, 164
— — availability of, in U.S.A., 1049
— — distribution to hospitals in Britain, 1375 (L)
— — effect on capillary resistance, 971
— — eosinopenia in cortisone and A.C.T.H. therapy, 1235
— — grants for research on, 42
— — in prolonged treatment of rheumatoid arthritis (J. Goslings and others), 1019 (O)
— — in treatment of burns, 242
— — international standard, 1472
— — mechanism of relief of rheumatoid arthritis by, 769
— — neural control of secretion (G. W. Harris), 285
— — objective assessment of effect in rheumatoid arthritis, 1244; 1263 (L)
ADRENALS (*continued*):
Adrenocorticotrophic hormone, present status in treatment of rheumatoid arthritis, 942
— — regulation of secretion, 1242
Insufficiency after suramin treatment of pemphigus (L. J. Mahoney and H. J. Barrie), 655 (O)
— effect of cortisone on cardiogram in (Walter Somerville), 860 (O)
Sweat and adrenal function, 667 (A)
Adrenocorticotropic hormone. *See* Adrenals
ADRIAN, E. D: Experiments on the nervous system, 1385
— awarded gold medal of Royal Society of Medicine, 119
— elected president of the Royal Society, 1320 (L); 1326
Aero Medical Association of America: Raymond F. Longacre Award to Sir Charles Symonds, 422
Aerocele; case (J. H. McIntyre), 25
Africa: Infant-feeding in North-East Africa (Leslie Housden), 456
— Mental illness in West Africa, 1212
— Scientific Council for Africa South of the Sahara, 1289
Aftercare by health visitors (J. Greenwood Wilson), 291
AGASSIZ, C. D. S.: General care of the physically handicapped child, 272
Aged persons: Activity in advancing years, 353; (Marjory W. Warren), 921 (O); correspondence, 1120, 1175
Agene and peptic ulcer (parliamentary note), 53
Aggeler, Paul M., and Lucia, S. P.: *Haemorrhagic Disorders*, 765
Agglutinins, cold, in primary atypical pneumonia, 1463
Agnew, Henry Murray, obituary of, 789
AINSWORTH, Norman J.: Exercises in the bath, 1330
Ainsworth-Davis, J. C.: *Essentials of Urology*, 401
Air hygiene in public conveyances, 1393
Aitken, Robert Young, obituary of, 1063
Albuminuria and hyperpiesis; investigation and treatment, 377
Alcohol, effect on blood sugar, 232
ALDER, A. *See* SCHLEIP, K., 765
ALDINGTON, J. N.: Radiation, light and illumination, 277
ALEXANDER, David F.: The G.P.'s clinical training, 575
Alexander Pigott Wernher Memorial Trust Travelling Awards in Ophthalmology and Otology, 791
Alfred Adler Medical Society, 635
Alfred Hospital Clinical Reports, 307
Aliens and National Health Service (parliamentary note), 1065
Allan, A. W., Honorary Fellowship of Royal College of Surgeons of Edinburgh conferred on, 176
Allan, George Allison, obituary of, 1121
ALLEN, Clifford: Reflections on criminal conduct, 459
— Psychology and science, 1057
ALLERGY: *See also* Asthma
Diffuse eosinophilic arteritis of allergic origin, 645
Hay-fever, treatment of, 60
Immunization of allergic children, 848
Morphine and histamine in bronchial asthma, 167, 300, 418
ALLISON, D. Rhodes: Clinical interpretation of pain in the chest, 289
Almeyda, John: *Major Symptoms in Clinical Medicine*, 499
Alopecia areata; a clinical study (Ian Anderson), 1250 (O)
Alvarenga Prize, 534
AMBROSE, A. J.: Clinical impression versus cold science, 631
AMBRUS, Clara M. *See* AMBRUS, Julian L., 891
AMBRUS, Julian L., and AMBRUS, Clara M.: Histamine desensitization, 891
Amechol in Raynaud's disease, 1128
Amenorrhoea, investigation of, 59
American Academy of Forensic Sciences; second annual meeting, 1401
American Association for Thoracic Surgery: travelling fellowship, 422
— Cancer Society, 212
— College of Chest Physicians; prize award, 900
— Public Health Association; 78th annual meeting, 422
Aminopterin for leukaemia, 46
p-Amino-salicylic acid as cause of acute toxic jaundice, 729, 949
— — dispensing of, 901, 1072
— — in pulmonary tuberculosis, 424
— — in treatment of pulmonary tuberculosis (Medical Research Council investigation), 1073 (O); 1102 (L); 1391 (C)
— — in treatment of tuberculous cervical adenitis, 583
— — slide test for assessment of sensitivity to, 1391
— ointment for leg ulcer, 1119
Amoebiasis in Great Britain, with special reference to carriers (Cecil A. Hoare), 238 (O); 259 (A); 525 (C), 530 (C)
— latent (A. Everard), 818; correspondence, 1175
— treatment with fumigillin, 1289
Amphetamine during lactation, 848
— in barbiturate poisoning, 1333
— sulphate, intravenous, in acute barbiturate poisoning (J. D. N. Nabarro), 924 (O); correspondence, 1333
Amputation, spontaneous, in arteriosclerotic gangrene, 1393
— stump complicating arteriovenous fistula (A. Naylor), 928
— — painful, treatment of (W. Ritchie Russell and J. M. K. Spalding), 68 (O); 415 (C)
Amputations, Atlas of (D. B. Slocum), 716
Anaemia, aplastic, complicating miliary tuberculosis (Robert J. Kernohan), 399
— Erythrocyte sedimentation in anaemia (Richard Terry), 1296 (O); correspondence, 1445
— Familial crisis in acholuric jaundice (F. Graham Marson, M. J. Meynell, and H. Tabbush), 760 (O)
— haemolytic, 672
— hypochromic, associated with rheumatoid arthritis; treatment with intravenous iron (R. J. G. Sinclair and J. J. R. Duthie), 1257 (O)
— in *Diphyllobothrium* infestation, 188, 418; correction, 424
— nutritional factors in, 672
— pernicious, absorption of vitamin B_{12} in (C. C. Ungley) 905 (O), 908 (O), 915 (O), with G. A. Childs, 911 (O); 933 (L); correction, 1014
— — associated with tumours of stomach (M. H. Oelbaum and N. J. Roussak), 1368
— — content of haemopoietic factors in liver extracts (Ronald H. Girdwood, Kathleen M. Carmichael, and B. Woolf), 1357 (O)
— — diagnosis and treatment of (R. Bodley Scott), 157
— — mortality from and risk of gastric carcinoma among patients with (Johannes Mosbech and Aage Videbaek), 390 (O); 405 (A); correspondence, 575, 892, 1059
— — Studies on nature of intrinsic factor of Castle (Byron E. Hall), 585 (O); 612 (L); correction, 960
— — treated with folic acid; effect of vitamin B_{12} on neuropathy in (H. Fuld), 147 (O); 417 (C); 527 (C)
— — treatment with folic acid; effect on nervous system, 527
— — — with vitamin B_{12}, 671
ANAESTHESIA:
Abdominal operations (Stuart C. Cullen), 276
Aid to intubation (W. N. Vellacott), 1113
Anaesthesia in France, 783
Anaesthetic aspects of surgical conditions in the newborn, 287
26th Annual Congress of Anaesthetists, 1453
Boyle's anaesthetic apparatus, novel modification of (W. B. Primrose), 676; 787 (C), 1003 (C)
Cardiac arrest during anaesthesia, 339 (A)
Cardiovascular surgery, 295, 415
Danger of mixed anaesthetics, 681
Decamethonium iodide as curarizing agent in general anaesthesia (A. R. Ellerker), 398 (O)
— — in anaesthesia for peroral endoscopy (C. F. Scurr), 1311 (O)
— — in treatment of tetanus (R. McD. S. Keir), 984 (O); 994 (A)
Electroencephalographic control, 667 (A)
Head injuries; management from the anaesthetist's point of view (R. Bryce-Smith), 322 (O)
in the newborn (G. Jackson Rees), 1419 (O); 1433 (A)
in the newborn (T. N. P. Wilton), 292
Obstetrical anaesthesia, 47, 218, 461

ANAESTHESIA (*continued*):
Pethidine as adjunct to nitrous oxide and oxygen anaesthesia (H. F. Griffiths), 763; correspondence, 1334
Prolonged intercostal paralysis due to a relaxant (H. Barrie Fairley), 986 (O)
Thiopentone, rectal, for minor surgery, 690
Trichlorethylene for dental operations, 690

ANALGESIA:
Administration by midwives in London, Jan.–June, 1438
Analgesia in Scotland (parliamentary note), 303
Analgesics in anaesthesia (L. Rendell-Baker), 293
Nerve blocking, therapeutic applications of (G. C. Steel), 293
Obstetric analgesia and placental insufficiency (E. H. Seward), 1422 (O)
Spinal analgesia, collapse during, 527, 681
— — for removal of foreign body in rectum, 785

Anatomy: *Osteology for Dissectors* (Robert King Howat), 661
— Progress and trends; Presidential address, 5th International Anatomical Congress at Oxford (W. E. Le Gros Clark), 233 (O); 258 (L)
— Structure of the living organism, 258 (L)
— *The Vertebrate Body* (A. S. Romer), 150
— *Vorlesungen über topographische Anatomie* (O. Grosser), 1426
— comparative: *Anatomy of Semnopithecus Entellus* (A. Ananthanarayana Ayer), 90
ANDERSON, A. B.: Mechanical aids to instruction, 678
ANDERSON, E. W.: Puerperal psychoses, 276
ANDERSON, Graham H.: The dumping syndrome, 528
ANDERSON, Ian: Alopecia areata: a clinical study, 1250 (O)
ANDERSON, J. P.: Eccentric nozzles for syringes, 1227
Anderson, John Hubback, obituary of, 1176, 1228
ANDREWS, C. T.: Geriatrics: Liaison between hospital and general practitioner, 363
ANDREWS, M. C.: Psychiatry and the common cold, 1448
Androstenedione in treatment of rheumatoid arthritis, 851
Aneurysm, unusual thoracic, type of, 1118
ANGELMAN, Harry, HALL, E. G., and SPENCER, R.: The syndrome of obstruction of inferior vena cava in childhood, 752 (O)
Angina, abdominal, 771 (A)
— pectoris, electrocardiogram in, 881
Angiocardiography, 59
— blood pressure changes during (Sheila Howarth), 1090 (O)
Animal experiments: Protection of laboratory animals, 724, 888, 951, 1114, 1389
— — Value in investigation of nervous system, 1385
Ankle amputation, 168
Annals of Tuberculosis, 1233
ANNING, S. T.: Heredity and leg ulcers, 1305 (O); 1495 (C)

ANNOTATIONS:
Abdominal angina, 771
Africa: Mental illness in West Africa, 1212
Amoebiasis in Britain, 259; 525 (C)
Anaesthesia: Electroencephalographic control, 667
— in the newborn, 1433
Antibiotics: Indications for the newer antibiotics, 1211
Antihormones and A.C.T.H., 156
Appendicitis, mortality from, 1375
Armed Forces: Pay increases, 1266
Aspirin and cortisone, 1432
Bacterial antagonism, induced, 879
— polysaccharides for cancer, 32
Bacterium coli and diarrhoea, 205; 460 (C), 577 (C), 889 (C), 1128 (C)
Barker, Sir Herbert, 260
Bibliography, medical, 616
Biology, teaching of, 505
Blood supply of peripheral nerves, 261
— transfusion, circulatory overload from, 770
B.M.A. war memorial, 156
Broncholithiasis; On coughing up calcium, 452
Burns, 1044
Cancer diagnosis, 1213
— Multiple primary neoplasms, 995
— registration, 1046; correspondence, 1227
Cardiac arrest during anaesthesia, 339
— — treatment of, 721
— disease and pregnancy, 936
Charities, medical, 1106
Children and the cinema, 96
— Physique of London's children, 155
— Treatment of the maladjusted child, 1265
Colonial health services, 771
Dental nurses in New Zealand, 1162
Diabetes: Victory medal for diabetics, 827; 840 (C)
Diphtheria, immunity to, 30
Disseminated sclerosis; early diagnosis, 451
Distinction [awards] denied, 878; 887 (C), 944 (C)
Doctor as public speaker, 668
Drug action and suggestion, 826
Durham and the doctors, 1265
Education and medicine, 1105
— More on medical education, 504
Electron microscopy, 1432
Electron sterilization, 615
Emotions and the skin, 1322; 1496 (C)

ANNOTATIONS (*continued*):
Endocrinology: Hormonal treatment of peptic ulcer, 205 (A)
Examination results, 505
Femur, fracture of neck of, 721
Gallstones, ultrasonic irradiation of, 1107
Gastric ulcer, vascular changes in, 1484
Glutamic acid; effect on intelligence, 1161
Heart disease, hypertensive and ischaemic, 1163
Helminthic infections, imported, 206; 526 (C)
Heparin, treatment with, 1433
Herpes zoster and the new antibiotics, 1485
"Hetrazan" in filariasis, 772
Hexamethonium, 826
Hospitals: The patient's needs, 878
How many doctors?, 506
Ice-cream; bacteriological grading, 1431
Inhalation during dental extraction, 936
Isotope production, progress in, 31
Joules and calories, 1213
Kingston and Malden Victoria Hospital threatened, 1106
Linear accelerators, 616
Lung abscess as complication of E.C.T., 1377
Malaria, congenital, 451
Medical Practitioners' Handbook, 452
Mental hospitals, optimism in, 568; 729 (C)
Muscle spasm in poliomyelitis, relief of, 879
Neomycin, 615
Neuralgia, facial, 1045
Neurosyphilis, treatment of, 934
Nobel prizes, 1046
Optics and medicine, 261
Parkinson's disease, surgical treatment of, 1160
Parkinsonism, drug treatment of, 569
Paying the doctor, 1264
Pernicious anaemia and gastric carcinoma, 405; correspondence, 575, 892, 1059
Personality changes after head injury, 1377
Phonocardiography, 567; 838 (C)
Physiology of learning, 94
Phytate, anti-calcifying action of, 935
Pneumonia, atypical, 1484
Porphyria, 259
Pregnancy and pulmonary tuberculosis, 877
Prize Fund, expropriation of, 406
Proteins and the clinician, 1267
Pulmonary complications of pertussis, 1162; correspondence, 1448
Radiology: An accident in the *x*-ray room, 827; 1058 (C)
Radiotherapy research, 260
Roseola infantum, 876
R.S.M. Section of General Practice, 935
Rutherford Memorial, 1265
Secretary of the B.M.A., 1107
Skin cancer and cutting oils, 568
Smoking and peptic ulcer, 994
Spens awards and charity, 1163; correspondence, 1170, 1329
Spondylitis, ankylosing, 1104
Stillbirths, 95
Streptomycin in genito-urinary tuberculosis, 1376
Sweat and adrenal function, 667
Syphilis and yaws in Haiti, 668
— in Greenland, 155
Syringe sterility, 204; 837 (C)
Teething troubles, 1266
Tetanus, treatment of, 994
Thrombosis: Pre-thrombotic state, 406
Training for the job, 504
Tuberculin-jelly test, 154
Tuberculosis as a prescribed disease, 1321; 1493 (C)
— local chemotherapy in, 31
— miliary, early diagnosis of, 720
— Post-tuberculous middle lobe syndrome, 407
— Rehabilitation of the tuberculous, 154
— Tuberculous students, 1484; 1497 (C)
Tubocurarine, central action of, 95
Varicose ulceration, 338; 529 (C)
Vomiting, treatment of, 719; 836 (C)

Annual Meeting, B.M.A., 94 (L), 256 (L)
— Representative Meeting, B.M.A., 256 (L)
Anoxia as cause of liver damage, 960
"Antergan" in sea-sickness, 836
Anthisan, 347
— pharmacological action of, 691, 836
Anthrax in cattle (epidemiological note), 375, 421

ANTIBIOTICS:
Antibiotics (Robertson Pratt and Jean Dufrenoy), 90
in treatment of herpes zoster, 1485 (A)
Indications for use, 722; 1211 (A)
sensitivity of organisms to, 1346
Synergism and antagonism, 1160 (L), 1392

Antibodies: Auto-antibody formation and disease, 163
Anticoagulants in treatment of coronary thrombosis (John A. Tulloch and A. Rae Gilchrist), 965 (O); 991 (L); correspondence, 1226
— Intramuscular heparin (D. Gordon Abrahams), 1418 (O); 1433 (A)
— proper use of, 1226

ANTIHISTAMINES:
"Antergan" in sea-sickness, 836
The Antihistamines, Their Clinical Application (S. M. Feinberg), 1040, 1184

ANTIHISTAMINES (*continued*):
Administration to diabetics, 690
Anthisan, 347
— pharmacological action of, 691, 836
Antistin in the common cold (Gerard Lorriman and W. J. Martin), 430 (O); 449 (L); correspondence 631, 785
"Benadryl" in paralysis agitans, 30
— in sea-sickness, 946
— pharmacological action of, 691, 836
Dramamine in travel sickness, 347, 692, 836; 719 (A)
— in sea-sickness, 836, 946
in enuresis, 1224
in nocturnal frequency, 836
in peptic ulcer, 848
in prevention and treatment of common cold; clinical trials (Medical Research Council), 425 (O); 448 (L); correspondence, 631, 785, 1062, 1444
in sea-sickness, 692, 719, 836, 946
Pharmacological action (J. H. Burn), 691 (O); 836 (C), 946 (C), 951 (C)
Pharmacology (J. H. Burn and others), 347
"Phenergan" in sea-sickness, 836
Side-effects, 691

Antihormones and A.C.T.H., 156 (A)
Antireticular cytotoxic serum, 902
Antistin in the common cold (Gerard Lorriman and W. J. Martin), 430 (O); 449 (L); correspondence, 631, 785
Antrum, damage during dental extraction, 630, 1062

ANY QUESTIONS:
Abdomen: Tumour in abdominal wall, 1506
Abortion: Repeated abortions; cause and treatment, 1505
Adenitis, cervical, tuberculous; treatment, 583
Adenoidectomy without tonsillectomy; indications, 121
Amenorrhoea, investigation of, 59
p-Amino-salicylic acid in pulmonary tuberculosis, 424
Amphetamine during lactation, 848
Angiocardiography, 59
Anoxia as cause of liver damage, 960
Antibiotics, sensitivity of organisms to, 1346
Antihistamines; administration to diabetics, 690
— in peptic ulcer, 848
Athletes and "heart strain," 1291
Athleticism; effects on longevity, 1183
Baby show judging, 637
Backache in bed; cause and significance, 1455
Barbiturates, loss of memory due to, 848
B.C.G. vaccination, hypersensitivity after, 1403
Bed-pans, sterilization of, 1236
Bee-stings, sensitization to, 794
Bee-venom, desensitization to, 1128
Blindness, hereditary causes and age of onset of, 1404
Blood pressure, high, on waking, 902
— — normal variations of, 178
Bogomoletz serum, 902
Bone-marrow; plasma-cell myeloma, 232
Breast-feeding, conferment of immunity by, 638
Bronchitis, effect of vitamin D in, 960
Buried alive for 8 hours, 1506
Calculus, vesical, removal of, 1014
Cancer in young patients, 310
— Primary carcinoma of the other breast; incidence, 469
— Waxed paper as carcinogen, 1235
Carbon dioxide inhalations in asthma, 1236; correspondence, 1404
Chloramphenicol, hoarseness or aphonia due to, 1292
Choline chloride, nature and mode of action of, 1071
Choline in treatment of coronary thrombosis, 1072
Chondromalacia of patella, 377
Climacteric, persistent, 737
Coeliac disease, treatment of, 1456
Coroners, appointment and qualification of, 423
Cramp, nocturnal, 584; 738 (C)
Cyanide killing of salmon; risks to consumer, 1127
Cystine calculi in kidney, 1505
Detergents, dangers of, 1014
Diaphragm: Corona diaphragmatica, 848
Diastolic murmurs; diagnosis and significance, 847
Diet for patient with duodenal ulcer, obesity and hypertension, 690
Dioxyamidopyrine in asthma, 470
Diphtheria immunization and poliomyelitis, 1013
Drugs, dangerous, issued to nurses; regulations, 121
Dwarfism, treatment of, 1291
Eclampsia; incidence and methods of treatment, 1071
Eczema, infantile, familial risk of, 1127
Encephalitis, post-vaccinal, 738
Encephalopathy, hypertensive; treatment and prophylaxis, 1235
Eosinopenia in cortisone and A.C.T.H. therapy, 1235
Ephedrine; effect on the bladder, 793
Epilepsy, inheritance of, 1404
— Residential epileptic schools, 310
Epispadias, treatment of, 1506
Faecal incontinence in childhood; cause and treatment, 1346

ANY QUESTIONS (*continued*):
Family history, practical value of, 637
Fat absorption, defective; treatment, 470
Fats, faecal, in pancreatic disease and sprue, 794
Fingertips, cracked and painful; treatment, 178
Foreskin, retraction of, in infants, 1235
Gammexane poisoning, symptoms and signs of, 1014
Gas gangrene antiserum, value of, 121
Gastro-enteritis, tropical, in children, 1291
Gin and Benedict's solution, 232
Gingivitis, infective, aetiology and treatment of, 901
Glandular fever, 1455
"Golf elbow," 177; correspondence, 310, 378
Growth, stimulation of, by thymus extract, 122
Guaiacol, 1506
Guanidine in myasthenia gravis, 178
Gums, bleeding, treatment of, 960
Haemospermia; causes and treatment, 377
Halitosis, 1236
Harvesters' lung, 1184
Hay-fever, treatment of, 60
Heart: Minor degrees of toxic carditis, detection of, 60
Heparin and hyaluronidase; indications for, 1072
Herpes simplex, recurrent; treatment, 1184
— zoster, aetiology of, 1236
Hormones: Male hormone assay, 309
Hymen, origin of, 959
Hyperpiesis and albuminuria; investigation and treatment, 377
Ileostomy, prolapse of; prevention and treatment, 178
Immunization of allergic children, 848
Infant mortality; reduction in Chicago, 177
Infant, premature, prevention of intracranial injury in, 423
Insecticides: Toxicity of "P.M.4," 1127
Instruments subject to damage by moist heat, sterilization of, 1128
Insulin ointment, 378
Iodine, thyroid, and aspirin preparation, 584
Iritis, treatment of, 122
— palatable prescription of, 1291
— intravenous; indications, contraindications, dosage and technique of administration, 469
Jaundice, continued, management of, 737
— homologous serum, transmitted by syringe, 469
Kerato-conjunctivitis, aetiology of, 1403
Kidney, horseshoe, treatment of, 794
Kimmelstiel–Wilson syndrome, 1072
Knee, chronic synovitis of, 637
Kraurosis vulvae, treatment of, 121
Lactation, falling of hair during, 1184
Leeches, indications for use of, 59
Lemon juice, effect on calcium absorption, 378
Leucoderma, treatment and effect of pregnancy on, 1404
Leucopenia, treatment of, 960
Leucotomy, prefrontal; indications and prognosis, 959
Libido, excessive, reduction of, 848
Lichen planus, treatment of, 690
Lip: Peribuccal pigmentation, 638
Liver, function tests in infancy, 793
Magnesium sulphate, local action of, 310
Malformations, congenital, risk of, 793
Marrow, vegetable, diuretic effect of, 1014
Meat and chicken soups, nutritive value of, 1404
Methyl bromide and ethylene oxide poisoning, 848
Micturition, inhibition in males, 469
Midge-bites, treatment of delayed reaction to, 377
Milk; value of pasteurization, 1345
Mongolism, familial incidence of, 959
Morphine substitutes, 737; 794 (C)
Muscle: spasm in paraplegics, 793
Naevus, treatment of, 122
Nail biting, treatment of, 1071
Oestrogen therapy, prolonged, 1456
Paget's disease of bone, hereditary influences in, 738
Pancreas, fibrocystic disease of, familial, 959
Pancreatitis, chronic, and carcinoma, 378
Paraldehyde, sterilization of, 1235
Parkinson's disease, control of tremor in, 60
— — "myanesin" in, 121
Parthenogenesis, artificial, 470
P.A.S., dispensing of, 901; correspondence, 1072
Peanuts and vitamins, 310
Pelvis, diameters of, 737
Penicillin: Desensitization to penicillin, 1236
— dosage, 309
— in chronic sinusitis, 424
Penis, erection, post-operative, prevention of, 1127
Perspiration, red, 1072; correspondence, 1184
Poliomyelitis and physical activity, 231
Polycythaemia vera; treatment with radioactive isotopes, 1127
Pregnenolone, 902
Pressure cooking; effect on vitamins, 1183
Prickly heat, treatment of, 847; correspondence, 1292
Procaine, intravenous, 1506
— — in asthma, 469
Prostatitis and vesiculitis, tuberculous, diagnosis and treatment, 178
Pseudomonas pyocyanea infection of middle ear, treatment of, 423
Punch-drunkenness, 793; correspondence, 1292
Pyelitis, chronic, due to *Bact. coli*; treatment, 583
Quinidine therapy, prolonged, 1456

ANY QUESTIONS (*continued*):
Radium for uterine cancer; indications and results, 637
Raynaud's disease, treatment of, 738; correspondence, 1128
Rectum: Prolapse for 40 years, treatment of, 1184; correspondence, 1346
Rheumatoid arthritis and cortisone, 1455
— — effect of sulphur in, 794
— — incidence according to climate, 378
Rhinitis, allergic; diagnosis and treatment, 1292
Ringworm of nails, treatment of, 1291
Saccharin as carcinogen, 1184
Salicylates, intravenous, efficacy of, 232
Scalp, neurodermatitis of, 584
Schizophrenia, stress as causal factor in, 1072
Smallpox; Treatment, 583
— Vaccination; storage of vaccine lymph, 1455
Spina bifida, inheritance of, 122, 793
Spinal cord; subacute combined degeneration; liver therapy, 377
Splenomegaly in thrombocytopenic purpura, 793; 960 (C)
Spondylitis, ankylosing; aetiology, diagnosis and treatment, 689
Sterilization of the male; effects of vasotomy, 689
Sterilization test-papers, 738
Stilboestrol and cancer of breast, 638
— effect on retention due to prostatic enlargement, 584
Streptomycin; Local application, 738
— resistance to, by tubercle bacillus, 902
Sunlight and pulmonary tuberculosis, 1345
Syphilis, primary, prognosis of, 122
— prophylaxis, 231; correspondence, 470
Tachycardia, sinus, in psychoneurotic, 794
Teeth: Repair of worn incisors, 1292
Teething, infant ailments ascribed to, 1013; correspondence, 1281, 1335, 1391
Tetanus antitoxin; indications, 1128; correspondence, 1236
Thiopentone, rectal, for minor surgery, 690
Thrombophlebitis migrans, prognosis and treatment of, 901
Thrush in myasthenia gravis; treatment, 470
Tobacco smoking, cure for, 1235
Tongue; unilateral recurrent irritation, 232
Trachoma; treatment, 309
Trauma and tuberculous meningitis, 1345
Trichlorethylene for dental operations, 690
Tuberculin testing by general practitioner, 177
Tuberculosis and marriage, 309
— pulmonary; effect of East African climate, 1072
— — in relation to occupation; mortality rates, 178
— spinal, small temperature swings in, 1403
— treatment of, domiciliary, with antibiotics, 470
Twins and their finger-prints, 1456
—uniovular, diagnosis of, 1128
Ulcer, peptic; familial and hereditary factors, 1345
Ultra-violet light, value of, to children, 1404
Urethra: Post-operative paralysis of compressor urethrae, 1456
Urethritis, mycotic, treatment of, 1127
Uterus, cervix: Treatment of erosion, 1183
Vaccination, local reaction to; dangers of subsequent inoculation, 1128
— reactions in, 1013
— Sensitization to calf lymph, 424
— with negative results, 690
Vaginal examination in virgins without anaesthetic, 1291
Vagotomy; technique and effects, 1346
Varicose ulcers; method of treatment with rubber sponge, 1456
— vein injections, unpleasant sequelae of, 689
Visual acuity testing in small surgery, 847
Vitamin B_{12} in disseminated sclerosis, 59
Vomiting during menstruation, 177
Warts, treatment of, with wart-weed and spurge, 584; 729 (C)
Water-divining, 59
Weil–Felix reaction in Q fever, 309
Whitlows, treatment of, 231
Whooping-cough: Reactions to pertussis vaccine, 231
— — vaccine, value of, 60

Aorta, coarctation of, 642
— dissecting aneurysm of, precipitated by oesophageal foreign body (E. H. Hadfield), 1477
Apparatus: Liability of manufacturers for injuries to patients from defective apparatus (W. M. Levitt) (Medico-legal note), 1122
Appendicectomy, 1351
— intussusception following, 298
Appendicitis (Sir Cecil Wakeley and Peter Childs), 1347 (O); 1375 (A)
— acute, pathology in, 1349
— chronic, pathology in, 1350
— diagnosis of, 1351
— mode of infection in, 1351
— mortality before advent of sulphonamide and penicillin therapy, 1352
— — rate, 1347; 1375 (A)
— Situs inversus and perforated appendix, 892
Appendix, anatomy and embryology of, 1347
Appointments, 120, 176, 230, 308, 376, 468, 636, 688, 736, 792, 901, 958, 1013, 1125, 1182, 1234, 1344, 1402, 1504

ARCHER, G. T. L.: Infection by syringe, 837
ARDEN, G. P., and WALLEY, G. J.: Treatment of intertrochanteric fractures of femur by internal fixation, 1094 (O); correspondence, 1225
Argentine: First Argentine Congress of Pathology, 176
Arm pain; diagnosis and treatment (M. J. McArdle), 354

ARMED FORCES:
Appointments and retirements, 465, 734, 897
Awards and Decorations, 55, 226, 465, 897, 1179, 1400, 1502
Doctors for the Forces; man-power, pay, and isolation (parliamentary note), 1005
Industrial health in Services, 1168
Mentions in Despatches, 1179
Pay in the Services, 372, 1065
— increases, 1266 (A)
Professional training of Army Medical Officers, 517; correction 638
R.A.F. Institute of Pathology and Tropical Medicine, 1453
R.A.M.C.; Pay and conditions of service (parliamentary note), 372
— Recruitment of specialists (parliamentary note), 1006
— Roll of Honour, 369
— War Memorial Fund "Book of Remembrance," 467

ARNOLD, Harry L., Jun.: Pernicious anaemia and gastric carcinoma, 892
Arrhythmia, electrocardiogram in, 880
Art: *On Not Being Able to Paint* (Joanna Field), 500
"Artane" in paralysis agitans, 30
Arteries; thrombosis, treatment, 168
Arteriosclerosis as cause of death in diabetic children, 1295
— Claudication, intermittent; evaluation of treatment (J. T. Shepherd), 1413 (O)
— gangrene of, spontaneous amputation in, 1393
— obliterans, treatment with intra-arterial histamine, 1086
Arteriovenous fistula complicating amputation stump (A. Naylor), 928
— shunts, 1176
Arteritis, eosinophilic, diffuse (George Lumb), 645 (O)
Arthritis, management of, in elderly patient, 923
— Psoriasis arthropathica, 1490
— rheumatoid: Clinical assessment of rapidly acting agents (C. E. Quin, R. M. Mason, and J. Knowelden), 810 (O); 826 (A); 875 (L); 947 (C), 1116 (C)
— — clinical effects of cortisone in, 592
— — Cortisone in long-standing case, 1455
— — effect of adrenocorticotrophic hormone on capillary resistance in, 974
— — effect of sulphur in, 794
— — incidence according to climate, 378
— — intravenous iron in treatment of hypochromic anaemia associated with (R. J. G. Sinclair and J. J. R. Duthie, 1257 (O)
— — manubrio-sternal joint in (Andrew Bogdan and Justin Clark), 1361 (O)
— — mechanism of relief in, 768 (L)
— — objective assessment of improvement (O. Janus), 1244 (O); 1263 (A)
— — splenectomy for, 1490
— — symptoms, objective assessment of, 947
— — treatment; present status of cortisone and A.C.T.H., 942
— — — prolonged, with A.C.T.H. alone and with gold (J. Goslings and others), 1019 (O)
— — — with cortisone and other steroids (W. S. C. Copeman and others), 849 (O); 874 (L)
— — — with insulin and E.C.T. (G. D. Kersley and others), 855 (O); 874 (L); correspondence, 1058
— treatment by intra-articular injections, 60
— — with intra-articular injections, 232
— tuberculous, of hip-joint (H. B. Seddon), 293
Arthropod reactions directly injurious to the skin of man (R. M. Gordon), 316 (O)
Ascorbic acid; influence on healing of corneal ulcers in man (T. A. S. Boyd and F. W. Campbell), 1145 (O)
— — in rheumatoid arthritis; clinical assessment, 810
ASHBY, D. W., and BULMER, E.: Acute idiopathic porphyria; report of two cases, 248 (O); 259 (A)
ASHERSON, N.: Cerebrospinal fluid in intracranial otogenic abscess, 47
Aspirin, iodine, and thyroid preparation, 584
— mild Cushing's syndrome following administration of (I. B. Cochran, R. D. Watson, and J. Reid), 1411 (O); 1432 (A)
Assam, residual insecticides in, 414
Assmann, H., and others: *Lehrbuch der inneren Medizin*, Vols. I and II, 662
Association of Clinical Pathologists; 44th Scientific Meeting, 458
— of Scientific Workers, 899

See also:
Aero Medical Association of America
American Association for Thoracic Surgery
American Public Health Association
British Association
British Epilepsy Association
British Health Resorts Association

ASSOCIATION (*continued*):
British Hospitals Contributory Schemes Association
British Limbless Ex-Service Men's Association
British Medical Association
British Orthopaedic Association
British Rheumatic Association
Invalid Children's Aid Association
National Association for the Paralysed, 301
Renal Association
West Midlands Physicians Association
Asthma, bronchial, effect of cortisone in, 593
— — morphine and histamine in, 167, 300, 418
— treatment with carbon dioxide inhalations, 1236, 1404
— — with dioxyamidopyrine, 470
— — with intravenous procaine, 469
— Visit of asthmatic children to Switzerland, 956
Atelectasis and bronchiectasis in pertussis (A. W. Lees), 1138 (O); 1162 (A); correspondence, 1331, 1448
Athletes and "heart strain," 1291
Athleticism; effects on longevity, 1183
ATKIN, I.: Displaced registrars, 1276
Atmospheric pollution, 761
Atomic energy, biological aspects of; conference at Royal Institution, 999
— warfare: *Effects of Atomic Weapons* (U.S. Department of Defense and U.S. Atomic Energy Commission, 1478
— — instruction on medical aspects of, 1148
— — medical aspects of, 1463
Atropine in treatment of insecticide poisoning, 274
— poisoning; fatal case (W. E. Heath), 608
Audiology, international course in, 957
Aureomycin, action and indications for use of, 722
— in treatment of trachoma, 309
— manufacture in Britain, 1289
— production of, 1319
— supplies (parliamentary notes), 1065, 1286
Australia: *Alfred Hospital Clinical Reports*, 307
Austria: Social insurance, 477
Auxiliary medical services, 523
Ayer, A. Ananthanarayana: *The Anatomy of Semnopithecus Entellus*, 90

B

Baby show judging, 637
BACH, Francis: Splenectomy for rheumatoid arthritis, 1490
Back pain, low, 1217
Backache in bed; cause and significance, 1455
— in cervical erosion, 648
BACTERIOLOGY:
Bacterial antagonism, induced, 879 (A)
— polysaccharides for cancer, 32 (A)
Bacterium coli D 433 in cases of diarrhoea in adults (John S. Stevenson), 195 (O); 205 (A); 462 (C)
— — in epidemic diarrhoea, 192, 195, 205, 460, 577, 889; correction, 1128
— — specific serological type found in infants' home in absence of epidemic diarrhoea (A. M. M. Payne and G. T. Cook), 192 (O); 205 (A); 460 (C)
Classification of the Shigella Types (Sten Madsen), 610
Cytology and Life-History of Bacteria (K. A. Bisset), 201
BAENSCH, W. E. *See* SCHINZ, H. R., 929
Bagdad University. *See* Universities: Bagdad
Bainbridge, Isaac, obituary of, 1064
Baird, Dugald (Editor): *Combined Textbook of Obstetrics and Gynaecology*, 5th ed., 254
BAKER, W. H. J.: Infection from the bite of a bear, 839
B.A.L. in treatment of arsenical and other metallic poisonings, 352
Balfour, D. C., Honorary Fellowship of Royal College of Surgeons of Edinburgh conferred on, 176
BALLANCE, G. A.: Jaundice and para-aminosalicylic acid, 949
Balme, Harold, appointed technical consultant on rehabilitation to the U.N. Department of Social Affairs and the World Health Organization, 901
BANHAM, A. R.: Intestinal obstruction due to food, 109
Bankes, John Herbert, obituary of, 465
BANKS, H. Stanley, and BEALE, A. J.: Poliomyelitis and immunization against whooping-cough and diphtheria, 251 (O)
BANNEN, J. E.: Radiology and the diagnosis of miliary tuberculosis, 951
BARER, R.: New methods of microscopy, 272
Barbiturate poisoning, acute, amphetamine sulphate in (J. D. N. Nabarro), 924 (O); correspondence, 1333
— — — management of, 926
Barbiturates, loss of memory due to, 848
BARFORD, J. L.: Sulphonamide therapy, 628
— obituary of, 1397
Barium carbonate poisoning; seven cases (Geoffrey Dean), 817 (O); 827 (A); correspondence, 1058
Barker, Sir Herbert, 260 (A)
BARLOVATZ, A.: Mass inoculation technique, 1393
BARNES, E. J., and BARNES, I.: Medical administration in the Tropics, 50
BARNES I., *See* BARNES, E. J., 50
Barnett, Anthony: *The Human Species: A Biology of Man*, 1157
BARNS, H. H. Fouracre: Threats to general hospitals, 731
BARNSLEY, R. E.: R.A.M.C. Roll of Honour, 369
Baron, Bernhard, charitable bequests of, 1400
BARRIE, H. J. *See* MAHONEY, L. J., and BARRIE, H. J., 655
Bartlett: *Did Adelaide Bartlett . . .?* (Gordon Gwynn), 1261
Barton, Bertram Henry, obituary of, 684
BASU ROY, B. *See* CHATTERJEE, P. K., 1334
Bates, John Vincent, obituary of, 684
Bath, exercises in (Sir Leonard Hill), 1153 (O); correspondence, 1281, 1329, 1494
BATTESON, C. Luther: Royal Medical Benevolent Fund, 1281
BATTINGER, Herbert M.: Treatment of burns, 360
Battle exhaustion, 788
BAUER, Albert W.: Johann Mikulicz-Radecki; a reply, 839
BAUER, Gunnar: Division of popliteal vein in treatment of so-called varicose ulceration, 318 (O); 338 (A); 529 (C)
— Varicose ulceration, 269
Baxter, Cedric, obituary of, 733
BAYLISS, R. I. S.: Pulmonary hypertension, 268
— *Practical Procedures in Clinical Medicine*, 499
BAYON, H. P.: A secret remedy for cancer, 726
Bazett, Henry Cuthbert, obituary of, 220
B.C.G. vaccination (parliamentary note), 225
— — course on use of, 1343
— — hypersensitivity after, 1403
— — technique, 993 (L)
BEALE, A. J. *See* BANKS, H. Stanley, 251
Bear, infection from bite of, 839
BEAUMONT, G. E.: The treatment of ulcerative colitis, 937; 1062 (C)
Bed, adjustable for patients at home, 530, 631
Beds available in hospitals in England and Wales, 1299
Bed-pans, sterilization of, 1236
Bed-wetting; incidence, differential diagnosis, aetiology, treatment and prognosis (Douglas Hubble), 1108; correspondence, 1224
BEDFORD, P. D.: Hygiene of urinal bottles, 1330
BEDSON, S. P.: Aetiology and diagnosis of atypical pneumonia, 283
— Primary atypical pneumonia, 1461 (O); 1484 (A)
Bee-stings, sensitization to, 794
Bee-venom, desensitization to, 1128
BEGG, R. Campbell: Survival on less than one kidney, 1497
BEGGS, S. T.: Chlorinated swimming-baths, 950
Bejel; Unicef–W.H.O. control project, 1328
BELCHER, J. R.: Resection of lung for pulmonary tuberculosis, 289
Belfast University. *See* Universities: Belfast
Bell's palsy, pathology and surgical treatment of, 1386
BELLAMY, C.: Radiology and the diagnosis of miliary tuberculosis, 1173
BELLAMY, E.: The dangers of mixing domestic cleansers, 893
BELLAMY, W. A.: Training for general practice, 622
BELSEY, R. H. R., and DONNISON, C. P.: Congenital atresia of oesophagus, 324 (O)
"Benadryl" in paralysis agitans, 30
— in sea-sickness, 946
— pharmacological action of, 691, 836
BENE, E. *See* KERSLEY, G. D., 855
Bengué Memorial Award Lecture, 783
BENJAMIN, B. *See* BREEN, G. E., 1473
BENNETT, E. A.: Psychology as science, 625
BENNETT, Harry M.: Atresia of small intestine, 1369
Berliner, M. L.: *Biomicroscopy of the Eye*, 254
Bertram Louis Abrahams Lecture, Royal College of Physicians of London, 32
BETENSON, W. F. W.: Useless routine medical examinations, 1171
BETHELL, M. F.: "Dramamine" and sea-sickness, 836
BEVAN, R. T.: Domiciliary care of premature babies, 216
Bibliography, medical, 616 (A)
BICKERSTAFF, Edwin R.: Massive lipoid deposit in atrophied muscle, 660
BICKFORD, B. John: Resection of lung for pulmonary tuberculosis, 289
BICKNELL, Franklin: Foetal pathology and vitamin A, 576
Bicycles, children's seats on, 1002
Biddle, Henry George, obituary of, 222
BIDSTRUP, P. Lesley: Dangers of insecticides, 273
— Poisoning by organic phosphorus insecticides, 548 (O)
BIGNALL, J. R.: Streptomycin in pulmonary tuberculosis, 213
BILLINGHAM, L. M., and LACEY, J. W.: Training registrars, 1443
Biochemistry: *Journal of Biochemistry*, 422
BIOGRAPHY:
Tom Cullen of Baltimore (Judith Robinson), 26
Paul Ehrlich by Martha Marquardt (Charles Singer) (Nova et Vetera), 267
S. Weir Mitchell: Novelist and Physician (Ernest Earnest), 989
Florence Nightingale, 1820–1910 (Cecil Woodham-Smith), 1315
My Life in Three Counties (H. W. Pooler), 564
Biology, teaching of, 505 (A)
— *The Human Species: A Biology of Man* (Anthony Barnett), 1157
BIRLEY, R.: The medical curriculum, 1052; correspondence, 1335
Birmingham Medical Library, 582
— University. *See* Universities: Birmingham
BISHOP, P. M. F.: Endocrine aspects of rheumatic disease, 1489
— Menstrual disorders and the menopause. I. Physiological basis and diagnosis, 1214, 1268
— RICHARDS, N. A., and DOLL, Richard: Habitual abortion; prophylactic value of progesterone pellet implantation, 130 (O)
— *See* COPEMAN, W. S. C., 849
BISHOP, W. J.: Medical librarianship in Great Britain, 102
BISSET, K. A.: *Cytology and Life-History of Bacteria*, 201
Bisset Hawkins Medal awarded to Sir Wilson Jameson, 373, 998
Bites and stings; injurious effects on skin, 316
BLACK, D. A. K.: Dangers of indiscriminate treatment with intravenous fluids, 1387
BLACKBURN, E. K.: Preventing wastage of stored blood, 840
Blackett, James Francis, obituary of, 684
Bladder, calculus in, removal of, 1014
Blair, David, obituary of, 1337
Blair-Bell Medal presented to J. M. Munro Kerr, 1326
BLAXLAND, P. J.: A vestigial tail, 870; correspondence, 1120
BLEASDALE, Noel: Chlorinated swimming-pools and poliomyelitis, 728
Blindness: *Causes of Blindness in England and Wales* (Arnold Sorsby), 1482
— hereditary causes and age of onset of, 1404
BLODI, F. *See* REESE, A. B., 343
BLOOD:
Atlas der Blutkrankheiten, 4th ed. (K. Schleip and A. Alder), 765
Circulation; Giordano Bruno and the circular motion of the blood (Walter Pagel), 621
Coagulation problems, 672
Disorders of the Blood, 6th ed. (Sir Lionel E. H. Whitby and C. J. C. Britton), 929
Erythrocyte sedimentation in anaemia (Richard Terry), 1296 (O); correspondence, 1445
— stippling in poisoning, 1496
Flow in human intestine (John Grayson), 1465 (O)
Haemoglobin metabolism, 672
Haemorrhagic Disorders (Paul M. Aggeler and S. P. Lucia), 765
International Society of Haematology; meeting in Cambridge, 582, 671
Klinische Pathologie der Blutkrankheiten (R. Schoen and W. Tischendorf), 765
Loss at operation, 50
Practical Haematology (J. V. Dacie), 929
Thermal coagulability of serum proteins and the diagnosis of malignant disease (Harold Jackson), 1201 (O); 1213 (A)
BLOOD GROUPS:
Erythroblastosis foetalis following ABO incompatibility, 680, 951
Family planning for the Rhesus-negative mother 1330
Kell–Cellano blood group system in pregnancy and transfusion (J. B. Cochrane, R. H. Malone, and I. Dunsford), 1203 (O)
Practical aspects of blood-group genetics, 354
BLOOD PRESSURE:
Changes during angiocardiography (Sheila Howarth), 1090 (O)
high. *See* Hypertension
normal variations in, 178
Primer of Venous Pressure (G. E. Burch), 1370
BLOOD TRANSFUSION:
and atomic warfare (parliamentary note), 1065
and viral hepatitis, 1103 (L); 1278
"Cambridge" exchange transfusion outfit (C. B. V. Walker), 1441
circulatory overload from, 770 (A)
Donors, Jan–June, 1950. 685, 1314
Kell–Cellano blood group system in pregnancy and transfusion (J. B. Cochrane, R. H. Malone, and I. Dunsford), 1203 (O)
Preventing wastage of stored blood, 840
BLOOD VESSELS:
Changes in diabetes, 107, 368
of a gastric ulcer (James A. Key), 1464 (O); 1484 (A)
BLOUNT, W. P.: Abnormalities in developing chickens, 785
BLUMBERG, E. F.: Penicillin and the skin, 629
Blunt, Eleanor Dorothea, obituary of, 1500
BLYTH, R. Ian K.: War on leeches, 1058
BOAS, L. C. *See* COLLENS, W. S., 821
Body weight in Graves's disease (Hugh Conway), 84 (O)
Boeck's sarcoidosis, erythema nodosum as initial manifestation of (F. E. Crawley), 1362 (O)
BOGDAN, Andrew, and CLARK, Justin: Manubriosternal joint in rheumatoid arthritis, 1361 (O)
Bogomoletz serum, 902
Bone, Elizabeth Honor, obituary of, 464

BONE: *See also* Fractures; Orthopaedics
Decalcification, generalized, 1218
Effect of hypervitaminosis A on foetal mouse bones cultivated *in vitro* (Honor B. Fell and Sir Edward Mellanby), 535 (O); 565 (L)
Grafts: *The Hinge Graft or Ginglymus Implant* (Arnold K. Henry), 446
Marrow infusions: Intratibial and intravenous routes compared (L. W. C. Massey), 197 (O)
— Plasma-cell myeloma; treatment and prognosis, 232
Ollier's disease: dyschondroplasia (Sydney G. Nardell), 555 (O)
Books received, 27, 91, 151, 201, 255, 334, 402, correction, 534; 447, 500, 564, 611, 662, 716, 766, 821, 873, 930, 990, 1040, 1101, (correction, 1236), 1157, 1207, 1261, 1317, 1371, 1427, 1479
Boots, surgical, 241
Bornholm disease, 623
— — Epidemic of benign dry pleurisy (D. G. H. Sylvester), 653 (O)
Boston Medical Library; seventy-fifth anniversary, 635
Bot-fly infestation of human eye, 928
BOUCHE, B. J.: Transmission of kala-azar, 1060
BOURDILLON, R. B., DAVIES-JONES, E., STOTT, F. D., and TAYLOR, L. M.: Respiratory studies in paralytic poliomyelitis, 539 (O); 566 (L)
BOURNE, I. H. J.: Arteriovenous shunts, 1176
BOURNE, W. A.: Psychology and science, 1057
BOUSFIELD, Guy: Infection by syringe, 366
— and HOLT, Lewis B.: P.T.A.P.: Determination of the essential Lf dosage, 73 (O)
Bowes, Kenneth (Editor): *Modern Trends in Obstetrics and Gynaecology*, 1100
BOWLBY, John. *See* SUTHERLAND, John D., 625
Boxing: Punch-drunkenness, 793, 1292
BOYD, A. M.: Varicose ulceration, 269
BOYD, J. M. *See* FORRESTER, M. E., 89
Boyd, Ringland Gilmore, obituary of, 842
BOYD, T. A. S., and CAMPBELL, F. W.: Influence of ascorbic acid on healing of corneal ulcers in man, 1145 (O)
Boyle's anaesthetic apparatus, novel modification of (W. B. Primrose), 676; 787 (C), 1003 (C)
B.R.A. Review, 1123
BRACEY, D. W.: The internal spermatic fascia, 625
Brachial plexus, post-operative paralysis of (A. W. Raffan), 149
BRAILSFORD, James F.: Tuberculosis and the Health Service, 1493
BRAIN:
Aerocele; case (J. H. McIntyre), 25
Cerebrospinal fluid in otogenic abscess, 46
Chronic subdural haemorrhage associated with schizophrenic reaction (Kirpal Singh), 562
Electroencephalography (Editors: Denis Hill and Geoffrey Parr), 563
Personality changes after head injury, 1377 (A)
Punch-drunkenness, 793, 1292
Sclerosis, tuberous: unusual case (A. J. N. Warrack), 1367 (O)
BRAITHWAITE, E. Wrigley: The common cold, 952
BRAUER, E.: Treatment of pink disease, 1003
Bread; extraction rate of flour (parliamentary note), 373
BREAST:
The Breast: Structure, Function, Disease (Editor: F. D. Saner), 989
Feeding. *See* Infants, feeding; Lactation
Haemolytic streptococcal gangrene of breast successfully treated with streptomycin (R. Marcus), 394 (O); correspondence, 1278
Primary carcinoma of the other breast; incidence, 469
Stilboestrol: contraindications in familial tendency to breast cancer, 638
Breath, malodorous, 1236
Breathing machines, dangers of, 539, 566
Breech presentation, mortality in, 418, 529
BREEN, G. E., and BENJAMIN, B.: Poliomyelitis in London in 1949, 1473 (O)
BREWER, A. C.: Varicose ulceration, 270
BREWSTER, John M.: Antihistamines and the common cold, 1444
Briggs, Isaac George, obituary of, 1338
Bright's Disease, Natural History of (G. E. M. Scott), 564
Bristol Physiotherapy Service, 56
— University. *See* Universities: Bristol
British Association: 112th annual meeting; matters of medical interest, 674
British Council, 76, 1343
— — Exhibition of medical literature in Lima, 1275
— — Thoracic surgery demonstrations in Spain, 1068
British Empire Cancer Campaign; annual report, 265
British Epilepsy Association, 687, 899
British Health Resorts Association handbook, 928
British Honduras; two years' antimalarial campaign, 1249
British Hospitals Contributory Schemes Association, 1037
British Institute of Radiology: Presidential Address (R. Fawcitt), 1011
British Journal of Delinquency, 422
British Journal for the Philosophy of Science, 467
British Journal of Psychiatric Social Work, 1085
British Journal of Tuberculosis and Diseases of the Chest, 468
British Legion village, 735; report for, 1947–9, 658
British Limbless Ex-Service Men's Association, 300
BRITISH MEDICAL ASSOCIATION:
Annual meeting, 94 (L), 256 (L)
— — Popular lecture, 265
— — President's Address, 179
Annual Representative Meeting, 256 (L)
Charles Hastings Lecture, 1272
Film library, 519
Medical Practitioners' Handbook, 452 (A)
Membership regulations, 521
National Health Service: reconsideration of B.M.A. policy, 1389
New Zealand Branch: Mars and Aesculapius; A New Zealand Memorial Oration (Sir Arthur Porritt), 1438
Secretary; resignation of Charles Hill and appointment of Angus Macrae, 1107
Tuberculosis and Diseases of the Chest Group Committee; Tuberculosis and the National Health Service, 1382; 1373 (L), 1493
War Memorial, 156 (A); 463
— — and Epsom College, 1057
BRITISH MEDICAL ASSOCIATION: ANNUAL MEETING, 1950: PROCEEDINGS OF SECTIONS:
Section of Anaesthetics:
Anaesthesia: Abdominal operations (Stuart C. Cullen), 276
Anaesthesia in the newborn (T. N. P. Wilton and others), 292
Section of Anatomy and Physiology:
Lymphatic system (J. M. Yoffey), 284
Section of Child Health:
Breast-feeding (F. Charlotte Naish and others), 350
General care of the physically handicapped child (C. D. S. Agassiz), 272
Clinical demonstration, 286
Epidemiology in relation to child health (S. G. Graham), 361
Section of Dermatology:
Chemotherapy of venereal diseases (Robert Lees and others), 351
Sections of Dermatology and Tropical Medicine:
Parasitology in relation to dermatology (R. M. B. MacKenna and others), 287
Section of Diseases of the Chest and Tuberculosis:
Resection of lung for pulmonary tuberculosis (O. F. Thomas and others), 288
Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine:
Care of the tuberculous patient in the home (F. R. G. Heaf and others), 352
Section of Geriatrics:
Activity in advancing years (Marjory W. Warren and others), 353
Hospital and general practitioner (C. T. Andrews), 363
Section of Medical Genetics:
Genetics and medical practice (L. S. Penrose and others), 354
Section of Medicine:
Cardiac failure (E. P. Sharpey-Schafer and others), 268
Pharmacology of antihistamine compounds (J. H. Burn and others), 347
Sections of Medicine and Pathology and Bacteriology:
Atypical pneumonia (C. H. Stuart-Harris and others), 282
Sections of Medicine and Surgery:
Ulcerative colitis (T. L. Hardy and others), 278
Section of Neurology:
Diagnosis and treatment of pain in the upper limb (M. J. McArdle and others), 354
Treatment of Parkinsonism (Hugh Garland), 363
Section of Obstetrics and Gynaecology:
Tuberculosis and pregnancy (J. A. Stallworthy and others), 270
Uterus, prolapse; prevention and treatment (R. A. Lennie and others), 279
Section of Occupational Health:
Insecticides, dangers of (P. Lesley Bidstrup and others), 273
Medical examination in industry (Leslie G. Norman and others), 289
Section of Ophthalmology:
Radiation, light, and illumination (J. N. Aldington), 277
Section of Orthopaedics:
Treatment of short leg (Goronwy E. Thomas and others), 358
Tuberculous arthritis of the hip-joint (H. B. Seddon), 293
Section of Oto-rhino-laryngology:
Deafness in children (R. R. Simpson and others), 364
Sections of Oto-rhino-laryngology and Radiology:
Carcinoma of the larynx (M. Lederman and others), 356, 638
Section of Pathology and Bacteriology:
Microscopy; new methods (R. Barer and others), 272
Section of Preventive Medicine:
Social medicine (J. M. Mackintosh and others), 274
Social medicine from the point of view of the M.O.H. (C. Fraser Brockington and others), 290
BRITISH MEDICAL ASSOCIATION (*continued*):
Section of Psychiatry:
Psychological involvements of child-bearing (Edward Glover and others), 275; 526 (C)
Role of the psychiatric social worker (J. B. S. Lewis and others), 291
Section of Radiology:
Some aspects of bronchiectasis (J. C. H. Mackenzie and others), 356
Section of Surgery:
Burns (Rowland P. Osborne and others), 360
Varicose ulceration (Gunnar Bauer and others), 269
Sections of Surgery and of Pathology and Bacteriology:
Renal failure (Ralph Shackman and others), 348
Section of Tropical Medicine:
Intestinal parasites of man in Great Britain (J. J. C. Buckley and others), 357; correction, 470
British Medical Students Association, 522
British Orthopaedic Association; annual meeting, 957, 1216
British Pharmacopoeia Commission, 582
British Postgraduate Medical Federation, 507
Lectures on the scientific basis of medicine, 845
New headquarters, 1400
Travelling fellowships, 1022
British Rheumatic Association, 965, 1123
Lord Nuffield appointed president, 899
British Student Tuberculosis Fund, 1497; 1484 A
BRITTON, C. J. C. *See* WHITBY, Sir Lionel E. H., 929
Broadley, John, obituary of, 1396
BROCKBANK, E. M.: Cancer of the respiratory system, 417
BROCKINGTON, C. Fraser: Social medicine from the point of view of the M.O.H., 290
Brodribb, Arthur Williamson, obituary of, 953
Bronchiectasis (J. C. H. Mackenzie and others), 356
— aetiology, diagnosis, treatment, and prognosis (F. P. Lee Lander), 1486
— and atelectasis in pertussis (A. W. Lees), 1138 (O); 1162 (A); correspondence, 1331, 1448
Bronchitis, effect of vitamin D in, 960
Bronchography; simple method, 527
Broncholithiasis, 452 (A)
Bronchopneumonia in relation to atelectasis, 1139
Bronchospirometry (Paul Frenckner), 1166
Bronchus, dislodgement of peanut from, by percussion, 1390
Brooke, B. N., appointed Reader in Surgery, University of Birmingham, 1286
BROOKE, Eileen M.: Relative incidence of gastric and duodenal ulcers, 560 (O)
BROWN, A. E.: Training in preventive medicine, 578
BROWN, Austin, and ELKES, Alexander Z.: Multiple primary carcinoma, 462
BROWN, C. E.: A plea for better understanding, 788
BROWN, Joyce W. *See* GALPINE, J. F., 819
BROWN, R. J. K.: Mongolism in one of twins, 1118
BROWN, R. Latham: Insulin and E.C.T. for rheumatoid arthritis, 1059
BROWN, William: Psychology as science, 624
BROWNE, Denis: Abnormalities in developing chickens, 1277
— Surgical conditions in the newborn, 286
BROWNE, F. J.: Cauterizing the cervix, 788
— Diagnosis and treatment of placenta praevia, 1055
— *Postgraduate Obstetrics and Gynaecology*, 610
BROWNE, M. P.: Strangulated hernia in infants, 629
BROWNRIGG-GLEESON, J.: Spontaneous amputation, 1393
BRUCE-CHWATT, Joan M. *See* BRUCE-CHWATT, Leonard J., 7
BRUCE-CHWATT, Leonard J., and BRUCE-CHWATT, Joan M.: Antimalarial drugs in West Africa, with particular reference to proguanil; results of a survey in Nigeria, 7 (O)
BRUN, C.: Internal spermatic fascia with reference to repair of indirect inguinal hernia, 443 (O); 625 (C)
Bruno, Giordano, and the circular motion of the blood (Walter Pagel), 621
Brussels Treaty Public Health Committee, 582, 702
BRYCE-SMITH, R.: Management of head injuries from the anaesthetist's point of view, 322 (O)
BUCHAN, T. W.: Convulsions in childhood; epidemiological note on their association with acute epilepsy, eclampsia, and stillbirth, 22 (O)
BUCHANAN, J. W.: Sudden death after spontaneous pneumothorax, 714
BUCKLEY, Charles W.: Osteoarthritis, 728
BUCKLEY, J. J. C.: Intestinal parasites of man in Great Britain, 357
BULL, G. M.: Acute tubular necrosis, 349
BULL, J. W. D.: Cerebrospinal fluid in intracranial otogenic abscess, 46
— Radiological anatomy of the cervical spine, 355
BULMER, E. *See* ASHBY, D. W., 248
Burch, G. E.: *A Primer of Venous Pressure*, 1370
BURGESS, C. G.: Scarlet fever, rheumatic fever, and acute nephritis, 109
Buried alive for 8 hours, 1506
Burlingame, C. Charles, obituary of, 895
BURN, J. H.: Pharmacological action of antihistamine compounds, 347; 691 (O); 836 (C), 946 (C), 951 (C)
BURNET, F. M.: Natural history of surgical infection, 39
BURNS, T. H. S.: Inflammability of ethyl chloride, 625

BURNS:
Experimental studies, including treatment with cortisone-active material extracted from urine (P. O. Crassweller, A. W. Farmer, and W. R. Franks), 242 (O)
First aid treatment, 1025
Guy Fawkes day—the afterglow, 1275
Infection; sources, effects and prevention, 1028
Initial treatment, local and general (R. P. Osborne), 1025 (O); 1044 (A)
Need for effective safety appliances for kitchen ranges and open coal-fires, 1366
New Approach to the Treatment of Burns and Scalds (Leonard Colebrook), 26
Prevention, 1044 (A)
Severe burns, treated with cortisone; three cases (P. O. Crassweller and others), 977 (O)
Skin cover for full-thickness skin loss (J. P. Reidy), 1030 (O); 1044 (A)
Treatment (Rowland P. Osborne and others), 360

BURT, Sir Cyril: Psychology and science, 943
BURTON, Alan C.: Infection by syringe, 1059
BURTON-BROWN, Jean R. C.: Spontaneous amputation of the cervix, 1061
BURY, J. D.: Training for general practice, 676
Buschke, Franz, Cantril, Simeon T., and Parker, Herbert M.: *Supervoltage Roentgentherapy*, 1370
BUTLER, T. J.: The dumping syndrome, 218
— *See* CAPPER, W. M., 893
BUTTERS, Andrew G.: Four brothers with duodenal ulcer, 1333
Button in pharynx of an infant, 1061

C

C10. *See* Decamethonium iodide
Caesarean section, anaesthesia in, 219
— — Contamination of wounds by vernix caseosa (Percy Malpas), 763
— — in eclampsia, 1071
— — Modification of lower-segment technique, 1335, 1496
CAIGER, Herbert: St. Luke's Day, 944
Calcium absorption, effect of lemon juice on, 378
— — effect of phytate on, 935
— gluconate in treatment of nocturnal cramps, 738
Calculus, cystine, in kidney, 1505
— vesical, removal of, 1014
CALDWELL, K. P. S.: Spontaneous intraperitoneal haemorrhage due to haemangioma of liver, 1155
— Torsion of gall-bladder, 1425
Calf lymph, sensitization to, 424
CALNAN, W. L.: Hospital failures in diagnosis of tuberculous meningitis, 296
Calomel: value as syphilis prophylactic, 231, 470
"Calorie", "joule" as substitute for, 1213 (A)
CALWELL, H. G.: Medicine by radio, 1060
Cambridge medical schools, 518
— University. *See* Universities: Cambridge
"Cambridge" exchange transfusion outfit (C. B. V. Walker), 1441
CAMERON, A.: Haematemesis from leeches, 679
CAMERON, Charles: Tuberculosis Service in Scotland, 169
CAMERON, K.: Role of the psychiatric social worker, 292
Cameron Prize, University of Edinburgh, awarded to R. A. Peters, 465
CAMPBELL, Allan, and ROBERTSON, Eric: Treatment of severe hypertension with hexamethonium bromide, 804 (O); 826 (A); 1496 (C)
CAMPBELL, Douglas J.: Chemotherapy of venereal diseases, 351
CAMPBELL, F. W. *See* BOYD, T. A. S., 1145
CAMPBELL, R. D.: Orf in man, 1496
CAMPBELL, W. A. B. *See* CROZIER, T. H., 869
CAMPS, Francis: Refusal to appear in court, 1392

CANCER:
Accommodation of cancer cases (parliamentary note), 1065
Annual report of British Empire Cancer Campaign, 265
Cancer Registration in England and Wales (P. Stocks), 1046; correspondence, 1227
Carcinogens in smoke, 761
Carcinoma of islets of Langerhans, 526
— of lung; association with tobacco smoking (Richard Doll and A. Bradford Hill), 739 (O); 767 (L); 889 (C), 890 (C), 1004 (C), 1060 (C)
— of larynx (M. Lederman and others), 356, 638
— of stomach, 217
— — symptoms, diagnosis and treatment (C. F. W. Illingworth), 262
Cellular transmission of mouse sarcomata with frozen-dried tumour tissues (L. Dmochowski and A. Millard), 1136 (O); 1159 (L)
Cervix uteri, 769 (L)
Chemotherapy; experiments with new compounds, 1271
Chorion carcinoma after ectopic gestation (Keith Vartan), 871
Cultivation *in vitro* of frozen and desiccated mouse tumour tissues (R. D. Passey and others), 1134 (O); 1159 (L)
Cytologic Diagnosis of Cancer (Vincent Memorial Laboratory), 820
CANCER (*continued*):
Diagnosis; thermal coagulability of serum proteins and the diagnosis of malignant disease (Harold Jackson), 1201 (O); 1213 (A)
Education of the public (Malcolm Donaldson), 35; 298 (C)
Freezing and desiccation of mouse tumours (R. D. Passey and L. Dmochowski), 1129 (O); 1159 (L)
Gastric carcinoma among patients with pernicious anaemia; mortality and risk (Johannes Mosbech and Aage Videbaek), 390 (O); 405 (A); correspondence, 575, 892, 1059
Gummatous infiltration of oesophagus masquerading as carcinoma (Stanley O. Aylett), 1476
in young patients, 310
Lung cancer and petrol lighter, 529, 682
— smoking and, 107
Multiple primary carcinoma, 107, 297, 462, 785
— — neoplasms, 995 (A)
Naming of cancer hospitals, 220
Primary carcinoma of the other breast; incidence, 469
Propaganda (parliamentary note), 1502
Publicity and research in U.S.A., 212
of respiratory system, 417
Saccharin as carcinogen, 1184
Secret remedy, 663 (L), 726, 835, 875 (L); 1004; correspondence between Minister of Health and D. Rees Evans, 885
Skin cancer and cutting oils, 568 (A)
Stilboestrol; contraindications in familial tendency to breast cancer, 638
Treatment with bacterial polysaccharides, 32 (A)
— with colchicine, 718 (L); 893
— with linear accelerators, 616 (A)
Waxed paper as carcinogen, 1235

CAPDEHOURAT, Eduardo L. *See* CASTEX, Mariano R., 604
CAPENER, Norman: Reconstructive surgery in infantile paralysis, 1217
Capillary resistance and adrenocortical activity (H. N. Robson and J. J. R. Duthie), 971 (O)
CAPLAN, Joseph: Creeping eruption in association with intestinal strongyloidiasis, 288
CAPON, Norman B.: Paediatric aspects of cerebral palsy, 1051
CAPPER, W. M., and BUTLER, T. J.: Gastric ulcer after vagotomy, 893
Carbon dioxide inhalations in asthma, 1236, 1404
— monoxide; methods of detection, 130
Carcinoma. *See* Cancer, and under organs and regions
Cardiology, Institute of, 507
— International Congress of, 230, 736
CARLISLE, J. M.: Cortisone (Compound E); summary of its clinical uses, 590 (O)
CARMICHAEL, Kathleen M. *See* GIRDWOOD, Ronald H., 1357
Carotene in bird plasma, 537
CARP, Louis: Mortality in geriatric surgery, 353; 1198 (O); 1390 (C)
Carruthers, Norman Stuart, obituary of, 790, 896
Cars, new, sale of (parliamentary note), 303
Carslaw, James, obituary of, 221
CASTEX, Mariano R., and CAPDEHOURAT, Eduardo L.: Medical treatment of hydatid cysts of lung, 604 (O)
Castle's intrinsic factor, interaction of vitamin B_{12} with, 905, 911, 915, 933
CAWADIAS, A. P.: British spas and health resorts. 169
CAWTHORNE, Terence: Pathology and surgical treatment of Bell's palsy, 1386
Census of 1951, 1503
Central Council for Health Education, reconstitution of, 1068
Central Midwives Board, 1232; annual report, 534
Cerebral palsy. *See* Paralyses, cerebral
Cerebrospinal fluid in intracranial otogenic abscess, 46
— — norms, 218
Certificates, dishonest (parliamentary note), 1065
— required by foreign governments, 215, 416, 530
Cervix uteri. *See* Uterus, cervix
Chadwick Trust Lecture, 1111
CHALMERS, J. A.: Every breech an abnormality, 529
— Pregnancy in horn of bicornuate uterus, 1119
CHANDLEY, G.: Limbless ex-service men, 300
Channel Islands and National Health Service, 307
Charing Cross Hospital; new site at Northwick Park, 1069
— — Medical School: Winter session; inaugural address, 884
Charities, medical, 1106 (A)
— — effect of nationalization (medico-legal note), 685
Charles Hastings Lecture, 1272
Charsley, Gilbert William, obituary of, 1063
Chartered Society of Physiotherapy: J. Whillis elected chairman, 957
CHATTERJEE, P. K., and BASU ROY, B.: Vasomotor collapse after chloramphenicol, 1334
CHATTERJEE, S. S.: Domiciliary treatment of tuberculosis, 626
Chelsea Clinical Society, 956, 1400
Chemistry: *Thorpe's Dictionary of Applied Chemistry*, Vol. 10, 4th ed., 1100
CHEMOTHERAPY:
Administration of penicillin (Lawrence P. Garrod), 453, 617; correspondence, 629
in tuberculosis, 576
Newer antibiotics (Lawrence P. Garrod), 722; 1227 (C)
Recent Advances in Chemotherapy, 3rd ed. (G. M. Findlay), 820
Streptomycin (Lawrence P. Garrod), 669

CHESSER, Eustace: The case for abortion, 626

CHEST:
American College of Chest Physicians; prize award, 582, 900
Clinical interpretation of chest pain (Donald Leeming and others), 289
Institute of Diseases of the Chest, 507
International Congress on Diseases of the Chest, 736
Thoracic surgery units in tuberculosis sanatoria, 1118

CHESTERMAN, C. C.: Human intestinal coccidiosis, 298
Chickens, insulin-induced skeletal abnormalities in (P. K. Duraiswami), 384 (O); 404 (L); 785 (C), 1002 (C), 1277 (C), 1495 (C)
Childbirth. *See* Labour; Obstetrics.

CHILDREN: *See also* Infant; Paediatrics
Acute intussusception in childhood (Sir James Spence and Donald Court), 920 (O)
Care of children with rheumatic hearts, 986
Child and his environment; maternity and child welfare conference, 210, 525
Child health and the future (Alan Moncrieff), 795 (O); 824 (L); 945 (C), 1001 (C), 1170 (C), 1280 (C)
Child psychiatry: International course in London, 1232
Children and the cinema, 96 (A)
Children with Mental and Physical Handicaps (J. E. Wallace Wallin), 990
Compleat Pediatrician, 6th ed. (Wilburt C. Davison), 201
Convulsions in childhood; epidemiological note on their association with epilepsy, eclampsia, and stillbirth (T. W. Buchan), 22 (O)
Deafness in children (R. R. Simpson and others), 364
Delinquents, 211
Diabetics: Lessons for future treatment from 472 fatalities in diabetic children (Elliott P. Joslin and James L. Wilson), 1293 (O)
Educationally subnormal children and mental defectives, 1503
Epidemiology in relation to child health, 361
Faecal incontinence; cause and treatment, 1346
General care of the physically handicapped child (C. D. S. Agassiz), 272
Influence of Harvey and his contemporaries on paediatrics (Harveian Oration) (Sir Leonard Parsons), 997
Institute of Child Health, 507
International Union for Child Welfare, 175
Lehrbuch der Kinderheilkunde, 4-5th eds. (R. Degkwitz and others), 1207
Physique of London's children, 155 (A)
Protection from tuberculosis; recommendations made by Joint Tuberculosis Council, 175
Provision of special schools for handicapped children, 755
School medical inspections, 798, 825
Thiopentone, rectal, as sedative (John Lorber), 21 (O); 368 (C), 891 (C)
Treatment of the maladjusted child, 1265 (A)
Ulster Paediatric Society, 57

CHILDS, G. A. *See* UNGLEY, C. C., 911
CHILDS, Peter. *See* WAKELEY, Sir Cecil, 1347
Chill: What is a chill?, 122

CHIROPODY:
Practice of Chiropody (K. C. Jones), 611
Register of Chiropodists, 176
Society of Chiropodists, 57

CHISHOLM, Brock: Organization and work of the World Health Organization, 1049; correction, 1346
Chloralose as antihistamine, 951

CHLORAMPHENICOL:
action and indications for use of, 722
Distribution; Ministry of Health statement, 1326; 1319 (L)
Effect in smallpox, 583
— in typhoid haemorrhage, 166
hoarseness or aphonia due to, 1292
in fulminating staphylococcal pneumonia (J. M. Walshe), 1313
in influenzal meningitis (R. Green, D. S. Mankikar, and J. S. Millett), 1154
in syphilis, 1227
in trachoma, 309
in typhoid; two cases (J. F. Galpine and Joyce W. Brown), 819
— — vasomotor collapse after, 1334
Indications for use, 1319 (L)
Chlorocyclizine hydrochloride in prevention and treatment of common cold, 425, 448
Chloromycetin. *See* Chloramphenicol

Choline chloride, nature and mode of action of, 1071
— in treatment of coronary thrombosis, 1072
CHOLMELEY, J. A.: Elmslie's Operation for calcaneus foot, 1217
Chondromalacia of patella, 377
Chorio-meningitis, lymphocytic, diagnosis of (J. O'H. Tobin), 1387
Chorion carcinoma after ectopic gestation (Keith Vartan), 871
Choroid: Radiological and pathological correlation of miliary tuberculosis of lungs in children, with special reference to choroidal tubercles (J. L. Emery and J. Lorber), 702 (O); 720 (A); 951 (C), 1173 (C)
Christmas and the *B.M.J.*, 1428, 1442
— Toast to Bacchus, 1428 (L)
Chromatography: *Progress in Chromatography* 1938–1947 (L. Zechmeister), 1316
Chronic sick, care of (C. R. Lowe), 699 (O)
CHUGH, Jagdish Chandra: A simpler method of bronchography, 527
Cigarette smoking. *See* Tobacco smoking
Cinema: Children and the cinema, 96 (A)
Circulation: Overloading due to transfusion, 770
CLARK, C. J. M.: Psychological factors in the assessment of rheumatoid therapy, 1490
CLARK, Justin. *See* BOGDAN, Andrew, 1361
CLARK, W. E. Le Gros: Progress and trends in the science of anatomy, 233 (O); 258 (L)
— appointed member of Medical Research Council, 468
Clarke, James Kilian Patrick, obituary of, 1283
CLARKE, P. R. R.: Recurrent obstruction of an obturator hernia, 1175
Claudication and rest pain, intra-arterial histamine in treatment of (W. Arthur Mackey), 1086 (O)
— intermittent; evaluation of treatment (J. T. Shepherd), 1413 (O)
CLAYE, Andrew M.: Abortion, 627
— Post-menopausal bleeding, 282
Cleansers, domestic, dangers of mixing, 893, 1059
Climacteric, persistent, 737
Clostridial infections, antisera for, 121
Coal-mining. *See* Mining
Coccidiosis, intestinal, human, 298
COCHRANE, J. B., MALONE, R. H., and DUNSFORD, I.: Kell–Cellano blood group system in pregnancy and transfusion, 1203 (O)
— WATSON, R. D., and REID, J.: Mild Cushing's syndrome due to aspirin, 1411 (O); 1432 (A)
Coeliac disease, treatment of, 1456
COHEN, H. M.: General care of the physically handicapped child; administrative aspects, 273
COHEN, Sir Henry: Medicine, science, and humanism; reflections on the first half of the twentieth century (presidential address, annual meeting of B.M.A.), 179 (O); 202 (L)
— Methods and men in the teaching of clinical medicine, 478 (O); 501 (L)
— Medical curriculum, 1053
— Harvey and the scientific method, 1405 (O)
— honorary LL.D. (Liverpool) conferred on, 156
COHEN, Lionel, and KIMMEL, Samuel A.: Treatment of simple epithelial cysts with secondary photoelectron radiation, 87 (O)
COHEN, R. C.: Tuberculosis and pregnancy, 271
Colby, Fletcher H.: *Essential Urology*, 334
Colchicine in the chemotherapy of cancer, 718 (L); 893
Cold, common; clinical trials of anti-histaminic drugs in prevention and treatment: report by special committee of Medical Research Council, 425 (O); 448 (L); correspondence, 631, 785, 1062, 1444
— — relation to emotional state, 952, 1120, 1448
Colebrook, Leonard: *New Approach to the Treatment of Burns and Scalds*, 26
Colectomy, intraperitoneal intestinal anastomosis in (W. Garden Hendry), 1148 (O); correspondence, 1331
COLEMAN, Filmer: Troubles of being biped, 1175
COLEMAN, P. N.: Anomalous findings in differential diagnosis of jaundice by biochemical tests, 246 (O)
Colitis, ulcerative (T. L. Hardy), 278
— — treatment of (G. E. Beaumont), 937; 1062 (C)
COLLEDGE, A. D.: Cigarettes and cancer, 889

Colleges. *See:*
Epsom College
Royal College of Obstetricians and Gynaecologists
Royal College of Physicians of Edinburgh
Royal College of Physicians of Ireland
Royal College of Physicians of London
Royal College of Surgeons of Edinburgh
Royal College of Surgeons of England
Royal College of Surgeons in Ireland
Royal Faculty of Physicians and Surgeons of Glasgow

Collens, W. S., and Boas, L. C.: *Helpful Hints to the Diabetic*, 821
Colney Hatch Asylum centenary, 1011
Colon, bacillus; specific serological type found in infants' home in absence of epidemic diarrhoea (A. M. M. Payne and G. T. Cook), 192 (O); 205 (A); 460 (C), 577 (C), 1128 (C)
— Blood flow, 1465
— effect of emotion on function of, 449 (L)
— Ogilvie's syndrome of false colonic obstruction, 108
Colon, sigmoid, volvulus of, causing intestinal obstruction during late pregnancy (D. W. James), 24
— transverse, volvulus of, complicating labour (Archie G. Murray), 659

COLONIAL MEDICAL SERVICE:
Information on, 522
Man-power, pay, and isolation (parliamentary note), 1005
Recruitment of specialists (parliamentary note), 1006

Colonies, health services in, 771 (A)
— Medicine in the Colonies (parliamentary note), 1230
Colour blindness, some aspects of (E. N. Willmer), 1141 (O)
— vision, in central fovea (E. N. Willmer), 278
Colporrhaphy, conservation of levatores ani in, 168
Colyer Prize, 534
Compound E. *See* Cortisone
COMPTON, Arthur: *Bact. coli* and infantile gastroenteritis, 889
Comroe, J. H. jun.: *Methods in Medical Research*, Vol. 2, 715
Conference of Local Medical Committees, 1043 (L)

CONGRESSES:
26th Annual Congress of Anaesthetists, 1453
5th International Congress of Anatomy; presidential address, 233
International Congress of Cardiology, 230, 736
International Congress of Clinical Pathology, 1401
International Congress on Criminology, 308
11th International Dental Congress, 57
10th International Congress of Dermatology, 58
International Congress on Diseases of the Chest, 736
International Scientific Film Association; 4th Congress, 582
Congrès International Jubilaire de la Société Francaise de Gynécologie, 1401
International Congress of Haematology, 582, 671
Homoeopathic Congress, 176
1st International Congress of Internal Medicine, Paris, 585–608; 612 (L); 940; correction, 960
13th International Congress of Military Medicine, 1453
Austrian Congress of Occupational Medicine, 736
16th International Congress of Ophthalmology, 57, 229, 343
1st Argentine Congress of Pathology, 176
10th Italian Congress of Pulmonary Tuberculosis, 1401
6th International Congress of Radiology, 410
International Society of Surgery; 14th Congress, 1951, 1504

Conjunctivitis, in Stevens–Johnson syndrome, 369
— larval (J. S. Conway), 928
Conquest; Research Defence Society publication, 687

CONSULTANTS AND SPECIALISTS:
Distinction awards, 726, 783, 835, 887, 944, 1006 (parliamentary note), 1060
— — and charity, 1163 (A); 1170, 1329
— — denied, 878 (A); 887, 944
Income of the specialist, 1220

Contract, medical, from the eighteenth century (A. Fessler), (Nova et Vetera), 1112
Convulsion therapy, complications of, 562
Convulsions in childhood; epidemiological note on their association with epilepsy, eclampsia, and stillbirth (T. W. Buchan), 22 (O)
CONWAY, Hugh: Body weight in Graves's disease, 84 (O)
CONWAY, J. S.: Larval conjunctivitis, 928
COOK, G. T. *See* PAYNE, A. M. M., 192
COOK, James: Reflections on criminal conduct, 459
COOK, Norman J.: Child health and the future, 946
COOPER, Duncan Gordon, obituary of, 301
COPE, D. H. P.: Isopropyl chloride as anaesthetic, 1116
COPE, V. Zachary: Actinomycosis of bone, 1218
COPEMAN, W. S. C., SAVAGE, Oswald, BISHOP, P. M. F., DODDS, E. C., GOTTLIEB, B., GLYN, J. H. H., HENLY, A. A., and KELLIE, A. E.: A study of cortisone and other steroids in rheumatoid arthritis, 849 (O); 874 (L)
COPPING, J. A.: Dead bodies in water, 1494
Corneal graft; fixation by an acrylic splint (H. B. Stallard), 1034 (O)
— ulcers, influence of ascorbic acid on healing of (T. A. S. Boyd and F. W. Campbell), 1145 (O)
Corner, G. W., hon. D.Sc., conferred on, 373
Coronary disease: *Les Maladies des Coronaires*, 2nd ed. (Ch. Laubry and P. Saulié), 872
— thrombosis, anticoagulants in treatment of (John A. Tulloch and A. Rae Gilchrist), 965 (O); 991 (L); correspondence, 1226
Coroners, appointment and qualification of, 423
Corpse, position assumed in water, 1172, 1277, 1389, 1494
CORT, Frank: Treatment of the common cold, 785
— Dangers of penicillin snuff, 1333

CORTISONE:
and aspirin; similarity of action in acute rheumatism, 1411
and other steroids in rheumatoid arthritis (W. S. C. Copeman and others), 849 (O); 874 (L)
and the psychoses, 729
CORTISONE (*continued*):
Chemical structure, 590
Distribution in U.S.A., 1180
— to hospitals in Britain, 1375 (L)
Effect in rheumatoid arthritis of long standing, 145
— on cardiogram in chronic adrenal insufficiency (Walter Somerville), 860 (O)
Eosinopenia in cortisone and A.C.T.H. therapy 1235
Experimental burn studies, including treatment with cortisone-active material extracted from urine (P. O. Crassweller, A. W. Farmer, and W. R. Franks), 242 (O)
in burns, severe; three cases (P. O. Crassweller and others), 977 (O)
Mechanism of action, 594
Objective assessment of effect in rheumatoid arthritis, 1244; 1263 (L)
Physiological or hormonal effects, 591
Present status in treatment of rheumatoid arthritis, 942
Research grants, 42
Summary of clinical uses (J. M. Carlisle), 590 (O)
Supply (parliamentary note), 1065

Corwin, E. H. L. (Editor): *Ecology of Health*. 447
Cosin, L.: *The Need for Emotional Adjustments in the Elderly*, 580
COTMAN, J. S., SPITTA, Harold, and GODDART, Ernest: The B.M.A. war memorial and Epsom College, 1057
COURT, Donald. *See* SPENCE, Sir James. 920
Coxsackie virus in benign dry pleurisy, 655
COYLE, Cecil D., NORRIS, T. St. M., and PEARSON, H. E. S.: Displaced registrars, 1223
CRADDOCK, D.: Preparing students for general practice, 524
CRAIG, W. S.: Pink disease; clinical picture aetiology and treatment, 773; correspondence, 1003, 1116, 1173
Cramp, nocturnal, 584, 738
CRASSWELLER, P. O., and others: Three cases of severe burn treated with cortisone, 977 (O)
— FARMER, A. W., and FRANKS, W. R.: Experimental burn studies including treatment with cortisone-active material extracted from urine, 242 (O)
CRAWLEY, F. E.: Erythema nodosum as initial manifestation of Boeck's sarcoidosis, 1362 (O)
CREDITOR, H.: Amphetamine in barbiturate poisoning, 1333
Creeping eruption in association with intestinal strongyloidiasis (Joseph Caplan), 288
Cremation Committee report, 619
CRICHTON, Derk: Observations on cervical erosion, 1003
CRICHTON, W. H.: Clinical impression versus cold science, 631
Crichton Royal Hospital; annual report, 568 (A); 729 (C)
Criminal conduct and its treatment (Sir David K. Henderson), 311 (O); 335 (L); 459 (C)
Criminology: International Congress on Criminology, 308
Cripples: Society for the Rehabilitation of Disabled and Crippled Children (of India); annual report, 927
Critchley, A. M., appointed Professor of Public Health, Royal University of Baghdad, 176
CRITCHLEY, Macdonald: Migraine, 996
CROCKETT, G. S. *See* WILSON, Andrew, 484
CROFTON, John W.: Intermittent dosage with streptomycin, 527
Crohn, Burrill B.: *Regional Ileitis*, 200
Crooks, Frederick, obituary of, 789
CROPPER, C. F. J.: Premedication for gastroscopy, 218
— HOUGHTON, P., and KIDD, P.: Low oesophageal perforation at gastroscopy, 1099
CROWTHER, H. A.: Cost of academic clinical office, 1389
Crozier, T. H.: *Aids to Medical Treatment*, 2nd ed., 716
— and CAMPBELL, W. A. B.: Mongolism in one of twins, 869 (O); correspondence, 1118
CULLEN, Stuart C.: Anaesthesia for abdominal operations, 276
Cullen, T., biography of, 26
Culverwell, George Hugh, obituary of, 1451
CUMMINS, Christopher: Transfixion by a muck fork, 198
Cunha, Felix: *Osler as a Gastroenterologist*, 872
CUNNINGHAM, A. T.: Haematemesis from leeches, 891

CURARE: *See also* Muscle relaxants
D-Tubocurarine salts and derivatives, 216, 367
Tubocurarine; effect on central nervous system, 95 (A)
Current List of Medical Literature, 516 (A)
Curriculum, medical. *See* Education, medical
Cushing's syndrome, mild, due to aspirin (J. B. Cochran, R. D. Watson, and J. Reid), 1411 (O); 1432 (A)
— — presenting with features of a "Type II" nephritis (F. W. Wolff), 1037
CUTBILL, Leslie J., and PENMAN, A. Clark: Mantoux conversion, 1173
Cyanide killing of salmon; risks to consumer, 1127

CYRIAX, J. H.: Tennis and golfer's elbow, 378
— Treatment of lumbar disk lesions, 1434
Cyst, dermoid, post-rectal (Raymond Purvis), 25
— epithelial; treatment with secondary photo-electron radiation, 87
Cystine calculi in kidney, 1505
Czechoslovakia, medicine in, 780, 948, 1003

D

Dacie, J. V.: *Practical Haematology*, 929
Da Costa's syndrome, 33
Dain, Guy, eightieth birthday of, 1111
Dain Fund; annual report, 1107
DALAL, P. A.: Infection by syringe, 838
DALE, Sir Henry: Scientific method in medical research, 1185 (O)
DALE, J. Murray, and others: Displaced registrars, 1388
DALRYMPLE-CHAMPNEYS, Sir Weldon: Ministry of Health Streptomycin Conference, 524
DALTON, C. H. C.: Amalgamation of radiological societies, 731
Daniel, Sir Augustus Moore, obituary of, 1177
Daniel, Peter Lewis, obituary of, 464, 531
Daniels, Davis Woodcock, obituary of, 52
Darlington, C. D., and Mather, K.: *The Elements of Genetics*, 1426
DARMADY, E. M.: Histological changes in renal failure, 349
Daubenton, Francois, appointed chief of World Health Organization Office for Africa, 1154
DAVIDSON, L. S. P.: The sprue syndrome—a plea for help, 893
DAVIES, D. L.: Safety in prams, 889
DAVIES, Florence M. E.: But was it poliomyelitis? 629
DAVIES-JONES, E. *See* BOURDILLON, R. B., 539
DAVIS, Albert: 2,665 cases of abortion, 123 (O); 152 (L); 367 (C), 626 (C), 1172 (C)
Davison, Wilburt C.: *The Compleat Pediatrician* 6th ed., 201
DAWSON, Robert: Mongolism in one of twins, 461
Dawson, William Richard, obituary of, 51
Dawson Renort reprinted, 1111
Dawson Williams Prize Lecture, 795
Day nurseries (parliamentary note), 1502
D.D.T. in control of malaria, 414
Dead body, position assumed, in water, 1172, 1277, 1389, 1494

DEAFNESS: *See also* Ear; Hearing; Otorhinolaryngology
Children (M. D. Sheridan), 273; (R. R. Simpson and others), 364
Hearing-aids, 364, 372
International course in audiology, 957
Lip-reading training (parliamentary note), 1065
National Institute for the Deaf; annual general meeting, 176

DEAN, Geoffrey: Seven cases of barium carbonate poisoning, 817 (O); 827 (A)
DEANE, E. H. W.: Value of tuberculin-jelly tests, 461
Death certificates; new regulations, 956
— Rigor mortis (H. A. Shapiro), 304
Decamethonium iodide as curarizing agent in general anaesthesia (A. R. Ellerker), 398 (O)
— — in anaesthesia for peroral endoscopy (C. F. Scurr), 1311 (O)
— — in treatment of tetanus (R. McD. S. Keir), 984 (O); 994 (A)
Degkwitz, R., and others: *Lehrbuch der Kinderheilkunde*, 4–5th eds., 1207
Degrees and diplomas, information on, 512, 520
Dehydro-*iso*-androsterone in treatment of rheumatoid arthritis, 851

DELINQUENCY:
British Journal of Delinquency, 422
Juvenile, 799
Reflections on criminal conduct and its treatment (Sir David K. Henderson), 311 (O); 335 (L); 459 (C)

DENT, C. E.: Generalized bone decalcification, 1218

DENTISTRY:
Dental nurses in New Zealand, 1162 (A)
Inhalation during dental extraction, 936 (A)
Institute of Dental Surgery, 507
11th International Dental Congress, 57
School Dental Service (parliamentary note), 1286

DENZ, F. A.: Dangers of insecticides, 274
Deoxycortone in rheumatoid arthritis; clinical assessment, 810
Derham, Thomas Hanson Crossfield, obituary of, 895
Dermatitis due to detergents, 1014
— herpetiformis, treatment of, with sulphapyridine 525
— pustular, of sheep; occurrence in man, 1119, 1279, 1496

DERMATOLOGY: *See also* Skin
Congress in 1952, 58
Institute of Dermatology, 507, 792
Modern Practice in Dermatology, 1950 (Editor: G. B. Mitchell-Beggs), 200

DERMATOLOGY (*continued*):
Parasitology in relation to dermatology (R. M. B. MacKenna), 287
Psychological treatment in skin disorders, with special reference to abreactive techniques (H. J. Shorvon, A. J. Rook, and D. S. Wilkinson), 1300 (O); 1322 (A); 1496 (C)
Regional Dermatologic Diagnosis (Ervin Epstein), 766

Dermoid, post-rectal, large (Raymond Purvis), 25
DESMARAIS, M. H. L. *See* KERSLEY, G. D., 855
Detergents, dangers of, 1014
Deutsche Gesellschaft für Innere Medizin; 57th meeting, 1401
DEVITT, D. C.: Anaesthesia in heart surgery, 295
Devon and Exeter Medico-chirurgical Society, 1233
"Dexedrine" in sea-sickness, 1117
— poisoning, 892

DIABETES MELLITUS:
Causes of death in, 1061, 1445
Diabetes without vascular disorder after 25 years, 840
Gin and Benedict's solution, 232
Helpful Hints to the Diabetic, 821
Indications for globin insulin (David W. Pugh), 657 (O); 949 (C)
Lessons for future treatment from 472 fatalities in diabetic children (Elliott P. Joslin and James L. Wilson), 1293 (O)
Retinal changes, 297
Urine-testing sets for diabetics (parliamentary note), 173
Vascular changes, 107, 368
Victory medal for diabetics, 827 (A); 840 (C)

DIAGNOSIS:
Clinical Examination of Patients (John Forbes and W. N. Mann), 499
Major Symptoms in Clinical Medicine (John Almeyda), 499
No diagnosis without clinical investigation, 732
Practical Procedure in Clinical Medicine (R. I. S. Bayliss), 499

4-4'-Diaminodiphenylsulphone in tuberculosis, 31 (A)
Diaphragm: Corona diaphragmatica, 848
Diarrhoea, epidemic, *Bact. coli* in, 192, 195, 205, 460, 577, 889, correction, 1128
— in adults, *Bact. coli* D 433 (John S. Stevenson), 195 (O); 205 (A); 462 (C)
Diastolic murmurs: diagnosis and significance, 847
DIBLE, J. H.: Histological changes in renal failure, 349
DICK, W. Pointon: Value of tuberculin-jelly test, 141 (O); 154 (A); 461 (C), 1333 (C)
Dickson, Frederick Lindsay, obituary of, 1121
Dicoumarol in coronary thrombosis, 967
Dienoestrol in treatment of schizophrenia, 1062
Diet for patient with duodenal ulcer, obesity and hypertension, 690
1-Diethyl carbamyl-4-methylpiperazine hydrochloride. *See* "Hetrazan"
Diethyl-*para*-nitrophenyl-thiophosphate (parathion) poisoning (H. L. Milles and H. B. Salt), 444
— toxic effects of, 548
DIGGORY, P. L. C.: A medical student in Prague, 780; 948 (C), 1003 (C)
Digitalis and Other Cardiotonic Drugs, 2nd ed. (E. R. Mowitt), 715
Dilling, Walter James, obituary of, 579, 732
DILLON, Frederick: Psychology and science, 943
Dimesyloxyalkane; death after use in treatment of cancer (medico-legal note), 633
Dioxyamidopyrine in asthma, 470
"Diparcol" in paralysis agitans, 30

DIPHTHERIA:
Immunity to diphtheria, 30 (A)
Immunization and poliomyelitis, 251, 1013
— and vaccination, record cards for, 862
— campaign, cost of, 1491
— neurological sequela (J. Vahrman), 608
Inoculation and poliomyelitis; statistical investigation (A. Bradford Hill and J. Knowelden), 1 (O); 28 (L); correspondence, 166, 220, 1391
Notifications (parliamentary note), 1398
P.T.A.P.: determination of the essential Lf dosage (Guy Bousfield and Lewis B. Holt), 73 (O)

Diphyllobothrium infestation and anaemia in Great Britain (J. C. Harland, J. G. Humble, and P. G. Mann), 188 (O); 206 (A); 418 (C); correction, 424
Diplomas, information on, 512, 520
— special, 520; correction, 794
Disabled persons: Limbless ex-service men, 300
— — When is disablement not disablement? 1224
Disinfectants: Standards of efficacy (parliamentary note), 226
Disk, intervertebral: treatment of lumbar disk lesions (James Cyriax), 1434
Displaced persons: Disordered society (R. N. Tronchin-James), 776
Disseminated sclerosis; early clinical manifestations (Douglas K. Adams, John M. Sutherland, and W. Bell Fletcher), 431 (O); 451 (A)
— — relation of rare forms of paroxysmal trigeminal neuralgia to (Wilfred Harris), 1015 (O); 1045 (A); correspondence, 1334, 1444
Disseminated sclerosis, vitamin B_{12} in, 59
Distinction awards, 172, 726, 783, 835, 887, 944, 1006 (parliamentary note), 1060, 1163 (A), 1170, 1285 (parliamentary note), 1329
— — denied, 878 (A); 887, 944
Diverticulosis, management of, 122
DLUGOSZ, H.: Erythrocyte sedimentation in anaemia, 1445
DMOCHOWSKI, L., and MILLARD, A.: Cellular transmission of mouse sarcomata with frozen-dried tumour tissues, 1136 (O); 1159 (L)
— *See* PASSEY, R. D., 1129, 1134
DOBSON, J.: Tuberculous arthritis of hip-joint, 293

DOCTORS: *See also* General practice
Doctor as public speaker, 668 (A)
Doctor exonerated for negligence (medico-legal note), 420
Lists, reduction of (parliamentary note), 1284
For new estates (parliamentary note), 1285
Ratio to population, 502 (L); 506 (A)

DODDS, E. C.: Protein structure and clinical problems, 1237 (O); 1267 (A)
— Endocrine aspects of rheumatic disease, 1488
— *See* COPEMAN, W. S. C., 849
Doggart, J. H.: *Ophthalmic Medicine*, 91
DOLL, Richard, and HILL, A. Bradford: Smoking and carcinoma of the lung, 739 (O); 767 (L); 889 (C), 890 (C), 1004 (C), 1060 (C)
— *See* BISHOP, P. M. F., 130
Donald, K. W., appointed Reader in Medicine, University of Birmingham, 1286
DONALDSON, J. M. B.: Inversion of the uterus, 331
DONALDSON, Malcolm: Education of the public concerning cancer, 35; 298 (C)
— Visual aids in medical teaching, 784
— The clinician and cancer records, 1227
DONNISON, C. P. *See* BELSEY, R. H. R., 324
DONOVAN, G. E.: Amplifying heart sounds, 838
DONOVAN, H., and GOUREVITCH, A.: Displaced registrars, 1276
Dore, Samuel Ernest, obituary of, 110
Doroll6, Pierre, appointed Deputy Director-General of W.H.O., 581
Dorothy Temple Cross Research Travelling Fellowship in Tuberculosis, 791
Douie, Mary Buchan, obituary of, 789
Doyle, L.: *Handbook of Obstetrics and Diagnostic Gynecology*, 150
"Dramamine" in sea-sickness, 836, 946
— in travel sickness, 347, 692, 719 (A), 836
Drowning: position assumed by body in water, 1172, 1277, 1389, 1494

DRUGS: *See also* under names of specific drugs
Clinical evaluation of effects of drugs on medical students as a teaching method (Andrew Wilson and others), 484 (O); 501 (L)
Concise Applied Pharmacology and Therapeutics, 3rd ed. (F. G. Hobart and G. Melton), 401
Dangerous drugs issued to nurses; regulations, 121
naming of, 1174

Drunk but not in charge of car, 1064
DRURY, M., and MCKENZIE, K.: Ring round the penis, 1278
DRURY, M.O'C.: Emergency leucotomy, 609; 787 (C), 1059 (C)
DRYLAND, G. W.: Training for general practice, 623
Dublin University. *See* Universities: Dublin
DU BOUCHET, N.: Modern anaesthesia in France and its developments related to cardiac surgery, 783
Ductus arteriosus, patent, 642
DUFF, Keith: Antenatal separation of umbilical cord, 578
DUFRESNOY, Jean. *See* PRATT, Robertson, 90
DUKE, H. L.: Infection by syringe, 461
"Dulcin" as carcinogen, 1184
DUMMER, F. H. M.: Should first M.B. be passed at school, 1335
Dumping syndrome; an operation for its prevention (Thomas O'Neill), 15 (O); 218 (C), 528 (C)
DUNDEE, John W.: Acquired sensitivity to thiopentone, 332; correction, 470
— *See* WINTERBOTTOM, E. H., 528
DUNKERLEY, A. H.: Crisis in tuberculosis, 165
DUNLOP, D. M.: Pharmacology of antihistamine compounds, 347
— Sulphonamide therapy, 408; 525 (C), 526 (C), 628 (C)
DUNNER, Lasar, and HARDY, R.: Chemotherapy in tuberculosis, 576
DUNSFORD, I. *See* COCHRANE, J. B., 1203
Dunton, W. R. (Editor): *Occupational Therapy: Principles and Practice*, 610
Duodenum, ulcer of. *See* Peptic ulcer
DURAISWAMI, P. K.: Insulin-induced skeletal abnormalities in developing chickens, 384 (O); 404 (L); 385 (C), 1032 (C), 1277 (C), 1495
DURRIN, F. C.: Nail-plate for intertrochanteric fractures, 1225
Durham County Council: trade union membership a condition of employment, 1210 (L); parliamentary notes, 1229, 1339; 1265 (A)
— University. *See* Universities: Durham
DUTHIE, J. J. R. *See* ROBSON, H. N., 971
— *See* SINCLAIR, R. J. G., 1257
Dwarfism, treatment of, 1291
DYER, F. J.: Protection of laboratory animals, 1115
Dyschondroplasia (Sydney C. Nardell), 555 (O)

Dysentery, amoebic. *See* Amoebiasis
— epidemiological note, 1454
Dysgerminoma of ovary (J. A. S. Green), 1098
Dysmenorrhoea in cervical erosion, 648
Dyspareunia in cervical erosion, 649

E

EAR: *See also* Deafness; Otorhinolaryngology
Common Diseases of Ear, Nose, and Throat (Philip Reading), 715
Middle ear, *B. pyocyanea* infection of, treatment, 423
Earnest, Ernest: *S. Weir Mitchell: Novelist and Physician*, 989
EASON, E. H.: Medicine by radio, 1060
EAST, Terence: The cardiogram in clinical diagnosis and prognosis, 828, 880
EASTWOOD, Cyril G.: Popular health journal, 108
Eccles, Herbert Anderson, obituary of, 733
Eclampsia, association of, with convulsions in childhood (T. W. Buchan), 22 (O)
— Five cases of puerperal tetanus (one associated with eclampsia) (D. B. Jelliffe, A. H. C. Walker, and Stafford Matthews), 814 (O)
— incidence and methods of treatment, 1071
Eczema, infantile, familial risk of, 1127
— varicose, 1324
EDGAR, W. H.: "Golf elbow," 310
Edinburgh University. *See* Universities: Edinburgh
Edington, Daniel Charles, obituary of, 954
EDMUNDS, H. Tudor: Smallpox in the unvaccinated, 463

EDUCATION:
The art of lecturing (G. Patrick Meredith), 475 (O); 501 (L)
Methods of education (J. A. Lauwerys), 471 (O); 501 (L); 784 (C)
Some mechanical aids to instruction (Robert Ollerenshaw and Peter Hansell), 488 (O); 678 (C), 784 (C)
Teaching the teacher, 501 (L)
University ventures old and new, 830

EDUCATION, MEDICAL: *See also* Students
Clinical evaluation of effects of drugs on medical students as a teaching method (Andrew Wilson and others), 484 (O); 501 (L)
The difficulty in medical education, 622
Effect of the Medical Act (1950), 337 (L)
A G.P. on his clinical training (Donald McI. Johnson), 493 (O); 501 (L); correspondence, 574, 622, 677, 727, 784
Headmaster of Eton and Sir Henry Cohen on the Medical Curriculum, 1052; correspondence, 1335
Improving the medical curriculum, 836
Medical education number, 471–524
Methods and men in the teaching of clinical medicine (Sir Henry Cohen), 478 (O); 501 (L)
More on medical education, 504 (A)
Postgraduate courses outside London, 510
— facilities in London, 507
Preclinical medical education, 1105 (A)
Provisions of the Medical Bill, 112
Some comments on medical education in Great Britain, 496 (O); 504 (A); correspondence, 575
Training of clinical teachers (R. D. Lawrence), 481 (O); 501 (L); correction, 1072

Edwards, A. Edward: *Thrombosis in arteriosclerosis of lower extremities*, 150
EDWARDS, C.: Management of diverticulosis, 122
EDWARDS, F. Ronald: Resection of lung for pulmonary tuberculosis, 288
Edwards, G. R., appointed Commander of the Order of the Crown, Belgium, 1123
EDWARDS, Harold C.: Timeless tests, 300
EDWARDS, L. M., and FREETH, H. D.: Chronic myeloid leukaemia and pregnancy, 199; 418 (C)
EDWARDS, W.: The naming of drugs, 1174
Effort syndrome, 33
EGERTON, Mary E.: Prickly heat, 1292
Ehalt, W.: *Unfallchirurgie im Röntgenbilde*, 1260
Ehrlich, Paul, biography of, by Martha Marquardt (Charles Singer) (Nova et Vetera), 267
Eire: Registrar-general's quarterly returns (epidemiological note), 1067
Eisenmenger's complex, 697
Elbow; pain following golf, 177, 310, 378
Electrocardiogram in chronic adrenal insufficiency, effect of cortisone on (Walter Somerville), 860 (O)
— in clinical diagnosis and prognosis (Terence East), 828, 880
— in congenital heart disease, 641
— normal, 828
Electrocardiography; nomenclature, 828
Electro-convulsion therapy, auricular fibrillation after (P. M. O'Flanagan and R. B. Taylor), 444
— — form of consent for (medico-legal note), 370; 528 (C)
— — in rheumatoid arthritis (G. D. Kersley and others), 855 (O); 874 (L); correspondence, 1058
— — lung abscess as complication of, 1377 (A)
— — problem of the therapeutic convulsion (Thomas D. Power), 1092 (O); correspondence, 1224
— — traumatic neurosis due to, 679
Electrocution; incidence in 1949 (parliamentary note), 1065
Electroencephalography (Editors: Denis Hill and Geoffrey Parr), 563
Electro-medical apparatus, liabilities of manufacturers for injuries to patients from defective apparatus (W. M. Levitt) (medico-legal note), 1122
Electron microscopy, 1432 (A)
Electron sterilization, 615 (A)
Electro-shock therapy, traumatic neurosis due to, 679
Elephantiasis, filaria, effect of "hetrazan" in, 772
ELKELES, A.: Chloralose as antihistamine, 951
ELKES, Alexander Z. *See* BROWN, Austin, 462
Elkins, Hervey B.: *Chemistry of Industrial Toxicology*, 821
ELLERKER, A. R.: Decamethonium iodide as curarizing agent in general anaesthesia, 398 (O)
ELLIOTT, J. R.: Tetanus antitoxin, 1236
Elmslie's operation for calcaneus deformity, 1217
Embryology: recent progress, 236
Emerson, Haven, *Selected Papers*, 334
EMERY, J. L., and LORBER, J.: Radiological and pathological correlation of miliary tuberculosis of lungs in children, with special reference to choroidal tubercles, 702 (O); 720 (A); 951 (C), 1173 (C)
Emotions and the colon, 449 (L)
Emphysema, interstitial, in measles (J. J. Linehan), 762 (O)
Empire Medical Advisory Bureau, 522
Employment Relations in a Group of Hospitals (Joan Woodward), 41
Encephalitis, post-vaccinal, 738
— virus, of mice, 1217
Encephalopathy, hypertensive; treatment and prophylaxis, 1235
Endocarditis, bacterial, subacute; after-history of successfully treated cases (Henry Matthew), 436 (O); 450 (A)
— treatment with penicillin, 618
Endocrine aspects of rheumatic disease, 1488
Endoscopy, peroral, decamethonium iodide in anaesthesia for (C. F. Scurr), 1311 (O)
ENGEL, Charles: Myocardial infarction after tetraethylammonium therapy, 1446
England and Wales: Registrar-General's quarterly returns (epidemiological note), 956
Engle, Earl T. (Editor): *Menstruation and its Disorders*, 1206
ENGLER, Gustav: Male toads croak when tickled, 1005
ENGLISH, Aitolia: Useless routine medical examinations, 1171
Entamoeba histolytica infection in Britain, 238
Enuresis; incidence, differential diagnosis, aetiology, treatment and prognosis (Douglas Hubble), 1108; correspondence, 1224
— nocturnal, 50
Eosinopenia in cortisone and A.C.T.H. therapy, 1235
Eosinophilic arteritis, diffuse (George Lumb), 645 (O)
"Epanutin." *See* Sodium phenytoin
Ephedrine; effect on the bladder, 793
Epidemics, old and new (C. O. Stallybrass), 265

EPIDEMIOLOGICAL NOTES: 56, 118, 174, 228, 306, 375, 421, 467, 532, 581, 635, 687, 734, 791, 844, 898, 956, 1010, 1067, 1126, 1183, 1232, 1288, 1340, 1402, 1453, 1504
Anthrax in cattle, 375, 421
Dysentery, 1454
Eire: Registrar-general's quarterly returns, 1067
England and Wales; Registrar-General's quarterly returns, 956
Food-poisoning at Horden, 174, 228
Industrial accidents and diseases in October 1950, 1340
Infant mortality, 376
Measles, 1454
Northern Ireland: Registrar-General's quarterly returns, 735, 1402
Poliomyelitis, 118, 174, 229, 306, 375, 421, 467, 532, 581, 635, 687, 734, 791, 844, 898, 956, 1010, 1067, 1126, 1183, 1232, 1288, 1340, 1402, 1453
— in England and Wales, 56
— in Isle of Wight, 532
Registrar-General's *Statistical Review for* 1948, Part I, 376
Scotland; Registrar-General's quarterly returns 735, 898
Smallpox on s.s. *Strathnaver*, 118
Tuberculosis: Mortality in certain countries, 1454
Whooping-cough, 1504

Epidemiology in relation to child health (S. G. Graham), 361
— Epidemics, old and new (C. O. Stallybrass), 265
Epidiascope; use in medical education, 489

EPILEPSY:
Association with convulsions in childhood (T. W. Buchan), 22 (O)
British Epilepsy Association, 687, 899
Employment of Epileptics (parliamentary note), 225, 1281
Inheritance of, 1404
Lingfield Colony; death of patient (parliamentary note), 372
Management of Epileptic (Sir Charles Symonds) 1047; correspondence, 1170
Residential epileptic schools, 310
Society for Epileptics, 58
Status epilepticus: A symptom complex of Africa trypanosomiasis (Edward F. B. Forster), 987
Epiloia, 1367
Episiotomy in prevention of prolapse (J. D. S. Flew), 280
Epispadias, treatment of, 1506
Epithelial cysts; treatment with secondary photo-electron radiation, 87
Epsom College, 463
— — and the B.M.A. war memorial, 1057
— — Annual general meeting, 414
EPSTEIN, Ben: Mercury and pink disease, 1173
Epstein, Ervin: *Regional Dermatologic Diagnosis*, 766
ERSKINE, John P.: Lower-segment caesarean section modified, 1335
Erythema exudativum multiforme and the Stevens–Johnson syndrome, 369
— nodosum, as initial manifestation of Boeck's sarcoidosis (F. E. Crawley), 1362 (O)
Erythroblastosis foetalis following ABO incompatibility, 680, 951
Erythrocyte sedimentation in anaemia (Richard Terry), 1296 (O); correspondence, 1445
ESSEX, Jack: Dispensing of P.A.S., 1072
ESSEX-LOPRESTI, P.: Fractures of the radial head with inferior radio-ulnar dislocation, 1217
ETHERINGTON-WILSON, W.: Multiple primary carcinoma, 297
Ethyl chloride, inflammability of, 625
Ethylene oxide poisoning, 848
Eugenics in prevention of hereditary disease, 904, 931
Euthanasia, 1318 (L); 1338 (parliamentary note); correspondence, 1447
— moral implications of, 1447
EVANS, A. Gordon: No diagnosis without clinical investigation, 732
Evans, D. Rees, and a secret remedy for cancer, 663, 726, 835, 875, 885, 1004
EVANS, E. Mervyn: Controlled pseudarthrosis for fracture of neck of femur, 1218
EVANS, G. S. W.: Stress and the general adaptation syndrome, 105
— Myeloid leukaemia and pregnancy, 681
EVANS, Geoffrey: Training for general practice, 622
EVANS, R. J., and SPOONER, E. T. C.: Possible mode of transfer of infection by syringes used for mass inoculation, 185 (O); 204 (A); 365 (C), 461 (C), 837 (C), 1059 (C)
EVANS, Robert M.: Pulmonary fibrosis among the elderly, 353
EVANS, William: Treatment of cardiac failure, 268
EVERARD, Angus: Latent amoebic dysentery, 818; correspondence, 1175
EVERS, Norman: D-tubocurarine salts and derivatives, 367
EWING, John A.: Methyl bromide poisoning, 681
Examination results, analysis of, 505 (A)
Exercises in the bath (Sir Leonard Hill), 1153 (O); correspondence, 1281, 1329, 1494
EXTON-SMITH, A. N. *See* WILSON, Andrew, 484

EYE: *See also* Ophthalmology; Vision
Biomicroscopy of the Eye (M. L. Berliner), 254
Eye Surgery, 2nd ed. (H. B. Stallard), 1206
Histology and Histopathology of the Eye and its Adnexa (I. G. Sommers), 254
Ophthalmic Operations (Seymour Philps), 1206
Spaltlampen-Mikroskopie des hinteren Augenabschnittes (Karl Hruby), 1478

F

Facial neuralgia, 1045 (A)
Factory doctors in the health team, 1280
Faecal incontinence in childhood; cause and treatment, 1346
Fainting as a military crime (parliamentary note), 172
FAIRLEY, H. Barrie: Prolonged intercostal paralysis due to a relaxant, 986 (O)
FAKIM, H.: Survival of 16-oz. baby, 445
Fallot's tetralogy, 696
Family Doctor, 1503
Family history, practical value of, 637
FARMER, A. W. *See* CRASSWELLER, P. O., 242, 977
FARMER, Frank T.: Protection of laboratory animals, 1115
Fat absorption, defective, treatment of, 470
Fats, faecal, in pancreatic disease and sprue, 794
FAWCITT, R.: Presidential address at British Institute of Radiology, 1011
Feet: Radiation dangers in the shoe-shop, 565 (L); 730, 1120
Feinberg, S. M.: *The Antihistamines*, Their Clinical Application, 1040, 1184
FELDMAN, H. M.: Psychiatry and the common cold, 1120
FELL, Honor B., and MELLANBY, Sir Edward: Effects of hypervitaminosis A on foetal mouse bones cultivated *in vitro*, 535 (O); 565 (L)
Fellowship of Postgraduate Medicine, 508
Femur, controlled pseudarthrosis for fracture of neck of, 1218
— fracture of neck of, 721 (A)
— intertrochanteric fractures of, treated by internal fixation (G. P. Arden and G. J. Walley), 1094 (O); correspondence, 1225
— trochanteric fractures of (Norman W. Roberts), 359
FERENCZI, Alexander: Carcinoma of islets of Langerhans, 526
FERNANDO, W. L.: Haematemesis from leeches, 1497

FERRIMAN, David: Displaced registrars, 1329
"Ferrivenin" in hypochromic anaemia/associated with rheumatoid arthritis, 1257
Fertility and intelligence, 1429 (L)
— Society for the Study of Fertility; inaugural conference, 44
FESSLER, A.: Medical contract from the eighteenth century (Nova et Vetera), 1112
Festival of Britain; accommodation for doctors, 1068
Fibrillation, auricular, after electric convulsion therapy (P. M. O'Flanagan and R. B. Taylor), 444
Fibula, fractures: treatment; traction apparatus (P. R. Sondhi), 346
Field, Joanna: *On Not Being Able to Paint*, 500
Fight Against Disease renamed *Conquest*, 687
Filariasis in Fiji, 660
— research unit in Tanganyika, 1033
— treatment of, with "hetrazan," 772 (A)
FILDES, Sir Paul: Development of microbiology (first Leeuwenhoek Lecture), 1220

FILMS:
"Before and After the Baby," 41
Censorship, 1453
Film Library of B.M.A., 519
Fourth annual congress of International Scientific Film Association, 582; international reference film library in Brussels, 1230
Italian Medical Film Unit, 1233
List of medical films, 1400
The medical teaching film, 519
"Oesophageal speech after laryngectomy," 1452
"Oxygen therapy," 955
Use in medical education, 491

Findlay, G. M.: *Recent Advances in Chemotherapy*, 3rd ed., 820
Finger: Hypertrophy of little finger (James A. Ross), 987
— injuries; simple method of treatment (S. Aubrey Jenkins), 252
Finger-prints of identical twins, 1456
Fingertips, cracked and painful; treatment, 178
Fireworks, burns due to, 1275
Fish, poisonous, 315
FISHER, A. C.: Clinical test for free blood, 1330
FISK, G. R.: Pigmented villonodular synovitis, 1218
Fitch, Edward Louis Vincent, obituary of, 222
FITZGERALD, M. G.: Training for general practice, 727
FITZGERALD, R., and others: Domiciliary treatment of tuberculosis, 369
FitzPatrick Lectures, 1289
"Flaxedil," prolonged intercostal paralysis due to, 986
FLEISCHHACKER, H. H.: Norms of cerebrospinal fluid, 218
FLEMING, Sir Alexander: Infection by syringes, 365
— conferment of hon. D.Sc., National University of Ireland on, 173
— awarded Gold Medal of the American College of Chest Physicians, 736
FLEMING, G. W.: Chlorinated swimming-baths, 950
FLETCHER, A. P. *See* LINSELL, W. D., 1190
FLETCHER, Ernest: Osteoarthritis and occupation, 948
Fletcher, Herbert Morley, obituary of, 683
FLETCHER, W. Bell. *See* ADAMS, Douglas K., 431
FLEW, J. D. S.: Episiotomy in prevention of prolapse, 280
Fliess, Robert (Editor): *The Psycho-Analytic Reader*, 1040
Florence Tong Lecture, 1289
Flour extraction rate (parliamentary note), 373
Fodor, Nandor, and Gaynor, Frank (Editors): *Freud: Dictionary of Psycho-Analysis*, 1479
Foetus, dead; prolonged retention in utero (A. Hallam Howie), 148
— double-headed, 988
— mortality and morbidity in failed forceps cases, 20
— — in breech presentations, 418, 529
— Obstetric analgesia and placental insufficiency (E. H. Seward), 1422 (O)
— pathology of, 404 (L); 576, 730
— streptomycin in blood of, 787, 952
Folic acid. *See* Pteroylglutamic acid
Food: electron sterilization, 615 (A)
— intestinal obstruction due to, 109
— Model by-laws governing cleanliness (parliamentary note), 1399
— production: Royal Society of Arts prize, 376
Food-poisoning at Horden (epidemiological note), 174, 228
— in Sheffield in 1949 (E. L. M. Millar and Margaret Pownall), 551 (O); 614 (L), 731 (L)
— kitchen hygiene standards, 613 (L); 731
— parliamentary note, 1178
Foot: Calcaneus deformity, Elmslie's operation for, 1217
— fracture dislocation of, 1217
— splint (H. Petty), 725
FOOTE, R. Rowden: Heredity and leg ulcers, 1495
Forbes, John, and Mann, W. N.: *Clinical Examination of Patients*, 499
Forceps, obstetric: cause and management of failed forceps cases (H. Derek Freeth), 18 (O); 219 (C)
FORD, R. Munro: Intermittent dosage with streptomycin, 369
Foreign body in rectum, 680, 785, 891, 950
Forensic medicine. *See* Medico-legal
Foreskin, retraction of, in infants, 1235
Fork: Transfixion by muck fork (Christopher Cummins), 198
FORRESTER, M. E., and BOYD, J. M.: Unusual case of subacute intussusception with spontaneous elimination, 89
FORRESTER-BROWN, M.: Reconstructive surgery in childhood, 1217
FORSTER, Edward F. B.: Status epilepticus: A symptom complex of African trypanosomiasis, 987
FORTY, Frank: Intraperitoneal intestinal anastomosis, 1332
Foss, George L.: Treatment of thyrotoxicosis with 2-mercaptoimidazole; clinical impressions, 1252 (O); correspondence, 1447
Fourmestraux, Jacques de, obituary of, 842
FOWLER, A. W.: Displaced registrars, 1276
France, anaesthesia in, 783
— National Health Scheme, 1180
Franco-Anglo-American Medical Society, 1401
FRANCON, F.: Psoriasis arthropathica, 1490
FRANKLIN, A. White: Atelectasis and bronchiectasis in pertussis, 1331
FRANKLIN, R. H.: Congenital deformities in the newborn, 286
FRANKLIN, R. T. D., and others: Erythroblastosis foetalis following ABO incompatibility, 680
FRANKS, W. R. *See* CRASSWELLER, P. O., 242, 977
FRASER, Kenneth: Foreign body in rectum, 950
FRASER, T. N.: Clinical assessment in rheumatoid arthritis, 1116
FRAZER, J. F. D., and WOHLZOGEN, F. X.: Use of the male British toad as pregnancy test animal, 330 (O); correspondence, 1005
FREEDMAN, R. H.: Substitutes for morphine, 794
FREEMAN, Zelman: Hexamethonium in hypertension, 1496
FREETH, H. Derek: Cause and management of failed forceps cases, 18 (O); 219 (C)
— *See* EDWARDS, L. M., 199
FRENCKNER, Paul: Bronchospirometry, 1166
FRESHWATER, D. G.: Cutaneous changes in oncho-cerciasis, 288
Freud, Sigmund: *Aus den Anfängen der Psychoanalyse*, 255
FRIEDL, E. *See* SCHINZ, H. R., 929
Friern Hospital centenary, 1011
FRISKNEY, C. E., and GIBB, J. W.: Poliomyelitis in general practice, 786
Fulbright travel grants, 1951–2, 1342
FULD, H.: Effect of vitamin B_{12} on neuropathy in pernicious anaemia treated with folic acid, 147 (O); 417 (C), 527 (C)
Fulton, J. F.: *Physiology of the Nervous System*, 3rd ed., 563
Fumigillin in amoebic dysentery, 1289

G

Galdston, E. (Editor): *Social Medicine: Its Derivations and Objectives*, 873
GALEWSKI, S.: Johann Mikulicz-Radecki, 630, 1004
GALL, H.: Cigarettes and cancer, 889
GALLAGHER, D. J. A. *See* PALMER, Harold, 558
Gall-bladder, torsion of (case) (K. P. S. Caldwell), 1425
GALLOP, E.: Nervous yet unafraid, 463
Gallstones, ultrasonic irradiation of, 1107 (A)
GALPINE, J. F., and BROWN, Joyce W.: Two cases of paratyphoid fever treated with chloramphenicol, 819
GALTON, Cecilia: Child health and the future, 1001
Galton Lecture, 36
Gammexane poisoning, symptoms and signs of, 1014
Gangrene, haemolytic streptococcal, of breast, successfully treated with streptomycin (R. Marcus), 394 (O); correspondence, 1278
Gardemin, Herbert: *Coxitis tuberkulosa*, 1370
GARDEN, R. S.: Tuberculous arthritis of the hip-joint, 293
GARDNER, Eric: The position assumed by a dead body in water, 1172
GARLAND, Hugh: Treatment of Parkinsonism, 363
GARMANY, Gerald: Forms of consent for E.C.T., 528
GARROD, Lawrence P.: Chemotherapy: I. Administration of penicillin, 453; II. Indications for use of penicillin, 617; III. Streptomycin, 669; IV. The newer antibiotics, 722; correspondence, 629, 1227
GARVIE, J. M. *See* PEIN, N. K., 253
Gas gangrene antiserum, value of, 121
Gastrectomy; the dumping syndrome, an operation for its prevention (Thomas O'Neill), 15 (O); 218 (C), 528 (C)
Gastric juice, effect of administration on vitamin B_{12} absorption, 908, 933
— — — of hexamethonium bromide on, 1471
— — — of oral hexamethonium salts on (A. W. Kay and A. N. Smith), 807 (O); 826 (A)
Gastro-enteritis, infantile, role of *Bact. coli* in, 577, 889; correction, 1128
— tropical, in children; treatment, 1291
Gastroscopy, low oesophageal perforation during (C. F. J. Cropper, P. Houghton, and P. Kidd), 1099
— premedication for, 218
GAY, Leslie: Dramamine, 347
GAYNOR, Frank. *See* FODOR, Nandor, 1479
GEAR, H. S.: Vaccination and inoculation certificates, 682
GEAR, J. H. S. *See* ZOUTENDYK, A., 1175
GEGGIE, J. H. S.: Interesting cancer case, 785
Gelfand, Michael: *Schistosomiasis in South Central Africa. A Clinico-Pathological Study*, 200
GEMMILL, J. S.: Smallpox in the unvaccinated, 107

GENERAL MEDICAL COUNCIL:
and the Medical Bill, 112 (parliamentary note); 302
Disciplinary cases with no complainant (parliamentary note), 225
— Committee (parliamentary note), 225
— functions; effect of the Medical Act (1950), 337 (L)

General Medical Services Committee, 1043 (L)

GENERAL PRACTICE: *See also* Doctors
Compensation for doctors (parliamentary note), 1230
Difficulties of entry into practice, 173
entry into, 516
A G.P. on his clinical training (Donald McI. Johnson), 493 (O); 501 (L); correspondence, 574, 622, 677, 727, 784
The G.P. at the crossroads, 169, 299
General practitioners and hospitals (parliamentary note), 1502
Lord Linlithgow's tribute to general practitioners at Harveian Society dinner, 101
My Life in Three Counties (H. W. Pooler), 564
Preparing students for general practice, 524
Rates of doctors to population, 502 (L); 506 (A)
Reduction of doctor's list (parliamentary note), 1284
Remuneration; demand for early settlement, 93 (L)
— Medical Practitioners Union scheme, 1264 (A)
— Professor Bradford Hill's inquiry, 1218; 1208 (L)
Royal Society of Medicine Section of General Practice, 935 (A)
Services to patients; Professor Bradford Hill's inquiry, 1218; 1208 (L)

GENETICS:
Elements of Genetics (C. D. Darlington and K. Mather), 1426
Genetic clinic, 354
Genetical structure of populations, 36
Genetics and medical practice (L. S. Penrose and others), 354
Value in medicine (L. S. Penrose), 903 (O); 931 (L)
Genito-urinary tuberculosis, treatment of, with streptomycin, 1376 (A)

GERIATRICS:
Activity in advancing years (Marjory W. Warren), 353; 921 (O); correspondence, 1120, 1175
Exercises in the bath (Sir Leonard Hill), 1153 (O); correspondence, 1329, 1494
Interests of the Aged, 45
Liaison between hospital and general practitioner (C. T. Andrews), 363
Mortality in geriatric surgery (Louis Carp), 1198 (O); 1390 (C)
The Need for Emotional Adjustments in the Elderly (L. Cosin), 580
Operative mortality in geriatric surgery, 353
Post-mortem findings in the aged, 363
Towards the Better Care of the Elderly, 921

German doctors; employment in Colonies (parliamentary note), 373
Germany: Public Health Advisers (parliamentary note), 55
Gestation period, abnormal duration of (360 days) (medico-legal note), 1451
— — length of, in relation to abortion, 123
GIBB, J. W. *See* FRISKNEY, C. E., 786
GIBBENS, John: Thrombophlebitis migrans, 1014
GIBSON, J. M.: Presidential address to Society of Medical Officers of Health, 1000
GIBSON, Thomas: Useless routine medical examinations, 1001
GILBERT, S. F.: Carbon dioxide and asthma, 1404
Gilbert Blane Medal awarded to E. B. Martin, 634
GILCHRIST, A. Rae. *See* TULLOCH, John A., 965
GILES, C.: *Bact. coli* and infantile gastro-enteritis, 577
GILGES, W.: Obstruction by mango, 787
Gillespie, Edward, obituary of, 684, 954
GILLISON, T. H.: An adjustable bed for patients at home, 530
GILSE, Henriette A. v. *See* GOSLINGS, J., 1019
Gingivitis, infective, aetiology and treatment of, 901
— treatment of, 960
GIRDWOOD, Ronald H., CARMICHAEL, Kathleen M., and WOOLF, B.: The content of haemopoietic factors in liver extracts; relationship to clinical response, 1357 (O)
GISSANE, William: Dangerous type of fracture dislocation of foot, 1217
— Guy Fawkes day—the afterglow, 1275
Glaister, John: *Medical Jurisprudence and Toxicology*, 9th ed., 446
Glandular fever, treatment of, 1455
Glasgow University. *See* Universities: Glasgow
Gleed, Seymour Richard, obituary of, 301
GLOVER, Edward: Psychological involvements of child-bearing, 275
— *Freud or Jung*, 446; correspondence, 576, 731
— Psychological polemics, 576

Gloves: Industrial safety-gloves, 133
Gloyne, Stephen Roodhouse, obituary of, 841, 953
Glutamic acid; effect on intelligence, 1161 (A)
GLYN, J. H. H. *See* COPEMAN, W. S. C., 849
Gold, Harry: *Quinidine in Disorders of the Heart*, 1426
Gold and adrenocorticotrophic hormone in treatment of rheumatoid arthritis (J. Goslings and others), 1019 (O)
Gold Coast: Mental illness, 1212 (A)
Golf: Leeds Medical Golf Competition, 119
— "Golf elbow," 177, 310, 378
GOODHART Ernest. *See* COTMAN, J. S., 1057
GOODMAN, Neville M.: Public health in Western Union countries, 1111
GOODWIN, Martin A.: Intussusception following appendicectomy, 298
GORDON, D. P., and others: Displaced registrars, 1223
GORDON, G. C.: Congenital deformities, 1495
GORDON, I.: Child health and the future, 1001
GORDON, R. M.: Reactions produced by arthropods directly injurious to the skin of man, 287; 316 (O)
Gordon, William Ingram, obituary of, 51
GOSLINGS, J., HIJMANS, W., LIMPT, P. M. van, and GILSE, H. A. van: Prolonged treatment of rheumatoid arthritis with A.C.T.H. alone and with gold, 1019 (O)
GOTTLIEB, B. *See* COPEMAN, W. S. C., 849
GOUREVITCH, A. *See* DONOVAN, H., 1276
GRAHAM, Alexander J. P.: Toxic effects in animals and man after tetraethylammonium bromide, 321 (O)
GRAHAM, S. G.: Epidemiology in relation to child health, 361
Graham-Little, Sir Ernest Gordon, obituary of, 894, 952, 1394
Grant, Francis William, obituary of, 1121
GRANTHAM-HILL, C.: "Dramamine" and seasickness, 836
Graves, T. C., retirement of, 57
Graves's disease, body weight in (Hugh Conway), 84 (O)
Gray, George Munn, obituary of, 222
GRAY, W. D.: Integration of the Tuberculosis Services, 352
— Domiciliary treatment of tuberculosis, 369, 626
GRAYSON, John: Observations on blood flow in human intestine, 1465 (O)
Green, David E., and KNOX, W. Eugene (Editors): *Research in Medical Science*, 873
GREEN, H. N.: Stress and the general adaptation syndrome, 215
GREEN, J. A. S.: Dysgerminoma of the ovary, 1098
GREEN, Lionel M.: Distinction awards, 835
GREEN, R., MANIKKAR, D. S., and MILLETT, J. S.: Influenzal meningitis treated with chloramphenicol, 1154
GREENBERG, M. J.: Should pregnant women receive streptomycin, 952
GREENE, Raymond: The management of thyrotoxicosis, 1378
Greenland: Syphilis in Greenland, 155 (A)
GREENWOOD, Kemble: Treatment of the common cold, 1062
— Herpes zoster provoked by smallpox vaccination, 1424
Gregg, E. A., honorary M.D. (Liverpool) conferred on, 156; correction, 232
— presentation to, 1011
GREGORY, I. Langdale: Indwelling tube for haemostasis, 1391
GRENVILLE-MATHERS, R.: Work of the chest clinic, 352
GRIFFITHS, H. F.: Pethidine as adjunct to nitrous oxide and oxygen anaesthesia, 763; correspondence, 1334
GROSS, W.: Unrecognized rupture of the uterus, 1117
— Red cell stippling in poisoning, 1496
Grosse-Brockhuff, F.: *Einführung in die pathologische Physiologie*, 766
Grosser, O.: *Vorlesungen über topographische Anatomie*, 1426
Groves, Charles Nixon, obituary of, 1177
Growth, retarded, treatment of, 1291
— stimulation of, by thymus extract, 122
G.T.41, death following use of (medico-legal note), 633
Guaiacol, intramuscular, dangers of, 1506
Guanidine in myasthenia gravis, 178
Gums, bleeding, treatment of, 960
Gwynn, Gordon: *Did Adelaide Bartlett . . .?* 1261

GYNAECOLOGY:
Combined Textbook of Obstetrics and Gynaecology, 5th ed. (Editor: Dugald Baird), 254
Congrès International Jubilaire de la Société Francaise de Gynécologie, 1401
Development of Gynaecological Surgery and Instruments (James V. Ricci), 163
Genealogy of Gynaecology, 2nd ed. (James V. Ricci), 1478
Gynäkologische Operationen und ihre topographisch-anatomischen Grundlagen, 6th ed. (Heinrich Martius), 563
Handbook of Obstetric and Diagnostic Gynecology (L. Doyle), 150
Institute of Gynaecology and Obstetrics, 508
Modern Trends in Obstetrics and Gynaecology (Editor: Kenneth Bowes), 1100

GYNAECOLOGY (*continued*):
North of England Obstetrical and Gynaecological Society, 214, 629
Postgraduate Obstetrics and Gynaecology (F. J. Browne), 610

H

HACKETT, Earle: Blood loss at operation, 50
HADFIELD, E. H.: Oesophageal foreign body precipitating dissecting aortic aneurysm, 1477
HADFIELD, J. A.: Traumatic neurosis and electro-shock, 679
HADDOW, Alexander: Chemotherapy of cancer, 1271
Häbler, Carl: *Marknagelung nach Küntscher bei Schaftbruchen der langen Röhrenknochen*, 2nd ed., 1316
Haematemesis and melaena (C. D. Needham and J. A. McConachie), 133 (O); 153 (L); 366 (C), 414 (C), 459 (C), 628 (C), 838 (C)
Haematemesis from leeches, 679, 891
Haematology. *See* Blood
Haemoglobin metabolism, 672
Haemoglobinuria following myanesin therapy in tetanus, 981
Haemolytic disease of the newborn, 1481 (L)
— streptococcal infections, penicillin in, 617
Haemophilus influenzae, sulphonamide sensitivity of (K. Zinnemann), 705 (O)
Haemoptysis caused by leeches, 784
Haemorrhage, chronic subdural, associated with schizophrenic reaction (Kirpal Singh), 562
— from peptic ulcer; report on 170 cases (A. G. Ogilvie and I. O. B. Spencer), 138 (O); 153 (L); 414 (C), 459 (C), 528 (C), 628 (C), 838 (C)
— Haematemesis and melaena (C. D. Needham and J. A. McConachie), 133 (O); 153 (L); 366 (C), 414 (C), 459 (C), 628 (C), 838 (C)
— intraperitoneal, spontaneous, due to haemangioma of liver (K. P. S. Caldwell), 1155
Haemospermia: causes and treatment, 377
HAGENBACH, Charles: Antihistaminics for enuresis, 1224
Hair: Alopecia areata; a clinical study (Ian Anderson), 1250 (O)
— Falling hair during lactation, 1184
Haiti; incidence of syphilis and yaws, 668 (A)
Halitosis, 1236
HALL, Byron E.: Studies on the nature of the intrinsic factor of Castle, 585 (O); 612 (L); correction, 960
HALL, E. G. *See* ANGELMAN, Harry, HALL, E. G., and SPENCER, R., 752
HALL, S. A.: Medical students in Prague, 948
Hallett Prize, Royal College of Surgeons, 634, 1066
HALLUM, Jean L.: Deaths in breech deliveries, 418
— *See* WEINER, W., 868
HAMILTON, C. J. K.: Postmaturity, 281
HAMILTON, D.: Bornholm disease, 623
Hampshire, C. H., re-elected chairman of Expert Committee on the Unification of Pharmacopoeias, World Health Organization, 1179
Hand: Hypertrophy of little finger (James A. Ross), 987
— infections, film on, 376
HANSELL, Peter. *See* OLLERENSHAW, Robert, 488
Harben Lectures, 230, 1233
HARDY, R. *See* DUNNER, Lasar, 576
HARDY, T. L.: Ulcerative colitis, 278
Harkness, A. H.: *Non-Gonococcal Urethritis*, 872
HARLAND, J. C., HUMBLE, J. G., and MANN, P. G.: *Diphyllobothrium* infestation and anaemia in Great Britain, 188 (O); 206 (A); 418 (C); correction, 424
HARMAN, J. B.: Useless routine medical examinations, 1170
HARRIES, J. R., and WINCHESTER, J. W.: Hodgkin's disease and pregnancy, 217
HARRIS, G. W.: Adrenocorticotrophic hormone; neural control of secretion, 285
HARRIS, R.: Objective assessment of symptoms in rheumatoid arthritis, 947
HARRIS, Wilfred: Rare forms of paroxysmal trigeminal neuralgia, and their relation to disseminated sclerosis, 1015 (O); 1045 (A); correspondence, 1334, 1444
— Producing anaesthesia of trigeminal nerve distribution, 1444
HARRISON, W. R. E.: Over-population, 732
HART, Bernard: Psychology as science, 623
HARTLEY, K. W. D.: Training for general practice, 784
HARTLEY, Leslie: Intra-articular injections for arthritis, 232
HARTLEY, Ronald: Rheumatic heart disease in service pensioners; review of 318 cases, 396 (O)
HARTSTON, W.: Imported helminthic infections, 526
Harveian Lecture, 1405
— Oration, 997
— Society dinner; Lord Linlithgow's tribute to the G.P., 101
— — Meeting at Papworth Village Settlement, 467
— — of Edinburgh, 961
Harvesters' lung, 1184
Harvey, William, and his contemporaries: their influence on paediatrics (Harveian Oration) (Sir Leonard Parsons), 997
Harvey and the scientific method (Sir Henry Cohen), 1405 (O)
— portraits of (Geoffrey Keynes) (*Nova et vetera*), 43
— Verities yet in their chaos (Charles McNeil), 961 (O)
HASLAM, John F. C.: Silicosis in Rhodesia, 731
Hastings Lecture, 1069
HAUGHTON, S.: Refresher course on psoriasis, 530
Hawking, F., and Lawrence, J. Stewart: *The Sulphonamides*, 90
Haworth, Henry Dean, obituary of, 1338
HAY, James R. W.: A failing policy, 1447
HAYES, W. E.: Training for general practice, 622
Hay-fever, treatment of, 60
Head injuries; management from the anaesthetist's point of view (R. Bryce-Smith), 322 (O)
— — personality changes after, 1377 (A)
HEAF, F. R. G., MORRIS, C. R., and ROOK, Alan F.: British Student Tuberculosis Fund, 1497
— and others: Care of the tuberculous patient in the home, 352, 1353
Health centres, 1382
— — Pioneer health centre, Peckham, bought by London County Council, 1503
— education, by the school doctor, 799, 825
— — conference, 899
— visitors and aftercare (J. Greenwood Wilson), 291
Heaney, Francis James Strong, obituary of, 632
Heard, Richard, obituary of, 532

HEART:
Anticoagulants in treatment of coronary thrombosis (John A. Tulloch and A. Rae Gilchrist), 965 (O); 991 (L)
Arrest; case of vagal inhibition relieved by procaine (Henri L. M. Roualle, 712 (O); 721 (A); correspondence, 1116
— during anaesthesia, 339 (A)
Atrial septal defect, 693
Auricular fibrillation after electric convulsion therapy (P. M. O'Flanagan and R. B. Taylor), 444
Cardiac disease and pregnancy, 936 (A)
Cardiological case finding by means of mass miniature radiography (Peter O. Leggat), 1364 (O)
Catheterization, 639
Congenital disease discovered by mass miniature radiography, 1365
— — review of clinical aspects in the light of experience gained by modern techniques (Paul Wood), 639 (O), 693 (O); 717 (L); 840 (C), 1174 (C)
Diastolic murmurs; diagnosis and significance, 847
Effect of heavy exercises, 1291
Eisenmenger's complex, 697
Electrocardiogram in clinical diagnosis and prognosis (Terence East), 828, 880
Failing heart; recognition and treatment (K. Shirley Smith), 340
Failure, meaning of, 1390
— modern conceptions and therapeutics (E. P. Sharpey-Schafer and others), 268
Fallot's tetralogy, 696
Hypertensive disease, 1163 (A)
Hypertrophy, electrocardiogram in, 829
Ischaemic heart disease, 1163 (A)
Minor degrees of toxic carditis, detection of, 60
Neuroses (Paul Wood), 33
Pain in cardiac neurosis, 289
Phonocardiography, 567 (A); 838
Pulmonary stenosis, 694
Quinidine in Disorders of the Heart (Harry Gold), 1426
Radiography: Blood changes during angiocardiography (Sheila Howarth), 1090 (O)
Rheumatic heart disease discovered by mass miniature radiography, 1365
— — — in service pensioners; review of 318 cases (Ronald Hartley), 396 (O)
Surgery, anaesthesia in, 295, 415
Transposition of great vessels, 698
Tricuspid atresia, 697
Ventricular septal defect, 643
Xanthoma palpebrarum associated with cardiovascular disease (P. P. McKinney), 1259

Hearing-aids, bone induction (parliamentary note), 372
— value for children, 364
HEATH, W. E.: Death from atropine poisoning, 608
HEATHFIELD, Kenneth W. G., and JEWESBURY, Eric C. O.: Supranuclear bulbar palsy (pseudobulbar palsy) in mitral stenosis, 1196 (O)
HEAVEY, Thomas F.: Obstetrical anaesthesia, 219
Heberden Society, 1068
— — Annual general meeting, 1488
— — Dinner, 898
HEGGIE, J. F.: The training of pathologists, 682
HEGINBOTHAM, John: Two public health problems, 1393
HELLER, R.: Emergency leucotomy, 787

HELMINTHOLOGY:
Diphyllobothrium infestation and anaemia in Great Britain (J. C. Harland, J. G. Humble, and P. G. Mann), 188 (O); 206 (A); 418 (C); correction, 424
Helminthic infections, imported, 206 (A); 526 (C)
Helminth infections of man in Great Britain, 357

Hemiplegia following diphtheria and pertussis immunization (J. Vahrman), 608
— management of, in elderly patient, 923
— *see also* Paralysis
HENCH, Philip S.: Cortisone and A.C.T.H. in rheumatic diseases, 942
— awarded Nobel Prize for Medicine, 1046, 1050
— visit to Britain, 957
HENDERSON, Sir David K.: Reflections on criminal conduct and its treatment, 311 (O); 335 (L); 459 (C)
HENDERSON, John: Family planning for the Rhesus-negative mother, 1330
HENDERSON, Norman P.: Sea-sickness, 1117
Henderson, Thomson: *Principles of Ophthalmology*, 1100; correspondence, 1227
HENDRY, R. W. *See* JOSEPHS, Cyril, 681
HENDRY, W. Garden: Intraperitoneal intestinal anastomosis in colectomy, 1148 (O); correspondence, 1331
Heney, James Wilson, obituary of, 532
HENLY, A. A. *See* COPEMAN, W. S. C., 849
Henry, Arnold K.: *The Hinge Graft or Ginglymus Implant*, 446
Henry, Claude Dawson, obituary of, 733
Heparin, administration of, 1226
— — intramuscular (D. Gordon Abrahams), 1418 (O); 1433 (A)
— and hyaluronidase; indications for, 1072
— in coronary thrombosis, 967
Hepatitis; anomalous findings in differential diagnosis by biochemical tests, 246
— viral, after blood transfusion, 1103 (L); 1278
HERD, David A.: A clip for syringes, 1279
HERDAN, A.: Medical students in Prague, 948
Heredity and leg ulcers (S. T. Anning), 1305 (O); 1495 (C)
— in ophthalmology (Laurence H. Snyder), 344
— Value of genetics in medicine (L. S. Penrose), 903 (O); 931 (L)
HEREORD, M. E. M.: Factory doctors in the health team, 1280
Hernia, diaphragmatic, strangulated; diagnosis and treatment, 756
— incisional; spontaneous dehiscence of coverings of, 167, 296
— Internal spermatic fascia, with reference to repair of indirect inguinal hernia (C. Brun), 443 (O); 625 (C)
— obturator, recurrent obstruction of (B. W. T. Pender), 1038; correspondence, 1175
— strangulated, in infants, 629
Herniation of gut, 758
HERON, J. P.: Orthopaedic aspect of activity for the aged, 353
Herpes simplex, recurrent; treatment, 1184
— zoster, aetiology of, 1236
— — provoked by smallpox vaccination (Kemble Greenwood), 1424
— — treatment with new antibiotics, 1485 (A)
HERXHEIMER, H.: Morphine and histamine in bronchial asthma, 167, 418
H.E.T.P. *See* Hexaethyl-tetraphosphate
"Hetrazan" in filariasis, 772 (A)
Hexaethyl-tetraphosphate, toxic effects of, 548
Hexamethonium bromide in duodenal ulcer (L. D. W. Scott and others), 1470 (O)
— — in severe hypertension (Allan Campbell and Eric Robertson), 804 (O); 826 (A); 1496 (C)
— salts, oral; effect on gastric secretion (A. W. Kay and A. N. Smith), 807 (O); 826 (A)
HEY, Wilson: The story of the Manchester medical societies, 1221
HICKINBOTHAM, Paul: Registrars and health service policy, 1444
HIMANS, W. *See* GOSLINGS, J., 1019
HILL, A. Bradford: Psychology and science, 1114
— Presidential address to Royal Statistical Society on the doctor's day and pay, 1218
— elected President of the Royal Statistical Society, 32
— and KNOWELDEN, J.: Inoculation and poliomyelitis; statistical investigation in England and Wales in 1949, 1 (O); 28 (L); correspondence, 166, 220, 1391
— *See* DOLL, Richard, and HILL, A. Bradford, 739
HILL, A. Wesley: General adaptation syndrome, 220
Hill, Charles, resignation from secretaryship of B.M.A., 257; 1107 (A)
Hill, Denis, and Parr, Geoffrey (Editors): *Electroencephalography*, 563
HILL, Sir Leonard: Exercises in the bath, 1153 (O); correspondence, 1281, 1329, 1494
Hillier, William Thomas, obituary of, 733
Hip: *Coxitis tuberkulosa* (Herbert Gardemin), 1370
HIRSCH, S. R.: Newer conceptions of arteriosclerosis, 353
HIRST, K. M.: Infections in nurseries, 362
Histamine desensitization, 891
— intra-arterial, in treatment of claudication and rest pain (W. Arthur Mackey), 1086 (O)
Histology; recent progress, 235
History, humanism, and natural science in medicine (F. M. R. Walshe), 379 (O); 524 (C), 623 (C), 676 (C), 677 (C), 783 (C), 943 (C), 1057 (C), 1114 (C)
History of medicine. *See* Medicine, history
Histostab, pharmacological action of, 691
HOARE, Cecil A.: Amoebiasis in Great Britain, with special reference to carriers, 238 (O); 259 (A); 525 (C), 530 (C)
Hobart, F. G., and Melton, G.: *Concise Applied Pharmacology and Therapeutics*, 3rd ed., 401
HOBSON, A. J.: Ogilvie's syndrome of false colonic obstruction, 108
— Volvulus of small intestine, 399
Hodgkin's disease and pregnancy, 47, 217, 296
HOFFSTAEDT, E. G. W.: Crisis in tuberculosis, 416
Hogben test for pregnancy, 328
HOLDSWORTH, F. W.: Supracondylar fracture of the humerus, 359
HOLMAN, C. C.: Spontaneous dehiscence of coverings of incisional hernia, 296
HOLMES, Gordon M.: Inaugural address, Charing Cross Hospital Medical School, 884
Holmes, T. H., and others: *The Nose: An Experimental Study of Reactions Within the Nose in Human Subjects During Varying Life Experiences*, 662; 952 (C), 1120 (C)
HOLT, Lewis B. *See* BOUSFIELD, Guy, 73
Homoeopathic Congress, 176
Homologous serum jaundice transmitted by syringe, 469
Hookworms in the throat, 1173
Horden, Durkam; food-poisoning outbreak (epidemiological note), 174, 228
HORDER, Lord: A secret remedy for cancer, 835
— (Editor): *The British Encyclopaedia of Medical Practice*, Vol. 1, 2nd ed., 1426
Hormones, cortical; regulation of secretion, 1242
— in treatment of peptic ulcer, 205 (A)
— male, assay of, 309
— of digestive tract, 675
— protein, 1238

HOSPITALS:
Advertising vacancies (parliamentary note), 54
Beds available in England and Wales, 1299
Central buying (parliamentary note), 1398
Claims against hospitals: Difference between Scots and English law (medico-legal note), 954
Consultant and S.H.M.O. grades (parliamentary note), 54
Costs, increase of (parliamentary note), 1123
Employment Relations in a Group of Hospitals (Joan Woodward), 41
General practitioners and hospitals (parliamentary note), 1502
Gifts (parliamentary note), 1398
Guide to London hospitals, 1011
Hospital morale; "Degree, priority, and place," 41
Hospital Improvement (O. Matthews), 878
Italian hospital reopened, 99
Kingston and Malden Victoria Hospital dispute, 1106 (A); 1178, 1397 (parliamentary notes)
Lebanon Hospital for Mental Diseases, 1069, 1503
Mental, progress in, 568 (A); 729
Name and identity (parliamentary note), 1178
National Hospital Service Reserve, 600
Oxford Regional Hospital Board; annual report, 267
Patient's needs, 878 (A)
Princess Tsahai Memorial Hospital, 176, 307, 376, 1288
Private patients (parliamentary note), 1230
Property sold or rented to Minister of Health, 457
St. John's Hospital, Lewisham; proposed dismemberment of, 219, 731
Sports facilities for patients and staff, 557
Staff and distinction awards, 887, 994
— rents for houses and flats owned by Ministry of Health, 294
Threats to general hospitals, 731
University College, London; premature baby unit, 834

HOUGHTON, Enid: "Dramamine" and sea-sickness, 947
HOUGHTON, P. *See* CROPPER, C. F. J., 1099
HOUGIE, C.: Proper use of anticoagulants, 1226
HOUSDEN, Leslie: Infant-feeding in North-East Africa, 456
Housing: Family life in flats; social needs and problems, 1123
— parliamentary note, 1399
HOWARD, Rutledge W.: Folic acid and pernicious anaemia, 417
HOWARD, Stanford: Intraperitoneal intestinal anastomosis 1332,
Howat, Robert King: *Osteology for Dissectors*, 661
Howell, T. E., appointed principal medical inspector of mines, Ministry of Fuel and Power, 1344
HOWELL, Trevor H.: Arthritic pain in elderly patients, 353
HOWIE, A. Hallam: Prolonged retention of dead foetus in utero, 148
HOWKINS, John: St. John's Hospital, Lewisham, 219
— Uterine sepsis from unabsorbable sutures, 659; 949 (C)
Hruby, Karl: *Spaltlampen-mikroskopie des hinteren Augenabschnittes*, 1478
HUBBLE, Douglas V.: Enuresis, 1108; correspondence, 1224
— *Diary of Sylas Neville*, 1767–1788. Edited by Basil Cozens-Hardy (Nova et Vetera), 1491
HUGHES, A. F.: Phase-contrast microscopy, 272
HUGHES, Brodie, and SMALL, J. M.: Producing anaesthesia of trigeminal nerve distribution, 1334
Hughes, Ernest Cranmer, obituary of, 419
Hughes, Ernest Ethelbert, obituary of, 1500
HUGHES, Robert: Infection by syringe, 366
Humanism, history, and natural science in medicine (F. M. R. Walshe), 379 (O); 524 (C), 623 (C), 676 (C), 677 (C), 783 (C), 943 (C), 1057 (C), 1114 (C)
HUMBLE, J. G. *See* HARLAND, J. C., 188
HUME, C. W.: First draft for a model Act for the protection of laboratory animals, 724; 888 (C), 951 (C), 1114 (C), 1389 (C)
Humerus, supracondylar fracture of (F. W. Holdsworth), 359
Hungary: Terms of service of medical officers, 112
Hunt, Josephine: *An Introduction to Medical Photography*, 930
Hunter, William: a new portrait (C. R. Rudolf) (Nova et Vetera), 886
Hunterian Society, 736; permanent headquarters, 898
HURRELL, George: Acute toxic jaundice, 729
HUTCHISON, Sir Robert: Haemorrhage from peptic ulcer, 459
Hutson, Sir John, obituary of, 370
Hyaluronidase and heparin, indications for, 1072
Hydatid cysts of lung; medical treatment (Mariano R. Castex and Eduardo L. Capdehourat), 604 (O)
Hyde Award, 1179
Hydrochloride; effect on bowel responses, 1467
Hydrotherapy: British spas and health resorts, 169
Hygiene: *Personal and Community Hygiene Applied* (J. F. Williams and G. G. Wetherill), 1427
Hymen, origin of, 959
Hyoscine in sea-sickness, 720, 836, 947, 1117, 1225
Hyperemesis gravidarum, treatment of, with oestrogens, 526
Hyperpiesis and albuminuria; investigation and treatment, 377
Hyperpyrexia, extreme, with recovery, 628
Hypertension; dietary treatment (H. Ucko), 144 (O)
— encephalopathy due to; treatment and prophylaxis, 1235
— ocular effects (F. H. Adler), 344
— on waking, 902
— pulmonary (R. I. S. Bayliss), 268
— severe; treatment with hexamethonium bromide (Allan Campbell and Eric Robertson), 804 (O); 826 (A); 1496 (C)
Hypervitaminosis A; effect on foetal mouse bones cultivated *in vitro* (Honor B. Fell and Sir Edward Mellanby), 535 (O); 565 (L)
Hysterectomy, vaginal, for complete rupture of uterus during labour (A. H. C. Walker), 1205

I

Ice-cream; bacteriological grading, 1431 (A)
— purity (parliamentary note), 1065
Ileitis, Regional (Burrill B. Crohn), 200
Ileostomy, prolapse of; prevention and treatment, 178
ILLINGWORTH, C. F. W.: Carcinoma of the stomach, 262
— *A Short Textbook of Surgery*, 5th ed., 1260
Illness, chronic, care of (C. R. Lowe), 699 (O)
Immigrants; health control form (parliamentary note), 1065

IMMUNIZATION:
Clinical poliomyelitis in association with peripheral inoculation of prophylactics (F. O. MacCallum), 6 (O); 28 (L)
Inoculation and poliomyelitis; statistical investigation in England and Wales in 1949 (A. Bradford Hill and J. Knowelden), 1 (O); 28 (L); correspondence, 166, 220, 1391
Neurological complication after combined diphtheria and pertussis immunization (J. Vahrman), 608
of allergic children, 848
Relation to poliomyelitis, 251, 300

Immuno-haematology, 673
Impact: quarterly bulletin issued by Unesco, 619
Inactivity, effect of, in advancing years, 921, 1120, 1175
Indonesia: W.H.O. campaign against yaws, 783

INDUSTRIAL MEDICINE: *See also* Mining; Toxicology
Austrian Congress of Occupational Medicine, 736
Chemistry of Industrial Toxicology (Hervey B. Elkins), 821
Factory doctors in the health team, 1280
Incidence and treatment of neurosis in industry (T. M. Ling, J. A. Purser, and E. W. Rees), 159
Industrial accidents and diseases in October 1950 (epidemiological note), 1340
Industrial Health (R. Passmore and Catherine N. Swanston), 401
Industrial health in the Services, 1168
Industrial Injuries Advisory Council: medical members, 1401
Industrial injury claims (parliamentary note), 53
Medical examination in industry (Leslie G. Norman), 289

INDUSTRIAL MEDICINE (*continued*):
Notes on the Diagnosis of Occupational Diseases Prescribed under the National Insurance (Industrial Injuries) Act, 90, 1011
Occupational health in the Royal Navy, 1168
Pneumoconiosis (parliamentary notes), 373, 1398
— Research Unit, Medical Research Council, 957, 1167

Silicosis in Cornwall (parliamentary note), 172
— in Rhodesia, 731
Tuberculosis and occupation, 178

INFANT: *See also* Children
Feeding and mortality rate, 945
— in North-East Africa (Leslie Housden), 456
— pamphlets published by Central Council for Health Education, 1089
— Provision of infant foods (parliamentary note), 1065
Infection in the hospital ward, 362
Judging a baby show, 637
Mortality (epidemiological note), 376
— Reduction in Chicago, 177
Newborn: Anaesthesia (G. Jackson Rees), 1419 (O); 1433 (A)
— Anaesthesia (T. N. P. Wilton), 292
— Anaesthetic aspects of surgical conditions (G. J. Rees), 287
— haemolytic disease of; diagnosis and treatment, 1481 (L)
— Postmaturity, 281
— Resuscitation, 277
— Surgical conditions (Denis J. Browne and others), 286
— Survival of 16-oz. baby (H. Fakim), 445
Premature, delayed feeding of, 106
— domiciliary care of, 216
— Premature baby unit at University College Hospital, London, 834
— Prevention of intracranial injury, 423
— Survival of 16-oz. baby (H. Fakim), 445
— with pyloric stenosis, 681
Thrush in infants, 1430 (L)
Welfare centres, 795
— in north-east Africa, 457

Infection: Natural history of surgical infection, 39
— of infants in the hospital ward, 362
Infectious diseases, weekly table: 56, 118, 174, 228, 305, 375, 421, 466, 533, 580, 634, 686, 734, 790, 843, 897, 955, 1010, 1067, 1126, 1182, 1231, 1287, 1341, 1403, 1455, 1505
Infertility. *See* Fertility
Influenzal meningitis treated with chloramphenicol (R. Green, D. S. Mankikar, and J. S. Millett), 1154
Infusions into bone-marrow; intratibial and intravenous routes compared (L. W. C. Massey), 197 (O)
INGLIS, James McNaught: Modification of Boyle's apparatus, 1003
Inguinal ring, internal, anatomy of, 443
Inhalation during dental extraction, 936 (A)
INNES, James: Aminopterin for leukaemia, 46
Inoculation and poliomyelitis, 416, 628
— — — statistical investigation in England and Wales in 1949 (A. Bradford Hill and J. Knowelden), 1 (O); 28 (L); correspondence, 166, 220, 1391
— Certificates required by foreign governments, 215, 416, 530, 682
— Clinical poliomyelitis in association with peripheral inoculation of prophylactics (F. O. MacCallum), 6 (O); 28 (L)
— mass, technique in, 1393
— Possible mode of transfer of infection by syringes used for mass inoculation (R. J. Evans and E. T. C. Spooner), 185 (O); 204 (A); 365 (C), 461 (C), 837 (C), 1059 (C)
Insecticides: Poisoning by organic phosphorus insecticides (P. Lesley Bidstrup), 548 (O)
— residual, in control of malaria, 414
— Toxicity of "P.M.4," 1127
Institute of Cardiology, 507
— of Child Health, 507
— of Dental Surgery, 507
— of Dermatology, 507; lectures, 792
— of Diseases of the Chest, 507
— of Laryngology and Otology, 507, 1124
— of Neurology, 507
— of Obstetrics and Gynaecology, 508
— of Ophthalmology, 508
— of Orthopaedics, 508
— of Psychiatry, 508
— of Social Medicine, Oxford; annual report, 1503
— of Urology, 508
Instruments subject to damage by moist heat, sterilization of, 1128
Insulin and E.C.T. in treatment of rheumatoid arthritis; report on a pilot series of cases (G. D. Kersley and others), 855 (O); 874 (L); correspondence, 1058
— Indications for globin insulin (David W. Pugh), 657 (O); 949 (C)
— ointment, 378
— Skeletal abnormalities in developing chickens, insulin-induced (P. K. Duraiswami), 384 (O); 404 (L); 785 (C), 1002 (C), 1277 (C), 1495 (C)
— structure and biological activity of, 1238
Intelligence, effect of glutamic acid on, 1161 (A)
— relation to fertility, 1429 (L)
Intercostal paralysis, prolonged, due to a relaxant (H. Barrie Fairley), 986 (O)
International Congresses. *See under* Congresses
International Dental Journal, 1233
International Federation of Physical Medicine, formation of, 229
— Labour Office: Joint report of I.L.O./W.H.O. Committee on Hygiene of Seafarers, 813
— Society of Haematology; meeting in Cambridge, 671
— Society of Surgery; 14th congress, 1951, 1504
— Union for Child Welfare, 175
Intervertebral disk lesions, symptoms due to, 355
— — Treatment of lumbar disk lesions (James Cyriax), 1434

INTESTINE:
Acute intussusception in childhood (Sir James Spence and Donald Court), 920 (O)
Blood flow in human intestine (John Grayson), 1465 (O)
Coccidiosis in humans, 298
Infections; treatment with streptomycin, 671
Intraperitoneal anastomosis in colectomy (W. Garden Hendry), 1148 (O); correspondence, 1331
Intussusception, acute, in childhood (Sir James Spence and Donald Court), 920 (O)
— following appendicectomy, 298
— subacute, with spontaneous elimination (M. E. Forrester and J. M. Boyd), 89
Obstruction due to food, 109
— due to mangoes, 787
— during late pregnancy caused by volvulus of sigmoid colon (D. W. James), 24
Parasites of man in Great Britain (J. J. C. Buckley), 357
small, atresia of, congenital (Harry M. Bennett), 1369
— volvulus of (A. J. Hobson), 399; 1392
Intracranial injury in premature infants; prevention of, 423
Intravenous therapy, dangers of (D. A. K. Black), 1387
Intrinsic factor of Castle (Byron E. Hall), 585 (O); 612 (L); correction, 960
Intubation, aid to (W. N. Vellacott), 1113
— endotracheal, in newborn, 1420
Intussusception, acute, in childhood (Sir James Spence and Donald Court), 920 (O)
— following appendicectomy, 298
— subacute, with spontaneous elimination (M. E. Forrester and J. M. Boyd), 89
Invalid Children's Aid Association, 986
Iodine, thyroid and aspirin preparation, 584
Iodoacetic acid test for malignancy, 1201

IRELAND: *See also* Northern Ireland
Irish Medical Directory and Hospital Yearbook, 766
Irish medical schools, 518
National University of. *See* Universities: Ireland
Present state of public health, 766
Royal Academy of Medicine in Ireland; officers elected, 957

Iridium isotope, 751
Iritis, treatment of, 122
Iron, intravenous, in treatment of hypochromic anaemia associated with rheumatoid arthritis (R. J. G. Sinclair and J. J. R. Duthie), 1257 (O)
— — indications, contraindications, dosage and technique of administration, 469
— palatable prescription of, 1291
IRONSIDE, R. W.: Lung cancer and petrol lighter, 529
IRVINE, K. Neville: Saving money on N.H.S. prescriptions, 529
Islets of Langerhans, carcinoma of, 526
Isolation hospitals and sanatoria, 1000
Isopropyl chloride as anaesthetic, 1116
Isotopes, radio-active. *See* Radio-isotopes
Italian hospital reopened, 99
Italian medical film unit, 1233

J

JACKSON, George A.: Intestinal obstruction due to food, 109
JACKSON, Harold: Thermal coagulability of serum proteins and the diagnosis of malignant disease, 1201 (O); 1213 (A)
JACKSON, Noel I.: Training for general practice, 728
JACOBS, J. *See* WATKINS, A. G., 106
JAMES, D. W.: Intestinal obstruction during late pregnancy caused by volvulus of sigmoid colon, 24
JAMES, J. I. P.: Curve patterns in idiopathic structual scoliosis, 1216
Jameson, Sir Wilson, awarded Bisset Hawkins Medal of Royal College of Physicians, 373, 998
JANUS, O.: Objective assessment of improvement in rheumatoid arthritis, 1244 (O); 1263 (A)
JARMAN, A. S.: Displaced registrars, 1443
Jaundice, acholuric, familial crisis in (F. Graham Marson, M. J. Meynell, and H. Tabbush), 760 (O)
— Anomalous findings in differential diagnosis by biochemical tests (P. N. Coleman), 246 (O)
Jaundice, continued, management of, 737
— homologous serum, transmitted by syringe, 469
— toxic, acute, 729, 949
Jaw: *Klinik der Zahn-, Mund- und Kiefer-Krankheiten* (Herrmann Wolf), 254
JEFFERSON, Sir Geoffrey: Doubts about surgical treatment of Parkinsonism, 364
— lecture tour in N. America, 687
JEFFREY, M. R. *See* KERSLEY, G. D., 855
JELLIFFE, D. B., WALKER, A. H. C., and MATTHEWS, Stafford: Five cases of puerperal tetanus (one associated with eclampsia), 814 (O)
JENKINS, S. Aubrey: Simple method of treating injuries of the fingers, 252
JENNINGS, Denys: Pernicious anaemia and gastric carcinoma, 575
Jensen, Ernest Thomas, obituary of, 419
JEWESBURY, Eric C. O. *See* HEATHFIELD, Kenneth W. G., 1196
JOHNSON, Donald McI.: A G.P. on his clinical training, 493 (O); 501 (L); correspondence, 574, 622, 677, 727, 784
JOHNSON, H. A.: Employment of epileptics, 1281
JOHNSTON, Lennox: Smoking and carcinoma of the lung, 1004
— and MORGAN, F. C.: Minority crusade, 630
Johnstone, Alexander, obituary of, 1395
Johnstone, R. W.: *Development of Gynaecological Surgery and Instruments*, by James V. Ricci (Nova et Vetera), 163
— conferment of hon. LL.D. Edin. on, 226
Joint Tuberculosis Council: Recommendations on protection of children from tuberculosis, 175
JOKL, Ernst: Punch-drunkenness, 1292
JONES, A. Thelwall: Medical examination in industry, 290
JONES, B. S.: Congenital malaria; report of three cases, 439 (O); 451 (A)
JONES, F. Avery: Mortality in bleeding peptic ulcer, 838
Jones, George Arthur, obituary of, 1396
JONES, J. O. V.: Spread of poliomyelitis, 786
Jones, K. C.: *The Practice of Chiropody*, 611
JONES, W. L.: Problem of the therapeutic convulsion, 1224
Jordan Medical Journal, 1401
Joseph Goldberger Award (1950), 376
JOSEPHS, Cyril, and HENDRY, R. W.: Pyloric stenosis in premature infant, 681
JOSLIN, Elliott P.: Causes of death in diabetes, 1445
— and WILSON, James L.: Lessons for future treatment from 472 fatalities in diabetic children, 1293 (O)
"Joule" as substitute for "calorie," 1213 (A)

JOURNALS:
Acta Physiologica et Pharmacologica Neerlandica, 687
Alfred Hospital Clinical Reports, 307
Annals of Tuberculosis, 1233
British Journal of Delinquency, 422
British Journal for the Philosophy of Science, 467
British Journal of Psychiatric Social Work, 1085
British Journal of Tuberculosis and Diseases of the Chest, 468
B[ritish] R[heumatic] A[ssociation] Review, 1123
Conquest, 687
Current List of Medical Literature, 616 (A)
Impact (Unesco publication), 619
International Dental Journal, 1233
Journal of Biochemistry, 422
Journal of Neuropathology and Experimental Neurology: editorial changes, 1012
Jordan Medical Journal, 1401
Neurology, 1233

Jurisprudence, medical. *See* Medico-legal

K

Kala-azar, mode of transmission of, 1060, 1333, 1495
KARN, H. M.: Haemolytic streptococcal gangrene treated with streptomycin, 1278
KARVE, S. D.: Case of double-headed monster, 988
Katz, B., appointed Reader in Physiology, University College, London, 466
KAY, A. W., and SMITH, A. N.: Effect of oral hexamethonium salts on gastric secretion, 807 (O); 826 (A)
— *See* SCOTT, L. D. W., 1470
KEALL, John: Accidents in the *x*-ray room, 1058
KEELING, G. S.: Poliomyelitis, 679
KEIR, R. McD. S.: Case of tetanus treated with decamethonium iodide, 984 (O); 994 (A)
Kell–Callano blood group system in pregnancy and transfusion (J. R. Cochrane, R. H. Malone, and I. Dunsford), 1203 (O)
KELLEHER, W. Howlett: Poliomyelitis, 570; 679 (C), 786 (C), 1060 (C)
— Camels and the temperature chart, 1060
KELLETT, H. S.: Erythrocyte sedimentation in anaemia, 1445
KELLGREN, J. H.: Pain as an aid to diagnosis, 1492
KELLIE, A. E. *See* COPEMAN, W. S. C., 849
Kempner's rice diet, 144
Kendall, E. C., awarded Nobel Prize for Medicine, 1046, 1050
Kennaway, Sir Ernest L., presentation of Osler Memorial Medal to, 827

Kerato-conjunctivitis, aetiology of, 1403
KERNOHAN, Robert J.: Aplastic anaemia complicating miliary tuberculosis, 399
KERR, A. Sutcliffe: Care of paraplegics, 355
Kerr, Francis Kenneth, obituary of, 953
Kerr, J. Munro, awarded Blair-Bell medal, 1326
KERSHAW, J. D.: Social medicine, 274
Kersley, G. D.: *The Rheumatic Diseases*, 3rd ed., 26
— MANDEL, L., JEFFREY, M. R., DESMARAIS, M. H. L., and BENE, E.: Insulin and E.C.T. in treatment of rheumatoid arthritis; report on a pilot series of cases, 855 (O); 874 (L); correspondence, 1058
KEY, James A.: Blood vessels of a gastric ulcer, 1464 (O); 1484 (A)
KEYNES, Geoffrey: The portraits of William Harvey (Nova et vetera), 43
KIDD, H. A.: Tremor in Parkinson's disease, 310
KIDD, P. *See* CROPPER, C. F. J., 1099

KIDNEY:
Acute tubular necrosis, 109, 349
Calculi, cystine, 1505
Cushing's syndrome presenting with features of a "Type II" nephritis (F. W. Wolff), 1037
Development of renal physiology; meeting of the Renal Association, 345
Histological changes in renal failure, 349
horseshoe, treatment of, 794
infection, sulphonamide dosage in, 526
innervation of, 1180
Kimmelstiel–Wilson syndrome, 1072
Natural History of Bright's Disease (G. E. M. Scott), 564
Nephritis. *See* Nephritis
Renal failure (Ralph Shackman and others), 348
— — steps in treatment, 349
Survival on less than one kidney, 1497
Symmetrical cortical necrosis, 1327

Kilner, Hugh Pomfret, obituary of, 1283
KIMMEL, Samuel A. *See* COHEN, Lionel, 87
Kimmelstiel–Wilson syndrome, 1072
KING, A.: Phase-contrast microscopy, 272
KING, H. H.: Protection of laboratory animals, 1115
King Edward's Hospital Fund for London: Guide to London hospitals, 1011
King's College Hospital Medical School: Opening of winter session, Sir Lionel Whitby's address, 832; annual dinner, 845
Kingston and Malden Victoria Hospital dispute, 1106 (A); 1178, 1397 (parliamentary notes)
KINSELLA, V. J.: Indwelling tube for gastric haemorrhage, 1174
KIPLING, J. J.: Cost of academic clinical office, 1389
Kirkpatrick, William Alexander, obituary of, 733
Kitchen hygiene, 613 (L); 731
Knaus, Hermann: *Die Physiologie der Zeugung des Menschen*, 3rd revised ed., 1206
Knee, chronic synovitis of, 637
Knockshinnoch Castle Colliery disaster, 834
KNOWELDEN, J. *See* HILL, A. Bradford, 1
— *See* QUIN, C. E., 810
KNOX, W. Eugene. *See* GREEN, David E., 873
KOHN, J. *See* VITALI, M., 415
Korea: Medical services of United Nations Forces, 1169
— Tuberculosis in South Korea, 102
— W.H.O. mission, 844
Kraurosis vulvae, treatment of, 121
KREMER, M.: Symptoms due to cervical disk lesions, 355
Kretschmer, Ernst: *Medizinische Psychologie*, 10th ed. 1261
KRISHNAMURTHY, V. N.: Effects of penicillin and streptomycin on vaccine lymph, 1035 (O)

L

Laboratory animals, care and management of, 1176
— — protection of, 724, 888, 951, 1114, 1389

LABOUR: *See also* Abortion; Caesarean section; Infant, newborn; Obstetrics; Pregnancy; Puerperium
Cause and management of failed forcep cases (H. Derek Freeth), 18 (O); 219 (C)
complicated by volvulus of transverse colon (Archie G. Murray), 659
Management of malpositions of vertex (Hector R. MacLennan), 800 (O); correspondence, 1172
Mortality in breech presentations, 418, 529
squatting position in, 1174

LACEY, J. W. *See* BILLINGHAM, L. M., 1443

LACTATION:
Breast-feeding (F. Charlotte Naish and others), 350
— conferment of immunity by,
effect of amphetamine on, 848
falling of hair during, 1184

LAING, G. D.: Calcium gluconate in treatment of nocturnal cramps, 738
LAIRD, Sydney M.: Chemotherapy of venereal diseases, 351
LAMBERT, V. F.: Carcinoma of larynx, 638
Laminectomy, indications for, 1437
LANCASTER, Leonard: Displaced registrars, 1329
LANDER, F. P. Lee: Bronchiectasis, 1486
LANE, R. E.: Medical examination in industry, 290
LANE-PETTER, W.: Protection of laboratory animals, 1114
LANG, R. Russell: Sea-sickness, 1117
LANGHAM, S. T.: Dexedrine poisoning, 892
Lantern slides, 490
Laryngectomy, oesophageal speech after (film), 1452
Laryngology and Otology, Institute of, 507, 1124
Larynx, carcinoma of (M. Lederman and others), 356, 638
LASK, Samuel: Every breech an abnormality, 529
Lasker Awards for 1950, 1289
LASNITZKI, Ilse. *See* PASSEY, R. D., 1134
LATNER, A. L.: Treatment of acute yellow atrophy, 629
— Regime for treatment of severe and acute liver disease, 748 (O); correspondence, 1002, 1117
LATTO, Douglas, and NORMAN, Richard: Pregnancy in rudimentary horn of bicornuate uterus, 926 (O); correspondence, 1119
Laubry, Ch., and Soulié, P.: *Les Maladies des Coronaires*, 2nd ed., 882
LAUWERYS, J. A.: Methods of education, 471 (O); 501 (L); 784 (C)
Lavatories at omnibus stations and termini (parliamentary note), 1502
LAWLER, Sylvia D.: Mongolism in one of twins, 1172
LAWRENCE, J. Stewart. *See* HAWKING, F., 90
LAWRENCE, R. D.: Vascular changes in diabetes, 107
— Training of clinical teachers, 481 (O); 501 (L); correction, 1072
— lecture tour in Netherlands, 1233
LAYBORN, T. A. E.: Tuberculosis as a prescribed disease, 1493

LEADING ARTICLES:
Abortion, 152
Adrian, E. D., elected president of the Royal Society; 1320, 1326
Anatomy: Structure of the living organism, 258
Annual Meeting of B.M.A., 94, 256
— Representative Meeting, 256
Antibiotics: Synergism and antagonism, 1160; correspondence, 1392
Anticoagulant therapy of acute myocardial infarction, 901
Antihistaminic drugs and the common cold, 448
B.C.G. vaccination; technique, 993
Blood transfusion and viral hepatitis, 1103; correspondence, 1278
Breathing-machines, dangers of, 566
Cancer: a secret remedy, 663; correspondence, 726, 835, 875, 1004; correspondence between Minister of Health and D. Rees Evans, 885
— of cervix, 769
Cigarettes and cancer, 767
Chloramphenicol now available, 1319
Colchicine in the chemotherapy of cancer, 718; 893 (C)
Congenital heart disease, 717
Cortisone and A.C.T.H. in Britain, 1375
Delinquency, causes of, 335
Doctors and population, 502; 506 (A)
Durham and the doctors, 1210; annotation, 1265; parliamentary notes, 1229, 1339
Emotions and the colon, 449
Endocarditis, bacterial, healed, 450
Eugenics and heredity, 931
Euthanasia, 1318; parliamentary note, 1338; correspondence, 1447
Fertility and intelligence, 1429
Foetus, pathology of, 404; correspondence, 576, 730
General practitioners' conference, 1043
Haemolytic disease of the newborn, 1481
Haemorrhage from peptic ulcer, 153; 838 (C)
Inoculation and poliomyelitis, 28; correspondence, 220
Inquiry by questionary, 1208
International Congress of Internal Medicine, 612
Kitchen hygiene, 613; 731 (C)
Medical Act 1950, 337
Medicine: Widening horizons, 665
National Health Service: A failing policy, 1262; correspondence, 1328, 1389, 1447, 1497
Paediatrics, preventive, 824 (L)
Paralysis agitans, 29
Pay in the salaried services, 992
Pernicious anaemia and the intrinsic factor, 612
Placenta praevia, x-ray diagnosis of, 1042
Poliomyelitis and the community, 664
Presidential Address, 202
Public health salaries, 1480
Rabies, treatment of, 823
Radiation in the shoe-shop, 565; 730 (C), 1120 (C)
Registrars, displaced, 1158, 1372; correspondence, 1222, 1276, 1329
Remuneration: Demand for early settlement, 93
— Public health dispute, 336; correction, 424
Rheumatoid arthritis; measuring improvement, 1263
— — Mechanism of relief, 768
— — treatment with steroids, 874
Senior hospital medical officer grade; limits, 876
Shaw, Bernard, 1104
Streptomycin therapy in tuberculosis, 203
Teaching the teacher, 501
Terramycin, 1209
Thrush in infants, 1430
Toast to Bacchus, 1428

LEADING ARTICLES (*continued*):
Tuberculosis and the National Health Service, 1373; 1493 (C)
— chemotherapy of, 1102
— crisis in, 92; correspondence, 165
— non-pulmonary, 403
Tumours, "drying" of, 1159
Vision, loss of, 1482
Vitamin A and the skeleton, 565
— — deprivation in man, 932
— B_{12}, absorption of, 933; correction, 1014
Women in medicine, 822; 887 (C)
World Medical Association; Fourth General Assembly, 1041

Leakey, L. S. B., Hon. D.Sc., conferred on, 373
Learning, physiology of, 94 (A)
Lebanon Hospital for Mental Diseases, 1069, 1503
Lee, James Stewart Jowett, obituary of, 842
Leech, Ernest Bosdin, obituary of, 788
Leeches, indications for use of, 59
— infestation with, haematemesis due to, 679, 784, 891, 1058, 1497
Leeds Joint Council on Industrial Health; annual report, 1180
— University. *See* Universities: Leeds
LEEMING, Donald: Clinical interpretation of pain in the chest, 289
LEES, A. W.: Atelectasis and bronchiectasis in pertussis, 1138 (O); 1162 (A); correspondence, 1331, 1448
LEES, Robert, and others: Chemotherapy of venereal diseases, 351
LEESON, Harold: Time and the doctor, 168
Leeuwenhoek Lecture, Royal Society, 1220
LEFANU, W. R.: The Royal College of Surgeons of England: 150th anniversary, 37
Left, S.: *The Health of the People*, 1207
Leg equalization, femoral lengthening in, 1216
— short, treatment of (Goronwy E. Thomas), 358
— *Thrombosis in arteriosclerosis of lower extremities* (Edward A. Edwards), 150
— Treatment of post-phlebitic leg and application of venous-pressure measurement (A. J. Walker), 1307 (O); 1495 (C)
— ulcer of, para-aminosalicylic ointment for, 1119
— — gravitational influence of heredity in (S. T. Anning), 1305 (O); 1495 (C)
Legg Memorial Lecture, 1289
LEGGAT, Peter O.: Cardiological case finding by means of mass miniature radiography, 1364 (O)
LEHLINGER, E. *See* SCHINZ, H. R., 929
LEHR, David: Choice of sulphonamides for mixture therapy, 601 (O)
Leishmaniasis, mode of transmission of, 1060, 1333, 1495
LEITNER, Z. A.: Foetal pathology and vitamin A, 730
Lemon juice, effect on calcium absorption, 378
LENNIE, R. A.: Prevention of prolapse, 279
LENNON, G. Gordon: Midwife and doctor, 1062
Lens: Retrolental fibroplasia (A. B. Reese and F. Blodi), 343
Leprosy: Mission to lepers, 110
Leucoderma, treatment and effect of pregnancy on, 1404
Leucopenia, treatment of, 960
Leucorrhoea in cervical erosion, 647
Leucotomy: emergency operation (M. O'C. Drury), 609; 787 (C), 1059 (C)
— prefrontal: indications and prognosis, 959
Leukaemia, 672
— congenital; case (N. K. Pein and J. M. Garvie), 253
— myeloid, associated with pregnancy, 681
— — chronic, associated with pregnancy (L. M. Edwards and H. D. Freeth), 199; 418 (C)
— treatment of, with aminopterin, 46
Levatores ani, conservation in colporrhaphy, 168
Leverhulme Research Grant, 230
LEVICK, P. G.: Training for general practice, 727
LEVITT, W. M.: Liability of manufacturers for injuries to patients from defective apparatus (medico-legal note), 1122
LEVONIAN, Rendel: Leech in the nasopharynx, 1058
LEWES, David: Displaced registrars, 1222
LEWIS, A.: Treatment of obesity, 51
— The roots of all evil, 840
LEWIS, Ivor: Indwelling tube for gastric haemorrhage, 1393
LEWIS, J. B. S.: Role of the psychiatric social worker, 291
LEWIS, K. M.: Role of the psychiatric social worker, 292
LEYS, Duncan: Cost of academic clinical office, 1388
Libido, effect of radium-induced menopause on, 79
— excessive, reduction of, 848
Libraries: Medical librarianship in Great Britain, 102
— Medical library of Dr. Erik Waller for Upsala University, 1452
— Role of medical library in the advance of medicine, 883
Lichen planus, treatment of, 690
Lichtenstein, Adolf, obituary of, 1395
Ligatures, unabsorbable, in uterus, 949
Light, polarized, effect on vision, 50
Lighting: Radiation, light and illumination (J. N. Aldington), 277
LIMPT, P. M. v. *See* GOSLINGS, J., 1019
LINDSEY, Mabel: Teething, 1391
Linear accelerators, 616 (A)
Linacre Lecture, 379

LINEHAN, J. J.: Interstitial emphysema in measles, 762 (O)
Linen textiles, British Standard for, 400
LING, T. M., PURSER, J. A., and REES, E. W.: Incidence and treatment of neurosis in industry, 159
LINSELL, W. D., and FLETCHER, A. P.: Laboratory and clinical experience with terramycin hydrochloride, 1190 (O); 1209 (L)
Lipidoses: Diseases of the Cellular Lipid Metabolism (S. J. Thannhauser), 1156
Lipoid deposit in atrophied muscle (Edwin R. Bickerstaff), 660
Lip: Peribuccal pigmentation, 638
Lister Institute; annual report, 212
LISTON, R. Prosper: Reconsideration of B.M.A. policy, 1389
Liston, William Glen, obituary of, 1063
LITTLE, J. D.: Oedema of glottis treated by tracheotomy, 1476
— infestation with, haematemesis due to, 679, 784, 891, 1058, 1497
LITTLER, T. S.: Hearing-aids; value for children, 364

LIVER:
Acute yellow atrophy, treatment of, 629
Anomalous findings in differential diagnosis of jaundice by biochemical tests (P. N. Coleman), 246 (O)
Anoxia as cause of liver damage, 960
disease, severe and acute; regime for treatment (A. L. Latner), 748 (O); correspondence, 1002, 1117
extracts, content of haemopoietic factors in; relationship to clinical response (Ronald H. Girdwood, Kathleen M. Carmichael, and B. Woolf), 1357 (O)
Function tests in infancy, 793
haemangioma of, spontaneous intraperitoneal haemorrhage due to (K. P. S. Caldwell), 1155
therapy: Castle's intrinsic factor (Byron E. Hall), 585 (O); 612 (L); correction, 960

Liverpool Medical Institution, 1179, 1342
— — — Student health services, 1056
— University. *See* Universities: Liverpool.
LIVINGSTONE, D. J.: Acute myocardial infarction following tetraethylammonium chloride therapy, 713; correspondence, 1446
LIVINGSTONE-SPENCE, H. D.: Dead bodies in water, 1389
LLEWELYN, Joan: Inoculation and poliomyelitis, 166
Lloyd, Hilda N., resignation from Chair of Obstetrics and Gynaecology, University of Birmingham, 1286
Lloyd-Williams, Hugh, obituary of, 531
LLOYD-WILLIAMS, Katharine: Women in medicine, 887
— Distinction awards for charity, 1170
Loa loa, effect of "hetrazan" on, 772 (A)
Local Medical Committees, Conference, 1043 (L)
LODGE, W. O.: Damage to antrum during dental extraction, 630
— Oro-antral fistulae, 1062
London County Council, Medical Service, 523
— — — *Report on the Heights and Weights of School Pupils in the County of London in* 1949, 155
London Hospital dinner, 1011
London medical schools, 509
— — — teaching staff, 515
London School of Hygiene and Tropical Medicine: F. Murgatroyd appointed Professor of Clinical Tropical Medicine, 466
London University. *See* Universities: London
Longevity, effect of athleticism on, 1183
LORBER, John: Use of rectal thiopentone in children, 21 (O); 368 (C), 891 (C)
— *See* EMERY, J. L., 702
LORRIMAN, Gerard, and MARTIN, W. J.: Trial of antistin in the common cold, 430 (O); 449 (L); correspondence, 631, 785
LOUDON, A. W. B.: Training for general practice, 622
Louis, Florence, obituary of, 580
LOVE, R. J. McNeill: Intravenous morphine, 215
— A vestigial tail, 1005
Low, Alexander, obituary of, 1282
LOWE, C. R.: Care of the chronic sick—V. (Investigation of 393 patients seeking admission to a hospital for the chronic sick), 699 (O)
Lowenberg, Max, obituary of, 1394
LOWIS, R. M. B.: Unusual thoracic aneurysm, 1118
Lowson, William, obituary of, 954
LOXTON, Geoffrey E.: The true source of colchicine, 893
LUCIA, S. P. *See* AGGELER, Paul M., 765
LUMB, George: Diffuse eosinophilic arteritis, 645 (O)

LUNG:
Abscess as complication of E.C.T., 1377 (A)
Atelectasis and bronchiectasis in pertussis (A. W. Lees), 1138 (O); 1159 (A); correspondence, 1331, 1448
Cancer of lung and smoking, 107
— production by use of petrol lighter, 529, 682
Carcinoma; association with tobacco smoking (Richard Doll and A. Bradford Hill), 739 (O); 767 (L); 889 (C), 890 (C), 1004 (C), 1060 (C)
Harvesters' lung; a fungus infection, 1184
Hydatid cysts; medical treatment (Mariano R. Castex and Eduardo L. Capdehourat), 604 (O)
Inhalation of blood and other debris during dental extraction, 936 (A)

LUNG (*continued*):
Post-pneumonic collapse of right lower lobe relieved by bronchoscopic aspiration (Arthur Miller), 764
Post-tuberculous middle lobe syndrome, 407 (A)
Pulmonary stenosis, 694
Resection in pulmonary tuberculosis (O. F. Thomas), 288
tuberculosis of. *See* Tuberculosis, pulmonary

Lupus erythematosus—an auto-antibody disease?, 1175
— — disseminated, effect of adrenocorticotrophic hormone on capillary resistance in, 975
— — effect of cortisone in, 593
LYELL, Alan: Treatment of warts, 729
— and MILES, J. A. R.: Orf in man, 1119
Lyle, William, obituary of, 531
Lymphatic system (J. M. Yoffey and others), 284
LYON, L. Carlyle: Osler memorials, 298
Lyons, James, obituary of, 111
Lysivane therapy for parkinsonism (Harold Palmer and D. J. A. Gallagher), 558 (O); 569 (A)
LYTH, Oliver: Problem of the therapeutic convulsion, 1224
LYTLE, J. D. M.: Sea-sickness, 1225

M

MABERLY, Alan: General care of the physically handicapped child: psychological effects, 273
— Do weed-killers poison food?, 299
MACAFEE, C. H. G.: Limitations of radiographic assistance in diagnosis of placenta praevia, 1055
McALPINE, Kenneth, obituary of, 112
McAUSLAND, Stuart: Varicose ulceration; importance of bandaging, 270
MACCALLUM, F. O.: Clinical poliomyelitis in association with peripheral inoculation of prophylactics, 6 (O); 28 (L)
MACCALMAN, D. R.: Role of the psychiatric social worker, 292
McCANCE, R. A.: Practice of experimental medicine, 1492
McCARTHY, Brendan: Volvulus of small intestine, 1392
MACCARTHY, Robert A.: Cortisone and psychoses, 729
McCONACHIE, J. A. *See* NEEDHAM, C. D., 133, 415
MacCormac, Henry, obituary of, 1449, 1500
McCrea, John, obituary of, 1177
McCURRICH, H. J.: Multiple primary carcinoma, 107
MACDONALD, A. C., MONRO, I. C., and SCOTT, G. I.: Fatal case of poisoning due to inhalation of methyl bromide, 441 (O); correspondence, 625, 681
MACDONALD, D. S.: Psychology and science, 1114
MACDONALD, G.: Residual insecticides in Assam, 414
MACDONALD, T. C.: Scarlet fever, rheumatic fever, and acute nephritis, 49
McDWYER, A. D.: Penicillin in typhoid, 1392
Macevoy, Henry John, obituary of, 1396
McFARLANE, A. S.: Electron microscopy, 272
McGINNESS, W. J., and TELLING, R. C.: Vulvovaginitis in a child due to *Shigella flexneri*, 1424
McINTYRE, J. H.: Aerocele: case, 25
McIntyre, Sir John, obituary of, 952
MACKAY, W. A.: Smallpox in the unvaccinated, 220
McKEE, G. K.: Nail-plate for intertrochanteric fractures, 1225
MACKEITH, R. C.: Helminth infestation in children, 358
MACKENNA, R. M. B.: The problem of psoriasis, 207; 530 (C)
— Parasitology in relation to dermatology, 287
MACKENZIE, J. C. H.: Some aspects of bronchiectasis, 356
McKENZIE, K. *See* DRURY, M., 1278
MACKEY, W. Arthur: Intra-arterial histamine in treatment of claudication and rest pain, 1086 (O)
McKINNEY, P. P.: Xanthoma palpebrarum and cardiovascular disease, 1259
MACKINTOSH, J. M.: Social medicine, 274
MACLACHLAN, J. T.: Teaching of the medical student, 524
— obituary of, 1228
McLACHLIN, A. D. *See* CRASSWELLER, P. O., 977
McLAREN, Hugh C.: Ill effects of the radium menopause, 76 (O)
— Abortion, 367
MacLean, Archibald, obituary of, 895
MACLENNAN, Hector R.: Management of malpositions of the vertex, 800 (O); correspondence, 1172
MACLEOD, Kenneth I. E.: Leech in the nasopharynx, 1058
MacLeod, Roderick, obituary of, 171
MACMATH, Ian F.: Spontaneous amputation of cervix, 498; 1061 (C)
M'Naghten Rules, 312
MCNEIL, Charles: Verities yet in their chaos, 961 (O)
— Special centres for child health, 1170
Macpherson, Angus Duncan, obituary of, 631
Macrae, Angus, appointed Secretary of B.M.A., 1107 (A)
MACWILLIAM, H. H.: Displaced registrars, 1329
Madsen, Sten: *On the Classification of the Shigella Types*, 610
Magnesium sulphate, local action of, 310
MAHER, J. B.: Stevens-Johnson syndrome, 369
MAHONEY, L. J., and BARRIE, H. J.: Adrenal insufficiency after suramin treatment of pemphigus, 655 (O)
Maingot, Rodney (Editor): *Techniques in British Surgery*, 1039
MAITLAND, D. G.: Radiation in the shoe shop, 1120
Maladie de Roger, 643, 645

MALARIA:
Antimalarial drugs in West Africa, with particular reference to proguanil; results of a survey in Nigeria (Leonard J. Bruce-Chwatt and Joan M. Bruce-Chwatt), 7 (O)
Comparative therapeutic value of antimalarial drugs, 9
congenital; report of three cases (B. S. Jones), 439 (O); 451 (A)
Control by residual insecticides, 414
— campaigns (parliamentary note), 1502
— in Assam, 414
— in East Bengal, 589
Incidence in non-Africans living in West Africa, 8
parasite, recent advances in knowledge of (H. E. Shortt), 606 (O)
Ross Award, 1069
Toxic effects of antimalarial drugs, 10
World Health Organization control projects in India, Thailand and Afghanistan, 816

Malaya: Health of troops, 54
Malformations, congenital, risk of, 793
MALONE, R. H.: Transmission of kala-azar, 1333
— *See* COCHRANE, J. B., 1203
MALPAS, Percy: Contamination of caesarean wounds by vernix caseosa, 763

Manchester Medical Society:
Formation, 104, 899
Inaugural meeting, 1221
Section of Medicine: Dangers of indiscriminate treatment with intravenous fluids, 1387
Section of Odontology: Pain as an aid to diagnosis, 1492
Section of Pathology: Laboratory diagnosis of lymphocytic chorio-meningitis, 1387
Manchester University. *See* Universities: Manchester
MANDEL, L. *See* KERSLEY, G. D., 855
Mangoes, intestinal obstruction due to, 787
MANKIKAR, D. S. *See* GREEN, R., 1154
MANLEY, W. B.: Medical Bill, 108
MANN, Bertram: Atelectasis and bronchiectasis in pertussis, 1331
Mann, Dorothea Jane, obituary of, 464
MANN, Hamish M.: Controller for the all-glass syringe, 294
MANN, P. G. *See* HARLAND, J. C., 188
MANN, W. N. *See* FORBES, John, 499
MANSON-BAHR, Sir Philip: Vaccination and inoculation certificates, 215
Mantoux conversion, 1173
Manubrio-sternal joint in rheumatoid arthritis (Andrew Bogdan and Justin Clark), 1361 (O)
Manufacturers, liability for injuries to patients from defective apparatus (W. M. Levitt) (medico-legal note), 1122
MARCUS, R.: Haemolytic streptococcal gangrene of breast successfully treated with streptomycin, 394 (O); correspondence, 1278

Marriage and tuberculosis, 309
MARRIOTT, O.: Vaccination certificates, 416
Marrow, vegetable, diuretic effect of, 1014
— *See also* Bone-marrow
MARSH, Joan: Safety in prams, 1002
MARSHALL, C. McIntosh: Diagnosis of placenta praevia, 1055
MARSON, F. Graham, MEYNELL, M. J., and TARBUSH, H.: Familial crisis in alcholuric jaundice, 760 (O)
Martin, E. B., awarded Gilbert Blane Gold Medal of Royal College of Physicians, 634
MARTIN, W. J. *See* LORRIMAN, Gerard, 430
Martius, Henrich: *Gynäkologische Operationen und ihre topographisch-anatomischen Grundlagen*, 6th ed., 563
MASON, George A.: Pulmonary tuberculosis and thoracic surgery, 1118
MASON, R. M.: Familial ankylosing spondylitis, 1490
— *See* QUIN, C. E., 810
MASSEY, L. W. C.: Bone-marrow infusions: intratibial and intravenous routes compared, 197 (O)
Matches, paraffin-impregnated, as possible cause of lung cancer, 682
Maternal mortality and morbidity in failed forceps cases, 20
Maternity benefits for confinement at home (parliamentary note), 1065
— home vested in the Minister (medico-legal note), 55
MATHER, K. *See* DARLINGTON, C. D., 1426
Matthew, Edwin, obituary of, 221
MATTHEW, Henry: After-history of successfully treated cases of subacute bacterial endocarditis, 436 (O); 450 (A)
Matthews, O.: *Hospital Improvement*, 878
MATTHEWS, Stafford. *See* JELLIFFE, D. B., 814
Mayo, Thomas Alfred, obituary of, 1228

Measles (epidemiological note), 1454
— interstitial emphysema in (J. J. Linehan), 762 (O)
Meat and chicken soups, nutritive value of, 1404
— porters, hygienic clothing for (parliamentary note), 1502
Medical Act, 1950, 337 (L)
Medical and Dental Defence Union of Scotland, 521
Medical Annual, 1950, 990
Medical Auxiliary Services, 523
Medical Bill, 108; 112 (parliamentary note)
— — Committee stage (parliamentary note), 223
— — further consideration in Committee, 302; Report stage, 303 (parliamentary notes)
— Royal Assent (parliamentary note), 371
Medical contract from the eighteenth century (A. Fessler) (Nova et Vetera), 1442
Medical Defence Union, 521; annual report, 1050
Medical education. *See* Education, medical
Medical examinations, routine, 1001, 1170
Medical Group (parliamentary note), 55
Medical Insurance Agency: annual meeting, 119
Medical items in the popular press, 890
Medical officer of health, social medicine in relation to, 290
Medical Officers of Health, Society of, 521, 899
Medical Practices Advisory Bureau, 517
Medical Practices Committee, 517
Medical Practitioners' Handbook, 452 (A)
Medical Practitioners Union: Scheme for remuneration of general practitioners, 1264 (A)
Medical Protection Society, 521
Medical Register: statistics, 514
Medical research in Scotland; Advisory Committee, 175
— — Nuffield Foundation; annual report, 42
Medical Research Council:
Causes of blindness in England and Wales; memorandum by Arnold Sorsby, 1482
Clinical trials of antihistaminic drugs in the prevention and treatment of common cold; report by special committee of Medical Research Council, 425 (O); 448 (L); correspondence, 631, 785, 1062, 1444
New members, 468
Non-pulmonary tuberculosis, 403 (L)
Pneumoconiosis Research Unit, 957
— — — opening of new laboratories at Llandough Hospital, 1167
Special Report No. 264: *Vitamin-A Requirements of Human Adults—A Study of Vitamin-A Deprivation in Man*, 932
Special Report Series, No. 270: *Design of Toxicity Tests* (W. L. M. Perry), 1101
Travelling awards, 791
Treatment of pulmonary tuberculosis with streptomycin and para-amino-salicylic acid, 1073 (O); 1102 (L); 1391 (C)
Medical schools, undergraduate, 509, 511
Medical Sickness Annuity, and Life Assurance Society, Ltd.; annual general meeting, 73
Medical Society of London; annual oration, 1233
Medical Women's Federation, 521, 534
Medicine:
The advance of medicine (Sir Lionel Whitby), 832
British Encyclopaedia of Medical Practice, Vol. 1, 2nd ed. (Editor: Lord Horder), 1426
Clinical Examination of Patients (John Forbes and W. N. Mann), 499
experimental: Practice of experimental medicine, 1492
forensic. *See* Medico-legal
Further Rare Diseases and Debatable Subjects (Editor: F. Parkes Weber), 446
history. *See also* Nova et Vetera
— Humanism, history, and natural science in medicine (F. M. R. Walshe), 379 (O); 524 (C), 623 (C), 676 (C), 677 (C), 783 (C), 943 (C), 1057 (C), 1114 (C)
— Manchester University lectures, 1179
— Medico-historical pilgrimage, 214
— Royal College of Surgeons of England: 150th anniversary (W. R. LeFanu), 37
— Scottish Society of the History of Medicine, 2nd annual report, 1440
— Verities yet in their chaos (Charles McNeil), 961 (O)
in the Colonies (parliamentary note), 1230
internal: International Congress of Internal Medicine, 585–608; 612 (L); 940
Lehrbuch der Inneren Medizin, Vols. I and II (H. Assmann and others), 662
Medicine, science, and humanism; reflections on the first half of the twentieth century (Sir Henry Cohen), 179 (O); 202 (L)
Methods and men in the teaching of clinical medicine (Sir Henry Cohen), 478 (O); 501 (L)
nomenclature. *See* Nomenclature
tropical. *See* Tropical medicine
Widening horizons, 665
Medico-legal:
American Academy of Forensic Sciences; second annual meeting, 1401
Apparatus: Liability of manufacturers for injuries to patients from defective apparatus (W. M. Levitt), 1122
Claim against doctors fails, 116
Medico-legal (*continued*):
Claims against hospitals; difference between Scots and English law, 954
Death after new drug (G.T.41), 633
Doctor exonerated for negligence, 420
Drunk but not in charge of car, 1064
Lehrbuch der gerichtlichen Medizin (Editor: Albert Ponsold), 1479
Maternity home vested in the Minister, 55
Medical Jurisprudence and Toxicology, 9th ed. (John Glaister), 446
Nationalization and charity, 685
Pregnancy, abnormal duration of, 1451
Refusal to appear in court, 1176, 1392
Rigor mortis (H. A. Shapiro), 304
Swab, death due to, 1399
Tetanus, death from, 1283
Trespass and assault, 370
Trespass by house-surgeon, 171, 370; 528 (C)
Meenan, James Nahor, obituary of, 1337
Meiklejohn, A. P.: General adaptation syndrome, 164
Melaena, haematemesis and (C. D. Needham and McConachie), 133 (O); 153 (L); 366 (C), 414 (C), 459 (C), 628 (C), 838 (C)
Melgrave, M.: The G.P.'s clinical training, 574
Mellanby, Sir Edward. *See* Fell, Honor B., 535
Mellor, Norman: Syphilis and "chloromycetin," 1227
Melton, G. *See* Hobart, F. G., 401
Menarche, further observations on age at (Dagmar C. Wilson and Ian Sutherland), 862 (O)
Meningitis, influenzal, treated with chloramphenicol (R. Green, D. S. Mankikar, and J. S. Millett), 1154
— pneumococcal: treatment with penicillin, 618
— spinal, adhesive, chronic, associated with lumbar naevus and dimple (T. R. Savage), 709 (O)
— treatment with streptomycin, 670
— tuberculous, hospital failures in diagnosis of, 296
— — in pregnancy; effect of streptomycin therapy on foetus, 787, 952
— — relation of onset to trauma, 1345
— — treatment with streptomycin, 413, 524
Menopause, artificial; ill effects of the radium menopause (Hugh C. McLaren), 76 (O)
— physiological basis, diagnosis, management, and treatment, 1214, 1268
— Post-menopausal bleeding (A. M. Claye), 282
— prolonged, 737
Menorrhagia in cervical erosion, 648
Menstruation, age of onset of; further observations (Dagmar C. Wilson and Ian Sutherland), 862 (O)
— Amenorrhoea, investigation of, 59
Menstruation and its Disorders (Editor: Earl T. Engle), 1206
— Menstrual disorders and the menopause; physiological basis and diagnosis; management and treatment (P. M. F. Bishop), 1214, 1268
— vomiting in, 177
Mental Defect, Biology of (Lionel S. Penrose), 1156
Mental Health:
Conference at Salford, 713
Mental hospitals, progress in, 568 (A); 729
— — reduced fares for visitors, 346
World Federation for Mental Health; 3rd annual meeting, 422, 620
Menzies, Hilda: Child welfare—past, present, and future, 1280
2-Mercaptoimidazole in treatment of thyrotoxicosis; clinical impressions (George L. Foss), 1252 (O); correspondence, 1447
Mercer, Walter: Treatment of acute osteomyelitis, 359
Meredith, G. Patrick: The art of lecturing, 475 (O); 501 (L)
Merit awards. *See* Distinction awards
Merrill, V.: *Atlas of Roentgenographic Positions*, 200
Methyl bromide poisoning, effects of, 848
— — — fatal due to inhalation (A. C. MacDonald, I. C. Monro, and G. I. Scott), 441 (O); correspondence, 625, 681
Methyl-thiouracil in thyrotoxicosis, 81
Meulengracht, E.: Thiouracil and vertigo epidemica, 1493
Mewhirter, William Henry Walker, obituary of, 789
Meyer, B.: Domiciliary treatment of tuberculosis, 626
Meynell, M. J. *See* Marson, F. Graham, Meynell, M. J., and Tabbush, H., 760
Michie, W.: Haemorrhage from peptic ulcer, 628
Micklem, Lorna P. *See* Shattock, F. Mackenzie, 1058
Micks, R. H.: *The Essential of Materia Medica, Pharmacology and Therapeutics*, 5th ed., 91
Microbiology, development of; first Leeuwenhoek Lecture of the Royal Society, 1220
— International centre for chemical microbiology in Rome, 1289
Microscopy: Electron microscopy, 1432 (A)
— new methods (R. Barer and others), 272
Micturition; frequency in cervical erosion, 648
— frequency of, treatment with antihistamines, 836
— inhibition in males, 469
Middlesex Hospital Medical School: Annual dinner, 832
Midge-bites, treatment of delayed reaction to, 377
Midwives: Annual Report of Central Midwives Board, 534
— Midwives (Amendment) Bill (parliamentary note), 116
— Relationship with doctor, 1062
— Uniform (parliamentary note), 116
— without certificates (parliamentary note), 1123
Migraine; symptomatology and treatment (Macdonald Critchley), 996
Mikulicz-Radecki, Johann, centenary of birth of (Nova et Vetera), 103; correspondence, 630, 839, 1004
Mileage allowances for country doctors (parliamentary note), 172
Miles, J. A. R. *See* Lyell, A., 1119
Military medicine: 13th International Congress of Military Medicine, 1453
Milk productions, supervision of, 1000
— value of pasteurization, 1345
Millar, E. L. M., and Pownall, Margaret: Food-poisoning in Sheffield in 1949, 551 (O); 614 (L); 731 (C)
Millar, J. H. D.: Stress and the general adaptation syndrome, 104
Millard, A. *See* Dmochowski, L., 1136
— *See* Passey, R. D., 1134
Millard, C. Killick: Smallpox in the unvaccinated, 300
— Activity in advancing years, 1120
— Euthanasia, 1447
Miller, A. Donald: Mission to lepers, 110
Miller, Arthur: Post-pneumonic collapse of right lower lobe relieved by bronchoscopic aspiration, 764
Miller, Emanuel: Treatment of obsessional neuroses, 41
— Psychological needs of the child, 211
Miller, H. *See* Walter, J., 333
Miller, James: Amoebiasis in Great Britain, 530
Miller, R. A.: Precordial pulsation in children, 1174
Milles, H. L., and Salt, H. B.: Parathion poisoning, 444
Millett, J. S. *See* Green, R., 1154
Milligan, Wyndham Anstruther, obituary of, 632
Mills, W. G.: Hydrops foetalis and rhesus incompatibility, 951
Milne, Francis Molison, obituary of, 1450
Milner, I. H.: Brachial neuralgia, 48
Mining:
Deaths and injuries in mines, 1948–9, 1465
Health and safety in mines (parliamentary note) 303
Knockshinnoch Castle Colliery disaster, 834
Miners' Welfare Commission, 376
Ministry of Health:
Circular on registrars, 1158 (L), 1222, 1276, 1284, 1329, 1340, 1372 (L), 1388, 1443, 1501
Circular on senior hospital medical officer grade, 876
Duty-free spirits in hospitals, 163
Interim Report of the Departmental Committee on the Deterioration of Cast Iron and Spun Iron Pipes, 196
Streptomycin in treatment of tuberculous meningitis, 413, 524
Minnitt, R. J.: Resuscitation of the newborn, 277
Missions, medical, 522
Mitchell, S. Weir: Novelist and Physician (Ernest Earnest), 989
Mitchell-Heggs, G. B. (Editor): *Modern Practice in Dermatology*, 1950, 200
Mitra, A. K. *See* Mukherjee, S. K., 88
Mitral stenosis, supranuclear bulbar palsy (pseudo-bulbar palsy) in (Kenneth W. G. Heathfield and Eric C. O. Jewesbury), 1196 (O)
Models; use in medical education, 489
Mogey, G. A., and Trevan, J. W.: D-Tubocurarine salts and derivatives, 216
Moir, Edward, obituary of, 464
Moir, H. Maitland: Cracked and painful fingertips, 424
Moncrieff, Alan: Child health and the future, 795 (O); 824 (L); 945 (C), 1001 (C), 1170 (C), 1280 (C)
Mongolism, familial incidence of, 959
— in one of twins, 461; rhesus groups, 1172
— in one of twins (T. H. Crozier and W. A. B. Campbell), 869 (O); correspondence, 1118
Monilia albicans infection, 1430
Mononucleosis, infectious, treatment of, 1455
Monro, I. C.: Poliomyelitis and fatigue of travel, 164
— The importance of preventive medicine, 678
— *See* MacDonald, A. C., 441
Monsarrat, K. W.: *Human Desires and Their Fulfilment*, 1316
Monsters: Case of double-headed monster (S. D. Karve), 988
Montag: Mildred. *See* Wright, Harold N., 255
Montana sanatorium, 295
Montuschi, E.: Sulphonamide dosage in kidney infection, 526
Moodie, G.: Thrombocytopenic purpura due to quinidine, 553 (O)
Moore, Alfred William, obituary of, 896
Moore, H. D.: Some unusual but instructive surgical emergencies, 756 (O)
Moore, L. G., and Rumball, C. A.: Treatment of typhoid carrier with penicillin and sulphamerazine, 400

Moragas, E.: A foreign body in the rectum, 891
Morgan, F. C. *See* Johnston, Lennox, and Morgan, F. C., 630
Morley, A. H.: Obstetrical anaesthesia, 47, 461
Morley, Derek Wragge: A secret remedy for cancer, 726, 1004
Morphine in status asthmaticus, 110
— intravenous administration, advantages of, 215
— substitutes, 737, 794
Morrah, Dermot: The delinquent child, 211
Morris, C. R., and others: A Leeds commemoration, 297
— *See* Heaf, F. R. G., 1497
Morris, W. I. C.: Psychological involvements of child-bearing, 275; 526 (C)
Morrissey, D. M.: Gastric ulcer occurring after vagotomy, 651 (O); 893 (C), 950 (C)
Mosbech, Johannes, and Videbaek, Aage: Mortality from and risk of gastric carcinoma among patients with pernicious anaemia, 390 (O); 405 (A); correspondence, 575, 892, 1059
Mosquito bites; treatment, 178
Mouth: *Klinik der Zahn-, Mund- und Kieferkrankheiten* (Hermann Wolf), 254
— Peribuccal pigmentation, 638
Movitt, E. R.: *Digitalis and Other Cardiotonic Drugs*, 2nd ed., 715
Moyne Institute of Preventive Medicine, 899
Moynihan, F. J.: Euthanasia, 1447
Moynihan Lecture, 39
Mukherjee, S. K., and Mitra, A. K.: *Plasmodium vivax* infection, 88
Mulcahy, Risteard: The meaning of heart failure, 1390
Murgatroyd, F., appointed Professor of Clinical Tropical Medicine at London School of Hygiene and Tropical Medicine, 466
Murley, Reginald S.: Distinction awards, 726, 887
Murray, Archie G.: Volvulus of transverse colon complicating labour, 659
Murray, E. R. B.: Delayed post-natal separation of the cord, 893
Murray, F.: Treatment of pink disease, 1116
Murray, Farquhar: Treatment of occipito-posterior presentations, 1172
Murray, Ian: Observations on the treatment of thyrotoxicosis, 80 (O)
Murray, James Alexander, obituary of, 1281
Murray-Browne, W. G.: B.M.A. policy, 1497
Muscles:
Atrophy, lipoid deposit in (Edwin R. Bickerstaff), 660
Movements, 674
Relaxants: Decamethonium iodide as curarizing agent in general anaesthesia (A. R. Ellerker), 398 (O)
— — — in anaesthesia for peroral endoscopy (C. F. Scurr), 1311 (O)
— — — in treatment of tetanus (R. McD. S. Keir), 984 (O); 994 (A)
— Hexamethonium bromide in duodenal ulcer (L. D. W. Scott and others), 1470 (O)
— — — in severe hypertension (Allan Campbell and Eric Robertson), 804 (O); 826 (A)
— — salts, oral; effect on gastric secretion (A. W. Kay and A. N. Smith), 807 (O); 826 (A)
— Prolonged intercostal paralysis due to a relaxant (H. Barrie Fairley), 986 (O)
— Tubocurarine, effect on central nervous system, 95 (A)
— D-Tubocurarine salts and derivatives, 216, 367
— Unusual complication of myanesin in treatment of tetanus (M. L. Newhouse, J. D. Rochford, and G. Riddell Royston), 981 (O); 994 (A)
— Use in newborn, 1420
Spasm in paraplegics, 793
— in poliomyelitis, relief of, 879 (A)
Mushin, W. W.: Visit to Copenhagen, 956; correction, 1014
Mustafa, Dawood: Some aspects of *Schistosoma mansoni* infection, 658 (O)
"Myanesin" in Parkinson's disease, 121
— in treatment of tetanus; an unusual complication (M. L. Newhouse, J. D. Rochford, and G. Riddell Royston), 981 (O); 994 (A)
Myasthenia gravis; treatment with guanidine, 178
Myeloma, plasma-cell; treatment and prognosis, 232
Myers, Bernard: Splenomegaly in thrombocytopenic purpura, 960
Myocardial disease, electrocardiogram in, 881
— infarction, acute, following tetraethylammonium chloride therapy (D. J. Livingstone), 713; correspondence, 1446
— — anticoagulant therapy, 965
— — electrocardiogram in, 881

N

Nabarro, J. D. N.: Use of intravenous amphetamine sulphate in acute barbiturate poisoning, 924 (O); correspondence, 1333
Naevus, lumbar, in chronic adhesive spinal meningitis, 709
— treatment of, 122
Nail biting, treatment of, 1071
Nails, ringworm of; treatment, 1291
Naish, F. Charlotte: Child health and the future, 945
— and others: Breast-feeding, 350
Napier, L. Everard: Dermal manifestations of parasitic infections, 288
— Transmission of kala-azar, 1495
Nardell, Sydney G.: Ollier's disease: dyschondroplasia, 555 (O)
National Assistance Board: Travelling expenses of patients, 562
National Association for Maternity and Child Welfare; annual conference, 210, 525
National Association for the Paralysed, 301
National Association for the Prevention of Tuberculosis: Tuberculosis Prize, 1233
National Conference of Social Work: *Social Work in the Current Scene*, 716
National Health Service:
Aliens and National Health Service (parliamentary note), 1065
Capitation fee (parliamentary note), 1398
Distinction awards, 172 (parliamentary note), 726, 783, 835, 887, 944, 1006 (parliamentary note), 1060, 1163 (A), 1170, 1285 (parliamentary note), 1329
— — and charity, 1163 (A); 1170, 1329
— — denied, 878 (A); 881, 944
Doctor's list, reduction of (parliamentary note), 1284
Doctors for new estates (parliamentary note), 1285
Doctors' prescription of unauthorized substances (parliamentary note), 372
Drugs; cost (parliamentary note), 116
Expenditure: a failing policy, 1262 (L); 1328, 1389, 1447, 1497
Free treatment when abroad (parliamentary note), 1230
Maternity benefits for confinement at home (parliamentary note), 1065
Maternity expenses incurred in private institution, reimbursement for (parliamentary note), 1230
Maternity home vested in the Minister (medico-legal note), 55
Merit awards. *See* Distinction awards, *above*
National Hospital Service Reserve; enrolments at Sept. 1950, 1477
Nationalization and charity (medico-legal note), 685
Pay in the salaried services, 992 (L); 1480
Prescriptions, economy in, 529
Prize Fund, expropriation of, 406 (A)
Public Health Service; salary award by Industrial Court, 1480
Reciprocal arrangements with the Channel Islands, 307
Reconsideration of B.M.A. policy, 1389; 1497 (C)
Registrars, reduction in number of, 1158 (L); 1222, 1276, 1329, 1372 (L), 1388, 1443; 1284, 1340, 1501 (parliamentary notes)
Remuneration: Demand for early settlement, 93 (L)
— Professor Bradford Hill's inquiry, 1218; 1208 (L)
Senior hospital medical officer grade; limits, 876 (L)
Sports facilities for hospital patients and staff, 557
Superannuation: Ministry of Health booklet, 1327
Superannuation Scheme for Those Engaged in the N.H.S., 559
Tuberculosis and the National Health Service; report of B.M.A. Tuberculosis and Diseases of the Chest Group committee, 1382; 1373 (L); 1493
— Treatment; memorandum from Minister of Health, 162; 154 (A); 416 (C), 577 (C)
National Hospital Service Reserve, 600
National Institute for the Deaf; annual general meeting, 176
National Insurance Act: Local advisory committees, 149
— — — Sickness benefit; time limits, 7
— — contributions, exemption for foreign students, 474
National Marriage Guidance Council, 248
National Register of Medical Auxiliary Services (Speech Therapists), 956
National Service exemption (parliamentary note), 1399
— — — of university students from extended service (parliamentary note), 843
National Smoke Abatement Society, 761
Natural science, humanism, and history in medicine (F. M. R. Walshe), 379 (O); 524 (C), 623 (C), 676 (C), 677 (C), 783 (C), 943 (C), 1057 (C), 1114 (C)
Naylor, A.: Arteriovenous fistula complicating an amputation stump, 928
Naylor, E. J. *See* Stanworth, A., 50
Neech, F. D.: Substances added to tobacco, 1060
Needham C. D and McConachie, J. A.: Haematemesis and melaena, 133 (O); 153 (L); 366 (C), 414 (C), 415 (C), 459 (C), 628 (C), 838 (C)
Needles, surgical, shortage of (parliamentary note), 372
Negligence; doctor exonerated (medico-legal note), 420
"Neoantergan," pharmacological action of, 691
Neomycin and streptomycin; an antibiotic approach to tuberculosis (Selman A. Waksman), 595 (O); 615 (A)
— potentialities of, 600
Neonatal infections, 361
Nephritis, acute, duration of fatal case, 109
— — incidence compared with scarlet fever and rheumatic fever, 49
— *Natural History of Bright's Disease* (G. E. M. Scott), 564
— "Type II," Cushing's syndrome presenting with feature of (F. W. Wolff), 1037
Nerve blocking, therapeutic applications of (G. C. Steel), 293
— fibres, 675
Nerves, peripheral, blood supply of, 261 (A)
Neuralgia, brachial, 48
— glossopharyngeal, 1045 (A)
— trigeminal, paroxysmal; rare forms and their relation to disseminated sclerosis (Wilfred Harris), 1015 (O); 1045 (A); correspondence, 1334, 1444
Neurodermatitis of scalp, 584
Neurology:
Experiments on the nervous system; Stephen Paget Memorial Lecture (E. D. Adrian), 1385
Institute of Neurology, 507
Neurology, 1233
Nomenclature, 463
Practical Neurological Diagnosis, 4th ed. (R. Glen Spurling), 27
Neuropathy in folic-acid-treated pernicious anaemia; effect of vitamin B_{12} on (H. Fuld), 147 (O); 417 (C), 527 (C)
Neurophysiology: *Physiology of the Nervous System*, 3rd ed. (J. F. Fulton), 563
Neurosis in industry; incidence and treatment (T. M. Ling, J. A. Purser, and E. W. Rees), 159
— Observations on a refugee population in Austria, 776
Neurosurgery: Society of British Neurological Surgeons, 214
Neurosyphilis, treatment of, 934 (A)
Neville, Sylas, Diary of. Edited by Basil Cozens-Hardy (D. V. Hubble) (Nova et Vetera), 1491
New York: Health Council of Greater New York, 14
New Zealand: Mars and Aesculapius; A New Zealand Memorial Oration (Sir Arthur Porritt), 1438
New Zealand School Dental Nurses, 1162
Newbold, George: Unsuspected coat button in an infant, 1061
Newborn. *See* Infant, newborn
Newcastle Town Moor Isolation Hospital to be equipped as plastic surgery centre, 1064
Newcombe, J.: Poliomyelitis and inoculations, 416
Newell, R. L.: Distinction awards, 783
Newhouse, M. L., Rochford, J. D., and Royston, G. Riddell: An unusual complication of myanesin therapy in treatment of tetanus, 981 (O); 994 (A)
Newlands, Bethia Muir, obituary of, 112
Newman, P. P.: Emergency leucotomy, 787
Newspapers, medical items in, 890
Newton, Robert: Value of antenatal exercises in prevention of prolapse, 280
Nicholson, David: Pulmonary complications of pertussis, 1448
Nicholson, G. W. deP.: *Studies on Tumour Formation*, 333
Nightingale, Florence, biography of (Cecil Woodham-Smith), 1315
— Views on the age at which a young lady should become a nurse (Nova et Vetera), 1328
Nightingale, H. J.: Radical cure of hernia, 731
Nitrogen mustards in chemotherapy of cancer, 1272
Nitrous oxide and oxygen anaesthesia, pethidine as adjunct to (H. F. Griffiths), 763; correspondence, 1334
Niven, Janet: Histopathology of atypical pneumonia, 283
Nixon, W. C. W., tour of U.S.A., 636
Nobel prizes, 1046 (A); 1050
— — review of awards during 50 years, 1385
Nomenclature, medical, 462
— Naming of drugs, 1174
Norman, H. Bathurst: Distinction awards, 944
Norman, Leslie G.: Medical examination in industry, 289
Norman, Richard. *See* Latto, Douglas, 926
Norman-Barnett, H.: Wrong use of fenestration operation, 1281
Norris, T. St. M. *See* Coyle, Cecil D., 1223
North of England Obstetrical and Gynaecological Society, 214, 629, 1342, 1503
North of England Surgical Society, 1123
North-east London Clinical Society, 57
Northern Ireland: Registrar-General's quarterly returns (epidemiological note), 735, 1402
— — Restriction of medical list (parliamentary note), 53
Nose: An Experimental Study of Reactions Within the Nose in Human Subjects During Varying Life Experiences (T. H. Holmes and others), 662; 952 (C), 1120 (C)
Notes and Comments: 60, 122, 178, 232, 310, 378, 424, 470, 584, 638, 738, 794, 960, 1014, 1072, 1128, 1184, 1236, 1292, 1346, 1404
Nova et Vetera:
Giordano Bruno and the circular motion of the blood (Walter Pagel), 621
Development of Gynaecological Surgery and Instruments by James V. Ricci (R. W. Johnstone), 163

NOVA ET VETERA (*continued*):
Diary of Sylas Neville, 1767–1788 (Editor: Cozens-Hardy, Basil) (D. V. Hubble), 1491
Paul Ehrlich by Martha Marquardt (Charles Singer), 267
William Harvey, portraits of (Geoffrey Keynes), 43
William Hunter; a new portrait (C. R. Rudolf), 886
Medical contract from the eighteenth century (A. Fessler), 1112
A medico-historical pilgrimage, 214
Johann Mikulicz-Radecki, centenary of birth of, 103; correspondence, 630, 839, 1004
Florence Nightingale: Views on the age at which a young lady should become a nurse, 1328
Nuffield, Lord, appointed president of British Rheumatic Association, 899
Nuffield Foundation; annual report, 42
— — Dominion travelling fellowships, 635
— Laboratory of Ophthalmology, presentation to, 1012
NURSES AND NURSING:
Conference on educational scope and potentialities of the Nurses Act (1949), 656
Educational requirements of recruits, 547
Florence Nightingale's views on the age at which a young lady should become a nurse (Nova et Vetera), 1328
Nurses Act, 1949; educational scope and potentialities, 656
Nurses and tuberculosis, 525
— for tuberculosis sanatoria (parliamentary note), 1285
Part-time nurses (parliamentary note), 1286
Revised rates of payment for health visitors, district nurses and midwives, 782
— salary scales, 328
Scottish *Register*, 604
War Memorial Chapel, 1124
NUSSEY, A. M.: Haemorrhage from peptic ulcer, 366
Nutrition Research Laboratories, Coonoor, 102

O

Obesity, treatment of, 51
— — in hypertensive patient with duodenal ulcer, 690
O'BRIEN, Brendan: Myeloid leukaemia and pregnancy, 418
OBSTETRICS: *See also* Abortion; Caesarean section; Labour; Pregnancy; Puerperium
Anaesthesia, 47, 218, 461
Analgesia administrations by midwives in London, Jan.-June, 1438
— and placental insufficiency (E. H. Seward), 1422 (O)
Cause and management of failed forceps cases (H. Derek Freeth), 18 (O); 219 (C)
Combined Textbook of Obstetrics and Gynaecology, 5th ed. (Editor: Dugald Baird), 254
Five cases of puerperal tetanus (one associated with eclampsia) (D. B. Jelliffe, A. H. C. Walker, and Stafford Matthews), 814 (O)
Handbook of Obstetrics and Diagnostic Gynecology (L. Doyle), 150
Institute of Obstetrics and Gynaecology, 508, 735
Introduction to Motherhood (Grantly Dick Read), 1101
Management of malpositions of the vertex (Hector R. MacLennan), 800 (O); correspondence, 1172
Midwives without certificates (parliamentary note), 1123
Modern Trends in Obstetrics and Gynaecology (Editor: Kenneth Bowes), 1100
North of England Obstetrical and Gynaecological Society, 214, 629, 1342, 1503
Postgraduate Obstetrics and Gynaecology (F. J. Browne), 610
Psychological involvements of child-bearing (Edward Glover and others), 275; 526 (C)
Reimbursement for maternity expenses incurred in private institution (parliamentary note), 1230
Obturator hernia, recurrent obstruction of (B. W. T. Pender), 1038; correspondence, 1175
Occipito-posterior presentation, persistent, management of, 803
Occupational medicine. *See* Industrial medicine
Occupational Therapy: Principles and Practice (Editor: W. R. Dunton), 610
Octa-methyl-pyrophosphoramide, toxic effects of, 548
Odlum, Doris M., elected president of the Medical Women's Federation, 534
Oedema of glottis treated by tracheotomy (J. D. Little), 1476
OELBAUM, M. H., and ROUSSAK, N. J.: Pernicious anaemia associated with tumours of stomach, 1368
Oesophagus, congenital atresia of (R. H. R. Belsey and C. P. Donnison), 324 (O)
— foreign body in, precipitating dissecting aortic aneurysm (E. H. Hadfield), 1477
— gummatous infiltration of, masquerading as carcinoma (Stanley O. Aylett), 1476
— low perforation of, at gastroscopy (C. F. J. Cropper, P. Houghton, and P. Kidd), 1099
Oestrogen therapy in hyperemesis gravidarum, 526
— — prolonged, 1456
O'FLANAGAN, P. M., and TAYLOR, R. B.: Auricular fibrillation after electric convulsion therapy, 444
OGILVIE, A. G.: Morphine in bronchial asthma, 300
— and SPENCER, I. O. B.: Haemorrhage from peptic ulcer; report on 170 cases, 138 (O); 153 (L); 414 (C), 459 (C), 528 (C), 628 (C), 838 (C)
Ogilvie's syndrome of false colonic obstruction, 108
O'Gorman, Patrick Wilkins, obituary of, 1063
O'Grady, William Henry, obituary of, 222
O'HARE, M. M. *See* SCOTT, L. D. W., 1470
Oil, hot, in sterilization of syringes, 837
— Skin cancer and cutting oils, 568 (A)
OLLERENSHAW, Robert, and HANSELL, Peter: Some mechanical aids to instruction, 488 (O); 678 (C), 784 (C)
Ollier's disease: dyschondroplasia (Sydney G. Nardell), 555 (O)
O.M.P.A. *See* Octa-methyl-pyrophosphoramide
Onchocerciasis, cutaneous changes in (D. G. Freshwater), 288
O'NEILL, Thomas: Dumping syndrome; an operation for its prevention, 15 (O); 218 (C), 528 (C)
OPHTHALMOLOGY: *See also* Eye; Vision
Biomicroscopy of the Eye (M. L. Berliner), 254
16th International Congress of Ophthalmology, 57, 229, 343
Histology and Histopathology of the Eye and its Adnexa (I. G. Sommers), 254
Institute of Ophthalmology, 508
Ophthalmic Medicine (J. H. Doggart), 91
Ophthalmic Operations (Seymour Philps), 1206
Ophthalmological Society of the United Kingdom; annual congress, 1951, 1181
Principles of Ophthalmology (Thomson Henderson), 1100; correspondence, 1227
Sight-testing (parliamentary note), 303
Spaltlampen-Mikroskopie des hinteren Augenabschnittes (Karl Hruby), 1478
travelling fellowship, 791
Optics and medicine, 261 (A)
— International Optical Commission, 245
Orf in man, 1119, 1279, 1496
ORGANE, G. S. W.: Resuscitation of the newborn, 277
— lecture tour in Middle East, 1123
ORMEROD, F. C.: Streptomycin in otolaryngology, 213
ORTHOPAEDICS:
British Orthopaedic Association; annual meeting, 957, 1216
Foot splint (H. Petty), 725
The Hinge Graft or Ginglymus Implant (Arnold K. Henry), 446
Institute of Orthopaedics, 508
Marknagelung nach Küntscher bei Schaftbrüchen der langen Röhrenknochen, 2nd ed. (Carl Häbler), 1316
Reconstructive surgery in infantile paralysis, 1217
Treatment of intertrochanteric fractures of femur by internal fixation (G. P. Arden and G. J. Walley), 1094 (O); correspondence, 1225
Treatment of short leg, 358
OSBORNE, Rowland P.: Treatment of burns, 360
— Burns. Initial treatment, local and general, 1025 (O); 1044 (A)
Osler as a Gastroenterologist (Felix Cunha), 872
Osler Memorial Medal presented to Sir Ernest L. Kennaway, 827
— memorials, 298
OSMOND-CLARKE, H.: Hidden dislocations of lower limb, 359
Osteitis deformans, hereditary influences in, 738
Osteoarthritis, 629, 728, 948
Osteology for Dissectors (Robert King Howat), 661
Osteoporosis due to immobilization, 1216
OTORHINOLARYNGOLOGY:
Common Diseases of Ear, Nose, and Throat (Philip Reading), 715
Institute of Otology and Laryngology, 507
The Nose: An Experimental Study of Reactions Within the Nose In Human Subjects During Varying Life Experiences (T. H. Holmes and others), 662; 952 (C), 1120 (C)
Streptomycin in tuberculous conditions, 213
Otosclerosis: Wrong use of fenestration operation, 1281
OTTY, J. H.: Hearing-aids; value for children, 364
Ovary: Activity after radium-induced menopause, 78
— dysgerminoma of (J. A. S. Green), 1098
Over-population, 732
Ovulation: *Physiologie der Zeugung des Menschen*, 3rd revised ed. (Hermann Knaus), 1206
Oxford medical schools, 518
— Regional Hospital Board; annual report, 267
— University. *See* Universities: Oxford
Oxygen therapy, film on, 955

P

Paddle, Kenneth Cecil Lawrence, obituary of, 52
"Padutin" in treatment of intermittent claudication, 1414
Paediatrics: *See* Children; Infants
PAGE, G. F. B.: A different view of the tuberculosis problem, 1380; 1373 (L)
PAGEL, Walter: Giordano Bruno and the circular motion of the blood (Nova et Vetera), 621
Paget's disease of bone, hereditary influences in, 738
Pain as aid to diagnosis, 1492
Painting: *On Not Being Able to Paint* (Joanna Field), 500
Palmer, Charles James, obituary of, 895
PALMER, Harold, and GALLAGHER, D. J. A.: Lysivane therapy for parkinsonism, 558 (O); 569 (A)
PALMER, J. M.: "Dramamine" and sea-sickness, 946
Palsy. *See* Paralysis
"Paludrine." *See* Proguanil
Pancreas: Carcinoma of islets of Langerhans, 526
— Faecal fats in pancreatic disease and sprue, 794
— fibrocystic disease of, familial, 959
Pancreatitis, chronic, and carcinoma, 378
Para-amino-salicylic acid. *See* *p*-Amino-salicylic acid
Paraldehyde, sterilization of, 1235
PARALYSIS: *See also* Paraplegia
agitans, 29 (L)
cerebral, conference on, 1051
facial, pathology and surgical treatment of, 1386
following inoculation, 1, 1391
intercostal, prolonged, due to a relaxant (H. Barrie Fairley), 986 (O)
Site in relation to site of inoculation, 3
Supranuclear bulbar palsy (pseudobulbar palsy) in mitral stenosis (Kenneth W. G. Heathfield and Eric C. Jewesbury), 1196 (O)
PARAMORE, R. H.: Failed forceps, 219
— Protection of laboratory animals, 1116
Paraplegia, muscular spasm in, 793
Paraplegics, care of, 355
Parasitology in relation to dermatology (R. M. B. MacKenna), 287
"Parathion." *See* Diethyl-*para*-nitrophenyl-thiophosphate
Paratyphoid fever; two cases treated with chloramphenicol (J. F. Galpine and Joyce W. Brown) 819
PARKINSONISM:
Control of tremor in Parkinson's disease, 60, 310
Lysivane therapy (Harold Palmer and D. J. A. Gallagher), 558 (O); 569 (A)
"Myanesin" in Parkinson's disease, 121
Paralysis agitans (L), 29
Surgical treatment of Parkinson's disease, 1160 (A)
Treatment (Hugh Garland), 363
PARLIAMENT:
Absenteeism in Royal Ordnance factories, 54
Agene and peptic ulcer, 53
Aliens and N.H.S., 1065
Analgesia in Scotland, 303
Armed Forces: Doctors for the Forces; manpower, pay, and isolation, 1005
— — Pay in the Services, 1065
— — R.A.M.C.: Recruitment of specialists, 1006
Aureomycin, supply of, 1065, 1286
B.C.G. vaccination, 225
Blood transfusion and atomic warfare, 1065
Bread; extraction rate of flour, 373
Cancer: Accommodation of cancer cases, 1065
— propaganda, 1502
Capitation fee, 1398
Cars, new, sale of, 303
Certificates, dishonest, 1065
Colonial Medical Service: Recruitment of specialists, 1006
Cortisone, supply of, 1065
Day nurseries, 1502
Deaf, lip-reading training for, 1065
Diabetes; urine-testing sets for diabetics, 173
Diphtheria notifications, 1398
Disinfectants; standards of efficacy, 226
Distinction awards, 172, 1006; correspondence, 1060 1285
Doctor's list, reduction of, 1284
Doctors for new estates, 1285
Durham dispute, 1339
Electrocution; incidence in 1949, 1065
Epilepsy: Lingfield Colony; death of patient, 372
Epileptics, employment of, 225
Euthanasia; debate in the Lords, 1338; 1318 (L); correspondence, 1447
Fainting as a military crime, 172
Food; model by-laws governing cleanliness, 1399
Food-poisoning, 1178
General Medical Council: Disciplinary Committee, 225
General practice: Difficulties of entry into practice, 173
General practitioners and hospitals, 1502
Germany: Doctors; employment in Colonies, 373
— Public Health Advisers, 55
Hearing-aids, bone induction, 372
Hospitals: Advertising vacancies, 54
— Central buying, 1398
— Consultant and S.H.M.O. grades, 54
— Costs, increase of, 1123
— General practitioners and hospitals, 1502
— Name and identity, 1178
— Private patients, 1230
Housing, 1399
Ice-cream, purity of, 1065
Immigrants; health control form, 1065
Industrial injury claims, 53
Infants: Provision of infant foods and maternity benefits, 1065
Kingston and Malden Victoria Hospital dispute, 1178, 1397

PARLIAMENT (*continued*):
Lavatories at omnibus stations and termini, 1502
Malaria control campaigns, 1502
Malaya: Health of troops, 54
Meat; hygienic clothing for porters, 1502
Medical Act, 1950, 337 (L)
Medical Bill: Second reading, 112; Committee stage, 223; further consideration in Committee, 302; Report stage, 303; Royal Assent, 371
Medical Group, 55
Medicine in the Colonies, 1230
Merit awards, 172, 1006, 1060, 1285
Midwives; uniform 116
— without certificates, 1123
Midwives (Amendment) Bill, 116
Mileage allowances for country doctors, 172
Mines, health and safety in, 303
N.H.S.: Doctors' prescription of unauthorized substances, 372
— Drugs; cost, 116
— Free treatment when abroad, 1230
— Remuneration: Specialists in Ministry of Pensions hospitals, 172
National Service exemption; statistics for 1946–50, 1399
— — — of university students from extended service, 843
Needles, surgical, shortage of, 372
Northern Ireland: Restriction of medical list, 53
Nurses for tuberculosis sanatoria, 1285
— part-time, 1286
Obstetrics: Reimbursement for maternity expenses incurred in private institution, 1230
Ophthalmology: Sight-testing, 303
Penicillin (Merchant Ships) Bill, 1286
Physiotherapy services, domiciliary, 1398
Pneumoconiosis, 373, 1398
Practices: Compensation for doctors, 1230
Prescriptions for publicly advertised preparations, 1178
Quarantine certificates, 53
Registrars, reduction in number of, 1284, 1340, 1501
— Transfer system, 1398
River pollution, 303
Rivers (Prevention of Pollution) Bill, 1397
R.A.M.C. pay and conditions of service. 372
St. Thomas's Hospital, reconstruction of, 1065
School Dental Service, 1286
Silicosis in Cornwall, 172
Smallpox, 372
— notifications, 1398
— prophylaxis, 53
Smoke abatement, 842
Spectacles, supply of, 1286
Surgical appliance contracts, 372
Terramycin, supply of, 1065
Trade union membership a condition of employment, 1229, 1339
Tricycles for invalids, 1178
Tuberculosis: Hospital beds, 173
— in Scotland, 371
— insurance for nurses, 1340
— Rations for the tuberculous, 1178
— Ravages of tuberculosis, 1178
— Statistics for 1949, 1284
— Treatment, domiciliary, 226
— — — in foreign sanatoria, 1286
— — — in Switzerland, 371
— waiting-lists, 303
Vivisection, 1178
Welfare foods, 843
PARNELL, R. W.: Reflections on criminal conduct, 459
"Parpanit" in paralysis agitans, 30
— in parkinsonism, 569 (A)
PARR, D. J.: Medical items in the popular press, 890
PARR, Geoffrey. *See* HILL, Denis, 563
PARSONS, Sir Leonard: Influence of Harvey and his contemporaries on paediatrics (Harveian Oration), 997
— obituary of, 1498
Parthenogenesis, artificial, 470
PARTINGTON, C. N.: Acute poisoning with potassium bichromate, 1097 (O)
P.A.S. *See* *p*-Amino-salicylic acid
PASCALL, K. G.: Displaced registrars, 1329
PASSEY, R. D., and DMOCHOWSKI, L.: Freezing and desiccation of mouse tumours, 1129 (O); 1159 (L)
— DMOCHOWSKI, L., LASNITZKI, Ilse, and MILLARD, A.: Cultivation *in vitro* of frozen and desiccated mouse tumour tissues, 1134 (O); 1159 (L)
Passmore, R., and Swanston, Catherine N.: *Industrial Health*, 401
Pasteurella septica infection from the bite of a bear, 839
Pasteurization of milk, value of, 1345
Patella, chondromalacia of, 377
Pathologists, training of, 515, 682
Pathology: Association of Clinical Pathologists; 44th Scientific Meeting, 458
— clinical; International Congress (1951), 1401
— First Argentine Congress, 176
— *Introduction to Pathology* (G. Payling Wright), 499
PATTERSON, C. F.: Psoriasis, 463
PAUL, M. B.: Case-finding in pulmonary tuberculosis, 167
— Beds for the tuberculous, 1223
PAULLEY, J. W.: Ulcerative colitis; psychological factors, 279
— Amoebiasis and personality, 525
PAXON, Thomas: Mass radiography, 1279
PAYNE, A. M. M., and COOK, G. T.: Specific serological type of *Bact. coli* found in infants' home in absence of epidemic diarrhoea, 192 (O); 205 (A); 460 (C)
PAYNE, Reginald T.: Treatment of varicose veins, 1323
PEACOCK, W. Baly: Dead bodies in water, 1277
Peanut dislodged from bronchus by percussion, 1390
Peanuts and vitamins, 310
Pearse, A. G. E., awarded Raymond Horton-Smith Prize, Cambridge University, 1286
PEARSON, H. E. S. *See* COYLE, Cecil D., 1223
Peckham Health Centre bought by London County Council, 1503
PEIN, N. K., and GARVIE, J. M.: Congenital leukaemia, 253
Pelvis, diameters of, 737
Pemphigus; treatment with suramin as cause of adrenal necrosis, 655
PENDER, B. W. T.: Recurrent obstruction of an obturator hernia, 1038; correspondence, 1175
PENICILLIN:
Administration and therapeutic action, 453
Bacterial sensitivity, 617
Dangers of penicillin snuff, 1333
Desensitization to penicillin, 1236
Dosage, 399
Effect of administration to cows on cheese-making, 1453
— on skin, 629
— on vaccine lymph, 1035
in chronic sinusitis, 424
in fulminating staphylococcal pneumonia (J. M. Walshe), 1313
in neurosyphilis, 934
in subacute bacterial endocarditis; after-history of successfully treated cases, 436
in suspected poliomyelitis, 629, 786
Indications for use, 617
(Merchant Ships) Bill (parliamentary note), 1286
Prophylactic use, 619
Prophylaxis in rheumatic fever, 781
Synergistic and antagonistic action, 1160, 1392
Typhoid carrier treated with penicillin (L. G. Moore and C. A. Rumball), 400
Penis: Constricting iron ring round the penis, 1278
— erection, post-operative, prevention of, 1127
— Retraction of foreskin in infants, 1235
PENMAN, A. Clark. *See* CUTBILL, Leslie J., 1173
PENMAN, John: Producing anaesthesia of trigeminal nerve distribution, 1444
PENROSE, L. S.: Genetics and medical practice, 354
— Value of genetics in medicine, 903 (O); 931 (L)
— *Biology of Mental Defect*, 1156
— awarded Weldon Memorial Prize, 1399
PENSON, Lillian: University ventures old and new, 830
PEPTIC ULCER:
Blood vessels of gastric ulcer (James A. Key), 1464 (O); 1484 (A)
Duodenal ulcer (Jurgen Ruesch and others), 150
Duodenal ulcer, in four brothers, 1333
differential diagnosis from gastric carcinoma, 263
Familial and hereditary factors, 1345
Gastric ulcer, occurring after vagotomy (D. M. Morrissey), 651 (O); 893 (C), 950 (C)
— and duodenal ulcers, relative incidence of (Eileen M. Brooke), 560 (O)
Haematemesis and melaena (C. D. Needham and J. A. McConachie), 133 (O); 153 (L); 366 (C), 414 (C), 459 (C), 628 (C), 838 (C)
haemorrhage from peptic ulcer; report on 170 cases (A. G. Ogilvie and I. O. B. Spencer), 138 (O); 153 (L); 414 (C), 459 (C), 528 (C), 628 (C), 838 (C)
hexamethonium bromide in duodenal ulcer (L. D. W. Scott and others), 1470 (O)
Indwelling tube for gastric haemorrhage in peptic ulcer, 1174, 1391, 1393
Relation to tobacco smoking, 994 (A)
Treatment with antihistamines, 848
— with hormones, 205 (A)
Vagotomy for duodenal ulcer; gastric ulcer as sequel, 651, 893, 950
Perambulators: Dangerous "prams," 219, 889, 1002, 1120
PERISTIANY, T. J.: Carcinoma of the stomach, 217
Peritoneum: Clinical test for free blood, 1330
— Intraperitoneal spontaneous haemorrhage due to haemangioma of liver (K. P. S. Caldwell), 1155
Peritonitis, biliary; diagnosis and treatment, 757
PERTY, W. L. M.: *Design of Toxicity Tests*, 1101
Personality changes after head injury, 1377 (A)
Perspiration, red, 1072, 1184
Pertussis. *See* Whooping-cough
Peters, R. A., awarded Cameron Prize, University of Edinburgh, 465
PETCH, C. P.: Fibrillation and flutter, 1447
Pethidine and decamethonium iodide in treatment of tetanus, 984
— as adjunct to nitrous oxide and oxygen anaesthesia (H. F. Griffiths), 763; correspondence, 1334
— in anaesthesia, respiratory arrest following, 1334
Petrol lighters and production of lung cancer, 529, 682
PETTY, H.: Foot splint, 725
Phantom limb pain, treatment of, 68, 415
Pharmaceutical Society of Great Britain: Appointments, 176
PHARMACOLOGY:
Action of antihistamine compounds (J. H. Burn), 691 (O); 836 (C), 946 (C), 951 (C)
Clinical evaluation of effects of drugs on medical students as a teaching method (Andrew Wilson and others), 484 (O); 501 (L)
Concise Applied Pharmacology and Therapeutics, 3rd ed. (F. G. Hobart and G. Melton), 401
Recent Advances in Pharmacology (J. M. Robson), 1260
Textbook of Pharmacology and Therapeutics (Harold N. Wright and Mildred Montag), 255
Pharmacy: Research scholarships, 1369
Pharmacy and Poisons Act (1933), 455
Pharynx, foreign body in, 1061
— hookworm infestation of, 1173
"Phenergan" in sea-sickness, 836
Phenobarbitone in epileptic attack, 1047
2-Phenyl-benzyl-aminomethyl-imidazoline hydrochloride. *See* Antistin
Phillips, Albert Edward, obituary of, 52
PHILLIPS, Bentley: Naming of cancer hospitals, 220
PHILLIPS, J. H. C.: Intraperitoneal intestinal anastomosis, 1331
Philosophy: *A Doctor Digresses* (Kenneth Walker), 401
— Royal Institute of Philosophy: Lectures, 846
Philps, Seymour: *Ophthalmic Operations*, 1206
Phlebitis of lower limbs, 1324
— Treatment of post-phlebitic leg and application of venous pressure measurement (A. J. Walker), 1307 (O); 1495 (C)
Phonocardiography, 567 (A); 838
Phosphorus insecticides, poisoning by, 548
Photography: Exhibition of medical photography, 1051
— *Introduction to Medical Photography* (Josephine Hunt), 930
— medical, at Royal Photographic Society: annual exhibition, 673
Phthalylsulphathiazole, 409
Phthisis. *See* Tuberculosis
Physical Medicine, International Federation of, 229
Physics: *Energy and Matter* (R. L. Worrall), 402
Physiology: *Einführung in die pathologische Physiologie* (F. Grosse-Brockhoff), 766
Physiotherapy, Chartered Society of: J. Whillis elected chairman, 957
— London Area Mobile Physiotherapy Service, 1307
— *Manual of Massage and Movements* (E. M. Prosser), 1317
— services, domiciliary (parliamentary note), 1398
Phytates anti-calcifying action of, 935 (A)
PICKERING, G. W.: Haemorrhage from peptic ulcer, 414
PICKLES, W. N.: Tuberculosis in the home, 362
Picture Post article on cancer, 663 (L), 726, 835, 875 (L), 1004; correspondence between Minister of Health and D. Rees Evans, 885
PINES, N.: Vascular changes in diabetes, 297
PINEY, A.: Cigarettes and cancer, 889
— Displaced registrars, 1388
Pink disease; clinical picture, aetiology and treatment (W. S. Craig), 773; correspondence, 1003, 1116, 1173
Pipettes, British Standard for, 1413
PIRRIE, Ivan: The G.P. at the crossroads, 169
Placenta accreta, 1503
— Obstetric analgesia and placental insufficiency (E. H. Seward), 1422 (O)
— praevia, diagnosis and treatment of, 1055, 1172, 1226, 1393
— — *x*-ray diagnosis of, 1042 (L)
Plague; treatment with streptomycin, 670
Plasmodium vivax infection (S. K. Mukherjee and A. K. Mitra), 88
Pleurisy, dry, benign, epidemic of (D. G. H. Sylvester), 653 (O)
"P.M.4" insecticide, toxicity of, 1127
Pneumococcal infections, penicillin in, 618
Pneumoconiosis (parliamentary notes), 373, 1398
Pneumoconiosis Research Unit, Medical Research Council, 957, 1167
Pneumonia, atypical (C. H. Stuart-Harris), 282; 1457 (O); 1484 (A)
— — primary (S. P. Bedson), 1461 (O); 1484 (A)
— Post-pneumonic collapse of right lower lobe relieved by bronchoscopic aspiration (Arthur Miller), 764
— staphylococcal, fulminating, treated with massive doses of chloramphenicol and penicillin (J. M. Walshe), 1313
Pneumothorax, spontaneous, sudden death after (J. W. Buchanan), 714
Poisons List Order (1950), 455
Poisons Rules (1950), 455
Poland; withdrawal from World Health Organization, 581
POLIOMYELITIS:
Aetiology, clinical course, prognosis, and treatment (W. Howlett Kelleher), 570; 679 (C), 786 (C), 1060 (C)
Age incidence, 786, 950, 1120
and the community, 664 (L)
and fatigue of travel, 164
and immunization, 300

POLIOMYELITIS (*continued*):
Clinical poliomyelitis in association with peripheral inoculation of prophylactics (F. O. MacCallum), 6 (O); 28 (L)
Epidemiological notes, 118, 174, 229, 306, 375, 421, 467, 532, 581, 635, 687, 734, 791, 844, 898, 956, 1010, 1067, 1126, 1183, 1232, 1288, 1340, 1402, 1453
in England and Wales (epidemiological note), 56
in Isle of Wight (epidemiological note), 532
in London in 1949 (G. E. Breen and B. Benjamin), 1473 (O)
Infectivity, 679
Inoculation and poliomyelitis; statistical investigation in England and Wales in 1949 (A. Bradford Hill and J. Knowelden), 1 (O); 28 (L); correspondence, 166, 220, 1391
Inoculations and poliomyelitis, 416, 628, 1474
Reconstructive surgery in infantile paralysis, 1217
Relation to immunization against whooping-cough and diphtheria (H. Stanley Banks and A. J. Beale), 251 (O)
Relief of muscle spasm, 879 (A)
Respiratory studies in paralytic poliomyelitis (R. B. Bourdillon and others), 539 (O); 566 (L)
Restriction of physical activity in pre-paralytic stage, 231
spread of, 786
— in chlorinated swimming-pools, 625, 728, 950
suspected, penicillin in, 629, 786

POLLOCK, G. A.: Aetiology of cerebral palsy, 1051
Polyarteritis nodosa, 458
Polycythaemia vera; treatment with radioactive isotopes, 1127
Polysaccharides, bacterial, in treatment of cancer, 32 (A)
Ponsold, Albert (Editor): *Lehrbuch der gerichtlichen Medizin*, 1479
Pooler, H. W.: *My Life in Three Counties*, 564
POORS, Robert: The G.P.'s clinical training, 574
Popliteal vein division in treatment of so-called varicose ulceration (Gunnar Bauer), 318 (O); 338 (A); 529 (C)
Popular health journal, 108
Population: Over-population, 732
— *Papers of the Royal Commission on Population*, Vol. 5, 1950, 1429
— ratio of doctors to, 502 (L); 506 (A)
Populations, genetical structure of, 36
Porphyria, acute, in negro; fatal case (C. A. Wiggins), 866 (O)
— idiopathic, acute; report of two cases (D. W. Ashby and E. Bulmer), 248 (O); 259 (A)
Porphyrin metabolism and porphyria, 574
PORRITT, Sir Arthur: Mars and Aesculapius; A New Zealand Memorial Oration, 1438
Postgraduate education; facilities in London, 507
Postgraduate Medical School of London, 507
— — — C. Read appointed Director, Institute of Obstetrics and Gynaecology, 735
Potassium bichromate, acute poisoning with (C. N. Partington), 1097 (O)
POWER, M. H.: Histology and physiology of the adrenal cortex, 285
POWER, Thomas D.: The problem of the therapeutic convulsion, 1092 (O); correspondence, 1224
POWNALL, Margaret. *See* MILLAR, E. L. M., 551
Practice, entry into, 516
Practices: Compensation for doctors (parliamentary note), 1230
Prague: Medical student's visit to World Student Congress (P. L. C. Diggory), 780; 948 (C), 1003 (C)
Pratt, Robertson, and Dufrenoy, Jean: *Antibiotics*, 90
Precordial pulsation in children, 1174
Pregnadienolone in treatment of rheumatoid arthritis, 851

PREGNANCY:
Abnormal duration (medico-legal note), 1451
Cardiac disease and pregnancy, 936 (A)
chronic myeloid leukaemia associated with (L. M. Edwards and H. D. Freeth), 199; 418 (C)
Diagnosis: review of one year's work in Watford Pregnancy Diagnostic Centre (H. Schwabacher), 328 (O)
— use of the male British toad as test animal (J. F. D. Frazer and F. X. Wohlzogen), 330 (O); 1005 (C)
— early (F. Stabler), 282
ectopic, followed by chorion carcinoma (Keith Vartan), 871
Effect on pulmonary tuberculosis, 877 (A)
Hodgkin's disease and pregnancy, 47, 217, 296
in rudimentary horn of bicornuate uterus (Douglas Latto and Richard Norman), 926 (O); correspondence, 1119
Intestinal obstruction during late pregnancy caused by volvulus of sigmoid colon (D. W. James), 24
Kell-Cellano blood group system in pregnancy and transfusion (J. B. Cochrane, R. H. Malone, and I. Dunsford), 1203 (O)
myeloid leukaemia associated with, 681
streptomycin in, 952
Tuberculosis and pregnancy (R. C. Cohen and others), 271
Varicose veins, 1325
Pregnenolone in treatment of rheumatoid arthritis, 851, 902
Premature Baby Unit at University College Hospital, London, 834
Prematurity. *See* Infant, premature
PRENDIVILLE, J. B.: An unusual foreign body in rectum, 680

PREPARATIONS AND APPLIANCES:
Boyle's anaesthetic apparatus, novel modification of (W. B. Primrose), 676; 787 (C), 1003 (C)
"Cambridge" exchange transfusion outfit (C. B. V. Walker), 1441
Foot splint (H. Petty), 725
Intubation, aid to (W. N. Vellacott), 1113
Syringes: Controller for the all-glass syringe (Hamish M. Mann), 294
Tibia and fibula fractures; treatment; traction apparatus (P. R. Sondhi), 346
Urethral sphincter guard (A. Wilfrid Adams), 1052

Prescribing, economy in, 529
Prescriptions for publicly advertised preparations (parliamentary note), 1178
Pressure cooking; effect on vitamins, 1183
Preston Hall, the British Legion village, 735
Preventive medicine, training for, 578
PRICE, C. Frederick: Domiciliary treatment of tuberculosis, 786
PRICE, E. W.: Inoculation and injection paralysis, 1391
Price, Ivor Isaac, obituary of, 370
PRICE, John: Training for general practice, 727
Prickly heat, treatment of, 847, 1292
PRIME, F. J.: Lung function in bronchiectasis, 356
Primigravidae, rhesus-negative, follow-up of: development of rhesus immunization (W. Weiner and Jean L. Hallum), 868 (O)
PRIMROSE, W. B.: Novel modification of Boyle's anaesthetic apparatus, 676; 787 (C), 1003 (C)
Princess Tsahai Memorial Hospital, 176, 307, 1288; staff appointments, 376
"Priscol" in Raynaud's disease, 738
"Priscoline" for relief of muscle spasm in poliomyelitis, 879 (A)
Prisoners: Psychiatric treatment of offenders serving short sentences, 414
PRITCHARD, E. K.: Crisis in tuberculosis, 577
Prizes: Alvarenga Prize, 534
— Colyer Prize, 534
— Investigation into chest disease, 582, 900
Procaine in relief of cardiac arrest, 712, 721
— intravenous, in asthma, 469
— — indications and side-effects, 1506
Progesterone in treatment of rheumatoid arthritis, 851
— pellet implantation in habitual abortion, 130
Proguanil, prophylactic and therapeutic efficacy in West Africa, 7
Prolapse. *See* Uterus, prolapse
Promethazine hydrochloride in prevention and treatment of common cold, 425, 448, 1062
Prosser, E. M.: *Manual of Massage and Movements*, 1317
Prostate: Effect of stilboestrol in prostatic enlargement, 584
Prostatitis, tuberculous; diagnosis and treatment, 178
Proteins, metabolism; effect of burns on, 1028
— Structure and clinical problems (E. C. Dodds), 1237 (O); 1267 (A)
— toxicity, 1240
PROUDFOOT, T. M.: An adjustable bed for patients at home, 631
Provincial medical centres, 511, 518
PROWSE, C. Barrington: A toxic effect of thiouracil hitherto undescribed, 1312; correspondence, 1493
Pruritus vulvae in cervical erosion, 648
PRYER, Richard R. L.: Spontaneous dehiscence of coverings of incisional hernia, 167
Pseudomonas aeruginosa, appeal for strains of, 788
— *pyocyanea* infection of middle ear, treatment of, 423
Psoriasis, 463
— aetiology, symptoms and treatment (R. M. B. MacKenna), 207; 530 (C)
— arthropathica, 1490

PSYCHIATRY. *See also* Mental Health
Aftercare for soldiers discharged on psychiatric grounds, 645
Biology of Mental Defect (L. S. Penrose), 1156
Institute of Psychiatry, 508
Interesting advertisement, 625
Klinische Psychopathologie, 3rd ed. (Kurt Schneider), 1371
Lung abscess as complication of E.C.T., 1377 (A)
Progress in treatment, 568 (A), 729
Psychological involvements of child-bearing (Edward Glover and others), 275; 526 (C)
Reflections on criminal conduct and its treatment (Sir David K. Henderson), 311 (O); 335 (L); 459 (C)
Role of the psychiatric social worker (J.B.S. Lewis), 291
Studies In Mental Illness in the Gold Coast (G. Tooth), 1212
Training courses, 516; correction 638
Treatment of offenders serving short sentences, 414

Psychoanalysis: *Aus den Anfängen der Psychoanalyse* (Sigmund Freud), 255; 462 (C)
— *Freud: Dictionary of Psycho-analysis* (Editors: Nandor Fodor and Frank Gaynor), 1479
Psychoanalysis: *The Psycho-Analytic Reader* (Editor: Robert Fliess), 1040

PSYCHOLOGY:
Freud or Jung (Edward Glover), 446; correspondence, 576, 731
Human Desires and Their Fulfilment (K. W. Monsarrat), 1316
Medizinische Psychologie, 10th ed. (Ernst Kretschmer), 1261
Psychological medicine as science, 623
Psychological polemics (correspondence on review of *Freud or Jung*), 576, 731
Psychology and science, 783, 943, 1057, 1114

Psychoses, effect of cortisone on, 729
Psychotherapy: Psychological treatment in skin disorders, with special reference to abreactive techniques (H. J. Shorvon, A. J. Rook, and D. S. Wilkinson), 1300 (O); 1322 (A); 1496 (C)
— Social Psychotherapy Centre, 481
P.T.A.P.: Determination of the essential Lf dosage (Guy Bousfield and Lewis B. Holt), 73 (O)
Pteroylglutamic acid content of liver extract, 1357
— — in pernicious anaemia, neuropathy following; effect of vitamin B_{12} on (H. Fuld), 147 (O); 417 (C), 527 (C)

PUBLIC HEALTH:
Brussels Treaty Public Health Committee, 702
Courses of instruction, 521
Diplomas, 520; correction, 794
Ecology of Health (Editor: E. H. L. Corwin), 447
Health of the People (S. Lett), 1207
Importance of preventive medicine, 678
in Western Union countries, 1111
Personal and Community Hygiene Applied (J. F. Williams and G. G. Wetherill), 1427
Selected Papers of Haven Emerson, A.M., M.D., D.S.M., 334
Service, entry into, 523
— Medical officers; remuneration, 336 (L); 992 (L); salary award by Industrial Court, 1480

Public speaking and the doctor, 668 (A)
Puerperium, early rising in, 47, 890
— five cases of tetanus in (one associated with eclampsia) (D. B. Jelliffe, A. H. C. Walker, and Stafford Matthews), 814 (O)
Puffer, Ruth R.: *Practical Statistics in Health and Medical Work*, 610
PUGH, D. L.: Latent amoebic dysentery, 1175
PUGH, David W.: The indications for globin insulin, 657 (O); 949 (C)
Pulmonary stenosis, 694
Pulse in congenital heart disease, 641
Punch-drunkenness, 793, 1292
Purce, George Raphael Buick, obituary of, 170
Purdon, William Brooke, obituary of, 1449
Purpura, thrombocytopenic, due to quinidine (G. Moodie), 553 (O)
— — idiopathic, effect of adrenocorticotrophic hormone on capillary resistance in, 975
— — splenomegaly in, 793, 960
PURSER, J. A. *See* LING, T. M., 159
Purslow, Charles Edwin, obituary of, 788
PURVIS, Raymond: Large post-rectal dermoid, 25
Pyelitis, chronic, due to *Bact. coli*; treatment, 583
Pylorus, stenosis, associated with haematemesis and melaena, 137
— — in premature infant, 681

Q

Q fever (M. G. P. Stoker and others), 283
— — Weil-Felix reaction in, 309
Quarantine certificates, 53
Questions and Comments. *See* Any Questions?
QUIN, C. E., MASON, R. M., and KNOWELDEN, J.: Clinical assessment of rapidly acting agents in rheumatoid arthritis, 810 (O); 826 (A); 875 (L); 947 (C), 1116 (C)
QUINET, P.: Acute volvulus of the stomach, 1259
Quinidine sulphate in auricular fibrillation; effect of prolonged administration, 1456
— thrombocytopenic purpura due to (G. Moodie), 553 (O)
— *Quinidine in Disorders of the Heart* (Harry Gold), 1426

R

Rabies prophylaxis inoculation, paraplegia due to, 220
— treatment of, 823 (L)
RACE, R. R.: Practical aspects of blood-group genetics, 354
Radiation dangers in the shoe-shop, 565 (L); 730, 1120
— light, and illumination (J. N. Aldington), 277
Radio: Medicine by radio, 890, 1060
— X-ray photographs by radio, 1288
Radioisotope applications, brochure of instruments and accessories for, 855
— progress in production, 31 (A)
RADIOLOGY:
Amalgamation of radiological societies suggested, 530, 731
Atlas of Roentgenographic Positions (V. Merrill), 200

ADIOLOGY (*continued*):
Barium meal; seven cases of barium carbonate poisoning (Geoffrey Dean), 817 (O); 827 (A); correspondence, 1058
British Institute of Radiology, Presidential Address (R. Fawcitt), 1011
Cardiological case finding by means of mass miniature radiography (Peter O. Leggat), 1364 (O)
6th International Congress, 410
Fellowship in Radiology, 521
Lehrbuch der Röntgendiagnostik, 5th ed. (H. R. Schinz and others), 929
Mass radiography; value in early diagnosis of tuberculosis, 1279
Radiation dangers in the shoe-shop, 565 (L); 730, 1120
Radiological and pathological correlation of miliary tuberculosis of lungs in children, with special reference to choroidal tubercles (J. L. Emery and J. Lorber), 702 (O); 720 (A); 951 (C), 1173 (C)
Society of Radiographers; fourth annual conference dinner, 539
Textbook of X-ray Diagnosis, Vols. 3 and 4, 2nd ed., 661
Unfallchirurgie im Röntgenbilde (W. Ehalt), 1260
X-ray appearances in congenital heart disease, 641
— diagnosis of placenta praevia, 1042 (L)
— photographs by radio, 1288

ADIOTHERAPY:
Linear accelerators, 616 (A)
Research, 260 (A)
Short Textbook of Radiotherapy for Technicians and Students (J. Walter and H. Miller), 333
Supervoltage Roentgentherapy (Franz Buschke, Simeon T. Cantril, and Herbert M. Parker), 1370
Treatment of simple epithelial cysts with secondary photo-electron radiation (Lionel Cohen and Samuel A. Kimmel), 87 (O)

adium for uterine cancer; indications and results, 637
– Ill effects of the radium menopause (Hugh C. McLaren), 76 (O)
adius: Fractures of the radial head with inferior radio-ulnar dislocation, 1217
AFFAN, A. W.: Post-operative paralysis of the brachial plexus, 149
AMSAY, A. Melvin, and VAHRMAN, J.: Abortion, 367
anken, Margaret, obituary of, 532
ANKIN, A. K.: Orf in man, 1279
ankin, John, obituary of, 1395
ANKIN, M. Neal: Unabsorbable sutures, 1279
AW, May: Protection of laboratory animals, 951
AWLINGS, E. F.: Unabsorbable sutures, 949
ay, Matthew Burrow, obituary of, 632
aymond F. Longacre Award, 422
aymond Horton-Smith Prize awarded to A. G. E. Pearse, 1286
aynaud's disease, treatment of, 738, 1128
ead, C., appointed Director, Institute of Obstetrics and Gynaecology, Postgraduate Medical School of London, 735
ead, Grantly Dick: *Introduction to Motherhood*, 1101
eading, Philip: *Common Diseases of the Ear, Nose, and Throat*, 715
ectum; Prolapse for 40 years, treatment of, 1184, 1346
– unusual foreign body in, 680, 785, 891, 950
EDMAN, T. F.: Modified caesarean section, 1496
EES, E. W. *See* LING, T. M., 159
EES, G. J.: Surgical conditions in the newborn; anaesthetic aspects, 287
– Anaesthesia in the newborn, 292; 1419 (O); 1433 (A)
EES, J. O. M.: Economy in the Health Service, 1328
EES, Thomas: Training for general practice, 728
EESE, A. B., and BLODI, F.: Retrolental fibroplasia, 343
EES-JONES, G. I.: Tuberculosis and the Health Service, 1493

REFRESHER COURSE FOR GENERAL PRACTITIONERS:
Addison's disease (S. Leonard Simpson), 1164
Anaemia, pernicious, diagnosis, and treatment of (R. Bodley Scott), 157
Bronchiectasis (F. P. Lee Lander), 1486
Chemotherapy. I. Administration of penicillin; II. Indications for use of penicillin; III. Streptomycin; IV. Newer antibiotics (L. P. Garrod), 453, 617, 669, 722
Colitis, ulcerative, treatment of (G. E. Beaumont), 937
Electrocardiogram in clinical diagnosis and prognosis (Terence East), 828, 880
Enuresis (Douglas Hubble), 1108
Epileptic, management of (Sir Charles Symonds), 1047
Heart: Cardiac neuroses (Paul Wood), 33
— Failing heart; recognition and treatment (K. Shirley Smith), 340
Lumbar disk lesions, treatment of (James Cyriax), 1434
Menstrual disorders and the menopause; physiological basis and diagnosis (P. M. F. Bishop), 1214; management and treatment, 1268
Migraine (Macdonald Critchley), 996
Pink disease (W. S. Craig), 773

REFRESHER COURSE FOR GENERAL PRACTITIONERS (*continued*):
Poliomyelitis (W. Howlett Kelleher), 570; 679 (C)
Psoriasis (R. M. B. MacKenna), 207
Stomach, carcinoma of; symptoms, diagnosis and treatment (C. F. W. Illingworth), 262
Sulphonamide therapy (D. M. Dunlop), 408
Thyrotoxicosis, management of (Raymond Greene), 1378
Tuberculosis: Pulmonary tuberculosis, management of (F. H. Young), 97
Varicose veins, treatment of (Reginald T. Payne), 1323

Refugees: Disordered society (R. N. Tronchin-James), 776
Registrar-General: Quarterly returns for England and Wales (epidemiological note), 956
— Quarterly returns for Northern Ireland (epidemiological note), 735
— Quarterly returns for Scotland (epidemiological note), 735, 898
— *Statistical Review for* 1948, Part I (epidemiological note), 376
Registrars: General-practice training, 1329
— Group practice suggested, 1329
— Reduction in number, 1158 (L); 1222, 1276; 1372 (L); 1388, 1443; (parliamentary notes, 1284, 1340, 1501).
— Transfer system (parliamentary note), 1398
Rehabilitation in tuberculosis, 1385
Reichstein, T., awarded Nobel Prize for Medicine, 1046, 1050
Reid, Alexander Christie, obituary of, 632
REID, James: Biochemical changes in rheumatic fever, 1490
— *See* COCHRAN, J. B., 1411
REID, Ronald W.: Treatment of renal failure, 349
REIDY, J. P.: Burns. Skin cover for full-thickness skin loss, 360; 1030 (O); 1044 (A)
REINHOLD, C. H.: Inoculation and paraplegia, 220
Reiter's syndrome; treatment with streptomycin, 166

REMUNERATION:
Cost of academic clinical office, 1275, 1388, 1447
Demand for early settlement, 93 (L)
Medical Practitioners Union scheme, 1264 (A)
Professor Bradford Hill's inquiry, 1218; 1208 (L)
Public Health medical officers, 336 (L); 992 (L); salary award by Industrial Court, 1480
Specialists in Ministry of Pensions hospitals (parliamentary note), 172
Time and the doctor, 168

Renal Association, 345, 957, 1180
RENDELL-BAKER, L.: Analgesics in anaesthesia, 293

RESEARCH:
Harvey and the scientific method (Sir Henry Cohen), 1405 (O)
Methods in Medical Research, Vol. 2 (J. H. Comroe, jun.), 715
Research Defence Society publication, *Conquest*, 687
Research In Medical Science (Editors: David E. Green and W. Eugene Knox), 873
Scientific method in medical research (Sir Henry Dale), 1185 (O)

Respirators, dangers of, 539, 566
Respiratory studies in paralytic poliomyelitis (R. B. Bourdillon and others), 539 (O); 566 (L)
— system, cancer of, 417
Resuscitation of the newborn, 277
RETI, L.: Poliomyelitis and inoculations, 628
Retina, diabetic changes in, 297
Rhesus factor: Erythroblastosis foetalis following ABO incompatibility, 680, 951
— — Family planning for the Rhesus-negative mother, 1330
— — Follow-up of rhesus-negative primigravidae; development of rhesus immunization (W. Weiner and Jean L. Hallum), 868 (O)
— — immunization, 1481
Rheumatic fever, biochemical changes in, 1490
— — clinical effects of cortisone, 592
— — duration of fatal case, 109
— — penicillin prophylaxis in, 711

RHEUMATISM:
Acute rheumatism; mild Cushing's syndrome following treatment with aspirin, 1411
British Rheumatic Association, 965; *B.R.A. Review*, 1123
Care of children with rheumatic hearts, 986
Endocrine aspects of rheumatic disease, 1488
Heart failure in chronic rheumatic heart disease, 341
Psychological factors in treatment, 1490
Rheumatic Diseases, 3rd ed. (G. D. Kersley), 26
Rheumatic heart disease discovered by mass miniature radiography, 1365
Stress and the adaptation syndrome, 104, 215, 220

RHEUMATOID ARTHRITIS:
Clinical assessment of rapidly acting agents (C. E. Quin, R. M. Mason, and J. Knowelden), 810 (O); 826 (A); 875 (L); 947 (C), 1116 (C)
Clinical effects of cortisone, 592
Cortisone in long-standing case, 1455
Effect of adrenocorticotrophic hormone on capillary resistance in, 974
Effect of sulphur, 794
Incidence according to climate, 378

RHEUMATOID ARTHRITIS (*continued*):
intravenous iron in treatment of hypochromic anaemia associated with (R. J. G. Sinclair and J. J. R. Duthie), 1257 (O)
manubrio-sternal joint in (Andrew Bogdan and Justin Clark), 1361 (O)
Mechanism of relief, 768 (L)
Objective assessment of improvement (O. Janus), 1244 (O); 1263 (A)
splenectomy for, 1490
Symptoms, objective assessment of, 947
Treatment; present status of cortisone and A.C.T.H., 942
— prolonged, with A.C.T.H. alone and with gold (J. Goslings and others), 1019 (O)
— with cortisone and other steroids (W. S. C. Copeman and others), 849 (O); 874 (L)
— with insulin and E.C.T. (G. D. Kersley and others), 855 (O); 874 (L); correspondence, 1058

Rhinitis, allergic; diagnosis and treatment, 1292
Rhinology: *The Nose: An Experimental Study of Reactions Within the Nose in Human Subjects During Varying Life Experiences* (T. H. Holmes and others), 662; 952 (C), 1120 (C)
Rhodesia, silicosis in, 731
Ricci, James V.: *Development of Gynaecological Surgery and Instruments*, 163
— *Genealogy of Gynaecology*, 2nd ed., 1478
RICE-EDWARDS, J. T.: Urethra obstructed by crystals, 1445
RICHARDS, N. A. *See* BISHOP, P. M. F., 130
RICHARDSON, K. C.: Histology and physiology of the adrenal cortex, 285
— Breast-feeding, 350
RIDDOCH, J. W.: Foreign body in the rectum, 785
— Modified skin stitch, 1279
RIDING, D.: Vitamin B_{12}, 348
Rigor mortis (H. A. Shapiro), 304
Ringworm of nails, treatment of, 1291
RINK, E. H.: Anaesthesia in heart surgery, 415
River pollution (parliamentary note), 303
Rivers (Prevention of Pollution) Bill (parliamentary note), 1397
RIVLIN, Stanley: Popliteal ligation for post-phlebitic leg, 1495
ROAF, Robert: Science before history, 524
ROBB, Douglas: Medicine by radio, 890
ROBB, J. C.: Foreign body in rectum, 950
ROBERTS, E. Hesketh: Revaluing the levators in colporrhaphy, 168
— Technique of ventrosuspension, 1448
ROBERTS, Ff.: Stress and the general adaptation syndrome, 104, 215
ROBERTS, F. W.: Rectal thiopentone in children, 891
ROBERTS, J. A. Fraser: The child and his environments; the influences of heredity, 210; 525 (C)
— Genetic clinic, 354
ROBERTS, Norman W.: Trochanteric fractures of the femur, 359
Roberts, Sir George, obituary of, 896
Robertson, Claude, obituary of, 1121
ROBERTSON, Eric. *See* CAMPBELL, Allan, 804
ROBERTSON, G. Stuart: Child health and the future, 946
ROBINSON, Alan: Sea-sickness, 1225
Robinson, George Drummond, obituary of, 579
ROBINSON, H.: Protection of laboratory animals, 888
ROBINSON, Henry: A school for doctors' children, 463
Robinson, Judith: *Tom Cullen of Baltimore*, 26
ROBSON, H. N., and DUTHIE, J. J. R.: Capillary resistance and adrenocortical activity, 971 (O)
Robson, J. M.: *Recent Advances in Pharmacology*, 1260
ROCHE, Hilary: Crisis in tuberculosis, 295
ROCHFORD, J. D. *See* NEWHOUSE, M. L., 981
Rockefeller grants, 898
— travelling fellowships in medicine, 791
RODAN, K. S.: Slide test for P.A.S. sensitivity, 1391
ROE, C. Watney: Morphine in status asthmaticus, 110
Rolleston, Christopher, obituary of, 1283
Romano, John (Editor): *Adiptation*, 402
Romer, A. S.: *The Vertebrate Body*, 150
ROOK, A. J. *See* SHORVON, H. J., 1300
ROOK, Alan F. *See* HEAF, F. R. G., 1497
ROOT, Howard F.: Diabetes without vascular disorder after 25 years, 840
ROSENBERG, G.: Schizophrenia and dienoestrol, 1062
Roseola infantum, 876 (A)
ROSS, James: Hyperemesis gravidarum and oestrogens, 526
ROSS, James A.: Hypertrophy of the little finger, 987
ROSS, Jean R. W.: Observations on symptomatology and treatment of cervical erosion, 647 (O); 788 (C), 1003 (C), 1119 (C)
Ross award, 1069
Ross commemoration ceremony, 534
ROUALLE, Henri L. M.: Case of cardiac arrest; vagal inhibition relieved by procaine, 712 (O); 721 (A); correspondence, 1116
ROUSSAK, N. J. *See* OELBAUM, M. H., 1368
ROWLING, J. T.: Extreme hyperpyrexia with recovery, 628
Rowling, Samuel Thompson, obituary of, 1064
Royal Academy of Medicine in Ireland, officers elected, 957
Royal Air Force, industrial health in, 1169
— — — Institute of Pathology and Tropical Medicine, 1453

Royal Army Medical Corps Roll of Honour, 369; War Memorial Fund "Book of Remembrance," 467

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS:
Annual dinner, 845
Appointments, 897
Diplomas granted, 1231
Donations, 845, 897
Hilda Lloyd re-elected President, 307
Members elected, 466, 897
Officers elected, 466

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH:
Appointments, 1400
Diplomas granted, 634, 1287
Fellows elected, 305, 1287
Members elected, 1287

ROYAL COLLEGE OF PHYSICIANS OF IRELAND:
Appointments, 1009
Conjoint examination results, 1400
Fellows elected, 1009
Licentiates admitted, 466
Members admitted, 1340

ROYAL COLLEGE OF PHYSICIANS OF LONDON:
Appointments, 373, 1066
Bertram Louis Abrahams Lecture, 32, 1237
Bissett Hawkins Medal awarded to Sir Wilson Jameson, 998
Councillors elected, 1066
Diplomas granted, 374, 634, 1066, 1287
FitzPatrick Lectures, 1289
Harveian dinner, 1011
— Oration, 997
Jameson, Sir Wilson, awarded Bisset Hawkins Medal, 373
Lecturers appointed, 373
Licences conferred, 373, 1066
Martin, E. B., awarded Gilbert Blane Gold Medal, 373
Members elected, 373, 1066
Officers elected, 373
Scholarships, 1066

ROYAL COLLEGE OF SURGEONS OF EDINBURGH:
Diplomas granted, 634
Fellows admitted, 305, 1067
Honorary *Fellowships*, *176*
Officers elected, 1123

ROYAL COLLEGE OF SURGEONS OF ENGLAND:
150th anniversary (W. R. LeFanu), 37; dinner, 100
Appointments, 374, 634, 1066, 1287
Council election, 173
Diplomas awarded, 374, 634, 1066, 1287
Election of officers, 374
Fellows elected, 374
Fellowship Diplomas, 634
Gilbert Blane Medal awarded to E. B. Martin, 634
Hallett Prize, 1066
Hospitals recognized, 634, 1287
Lecturers appointed, 374
Lectures, 55, 1009
Membership diplomas, 634
Moynihan Lecture, 39
Prizes awarded, 634
Scholarships, 1066
Thomas Vicary Lecture, 1233
Wakeley, Sir Cecil, presented with Honorary Medal, 956
Webb-Johnson, Lord, awarded Honorary Medal, 422, 633, 1066

ROYAL COLLEGE OF SURGEONS IN IRELAND:
Conjoint examination results, 1400
Fellows elected, 227, 1340
Licentiates admitted, 466

Royal Commission on Population: *Papers of the Royal Commission on Population*, Vol. 5, 1950, 1429

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW:
Diplomas granted, 634, 1287
Fellows admitted, 686, 955, 1452
Lectures, 843, 1067, 1231, 1340
Officers elected, 1287

Royal Household: Medical appointments, 119
Royal Institute of Philosophy: Lectures, 846
Royal Institution: *Conference on biological aspects of atomic energy*, 999
Royal Medical Benevolent Fund, 307; Charities appeal, 887; 1106 (A); 1281
Royal Navy, occupational health in, 1168
Royal Ordnance factories, absenteeism in, 54
Royal Photographic Society Medical Group, 1051
Royal Sanitary Institute: J. Greenwood Wilson appointed chairman of council, 736
Royal Society: E. D. Adrian elected president, 1320 (L); 1326
— — Leeuwenhoek Lecture, 1220
— — Medallists, 1232

ROYAL SOCIETY OF MEDICINE:
Annual meeting, 119
Blair-Bell medal, 1326
Gift to Library from Wellcome Foundation trustees, 1014
Section of Experimental Medicine: Practice of experimental medicine, 1492
Section of General Practice, 935 (A); inauguration of, 1274

ROYAL SOCIETY OF MEDICINE (*continued*):
Section of Obstetrics and Gynaecology: Diagnosis and treatment of placenta praevia, 1055; correspondence, 1172, 1226, 1393
Symmetrical cortical necrosis of kidneys, 1327
Section of Otology: Pathology and surgical treatment of Bell's palsy, 1386
Sections of Otology and Laryngology: Streptomycin in otolaryngology, 213
Section of Psychiatry: Treatment of obsessional neuroses, 43
Services Section: Industrial health in the Services, 1168

Royal Statistical Society, 57, 1216
ROYSTON, G. Riddell. *See* NEWHOUSE, M. L., 981
RUDOLF, C. R.: A new portrait of William Hunter (Nova et Vetera), 886
Ruesch, Jurgen, and others: *Duodenal ulcer*, 150
RUMBALL, C. A. *See* MOORE, L. G., 400
Russell, C. S., appointed to Chair of Obstetrics and Gynaecology, University of Sheffield, 227
Russell, Henry Bret, obituary of, 1337
RUSSELL, W. Ritchie: Registrar House, 1329
— and SPALDING, J. M. K.: *Treatment of painful amputation stumps*, 68 (O); 415 (C)
Rutherford Memorial, 1265 (A)

S

SAALER, B. C.: Genius and crank, 462
— Emotions and the skin, 1496
Saccharin as carcinogen, 1184
St. Andrews University. *See* Universities: St. Andrews
St. Bartholomew's Hospital: Dinner for Bart's men in South Africa, 1288
— — teaching at, 784
St. Cyres Lecture, 639, 693
St. John's Hospital, Lewisham; proposed dismemberment of, 219, 731
St. Johnston, Sir Reginald, obituary of, 631
St. Luke's Day, 944
St. Thomas's Hospital, reconstruction of (parliamentary note), *1065*
Salicylates, intravenous, efficacy of, 232
Salmon, cyanide-killed: *risks to consumer*, *1127*
SALMOND, J. R.: Dead bodies in water, 1390
SALT, H. B. *See* MILLES, H. L., *444*
SAMES, C. Patrick: Gangrene of vestigial tail, 1120
SANDERS, Kingsley: Virus encephalitis of mice, 1217
Sanderson-Wells Lecture, 1286
— Nurses Prize fund, expropriation of, 406 (A)
— Prize, 1340
SANDIFORD, B. R.: Lung cancer and petrol lighters, 682
SANDIFORD, H. B. C.: Modification of Boyle's apparatus, 1003
Saner, F. D. (Editor): *The Breast. Structure: Function: Disease*, 989
SANGUINETTI, Harold H.: *Improving the medical curriculum* 836
SANJANA, A.: The G.P. at the crossroads, *170*
Sarcoidosis of Boeck, erythema nodosum as initial manifestation of (F. E. Crawley), 1362 (O)
Sarcoma: Cellular transmission of mouse sarcomata with frozen-dried tumour tissues (L. Dmochowski and A. Millard), 1136 (O); 1159 (L)
— Cultivation *in vitro* of frozen and desiccated mouse tumour tissues (*R. D. Passey and others*), *1134* (O); 1159 (L)
SARGANT, William. *See* SLATER, Eliot, 44
SAUNDERS, S. R.: Squatting position in labour, 1174
SAVAGE, Oswald. *See* COPEMAN, W. S. C., 849
SAVAGE, T. R.: Chronic adhesive spinal meningitis associated with lumbar naevus and dimple, *709 (O)*
SAVILLE, P. R.: Teething, 1335
Savory and Moore: Raynaud's disease, *1128*
Scalds: *New Approach to the Treatment of Burns and Scalds* (Leonard Colebrook), 26
Scalp, neurodermatitis of, 584
Scarborough, H., appointed Professor of Medicine and Director of the Medical Unit, Welsh National School of Medicine, 117
Scarlet fever, duration of fatal case, *109*
— — rheumatic fever, and acute nephritis, 49
SCHIFF, Charles: Congenital malformation and disease, 840
Schinz, H. R., and others: *Lehrbuch der Röntgendiagnostik*, 5th ed., 929
Schistosomiasis: Some aspects of *Schistosoma mansoni* infection (Dawood Mustafa), 658 (O)
— *Schistosomiasis in South Central Africa*. A Clinico-Pathological Study (Michael Gelfand), 200
Schizophrenia: Chronic subdural haemorrhage associated with schizophrenic reaction (Kirpal Singh), 562
— dienoestrol in, 1062
— stress as causal factor in, 1072
Schleip, K., and Alder, A.: *Atlas der Blutkrankheiten*, 4th ed., 765
Schneider, Kurt: *Klinische Psychopathologie*, 3rd ed., 1371
Schoen, R., and Tischendorf, W.: *Klinische Pathologie der Blutkrankheiten*, 765
School Dental Service (parliamentary note), 1286
— medical inspections, 798, 825, 1170
SCHWABACHER, H.: Review of one year's work in Watford Pregnancy Diagnostic Centre, 328 (O)
Science centre in London proposed, 1342
Sclerosis, disseminated: early clinical manifestations (Douglas K. Adams, John M. Sutherland, and W. Bell Fletcher), 431 (O); 451 (A)
— — relation of rare forms of paroxysmal trigeminal neuralgia to (Wilfred Harris), 1015 (O); 1045 (A); correspondence, 1334, 1444
— — vitamin B_{12} in, 59
— tuberous: unusual case (A. J. N. Warrack), 1367 (O)
Scoliosis, structural, idiopathic, curve patterns in, 1216
SCOTLAND:
Analgesia in Scotland, 303
Blind persons in Scotland, 307
General Nursing Council; new members, 1342
Medical and Dental Defence Union of Scotland, 521
Medical research; advisory committee, 175
Medical schools, 518
Registrar-General's quarterly returns (epidemiological note), 735, 898
Scottish Fever Group; 4th annual meeting, 1050
Scottish Society of the History of Medicine; Second annual report, 1440
Tuberculosis; expansion of service (parliamentary note), 371
— service in Scotland; *Report of subcommittee* appointed jointly by Central Consultants and Specialists Committee of Scotland and Tuberculosis Society of Scotland, 61 (O); 92 (L); correspondence, 169, 295, 461
SCOTT, Eric A.: Collapse during spinal analgesia, 681
Scott, G. E. M.: *Natural History of Bright's Disease*, 564
SCOTT, G. I. *See* MACDONALD, A. C., 441
SCOTT, L. D. W., and others: Hexamethonium bromide in duodenal ulcer, *1470 (O)*
SCOTT, R. Bodley: Diagnosis and treatment of pernicious anaemia, 157
SCURR, C. F.: Use of decamethonium iodide in anaesthesia for peroral endoscopy, 1311 (O)
Seamen: Joint report of I.L.O./W.H.O. Committee on Hygiene of Seafarers, 813
Sea-sickness, *antihistamines in*, 692, 719 (A), 836, 1225
— treatment with "dexedrine," 1117
— — with dramamine, 347, 946
— — with hyoscine, 1117
— — with sodium bicarbonate and citrate, 952
SEDDON, H. B.: Tuberculous arthritis of the hip-joint, 293
Semen: Haemospermia; causes and treatment, 377
Semon Lecture, *1166*
SEN GUPTA, J. M.: The causes of death in diabetes, 1061
Senior hospital medical officer grade; limits, 876 (L)
Septicaemia: treatment with streptomycin, 670
Services. *See* Armed Forces
SEWARD, E. H.: Obstetric analgesia and placental *insufficiency*, 1422 *(O)*
Sex hormones in chemotherapy of cancer, 1271
Sexton, Helen Mary, obituary of, 1228
Sexual intercourse, excessive, 848
— urge, effect of radium therapy on, 77
SHACKMAN, Ralph: Renal failure, 348
Shakespeare's plays and psychoanalysis, 1364
SHAPIRO, H. A.: Rigor mortis, 304
SHARPEY-SCHAFER, E. P.: Cardiac failure, 268
SHATTOCK, F. Mackenzie, and MICKLEM, Lorna P.: Insulin and E.C.T. for rheumatoid arthritis, 1058
Shaw, Bernard, 1104 (L)
SHEEHAN, H. L.: Symmetrical cortical necrosis of kidneys, 1327
Sheffield: Food-poisoning in 1949 (E. L. M. Millar and Margaret Pownall), 551 (O); 614 (L); 731 (C)
— University. *See* Universities: Sheffield
SHEPHERD, J. T.: Evaluation of treatment in intermittent claudication, 1413 (O)
SHERIDAN, Mary D.: Deafness in children, 273
SHERRIFF, Geoffrey G.: Cost of academic clinical office, 1447
Shigella: *Classification of the Shigella Types* (Sten Madsen), 610
— *flexneri*, vulvovaginitis in a child due to (W. J. McGinness and R. C. Telling), 1424
Shoe-fitting fluoroscope, dangers of, 565 (L); 730, 1120
Shortall, Christopher Joseph, obituary of, 171
SHORTT, H. E.: Recent advances in our knowledge of the malaria parasite, 606 (O)
SHORVON, H. J., ROOK, A. J., and WILKINSON, D. S.: Psychological treatment in skin disorders; with special reference to abreactive techniques, 1300 (O); 1322 (A)
SHUBSACHS, S.: Treatment by mechanical vibration, 415
— Exercises in the bath, 1281
SHUCKSMITH, H. S.: Treatment of arterial thrombosis, 168
SHUN SHIN, M.: Situs inversus and perforated appendix, 892
SICHER, K.: The public and cancer, 298
Sickness benefit; time limits, 7
Silicosis in Cornwall (parliamentary note), 172
— in Rhodesia, 731

SILVER, A. L. Leigh: Red perspiration, 1184
Simmons, Stewart Septimus, obituary of, 1064
SIMPSON, J. A. *See* SCOTT, L. D. W., 1470
SIMPSON, R. R.: Deafness in children, 364
SIMPSON, S. Leonard: Addison's disease, 1164
Sinclair, Neil Frederick, obituary of, 1227
SINCLAIR, R. J. G., and DUTHIE, J. J. R.: Intravenous iron in treatment of hypochromic anaemia associated with *rheumatoid arthritis*, 1257 *(O)*
Singer, Charles: *Paul Ehrlich*, by Martha Marquardt (Nova et Vetera), 267
SINGH, Kirpal: *Chronic* subdural haemorrhage associated with schizophrenic reaction, 562
SINTON, Alastair: Nocturnal enuresis, 50
Sinusitis, chronic, treatment with penicillin, 424
Situs inversus and perforated appendix, 892
Skeleton; insulin-induced *abnormalities* in developing chickens (P. K. Duraiswami), 384 (O); 404 (L); 785 *(C)*, 1002 *(C)*, 1277 *(C)*, *1495 (C)*
SKIN. *See also* Dermatology
Creeping eruption in association with intestinal strongyloidiasis (Joseph Caplan), 288
effect of penicillin on, 629
Functions in vertebrates, 674
grafting, 284
grafts for full-thickness skin lesion burns (J. P. *Reidy*), *1030 (O)*; 1044 (A)
Reactions produced by arthropods directly *injurious* to the skin of man (R. M. Gordon), 316 (O)
Psychological treatment in skin disorders, with special reference to abreactive techniques (H. J. Shorvon, A. J. Rook, and D. S. Wilkinson), 1300 (O); 1322 (A); 1496 (C)
Skin cancer and cutting oils, 568 (A)
SLACK, Cyril C.: Displaced registrars, 1223
SLACK, W. K.: Kitchen hygiene, 731
SLATER, Eliot, and SARGANT, William: Physical treatment of obsessional neuroses, 44
SLEIGH, J.: Poliomyelitis and immunization, 300
Slocum, D. B.: *An Atlas of Amputations*, 716
SMALL, J. M. *See* HUGHES, Brodie, 1334

SMALLPOX:
Control, 581
Herpes zoster provoked by smallpox vaccination (Kemble Greenwood), 1424
in the unvaccinated, 107, 220, 300, 463
Leverhulme Research Grant, 230
notifications (parliamentary note), 1398
on s.s. *Strathnaver* (epidemiological note), 118
Parliamentary note, 372
Post-vaccinal encephalitis, 738
prophylaxis (parliamentary note), 53
treatment, 583
Vaccination certificates required by foreign governments, 215, 416, 530, 682
— *reactions in*, *1013*
— sensitization to calf lymph, 424
— storage of vaccine lymph, 1455
Smart, G. A., appointed Reader in Medicine, University of Durham, 227
SMITH, A. N. *See* KAY, A. W., 807
SMITH, C. Simpson: Poliomyelitis; age incidence, 786, 1120
Smith, Henry Faithful, obituary of, 420
SMITH, Homer: Development of renal physiology, 345
SMITH, J. Anstruther: Danger of mixed anaesthetics, 681
SMITH, K. Shirley: The failing heart, 340
Smith, Sydney Watson, obituary of, 1450
Smoke abatement (parliamentary note), 842
Smoking. *See* Tobacco smoking
SNAITH, Linton: Caesarean section in placenta praevia, 1056
SNOW, R. H. B.: Chloromycetin and typhoid haemorrhage, 166
Snowden, Arthur de Winton, obituary of, 52
SNYDER, Laurence H.: Heredity in ophthalmology, 344
Social medicine (J. M. Mackintosh), 274
— — from the point of view of the M.O.H. (C. Fraser Brockington), 290
— — research at Oxford, 1503
— — *Social Medicine: Its Derivations and Objectives* (Editor: I. Galdston), 873
Social Psychotherapy Centre, 481
Social Work in the Current Scene (National Conference of Social Work), 716
Socialist Medical Association and displaced registrars, 1372 (L); 1501 (parliamentary note)
Societies, medical, 521
Society of Apothecaries of London: Announcements, 1287
Appointments, 686, 1287
Diplomas granted, 686, 1287
Lectures, 1179
Society of British Neurological Surgeons, 214
Society of Chiropodists, 57
Society for Epileptics, 58
Society of Medical Officers of Health, 521, 899
Annual dinner, 1288
Presidential address (J. M. Gibson), 1000
Society of Radiographers; fourth annual conference dinner, 539
Society for Relief of Widows and Orphans; annual general meeting, 119
Society for the Study of Fertility; inaugural conference, 44
See also Alfred Adler Society
Cancer Society
Chelsea Clinical Society, 1400
Deutsche Gesellschaft für Innere Medizin
Devon and Exeter Medico-Chirurgical Society
Franco-Anglo-American Medical Society
Hunterian Society
International Society of Haematology
International Society of Surgery
Manchester Medical Society
Medical Protection Society
Medical Society of London
North of England Obstetrical and Gynaecological Society
North of England Surgical Society
North-east London Clinical Society, 57
Ophthalmological Society of the United Kingdom
Royal Statistical Society
Scotland: Scottish Society of the History of Medicine
Ulster Paediatric Society
Sodium phenytoin in epileptic attack, 1047
Solly, Ernest, obituary of, 465
SOLOMONS, Bethel: Diagnosis and treatment of placenta praevia, *1172*
SOMERVILLE, Walter: The effect of cortisone on the cardiogram in chronic adrenal insufficiency, 860 (O)
Sommers, I. G.: *Histology and Histopathology*, 254
SONDHI, P. R.: Treatment of fractures of tibia and fibula, 346
SOPHIAN, John: *Acute tubular necrosis*, *109*
Sorbitan polyoxyethylene mono-oleate in treatment of defective fat absorption, 476
Sorsby, Arnold: *Causes of Blindness in England and Wales*, 1950, 1483
SOULIE, P. *See* LAUBRY, Ch., 872
Soups, meat and chicken, nutritive value of, 1404
SPALDING, J. M. K. *See* RUSSELL, W. Ritchie, 68
Spas and health resorts, British, 169
Specialists. *See* Consultants and Specialists
Spectacles, supply of (parliamentary note), 1286
Speech therapists, Register of, 956
SPENCE, Sir James, and COURT, Donald: Acute intussusception in childhood, 920 (O)
SPENCER, I. O. B. *See* OGILVIE, A. G., 138, 528
SPENCER, R. *See* ANGELMAN, Harry, HALL, E. G., and SPENCER, R., 752
Spens awards and charity, 1163 (A); 1170, 1329
Spina bifida, inheritance of, 122, 793
Spinal cord; subacute combined degeneration; liver therapy, 377
Spine: Ankylosing spondylitis, 1104 (A)
— Chronic adhesive spinal meningitis associated with lumbar naevus and dimple (T. R. Savage), 709 (O)
— Treatment of lumbar disk lesions (James Cyriax), 1434
Spirits: Duty-free spirits in hospitals, 163
SPITTA, Harold. *See* COPEMAN, J. S., 1057
Spleen: Hypersplenism, 672
Splenectomy for rheumatoid arthritis, 1490
Splenomegaly in thrombocytopenic purpura, 793, 960
Spondylitis, ankylosing, 1104 (A)
— — aetiology, diagnosis and treatment, 689
— — effect of adrenocorticotrophic hormone on capillary resistance *in*, 975
— — familial, 1490
SPOONER, E. T. C. *See* EVANS, R. J., 185
Sprue, faecal fats in, 794
— syndrome, familial incidence of, 893
Spurge in treatment of warts, 584, 729
Spurling, R. Glen: *Practical Neurological Diagnosis*, 4th ed., 27
Sputum-testing in diagnosis of pulmonary tuberculosis, *167*
Squatting position in labour, 1174
STABLER, F.: Diagnosis of early pregnancy, 282
STALLARD, H. B.: Fixation of a corneal graft by an acrylic splint, 1034 (O)
— *Eye Surgery*, 2nd ed., 1206
STALLWORTHY, J. A.: Genital tuberculosis, 270
— *Clinical signs and X-ray appearances of placenta praevia*, 1055
STALLYBRASS, C. O.: Epidemics, old and new, 265
— Child *health and the future*, 945
— honorary M.D. (Liverpool) conferred on, 156; correction, 232
STAMM, T. T.: Subtaloid arthrodeses, 1217
STANWORTH, A., and NAYLOR, E. J.: Some effects of polarized light on vision, 50
Staphylococcal infections, penicillin in, 618
Staphylococcus aureus, food-poisoning due to, 552
STARK, M. C.: Training for general practice, 784
Statistics: *Practical Statistics in Health and Medical Work*, 610
Status asthmaticus, morphine in, 110
— epilepticus, treatment of, 1048
STEEL, G. C.: *Some therapeutic applications of* nerve blocks, 293
STEELE, W. H.: Ankle amputation, 168
— obituary of, 1282
STEEN, D. J. Ross: Haemorrhage from peptic ulcer, 628
STEINBERG, Hannah. *See* WILSON, Andrew, 484
STEPHEN, Karin: Treatment of obsessional neuroses, 43
Stephen Paget Memorial Lecture, 1124, 1385
Sterilization, electronic, of food, 615 (A)
— *of the male; effects of vasotomy*, 689
— test-papers, 738
Stevens-Johnson syndrome, 369
Stevenson, Claude Maberley, obituary of, 301
Stevenson, Douglas Stuart, obituary of, 1177
STEVENSON, F. Harwood: Diphyllobothrium infestation, 418
— *Immobilization osteoporosis*, 1216
STEVENSON, J. J.: Radiological examination of the larynx, 357
STEVENSON, John S.: *Bact. coli* D 433 in cases of diarrhoea in adults, 195 (O); 205 (A); correspondence, 462
Stewart, F. S., appointed Professor of Bacteriology and Preventive Medicine, University of Dublin, 226
Stewart, Matthew J., *retirement of*, 297
— appointed Emeritus Professor of Pathology, University of Leeds, 1009
Stilboestrol: contraindication in *familial tendency to* breast cancer, 638
— effects of prolonged administration in female, 1456
— — *on retention* due to prostatic enlargement, 584
Stillbirths, 95 (A)
— association with convulsions in childhood (T. W. Buchan), 22 (O)
Stitch: Modified skin stitch, 1279
Stocks, P.: *Cancer Registration in England and Wales*, 1046; correspondence, 1226, 1227
STOKER, M. G. P.: Q fever, 283

STOMACH:
Carcinoma, 217
— among patients with pernicious anaemia; mortality and risk (Johannes Mosbech and Aage Videbaek), 390 (O); 405 (A); correspondence, 575, 892, 1059
— associated with pernicious anaemia (M. H. Oelbaum and N. J. Roussak), 1368
— symptoms, diagnosis and treatment (C. F. W. Illingworth), 262
Gastric secretion, effect of oral hexamethonium salts (A. W. Kay and A. N. Smith), 807 (O); 826 (A)
Gastroscopy, premedication for, 218
Haemorrhage from peptic ulcer, indwelling tube for, 1174, 1391, 1393
Secretion; drug action and suggestion, 826 (A)
Surgery; the dumping syndrome, an operation for its prevention (Thomas O'Neill), 15 (O); 218 (C), 528 (C)
Tumours in pernicious anaemia (M. H. Oelbaum and N. J. Roussak), 1368
ulcer. *See* Peptic ulcer
Volvulus, acute (P. Quinet), 1259

STONHAM, Franklyn: Osteoarthriti, 629
STOPES, Marie: Nocturnal cramps, 738
STOTT, F. D. *See* BOURDILLON, R. B., 539
Strathearn, Sir John Calderwood, obituary of, 578; 1394
Streptococcus, *haemolytic, gangrene of breast due to*, successfully treated with streptomycin (R. Marcus), 394 (O); correspondence, 1278

STREPTOMYCIN:
and neomycin; an antibiotic approach to tuberculosis (Selman A. Waksman), 595 (O); 615 (A)
Antimycobacterial properties, 596
development of resistance to, 599
Effect in experimental and clinical tuberculosis, 597
— on vaccine lymph, 1035
Haemolytic streptococcal gangrene of breast successfully treated with streptomycin (R. Marcus), 394 (O); correspondence, 1278
in foetal blood after treatment of tuberculous meningitis, 787, 952
in genito-urinary tuberculosis, 1376 (A)
in otolaryngology, 213
in pulmonary tuberculosis, 213, 369, 527
— — pulmonary tuberculosis; Medical Research Council investigation, 1073 (O); 1102 (L); 1391 (C)
in Reiter's syndrome, 166
in tuberculosis, 203 (L)
in tuberculous cervical adenitis, 583
in tuberculous meningitis, 413, 524
Local application, 738
Mode of administration and action, toxic effects, and indications for use, 669
resistance to, by tubercle bacillus, 902

Stress and the general adaptation syndrome, 104, 164, 215, 220
Strongyloidiasis, creeping eruption in association with (Joseph Caplan), 288
Struthers, Andrew Edgar, obituary of, 953
STUART-HARRIS, C. H.: Atypical pneumonia, 1457 (O); 1484 (A)
Students, foreign, exempted from National Insurance contributions, 474
— health of, in Belfast, 1221
— medical, health services for, 1056
— — in Great Britain; 1938–9 and 1948–9 compared, 833
— — numbers admitted to schools in 1942–50, 514
— — Treatment of *tuberculous students*, 1497; 1484 (A)
Succinylsulphathiazole, 409

SUCHETT-KAYE, A. I.: Treatment of Reiter's syndrome, 166
Sulphacetamide, 409
Sulphadiazine, 408
Sulphadimidine, 409
Sulphaguanidine, 409
Sulphamerazine, 409
— crystals, causing urethral obstruction, 1445
— in treatment of typhoid carrier, 400
Sulphanilamide, 408
Sulphapyridine, 408
Sulphathiazole, 408
Sulphatriad, 409
SULPHONAMIDES:
Choice for mixture therapy (David Lehr), 601 (O)
Dosage in kidney infection, 526
Relation of dosage to incidence of allergy, 601
Sensitivity of *H. influenzae* strains, with special reference to the combined use of antibacterial drugs (K. Zinnemann), 705 (O)
Sulphonamides (F. Hawking and J. Stewart Lawrence), 90
Therapy (D. M. Dunlop), 408; 525 (C), 526 (C), 628 (C)
Sulphones: Diaminodiphenylsulphone in tuberculosis, 31 (A)
Sulphur, effect in rheumatoid arthritis, 794
— in treatment of psoriasis, 530
Sunlight, effect of, on convalescent tuberculous patient, 1345
Superannuation Scheme for Those Engaged in the N.H.S., 559
Suprarenal. *See* Adrenal
Suramin therapy as cause of adrenal necrosis, 655
SURGERY:
Advanced revision courses, 508
Atlas of Amputations (D. B. Slocum), 716
Blood loss at operation, 50
Instruments subject to damage by moist heat, sterilization of, 1128
International Society of Surgery; 14th congress, 1951, 1504
Modified skin stitch, 1279
Mortality in geriatric surgery (Louis Carp) 1198 (O); 1390 (C)
Natural history of surgical infection, 39
Short Textbook of Surgery, 5th ed. (C. F. W. Illingworth), 1260
Some unusual but instructive surgical emergencies (H. D. Moore), 756 (O)
Surgical operations; form of consent (medico-legal note), 370
Techniques in British Surgery (Editor: Rodney Maingot), 1039
Treatment of painful amputation stumps (W. Ritchie Russell and J. M. K. Spalding), 68 (O); 415 (C)
Surgical appliance contracts (parliamentary note), 372
SUTHERLAND, Ian. *See* WILSON, Dagmar C., 862
SUTHERLAND, John D., and BOWLBY, John: An interesting advertisement, 625
SUTHERLAND, John M. *See* ADAMS, Douglas K., 431
Sutures: Modified skin sutures, 1279
— unabsorbable, causing uterine sepsis (John Howkins), 659; 949 (C), 1279 (C)
Swab, death due to (medico-legal note), 1399
SWAIN, Valentine: Antihistaminics and nocturnal frequency, 836
SWANSTON, Catherine N.: Employment of epileptics, 1170
— *See* PASSMORE, R., 401
SWARBRECK, Allen B.: Early rising for puerperal women, 47
Sweat and adrenal function, 667 (A)
SWEETNAM, W. P.: Poliomyelitis: Age incidence, 950
SWIFT, P. N.: Streptomycin in foetal blood, 787
Swimming-pools, chlorinated, and poliomyelitis, 625, 728, 950
Switzerland: Treatment of tuberculosis (parliamentary note), 371
SYDENHAM Annie: Separation of umbilical cord before delivery, 50; correspondence, 578
SYLVESTER, D. G. H.: Epidemic of benign dry pleurisy, 653 (O)
Syme's amputation, 168
SYMONDS, Sir Charles: Management of the epileptic, 1047; correspondence, 1170
— awarded Raymond F. Linacre Award, 422
SYMONS, A. D.: Chlorinated swimming-pools and poliomyelitis, 728
Sympathectomy for intermittent claudication; prediction of effects, 1416
Synovitis, chronic, of knee, 637
— villonodular, pigmented, 1218
SYPHILIS:
Chemotherapy, 351
Gummatous infiltration of oesophagus masquerading as carcinoma (Stanley O. Aylett), 1476
in Greenland, 155 (A)
in Haiti, 668 (A)
primary, prognosis of, 122
prophylaxis, 231, 470
Treatment of neurosyphilis, 934
— with chloromycetin, 1227
Syrian University: Faculty of Medicine, 523
SYRINGES:
Clip for syringes, 1279
Controller for the all-glass syringe (Hamish M. Mann), 294
Eccentric nozzles, 1227
Possible mode of transfer of infection by syringes used for mass inoculation (R. J. Evans and E. T. C. Spooner), 185 (O); 204 (A); 365 (C), 461 (C), 837 (C), 1059 (C)
Sterilization, 365

T

TABBUSH, H. *See* MARSON, F. Graham, MEYNELL, M. J., and TABBUSH, H., 760
Tachycardia, sinus, in psychoneurotic, 794
Tail, ritual, 1120
— vestigial (P. J. Blaxland), 870; 1005 (C), 1120 (C)
TANNER, Norman C.: Gastric ulcer and vagotomy, 950
TATTERSALL, W. H.: Crisis in tuberculosis, 416
TAYLOR, Frances M.: Useless routine medical examinations, 1171
TAYLOR, L. M. *See* BOURDILLON, R. B., 539
TAYLOR, R. B. *See* O'FLANAGAN, P. M., 444
Teaching: The art of lecturing (G. Patrick Meredith), 475 (O); 501 (L)
— of the medical student, 524
— Mechanical aids to instruction (Robert Ollerenshaw and Peter Hansell), 488 (O); 678 (C), 784 (C)
— Teaching the teacher, 501 (L)
— Training of clinical teachers (R. D. Lawrence), 481 (O); 501 (L); correction, 1072
Teeth: *Klinik für Zahn-, Mund- und Kiefer-Krankheiten* (Hermann Wolf), 254
— Repair of worn incisors, 1292
— Toothache, 1492
Teething, infant ailments ascribed to, 1013, 1266 (A), 1281, 1335, 1391
Television in medical education, 493
TELLING, R. C. *See* MCGINNESS, W. J., 1424
Tellurium poisoning, 1058
T.E.P.P. *See* Tetraethyl-pyrophosphate
Terramycin hydrochloride; laboratory and clinical experience (W. D. Linsell and A. P. Fletcher), 1190 (O); 1209 (L)
— production of, 1319
— supply of (parliamentary note), 1065
TERRY, Charles S. *See* TODD, James P., 788
TERRY, Richard: Erythrocyte sedimentation in anaemia, 1296 (O); correspondence, 1445
Tetanus antitoxin; indications, 1128, 1236
— death from (medico-legal note), 1283
— puerperal, five cases; (one associated with eclampsia) (D. B. Jelliffe, A. H. C. Walker, and Stafford Matthews), 814 (O)
— treated with *decamethonium iodide* (R. McD. S. Keir), 984 (O); 994 (A)
— — with *myanesin*; an unusual complication (M. L. Newhouse, J. D. Rochford, and G. Riddell Royston), 981 (O); 994 (A)
Tetraethylammonium bromide; toxic effects in animals and man (Alexander J. P. Graham), 321 (O)
— chloride therapy, acute myocardial infarction due to (D. J. Livingstone), 713; correspondence, 1446
Tetraethyl-pyronhosphate, toxic effects of, 548
Thannhauser, S. J.: *Lipidoses: Diseases of the Cellular Lipid Metabolism*, 1156
Therapeutics: *Aids to Medical Treatment*, 2nd ed. (T. H. Crozier), 716
— *Concise Applied Pharmacology and Therapeutics*, 3rd ed. (F. G. Hobart and G. Melton), 401
— *Essentials of Materia Medica, Pharmacology and Therapeutics*, 91
Thiopentone, acquired sensitivity to (John W. Dundee), 332; correction, 470
— danger of, when mixed with relaxant, 681
— rectal, for minor surgery, 690
— — in children (John Lorber), 21 (O); 368 (C), 891 (C)
Thiouracil; hitherto undescribed toxic effect (C. B. Prowse), 1312; correspondence, 1493
— in thyrotoxicosis, 81
— — — complications, 1379
THOMAS, A. Robinson: Amalgamation of radiological societies, 530
THOMAS, David: Dangerous "prams," 219
THOMAS, E.: Role of the psychiatric social worker, 292
THOMAS, Goronwy E.: Treatment of short leg, 358
THOMAS, J. A. B.: Toxic effects of streptomycin on the vestibular nerve, 213
THOMAS, O. F.: Resection of lung for pulmonary tuberculosis, 288
THOMPSON, Brian: Crisis in tuberculosis, 461
THOMSON, A. C.: The dangers of mixing domestic cleansers, 1059
THOMSON, Charles S.: Safety on cycles, 1002
Thomson, Henry James, obituary of, 222
THOMSON, Ian S.: Crisis in tuberculosis, 165
THOMSON, J. M.: Diagnosis of placenta praevia, 1226
THOMSON, T. R.: When is disablement not disablement ?, 1224
Thomson, Sir William Willis Dalziel, obituary of, 1335
Thonzylamine in prevention and treatment of common cold, 426, 448
Thorax. *See* Chest
Thorpe's Dictionary of Applied Chemistry, Vol. 10, 4th ed., 1100
Thrombophlebitis migrans, prognosis and treatment of, 901
— Treatment of post-phlebitic leg and application of venous-pressure measurement (A. J. Walker), 1307 (O); 1495 (C)
Thrombosis, arterial; treatment, 168
— cerebral, *neuralgia due to*, 1018
— coronary, anticoagulants in treatment of (John A. Tulloch and A. Rae Gilchrist), 965 (O); 991 (L); correspondence, 1226
— — *choline* in treatment of, 1072
— *Thrombosis in arteriosclerosis of lower extremities* (Edward A. Edwards), 150
— Pre-thrombotic state, 406 (A)
Thrush in infants, 1430 (L)
— in myasthenia gravis; treatment, 470
Thyroid, iodine, and aspirin preparation, 584
— Van Meter Prize Awards, 1069
Thyrotoxicosis, body weight in, 84
— management of (Raymond Greene), 1378
— psychiatric aspects, 82
— treatment of (Ian Murray), 80 (O)
— — with 2-mercaptoimidazole; clinical impressions (George L. Foss), 1252 (O); correspondence, 1447
Tibia, fractures; treatment; traction apparatus (P. R. Sondhi), 346
Tidal air measurements in health and poliomyelitis, 540
TIDY, Sir Henry: Haemorrhage from peptic ulcer, 459
— appointed Commander of the Order of the Crown, Belgium, 1123
TIETZE, H. M.: Teething, 1281
TIGHE, H. R.: Cancer of the lung and smoking, 107
TIPPETT, S. G.: Truth about tuberculosis, 1493
TISCHENDORF, W. *See* SCHOEN, R., 765
Tissue grafting (G. McC. Wyburn), 284
Tobacco smoking and cancer of lung, 107, 417
— — association with carcinoma of the lung (Richard Doll and A. Bradford Hill), 739 (O); 767 (L); 889 (C), 890 (C), 1004 (C), 1060 (C)
— — and pulmonary tuberculosis, 630, 840
— — cure for, 1235
— — relation to peptic ulcer, 994 (A)
— substances added to, 1060
TOBIN, J. O'H.: Laboratory diagnosis of lymphocytic chorio-meningitis, 1387
TODD, James P., and TERRY, Charles S.: Appeal for bacteria, 788
TODD, R. McL.: Infection of infants in the hospital ward, 362
Togna system of exercise and massage in the bath, 1153, 1283, 1329, 1494
Toilet paper, risk of infection from, 1393
Tong Lecture, 1289
Tongue, unilateral recurrent irritation; cause and treatment, 232
Tooth, G.: *Studies in Mental Illness in the Gold Coast*, 1212
TOUGH, David W.: Nurses and tuberculosis, 525
Toxicity: *Design of Toxicity Tests* (W. L. M. Perry), 1101
TOXICOLOGY:
Barium carbonate poisoning; seven cases (Geoffrey Dean), 817 (O); 827 (A)
Chemistry of Industrial Toxicology (Hervey B. Elkins), 821
Death from atropine poisoning (W. E. Heath), 608
Gammexane poisoning; symptoms and signs, 1014
Medical Jurisprudence and Toxicology, 9th ed. (John Glaister), 446
Methyl bromide inhalation, fatal case of poisoning due to (A. C. MacDonald, I. C. Monro, and G. I. Scott), 441 (O); 625 (C), 681 (C)
Methyl bromide and ethylene oxide poisoning, 848
Parathion poisoning (H. L. Milles and H. B. Salt), 444
Poisoning by organic phosphorus insecticides (P. Lesley Bidstrup), 548 (O)
Potassium bichromate poisoning, acute (C. N. Partington), 1097 (O)
Red cell stippling in poisoning, 1496
Toxic effects in animals and man after tetraethylammonium bromide (Alexander J. P. Graham), 321 (O)
Use of intravenous amphetamine sulphate in acute barbiturate poisoning (J. D. N. Nabarro), 924 (O); correspondence, 1333
Toxins, bacterial, 1240
Tracheotomy in oedema of glottis (J. D. Little), 1476
Trachoma; treatment, 309
Trade union membership a condition of employment in Durham, 1210 (L); 1265 (A); parliamentary notes, 1229, 1339
Transfixion by a muck fork (Christopher Cummins), 198
Travel fatigue and poliomyelitis, 164
Travelling expenses of patients, payment for, 562
TRENCHARD, H. J.: Crisis in tuberculosis, 295
Trespass by a house-surgeon (medico-legal note), 171, 370
TREVAN, J. W. *See* MOGEY, G. A., 216
Trichlorethylene for dental operations, 690
Tricuspid valve, atresia of, 697

Tricycles for invalids (parliamentary note), 1178
"Tridione." *See* Troxidone
Trigeminal nerve, anaesthetization of, 1334
— neuralgia, paroxysmal; rare forms and their relation to disseminated sclerosis (Wilfred Harris), 1015 (O); 1045 (A); correspondence, 1334, 1444
TRIMMER, Eric J.: Cigarettes and cancer, 889
Trinity College Dublin: Moyne Institute of Preventive Medicine, 899
TRONCHIN-JAMES, R. N.: Disordered society, 776
Tropical medicine and hygiene; new diploma, 791
— — *Research institute* at Harbel, Liberia, 1091
ulcers, treatment of, 49
Tropics, medical administration in, 50
TROUTON, Derrick S.: Psychological polemics, 731
Troxidone in epileptic attack, 1047
Trypanosomiasis: Status epilepticus; a symptom complex of African trypanosomiasis (Edward F. B. Forster), 987
Tuberculin-jelly test, value of (W. Pointon Dick), 141 (O); 154 (A); 461 (C), 1333 (C)
TUBERCULOSIS:
and marriage, 309
and the National Health Service; report of B.M.A. Tuberculosis and Diseases of the Chest Group committee, 1382; 1373 (L); 1493
and pregnancy (R. C. Cohen and others), 271
as cause of death in diabetic children, 1294
as prescribed disease, 1321 (A); 1493
B.C.G. vaccination; technique, 993 (L)
Beds for the tuberculous, 173, 1223
British Legion Village; report for 1947–9, 658
Care and rehabilitation of tuberculous persons, 1232
4th Uruguayan Congress, 1233
Coxitis tuberkulosa (Herbert Gardemin), 1370
Diagnosis; value of mass radiography, 1279
Domiciliary treatment, 226, 369, 525, 626, 786, 1353 (O) (F. R. G. Heaf)
Genital tuberculosis (J. A. Stallworthy), 270
Genito-urinary tuberculosis, streptomycin in, 1376 (A)
Hypersensitivity after B.C.G. vaccination, 1403
in South Korea, 102
Mantoux conversion, 1173
Meningeal and acute miliary tuberculosis; effect of streptomycin, 597
miliary, complicated by aplastic anaemia (Robert J. Kernohan), 399
Mortality in certain countries (epidemiological note), 1454
non-pulmonary, 403 (L)
— distribution and frequency, 458
Nurses for sanatoria (parliamentary note), 1285
— *insurance under National Insurance* (Industrial Injuries) Act (parliamentary note), 1340
Post-tuberculous middle lobe syndrome, 407 (A)
Prize, 1233
Protection of children; recommendation of Joint Tuberculosis Council, 175
pulmonary, case-finding in, 167
— 10th Italian Congress, 1401
— effect of East African climate, 1072
— effect of pregnancy on, 877 (A)
— — of sunlight in convalescence, 1345
— effects of tobacco smoking, 630, 840
— in relation to occupation; mortality rates, 178
— indications for P.A.S. in, 424
— *management of* (F. H. Young), 97
— Radiological and pathological correlation of miliary tuberculosis in children, with special reference to choroidal tubercles (J. L. Emery and L. Lorber), 702 (O); 720 (A); 951 (C), 1173 (C)
— resection of lung for (O. F. Thomas), 288
— sudden death after spontaneous pneumothorax, 714
— treatment with intermittent streptomycin, 369, 527
— — with streptomycin, 213, 598
— — with streptomycin and para-amino-salicylic acid (Medical Research Council), 1073 (O); 1102 (L); 1391 (C)
Rations for the tuberculous (parliamentary note), 1178
Ravages of tuberculosis (parliamentary note), 1178
Rehabilitation of the tuberculous, 154 (A); 162
Resistance to streptomycin of tubercle bacillus, 902
Scholarship award to nurses by National Association for the Prevention of Tuberculosis, 819
Scotland; expansion of tuberculosis service (parliamentary note), 371
— Tuberculosis service; Report of subcommittee appointed jointly by Central Consultants and Specialists Committee of Scotland and Tuberculosis Society of Scotland, 61 (O); 92 (L); correspondence, 169, 295, 461
Services, reorganization of, 1356
spinal, small temperature swings in, 1403
Statistics for 1949 (parliamentary note), 1284
Thoracic surgery units in sanatoria, 1118
Treatment; chemotherapy, 576
— *A different view of the tuberculosis problem* (G. F. B. Page), 1380; 1373 (L)
— domiciliary (parliamentary note), 226, 369, 525, 626, 786, 1353 (O) (F. R. G. Heaf)
— — with antibiotics, 470
— in foreign sanatoria (parliamentary note), 1286
— in Switzerland (parliamentary note), 371; 1342
TUBERCULOSIS (*continued*):
Treatment; memorandum from Minister of Health, 162; 154 (A); 416 (C), 577 (C)
— of students, 1497; 1484 (A)
— risks of cortisone and A.C.T.H., 1490
— with 4-4'-diaminodiphenylsulphone, 31 (A)
— with streptomycin, 203 (L); 670
— with streptomycin and neomycin, 595, 615
Tuberculin testing by general practitioner, 177
Tuberculin-jelly test (W. Pointon Dick), 141 (O); 154 (A); 461 (C), 1333 (C)
Tuberculosis and Other Communicable Diseases in Relation to Nurses and Other Health Workers, 1321 (A); 1493
Tuberculosis Society of Scotland: Tuberculosis service in Scotland; Report of subcommittee appointed jointly by Central Consultants and Specialists Committee of Scotland and Tuberculosis Society of Scotland, 61 (O); 92 (L); correspondence, 169, 295, 461
Tuberculous cervical adenitis; treatment with para aminosalicylic acid, 583
— meningitis, hospital failures in diagnosis of, 296
— — relation of onset to trauma, 1345
— — *streptomycin in treatment of*, 413, 524
Tuberculosis: Waiting-lists, 303
Work of the chest clinic, 352
TUBOCURARINE: *See also* Decamethonium iodide; *Hexamethonium* iodide
Effect on central nervous system, 95 (A)
D-Tubocurarine salts and derivatives, 216, 367
Tularaemia; treatment with streptomycin, 670
TULLOCH, John A., and GILCHRIST, A. Rae: Anticoagulants in treatment of coronary thrombosis, 965 (O); 991 (L); correspondence, 1226
TUMOURS:
Cellular transmission of mouse sarcomata with frozen-dried tumour tissues (L. Dmochowski and A. Millard), 1136 (O); 1159 (L)
Cultivation *in vitro* of frozen and desiccated mouse tumour tissues (R. D. Passey and others), 1134 (O); 1159 (L)
Freezing and desiccation of mouse tumours (R. D. Passey and L. Dmochowski), 1129 (O); 1159 (L)
Multiple primary *neoplasms*, 995 (A)
Studies on Tumour Formation (G. W. deP. Nicholson), 333
Treatment with linear accelerators, 616 (A)
TUNNELL, N.: Peanut from bronchus by percussion, 1390
TURNER, G. Grey: Johann Mikulicz-Radecki, 1004
Twins, conjoined, 988
— identical, and their finger-prints, 1456
— mongolism in one (T. H. Crozier and W. A. B. Campbell), 869 (O); correspondence, 1118, 461, 1172
— uniovular, *diagnosis of*, 1128
TYLDEN, Elizabeth: Psychological involvements of child-bearing, 276
Typhoid carrier treated with penicillin and sulphamerazine (L. G. Moore and C. A. Rumball), 400
— haemorrhage in, effect of chloramphenicol on, 166
— treatment with *chloramphenicol*, *vasomotor* collapse after, 1334
Typhus: Q fever (M. G. P. Stoker and others), 283
— Weil–Felix reaction in Q fever, 309

U

UCKO, H.: Dietary Treatment of hypertension 144 (O)
Uganda, incidence and treatment of yaws in, 676
UHMA, C.: Diagnosis of placenta praevia, 1393
Ulcer, gastric and duodenal. *See* Peptic ulcer
— gravitational, of leg, influence of heredity in (S. T. Anning), 1305 (O); 1495 (C)
— peptic. *See* Peptic ulcer
— tropical, treatment of, 49
Ulster Paediatric Society, 57, 1179, 1503
Ultrasonic irradiation of gallstones, 1107 (A)
Ultra-violet light, value of, to children, 1404
Umbilical cord, delayed post-natal separation of, 893
— — separation before delivery, 50, 578
Unesco Book Coupons, 57
— *Impact*: Quarterly bulletin issued by Unesco, 619
UNGLEY, C. C.: Absorption of vitamin B_{12} in pernicious anaemia. I. Oral administration without a source of intrinsic factor, 905 (O); II. Oral administration with normal gastric juice, 908 (O); III. Failure of fresh milk or concentrated whey to function as Castle's intrinsic factor or to potentiate the action of orally administered vitamin B_{12} (with G. A. Childs), 911 (O); IV. Administration into buccal cavity, into washed segment of intestine, or after partial sterilization of bowel, 915 (O); 933 (L); correction, 1014
UNITED STATES OF AMERICA:
Call-up of doctors, dentists, and allied specialists, 809
Cost of medical education, 1325
Dentists, 1425
Department of Defense and *U.S. Atomic Energy* Commission: *Effects of Atomic Weapons*, 1478
Fulbright travel grants, 1951–2, 1342
Government grants for visiting America, 1342
UNIVERSITIES:
Aberdeen: Degrees conferred, 896
Bagdad: A. M. Critchley appointed Professor of Public Health, 176
Belfast: Department of Student Health; second annual report, 1221
Examination results, 305
Birmingham: *Appointments and retirements*, 55, 305, 896, 1286, 1400 (correction)
B. N. Brooke appointed Reader in Surgery, 1286
Degrees conferred, 305
K. W. Donald appointed Reader in Medicine, 1286
Honorary degrees conferred, 117
Hostel for students, 1452
Lectures, 896, 1452
Hilda N. Lloyd, resignation from Chair of Obstetrics and Gynaecology, 1286
Bristol: Degrees conferred, 633
Examination results, 227, 1286
Cambridge: Appointments, 226, 465, 955, 1179, 1286
Degrees conferred, 226, 633, 1009, 1123, 1231, 1399
Examination results, 117
Raymond Horton-Smith Prize awarded to A. G. E. Pearse, 1286
Dublin: Degrees conferred, 227
School of Physic, Trinity College: Appointments, 226
Examination results, 305
Trinity College: Moyne Institute of Preventive Medicine, 899
Durham: Appointments, 227
Diplomas granted, 955
Examination results, 420
Lectures, 1340
Edinburgh: Degrees conferred, 465
Diplomas conferred, 465
Honorary degrees conferred, 226
Lectures, 55, 117, 686, 1009, 1179
R. A. Peters awarded Cameron Prize, 465
Scholarships, bursaries, and prizes, 466
Glasgow: Degrees conferred, 226, 305, 1123, 1399
Ireland: Fleming, Sir Alexander, conferment of hon. D.Sc. on, 173
Leeds: Appointments, 117, 305, 1009
M. J. Stewart appointed Emeritus Professor of Pathology, 1009
Liverpool: Examination results, 227, 955
Honorary degrees conferred, 156; correction, 232
London: *Appointments*, 55, 227, 420, 466, 633, 1340
Approved institutions for M.D. and M.S. degrees, 227
Charing Cross Hospital Medical School: winter session; inaugural address, 884
Degrees conferred, 1066
Diplomas granted, 1452
Examination results, 227, 305, 420, 1009, 1399
Hospitals recognized, 420, 1452
King's College Hospital Medical School; opening of winter session, 832
Lectures, 734, 896
Plan for new medical centre, 1400
Postgraduate Diploma in Psychological Medicine, 633
Recognized mental hospitals for M.B., B.S. degrees, 227
Representatives, 1452
Sanderson-Wells Lecture, 1286
Sanderson-Wells Prize, 1340
Teacher's recognized, 420, 1452
University College, B. Katz appointed Reader in *Physiology*, 466
Westminster Medical School; inaugural address, 885
Manchester: Appointments and retirements, 843
Examination results, 227, 1502
Lectures on history of medicine, 1179
Oxford: Degrees conferred, 305, 373, 633, 1066, 1286
Honorary degrees conferred, 373, 1231
Mass radiography, 898
Master of Surgery degree; new regulations, 1179
L. S. Penrose awarded Weldon Memorial Prize, 1399
Research into effect of injection of radioactive substances, 1179
St. Andrews: Degrees conferred, 117
Examination results, 117
Sheffield: *Appointments*, 227, 1009
Degrees conferred, 843
Syria: Faculty of Medicine, 523
Wales: Welsh National School of Medicine, 512
Examination results, 117, 1231, 1286, 1340
H. Scarborough appointed Professor of Medicine and Director of the Medical Unit, 117
University College Hospital, London; premature baby unit, 834
Urethane in chemotherapy of cancer, 1272
Urethra obstructed by crystals, 1445
— Post-operative paralysis of compressor urethrae; *aetiology*, prognosis and treatment, 1456
— sphincter guard (A. Wilfrid Adams), 1052
Urethritis, mycotic, treatment of, 1127
— *Non-Gonococcal Urethritis* (A. H. Harkness), 872

Urinal bottles, hygiene of, 1330
Urinary-tract infections, penicillin in, 618
— — treatment with streptomycin, 670
Urology: *Essential Urology* (Fletcher H. Colby), 334
— *Essentials of Urology* (J. C. Ainsworth-Davis), 401
— Institute of Urology, 508
Urticaria in *P. vivax* infection, 88
UTERUS:
Cancer; treatment with radium, indications and results, 637
Cervix, cancer of, 769 (L)
— cauterization for chronic cervicitis, 788
— Observations on symptomatology and treatment of erosion (Jean R. W. Ross), 647 (O); 788 (C), 1003 (C), 1119 (C)
— Spontaneous amputation (Ian F. MacMath), 498; 1061 (C)
— Treatment of erosion, *1183*
Inversion (J. M. B. Donaldson), 331
Pregnancy in rudimentary horn of bicornuate uterus (Douglas Latto and Richard Norman), 926 (O); correspondence, 1119
Prolapse; prevention and treatment (R. A. Lennie and others), 279
Retroversion associated with abortion, 126
rupture of, unrecognized, 1117
Sepsis from unabsorbable sutures (John Howkins), 659; 949 (C), 1279 (C)
Technique of ventrosuspension, 1448
Vaginal hysterectomy for complete rupture during labour (A. H. C. Walker), 1205
Utidjian, Haigouni Dikran Absalom, obituary of 1395

V

VACCINATION:
Certificates required by foreign governments, 215, 416, 530, 682
local reaction to; dangers of subsequent inoculation, 1128
Post-vaccinal encephalitis, 738
Reactions, 1013
Sensitization to calf lymph, 424
Smallpox in the unvaccinated, 107, 220, 300, 463
Vaccine lymph, bacterial contamination of, effects of *penicillin and streptomycin* on (*V.* - N. Krishnamurthy), 1035 (O)
— — storage of, 1455
with negative results, 690
Vaginal examination in virgins, without anaesthetic, 1291
Vagotomy, gastric ulcer as sequel to (D. M. Morrissey), 651 (O); 893 (C), 950 (C)
— technique and effects, 1346
VAHRMAN, J.: Neurological complication after combined diphtheria and pertussis immunization, 608
— *See* RAMSAY, A. Melvin, 367
Van Meter Prize Award, 1069
VANNIASINGHAM, T. W.: Pethidine in anaesthesia, 1334
Varicose ulceration (Gunnar Bauer and others), *269*
— — method of treatment with rubber sponge, 1456
— — so-called: treatment by division of popliteal vein (Gunnar Bauer), 318 (O); 338 (A); 529 (C)
— veins, injections, unpleasant sequelae of, 689
— — methods of marking, 1446
— — treatment (Reginald T. Payne), 1323
VARTAN, Keith: Chorion carcinoma after ectopic gestation, 871
Vasomotor collapse after chloramphenicol, 1334
Vasotomy, effects of, 689
VAUGHAN, B. D.: Early rising for puerperal women, 890
VAUGHAN-JACKSON, O. J.: Distinction awards, 835
Vein, *popliteal; division in treatment of so-called* varicose ulceration (Gunnar Bauer), 318 (O); 338 (A); 529 (C)
Veins: *Primer of Venous Pressure* (G. E. Burch), 1370
— varicose. *See* Varicose veins
VELLACOTT, W. N.: Aid to intubation, 1113
Vellore Hospital and Medical College; Golden Jubilee celebrations, 844, *1123*
Vena cava, inferior; syndrome of obstruction in childhood (Harry Engelman, E. G. Hall, and R. Spencer), 752 (O)
Venereal diseases; chemotherapy, 351
— — *Textbook of Venereal Diseases* (R. R. Willcox), 989
VENNING, G. R.: Displaced registrars, *1329*
VERE-HODGE, E. H.: Treatment of intestinal helminths, 358; correction, 470
Vernix caseosa contaminating caesarean wounds (Percy Malpas), 763
Vertex presentation, malpositions of; management (Hector R. MacLennan), 800 (O); correspondence, *1172*
Vertigo epidemica, 1493
Vesiculitis, tuberculous; diagnosis and treatment, 178
Vibration, mechanical, therapeutic value of, 415
VICKERS, H. E.: Inflammability of ethyl chloride, 625
VIDEBAEK, Aage. *See* MOJBECH, Johannes, 390, 1059
Vincent, Clive Rowland Bishop, obituary of, 531, 734
Vincent, Jean Hyacinthe, obituary of, 1393
Vincent Memorial Laboratory: *The Cytologic Diagnosis of Cancer*, 820
VINTER, F. Jean: Care and management of laboratory animals, 1176
Virus proteins, 1241
VISCHER, A. L.: Post-mortem findings in the aged, 363
Vision, loss of, 1482 (L)
— Some aspects of colour-blindness (E. N. Willmer), 1141 (O)
— Some effects of polarized light on vision, 50
Visual acuity testing in *small* surgery, 847
— aids in teaching; some mechanical aids to instruction (Robert Ollerenshaw and Peter Hansell), 488 (O); 678 (C), 784 (C)
— education: The medical teaching film, 519
VITALI, M., and KOHN, J.: Treatment of painful amputation stumps, 415
Vital Statistics, weekly table: *56, 118, 174, 228, 305,* 375, 421, 466, 533, 580, 634, 686, 734, 790, 843, 897, 955, 1010, 1067, 1126, 1182, 1231, 1287, 1341, 1403, 1455, 1505
Vitamin A deficiency; effect on foetus, 576, 730
— — deprivation in man, 932 (L)
— — Effects of hypervitaminosis A on foetal mouse bones cultivated *in vitro* (Honor B. Fell and Sir Edward Mellanby), 535 (O); 565 (L)
— — in bird plasma, 537
— B_{12}: absorption in pernicious anaemia (C. C. Unley), 905 (O), 908 (O), 915 (O); (with G. A. Childs), 911 (O); 933 (L); correction, 1014
— — content of liver extracts, 1357
— — effect on neuropathy in pernicious anaemia treated with folic acid (H. Fuld), 147 (O); 417 (C), 527 (C)
— — in disseminated sclerosis, 59
— — in pernicious anaemia, 585, 671; correction, *960*
— — present knowledge of, 348
— C; influence of ascorbic acid on healing of corneal ulcers in man (T. A. S. Boyd and F. W. Campbell), 1145 (O)
Vitamins and peanuts, 310
Vivisection (parliamentary note), 1178
— Protection of laboratory animals, 724, 888, 951, 1114, 1389
VOGT, Marthe: Regulation of secretion of cortical hormones, 1242 (O)
VOIGT, Mary: Mosquito bites, 178
Volvulus, acute, of stomach (P. Quinet), 1259
— of sigmoid causing intestinal obstruction during late pregnancy (D. W. James), 24
— of small intestine, 1392; 399 (A. J. Hobson)
— of transverse colon complicating labour (Archie G. Murray), 659
Vomiting during menstruation, 177
— treatment of, 719 (A); 836
Vulva, kraurosis of; treatment, 121
Vulvovaginitis in child due to Shigella flexneri (W. J. McGinness and R. C. Telling), 1424

W

WADE, Phyllis: Radiation in the shoe shop, 730
WAINWRIGHT, D.: Femoral lengthening in leg equalization, 1216
WAKELEY, Sir Cecil: Inaugural address, Westminster Medical School, *885*
— presented with Honorary Medal of Royal College of Surgeons, 956
— and CHILDS, Peter: Appendicitis, 1347 (O); 1375 (A)
WAKSMAN, Selman A.: Streptomycin and neomycin; an antibiotic approach to tuberculosis, 595 (O); *615 (A)*
— *The Actinomycetes*. Their Nature, Occurrence, Activities, and Importance, 930
Wales: Welsh National School of Medicine. *See* Universities: Wales: Welsh National School of Medicine
WALFORD, A. A.: Refusal to appear in court, 1176
WALKER, A. H. C.: Vaginal hysterectomy for complete rupture of uterus during labour, 1205
— *See* JELLIFFE, D. B., 814
WALKER, A. J.: Treatment of post-phlebitic leg and application of venous-pressure measurement, 1307 (O); 1495 (C)
WALKER, C. B. V.: "Cambridge" exchange transfusion *outfit, 1441*
WALKER, H. B.: Training for general practice, 676
WALKER, Kenneth: Diagnosis and treatment of male infertility, 45
— *A Doctor Digresses*, 401
WALKER, M. M.: Safety in prams, 1120
WALKER, T.: Para-aminosalicylic ointment for leg ulcer, *1119*
WALLACE, A. B.: Burns; treatment by exposure, 360
WALLER, H. K.: Breast feeding; breast tension, 351
WALLEY, G. J. *See* ARDEN, G. P., 1094
Wallin, J. E. Wallace: *Children with Mental and Physical Handicaps*, 990
WALLIS, Hugh R. E.: Training for general practice, 622
WALSH, R. Crosbie: Domiciliary treatment of tuberculosis, 525
WALSHE, F. M. R.: Humanism, history, and natural science in medicine, 379 (O); correspondence, 524, 623, 676, 677, 783, 943, 1057, 1114
WALSHE, J. M.: Acute liver disease, 1002
— Fulminating staphylococcal pneumonia treated with massive doses of chloramphenicol and penicillin, 1313
Walter, J., and Miller, H.: *Short Textbook of Radiotherapy for Technicians and Students*, 333
WALTER, L. H.: Hodgkin's disease and pregnancy, 47
War memorial, 156 (A); 463
— — and Epsom College, *1057*
— neurosis; battle exhaustion, 788
Ward, Bernard Joseph, obituary of, 463
Ward, John Forbes, obituary of, 111, 171
WARD, R. Ogier: *Chlorinated swimming-pools and* poliomyelitis, 625
WARNER, E. C.: Distinction denied, 1060
WARNOCK, J. G.: Obstetrical anaesthesia, 218
WARRACK, A. J. N.: Unusual case of tuberous sclerosis, *1367 (O)*
WARREN, Marjory W.: Activity in advancing years, 353; 921 (O); *correspondence*, 1120, 1175
Warts, treatment of, 729
— — with wart-weed and spurge, 584, 729
Water supply: Minister of Health: *Interim Report of Departmental Committee on the Deterioration of Cast Iron and Spun Iron Pipes*, 196
Water-divining, 59
Watford Pregnancy Diagnostic Centre; review of one year's work (H. Schwabacher), 328 (O)
WATKINS, A. G., and JACOBS, J.: Delayed feeding of premature infants, 106
WATSON, C. J.: Porphyrin metabolism and porphyria, 574
WATSON, R. D. *See* COCHRAN, J. B., 1411
Watt, Robert, obituary of 531
WAUCHOPE, G. M.: Vascular changes in diabetes, 368
— Indications for globin insulin, 949
WAUGH, W. Grant: Intra-articular injections for arthritis, 60
— Osteoarthritis and occupation, *948*
WEATHERHEAD, E.: Emergency tucotomy, 1059
— Protection of laboratory animals, 1115
WEBB, Lowell: Tailed races, 1120
WEBBER, Brian: A dromedary has one hump, 682
WEBB-JOHNSON, Lord: Royal Medical Benevolent Fund, 887
— awarded Honorary Medal of Royal College of Surgeons, 422, 633, 1066
Weber, F. Parkes (Editor): *Further Rare Diseases and Debatable Subjects*, 446
WEBSTER, J. H. D.: Treatment of sea-sickness, 952
Weed-killers; do they poison food?, 462
Weil-Felix reaction in Q fever, 309
WEINER, W., and HALLUM, Jean L.: Follow-up of rhesus-negative primigravidae; development of rhesus immunization, 868 (O)
WEITZMAN, David: Displaced registrars, 1277
Weldon Memorial Prize awarded to L. S. Penrose, 1399
Welfare foods (parliamentary note), 843
Wellcome Foundation: Gift to library of Royal Society of Medicine, 1011
— Museum of Medical Science, 519
WELLS, A. V.: Hookworms in the throat, 1173
Welsh National School of Medicine, 512. *See* Universities: Wales
WEST, H. F.: Haematemesis from leeches, 784
West Midlands Physicians Association, 1068
Westminster Medical School; inaugural address, 885
WETHERILL, G. G. *See* WILLIAMS, J. F., 1427
WHIGHAM, J. R. M.: Rectal prolapse, 1346
WHITBY, Sir Lionel: The advance of medicine, 832
— Can disease be prevented?; Sir Charles Hastings Lecture, 1272
— and Britton, C. J. C.: *Disorders of the Blood*, 6th ed., 929
Whitlows, treatment of, 231
WHITTINGHAM, Sir Harold E.: Inoculation certificates required abroad, 530
WHITTLES, J. H.: Do weed-killers poison food?, 462
WHITWELL, F.: Pathological changes in bronchiectasis, 356
WHOOPING COUGH:
Atelectasis and bronchiectasis in pertussis (A. W. Lees), 1138 (O); 1162 (A); correspondence, 1331, 1448
Epidemiological note, 1504
Immunization; neurological sequelae (J. Vahrman), 608
— poliomyelitis following, 251
Inoculation and poliomyelitis; statistical investigation in England and Wales in 1949 (A. Bradford Hill and J. Knowelden), 1 (O); 28 (L); correspondence, 166, 220, 1391
Vaccine, reactions to, 231
— value of, 60
WIENER, Alexander S.: Auto-antibody formation and disease, 163
WIGFIELD, Arthur S.: Chemotherapy in venereal diseases; interference with immunity, 352
— Prophylaxis against syphilis, 470
WIGGINS, C. A.: Fatal case of acute porphyria in a negro, 866 (O)
WILKINSON, D. S. *See* SHORVON, H. J., 1300
WILKINSON, J. F.: Present knowledge of vitamin B_{12}, 348
— Pernicious anaemia and gastric carcinoma, 576
William Hyde Award, 1179
Willcox, R. R.: *A Texthook of Venereal Diseases*, 989
WILLIAMS, Bryan: Uterus, prolapse; delivery after repairs, 280
WILLIAMS, D. I.: B.A.L. in treatment of arsenical and other metallic poisonings, 352
— Sulphapyridine for dermatitis herpetiformis, 525

Williams, J. F., and Wetherill, G. G.: *Personal and Community Hygiene Applied*, 1427
WILLMER, E. N.: Colour vision in the central fovea, 278
— Some aspects of colour-blindness, 1141 (O)
Willmore, James Graham, obituary of, 1500
WILLOUGHBY, Hugh: Dead bodies in water, 1277
Wills, 119, 230, 307, 468, 688, 791, 957, 1124, 1180, 1233, 1289, 1343, 1401, 1453
WILSON, Andrew, and others: Clinical evaluation of effects of drugs on medical students as a teaching method, 484 (O); 501 (L)
WILSON, C. J.: Prickly heat, 1292
WILSON, C. P.: Carcinoma of the larynx, 356
WILSON, Dagmar C., and SUTHERLAND, Ian: Further observations on the age of the menarche, 862 (O)
WILSON, Edric: Marking varicose veins, 1446
WILSON, J. Greenwood: Aftercare by health visitors, 291
— appointed chairman of council, Royal Sanitary Institute, 736
WILSON, James L. *See* JOSLIN, Elliott P., 1293
WILTON, T. N. P.: *Anaesthesia in the newborn*, 292
WINCHESTER, J. W. *See* HARRIES, J. R., 217
WINSTON, R.: The G.P. at the crossroads, 299
WINTERBOTTOM, E. H., and DUNDEE, J. W.: Collapse during spinal analgesia, 527
Wireless: Medicine by radio, 890, 1060
WISEMAN, A.: Multiple primary carcinoma, 297
WITH, P. A.: *Prickly heat, 1292*
Witness, medical; refusal to appear in court, 1176, 1392
WITTS, L. J.: The difficulty in medical education, 622
Woerdeman, M. W., hon. D.Sc. (Oxford) conferred on, 373
WOHLZOGEN, F. X. *See* FRAZER, J. F. D., 330
Wolf, Hermann: *Klinik der Zahn-, Mund- und Kiefer-Krankheiten*, 254
WOLFF, F. W.: Cushing's syndrome presenting with features of a "*Type II*" *nephritis, 1037*
Women in medicine, 822 (L); 833, 887
WOOD, Paul: Cardiac neuroses, 33
— Cardiac failure, 268
WOOD, Paul: Congenital heart disease; review of its clinical aspects in the light of experience gained by means of modern techniques, 639 (O), 693 (O); 717 (L); 840 (C), 1174 (C)
Woodcock, Herbert de Carle, obituary of, 841
Woodham-Smith, Cecil: Florence Nightingale, 1820–1910, 1315
Woodward, Joan: *Employment Relations in a Group of Hospitals*, 41
WOOLF, B. *See* GIRDWOOD, Ronald H., 1357
World Federation for Mental Health; 3rd annual meeting, 422, 620
WORLD HEALTH ORGANIZATION:
Activities in Western Pacific, 342
Appointments, 581, 1154
Child health, 804
Director-General's speech in London, 1049; correction, 1346
Expert Committee on Biological Standardization; international standards published, 1472
Expert Committee on rabies, 823 (L)
Expert Committee on Unification of Pharmacopoeias, 1179
Health services for children, 468
Joint report of I.L.O./W.H.O. Committee on Hygiene of Seafarers, 813
Malaria control in East Bengal, 589
— — projects in India, Thailand and Afghanistan, 816
Mission to Korea, 844
Review of work, 725
Tuberculosis in South Korea, 102
Withdrawal of Poland, 581
Yaws campaign in Indonesia, 783
World Medical Association; Fourth General Assembly, 1041 (L)
Worrall, R. L.: *Energy and Matter*, 402
WRIGHT, B. M.: Erythrocyte sedimentation in anaemia, 1445
Wright, G. Payling: *An Introduction to Pathology* 499
WRIGHT, Harold N., and Montag, Mildred: *Textbook of Pharmacology and Therapeutics*, 255
WRIGHT, J. L.: *Hodgkin's disease and pregnancy*, 296
WRIGHT, Joyce: Typing of *Bact. coli*, 460
WRIGHT, Sewall: Genetical structure of populations, 36
WYANT, Gordon M.: Rectal thiopentone in children, 368
WYBURN, G. McC.: Tissue grafting, 284

X

Xanthoma palpebrarum associated with cardiovascular disease (*P. P. McKinney*), 1259
X rays. See Radiology; Radiotherapy

Y

Yaws in Haiti, 668 (A)
— *incidence and treatment in Uganda, 676*
— W.H.O.–Unicef campaign in Indonesia, 783
YELLOWLEES, David: Optimism in mental hospitals, 729
Young, F. B., appointed member of Medical Research Council, 468
YOUNG, F. H.: Management of pulmonary tuberculosis, 97
Young, H. T. P., appointed Inspector of Retreats, 176
Young, James Carruthers, obituary of, 732

Z

Zechmeister, L.: *Progress in Chromatography*, 1938–1947, 1316
ZINNEMANN, K.: Sulphonamide sensitivity of *H. influenzae strains, with special reference to* the combined use of antibacterial drugs, 705 (O)
ZOUTENDYK, A., and GEAR, J. H. S.: Lupus erythematosus—an auto-antibody disease?, 1175
ZUCK, D.: Modification of Boyle's apparatus, 787
ZWIERZ, M.: Treatment of tropical ulcers, 49

KEY TO DATES AND PAGES

The following table gives a key to the dates of issue and the page numbers of the BRITISH MEDICAL JOURNAL and SUPPLEMENT in the second volume for 1950.

Serial No.	Date of Issue	Journal Pages	Supplement Pages
4669	July 1	1– 60	1– 12
4670	„ 8	61– 122	13– 26
4671	„ 15	123– 178	27– 32
4672	„ 22	179– 232	33– 64
4673	„ 29	233– 310	65– 76
4674	Aug. 5	311– 378	77– 84
4675	„ 12	379– 424	85– 90
4676	„ 19	425– 470	91– 94
4677	„ 26	471– 534	95– 98
4678	Sept. 2	535– 584	99–124
4679	„ 9	585– 638	125–130
4680	„ 16	639– 690	131–136
4681	„ 23	691– 738	137–138
4682	„ 30	739– 794	139–142
4683	Oct. 7	795– 848	143–152
4684	„ 14	849– 902	153–164
4685	„ 21	903– 960	165–174
4686	„ 28	961–1014	175–180
4687	Nov. 4	1015–1072	181–190
4688	„ 11	1073–1128	191–202
4689	„ 18	1129–1184	203–208
4690	„ 25	1185–1236	209–220
4691	Dec. 2	1237–1292	221–234
4692	„ 9	1292–1346	235–244
4693	„ 16	1347–1404	245–250
4694	„ 23	1405–1456	251–254
4695	„ 30	1457–1506	255–264

INDEX TO SUPPLEMENT FOR VOLUME II, 1950

A

ABRAHAMS, Sidney: Negotiations through Whitley machinery, 262
Accident, road; failure to treat, 120, 135, 141, 168
Accidents and professional secrecy, 138
Africa, East and Central: Colonial Medical Service salaries, 31, 166, 264
Aftercare, 111, 185
Ambulance services; report of Select Committee on Estimates, 92
Amending Acts Committee, 156, 178
Anaesthetics, fees for administration of, 110
— Dental anaesthetic fees, 40
— given by trainee assistants, fees for, 30, 110
— in midwifery, 102
— — — fees for, 48
Anaesthetists Group Committee, 158
ANTHONY, E.: Whitley machinery, 32
— Financial difficulty in Essex, 190
Appliances approved for prescription, 108, 155
Arbitration: Independent court of arbitration, 84, 92, 97, 98, 124

ARMED FORCES:
Armed Forces Committee, 151, 156
Army: Appointments and retirements, 12, 164, 233, 249
Regular Army Reserve of Officers: Appointments and retirements, 75, 138, 249
R.A.M.C.: Appointments and retirements, 12, 63, 75, 89, 98, 138, 142, 164, 201, 233, 264
Emergency Commissions; Appointments and retirements, 12, 142, 233, 249, 264
Short-service commissions, 240
Supplementary Reserve of Officers: R.A.M.C.: Appointments and retirements, 233, 264
Territorial Army: R.A.M.C.; Appointments and retirements, 63, 89, 98, 164, 249, 254
Territorial Army Reserve of Officers: R.A.M.C.; Appointments and retirements, 63, 98, 138, 249, 264
Arrangements for future mobilization of medical officers, 126, 169
Conscription, 200, 243
Extended service of doctors, 152
Eye examinations of recruits, 128
Indian Medical Service: Appointments and retirements, 63, 98, 233
Irish doctors and military service, 212
National service for doctors in medical grades III and IV, 247
— — medical officers, disadvantages of, 135, 170
— — part-time, 227
Pay; deputation to Ministers, 29; further representation, 155
— increases, 125, 172, 228, 231, 254
Professional secrecy, 125
Promotion, 199
Protection of practices on call-up, 139
Reinstatement of demobilized service personnel in doctors' lists, 110
Royal Air Force: Appointments and retirements, 63, 98, 233
R.A.F.V.R.: Appointments and retirements, 63, 98, 233
Royal Canadian Navy: Appointments and retirements, 75
Royal Navy: Appointments and retirements, 12, 75, 138, 201, 249
R.N.V.R.: Appointments and retirements, 12, 75, 138, 201, 249
Service in relation to house-officer appointments, 247
Temporary release from the Forces, 110
Ashridge: Week-end discussion group, 247
Assistants: 3, 109, 122, 200
— and unestablished doctors; special group asked for, 239
— maximum numbers of patients allowed for, 30
— not permitted to practice obstetrics, 263
— permanent, definition of, 109
— — pay in general practice, 137
— poor prospects in general practice, 172, 200, 207, 219, 243, 254
— superannuation payments of, 109
— trainee, 109
— — abolition proposed, 179
Assistants and Young Practitioners subcommittee, 83, 212

ASSOCIATION: *See*
British Medical Association
Executive Councils' Association
Irish Medical Association
National Ophthalmic Treatment Board Association
Socialist Medical Association
ATKINSON, E. C.: More scientific opportunities, 73
— Terms of slavery, 232
Australia: Health Service; free medicine scheme, 125
— To Brisbane and back (Angus Macrae), 27
Australian branches: Election of members of Council to represent the South Australian, Tasmanian, Victorian, and Western Australian branches for the period 1950–2, 142
Autonomous bodies, 33, 34

B

Babies, registration of, in National Health Service, 111
BAILEY, J. Shackleton: Status of general practice, 25
— A free profession ?, 198
— Officials with maps, 230
BARBER, C. H.: The war memorial, 170
BARWELL, T. E.: Professional secrecy and accidents, 138
Basic salary, 101, 184
BATTEN, Lindsey W.: Cui bono ?, 190
BELL, J. A.: Status of general practice, 83
BENSTED-SMITH, W. F.: N.H.S. and politics, 263
BICKMORE, G. H.: War memorial, 142
Birth control, advice on, 60
BLAIR, G. L. McCall. *See* SMITH, W. L. Winslow, 179
BLAQUIERE, H. M.: Obligation to emergency cases, 168
BLOWERS, Robert: War memorial, 75
Board and lodging deductions during absence on holiday, 96
Branch surgeries, 206
BREACH, A. C. E.: Tribunal and medical services committees, 168
BREESE, M. C.: Disciplinary powers of B.M.A., 26
Brisbane and back (Angus Macrae), 27

BRITISH MEDICAL ASSOCIATION:
Annual General Meeting, 59, 65
Annual Meeting, Liverpool and Southport, 1950; Arrangements at Representative Meetings, 124
Committee on Organization of Scientific Sections, 161
Dinner, 67
Exhibition, 70
Pathological museum, 70
President, induction of, 59
Programme, 13; amended, 28
Religious services, 69, 70
Annual Meeting in South Africa, 1951, 58, 167
Special Arrangements Committee, 160
Annual meeting of Executive Councils and Local Medical Committees conference; clash of dates, 169
Annual Representative Meeting, 1950, 33 (corrections, 82), 143
Correspondence on report of, 84, 89
Dinner, 58
Motions and amendments from Divisions and Branches, 4
Annual Representative Meeting, 1951, 84
Caribbean conference, 240
Charles Hastings Clinical Prize Essay Competition, 90
Committees for 1950–1, 156
Council for 1950–1, 156
— elections, 57
— proceedings, 59, 65, 191, 221
— Scottish representation on, 191, 213
Disciplinary powers, 26
Elections, 49
Film Library; additions, 64, 76, 87, 173
Finance and buildings, 193
— treasurer's report, 150
Financial statement, 150
Glasgow office opened, 175
Gold Medal presented to J. P. S. Jamieson, 27
Katherine Bishop Harman Prize, 63
Leadership needed, 217
Library; Additions, 76, 129, 136, 138, 173, 250, 252
— rules, 232
Maritime Subcommittee, 201
Nurses, prizes for, 233
Occupational Health Prize, 63
Overseas branches, 50
— members; conference, 66
Pharmaceutical Society and Joint Committee on, 161
President for 1951–2, 59
Public Relations Department, 242, 262
Representative Meetings, conduct of, 72
future procedure, 143

BRITISH MEDICAL ASSOCIATION (*continued*):
Royal College of Nursing Liaison Committee, 161
Scholarships in aid of scientific research, 201, 250
Scottish House; reference library facilities, 212
Scottish representation on Council, 213
Secretary's request to resign, 58
— resignation of Charles Hill and appointment of Angus Macrae, 191
Students; prize essay competition, 63
Treasurer's report, 150
T.U.C. and, Joint Committee of, 161
War memorial, 35, 49, 62, 74, 89, 94, 98, 128, 135, 170, 261
— — description and illustration, 131
West Africa; proposed Branch in Nigeria, 213
British Medical Guild, 66, 87, 144, 153, 182, 193, 214, 218, 223, 231
— — — Circular on National Health Service, 154
— — — Withdrawal of practitioners from the Service, 139
British Medical Journal: Journal Committee, 157; report, 148
British Medical Students' Association; 9th annual general meeting, 229
British Pharmacopoeia; use of Latin titles, 239
BROWNE, Robert: Assistants in general practice, 200
BUCHANAN, A. M.: The J.H.M.O. grade, 32
Building Committee, 160; report, 151
BUXTON, R. J.: Merit awards, 61

C

Calls, frivolous, 185
Canada: Medical exchanges between British and Canadian doctors, 240
Cancer and Radiotherapy Advisory Committee, 31
Capitation fee, 74, 171
— — in Scotland, 196
— — increase of, 171
Caribbean Conference of B.M.A., 240
CARROLL, Charles H.: Four days lost, 62
Cars, 177
— Income-tax allowance, 178
CASTILLO, R.: Trainee assistants, 231
Central Consultants and Specialists Committee. *See under* Consultants and Specialists
Central Ethical Committee, 157, 260
— — — Powers of B.M.A. in regard to members, 149
Central Health Services Council, 30
Central Practitioners' Fund; basis of calculation, 101
Certificates from practitioners not on N.H.S., validity of, 249
— from unregistered practitioners, 50
— General Medical Services Committee Report, 107
— Refusal to sign death certificates, 243
— withholding of, after withdrawal from N.H.S., 182, 198, 210, 221, 248, 262
CHALON, J.: Prescribing of drugs advertised to public, 199
Change of doctor, 42, 103, 137, 171, 201, 208, 252
Channel Islands: Reciprocal health service agreement, 125
Charities Committee, 157
Charles, Sir John; inaugural address at annual meeting of Executive Councils' Association, 194
Charles Hastings Clinical Prize Essay competition, 90
— — festival, 1951, 126
Chemists: Isle of Man dispute, 188, 212, 239, 246
— Scottish, payment of, 92
— — withdrawal from National Health Service, 125, 134
— Ulster chemists defer resignation, 155
Chest physicians, remuneration of, 246
CLARKE, R. E.: Status of general practice, 25
CLAY, A. A.: Increasing the capitation fee, 171
Clerical work of a doctor's surgery; a motion-study investigation (E. D. Willis and Anne G. Shaw), 132; correspondence, 169, 178
Collier, John William Paterson, disciplinary case of, 236
COLLINGWOOD, G. Eve: Training of nurses, 26
Collis, Eugene Wlodzimierz, disciplinary case of, 238
Colonial Medical Service, 12, 66, 84, 142, 164, 201, 233
— — — Interchange with National Health Service, 137
— — — Salaries in East and Central Africa, 31, 166, 264
Colonies and Dependencies Committee, 157
Compensation and Superannuation Committee, 160
— for goodwill of practice, 39, 61, 186
— — — final date for claims, 203, 239, 247
Conscription, 200, 243

CONSULTANTS AND SPECIALISTS:
Appointment of, 210
Central Consultants and Specialists Committee. 156
Report to Council, 52
Relationship to Joint Committee and Whitley machinery, 165
Special meeting to consider Ministry of Health circular on registrar grades, 245
Distinction awards, 61, 263
Domiciliary visits, 11, 54
General-practitioner specialists, 145
Mileage fees, 55
part-time distinction awards for, 263
Prospects, 53
"Sub-consultants," 56
Survey of 250 domiciliary visits, 10
Whole-time posts, 54
Contraception advice, 60
COOPER, G. H.: Status of general practice, 127
Council, B.M.A., 1950–1, 156
— Elections, 57
— proceedings, 59, 65, 191, 221
— Scottish representation on, 213
COVENTON, A. W. D.: One profession, 32
COX, Alfred: The war memorial, 98
Cremation regulations, 176
CRIDLAND, Nigel: *Merit awards*, 263
CRONIN, Thomas J.: Withholding certificates, 262
CROSBY, G. J. V.: General practitioners and hospitals, 208
CROWN, S.: Disciplinary powers of B.M.A., 26
Currency, foreign; applications for visits abroad by hospital medical and dental staff, 134

D

DAIN, H. Guy: Public relations, 242
Dain Fund; report of Trustees, 1949–50, 195
DAVIES, F. M. E.: Jobs and jobless, 219
DAVIES, G. L.: *Inside the N.H.S.*, 231
DEAKIN, H. V.: The war memorial, 94, 128
DEBENHAM, G. P.: "Posting" of house officers, 248
Defence Trusts, 112
Definition of Drugs Joint Subcommittee of Central and Scottish Health Services Councils; report on classification of toilet preparations, 83
Dental anaesthetics, fees for administration of, 40, 110, 185
— operations, emergency treatment following, 110
Dentists, remuneration of, 143, 219
Dermatitis, industrial; ethical aspects, 177
Dermatologists Group Committee, 158
Diagnostic facilities, 47
DILL, A. V.: *Ship surgeon's life*, 88
Disability: Fate of the disabled doctor, 169
Disciplinary cases, publicity for, 105
— machinery; Medical Advisory Committee, 104
Dispensing capitation fee, 113
— Doctors paid on prescription basis; permission to issue prescriptions to be dispensed by chemist, 10
Distinction awards, 61
— — for part-time specialists, 263
DOCTORS: *See also* Consultants and Specialists; General Practitioners; Hospitals, medical officers
and hospital management committees, 44, 83, 129
Change of doctor, 42, 103
— — — new arrangements, 137, 171, 201, 208, 252
Doctor-patient relationship; week-end course at Ashridge, 188
Extended National Service, 152
lists, numbers on, 62, 107, 183
Remuneration of doctors and dentists compared, 219
Treating oneself, 216
Domiciliary consultation arrangements, 11, 54
DOWLER, H. G.: Arrangements at Representative Meetings, 124
DRUGS: *See also* Prescribing
Additions to list of special drugs, 166
Approved names of medicines, 140
Classification, 24
Discount on, 207
Expensive drugs, 107, 178
Prescribing of drugs advertised to public, 199
Testing of drugs and appliances, 109
DRYLAND, G. W.: Public relations, 171
DUPRE, P.: School Health Service and the general practitioner, 135
Durham County Council; trade union membership a condition of employment, 209, 223, 226, 240, 262

E

EASON, E. H.: Fair conscription, 243
East Africa: Colonial Medical Service; salaries, 31, 166
East Norfolk Division, adjustment of area, 244
Education: Training of the general practitioner, 146
EDWARDS, W.: Public relations, 242
ELLIOTT, F.: War service, 169
Emergency calls, 135, 141, 168
— — fees for, 176
— — frivolous and unjustified, 43, 110
Emigrants, fees for examination of, 87, 176
— *x*-ray examination of, 61
Emoluments, residential, 11, 197
Enfield and Potters Bar Division, 124, 180
Epileptics under health and insurance schemes, 88
Essex, financial difficulty of doctors, 190
Ethics: Central Ethical Committee, 157, 260
— Powers of B.M.A. in regard to members, 149
EVANS, M. L. Hudson: Eye examinations of recruits, 128
Examinations, leave for, 197
Executive Councils' Association, annual meeting, 194
Eye examinations of recruits, 128

F

Faculty of Ophthalmologists, 96; correction, 130; meeting of council, 213
Family Doctor, 193
Fees for Part-time Work under Local Authorities Joint Committee on, 161
Fellowship for Freedom in Medicine; annual general meeting, 213
FILMS:
Committee, 35, 160
Demonstrations at Annual Meeting, 71
Library; additions: 64, 76, 87, 173
X-ray films, ownership of, 216
Finance Committee, 157
First aid in industry, 177
Flatley, Gerald Donagh, name restored to *Medical Register*, 239
Form E.C.1 redrafted, 109
Formulary Committee of British Medical Association and Pharmaceutical Society, Joint, 161
FORSTER, A.: Pharmacy more remunerative, 61
FRAIS, J. A.: Answer charges, 128
— M.P.U. scheme, 219
FRANKLIN, L. M.: Change of doctor, 171
— and others: Appointments at St. Paul's Cray, 232
FREETH, J. W. O.: Clear demands, 180
Full-time Non-professorial Medical Teachers, Laboratory and Research Workers Group Committee, 158

G

GEMMELL, John: Assistants in general practice, 200
GENERAL MEDICAL COUNCIL:
178th session: Disciplinary cases, 236
178th session: President's address, 235
Council and the Medical Bill, 1
Approved names of medicines, 140
Connexion with Royal College of Surgeons, 240
Disciplinary delays, 240
Increase of registration fees, 167
GENERAL MEDICAL SERVICES COMMITTEE: 37, 40, 49, 51, 157, 251
Assistants and Young Practitioners Subcommittee, 212
Attendances at meetings, 114
Election of direct representatives, 1950–1, 167
First meeting of new session, 206; correction, 1292 (*Journal*)
Inquiry into remuneration, 81
Members, 99
Nominees on Ministry of Health Distribution Committees, 100
Preparations for collection of resignations, 139
Report for 1949, 99
Representation on B.M.A. Committees, 100
Secretaryship, 187
Special conference, 3
Statement of year's work, 181
Wand, S., appointed Chairman for 1949–50, 99
Withholding of certificates, 259
General Medical Services Subcommittee (Scotland), 4, 112, 251
GENERAL PRACTICE:
Applications to start practices, 122
Assistants, 3, 137
— *poor* prospects of, 172, 200, 207, 219, 243, 254
Compensation, 39, 61, 186, 203, 239, 247
Difficulties of entry into practice, 74, 262
Entering general practice, 232
Exchanges, 104, 123
Experiment in group practice (B. Rosefield), 28
General Practice Review Committee, 87, 160
— — — — Inquiry into general practice, 239, 243
in Northern Ireland, 95
in Scotland, 196, 217
Motion-study investigation into the clerical work of a doctor's surgery (E. D. Willis and Anne G. Shaw), 132; *correspondence*, 169, 179
Protection of practices during call-up, 127, 139, 252
Rural areas, 230
Shortage of accommodation, 121
Survey by Medical Practices Committee of number of general practitioners practising in England and Wales, 77, 188
Vacancies, 112, 122
The way divides (Frank Gray), 85; *see also Journal*, p. 524
GENERAL PRACTITIONERS:
Attendance at training camps, 112
Circular from Ministry of Health, encouraging doctors to certain areas, 196
GENERAL PRACTITIONER (*continued*):
Committee on Association of General Practitioner with Hospital Work, 160
Distribution, 121
The G.P.'s job, 84, 94
G.P.s as employed persons, 171
Handbook for general practitioners, 155
Hospital work, 22, 106, 144, 186, 208, 261
— — Access to maternity hospitals, 103
— — Cottage hospitals, 3, 55, 107
— — *Designations*, 145
— — Hospital management committees, 44, 83, 106, 129
— — Interim report of Council, 56
— — Kingston and Malden Victoria Hospital dispute, 214, 242, 247, 253, 262
— — Practitioners on hospital staffs, 189
— — Representation on Regional Hospital Boards and Hospital Management Committees, 106
— — Surgery, 145
Maternity services, 126
More scientific opportunities, 73
Occupational risk of medical practice, 170
Remuneration, 180, 132; 198 (C); 206, 243, 263
— Basic salary, 101, 184
— Distribution of central pool, 197
— Doctors and dentists compared, 219
— General Medical Services Committee inquiry, 81
— Preparation for termination of contracts, 18; 74 (C)
Relation to specialist, 32
School Health Service, 111, 135, 148, 185
— Staffs of cottage hospitals, 106
Specialist, 145
Status, 22, 25, 37, 83, 127
Terms and conditions of service, 73, 100, 128, 168
Training, 146
"Unestablished" 259
Withdrawal. *See* National Health Service, withdrawal from
Gibbons, Leslie: A.R.M. correction, 84
GIBSON, H. J. *See* KINDERSLEY, Charles E., 88
GILBERT, J. C.: Fight now, 201
GIRBY, Adair: Count their blessings, 243
GITTINGS, F. C. B.: Disciplinary machinery in the N.H.S., 189
GLEN, T. M.: Refusal to sign death certificates, 243
GODFREY, M.: Group practice, 74
GOLDMAN, L.: Obligation to emergency cases, 141
GORSKY, J. Arthur: Independent court of arbitration, 92, 97
GRANT, Basil S.: Return to private practice, 62
— 80% resignations, 179
GRANTHAM-HILL, C.: Examination for hospital reserve, 219
GRANTON, G. R.: Withholding certificates, 248
GRAY, Frank: The way divides, 85. *See also Journal*, p. 524
GREGSON, A. H.: The G.P.'s job, 94
GRIFFITHS, A.: S.H.M.O. grade, 219
GRIFFITHS, Philip: Expensive life, 263
Group practice, an experiment in (B. Rosefield), 28; 74 (C)

H

Hackney, Henry Charles Coutts, name restored to *Medical Register*, 239
HAMILTON, Frank: Improving the prescription pads, 172
Hamilton, William, name restored to *Medical Register*, 239
Handbook for general practitioners, 155
HANS, Stanley: Medical patenting, 26
HARBOUR, A.: Payment in the Health Service, 62
HARDMAN, A. P.: Are G.P.s working ?, 73
— Difficulties of the G.P., 168
Harman Prize, 63
HARRIS, D. V.: Pay of doctors and dentists, 219
HARRIS, H. M.: Obligation to emergency cases, 141
HARRIS, Paul: Difficulty of entering general practice. 262
HART, S. S.: Change of doctor, 171
HARTLEY, Leslie: "Closed shop" at Durham, 231
HARWOOD, Robert P.: Obstetrics forbidden to assistants, 263
Hastings festival, 1951, 126
Health centres, 30, 104
— — at Sheffield, 198, 218
— — Committee, 160
— — *Subcommittee; interim report*, 114
Health education in schools, 111
Heard at Headquarters: 96, 189, 227, 240, 247, 252, 260
HEATH, Christopher: *The war memorial*, 135
Heredity versus environment, 252
Hill, Charles, resignation from secretaryship of B.M.A., 191
HODGSON, Stanley: Withdrawing from Health Service, 218
Holidays and pay, 75
HOLZER, R. S.: The J.H.M.O. grade, 32
Hopkins-Husson, Frederick James, disciplinary case of, 237
HOSPITALS:
Administration, 30, 141, 221, 245
Advisory Committees, 54
Beds; pay-bed regulations, 211
HOSPITALS (*continued*):
Economy in prescribing, 72
Expenditure, 225
— Cost accounting, 83
General practitioners in, 22, 106, 144, 186, 208, 261
— — and hospital committees, 44, 83, 106, 129
— — in cottage hospitals, 3, 55, 107
— — designations of, 145
— — Interim report of Council, 56
— — hospital staffs, 189
— — Representation on Regional Hospital Boards and Hospital Management Committees, 106
House officers; liability to additional duties, 248
Junior medical posts; classification of, 134
Kingston and Malden Victoria Hospital dispute, 199, 212, 214, 224, 242, 247, 253, 262
Locumtenent expenses, claims for, 247
Maintenance, payment by patients for, 55
Management committees, 129
— — representation of G.P.s, 106
Medical administrative officers of regional hospital boards, medical superintendents, and regional psychiatrists, remuneration of, 53, 166, 211
Medical officers; emoluments, 11, 197
— — conditions of service of, 211
— — grading of, 52
Organization; courses in domestic administration, 141
Out-patient departments, restriction to consultant work, 54
Part-time appointments, 172
Records: Loan of patients' records, 211
Regional Boards; relationship to Ministry, 1
— — plans of, 56
Registrars. *See* Registrars
Secretaries and other officers in postgraduate teaching hospitals; salaries, 208
Senior Hospital Medical Officer grade, 52, 61, 162, 178, 219, 246
Staff consultative committees, 72
— courses in domestic administration, 141
— junior hospital medical officer grade, 32
Teaching hospital appointments, 210
HUNT, Edward F.: Vaccination, 62
HUTCHIN, Kenneth C.: No mass resignations, 230
— Public Relations, 262

I

Immunization campaign, 148
— fees, 11, 46, 105
INCOME-TAX:
Allowance for car, 178
Assessment of basic salary, 261
Employment of "mother's help," 96
Relief for cost of extension of professional accommodation, 178
Scholarships, 134
Superannuation contributions, 247
Visitors from abroad, 178
Inducement Fund, 112
— payments, 123
Industrial Injuries Insurance; new regulations, 227
Industrial medical officers; salary scales, 177
— — — work of, 94
Infectious diseases, notification of, 107
Inoculation and poliomyelitis; doctor acquitted of negligence, 215
— of merchant seamen, fees for, 134
International Health Certificate, fee for, 96
International Medical Visitors Bureau, 260
International Relations Committee, 160
Ireland: Irish doctors and military service, 212
Irish Medical Association; annual meeting, 1951, 215
— — — Presidential Address, 1950, 82
Isle of Man: Chemists' dispute, 166, 188, 212, 239, 246
— — — Prescription charge, 166

J

Jamieson, J. P. S., presented with Gold Medal of British Medical Association, 27
JARVIS, H.: Change of doctor, 201
JONES, D. Gwyn: Strike action, 219
JONES, E. Idris: Survey of 250 domiciliary visits, 10
JONES, Ifan H.: War memorial, 75
JONES, Maurice H.: Withhold certificates, 198
Junior hospital medical officer; grade, 32
Journal Committee, 157; report to Council, 148

K

Katherine Bishop Harman Prize, 63
KELLERMAN, F.: The S.H.M.O. grade, 178
KEMP, Francis W.: G.P.s as employed persons, 171
KENNEDY, K. R.: Maximum lists, 74
KINDERSLEY, Charles E., and GIBSON, H. J.: Registrars, 88
Kingston and Malden Victoria Hospital dispute, 199, 212, 214, 224, 242, 247, 253, 262

L

LAMB, R.: Emoluments for hospital officers, 11, 197
LANDER, O. Ll., Co-operation between Health Services, 26
LANGFORD, F.: Vaccination fees, 11
LEAK, W. N.: Conduct of Representative Meetings, 72
— General-practitioner and consultant surgeons, 241
LEE, T. J.: Disciplinary machinery in the N.H.S., 218
LEESON, Harold: Withdrawal from Health Service, 170
— British Medical Guild, 218
Leeward Islands Branch; adjustment of area, 180, 264
Library; additions, 76, 129, 136, 138, 173, 250, 252
— rules, 232
Lists, numbers on, 62, 107, 183
LIVESEY, Frank: Independent inquiry into general practice, 243
Local Authorities; practitioners as members of committee, 176
— — representation of profession on, 144
LOCAL MEDICAL COMMITTEES:
Annual Conference of Representatives, 162, 181, 231
— — and annual meeting of Executive Councils; clash of dates, 169
— — Dinner, 187
— — resolutions considered by British Medical Guild, 194
Statutory levy for, 96

M

MCCLUSKEY, Conn: Shilling on prescriptions, 244
MCDOWELL, James G.: Obligation to emergency cases, 135
MCGREGOR, Donald: Change of doctor, 171
MCLEAN, I. E. D.: Leadership needed, 217
MCLEAN, R.: 80% resignations, 217
MACRAE, Angus: To Brisbane and back, 27
— appointed Secretary of B.M.A., 191
MADWAR, A.: Change of doctor, 171
MAIDEN, A. M.: Approach M.P.s, 230
MANNING, A. D.: Assistants in general practice, 200
Manx Chemists dispute, 166, 188, 212, 239, 246
— Health Service; new regulations, 166
Maritime Subcommittee of B.M.A., 201
MARSHALL, R. S. V.: Reform of N.H.S., 128
MARTINDALE, V. H.: Three things needed, 244
MASON, C. E. A.: Holidays and pay, 75
MASTERS, T. W.: Failure of Sheffield Health Centre, 218
Maternity and Midwifery Advisory Committee, 31
Maternity medical services, 95, 102, 166, 184
— — — Control of midwifery services, 198
— — — Drugs and dressings, 103
— — — Emergencies, 103
— — — Maternity cases at hospital, 56
— — — Mileage payments, 103
— — — Role of general practitioner, 126
MATTHEW, P. C.: "Removal or transfer," 89
Medical Act (1950), 229
Medical Advisory Committees, 31, 44
Medical Bill, 1
Medical Insurance Agency; Glasgow branch opened, 136
Medical officers of health. *See* Public Health Service
Medical Practices Committee, 100
— — — second report, 121, 139
— — — Survey of general practice, 77, 188
Medical Practitioners' Handbook, 192
Medical Practitioners' Union: Representation on Whitley Council, 259
— — — Scheme for negotiations, 219
Medical Service Committees: Constitution, function and procedure, 104, 168, 184, 189, 199, 207, 218
Medical Service Subcommittees, 41
Med-Legal: Inoculation and poliomyelitis; doctor acquitted of negligence, 215
Melrose, William, disciplinary case of, 237
Mental Health Advisory Committee, 31
— hospital patients, 107
Merchant seamen: Vaccination and inoculation fees, 105, 134
Merionethshire and Montgomeryshire Division, dissolution of, 190, 250
Merit awards, 61, 263
Midwifery. *See* Maternity medical services; Obstetrics
Migrants, examination of, 87
Mileage Fund and petrol, 40
— payments, 100
— — in maternity cases, 103
— — in rural districts, 40, 183, 207
— — in Scotland, 4, 113, 251
— — to specialists, 55
MILLMAN, C. Guy: The S.H.M.O. grade, 179
Mine accidents, liability to attendance at, 105
MINISTRY OF HEALTH:
Circular on hospital expenditure, 225
Circular on Registrar grades, 196, 204, 212, 225, 231
— on senior hospital medical officers' grade, 162
— to general practitioners, 196
Ministry of Pensions treatment sessions; fees, 252
Money: Applications for foreign currency, 134
MONRO, Nigel Harold Maurice Russell, disciplinary case of, 237
MORGAN, T. W.: Threatened hospitals, 199, 248
MURRAY, D. Stark: Hospital threatened, 242

N

National emergency, arrangements for, 185
National Formulary, 49, 188
NATIONAL HEALTH SERVICE:
Advisory Appointments Committees, 91
Amending Bill, 207
Amendment Act: Scilly Isles, 249
Appeal machinery; procedure for settling individual disputes, 95
Appliances and reagents approved for prescription, 108, 155
Arbitration: Independent court of arbitration, 84, 92, 97, 98, 124
Branch surgeries, 206
British Medical Guild circular, 154
Capitation fee, 74, 171, 196
Central pool, distribution of, 197
Change of doctor, 42
— — new arrangements, 137, 171, 201, 208, 252
Compensation for practices, 39, 61, 186
— final date for claims, 203, 239, 247
Co-operation between Health Services, 26
Disciplinary machinery, 189
Distinction awards, 61
— — for part-time specialists, 263
Distribution of moneys, 51
Drawbacks, 231
Economy in the Service, 253
Epileptics under health and insurance schemes, 88
Finance; report of Committee of Public Accounts, 95
— in Scotland, 177
Financial difficulty in Essex, 190
Handbook for general practitioners, 155
Interchange with Colonial Medical Service, 137
Lists, maximum numbers on, 62, 107, 183
Manx chemists' dispute, 188, 212, 239, 246
Maternity medical services. *See under* Maternity medical services
National Formulary, 49, 188
National Health Service Acts, 36
Need for reform, 128
Negotiations with Ministry, 51
Ophthalmic Services. Supplementary, 260
Physiotherapy facilities, 96
Politics and the N.H.S., 263
Prescribing. *See under* Prescribing
Refusing patients, 141
Registrars. *See* Registrars
Registration of babies, 111
"Removal or transfer," 75, 89
Remuneration. *See* Remuneration
Residents, temporary, 102, 252
Resignation. *See* National Health Service, withdrawal from
(Service Committees and Tribunal) Amendment Regulations (1950), 29
Spectacles, 87; correction, 96
Strike action, 219
Superannuation, 102
Terms and conditions of service; clear demands, 180
Tuberculosis and National Health Service, 192
Ulster chemists defer resignation, 155
The way divides (Frank Gray), 85. *See also Journal*, p. 524
Whitley machinery, 32, 167
Withdrawal, 62, 87, 135, 170, 182, 201, 217, 218, 221, 232
— British Medical Guild circular, 154
— majority necessary for, 179, 217, 230, 242
— possible effects of, 135, 170
— Preparations for collection of resignations, 139
— Three months' notice, 244
— Three things needed, 244
— Unite the profession, 241
National Hospital Reserve Service, examination for 219
National Ophthalmic Treatment Board Association, 197
National service; call-up of doctors, 152
— — for doctors in medical grades III and IV, 247
— — Medical Boards Disablement Advisory Committee, 111
— — medical officers, disadvantages of, 135, 170
— — part-time, 227
NEELY, Guy: Ruins, 219
NEILL, W. Davan: "Removal or transfer" 75
New Zealand Branch: J. P. S. Jamieson presented with Gold Medal of Association, 27
NICHOLAS, J. W.: The doctor's clerical work, 179
Night visit, definition of, 110
North of England Branch, 64
Northern Ireland: Chemists defer resignation from National Health Service, 155
— — General practice, 95
Nurses, medical examination of, 111
— prizes for, 233
— Salaries, 128
— Training, 26
Nursing Advisory Committee, 31
Nutrition, Committee on, 160

O

OBSTETRICS:
Anaesthetics in midwifery, fees for, 48
Beds, 48
Drugs and dressings, 103
Emergencies, 103
Forbidden to assistants, 263
Maternity and Midwifery Advisory Committee, 31
Maternity cases at hospital, 56
Maternity medical services, 95, 102, 166, 184, 198
Mileage payments, 103
Role of general practitioner in maternity services 126
Occupational Health Committee, 157, 177; report, 148
Occupational Health Prize, 63, 90, 130, 173, 201, 234
O'CONNOR, Donald M.: Obligation to emergency cases, 136, 168
ODLUM, Doris: Domiciliary consultations by full-time consultants, *11*
O'Driscoll, Florence Joseph, disciplinary case of, 238
O'FARRELL, P. T. O.: Presidential address to Irish Medical Association, 82
"Open" areas, 104
Operations, assisting at, remuneration for, 60
Ophthalmic Advisory Committee, 31
— Group Committee, 159
— — — Members elected, 142
— Services, Supplementary, 260; amending regulations, 95
Ophthalmologists, Faculty of, 96; correction, 130; meeting of Council, 213
Organization Committee, 157; report, 151
Orthopaedic Group Committee, 159
Otolaryngologists Group Committee, 159
Overseas members; conference, 66
Oxygen supplies, 108

P

Pakistan: All-Pakistan Medical Conference, 247
Parliament: Approach to M.P.s by Divisions of B.M.A., 230
Parliamentary Elections Committee, *161*
Partners and assistants; maximum permitted list, 109
Partnership agreements, 123
— — *in* Scotland, 4, 113
— Inducement payments, 101
PASMORE, H. Stephen: G.P.s on hospital staffs, 189
Patenting, medical, 26
Pathology: Consulting Pathologists Group Committee, 158
Patients: Change of doctor, 42, 137, 171, 201, 208, 252
— Lists, maximum numbers on, 62, 107, 183
— maximum numbers allowed for assistants, 30
Pay-bed regulations, *211*
Pension and insurance schemes for doctors and their employees, 112
Periodicals, cost of, income-tax allowance for, 60
PERREDES, J. F.: Pharmacy and medicine, 127
Petrol and the Mileage Fund, 40
— tax, 102
Pharmacists. *See also* Chemists
— Circulation of lists to general practitioners, 108
— Salaries, 62, 127, 143
Physical Medicine Group Committee, 159
Physiotherapy, 105
— in country districts, 3
— in National Health Service, 96
Pneumoconiosis, 177
Pneumonia, notification of, 207; correction, 1292 (*Journal*)
Police calls, fees for, 176, 251
— reports, and breach of confidence, 247
Poliomyelitis and inoculation; doctor acquitted of negligence, 215
Popular health journal, 193
PORTEOUS, P. B.: Organizing our clerical work, 169
— Distribution of Central Pool, 197
PORTER, Alan S.: Hospital taken, 218
PORTER, D. S.: Tuberculosis and the N.H.S., 264
POWER, John Hale: The G.P.'s job, 84
Practices. *See* General practice
Practitioner, unqualified, "covering" of, *111*
PRESCRIBING:
Charge for prescriptions; new regulations in Manx Health Service, 166
— Shilling on prescriptions, 244
Doctors paid on prescription basis; permission to issue prescriptions to be dispensed by chemist, 107
Economy in hospital prescribing, 72
— in prescribing, 108
Expensive drugs, 107
— — payment on account for, 178
Improvement of prescription pads, 172
Joint Subcommittee of Central Health Services Council, 30
No absolute restriction, 24
Preparations not drugs or medicines, 107
Proprietary medicines, 141, 199
Residential schools and institutions, 107
Rubber stamp or signature ?, 216
PRICE, Lois E. N.: Fair conscription, 200
PRIDHAM, J. A.: The World Medical Association, 2
— Unite the profession, 241
Private patients, in hospitals, charges for, 55
— — provision of medicines and appliances for, 49
— practice, 192
— — Committee, 157, 251; report, 150
— — — Regulations for cremation, 176
Prizes: Sir Charles Hastings Clinical Prize Essay competition, 90, 136, 173, 220, 233
— Essay competition for medical students, 63, 90, 130, 174, 202, 234
— Katherine Bishop Harman Prize, 63, 90, 130, 174, 202, 250
— Occupational Health Prize, 63, 90, 130, 173, 201, 234
— Prizes for nurses, 233
Professional secrecy in the Forces, 125
Proprietary medicines, prescribing of, 141, 199
Psychiatry and the Law, Committee on, 161
— *domiciliary consultations in*, 192
Psychological Medicine Group Committee, 159
Public Health Committee, 158, 176
— — — "Closed shop" in Durham, 209, 223, 226, 240, 262
— — — report of, 148
Public Health Service Defence Trust, 176
— — — Medical Officers, Advisory Committee re Salaries of Whole-time, 159
— — — — Industrial Court for examination of salaries, 87, 246
— — — — — Salaries, 246
— — — — — Salary award by Industrial Court, 255
— — — — — Terms and conditions of service, 155
Public relations; letters to lay press from practitioners, 171
— — *Committee*, *161*; *report to Council*, 151
— — Department, of B.M.A., 212, 262
PURVES, J. Ewart: Withholding certificates, 249

Q

Questions answered: 88, 96, 125, 134, 178, 197, 216, 247, 261

R

Radiologists Group Committee, 159
Reagents permitted under National Health Service, 155
REES, J. O. M.: Independent court of arbitration, 124
Refresher courses, 111
— — grants for, 46
Regional Hospital Boards; representation of G.P.s, 106
— medical officers, part-time, *186*
— — — reports of general practitioners to, 110
REGISTRARS, 88
Appointment, 91
Junior, abolition of, 212
Reduction in numbers appointed; Ministry of Health circular, 196, 204, 212, 225, 231
— Central Consultants and Specialists Committee on, 245
— Joint Committee disagrees with Minister, 245
— Views of Joint Committee, 225
— — of Manchester Region Registrars Group, 260
Registrars Group, 174, 215, 241
— — Committee, 159
— — Manchester meeting, 260
— — statement on reduction in numbers of registrars, 226
Rehabilitation units; scale of sessional fees, 177
REMUNERATION, 62, 100, 182, 198, 206
Basic salary, 101, 184
Chest physicians, 246
Clear demands, 180
Committee on Co-ordination of Policy re Remuneration, 160
Count their blessings, 243, 263
Distribution of central pool, 197
Doctors and dentists compared, 219
General Medical Services Committee inquiry, 81
general practitioners on staffs of cottage hospitals, 106
— — preparation for *termination of contracts*, *13*; 74 (C)
General practitioner and consultant surgeons, 241, 261
Medical officers in Armed Forces, 155, 254
Medical superintendents, regional administrative medical staff, and regional psychiatrists, 166, 211
Public Health Service, 246, 255
Representative Body Agenda Committee, 159
— Meetings; arrangements, 124
— — conduct of, 72
— — future procedure, 143
Residents, temporary, 252
Resignation. *See* National Health Service, withdrawal from
REZLER, H.: Meeting of unestablished doctors, 207, 254
RICE-EDWARDS, J. T.: Part-time appointments, 172
ROE, C. Watney: Hospital threatened, 262
ROSEFIELD, B.: An experiment in group practice, 28; 74 (C)
— Withdrawal from N.H.S., 135
ROWE, J. B. Wrathall: War memorial, 89
ROWORTH, Guy: Doctors and hospital management committees, 83
Royal College of Surgeons; Connexion with General Medical Council, 240
RUSSELL, Victor: Disciplinary machinery in N.H.S., 199
— 80% resignations, 217

S

Sack, Eric Leonard Neil Shorten, disciplinary case of, 236
St. Lucia, adjustment of area of, 180
Salaries of Medically Qualified Teachers, etc., Committee on, 161
SAMUEL, H. S.: Protection of practices, 127
SAPWELL, John: Obligation to emergency cases, 168
SAYLE-CREER, W.: Doctors and hospital management committees, 129
Scholarships and income-tax, 134
— in aid of scientific research, 201, 250
School Health Service and the general practitioner, *111*, *135*, *148*, *185*
Science Committee, 158; report to Council, 151
Scilly Isles: National Health Service Amendment Act, 249
SCOTLAND:
Chemists, payment of, 92
— withdrawal from National Health Service, 125, 134
Cost of Health Service, 177
Differential capitation fees, *196*
Dispensing capitation fee, 251
General Medical Services Subcommittee (Scotland), 4, 112
General practice, 196, 217
Mileage payments, 251
Representation on Council, 191, 213
Scottish Committee, 158, 212
— — vacancy on, 180
Scottish House of B.M.A.; reference library facilities, 212
Seamen, fees for vaccination and immunization of, *105*, *176*
— treatment of, 110
SEARLE, C. W. A.: Change of doctor, 208
Secrecy, professional, and accidents, 138
Secretary of B.M.A.; resignation of Charles Hill and appointment of Angus Macrae, 191
Selection Committee on Estimates; report of ambulance services, 92
Senior Hospital Medical Officer; grading, 52, 61, 162, 178, 219, 246
Service Committee regulations; deputies and assistants, 29
Services. *See* Armed Forces
SHAW, Anne G. *See* WILLIS, E. D., 132
Sheffield Health Centre, 198, 218
SHEPHERD, C. W.: Distinction awards for part-time *specialists*, 263
Ship surgeon's life, 88
Ship surgeons: Maritime Subcommittee of B.M.A., 201
SIBLEY, E. G.: General practitioners and hospitals, 261
Sichel, A. W. S., elected President for 1951–52, 59
Signature: Rubber stamp or signature ?, 216
SKENTELBERY, N.: Hospital threatened, 247
SMITH, Ralph G.: Hospital threatened, 253
SMITH, W. L. Winslow, BLAIR, G. L. McCall, and WALLACE, C. P.: 80% resignations, 179
Socialist Medical Association; annual general meeting, 88
Spa Practitioners Group Committee, 159
— treatment, 112
— — Committee re Report on, 161
Special Inducement Fund, 101
Specialists. *See* Consultants and Specialists
Spectacles under National Health Service, 87; correction, 96
STEPHEN, A.: Failure of Sheffield Health Centre, 198
STRADLING, Peter: The S.H.M.O. grade, 178
Students, medical, tuberculosis in, 229
— prize essay competition for, 63
Subsistence allowance, 88
Superannuation, 23, 48, 186
Surgeons, general-practitioner and consultant, remuneration of, 241, 261
Surgery, major, and the general practitioner, 145

T

Telephones: Charges, 111
— Facilities for unattended doctors' telephones, 252
Temporary residents, 102, 252
TENNENT, R. A.: Control of Midwifery Service, 198
THOMSON, E. J.: The B.M.A. war memorial, 62
THURSTON, Gavin: Difficulties of entry into practice, 74
Toilet preparations, 83
Toward, Ethel Grundy, disciplinary case of, 236
Trade union membership a condition of employment in Durham, 209, 223, 226, 240
— — — local authorities requiring, 26, 29, 62, 87, 92, 134, 172, 190, 208, 210, 233, 244

T[rea]t[men]t, emergency, fee for, 106
— [pri]vate, definition of, 106
Trinity House district medical officers; fees, 252
Tuberculosis Advisory Committee, 31
— among medical students, 229
— and the National Health Service. 192, 264
— Group Committee, 159
— officers, 264
— treatment, problem of, 143
TUCKER, Hugh M.: Refusing N.H.S. patients, 141
— Occupational risk of medical practice, 170

U

Ulster chemists defer resignation, 155
Unemployment benefit: Medical examination of claimants where capability for work is in doubt, 111
U.S.A.: Medical exchanges between *British* and American doctors, 240

V

Vacancies, filling of, 103, 184
Vaccination campaign, 148
— fees, 11, 46, 105
— — in Scotland, 4
— of merchant seamen, fees for, 134
VEITCH, H. C.: Withdrawal from Health Service, 170
Venereal disease: Treatment in Scotland, 113
Venereologists Group Committee, 159
VICARY, P. M.: War memorial, 74

W

WALLACE, C. P.: Independent court of arbitration, 84
— *See* SMITH, W. L. Wislow, 179
WALLER, W. E.: The war memorial, 128
Wand, S., appointed Chairman of General Medical Services Committee for 1949–50, 99
War: Arrangements for future mobilization of medical officers, 11, 169
— Memorial, 35, 49, 674, 89, 94, 98, 128, 135, 170, 261
— — Committee, 161
— — Description and illustration, 131
WATERFIELD, Noel E.: Clash of dates, 169
WATKINSON, Margaret: Nurses' salaries, 128
Welsh Committee, 158
West Norfolk Division; adjustment of area, 244
Westminster and Holborn Division, 254
WHITEHOUSE, C. Spence: Vaccination fees, 11
Whitley Council machinery, 32, 167, 192, 262
— — and compulsory arbitration, 38
— — and dual appointments, 176
— — regional appeals committees, 177
— — representatives, 12
Whole-time posts, 54
WIGFIELD, Arthur S.: Trading, 61
WIGODER, Robert: Numbers on lists, 62
— Wages compared, 74
WILLIAMS, Illtyd Gwyn, disciplinary case of, 239
WILLIS, E. D., and SHAW, Anne G.: Motion-study investigation into the clerical work of a doctor's surgery, 132; correspondence, 169, 175
WILSON, Ralph N.: The Industrial Medical Officer, 94
Winchester Division, 64
Withdrawal from National Health Service, 62, 87, 135, 170, 182, 201, 217, 218, 221, 232
— British Medical Guild circular, 154
— majority necessary for, 179, 217, 230, 242
— possible effects of, 135, 170
— Preparations for collection of resignations, 139
— *for termination of contracts*, 18; 74 (C)
— Three months' notice, 244
— Three things needed, 244
— Unite the profession, 241
WOODHOUSE, H. B.: Disciplinary machinery in N.H.S., 199
— Economy in the health service, 253
WOOLF, L. S.: Three months' grace, 244
WOOLLEY, Walter: General practitioner maternity services, 126
World Medical Association, 189
— — — (J. A. Pridham), 2
— — — finance of, 227
WRIGHT, E. T., and others: British Medical Guild, 231
WYNROE, A.: Assistants in general practice, 207

X

X-ray examination of emigrants, 61
— films, ownership of, 216



Published at the Office of the British Medical Association, Tavistock Square, W.C.1, and printed by Fisher, Knight and Co., Ltd., Gainsborough Press, St. Albans

471-484, 496 : 501, 1273

SECRETARIAT LIBRARY
22 OCT 1952
MADRAS GOVERNMENT

1273

1306